Twinning Project EE2003/IB/EN/03
CHRIS number 2003/005-026.09.02

Final report
Part I

Development of Estonian Fuel Quality Management System

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Final report

Part I



MINISTRY OF THE ENVIRONMENT

Federal Ministry
for the Environment, Nature Conservation
and Nuclear Safety

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Author/Editor: Twinning Project EE2003/IB/EN/03
Revised: Ene Kriis, Kristiina Nikkel, Joel Valge, Peter Möller, Priit Alumaa
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1 Content

2 Introduction

2.1 Starting points and background

Environmental issues are on the focus of national and international policies. The European Union has taken the responsibility to develop and implement appropriate response systems within the territory under its legislation to improve the situation or to avoid the deterioration of the environment concerned. Air quality was identified as one the target area. Among several factors with impact on air quality the transport sector was subject to legal actions. One aspect of the transport emissions was the quality of fuels in terms of efficiencies, reduction or exclusion of sulphur and lead and the reduction of aromatic components. The basic EC Directive elaborated with the aim to improve the quality of fuels, Directive 98/70/EC, came in force in 1998.

When Estonia applied for membership in the European Union it was already clear that environment would be one of the key areas of membership. The European Union developed a strategy to prepare Candidate Countries (CC) for membership by linking administrations of CC's and Member States (MS) in the framework of specific projects. This kind of support called PHARE support implemented in the form of joint Twinning projects, focused on the areas of political priorities, environment being one of them.

In the area of fuel quality, different challenges needed to be overcome:

- The Ministry of the Environment (MoE) and the Ministry of Economic Affairs and Communications (MoEAC) were confronted with poor quality of fuel in the Estonian market;
- The Energy Market Inspectorate found that 65% of diesel samples taken from Estonian fuel terminals during the first 4 months of 2002 did not comply with the Estonian standards for fuel quality;
- The Association of the Estonian Motor Vehicles Sales and Service Companies claimed that repairing cost due to poor fuel quality have risen in 2000 to 192 000 EUR;
- The Consumer Protection Board had also several cases of quarrels dealing with poor fuel quality;
- The Tax and Customs Board was confronted with declining size of excise revenues due to fraudulent actions against fuel quality or smuggling across border;
- The Estonian Environment Research Centre (EERC) was/is the leading laboratory under MoE to take fuel analyses but is lacking necessary resources to upgrade laboratory in short term to analyse fuels according to European standards;
- The Fuel quality monitoring programme for implementation of Directive 98/70/EC and supplementary Directives have not been introduced.

A due response to overcome this challenging situation was to start a twinning project supplemented by supply contract – development of a national fuel laboratory.

- Estonia initiated the required procedures for twinning and procurement in 2001.
- Germany was selected as a twinning partner on 6 October 2003.
- The Twinning Covenant covering the activities, time schedule and budget was conditionally approved by the Steering Committee on 28 April 2004.
- Estonia acceded to the European Union on 1 May 2004.
- The project started in September 2004.

2.2 Outline of the report

The final report consists of two parts. The first part will comprise of :

- description of the project;
- conclusions;

- reports on all activities accomplished;
- supporting documentation regarding training.

The second part will cover training activities on new lab equipment, intercalibration, accreditation and additional support concerning IT information system, oil data system and campaign to raise awareness about fuel quality.

2.3 Project description

2.3.1 Objectives (guaranteed results)

The aim of the project was to create a functioning fuel quality management system (FQMS) in Estonia. The FQMS is a co-coordinated, well-balanced system for the performance of the tasks of all authorities in fulfilling the European Union (EU) fuel quality legislation to ensure optimum, synchronized sampling activities, analyses and cost-effectiveness.

The project performed an institutional assessment and developed recommendations for an optimum institutional set up and arrangements to run the FQMS. Moreover, it elaborated joint sampling and analysis schemes for all stakeholders, identified training needs and conducted general as well as specific training sessions. Furthermore, it established the FQMS (fuel monitoring and analyses for environmental, customs and market surveillance purposes), developed relevant data provision schemes, installed hardware for the IT system, adjusted and installed software for the IT system and developed laboratory Quality Assurance/Control System and accreditation of the laboratory.

The established project results were:

- Recommendations for optimum institutional set up and arrangements to run the FQMS;
- The overall FQMS including environmental, customs and market surveillance components for petrol and diesel;
- Trained staff;
- The Quality Assurance and Control System;
- The laboratory is accredited and operating.

2.3.2 Acquis communautaire

Fuel quality and emissions

COUNCIL DIRECTIVE 93/12/EEC of 23 March 1993 relating to the sulphur content of certain liquid fuels (amended by 98/70 and 99/32)

COUNCIL DIRECTIVE 1999/32/EC of 26 April 1999 relating to a reduction in the sulphur content of certain liquid fuels and amending Directive 93/12/EEC

EUROPEAN PARLIAMENT AND COUNCIL DIRECTIVE 98/70/EC of 13 October 1998 relating to the quality of petrol and diesel fuels and amending Council Directive 93/12/EEC

EUROPEAN PARLIAMENT AND COUNCIL DIRECTIVE 94/63/EC of 20 December 1994 on the control of volatile organic compound (VOC) emissions resulting from the storage of petrol and its distribution from terminals to service stations

EUROPEAN PARLIAMENT AND COUNCIL DIRECTIVE 1999/94/EC of the European Parliament and of the Council of 13 December 1999 relating to the availability of consumer information on fuel economy and CO_2 emissions in respect of the marketing of new passenger cars

DIRECTIVE 2003/17/EC of the European Parliament and of the Council of 3 March 2003 amending Directive 98/70/EC relating to the quality of petrol and diesel fuels

COMMISSION DECISION 2002/159 of 18 February 2002 on common format for submission of summaries of national fuel quality data

COUNCIL DIRECTIVE 70/157/EEC of 6 February 1970 on the approximation of the laws of the Member States relating to the permissible sound level and the exhaust system of motor vehicles

Amended by:

73/350/EEC	77/212/EEC	81/334/EEC	84/372/EEC	84/424/EEC
87/354/EEC	89/491/EEC	92/97/EEC	96/20/EC	1999/101/EC

COUNCIL DIRECTIVE 70/220/EEC of 20 March 1970 on the approximation of the laws of the Member States relating to measures to be taken against air pollution by gases from positive-ignition engines of motor vehicles

Amended by:

74/290/EEC	77/102/EEC	78/665/EEC	83/351/EEC	88/76/EEC
88/436/EEC	89/458/EEC	89/491/EEC	91/441/EEC	93/59/EEC
94/12/EC	96/44/EC	96/69/EEC	98/69/EC	98/77/EC
1999/102/EC	2001/1/EC	2001/100/EC	2002/80/EC	2003/76/EC

COUNCIL DIRECTIVE 72/306/EEC of 2 August 1972 on the approximation of the laws of the Member States relating to the measures to be taken against the emission of pollutants from diesel engines for use in vehicles

Amended by:

89/491/EEC	97/20/EC	2005/21/EC

COUNCIL DIRECTIVE 88/77/EEC of 3 December 1987 on the approximation of the laws of the Member States relating to the measures to be taken against the emission of gaseous pollutants from diesel engines for use in vehicles

Amended by:

91/542/EEC	96/1/EEC	1999/96/EEC	2001/27/EC

COMMISSION RECOMMENDATION 2000/304/EC of 13 April 2000 on the reduction of CO_2 emissions from passenger cars

DIRECTIVE 2003/30/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 8 May 2003 on the promotion of the use of biofuels or other renewable fuels for transport

DIRECTIVE 2005/33/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 6 July 2005 amending Directive 1999/32/EC as regards the sulphur content of marine fuels

Customs

Customs Code

COUNCIL REGULATION (EEC) No 2913/92 of 12 October 1992 establishing the Community Customs Code with amendments

COMMISSION REGULATION (EEC) No 2454/93 of 2 July 1993 laying down provisions for the implementation of Council Regulation (EEC) No 2913/92 establishing the Community Customs Code with amendments

Movement and Storage

COUNCIL DIRECTIVE 92/81/EEC of 19 October 1992 on the harmonization of the structures of excise duties on mineral oils

COUNCIL DIRECTIVE 92/12/EEC of 25 February 1992 on the general arrangements for products subject to excise duty and on the holding, movement and monitoring of such products

Excise Law

COUNCIL DIRECTIVE 92/82/EEC of 19 October 1992 on the approximation of the rates of excise duties on mineral oils

VAT

COUNCIL DIRECTIVE of 17 May 1977 on the harmonization of the laws of the Member States relating to turnover taxes - Common system of value added tax: uniform basis of assessment with amendments

Energy

COUNCIL DIRECTIVE 2001/77/EC of 27 September 2001 on the promotion of electricity produced from renewable energy sources in the internal electricity market

COUNCIL DIRECTIVE 2001/80/EC of 23 October 2001 on the limitation of emissions of certain pollutants into the air from large combustion plants

Air Quality (limit values and exchange of information)

FRAMEWORK DIRECTIVE 96/62/EC on ambient air quality assessment and management

COUNCIL DIRECTIVE 99/30/EC on Sulphur Dioxide, Nitrogen Dioxide and Oxides of Nitrogen, Particulate Matter and Lead in Ambient Air

COUNCIL DIRECTIVE 92/72/EEC on Tropospheric Ozone Pollution

Directive 2000/69/EC relating to limit values for benzene and carbon monoxide in ambient air

COUNCIL DIRECTIVE 2001/81/EC of 23 October 2001 on national emission ceilings for certain atmospheric pollutants

COUNCIL DECISION 97/101/EC of 27 January 1997 establishing a reciprocal exchange of information and data from networks and individual stations measuring ambient air pollution within the Member States

COUNCIL DECISION 2001/752/EC of 17 October 2001 amending annexes to Council Decision 97/101/EC establishing reciprocal exchange of information and data from networks and individual stations measuring ambient air pollution within the Member States

DIRECTIVE 2002/3/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 12 February 2002 relating to ozone in ambient air

DIRECTIVE 2004/107/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 15 December 2004 relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air

2.3.3 Contents of Twinning Project

2.3.3.1 Structure of the Twinning Project

The Twinning project was implemented in five Components:

A. Institutions for control of fuel quality

1. Analysis of tasks and responsibilities, identification of gaps in institutional set-up
2. Recommendations for optimum institutional set-up and arrangements to run the FQMS by application of lean management methodology
3. Staff capacity
4. Institutional assessment summary report

B. National fuel quality monitoring programme

1. Design of a national fuel quality monitoring programme (environment)
2. Development of the full FQMS
3. Data provision and reporting schemes
4. Further activities in the area of compliance
5. Co-operation with the oil industry in Estonia
6. Transparency of fuel product quality
7. Description of the FQMS and final report

C. Training

1. Training needs assessment report and general project training plan
2. Training on general principles of fuel directives implementation and management of FQMS
3. Training on fuel sampling
4. Training on generation of good fuel quality data
5. Training on interpretation of fuel test results
6. Training on management of fuel test facilities
7. Training on multifunctional lab equipment, certification/classification of fuels

8. Training on implementation of Directive 94/63/EC
9. Future training system

D. Information Technology

1. Assistance in the procurement, installation and adjustment of the procured laboratory IT system
2. Operation Manual for the Laboratory IT system/database
3. Electronic data provision and reporting schemes
4. Training

E. Quality Assurance and Accreditation

1. User manuals for the analysis and sampling equipment
2. Preparation of standard methods for the equipment to be procured under the project
3. EERC quality manuals for accreditation and certification
4. Intercalibration
5. Completion of local and international accreditation

2.3.3.2 Link to other Projects

The Twinning project was implemented in close co-ordination with the following ongoing projects:

Project No	Name	Amount €
ES 98/IB-EN-01(a)	**Air Accession** The Twinning project took place from 1999 to 2001, consisted of 4 subcomponents: legislation, institutions, training and monitoring. The legislation subcomponents analysed fuel quality legislation in force under the project period. The current project builds on the outcome of the legislation subgroup of the Air Accession project by foreseeing extended legal gap assessment and drafting of missing legislation.	413 500
ES 99/IB/OT-029	**Institutional building – Consumer Protection Board** The project aims to improve the organisational efficiency and effectiveness of CPB with special emphasis on strengthening the market surveillance functions as required in EU internal market legislation.	350 000
PRAQ TR07. PHARE PRAQ	The mission of PRAQ III was to assist Central and East European countries (CEECs) in the accession process by fulfilling the following objectives: ▪ to facilitate the process of technical harmonization of CEECs' national legislation (priority on New Approach directives) ▪ to provide the instruments and create the proper environment for aligning of the CEECs' Quality Infrastructure (accreditation, certification, standardization, testing, metrology; ▪ to transfer information and provide training to Economic Operators on harmonization of the legislation and on the Quality Infrastructure. Some training series on market surveillance took place in the frames of the project.	N/A

Project No	Name	Amount €
ES0005-1	**Phare 2000 market surveillance** The project aims to develop operational MS service according to EU requirements, what will be carried out by institutions responsible for market surveillance –Technical Inspectorate, Labour Inspectorate, State Agency of Medicines, Chemicals Notification Centre, Ministry of Economic Affairs and Communications, Ministry of Social Affairs, Communications Board, Consumer Protection Board. After the end of project, following outputs should be achieved: 1. MS strategy document, implementation plan, financing plan, HRD plan completed (possible decisions including decision to establish a new body or agree that existing bodies will co-operate) 2. Draft legal framework for efficient horizontal MS system 3. Trained staff in MS institutions	1 700 000
N/A	Approximation of Legal Norms in the Energy Sector	N/A
ES 9404.04.01	**Project Implementation Unit for Energy sector** Co-ordination of PHARE energy projects in Estonia Implemented during the period of 1992-1998. The Project Implementation Unit (PIU) was the co-ordinator of all PHARE energy sector projects, incl. preparation of energy strategy, institutional development, etc.	500 000
ES-9404.01.03	**Energy Strategy Plan for Estonia** Formation of the Energy Market Inspection	450 000
-9404.04.02	**Institutional Development of the Energy Sector** Institutional development and restructuring of the energy sector under responsibility of Ministry of Economic Affairs and public energy utilities. Implemented during the period of 1996-1997. The result of the study was the programme for institutional development of Ministry of Economic Affairs. Energy Department was established instead of four different departments and energy market regulator -Energy Market Inspection- was set up. The next step is the administrative development of both institutions.	200 000
ES0005-2	**Phare 2002 project Computerized Master Tariff System** aims to provide timely and accurate tariff information for Estonian customs services for applying customs, VAT and excise duties in conformity with the community acquis in customs	2 600 000
ES 20002/000-266.02.01	**Phare 2002 (I) project Integration of the Estonian Customs information system with the DG TAXUD computer systems and modernisation of basic customs procedures** aims to introduce electronic monitoring and control over the movement of goods in accordance with the requirements for accession to the EU	4 000 000
Ministry of Finance Customs sector	**Phare 2002 (II) project Reinforcement of the Administrative and Operational Capacity of the Estonian Customs Board** aims to reinforce the administrative and operational capacity of the ECB, complete the approximation of customs legislation to EU requirements, reorganise and train Estonian Customs administration through introducing the best practices of Member States and improve services provided to the business community	4 000 000
2003/004-582.01.01	**Establishment of a Customs Laboratory in Estonia** Reinforcement of the administrative capacity of Estonian Customs to ensure EU compatible performance in customs laboratory related operations.	2 080 394
2002/000-579-07.01	**Establishment of Estonian Air Quality Management System** The project is a follow up to the previously mentioned air accession project aiming at establishing a system that will ensure improved air quality in Estonia and high public awareness of air quality.	4 560 000

Of all the projects listed above, the project "Establishment of a Customs Laboratory in Estonia" was of particular relevance to this Twinning project.

2.3.4 Beneficiaries

Beneficiary institution
Ministry of the Environment (MoE)
Ministry of Economic Affairs and Communications (MoEAC)
Estonian Environment Research Centre (EERC)
Tax and Customs Board (TCB)
Consumer Protection Board (CPB)
Energy Market Inspectorate (EMI)
Environmental Inspectorate (EI)
Environmental Information Centre (EIC)

2.4 Implementation of the project

2.4.1 Project organisation

The first and most important task was to put in place a working organisation (see also 2.4.2), a network of co-operation and expertise to accomplish the project results.

The STEERING COMMITTEE (SC) involving all institutions concerned supported the Twinning project in principal decisions, reassured activities and ensured sound cooperation.

SC meeting in January 2006.

Due to the fact that Estonia acceded the European Union in early 2004 the EC Delegation participated in only two SC meetings as observer. The Ministry of Finance had its observer in most SC meetings.

The daily work was entrusted to German experts and their Estonian counterparts. German Short Term Experts (STE) made analyses, recommendations and conclusions in cooperation with the Estonian counterparts. After the completion of activity reports, those were approved by the institutions concerned.

The Estonian Project Leader (PL) Joel Valge took also care of reporting. He and the German Project Leader Kai Schollendorf reported to the SC quarterly. Both PLs accomplished the final report.

The Resident Twinning Adviser (RTA) Peter Möller kept the daily work running and supported STEs, their counterparts and PLs.

Estonian PL, Estonian counterparts from the Tax and Customs Board (Lauri Aasmann) and the Estonian Environmental Research Centre (Margus Kört and Priit Alumaa) strongly supported the conduct of training activities and resolving of issues with different stakeholders.

RTA Assistant Kristiina Nikkel, disregarding her time and burden, contributed to keeping the lines of communication between the German and Estonian counterparts.

2.4.2 Project staff

ESTONIA	GERMANY
Program Officer: Rainer Rohesalu Allan Gromov (since April 2005)	
Project Leader: Joel Valge	Project Leader: Karin Burmester Kai Schollendorf (since March 2005)
Project Manager: Priit Alumaa	Project Manager: Christina Pykonen Rita Willing (since July 2005)
	Residential Twinning Adviser: Peter Möller
	Residential Twinning Adviser Assistant: Kristiina Nikkel
Experts and/or Member of Steering Committee: Viktor Grigorjev, MoE Olga Spirkina, MoE Annika Vahersalu, MoE Henn Pärnamets, MoE Hannes Müürisepp, MoF Ell-Mari Koppel, MoEAC Enn Otsa, EERC Margus Kört, EERC Sibylle Müller, EERC Kaire Ivask, EERC Urmas Kivi, EERC Samuel Tamm, EERC Urmas Suursalu, EERC Eve Usin, EERC Hugo Tang, EERC Toivo Truuts, EERC Erik Teinemaa, EERC Inari Truumaa, EERC	Short Term Experts: Matthias Dildey Karsten Frey Sabine Stoff-Isenberg Harald Creutznacher Gerhard Tscherch Harald Vogel Peter Wilcken Rainer Kropf Dieter Weis Rainer Mrasek Sabine Benkendorf Anna-Lieselotte Nimcyk

Ene Kriis, EERC Ene Reins, EERC Pille Väli, EERC Heiki Nurmsalu, EI Pavel Ojava, EI Ulvi Tuisk, EI Lauri Aasmann, TCB Enn-Toivo Annuk, TCB Vello Jõeäär, TCB Tiina Maldre, EMI Helle Aruniit, CPB Merle Lutsoja, CPB Andres-Ivar Kadaja, CPB Jüri Orlo, CPB Leo Saare, EIC Erkki Meikas, EIC Natalija Kohv, EIC Elo Mandel, EI	

2.4.3 Commitment of Beneficiaries

The Beneficiary institutions committed themselves from the start of the project to the institutional set up and arrangements for the fuel quality monitoring system, as well as to the results of the technical specification for the equipment compiled under the supply contract of the project. Such kind of agreement was made in the form of an official Letter of Commitment, which was duly signed by the authorised representatives in order to fulfil one of the project's conditionality according project fiche.

2.4.4 Time schedule

Activity	**Project month**																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Component A																									
A1																			completed						
A2																			completed						
A3																			completed						
A4																			completed						
Component B																									
B1																			completed						
B2																									
B3																			completed						
B4																									
B5																									
B6																									
B7																			completed						

Activity	Project month																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Component C																									
C1																			completed						
C2																			completed						
C3																			completed						
C4																									
C5																									
C6																									
C7																									
C8																			completed						
C9																									
C10																			completed						
C11																			completed						
C12																			completed						
Component D																									
D1																			completed						
D2																			completed						
D3																			completed						
D4																			completed						
Component E																									
E1																			completed						
E2																			completed						
E3																			completed						
E4																									
E5																									
Stering Committee Meetings																									
SC																									

2.4.5 Project execution

The project was started on the 9th of September 2004 and will terminate at the end of August 2006.

The Project was divided into two parts:

- All activities to accomplish without lab equipment and IT soft- and hardware to be procured by supply contract should be finished;
- Activities based on availability of new equipment and IT soft- and hardware will be started latest at the end of April 2006.

Components A and B have been finished, except additional activities.

Half of activities concerning components C, D and E have been achieved. Another part will be finished in the end of project August 2006.

2.4.6 Financing

The financial contribution of the PHARE programme amounted to € 757 000. Estonia covered its share of co-financing in the amount of € 65 000. These costs included mainly human resources, meeting and working premises and conduct of training seminar in Estonia.

2.4.7 Work schedule

Component A: Institutions for control of fuel quality

In this component, the institutions responsible for the fuel quality management in Estonia were prepared for their future tasks. The component consists of four activities.

A 1. Analysis of tasks and responsibilities, identification of gaps in institutional set-up

Duration: 2 months

The aim of this activity was to get an overview of the status quo of the distribution of the tasks and responsibilities in fuel quality management in Estonia and to identify gaps in the institutional set-up.

Tasks & Methods	Outputs	Benchmarks
Analyse the tasks and responsibility areas that are currently assigned to the competent authorities in fuel quality control in Estonia which are: ▪ Ministry of Finance ▪ Customs Board ▪ Ministry of Environment ▪ Environmental Inspectorate ▪ Estonian Environmental Research Centre ▪ Ministry of Economic Affairs and Communications ▪ Consumer Protection Board ▪ Energy Market Inspectorate ▪ Oil companies Identify the gaps in the institutional set-up that have to be closed in order to operate the FQMS fully and effectively including: ▪ Description of hierarchy ▪ Assessment of existing job descriptions ▪ Assessment of co-operation mechanisms ▪ Assessment of system of cross-use of data by different authorities possible Elaborate a flow diagram which shows the hierarchy and co-operation mechanisms between the involved institutions.	Current job descriptions and distribution of responsibilities; Identification of interfaces among these institutions; Determination of individual functions to operate FQMS; Determination of necessary jobs and hierarchies; Flow diagram of current institutional set up.	Survey on available staff ready

A 2. Recommendations for optimum institutional set up and arrangements to run the FQMS by application of lean management methodology

Duration: 4 months

Based on the results of A1, the experts made recommendations for an optimal institutional set up to operate the FQMS.

Tasks & Methods	Outputs	Benchmarks
Formulate recommendations for optimal institutional set-up including: ▪ legal basis ▪ organisational structure, coordination between actors ▪ competencies ▪ required staff resources ▪ monitoring and reporting. Discuss the recommendations with New Member State (NMS) experts. Submit the recommendations to stakeholders and have them approved.	Optimization analysis report including the following items: ▪ legal basis ▪ organisational structure, coordination between actors ▪ competencies ▪ required staff resources ▪ monitoring and reporting Letter of approval by all stakeholders.	Draft recommendations are available for discussion with NMS counterparts.

A 3. Staff capacity

Duration: 2 months

In this activity, the experts analysed the existing staff capacities and made a gap analysis, missing additional capacities were assessed in order to operate the FQMS as planned.

Tasks & Methods	Outputs	Benchmarks
Identify the required staff input per institution to fulfil the designated tasks. Elaborate of job descriptions including required qualifications. Analyse in how far the tasks can be fulfilled by existing staff members and estimate how much new staff has to be hired. Determine responsible representatives of stakeholders and optimal information flow paths between them. Set up of a committee from representatives of stakeholders for optimization of inter-institutional workflow.	Assessment of required staff resources and their competencies; Job descriptions (in Estonian and English); Gap analysis of staff capacity; Responsible representatives of stakeholders and optimal information flow paths between the determined (in Estonian and English); Committee from representatives of stakeholders for optimization of inter-institutional workflow set up (in Estonian and English).	Staff necessities evaluated information of participants concerned are collected

A 4. Institutional assessment summary report

Duration: 2 months

The experts elaborate a report on the assessment of the institutional set-up. The report included all relevant overviews, proposals, schemes and flow diagrams for the institutional set-up of the FQMS.

Tasks & Methods	Outputs	Benchmarks
Elaborate a report on the assessment if the institutional set up which includes all outputs under A1 – A3 i.e. relevant overviews, proposals, schemes and flow diagrams for the institutional set-up. Circulate the summary report to relevant stakeholders.	Institutional assessment report incorporating all outputs under A1 – A3; Institutional assessment report approved by all stakeholders.	Institutional set up assessment report is elaborated which includes all outputs under A1 – A3 i.e. relevant overviews, proposals, schemes and flow diagrams for the institutional set-up. Summary report circulated to relevant stakeholders.

Component B: Elaboration of a national fuel quality monitoring programme

B 1. Design of a national fuel quality monitoring programme (environment)

Duration: 4 months

Tasks & Methods	Outputs	Benchmarks
Elaborate national FQ monitoring programme. Discuss the monitoring programme with MoE. Submit the monitoring programme to the MoE and have it approved.	Database of all wholesale fuel terminals and retail fuel stations situated in Estonia; Guidelines on the implementation of relevant EC legislation (fuel quality monitoring from environmental point of view) (documents prepared in Estonian and English); National FQ environmental monitoring programme; National FQ monitoring programme approved by the MoE.	Draft national fuel quality monitoring programme (environment) is available.

B 2. Development of the full FQMS

Duration: 2 months

Tasks & Methods	Outputs	Benchmarks
Elaborate the full FQMS: Description of sampling and analyses schemes meeting all requirements of the stakeholders Discuss the full FQMS with all stakeholders Submit the full FQMS to all stakeholders and have it approved	Full FQMS document including *inter alia* the *d*escription of sampling and analyses schemes meeting all requirements of the stakeholders and flow charts for inter institutional coordination and synergy, description of the system of cross use of data (documents prepared in Estonian and English); Full FQMS approved by all stakeholders.	German corresponding guideline Draft of full FQMS is available

B 3. Data provision and reporting schemes

Duration: 3 months

Tasks & Methods	Outputs	Benchmarks
Elaborate data provision and reporting schemes Determine necessary data and develop reporting schemes for European Commission (EC) and special schemes for stakeholders The work will centre on the EC Decision on a common format for the submission of summaries of national fuel quality data Discuss the data provision and reporting schemes with all stakeholders Submit the data provision and reporting schemes to all stakeholders and have them approved	Reporting schemes for EC (including reporting schemes of environmental fuel quality monitoring) (in Estonian and English); Data provision and reporting schemes approved by all stakeholders.	Draft data and reporting scheme is available for discussion with counterparts.

B 4. Further activities in the area of compliance

Duration: 2 months

Tasks & Methods	Outputs	Benchmarks
Conduct of additional activities such as: ▪ systematic design of energy reporting system especially oil data system ▪ Design for labelling of fuels at service stations Basis: German industry Norms DIN	Assessment and recommendations for energy reporting system and statistics; Full set of labels designed for describing fuels at service stations and documentation of their usage instructions.	Draft assessment and recommendations ready Draft labels ready

B 5. Co-operation with the oil industry in Estonia

Duration: 1 month

Tasks & Methods	Outputs	Benchmarks
Raise awareness on necessity to upgrade fuel products. Prepare schedule for upgrading of fuel products. Prepare final report.	Awareness rising records; Schedule for upgrading of fuel products; Final report for B5.	Records of co-operation with oil industry

B 6. Transparency of fuel product quality

Duration: 1 month

Tasks & Methods	Outputs	Benchmarks
Ensure transparency of fuel quality on the import level Ensure transparency of fuel quality on the delivery level	Reports.	Progress reports on the implementation of harmonized system of the EC Progress report on the implementation of quality labelling system

B 7. Description of the FQMS and final report

Duration: 2 months

Tasks & Methods	Outputs	Benchmarks
Elaborate a composite FQMS report	Final report covering activities A1 to B6 (documents prepared in Estonian and English).	Consensus among stakeholders.

Component C: Training

C 1. Training needs assessment report and general project training plan

Duration: 2 months

In activity A3 the experts made an analysis of the available expertise and assessed missing expertise, which has to be acquired. Based on these results, a training plan was be developed in order to train the existing and new staff for their respective tasks and duties in operating the FQMS.

The training measures were addressed to the staff of the following institutions, which are directly involved in the implementation of the Fuel Quality Management System in Estonia:

- The Ministry of Finance (MoF);
- the subordinated Tax and Customs Board (TCB);
- the Ministry of the Environment (MoE);
- the subordinated Environmental Inspectorate (EI);
- the Estonian Environmental Research Centre (EERC);
- the Ministry of Economic Affairs and Communication (MoEC);
- the subordinated Consumer Protection Board (CPB);
- the subordinated Energy Market Inspectorate (EMI).

Following the tasks of the different institutions involved in the Twinning project the target groups of the training measures are defined in more detail in the foreseen training activities.

Tasks & Methods	Outputs	Benchmarks
Identify training needs. Formulate the training plan, discuss the recommendations with the counterparts and present the final training plan. Elaborate a preliminary training schedule for 2004-2005. Have training plans approved by all stakeholders.	Analyses report of training needs by stakeholders (in Estonian and English); Training plans for all training activities from C2 to C9 for all stakeholders; Preliminary training schedule for 2004-2005; Approved training plans and schedules.	Preliminary training plans and schedules ready.

C 2. Training on general principles of fuel directives implementation and management of FQMS

Duration: 2 months

Tasks & Methods	Outputs	Benchmarks
Organise and conduct two seminars on the general principles of fuel directives implementation and the FQMS. Training topics: To be specified together with the NMS counterparts. Target group: 60 people from MoE, MoEC, MoF, EERC, Energy Market Inspectorate, Environmental Inspectorate	Target group has participated in the training and have received all supporting documentation; Target group has filled in the training evaluation questionnaire.	Draft agenda of training is available for discussion with the NMS counterparts. Training invitations have been sent out.

C 3. Training on fuel sampling

Duration: 1 month

Tasks & Methods	Outputs	Benchmarks
Organise and conduct one seminar on fuel sampling including fuel volume and weight determination, introduction of issues with laboratory and sampling equipment procured within the supply component of the project program. Introduce sampling methods and issues related to sample preparation for laboratory analysis with the procured equipment. Training topics: To be specified together with the NMS counterparts. Target group: 25 people from EERC, Tax and Customs Board, Energy Market Inspectorate, CPB, Environmental Inspectorate	Target group has participated in the training according to prEN 14274 and have received all supporting documentation; Target group is evaluated and tested for understanding the material.	Draft agenda is available for discussion with the NMS counterparts. Invitations to the training have been sent out.

C 4. Training on generation of good fuel quality data

Duration: 1 month

Tasks & Methods	Outputs	Benchmarks
Organise and conduct a workshop on the generation of good fuel quality data and statistics. Training topics: Overview of all physical and chemical parameters important to fuel quality data and statistics generation. Specific requirements for fuel quality data and statistics representation Possible other topics to be specified together with the NMS counterparts. Target group: 7 laboratory staff members of EERC	Target group has participated in the training and have received all supporting documentation; Document describing the parameters and requirements important to fuel quality data and statistics; Target group is evaluated and tested for obtaining and understanding the material.	Draft agenda of training is available for discussion with the NMS counterparts. Training invitations have been sent out.

C 5. Training on interpretation of fuel test results

Duration: 2 months

Tasks & Methods	Outputs	Benchmarks
Organise and conduct two seminars on the interpretation of fuel test results. Training topics: To be specified together with the NMS counterparts. Target group: 60 people from EERC, Tax and Customs Board, Energy Market Inspectorate, CPB and EI.	Target group has participated in the training on interpretation of test results and have received all supporting documentation; Document describing the interpretation of fuel test results (documents prepared in Estonian and English); Target group is evaluated and tested for understanding the material.	Draft agenda is available for discussion with the NMS counterparts. Training invitations have been sent out.

C 6. Training on management of fuel test facilities

Duration: 1 month

Tasks & Methods	Outputs	Benchmarks
Organise and conduct a workshop on the management of fuel test facilities. Training topics: To be specified together with the NMS counterparts. Target group: 7 staff members of EERC	Document describing specific aspects of the fuel test facilities management including sample delivery, registration, storage and discarding issues (in Estonian and English); Target group has participated in the training and have received all supporting documentation; Target group is evaluated and tested for understanding the material.	Draft agenda is available for discussion with the NMS counterparts. Training invitations to the training have been sent out.

C 7. Training on multifunctional lab equipment: certification/classification of fuels

Duration: 1 month

Tasks & Methods	Outputs	Benchmarks
Organise and conduct a training seminar on multifunctional laboratory equipment and certification and classification of fuels Training topics to be specified together with NMS counterparts Target group: 7 staff members of EERC	Target group has participated in the training on multifunctional lab equipment as well as certification and classification of fuels and have received all supporting documentation; Target group is evaluated and tested for understanding the material.	Draft agenda is available for discussion with NMS counterparts. Training invitations have been sent out

C 8. Training on implementation of Directive 94/63/EC

Duration: 1 month

Tasks & Methods	Outputs	Benchmarks
Organise and conduct a seminar on the Council Directive 94/63/EC. Training topics: To be specified together with the NMS counterparts. Target group: 30 environmental inspectors from Environmental Inspectorate	Target group has participated in the training and has received all supporting documentation; Document describing issues related to the implementation and enforcement of 94/63/EC; Target group is evaluated and tested for understanding the material.	Draft agenda is available for discussion with the NMS counterparts. Training invitations have been sent out.

C 9. Future training system

Duration: 1 month

Tasks & Methods	Outputs	Benchmarks
Elaborate recommendations for future training system and attesting rules for fuel sampling staff. Determine responsible authorities and institutions. Discuss the training plans, attesting and examination plans with all stakeholders and have them approved	Training plans; Attesting and examination plans; Responsible authorities and institutions determined; Training plans, attesting and examination plans approved by all stakeholders.	Draft agenda is available for discussion with the NMS counterparts. Training invitations have been sent out.

Component D: Information Technology

D 1. Assistance in the procurement, installation and adjustment of the procured laboratory IT system

Duration: 2 months

Tasks & Methods	Outputs	Benchmarks
Assistance in the procurement, installation and adjustment of the procured IT system.	Laboratory IT systems step by step deployment plan; Audit documentation describing installed hardware and software settings; Verification document ensuring that the IT system is working according FQMS requirements and is satisfying all needs of stakeholders.	Information of participants concerned

D 2. Operation Manual for the Laboratory IT system/database

Duration: 3 months

Tasks & Methods	Outputs	Benchmarks
Elaborate the IT system operational manual.	Operational user manuals for all aspects of the IT system (in Estonian and English).	Manual is transmitted to the participants

D 3. Electronic data provision and reporting schemes

Duration: 2 months

This activity wasl be carried out together with the STE responsible for Component A (Institutions).

Tasks & Methods	Outputs	Benchmarks
Elaborate electronic data provision and reporting schemes.	Guidelines of database development for all FQMS parameters; Guidelines for data exchange and security requirements.	Information on the application of the IT data system

D 4. Training

Duration: 3 months

Tasks & Methods	Outputs	Benchmarks
Organise and conduct two seminars on the set up of the IT system, its functionalities, use etc. Topics: Use of the IT System and central database. Practical lessons on computers about using FQMS IT system. Target Group: EERC (8 people), Energy Market Inspectorate (2), CPB (2), Customs (10), Environmental Inspectorate (10).	Target group has participated in the training and has received all supporting documentation; Target group is evaluated and tested for the skills to run the IT system.	Draft agenda of training is available for discussion with the NMS counterparts. Training invitations have been sent out.

Component E: Quality Assurance and Accreditation

E 1. User manuals for the analysis and sampling equipment

Duration: 2 months

Tasks & Methods	Outputs	Benchmarks
Prepare user manuals for the analysis and sampling equipment to be procured under the project.	User manuals (in Estonian and English).	Draft manuals are available for discussion.

E 2. Preparation of standard methods for the equipment to be procured under the project

Duration: 2 months

Tasks & Methods	Outputs	Benchmarks
Prepare standard methods and standard operation procedures for the laboratory and sampling equipment to be procured under the project.	Standard methods and standard operation procedures for the laboratory and sampling equipment to be procured under the project (in Estonian and English).	International guidelines for the determination of fuel parameters given e.g. in prEN 14274 are available

E 3. EERC quality manuals for accreditation and certification

Duration: 1 month

Tasks & Methods	Outputs	Benchmarks
Analyse the chapter on fuel in the general quality manual of the EERC, preparation of relevant amendments in Estonian and English Submit the amendments to the Quality Manager of the EERC. Have the amendments approved by the Quality Manager of the EERC. Quality manual for certification procedures	Amendments submitted to the Quality Manager of the EERC and approved; Quality manual including all relevant procedures ready for accreditation; Quality manual including all procedures relevant for certification.	Draft amendments available Quality management manual according to the DIN EN ISO/IEC 17025

E 4. Intercalibration

Duration: 2 months

Tasks & Methods	Outputs	Benchmarks
Experts will prepare and carry out the intercalibrations of the quality and accreditation system. The task will include required reference materials.	Intercalibrations with German laboratories using referential fuels conducted; Intercalibration protocols sufficient for accreditation.	Reference materials procured before intercalibrations

E 5. Completion of international and local accreditation

Duration: 2 months

Tasks & Methods	Outputs	Benchmarks
Completion of accreditation by Deutsches Akkreditierungssystem Prüfwesen GmbH for the new methods and equipment procured within the project Completion of accreditation by the Estonian Accreditation Centre	Accreditaion certificates by: ▪ Deutsches Akkreditierung-system Prüfwesen and ▪ Estonian Accreditation Centre.	Finished work under activities E1 – E4

The Deutsches Akkreditierungssystem Prüfwesen GmbH (DAP) has already accredited the current quality system of the EERC. The EERC has been working together with DAP since 1999. In this time DAP has carried out two major accreditations for the EERC. The task of DAP was to accredit EN ISO/IEC 17025. Now DAP is well familiar with the tasks and structures of the EERC. The accreditations carried out by DAP took place in good and co-operative team work. Due to the extremely good experience acquired in the course of those accreditations in terms of qualification of experts, quality of advice received, and general co-operation, the EERC aims to contract DAP for the accreditation of new methods as well. To mandate DAP for the upcoming accreditation makes it possible to realise synergies for the further work of the EERC.

2.5 Conclusions

2.5.1 Component A. Institutions for control of fuel quality

General description

The tasks of institutions involved in fuel control had to be identified. Next step concerned the determination of institutional gaps to cover the monitoring of fuel quality. As result of these activities recommendations for optimum institutional set up to run the FQMS by application of lean management had to be elaborated. The existing and required staff capacities to run the FQMS were to assessed.

Results

Institutional tasks and responsibilities were identified. The present situation in institutional set up and staff capacity with regard to the FQMS has to be changed.

It was established that:

The Ministry of the Environment (MoE) has to ensure the implementation of EC legislation concerning fuel quality monitoring. Furthermore, it has to set the Estonian monitoring and enforcement mechanism to ensure compliance with requirements.

The MoE is the supervisory body of the Environmental Inspectorate, the Estonian Environment Research Centre and the Environmental Information Centre.

The Environmental Inspectorate (EI) is responsible for enforcing Directive 94/63/EC, which regulates VOC emissions from filling stations and distributing tank facilities. It shall also monitor the quality of light and heavy heating oil according to Directive 1999/32/EC.

The Environmental Information Centre (EIC) is responsible for the production of environmental reviews and reports.

The Estonian Environment Research Centre (EERC) is specialised in chemical analyses in the field of environment protection.

Its main activities are:

- chemical analyses of water;
- soil research;
- microbiological analyses;
- sampling to perform analyses;
- conduct and implementation of environmental monitoring programmes;
- training consultants and so on.

The Tax and Customs Board (TCB) monitors cross-border movement of goods and prevent smuggling of fuels. Furthermore, its obligation is to control the compliance of fuel quality with the established requirements to maintain the level of excise tax.

The Consumer Protection Board (CPB) deals with the protection of consumer rights, develops and implements policies in accordance with the requirements of the Consumer Protection Act. In particular it is responsible for investigation of consumer complaints regarding fuel quality.

The Estonian Energy Market Inspectorate (EMI) shall supervise fuel and energy market and ensure fair market competition. Insofar, it controls the conformity of fuel quality and fuel handling with legal requirements.

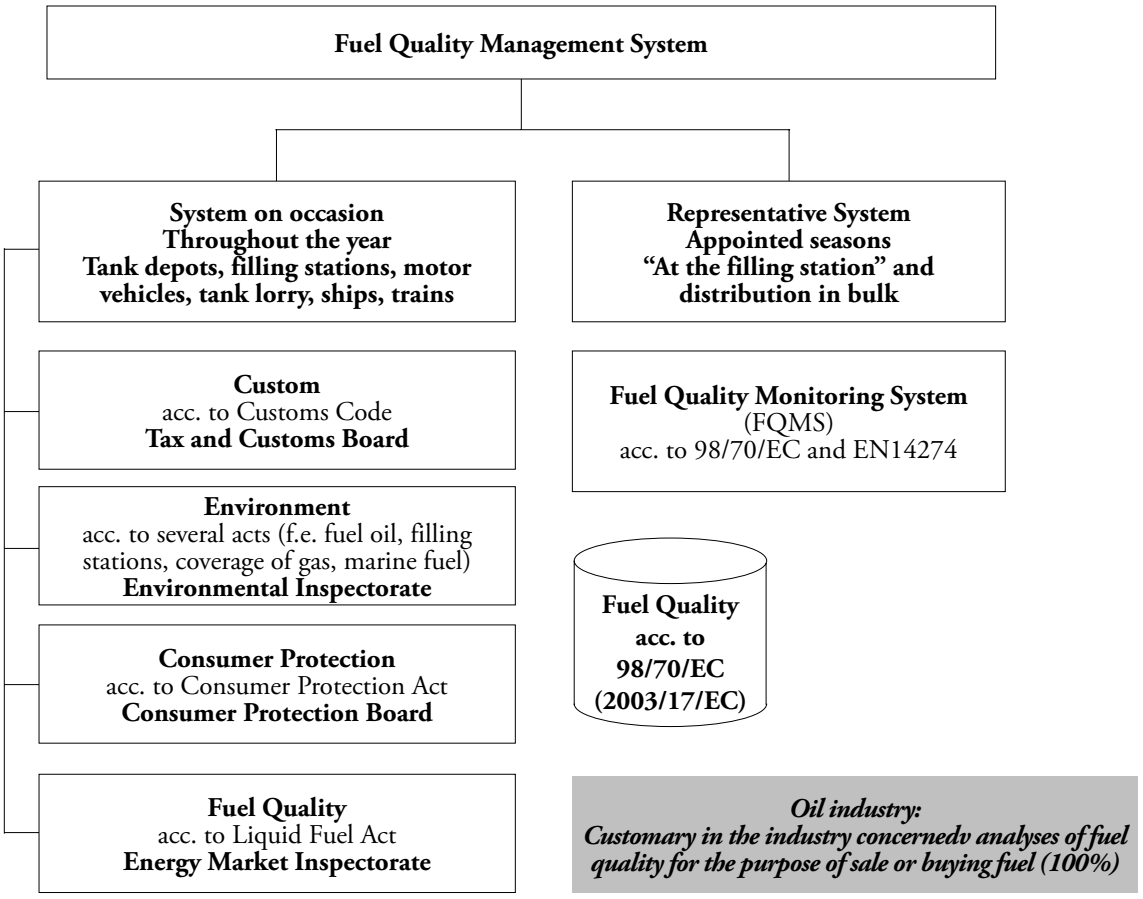
The Ministry of Economic Affairs and Communications (MoEAC) has started to implement EC legislation concerning fuel quality in setting fuel quality parameters in the Liquid Fuel Act.

Oil importers have to comply with fuel quality parameters.

With regard to gaps it was noted that:

- no organisation is assigned to run monitoring according to EN standard 14274;
- no staff with special tasks, no enforcement policies and no financial resources could be identified;
- the lab of the EERC is not yet qualified to analyse fuel quality according to the established requirements;
- no enforcement activities to monitor the quality of light and heavy heating oil existed.

This situation is covered by the following diagram.



The recommendations of the assessment are as follows:

The EERC should be appointed as manager for the FQMS according to EN Standard 14274. The EERC could best reconcile the requirements of keeping individual results of analyses confidential with the need to explain the reasons for cases of non-compliance with fuel quality parameters set by Directive 98/70/EC.

With regard to sample taking most institutions were already taking samples. Sample taking needs to be pooled.

Since most institutions have also legal authorisation to prosecute cases of non-compliance with fuel quality they can also take over the prosecution of violations in the frame of the FQMS.

The most crucial gap is to upgrade the EERC fuel laboratory to meeting all requirements of the FQMS. This issue will be dealt with in the „Training" and „Quality assurance and accreditation" components. The missing lab equipment will be procured under the supply contract. This supply component runs in parallel to the twinning project. One equipment item requires special attention: octane and cetane number counting engine. The numbers reflect the required fuel quality in terms of grades (92, 95, 98). The operation of these engines requires special know-how that needs to be provided. It is also necessary to assure adequate financial resources to fund staff, management, sample taking, analysing and enforcement. Some aspects of accurate cost estimate for fuel quality monitoring have yet to be developed.

With regard to the monitoring of fuels, which are not covered by Directive 98/70/EC the Tax and Customs Board and the Environmental Inspectorate appeared to be best appropriate to take over this monitoring.

In addition, Directive 2005/33/EC concerning monitoring of ship fuels needs implementation.

The MoE has asked the Tax and Customs Board to carry out monitoring and the EERC to analyse the samples.

In summary

All three levels of the FQMS monitoring and enforcement in terms of organisations were covered:

1) management of FQMS: monitoring to be achieved by EERC;
2) representative sample-taking: by pooling capacities of involved authorities;
3) analyses: to be provide by the EERC fuel lab after getting accreditation.

Secondly, other than FQMS fuel monitoring issues were addressed. The results were proposed at three levels:

1) management should be taken by institution, which fulfils its own legal obligation;
2) samples should also be taken by the relevant institution;
3) all analyses should be covered by the EERC.

The necessity to fund the tasks at an adequate level needs also to be emphasized.

Estonian response

The Estonian Ministry of the Environment has appointed the EERC to manage the FQMS. The sample-taking institutions have committed themselves to pooling their capacities. The MoE has also assigned the EERC to analyse all FQMS related samples.

2.5.2 Component B. Elaboration of national fuel quality monitoring programme

General description

This component covered the FQMS management and related activities and the synergies that could be achieved in monitoring and enforcement. Furthermore, it had to address the reporting requirements to the European Commission, the set up of oil data system and adequate activities to raise awareness of fuel quality.

Results

The content of Fuel Quality Monitoring System (FQMoS) according to EN standard 14274 was elaborated, focusing on the representative way of sample-taking.

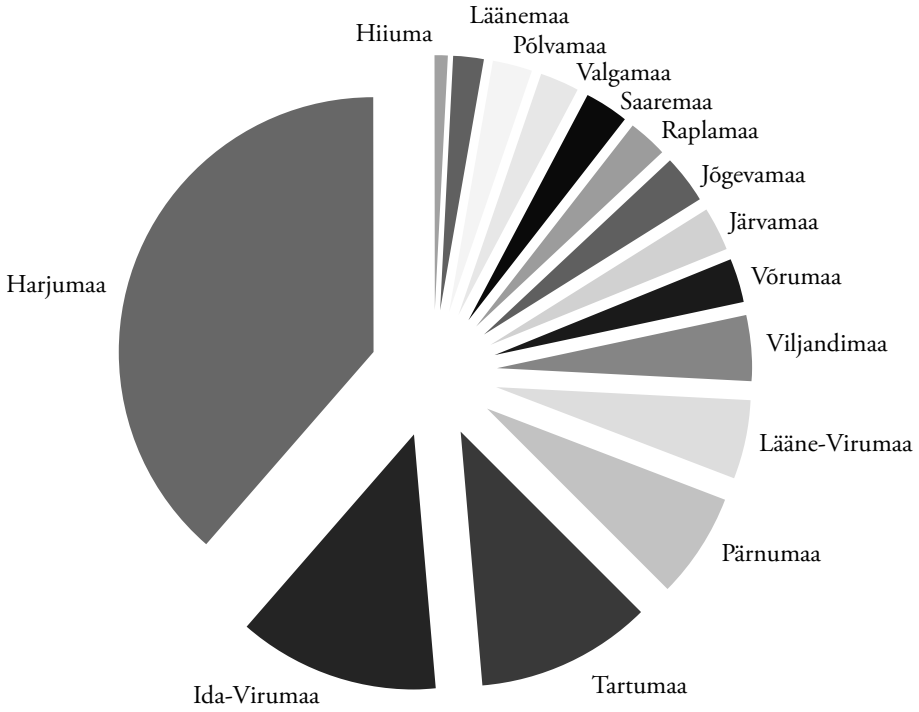
All required and available statistical details were compiled.

A list of Estonian filling stations by counties was produced.

Allocation of filling stations

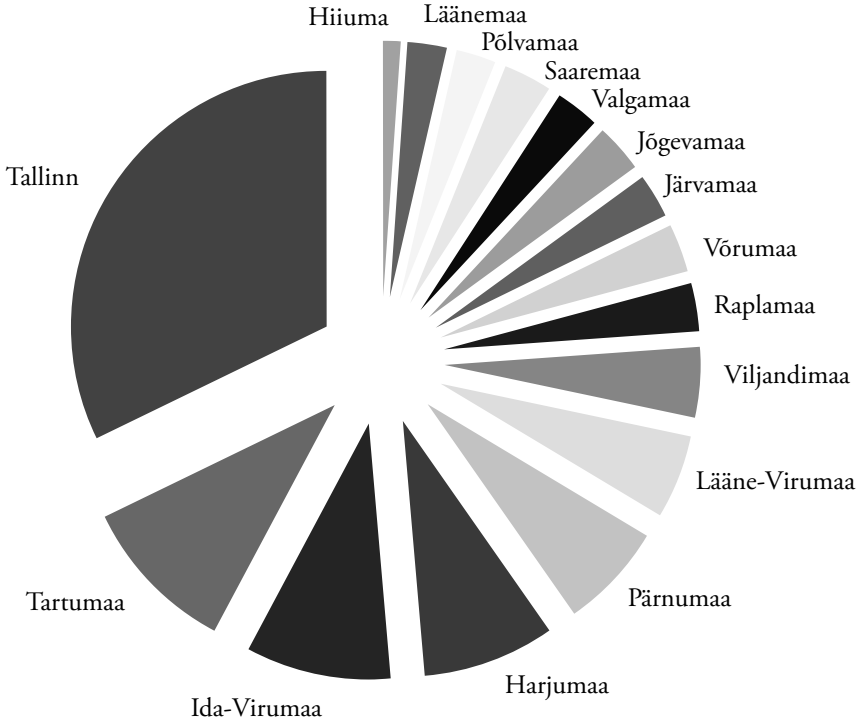
Distribution of inhabitants 01.01.2003

The size of Estonian population and its allocation to counties was established



Distribution of vehicle fleet (all motor vehicles as of 01.01.2002)

The Estonian vehicle fleet and its distribution between counties was also ascertained



Statistical data about the Estonian oil market were taken from the report of the Statistical Office. The required data were estimated. The total amount of fuel sales was established, which is 300,000 t/a of gasoline and 420,000 t/a of diesel. It was also noted that even these data were doubted by the Estonian oil industry.

The procedure for representative sample taking was described. Due to the lack of volume sales figures within region it is based on the appointment of representative filling stations This appointment was complicated due to the fact that the market share of filling stations is not proportional to the market share of oil suppliers. The market share of sales by big suppliers is about 90% whereas the market share of their filling stations is less than 50%. Representative filling stations were determined in proportion to population size and vehicle fleet by counties. Then the filling stations of representative fuel suppliers were appointed. It was proposed to take as minimum 400 fuel samples per year equivalent to 100 samples per grade.

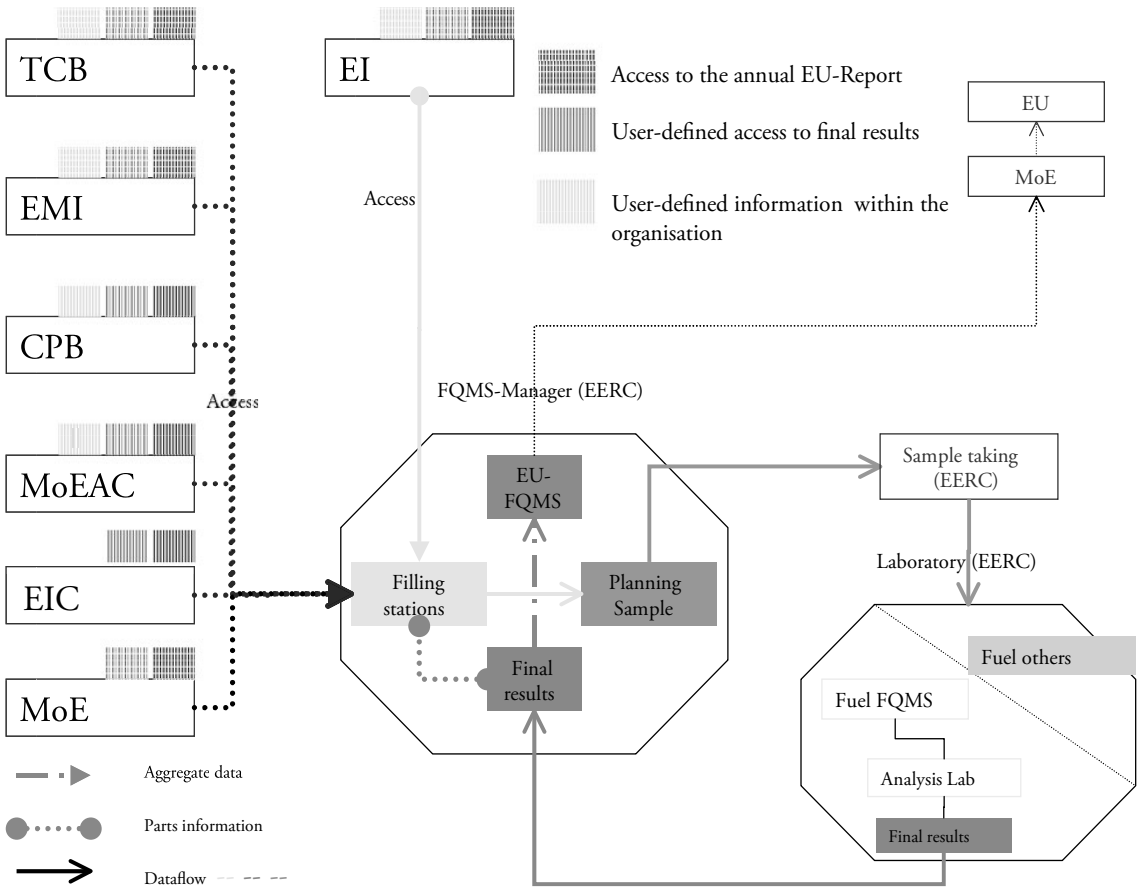
Next part of management procedure concerned the appointment of sample-taking organisations. Insofar, reference was made to the recommendation on pooling capacities of sample-taking organisations (Twinning Component A).

A model for sharing information on analytical results of different samples was developed.

First level of data sharing concerns all information on filling stations. This data base will be subject to permanent update. New information on filling stations should be contributed by all the institutions, which monitor filling stations.

Second level will be a database of fuel quality analyses performed under the FQMoS. Although these data are a matter of confidentiality, governmental institutions can share the results.

Third level is dedicated to the database of analyses results other than FQMoS.



This data sharing system reflects the synergies that can be achieved.

Next task was to explain all elements of the fuel quality report to the European Commission. On the basis of the established template all tables reflecting the results on compliance or non-compliance with fuel parameters were presented and explained.

The importance of the standard methods to measure fuel quality according to EN standard 228 and 590 was addressed.

Emphasis was also put on missing detailed oil data.

Finally, attention was paid to the requirement of sulphur-free fuels to be available in 2005 due to Directive 2003/17/EC.

Further activities in the area of compliance focused on bridging the gap with regard to oil data and to improve the transparency of Estonian oil market.

Consequently, a design for oil data system according to international standards was developed. It was drafted in the usual balancing system: opening stocks, inland production, import, export, inland consumption, closing stocks.

Since the EN standards 228 and 590 require some marking system at the pumps of filling stations the German label system was presented to raise public awareness of fuel quality.

Recommendations

Since the German label system addresses just technical aspects of fuel quality, it was recommended to consider a quality campaign instead or additional label system.

It was proposed that the EIC should be appointed to carry out this task.

Estonian response

The MoE approved the programme to monitor fuel quality. It also contracted the EERC to analyse the samples taken for the FQMoS according to the established requirements. The EERC has already submitted the annual report fuel quality monitoring covering year 2004 to the European Commission with a reservation that not all reporting requirements could yet be met.

The EERC has also organised two meetings with all institutions, who are taking fuel samples in order to prepare the sample taking for the FQMoS in 2006.

The MoE has also appointed EERC to take samples for the FQMoS in 2005 and to analyse the samples. All samples have already been taken.

The activities of the EERC to get accreditation as required by EN standard 14 274 will be covered by the results of Twinning Component E.

2.5.3 Component C. Training

General description

Training requirements for the different elements of FQMS had to be assessed and designed:

- First element concerned the management of FQMS;
- Next element covered sample taking according EN standard 3170 and 14275;
- The training on laboratory issues was split into theoretical and practical part. The practical part will start when the required lab equipment has been delivered;
- The last element of training was dedicated to the implementation of Directive 94/63/EC on limitation of volatile organic compounds at storage facilities (filling stations, large tanks) for petrol.

Results

A joint seminar followed by on site training was carried out in June 2005.

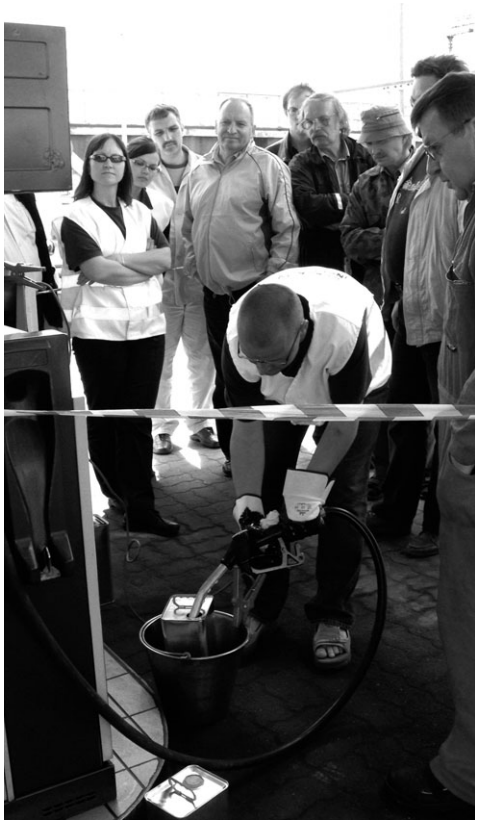
Invitation

Invitations for participation were sent to all stakeholders.

The requirements for management of FQMS were elaborated. Emphasis was put on the need to generate representative sample taking. The first results of the Twinning Components A and B focusing on that requirement were raised.

The need to monitor fuels, which are not covered by representative sample taking or belong to a different category of hydrocarbons was also expressed.

The practise on sample taking was introduced by an oral overview of the requirements of the two EN standards 3170 and 14275.



The sample taking with regard to Directive 98/70/EC was exercised at a Statoil owned filling station in Tallinn.

All elements of the relevant standard EN 14275 covering documentation of sample taking and filling of containers were trained.

This part of sample taking was followed by exercising sampling procedure according to EN standard 3170 at:

- shore tanks;
- railway tank wagon;
- car tank;
- ship bunker.

This kind of sample taking was trained at the Port of Muuga, near Tallinn. Special attention was paid to security requirements of petrol shore tanks and railway tank wagons since petrol fuels comprise gases, which are highly explosive.

The participants trained sampling and were instructed accordingly. Due to their good performance all attendees got a certificate issued by the German experts.

Certificate

The last part of training was dedicated to lab issues and limitation of volatile organic compounds.

Training on the interpretation of fuel test results and some aspects of management of fuel test facilities presented background information with regard to the properties of gasoline and diesel. This information is required when the compliance or non-compliance with standardised parameters are subject of disputes.

The mechanism between octane numbers, density and vapour pressure and fuel efficiency was also reflected and the parameters to prevent wear and tear of the engine (gum content and copper strip corrosion) were also addressed. The importance of low sulphur content, zero lead content and reduced aromatic compounds like benzene was emphasized.

Finally, all standard test methods of EN standards 228 and 590, which decide on the compliance with the fuel quality parameters were also dealt with.

All participants were satisfied with the high quality level of the seminar. The seminar was supplemented with an additional training concerning management tasks and fuel quality assurance in laboratory in Germany.

During the study visit to Karlsruhe several aspects of quality assurance were addressed at the UMEG laboratories (environmental measurement organisation of Baden-Württemberg), ESSO refinery and Petrolab Speyer. UMEG introduced the daily tasks related to quality work. The ESSO refinery presented its fuel, gaschromatographic and inorganic laboratory. The measurement of octane and cetane numbers by special engines was demonstrated. Petrolab trained on issues concerning the organisation and operation of lab and tested some fuels.

An inspection tour to Hamburg was dedicated to certain aspects of fuel quality management. The following Estonian institutions participated:

- Ministry of the Environment;
- Ministry of Economic Affairs and Communications;
- Tax and Customs Board;
- Energy Market Inspectorate;
- Consumer Protection Board;
- Environmental Inspectorate;
- Estonian Environmental Research Center.

The Ministry of the Environment of the State of Hamburg received the Estonian delegation and demonstrated different kinds of enforcement policies related to ambient air quality.

The Hamburg Consumer Protection Agency informed on different strategies to protect consumers in adequate ways.

An oil tanking company explained its activities concerning monitoring fuel quality at their shore tank farm in the port of Hamburg. The company addressed the testing procedure for fuel quality monitoring.

The Customs Authority of Hamburg presented its import procedures concerning oil and fuels. Special attention was paid to the procedure applied to ship bunkers and the promotional procedures for blending biofuels with fuels. The Hamburg Customs laboratory introduced to tests methods to classify all kinds of goods being subject to dispute according to the EC harmonized and combined system.

Both additional training activities were very much appreciated by the participants since different aspects of fuel management and fuel analysing were handled in a more detailed way.

2.5.4 Component D. Information Technology

General description

Requirements of the fuel laboratory information management system (LIMS) and guidelines of database development for all FQMS parameters had to be assessed and described. Guidelines for electronic data exchange between stakeholders and security requirements had to be addressed. Information system training activities should be accomplished.

Results

Twinning component D consists of four activities. To adjust the activities on the extended schedule and on the updated needs of the beneficiary it was decided that activities D1, D2 and D4 would be cancelled in the frame of the Twinning project. Guaranteed results targeted by the Twinning Covenant (Article 1) will not be changed because activities D1, D2, D4 will be accomplished by the supplier and the EERC with some advisory assistance and support from the German expert. One lot of the Supply Contract for the laboratory equipment is the laboratory IT system and the supplier shall deliver beside other equipment all necessary hardware and software components to support the work in the fuel laboratory. Also, LIMS application shall be developed by the supplier, which enables all the laboratory administrative tasks and the reporting under the FQMS.

Activity D3 covered technical support for the supply part concerning programming data requirements, electronic data provision and reporting schemes. It was achieved by STE Mrasek, expert for IT issues, in cooperation with STE Stoff-Isenberg involved in the identification of data requirements for the FQMS reports and data flows to stakeholders. In this context a data model on general information, analysis and FQMS-system was developed in terms of special tables structured according to common features. The features are: Key - Field - Definition - Meaning/List of values. The model was amended by a Data Flow Diagram.

As part of activity D STE Stoff-Isenberg will also assist the EERC in checking the results of programming of LIMS system. These discussions have been planned to continue at certain intervals under up to three working days until August 2006. The programming activities, which were part of the Supply Contract started in January 2006. The time allocated in the Covenant for covering the FQMS information system (Twinning Component B, activity B2) was increased by 12 additional working days of STE Stoff-Isenberg.

Recommendations

The general opinion voiced was that besides the ordinary general LIMS functions the database application should also support all the data processing necessary for the FQMS. The stakeholders who need information contained in the FQMS database should have direct access over secure Internet connections.

It was also the suggested by experts that aggregated statistics, general FQMS data and reports produced by the EERC and other stakeholders will be made available by the EIC. The EIC will get each year a statistical summary about the FQMS (no individual data). Reports and statistics for the Esto-

nian Government and the European Commission are the third vital element since the primary end-function of the FQMS-System must be the generation of the reporting templates about the quality of fuels to the European Commission.

Estonian response

The EERC has made a complete IT system analysis of it's laboratory data flow requirements. The EERC together with the contracted Supplier has started the LIMS database programming activities. EERC has also organised several meetings with the EIC and stakeholders about electronic data flow and reporting issues concerning filling stations and results of fuel quality analyses.

2.5.5 Component E. Quality Assurance and Accreditation

General description

Accreditation according to standard 14274 requires quality manual for the fuel laboratory and adequate appliance of test methods required by EN Standards 228 and 590. The Existing quality manual had to be adapted to the requirements of the fuel concerned. The general part of quality manual had to be complemented by the description of standard operational procedures to carry out fuel analyses. It needed further complementation by user manuals for analysis and sample taking. Preparatory steps to participate in round robins were done. Successful round robin tests will be the last milestone in getting the accreditation.

Results

- The all parts of the existing quality manual have been amended to comply with EN Standard ISO/IEC 17025.
- A list of required analytical test methods for fuel lab to meet the EN Standards 228 and 590 has been established.
- The laboratory quality manual was complemented by a description of 29 Standard Operational Procedures required by EN standard ISO/IEC 17025.
- A manual for the analysis and sampling equipment was elaborated.

Both the quality manual and the manual for the analysis and sampling equipment covers the equipment to be procured under the Supply component - development of a national fuel laboratory:

1. FAAS Analyser for detection of lead content in gasoline
   Standard: EN 237
   Equipment: Varian model AA240FS, SPS-3 autosampler, Spectra AA Pro software
2. GC analyser for hydrocarbon type content in gasoline
   Standard: EN 14517, ASTM D6293, 6839
   Equipment: Varian CP3800 PIONA+ system, Varian Galaxie workstation software with integrated PIONA+
3. GC analyser for detection of benzene content in gasoline
   Standard: EN 12177
   Equipment: Varian CP3800, Varian CP-8400 autosampler, Varian Galaxie Chromatographic software
4. GC analyser for detection of oxygen content and oxygenates in gasoline
   Standard: EN 13132
   Equipment: Varina CP3800, Varian CP-8400 autosampler, Varian Galaxie Chromatographic software

5. HPLC analyser for determination PAH in diesel
   Standard: EN 12961
   Equipment: Varian ProStar HPLC system with Varian ProStar 210 pump, RI detector
6. Wavelength dispersive X-ray spectrophotometric Sulphur analyser
   Standard: EN ISO 20884
   Equipment: Oxford Instruments MDX1060, MD17P, Oxford Instruments Expertase software
7. UV Fluorescense analyser for determination of sulphur
   Standard: EN ISO 20846
   Equipment: Antec model 9000LLS
8. Density measurement equipment
   Standard: EN ISO 12185
   Equipment: Anton Paar model DMA 4500, model SP-3m autosampler
9. Bath and hydrometers equipment for density measurement acording to EN ISO 3675 test method
   Standard: EN ISO 3675
   Equipment: Selecta model Digit-Cool constant temperature bath and general fuel laboratory equipment
10. Automatic apparatus for distillation of gasoline
    Standard: EN ISO 3405
    Equipment: Herzog model HDA628
11. Automatic apparatus for destillation of diesel fuel
    Standard: EN ISO 3405
    Equipment: Herzog model HDA628
12. Automated vapour pressure measurement apparatus
    Standard: EN 13016-1
    Equipment: Herzog model HVP972
13. Apparatus for determination of oxidation stability of gasoline
    Standard: ISO 7536
    Equipment: Petrotest model OBA-1
14. Copper strip corrosion apparatus
    Standard: ISO 2160
    Equipment: Petrotest
15. Gum content in gasoline apparatus
    Standard: ISO 6246
    Equipment: Herzog model HGT917
16. Automatic flash point apparatus
    Standard: ISO 2719
    Equipment: Herzog model HFP360
17. Apparatus for carbon residue in diesel
    Standard: ISO 10370
    Equipment: Alcor model MCRT 160
18. Apparatus for determination of ash content in diesel
    Standard: ISO 6245
    Equipment: general fuel laboratory equipment
19. System for measuring of water content in diesel
    Standard: ISO 12937
    Equipment: ISL model KFP 5G2 Karl Fischer titrator
20. Syste3 for determination of contamination in diesel
    Standard: EN 12662
    Equipment: general fuel laboratory equipment
21. Apparatus for measuring of oxidation stability of diesel
    Standard: ISO 12205
    Equipment: Stanhope-Seta 16900-4 Seta oxidation bath with Oxflo controller

22. Diesel lubricity apparatus
    Standard: ISO 12156
    Equipment: PCS Instrument
23. Automatic Viscometer
    Standard: EN ISO 3104
    Equipment: Herzog model HVU481
24. Apparatus for measurement of diesel cold flow plugging point (CFPP)
    Standard: EN116
    Equipment: ISL model CPP97-2 with CFPP heads
25. Apparatus for determination of cloud point of diesel fuels
    Standard: EN 23015
    Equipment: ISL model CPP97-2 with 2 CP measuring heads
26. FTIR analyser for FAME content in diesel fuels
    Standard: EN 14078
    Equipment: Shimadzu model IPPrestige-21
27. Equipment for measuring Octane number (RON/MON)
    Standards: EN ISO 5164 and 5163
    Equipment: Waukesha model F1/F2 CFR F-2U combination method octane rating unit
28. Equipment for measuring Cetane number
    Standards: EN ISO 5165
    Equipment: Waukesha model CFR5 CFR F-5 cetane method diesel rating unit
29. General sampling equipment for the collection of fuel samples from various sampling points
    Standards: EN ISO 3170, EN ISO 3171

2.5.6 Continuing activities

Overview

The extension of the project is necessary because:

- The schedule of training on the lab equipment depends on the availability of the lab equipment to be procured under the Supply Contract - development of a national fuel laboratory. Since the last day of deliveries of lab equipment under the Supply Contract will be the end of April 2006 the training can start accordingly later, latest in May 2006 (activities C5, C6, C9);
- The RON/MON and Cetane motors necessary to train the staff responsible for the determination of Octan- and Cetane numbers have not been installed in time. Training on Octane- and Cetane numbers can start not until February 2006 (activity C7);
- The legislative requirements to implement an adequate oil data system that covers all the details needed to comply with the reporting system of the EC will presumably pass the Parliament in spring 2006. Training on data collection, processing and reporting can start accordingly later, also in April 2006 (activity C4 and additional activities under B4, B5, B6);
- The international and local accreditation requires the completed intercalibration sufficient for accreditation. The intercalibration itself depends on the availability of lab equipment to be procured under the Supply Contract. Since the last day of deliveries of lab equipment under the Supply Contract will be the end of April 2006 the intercalibration and the accreditation can be completed accordingly later, latest in August 2006 (activity E4, E5).

Continuing activities

- Training on generation of good fuel quality data;
- Training on management of fuel test facilities;

- Training on multifunctional lab equipment, octane and cetane measuring engine;
- Future training system;
- Additional support to implement the IT based information system for institutions concerned;
- Additional support to implement oil data system;
- Additional support to raise public awareness for fuel quality;
- Participation of the EERC in a round robin exercise on testing fuel quality organized by FAM;
- Accreditation and certification by German and Estonian accreditation authorities.

The training activities will continue due to late delivery of all equipment required to analyse fuel quality with regard to quality parameters set by Directive 98/70/EC. The analyses will focus on appliance of test methods set by the EN standards 228 and 590. When these training activities are completed the laboratory will participate in a round robin test to give evidence of its qualification.

Additional support to achieve the implementation of the IT based information system is needed since the expert drafted the informational requirements in cooperation with all institutions concerned.

The support will be given to the company, which has been contracted by the EERC to develop its data system. The company has started its activities in December 2005 and they will be continued.

Additional support is necessary to establish an oil database, which meets international standards.

Legislation on oil data is expected in spring 2006.

The MoE is considering a system or a campaign to raise public awareness on fuel quality issues. Decision on the options is expected in spring 2006.

The results of the follow up activities will be covered in the second part of the final report.

3 Component A. Institutions for control of fuel quality

The European Parliament and the Council have in Directive 98/70/EC of 13 October 1998 relating to the quality of petrol and diesel fuels set requirements to sampling and analysis as well as reporting, which shall be met by Member States. In addition two fuel quality standards EN 14274:2003 must be met by Member States.

3.1 Activity A1. Analysis of tasks and responsibilities, identification of gaps in institutional set-up

Activity A1 describes the present situation in the institutional setup. It includes an overview of the status quo and identifies gaps, interfaces and possible cases of overlapping tasks and activities. The report will be continued by activity A2, which provides recommendations for optimum institutional setup and arrangements to run the FQMS by application of lean management methodology.

The results of analysis of tasks and responsibilities and identification of gaps in institutional set-up were given to the stakeholders for comment.

At the meeting held on the 8th of December 2005 the representatives of the Ministry of Finance and the Ministry of Environment agreed to the report with regard to their tasks.

3.1.1 Analyses of tasks and responsibilities

The work started with meetings held with various stakeholders, described in detail later in this report, to identify the tasks and responsibilities with regard to fuel quality monitoring. The description provided in Annex 1 in the end of this chapter reflects the present situation.

3.1.1.1 Present tasks and responsibilities of the Tax and Customs Board (TCB)

The national TCB under the juristiction of MoF is, among other duties, responsible for the movement of goods and transports across the customs frontiers; as well as for the prevention of smuggling and customs inspection. Further, it is also involved in the implementation of the FQMS. The main interface between the FQMS and the TCB is fuel sampling.

The present tasks and responsibilities were discussed with regard to the development of the Estonian FQMS with:

- Andres Kruusimägi, Deputy Head of Department;
- Lauri Aasmann, Chief Specialist.

The tasks are determined by different laws and include:

1. traditional tasks (income tax, control of import and exports of goods etc.);
2. special tasks pertaining to the Liquid Fuel Act. According to this law, the TCB has to control the compliance of the quality of fuels with the ISO standards, therefore the TCB has to take samples;

3. handling of taxes on fuels, alcohol and tobacco.

The TCB has to control 5% of all goods, which are imported or exported into or from Estonia. The relevant task with regard to FQMS derives from the above mentioned second task. In this context controlling and sample taking has to be achieved from different facilities and sources:

- Fuel storage facilities;
- Tanks in filling stations, and
- Private cars.

Currently about 1,000 samples per year are taken, which are analysed in the Estonian Environmental Research Centre (EERC) according to the ISO standards e.g 95 EVS-EN 228:2004 for gasoline or EVS-EN 590:2004 for diesel.

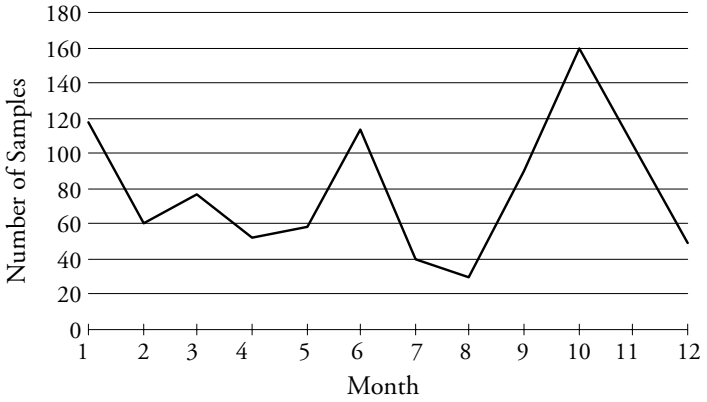


Figure 1: Fuel samples analysed at the EERC

Besides the traditional tasks the TCB collects data. The statistics is based on the Excise Duty Act and fulfils the information requirements of several institutions (e.g. oil supply security, reporting obligations to international organisations, energy balances, etc.). The available information concerns the total consumption of oil products, separated by quality and market share of different companies and supply pattern. These data fulfil the requirements of the FQMS, however, institutional arrangements are necessary, which would make these data available to the authority in charge of the FQMS.

The availability of and need for statistical information is elaborated in detail in Twinning Component B, activities B4 - B6.

Input of staff

The TCB employs five sampling teams[1] comprising of 4 people, which take 1,000 samples each year[2].

Cases of non-compliance are prosecuted by the Investigation Department of the TCB with the following two exceptions:

1. Up to 20,000 liters of non-complying fuels are prosecuted by the TCB. As a consequence, the sale of this fuel is restricted until re-fill of the tank with complying fuel has been achieved. The non-

[1] Annotation TCB from the 3rd of June 2005: TCB will be restructured on 1st July. Four new taxation centers will be formed. Tartu customs office and South-East customs office will be united into one unit. TCB has planned that 30 of their people will be involved with fuel control. Dealing directly and physically with fuel controlling takes about 15 person/years in one calendar year.

[2] Annotation TCB (as above): TCB has enough resources to take large amount of samples. Up to now this number has been around 1000 samples a year, and this resource will be available the following year(s).

complying fuel is confiscated. In some cases even the permit to operate the filling station can be withdrawn;

2. In those cases where the non-compliance causes additional damage beyond 248,000 EEK, the prosecution will be transferred to court.

The staff capacity in the EERC to analyse the samples taken by the TCB amounts to 4 employees working full time in the fuel lab plus (in case additional analyses are needed) part time support from 3 employees working in the instrumental lab.

Interfaces

There are obvious interfaces with regard to sample taking and analysis of fuels. The tasks of the TCB and the EERC do not overlap but correlate as there are different reasons for the sample taking and analysing. The TCB mainly wants to prevent fraud while the EERC has to fulfil the FQMS requirements.

Overlapping tasks

Overlapping tasks may be assumed with the duties of the Energy Market Inspectorate (EMI) as the EMI takes samples from fuel storage facilities and power plants.

Some overlap may also apply to the tasks of the Consumer Protection Board (CPB), since the CPB also takes samples at filling stations.

3.1.1.2 Present tasks and responsibilities of the Consumer Protection Board (CPB)

All necessary information was provided by Ms Helle Aruniit, Director General.

The CPB is a national institution dealing mainly with the protection of the rights of private consumers. The CPB has to develop and implement consumer policy in accordance with the provisions of the Consumer Protection Act and the UN-Guidelines. A survey of the different tasks is attached.

The tasks of the CPB

The tasks of the CPB are determined in section 23 of the Liquid Fuel Act:

- verification of registration based upon the sale of fuel (§ 4 Liquid Fuel Act);
- inspection of the conformity of fuel and fuel handling (§ 3 Liquid Fuel Act).

As seen verifying the quality of fuels is one of the tasks of CPB. Normally, upon complaints from consumers the CPB starts its activities with sample taking. The samples are taken at filling stations directly from pistols. The samples are analysed by different private laboratories.

In 2003, 50 samples were taken. Out of the 50 samples only 6 were non-complying with the requirements. Those were diesel with 4 cases and gasoline 95 with 2 cases.

Input of staff

The input of staff (only one part time working person) with regard to fuel samples (50) per year is so little that that it cannot be seen of particular importance.

Interfaces

Sample taking is the link with other institutions.

Overlapping tasks

The CPB has to respond to the complaints of consumers autonomously. After the implementation of the FQMS the amount of complaints with regard to minor fuel quality will probably diminish.

3.1.1.3 Present tasks and responsibilities of the Energy Market Inspectorate (EMI)

The required information was provided by Ms Tiina Maldre, Chief Specialist.

The main responsibility of the EMI is to exercise supervision upon fuel and energy market at the national level. It shall protect the interests of customers in relation to the predominating energy supplier on the market and secure that all fuel and energy suppliers have equal conditions for participating on the energy market. Further, the EMI promotes conditions for competition and implements free market principles in the fuel and energy sector.

The tasks of the EMI are determined by the Liquid Fuel Act.

These are:

1. verification of registration data (section 15 of the Liquid Fuel Act);
2. inspection of conformity of fuel and fuel handling (section 3 of the Liquid Fuel Act);
3. approval of acts involving non-conforming fuel (section 16 of the Liquid Fuel Act).

In 2003, out of 85 samples taken from tanks and terminals, 15 were non-complying with the requirements. The samples were analysed in three different private laboratories.

Input of staff

The EMI does not use its own staff for sampling. Samples are taken by different companies on order. Analyses are performed by private labs.

Interfaces

Sample taking is the link with other institutions.

Overlapping tasks

It could be taken into consideration whether EMI's samples and test results could also be used to implement the FQMS or whether the financial resources may be shared.

3.1.1.4 Present tasks and responsibilities of the Ministry of Economic Affairs and Communication (MoEAC)

The required information was provided by:

- Ms Ell-Mari Koppel, Deputy Head of Department, Ministry of Economic Affairs and Communication;
- Mr Alan Vaht, Member of Management Board (Estonian Oil Stockpiling Agency).

The task of the Ministry is to establish the requirements of the fuels according to the Liquid Fuel Act by a regulation, which has been accomplished. The monitoring of fuel quality has to be achieved by different institutions.

Input of staff

Staff input - with regard to FQMS - cannot be seen yet.

Interfaces

The Ministry is competent in this context for the transposition of the EC legislation on fuel quality. Beyond that task the Ministry supervises the CPB and the EMI.

Besides, the Ministry of Economic Affairs and Communication has the right to obtain information necessary for performance of the duties arising from the Liquid Fuel Stocks Act from the TCB.

Overlapping tasks

With regard to FQMS – none.

3.1.1.5 Present tasks and responsibilities of the Statistical Office of Estonia (SOE)

The required information was provided by Ms Rita Raudjärv. Head of Industry, Construction and Energy Statistics Service

The SOE creates the energy balance according to the Eurostat-Scheme on an annual basis. The required data are provided by the reports of the TCB, private households and commercial companies. The TCB submits both the import and export data on fuels. On the basis of representative reporting covering 2,000-3,000 households, the total consumption of all households is calculated by applying relevant methodology. The reports of companies are allocated by sectors of economy. The reporting obligation starts when a company has more than 49 employees.

The quality of these data does not meet the data requirements of the FQMS. The Ministry of the Environment has taken actions to bridge the gap.

Input of staff

With regard to FQMS - none.

Interfaces

The SOE gets fuel-data from the TCB.

Overlapping tasks

With regard to FQMS - none.

3.1.1.6 Oil importers

On the one hand, it is the obligation of the Estonian Government to monitor the quality of the fuels sold in Estonia and to inform the European Commission about the compliance with EU standards related to fuel quality and about the quantities sold.

On the other hand, it is the obligation of all companies, which are active on the Estonian oil market to supply consumers with fuels complying with the standards according to the legislation of the European Union and to provide the Estonian Government with relevant information to fulfil international reporting obligations.

According to Estonian legislation the oil sold on the Estonian market has to fulfil minimum standards. These requirements shall according to subsection 8 (1) of the Liquid Fuel Act be established by a regulation of the Ministry of Economic Affairs and Communications. The requirements are based on the purpose of the use of the fuels and environmental requirements. It is not allowed to sell liquid fuel, which does not meet these requirements. According to subsection 8 (2) of the Liquid Fuel Act it is not allowed to sell fuels, which do not meet the European standards.

Several meetings were held with the representatives of the Estonian Oil Association and an oil company Lukoil. The representatives of oil industry confirmed that companies are aware of the obligation to meet the quality standards. In addition, it was stated that some companies sell sulphur free fuels. Consequently, at least one part of the fuel sold in Estonia is even better than required by the standards.

At the meetings, the oil industry was informed about the necessity to provide information about supply pattern and market share of companies to ensure representative design of the sampling procedure for the FQMS and to fulfil the annual reporting obligations to the European Commission.

Input of staff

With regard to FQMS - none.

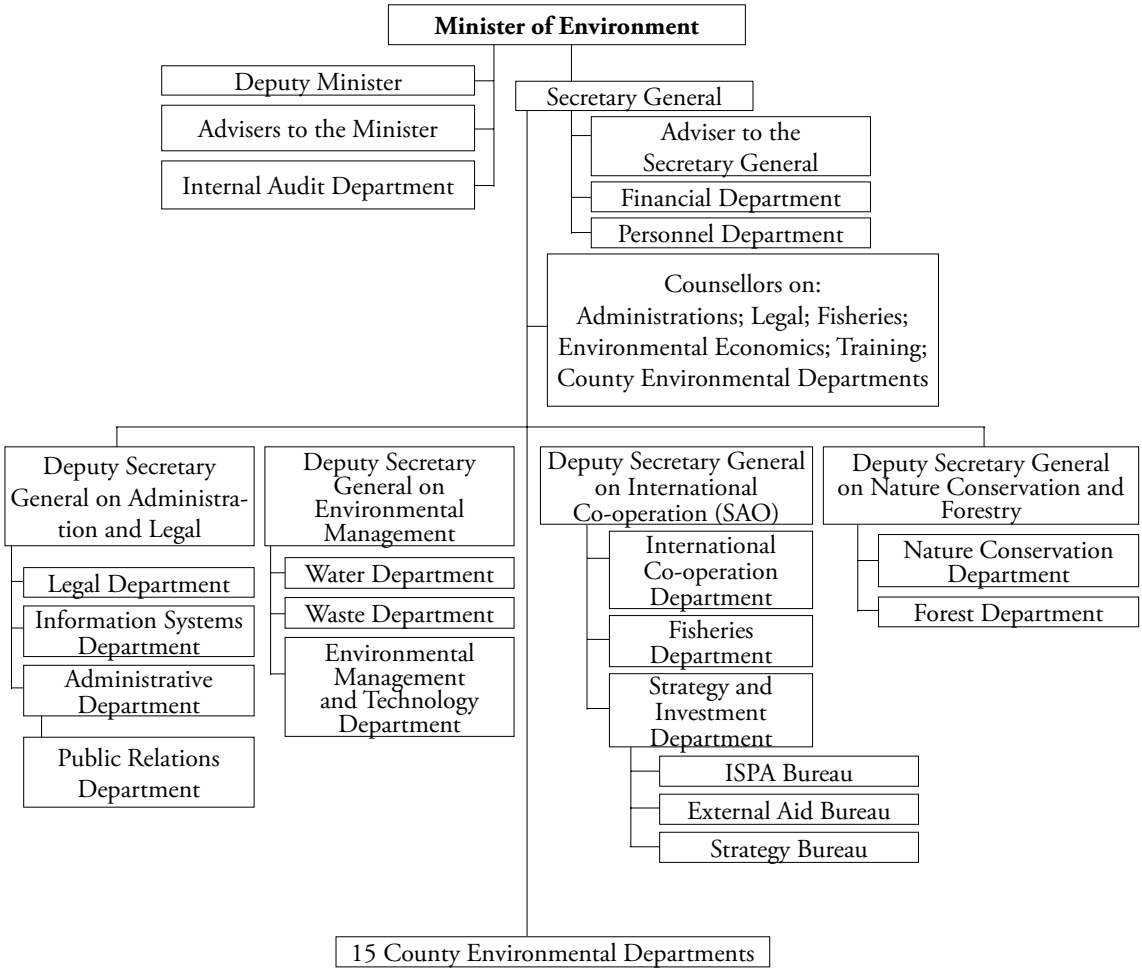
Interfaces

With regard to FQMS - none.

Overlapping tasks

With regard to FQMS - none.

3.1.1.7 Present tasks and responsibilities of the Ministry of the Environment (MoE)



The Ministry of the Environment (MoE) has within the Estonian Government the task to ensure the implementation of the EU legislation in regard to the FQMS. It was also the MoE who initiated the Twinning Project. The Ministry is the supervisory body of the Environmental Inspectorate and the Estonian Environmental Research Centre and the Environmental Information Centre.

Although the short term experts of the fuel quality project had the task of recommending the optimum organisational set up with regard to the FQMS, the Ministry of the Environment has finally to decide which institution will operate the FQMS.

On the 30th of September 2004 the Ambient Air Protection Act came in force. Subsections 58 and 59 of this act give delegation for regulations of the Minister of the Environment to limit pollutant and volatile organic compounds emissions to be elaborated. Both regulations were passed in May 2005.

Subsection 60 of the Ambient Air Protection Act regulates that monitoring the quality and volumes of motor fuels sold in Estonia shall be arranged by the Ministry of the Environment who also shall collect the relevant data.

Input of staff

With regard to FQMS - none.

Interfaces

With regard to FQMS - none.

Overlapping tasks

With regard to FQMS - none.

3.1.1.8 Present tasks and responsibilities of the Environmental Inspectorate (EI)

The Environmental Inspectorate has the task of implementing Directive 94/63/EC, which regulates VOC-emissions of fuels in filling stations and distributing tank facilities. This task is outside the scope of the FQMS.

In addition, the Environmental Inspectorate has to monitor the quality of heavy fuel oil. In this context samples are to be taken. Due to this task there appears a possibility to create synergies with the EERC.

More synergies can be expected with regard to necessary information to operate the FQMS.

Other links to FQMS are not recognisable.

Input of staff

With regard to FQMS - none.

Interfaces

With regard to FQMS - none.

Overlapping tasks

With regard to FQMS - none.

3.1.1.9 Present tasks and responsibilities of the Environmental Information Centre (EIC)

The Environment Information Centre (EIC) was established in 1989 and is subordinated to the Ministry of the Environment. The EIC collects, processes and generalises data on the Estonian nature, state of environment and influencing factors, provides environmental information for Estonian decision-makers, Estonian and foreign public and organisations. Its main activities are:

- National Environmental Monitoring Program (EMP);
- Environmental Geographic Information System (EGIS);
- Nature Conservation;
- Environment reviews and reports;
- International relations.

Input of staff

With regard to FQMS - none.

Interfaces

Interfaces result from section 60 of Ambient Air Protection Act, which says that the EIC is the competent authority in collecting relevant data for monitoring the quality and volumes of motor fuels sold in Estonia (see also 3.1.1.7).

In order to be able to also collect the data with regard to the FQMS missing legal basis should be created.

Overlapping tasks

With regard to FQMS - none.

3.1.1.10 Present tasks and responsibilities of the Estonian Environmental Research Centre (EERC)

The Estonian Environmental Research Centre (EERC) is a state owned company specialised in chemical analyses in the field of environment protection.

Its main fields of activity cover the following:

- Chemical analyses of water;
- Soil research;
- Microbiological analyses;
- Sampling to perform analyses;
- Conduct and implementation of environmental monitoring programmes;
- Training, etc.

Due to its outstanding competence and practical experience the TCB has contracted the EERC to analyse all fuel samples, which the TCB has taken from fuel storage facilities, filling stations and private cars. Recently, the TCB has also asked the EERC to take samples.

The equipment, which is presently available, is under heavy workload to fulfil the current demands of the EERC. Consequently it cannot be used for FQMS analyses. Furthermore, there are some new pieces of equipment necessary to run the FQMS according to EC Directive 98/70/EC.

Input of Staff

Recommendations for organizational set-up, staff input and job descriptions are provided in Component A, activity A2.

Interfaces

The EERC is the main counterpart in the project. In the future, after the set up of the new fuel laboratory, it will act as a link between all the described authorities and inspections.

Overlapping tasks

With regard to FQMS - none.

3.1.1.11 Present tasks and responsibilities of the Ministry of Finance (MoF)

The Ministry of Finance has only general budgetary tasks with regard to the FQMS. No additional information was required (see also 3.1.1.1).

3.1.2 Identification of the gaps with regard to implement FQMS

3.1.2.1 Availability of the data basis to run FQMS

As a first step, the implementation of the FQMS requires the availability of the following data specified in the standard EN 14274:2003:

- Total amount of fuels delivered in the whole country, including regional distribution;
- Total amount of each grade of fuel delivered in the whole country, including regional distribution;
- Total amount of diesel delivered in to the country, including regional distribution;
- Sources of supply as well as supply and distribution patterns.

A supplementary requirement is a list of all filling stations and large consumer filling stations. Each filling station must be identifiable by name and regional location. These data are not collected by any of the institutions involved.

The Ministry of the Environment has on the advice of the project short time experts prepared a questionnaire on these filling stations and sent the questionnaire to the 15 Estonian counties.

Further information about the size of population and regional distribution and last but not least the information on the total number of vehicles has been provided by the Statistical Office of Estonia and the Estonian Motor Vehicle Registration Centre.

3.1.2.2 Hierarchical placement of the operation of the FQMS

When it comes to the implementation of the FQMS and fulfilling the regular reporting obligation, the need for management issues, which are presently not being met, should be addressed. The implementation of the FQMS requires the reallocation of financial and staffing resources and the application of an organisational structure. All this is lacking at the moment.

The FQMS requires several of the following management tasks:

- Using the criteria of the amount of fuel delivered to inland market, a decision must be taken whether the Member State is a large-size or small-size country;
- Filling stations where the samples are to be taken according to the principle of accident must be selected;
- A institution needs to be appointed which will take samples.

The analytical report prepared by the laboratory shall only contain the following information:

- Laboratory identifier;

- Sample identification code;
- Site identification code;
- Type of fuel and fuel grade;
- Complete results of the test;
- Finally the meeting of reporting obligation according to the Directive 98/70/EC.

3.1.2.3 Requirements for the FQMS according to EN 14274:2003

This standard determines the system, which is necessary to comply with the Directive 98/70/EC.

As already mentioned, the decision on the size of the country will determine the minimum amount of samples for each grade of fuel in summer and in winter time.

Since Estonia consumes only 1 million tonne of fuels it belongs to the „small country" category.

As there is no refinery in Estonia, this amount of fuel was, according to the official statistics, imported.

3.1.2.4 Criteria for the appointment of the FQMS

The laboratory needs according to EN ISO/EC 17025 a valid accreditation. For the time being, no laboratory exists in Estonia, which meets all requirements of the FQMS. However, under current project the EERC will be upgraded with complete equipment and will be prepared for certification and accreditation.

After the completion of these requirements the laboratory will be capable of performing all physical, inorganic and organic analyses as well as of determining the octane number with regard to fulfilling the FQMS. To perform this task, sufficient number of appropriate staff must be made available.

3.1.3 Assessment

The aim of activity A1 was to get an overview of the status of distribution of the tasks and responsibilities for fuel quality management in Estonia and to identify gaps in the institutional set up. The results can be summarized as follows:

1. Currently no institution fulfils the tasks related to the FQMS. The implementation of FQMS in Estonia can be regarded as a new task, which has to be embedded in the present organisation – in consideration of a legal basis;
2. All sampling is currently arranged by responsible institutions because of their own statutory obligations (see also 3.1.1.1, 3.1.1.2 and 3.1.1.3);
3. The present laboratory equipment does not meet the requirements for analyses according to the FQMS (see also 3.1.2.4);
4. Legislation to ensure full statistical information and make it available to the managers of the FQMS needs to be drafted;
5. Business requirements, A good management system is an important factor to achieve the standards that are laid down in Directive 98/70/EC;
6. The Management System includes not only the staff and the equipment capacity: It is also very important for financial arrangements and resources, which shall be ensured on a continuous basis;
7. Council Directive 1999/32/EC (26 April 1999) relating to the reduction in the sulphur content of certain liquid fuels and amending Directive 93/12/EEC. The regulations and reporting obligations of the above mentioned Directive are not fulfilled until now (First obligation to report to the EC 30.06.2004);

8. Directive 2003/30/EC Promotion on the use of biofuels or other renewable fuels for transport. Member States shall pass the laws, regulations and administrative provisions necessary to comply with this Directive by 31. December 2004 at the latest and report to the Commission, by 1 July each year, on:

   - measures taken to promote the use of biofuels or other renewable fuels to replace diesel or petrol for transport purposes, (Art. 4 (1));
   - national resources allocated to the production of biomass for energy uses other than transport, and
   - Total sales of transport fuel and the share of biofuels (Art. 4 (1)).

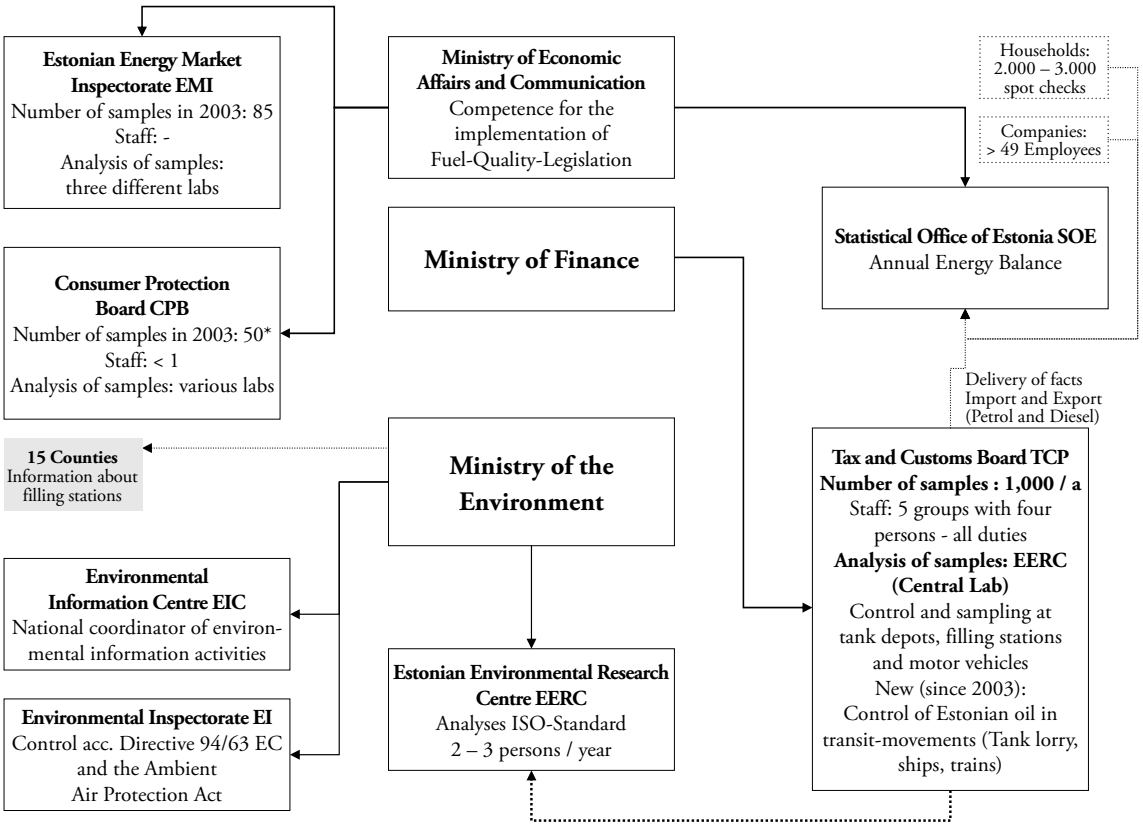
In the first report, following the entry into force of this Directive (May 2003), Member States had to indicate the level of their national indicative targets for the first phase.

In the report covering the year 2006, Member States shall indicate their national indicative targets for the second phase.

The above mentioned requirements are not fulfilled.

Annex 1

December 2004 - Present situation



* Trouble of consumers (focusing on the complaints)

3.2 Activity A2. Recommendations for optimum institutional set up and arrangements to run FQMS by application of lean management methodology

Activity A1 identified the tasks, responsibilities, interfaces and gaps of the Estonian institutions concerned with fuel quality management. One of the conclusions of this activity was that the new tasks of fuel monitoring are not fulfilled yet.

The task of activity A2 was to develop an appropriate set-up of the institutions to bridge the gaps without establishing new institutions.

The first set-up was already discussed with the relevant institutions in February 2005 and found acceptance. The following report reflects all promoting proposals to fine tune the set-up.

3.2.1 Institutional set up

3.2.1.1 Fuel Management System

The Fuel Quality Management System contains all samples and analyses in connection with fuel - according to the EU legislation. It covers two principle issues:

1. The traditional monitoring of
   - foreign trade flows of oil and the tax revenues from oil products;
   - consumer protection;
   - energy related tasks.

2. The new monitoring tasks:
   - Fuel Quality Monitoring System (FQMS), Directive 98/70/EC;
   - Fuel monitoring beyond this system;
   - Fuel monitoring of light and heavy heating oil, Directive 1999/32/EC;
   - Fuel monitoring of biofuels, Directive 2003/30/EC.

The following two corresponding tables will improve the transparency in regard to sampling and analyses as well as the interfaces:

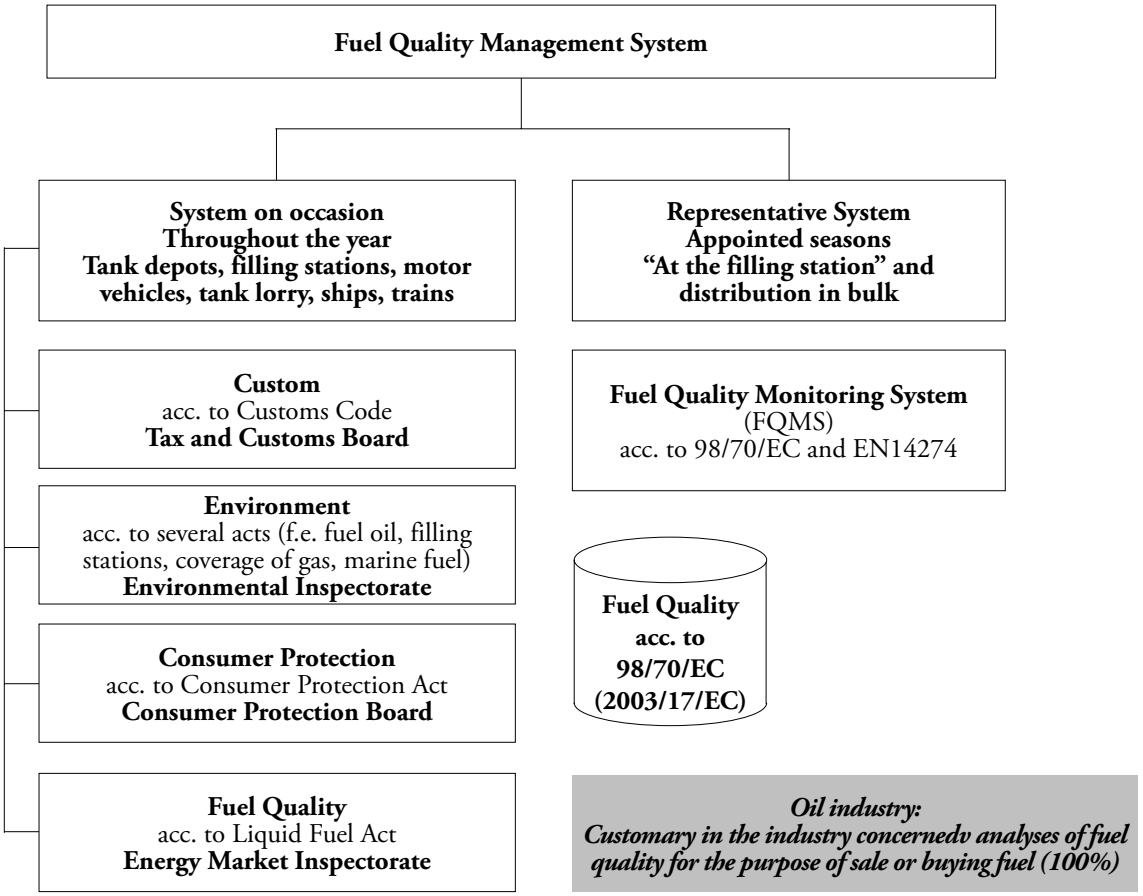
Sample ordered by / taken through	Reason / based on	Time of sampling	Sample taking at
Consumer Protection Board (CPB)[1]	Occasion - complaints of consumers (Liquid Fuel Act, Consumer Protection Act)	All-the-year	Filling stations
Environmental Inspectorate (EI)	Occasion (Ambient Air Protection Act, Environmental Supervision Act and other legal acts)	All-the-year	Heating plants, filling stations
Energy Market Inspectorate (EMI)[2]	Occasion (Liquid Fuel Act)	All-the-year	Bulk consumers

[1] own sampling or external processing of orders

[2] external processing of orders

Sample ordered by / taken through	Reason / based on	Time of sampling	Sample taking at
Tax and Customs Board (TCB)	Occasion (Liquid Fuel Act, Customs Code)	All-the-year	Tank depots, filling stations, motor vehicles, tank lorry, ships, trains
Oil industry	Securing quality for the purpose of sale or buying fuel	Even all-the-year	Tank depots
Estonian Environmental Research Centre (EERC)	Orders by contract (no own responsibility)	All-the-year	Tank depots, filling stations, bulk consumers
New task: FQMS	Representative sample	Twice a year (summer and win-ter)	Filling stations and bulk consumers

The previous table leads to the conclusion, that sample taking is a common task for most institutions concerned but the kind of sample taking is not appropriate to cover the FQMS. All activities of national sample taking obey the principle of occasion, whereas the sample taking according to FQMS needs to be representative. The next scheme reflects the sampling activities by different competent institutions:



The duties – without the new task of FQMS - are the statutory obligations of every competent authority.

The task of the oil industry to control fuel quality for the purpose of sale or buying fuel (samples are be taken at the storehouses) should be seen apart from national activities.

3.2.1.2 Fuel Quality Monitoring System (FQMS)

3.2.1.2.1 Competent authority

According to section 60 of the Ambient Air Protection Act the Ministry of the Environment (MoE) shall organise the monitoring of the quality and quantity of the motor fuels sold in Estonia and compile the corresponding data. In this sense the Ministry of the Environment is the competent authority to organise and implement the Fuel Quality Monitoring System according to EN 14274.

Because of implementation the Fuel Quality Monitoring System as a new duty and a part of the Fuel Management System different decisions need to be taken:

1. Who should be the manager of the FQMS? (see also 3.2.1.2.2)
2. Which organisation should be responsible for organisation of sample taking? (see also 3.2.1.2.3)
3. Who should be responsible for the analyses? (see also 3.2.1.2.4)
4. Who should be responsible for reporting? (see also 3.2.1.2.5)

3.2.1.2.2 Competent authority (Manager)

The duty of management should be divided in two responsibilities:

- political management;
- executive management.

The political management shall:

- cover the budget issues;
- determine the amount of samples to be taken;
- appoint the institution to manage the FQMS procedure and
- sign the report to Brussels.

The description is not exhaustive (finally). This political task should be performed by the Ministry of the Environment.

The executive management should appoint a person in charge (manager) who shall:

- prepare the sample taking according to the standard;
- arrange the organisation of sample taking;
- appoint the laboratory to analyse the samples and
- prepare the final report for signature by the Ministry of the Environment.

Short ways of communication between management, sample taking as well as analysing are essential for work effectively. For this reason the executive management should be assigned to the Estonian Environmental Research Centre (EERC). The EERC shall be responsible for the organisation of sample-taking as well as analyses and thereby EERC will become the main competitor in the FQMS.

The second basically qualified institution, the Environmental Information Centre (EIC), appears less suitable to take over this task – the analytical issues are not the key part of EIC.

3.2.1.2.3 Competent authority (Sampling)

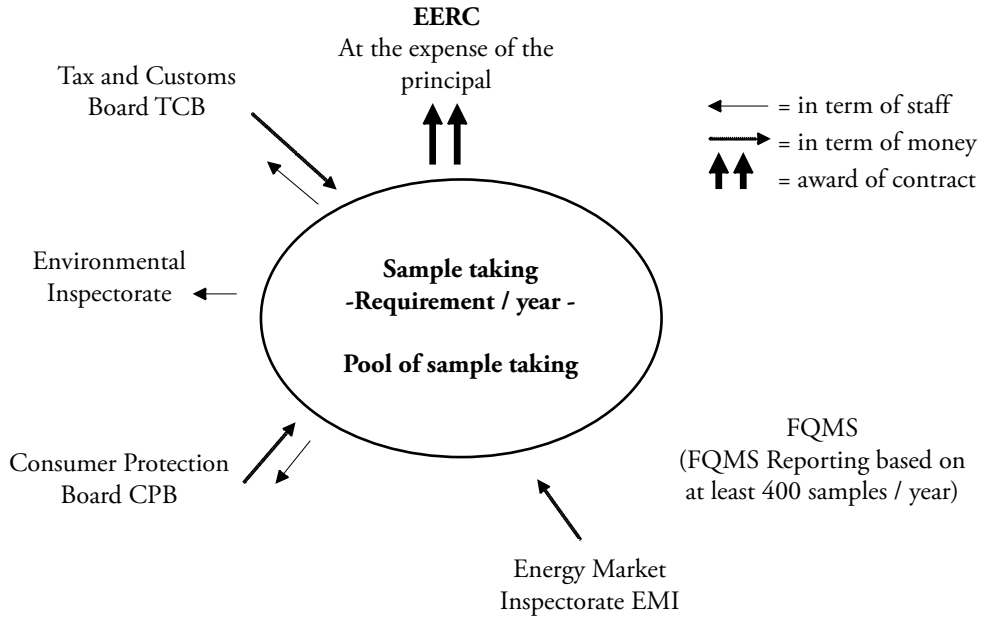
One of the results of Twinning Component A, activity A1 was that currently no institution has been assigned the tasks with regard to FQMS. In so far the implementation of FQMS in Estonia is a new task, which has to be embedded in the present organisation – in consideration of a legal base.

The present situation in sample - taking is typified by several competitors and procedures:

- Tax and Customs Board: Own staff or by EERC on behalf of TCB;
- Environmental Inspectorate: Own staff;
- Consumer Protection Board: Own staff or various labs on behalf of CPB;
- Energy Market Inspectorate: Three different labs on behalf of EMI.

This initial situation demands a coordinating strategy. Therefore, the task of sample taking should be assigned to all institutions, which already take samples, by the method of pooling all their financial and personal capabilities.

In this sense the creation of a "Pool of sample taking" can be recommended:



Pool of sample taking means the implementation of annual planning meetings with all stakeholders, for example always at the end of October, respectively at the beginning of November (according to the corresponding European norm the winter sampling period is from the 1st December to the 29th of February).

The goals of the planning meetings should be:

- to achieve the highest degree of efficiency of the laboratory;
- to find out, how many and which kind of samples will be taken by stakeholders in the following year (planning base);
- to clarify, who will be able to take how much samples (quantity depends on the availability of money and staff);
- to clarify, which samples are suitable to use for the FQMS.

All participating institutions should agree to the results of the meeting.

By this method the same sample can be used for different purposes that agree to the provided requirements of the FQMS. The samples have to:

- be representative;
- be treated confidentially;
- apply the same procedures for sample taking (to be implemented by Twinning Component B, activity B2) and
- be analysed by the same standards of Directive 98/70/EC amended by Directive 2003/17/EC.

For the future it means, that:

- previous stakeholders will take samples and
- they will fulfil their duty in several procedures based on the present situation: in term of staff and financial resources.

This kind of pooling needs coordination. The main task will be to identify the share of each institution in sampling to decide, which samples are suitable for the FQMS. The MoE will give the total number of samples, which have to be taken with regard to fuel monitoring.

It is already clear that the existing number of samples and analyses out of the pool will not be sufficient to fulfil the monitoring requirements of FQMS. It is expected that only a minor part of the samples will be suitable (the anticipated number of samples for the FQMS is 400). So, the Environmental Inspectorate and the EERC should take the remaining samples. Both institutions have skilled staff and the required equipment.

It has to be guaranteed that they will be capable of sample taking and analysing (money and staff) to fulfil the Estonian duty to report to the European Commission.

3.2.1.2.4 Competent authority (Analyses)

At present, the EERC is the mainly competitor in the area of national analyses. Without the Consumer Protection Board (CPB) and the Energy Market Inspectorate (EMI) all involved stakeholders are used to order their fuel analyses from the EERC.

After setting up the fuel laboratory at Suur Sõjamäe, Tallinn, the EERC will be state of the art and the only one in Estonia, which will be able to analyse octane and cetane numbers and also sulphur content, which will become even more important in the future (in view of implementing legislation on marine diesel). The fuel laboratory will get full certification and accreditation to analyse fuel samples.

Because of its unique standard the EERC should in the future be the only laboratory, which will analyse the fuel samples of national institutions. To consider the regulations for the competitive bidding procedure it may be necessary to complete them in such a manner that the technical standard of the EERC should be the Estonian standard for the acceptance of bid.

This should be binding for the future also for analyses of samples for the FQMS-Reporting.

3.2.1.2.5 Competent authority (Reporting)

According to part 7 and the introduction to Annex E of standard EN 14274 the final report for any one country shall contain two sections (general and analytical), in which all necessary information and data is given to allow a reliable judgement of the fuel quality in that country. The complete report shall be forwarded to the competent European authority, one for each season (summer and winter).

3.2.1.2.5.1 General section (acc. to standard annex E.2)

- Executing Member State;
- Season of the year and specific time periods, in which the FQMS has been executed;
- Complete list of the fuel grades available in its territory;
- Statistical model, including any additional provisions made;
- Information and identification of the defined regions;
- Volume information per county and per fuel grade, and their breakdown into regional sample numbers;
- Number of samples taken per fuel grade per region;
- Any other information deemed necessary to give a reliable description about the executed FQMS, like the organisation(s) responsible for compiling the report, etc.

3.2.1.2.5.2 Analytical section (acc. to standard annex E.3)

The reporting has to be effected separately for each grade containing:

- A detailed list of analytical results for each parameter which has been analysed;
- Information necessary for unambiguous identification of the fuel grades;
- Information about the time periods in which the samples have been taken and analysed.

The data shall be reported using the appropriate format(s) defined in standard tables D.1, D.2 and D.3.

3.2.1.2.5.3 Responsibility (preparation of report)

To prepare the analytical section seems like a duty for the EERC respective future manager.

General data, e. g. about the number of inhabitants and vehicles including their regional distribution will be predominantly available by the official web pages of ministries or other governmental institutions, so that it will be possible for the EERC to generate the data for the final report with only a small additional operating expense (see also 3.2.1.2.2).

3.2.1.2.6 The workflow of the Fuel Quality Monitoring System

The workflow of the Fuel Quality Monitoring System will consequently be as follows:

1. MoE requests the EERC to compile the FQMS (see also 3.2.1.2.2);
2. EERC organizes the FQMS (sampling, analysis, general data, preparation of the report) (see also 3.2.1.2.3, 3.2.1.2.4 and 3.2.1.2.5.3);
3. MoE signs the report and sends it to the European Commission (see also 3.2.1.2.2).

3.2.1.3 Legal basis

The legal basis for the different new tasks of the different institutions is necessary for the implementation of the task. If the existing legislation is not adequate or available it has to be drafted.

3.2.1.3.1 European law

The European basis for the quality control of fuel is laid down in the following legal acts:

- Directive 98/70/EC of the European Parliament and of the Council relating to the quality of petrol and diesel fuels and amending Council Directive 93/12/EC;
- European Standard EN 14274 "Automotive fuels – Assessment of petrol and diesel quality – Fuel quality monitoring system (FQMS)"; endorsed on 17.09.2003 with the notification being published in the official publication of the Estonian national standardisation organisation (EVS-EN 14274:2003);
- European Standard EN 14275 "Automotive fuels – Assessment of petrol and diesel fuel quality – Sampling from retail site pumps and commercial site fuel dispensers"; endorsed on 17.09.2003 with the notification being published in the official publication of the Estonian national standardisation organisation (EVS-EN 14275:2003);
- Directive 2003/30/EC of the European Parliament and the Council on the promotion of the use of biofuels or other renewable fuels for transport.

A complete list of all relevant European acquis are in 2.3.2.

3.2.1.3.2 Estonian law

The Estonian legislator has established the legal framework. Council Directive 93/12/EEC of 23 March 1993 relating to the sulphur content of certain liquid fuels (amended by 98/70/EC and 99/32/EC) was transposed into national law by the Ambient Air Protection Act, entered into force on 30 September 2004.

Chapter 3 of this Acts regulates the requirements for fuel including the responsibility for the monitoring quality and quantity of motor fuels (sections 58 – 60).

The environmental requirements for motor vehicle petrol, diesel fuel, light fuel oil, heavy fuel oil, shale oil and bioful are, based on subsection (2) §58 of the Ambient Air Protection Act, established by regulation no 38 of the Minister of the Environment from 19 May 2005: "Environmental Requirements for Liquid Fuels",The established requirements are distinguished between the purpose of use of the fuels and base on environmental requirements according to EN 228 and EN 590, established by a regulation no 97 of the Minister of Economic Affairs and Communications from 11 June 2003 "Requirements for Liquid Fuels" (see also Liquid Fuel Act).

The Liquid Fuel Act, which entered into force on 1 July 2003 provides, for the purpose of guaranteeing the accrual of fuel excise duty and the quality of more widely used motor fuels, the legal basis and procedure for handling liquid fuel as well as liability for the violation of this Act and lays down enforcement provisions.

The requirements for motor vehicle petrol, diesel fuel, light fuel oil and heavy fuel oil are established according to subsection (1) 8 of the Ambient Air Protection Act by regulation 97 of the Minister of Economic Affairs and Communications from 11 June 2003 "Requirements for Liquid Fuel" The requirements are established based on the purpose of use of the fuels and environmental requirements according to EN 228 and EN 590 (see also the Ambient Air Protection Act[3]).

The form of report on fuel handling and the procedure for the completion and submission thereof is established by a regulation of the Minister of Finance from 1 July 2003.

The Liquid Fuel Stocks Act entered into force on 9 March 2005. The Estonian Liquid Fuel Stocks Act provides the legal base for the establishment and storage of mandatory oil stocks to meet the obligation laid down in Council Directive 68/414/EEC of 20 December 1968. The level of mandatory

[3] Requirement: Agreement between Ministry of the Environment and Ministry of Economic Affairs and Communications, how to manage the sampling and analysis in a way that the requirements of FQMS will be fulfilled and samples shall not be taken twice

stocks corresponding to 90 days of average consumption in the previous year must be calculated each year (section 3). The costs for stock holding are paid by importers (sections 8 and 9). According to section 12, the TCB is obliged to submit to the stockholder a monthly report with data from importers about oil sold during the previous month. According section § 18 the stockholder shall analyse the supply situation based upon information from sellers of oil.

According subsection (9) 23 of the Estonian Liquid Fuel Stocks Act the format of statistical summaries is established by a regulation of the Minister of Economic Affairs and Communications (from 28 March 2005). It forms the basis of the data for the final report, section general data too.

3.2.1.4 Sanctions an Penalties for Non - Compliance

The prosecution of non complying fuels and the proceedings is regulated for TCB, CPB and EMI in section 29 of the Liquid Fuel Act.

For the Environmental Inspectorate, section 139 of the Ambient Air Protection Act regulates the liability in case of violation and section 143 the proceedings.

3.2.2 Organisational set up for remaining monitoring

In principle, the structure recommended for the FQMS can also be applied to the remaining monitoring but some modifications are needed to deal with different fuels.

3.2.2.1 Management

The monitoring of fuels not covered by the FQMS should be managed by the Environmental Inspectorate, which is already exercising environmental supervision and enforcement.

The monitoring of the fuels of non representative filling stations should be separated from the monitoring of the heating fuels. Such sample taking may also be covered by the pool of institutions (TCB, CPB, EMI and EI).

3.2.2.2 Sample taking

The non representative fuel samples should as far as possible be taken by the pool of institutions and the remaining part should be covered by the Environmental Inspectorate.

The heating fuels and the monitoring of biofuels should also be in the competence of EI.

With regard to the non representative fuels it must be reminded that the sample taking procedure and the analysing have to be identical with the FQMS procedure.

3.2.2.3 Analysing

The EERC should take all analyses of these fuels.

This concludes the recommendation for organisational set up.

3.2.3 Business requirements

3.2.3.1 Operating Budget

In addition to legal basis, allocation of sufficient financial resources to run Fuel Quality Management System (FQMS) is very important.

The financial resources are necessary to fund staff and equipment (see also 3.2.1.2.3).

3.2.3.1.1 Capacity - Staff

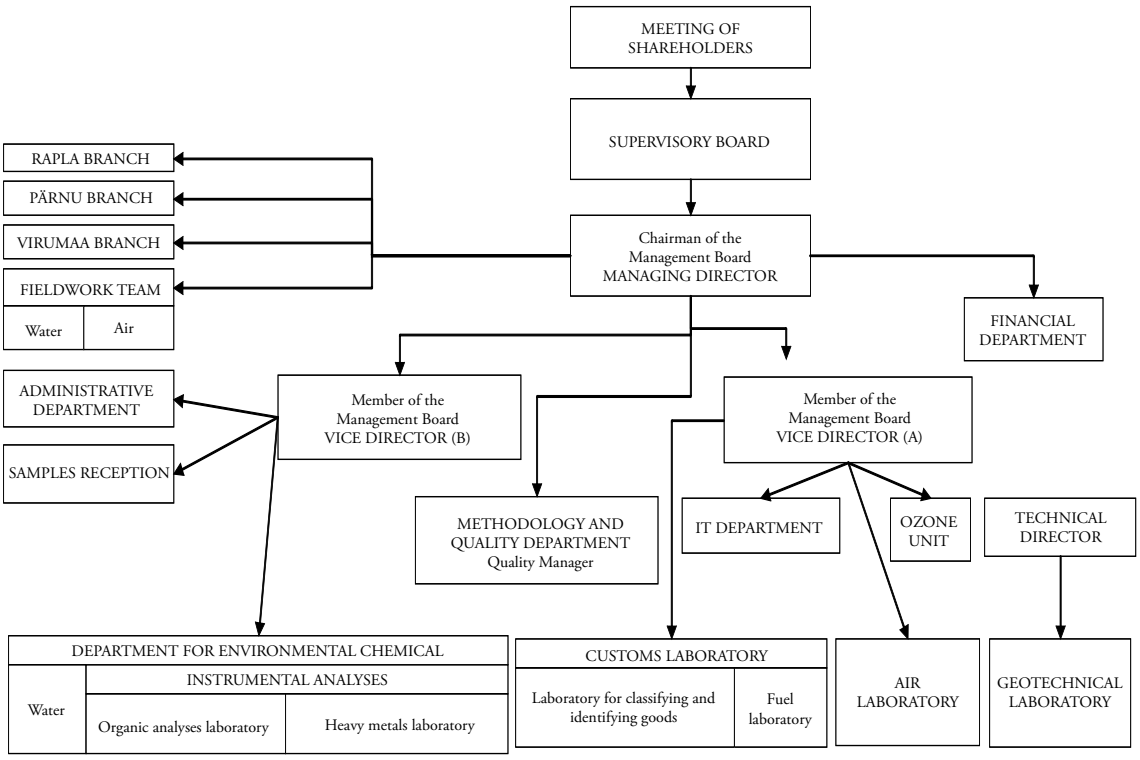
The staff - capacity depends very much on the size of the country and the complexity of the system. Considering the increasing costs of work in the long run, it is strongly recommended to keep the number of staff at low level at the beginning and to recalculate the costs each year, to make sure that the budget is correctly determined, making sufficient level of sampling and analysis possible.

In order to fulfil these requirements it is necessary to analyse the different jobs and the work steps, which are linked with the described activities.

The FQMS involves three main job – categories:

- FQMS-Manager and office;
- Laboratory, chemist and analytical staff;
- Samplers.

Estonian Environmental Research Centre (EERC) Organizational structure



3.2.3.1.2 Capacity - Equipment

The Laboratory- as well as the monitoring- and sampling equipment needed for the FQMS has to be evaluated and costs written off, so that after the anticipated average life of equipment a replacement or an expansion project will be possible.

3.2.3.2 Cost breakdown

Fuel Quality Management Costs	%
Costs relating to taking samples	4.10
Laboratory costing (analysis)	75.31
Fuel costs (for monitoring fleet)	0.75
Monitoring fleet maintenance	0.62
Insurance	0.21
Personnel	10.84
Computer	0.53
Office (supply)	0.27
Monitoring supply	3.46
Miscellaneous	0.15
Mobile phone supply	0.11
Mobile phone calls	0.26
Financial costs	0.19
Quality control	3.17
Travelling costs	0.03

Source: Fund for the Analysis of Petroleum Products (Fapetro), 2003

3.3 Activity A3. Staff capacity

This part of the report deals with the analyses of the existing personnel capacities and determines missing abilities to operate the FQMS as planned. The analysis involves the jobs at the Ministry of the Environment (MoE) and the Estonian Environmental Research Centre (EERC) who will be responsible for the political and executive management of the FQMS.

It was established that the only two new jobs will be needed: the Executive Manager of the FQMS and the Engines Operator/Laboratory-Assistant. In all other cases there is existing personnel with similar areas of responsibility and corresponding knowledge.

3.3.1 Assessment of the required personnel resources and their competencies

The assessment of the required personnel resources is based on eight working hours per day / 220 working days per calendar year.

Therefore, job descriptions for involved staff were elaborated. The descriptions include all required qualifications and work steps of the different employees involved in the FQMS:

1. Holder of the position (personnel data for future staffing);
2. Organisational integration of the job (recommendation);
3. Duties of the employee;
4. Description of the activities;
5. Organisational integration and competencies.

The next section evaluates each task in detail, so that the addition of the time rates allows a statement about the required personnel resources.

3.3.2 Identification of the required personnel resources to run the FQMS - FQMS-Management

According to section 60 of the Ambient Air Protection Act the Ministry of the Environment shall organise the monitoring of the quality and quantity of the motor fuels sold in Estonia and compile the corresponding data. In this sense the Ministry of the Environment is the competent authority who shall to organise and implement the Fuel Quality Monitoring System according to EN 14274.

According to the recommendation in 3.2.1.2.2 the management involves two responsibilities:

- political management;
- executive management.

3.3.2.1 Political Management

The political management shall:

- cover the budget issues;
- determine the amount of samples to be taken;
- appoint an institution to manage the FQMS procedure and
- sign the report to be sent to the European Commission.

This typically political task should be taken by the Ministry of the Environment.

The employment percentage will be not more than 5 % of the annual working time (Annex 1 in the end of this chapter).

3.3.2.2 Executive Management

The executive management shall:

- prepare sample taking according to the standard;
- organise sample taking;
- appoint a laboratory to analyse the samples and
- prepare the final fuel quality report for signature by the Ministry of the Environment.

Short ways of communications between Management, sample taking as well as analysing are essential to work efficiency. For this reason the executive management tasks should be assigned to the Estonian Environmental Research Centre (EERC), see also 3.2.1.2.2.

It is anticipated that one person with 100 % of the annual working time will be needed. The job description is enclosed (Annex 2 in the end of this chapter).

3.3.2.3 Results

The successful implementation of the FQMS hinges on the real-time availability for work of the executive manager. Without this post Estonia will not be able to fulfil the requirements of the FQMS.

3.3.2.4 Gaps

- Decision, who in the MoE should be responsible for this task;
- Job advertisement and appointment;
- Decision, who should fulfil the task of the Executive Manager during the transition period between the Twinning project and the ultimate implementation of the FQMS.

3.3.3 Identification of the required personnel resources to run the FQMS - laboratory

Based on the results of component B it is anticipated that the FQMS in Estonia will be based on 400 samples a year, so that annually 400 samples need to be taken and analysed in the future.

To make this possible, necessary work procedures by experts were described and their working load was evaluated.

The result is a modular concept of associated work steps.

- Head of the Laboratory (Annex 3 in the end of this chapter);
- Chemist (Annex 4 in the end of this chapter);
- Engines Operator/Laboratory-Assistant/Sample-Taker (Annex 5 in the end of this chapter).

The tasks of the Head of the Laboratory are described in detail in the attached job description form in the end of this chapter. The estimated expenditure of time for the FQMS will be 40 - 50 percent of his/her whole working time.

The work time shares of the Chemist and the Engine Operator/Laboratory Assistant and the sample-takers have been calculated on an Excel worksheet (Annex 6 in the end of this chapter), which can also be used for recalculation. The described tasks consider the requirements of the European Standards EN 14274 “Automotive fuels – Assessment of petrol and diesel quality – Fuel quality monitoring system (FQMS)” and EN 14275 “Automotive fuels – Assessment of petrol and diesel fuel quality – Sampling from retail site pumps and commercial site fuel dispensers”. The assumed time allocation is the result of an expert estimation.

Based on eight working hours per day as well as 220 working days per calendar year the following FQMS manpower requirements result from this:

- about one fourth of a job of Chemist in the GC-laboratory (22,73%);
- about 40% of a job of Chemist in the oil-laboratory (37,73%);
- about one third of the job "Engines Operator/Laboratory-Assistant" (30,45%). A time bonus was granted with regard to the missing experience of the Engines Operator/Laboratory-Assistant in the first year;
- about one third of the job "sample taker" (31,25%).

For the preservation of evidence, the samples should be taken by two sample-takers, so that the manpower need for this part of the FQMS will be two thirds.

3.3.3.1 Results

With regard to the FQMS it is possible to fulfil the laboratory- and the sample-taking activities with the existing personnel.

3.3.3.2 Gap

The necessary skills of the Engines Operator/Laboratory-Assistant are still missing in the existing personnel capacity and should be hired, by training an existing employee or – if it would not be possible – by fresh engagements.

This person needs to have a technical background: a car mechanic combined with the knowledge of a chemist would be the best choise. Furthermore, he needs a lot of practise and experience before he is able to run the „knocking machine" (octane and cetane engines) and to get the correct outputs. It is recommended to search as early as possible to find the ideal person for this job.

3.3.4 Working relationship (Workflow)

To ensure successful implementation of the FQMS it is necessary to determine an optimal flow path between the different stakeholders. This applies to the process of coordination of planning as well as to the actual cooperation.

3.3.4.1 Committee from representatives of stakeholders (planning group)

According to the recommendation given in 3.2.1.2.3 an annual planning meeting with all stakeholders needs to be established. The Executive Manager of the FQMS will bear the professional and organizational responsibility.

The targets of the planning meeting are:

- to achieve the highest degree of efficiency of the laboratory;
- to find out, how many and which kind of samples will be taken by stakeholders in the following year (planning base);
- to clarify, who will be able to take how much samples (quantity depends on the availability of money and staff);
- to clarify, which samples are suitable to use for the FQMS.

All participating institutions should agree to the results of the meeting.

The first planning meeting took place in December 2005.

In addition, the stakeholders should improve a basic strategy to organize the sampling in a way that several filling stations will not be inspected more than once a year and that the sampling is evenly distributed by all operators.

3.3.4.2 Sampling team (actual cooperation)

The stakeholders will be requested to declare in writing, providing the names of and contact details of their permanent contact persons, that they will take part in the pool of sample taking, so that the Executive FQMS-Manager as well as the Head of the Laboratory will be able to organize sampling in a reliable manner.

Annex 1

FQMS task breakdown - political management

No	Tasks	Required specialized knowledge including provisions of law and administration	Time slice in %
1	Conduct of Contract and budget negotiations with the EERC to implement FQMS in the every following year – based on the first draft prepared by EERC containing: ▪ planned number of samples; ▪ selection of filling-stations, where the samples should be taken; ▪ needed money for personnel and expendables[1]; ▪ selection of parameters, which should be analysed; ▪ timetable.	Directive 98/70/EC Directive 2003/30/EC European Standards: ▪ EN 14274 ▪ EN 14275 ▪ EN 228 ▪ EN 590 Ambient Air Protection Act Environmental Supervision Act Liquid Fuel Act Liquid Fuel Stocks Act	5
2	Signing of the fuel report to be sent to the European Commission		
3	Making necessary modifications in legal acts to allow the implementation of the FQMS		

[1] May be it will be necessary to estimate costs to pay the fuel taken by EERC in the connection with FQMS-sampling, until a legislation will go into force, that the sampling material has to provide free of charge by the operator of a filling station. Until now it is only ruled for samples taken by the Environmental Inspectorate (Environmental Supervision Act)

Annex 2

	FQMS – Manager - NEW DUTY	Date

Workplace and Job description

1. Holder of the position		
1.1 Surname, first name	1.2 Date of birth	1.3 Start at the position
1.4 Previous job description		
1.5 ☒ Full – time employee	☐ Part – time employee with hours per week	

2. Organisational integration of the position	
2.1 Place of employment EERC	2.2 Organisational Unit
2.3 Position Number FQMS- Executive Manager	2.4 Function Organisation and execution of the Fuel Quality Management System

3. Duties of the employee

3.1 Short description

- Organisation of the FQMS including the coordination of different competitors, sample-taking and analyses;
- Overall responsibility for the preparation of final fuel quality report to the European Commission;
- Contract and budget negotiations with the Ministry of the Environment.

3.2 a) Personal requirements (Education, profession, knowledge, skills and abilities)

Higher education, lawyer or equivalent professional studies, organisation and communication skills, skill to negotiate with different institutions and interests

b) Required graduation, university degree, examination

University diploma in law or equivalent certificate.

3.3 Work on computer

☒ yes ☐ no hours/day.

4. Description of the activities

Activities (to number consecutively 4.1, 4.2, etc.)		Required specialized knowledge including provisions of law and administration	Time slice in %
4.1	Organisation of FQMS including: - coordination of the different competitors (contracting entity, sample-taking, analyses, etc); - overall responsibility for the adequate execution of sample-taking and analyses according to the European Standards (e. g. work clothes acc. to industrial safety, required working materials and receptacles, non-polluting disposal of samples[1] etc.); - annual planning meetings with the Estonian stakeholders; - initiating the process of prosecution in case of non-compliance between samples and European Standards.	Directive 98/70/EC Directive 2003/30/EC European Standards: o EN 14274 o EN 14275, o EN 228 o EN 590 o EN ISO / IEC 17020:2004 Ambient Air Protection Act Environmental Supervision Act Liquid Fuel Act Liquid Fuel Stocks Act Understanding of organisation and duties of the Estonian ministries as well as the work-flow between them	50
4.2	Final report to the EU acc. to FQMS (annual) including: - fixing the number of samples; - selection of filling-stations, where representative the samples should be taken; - selection and fixing the parameters; - flow chart for the analyses incl. report form; - fixing the period of sample taking; - editing of general data for the final report; - preparation of the final report, except the signature of the MoE.	Directive 98/70 EC Directive 2003/30/EC European Standard EN 14274 European Standard EN 14275 Ambient Air Protection Act	30
4.3	Responsibility for the punctual availability of the general data including the information about the filling stations	Directive 98/70/EC Directive 2003/30/EC European Standards: o EN 14274 o EN 14275,	15
4.4	Contract and budget negotiations with the Ministry of the Environment (annual) to fulfil the requirements of the FQMS	European Standards: o EN 14274 o EN 14275, o EN 228 o EN 590 Ambient Air Protection Act	5

[1] Indicates EERC (after closed analysis) as well as the filling-station (disposal of backup sample after analysis has been effected)

5. Organisational integration and competences
5.1 The following employees are permanently subordinated to (only function):
5.2 The holder of the position is permanently subordinated to (function and salary group): Management of the EERC, in case of preparation the final report to the MoE
5.3 The holder of the position substitutes / represents
5.4 The holder of the position is substituted / represented by Head of the Fuel Laboratory
5. 5 The holder of the position has the following authorities (e. g. authority of signature, of directive, of decision, of control) Overall responsibility for the execution of the FQMS and preparation of the final report including all necessary decisions as well as the negotiations with the MoE
5.6 The holder of the position has the following duties to inform other authorities (e. g. inside the department, the house, to external) MoE in case of preparation the final report, Head of Fuel Laboratory, Stakeholders in FQMS
5.7 The holder of the position has to present his results to MoE in case of preparation the final report, Management of EERC
5.8 Other remarks (e. g. collaboration in committees)

Confirmation to the points 1 – 5

I took note of the preceding description of my workplace. .... Date Signature (holder of the position)
I confirm the correctness of the preceding job description: ☐ The holder of the position has been practising the function since _____ ☐ The holder of the position shall practise the function from the _____ .... Date Signature (head of division)

Annex 3

	HEAD OF LABORATORY	Date

Workplace and Job description

Teil I: Workplace

1. Holder of the position		
1.1 Surname, first name	1.2 Date of birth	1.3 Start at the position
1.4 Previous job description		
1.5 ☒ Full – time employee	☐ Part – time employee with hours per week	

2. Organisational integration of the job	
2.1 Place of employment EERC	2.2 Organisational Unit Fuel Laboratory
2.3 Position Number Head of Laboratory	2.4 Function Organising and controlling the functioning of laboratory. Ensuring the fulfillment of quality standards and demands of quality manual

3. Duties of the employee

3.1 Short description

- Ensuring the standard EVS EN ISO/IEC 17025:2000 quality requirements, enhancement and modernization of the quality system;
- Organization of proper registration, analysis and storage of samples;
- Supervision, control and evaluation of laboratory staff;
- Communication with clients, resolving possible problems and other issues;
- Organization of training and teaching of new employees;
- Being well informed and familiar with all approved and validated methods.

3.2 a) Personal requirements (Education, profession, knowledge, skills and abilities)

Higher education, chemist, skills to operate various laboratory equipment and knowledge of modern analyses techniques.

b) Required graduation, university degree, examination

University diploma in chemistry or equivalent baccalaureate degree

3.3 Work on computer

☒ yes ☐ no hours/day.

4. Description of the activities

Activities (to number consecutively 4.1, 4.2, etc.)	Required specialized knowledge including provisions of law and administration	Time slice in %
Executive functions (Personnel)		50
4.1 Supervision, control and evaluation of laboratory personnel (e.g. chemists, engine operator/laboratory assistant)		
4.2 Work flow Responsible for the: ➢ task control and job-sequence (registration, analysing and storing of samples); ➢ correctness of the analyses; ➢ report according to standard annex E to the FQMS – Manager.	EN 14274:2003, standard annex E	
4.3 Advanced Training Training and teaching of employees.		
4.4 Communication ➢ Communication to the inspected companies/organizations; ➢ Resolving of possible problems and other issues; ➢ Communication to the FQMS – Manager.		
4.5 Professional Qualifikation ➢ Has to be well informed and familiar with all approved and validated methods; ➢ Has to be familiar with all the works of his subordinated employees.		
4.6 Equipment Responsible for ➢ the supervising of the proper handling of the laboratory apparatus; ➢ the procurement of laboratory equipment; ➢ the procurement planning.		

5. Organisational integration and competences
5.1 The following employees are permanent subordinated to (only function): Chemists, technicians and laboratory assistants
5.2 The holder of the position is permanent subordinated to (function and salary group): Directorate of EERC
5.3 The holder of the position substitutes/represents Ohter chemists, technichians a.s.o.
5.4 The holder of the position is substituted/represented by Chemist
5. 5 The holder of the position has the following authorities (e. g. authority of signature, of directive, of decision, of control) Has authority of signature to sign analyse acts Must control the work of chemists, technicians and laboratory assistants In the competence of his position make decision about everyday laboratory work and organizing workflow Must control the accordance to safety rules at laboratory
5.6 The holder of the position has the following duties to inform other authorities (e. g. inside the department, the house, to external) Directorate of EERC
5.7 The holder of the position has to present his results to Directorate of EERC
5.8 Other remarks (e. g. collaboration in committees)

Confirmation to the points 1 - 5

I took note of the preceding description of my workplace. It is complete and objective correct. .... Date Signature (Holder of the Position)
I confirm the correctness of the preceding job description. ☐ The holder of the position practises the function since _____ ☐ The holder of the position shall practise the function from the _____ .... Date Signature (Head of Division)

Annex 4

	CHEMIST	Date

Workplace and Job description

Teil I: Workplace

1. Holder of the position		
1.1 Surname, first name	1.2 Date of birth	1.3 Start at the position
1.4 Previous job description		According to the job description of
1.5 ☒ Full – time employee	☐ Part – time employee with hours per week	

2. Organisational integration of the job	
2.1 Place of employment EERC	2.2 Organisational Unit Fuel Laboratory
2.3 Position Number Chemist	2.4 Function Analysis of samples according to approved methods and ensuring the quality of analyses and procedures. Development, implementation and validation of standards and new methods.

3. Duties of the employee

3.1 Short description

- Registration, analysis and storage of samples;
- Guaranteeing the fulfillment of demands laid down in the Quality Manual, performance of control samples and check analyses;
- Analysis of samples;
- Production of analysis reports;
- Guidance and control of technicians and laboratory assistants;
- Being well informed and familiar with all approved and validated methods;
- Development and implementation of new and standard analyses methods, deployment of new equipment;
- Teaching and guiding of new laboratory staff;
- Ensuring the routine laboratory workflow.

3.2 a) Personal requirements (Education, profession, knowledge, skills and abilities)
Higher education, chemist, skills to operate various laboratory equipment and knowledge of modern analyses techniques.

b) Required graduation, university degree, examination
University diploma in chemistry or equivalent baccalaureate degree

3.3 Work on computer

☒ yes ☐ no hours/day.

4. Description of the activities, which allows the valuation as a working procedure

Activities (to number consecutively 4.1, 4.2, etc.)	Required specialized knowledge including provisions of law and administration	Time slice in %
Analysing according to FQMS EN 14274	EN 14274	60
4.1 Set – up time ➢ Getting the sample from the storage; ➢ Sample has to be cooled (0° to 1° C).		
4.2 Determine of vapour pressure Splitting of the sample for: ➢ the Gaschromatographycal Laboratory (GCL); ➢ the mineraloil laboratory; ➢ the determination of RON/MON (knock-engine).		
4.3 GCL e.g. Methanol, Ethanol	EN 1601, EN 13132	
4.4 Fuel Laboratory (FL) e.g. determination of the distillation range, sulphur content, hydrocarbontypes etc.	EN 14517	
FQMS-Analyses according to EN 14274		30
Octan-Number		
4.5 ➢ warming up of the motors (having regard to the cooling-system); ➢ mixing of reference/calibration – fuel.		
4.6 Determination of RON/MON		
4.7 ➢ Appointment of the higher an lower octan-number; ➢ Determination of RON/MON Handwheel.		
4.8 Follow-up time		
4.9 Follow-up time Motor turn off– having regard to the cooling-system		

5. Organisational integration and competences

5.1 The following employees are permanent subordinated to (only function):
Technicians and laboratory assistants

5.2 The holder of the position is permanent subordinated to (function and salary group):
Head of the Fuel Laboratory

5.3 The holder of the position substitudes/represents
Head of Laboratory

5.4 The holder of the position is substituted/represented by
Other chemist, technician

5. 5 The holder of the position has the following authorities (e. g. authority of signature, of directive, of decision, of control)
Has authority of signature to sign analyse acts
Must control the work of technicians and laboratory assistants
In the competence of his position make decision about everyday laboratory work and organizing workflow
Must control the accordance to safety rules at laboratory

5.6 The holder of the position has the following duties to inform other authorities (e. g. inside the department, the house, to external)
Head of laboratory, management of EERC

5.7 The holder of the position has to present his results to Head of laboratory
5.8 Other remarks (e. g. collaboration in committees)

Confirmation to the points 1 – 5

I took note of the preceding description of my workplace. It is complete and objective correct. .... Date Signature (holder of the position)
I confirm the correctness of the preceding job description. ☐ The holder of the position practises the function since _____ ☐ The holder of the position shall practises the function from the _____ .... Date Signature (head of division)

Annex 5

	SAMPLE-TAKER, Engines Operator	Date

Workplace and Job description

Teil I: Workplace

1. Holder of the position		
1.1 Surname, first name	1.2 Date of birth	3.1 Start at the position
1.4 Previous job description		
1.5 ☒ Full – time employee	☐ Part – time employee with hours per week	

2. Organisational integration of the job	
2.1 Place of employment EERC	2.2 Organisational Unit Fuel Laboratory
2.3 Position Number Sample taker/ engine operator	2.4 Function Taking and analysis of samples according to approved methods and ensuring the quality of analyses and procedures.

3. Duties of the employee
3.1 Short description - Taking and storing of samples; - Analysis of samples; - Well informed and familiar with approved and validated methods concerning his/her duties.
3.2 a) Personal requirements (Education, profession, knowledge, skills and abilities) Higher education recommended with background of chemistry, physics or environmental studies, skills to operate various laboratory equipment and knowledge of analyses techniques concerning his/her duties
b) Required graduation, university degree, examination Vocational education or university diploma recommended
3.3 Work on computer ☒ yes ☐ no hours/day.

4. Description of the activities, which allows the valuation as a working procedure			
Activities (to number consecutively 4.1, 4.2, etc.)		Required specialized knowledge including provisions of law and administration	Time slice in %
	Sample – taking according to EN 14275:2003	EN 14275/14274 EVS – EN ISO/IEC 17020:2004	25
4.1	Set – up time ➢ check of containers and closures; ➢ placing of the containers into the car; ➢ labelling of the containers; ➢ driving - time to the place of action.		
4.2	Sampling ➢ cleaning of the delivery pipe nozzle; ➢ flushing of at least four litres; ➢ sample – taking with a maximum of 3litres per container and three container per grade; ➢ check for leaks (inverting the container); ➢ completing the label (place, date, time, grade, identification-code); ➢ sealing of the sample – container; ➢ completing a sampling statement in duplicate with signatures of the sample-taker and the manager of the filling/service station.		
4.3	Follow - up time ➢ placing the containers into the car; ➢ driving – time to the laboratory; ➢ integration of the samples into the archiving system.		
	FQMS-Analyses according to EN 14274 **Octan-Number**		30
4.4	Set - up time ➢ warming up of the motors (having regard to the cooling-system); ➢ mixing of reference/calibration – fuel.		
4.5	Determination of RON/MON ➢ Appointment of the higher an lower octan-number; ➢ Determination of RON/MON Handwheel.	EN ISO 5164, EN ISO 5163	
4.4	Follow-up time Motor turn off – having regard to the cooling-system		

5. Organisational integration and competences

5.1 The following employees are permanent subordinated to (only function):
none

5.2 The holder of the position is permanent subordinated to (function and salary group):
Head of the Fuel Laboratory, Chemist

5.3 The holder of the position substitutes/represents
Sample taker /Technician 2

5.4 The holder of the position is substituted/represented by
- Technician
- Chemist

5. 5 The holder of the position has the following authorities (e. g. authority of signature, of directive, of decision, of control)
- Has authority of signature sample taking acts
- In the competence of his position make decision about everyday laboratory work

5.6 The holder of the position has the following duties to inform other authorities (e. g. inside the department, the house, to external)
- Chemist
- Head of laboratory

5.7 The holder of the position has to present his results to
- Chemist
- Head of the Laboratory

5.8 Other remarks (e. g. collaboration in committees)

Confirmation to the points 1 - 5

I took note of the preceding description of my job. It is complete, objective and correct.

....

Date Signature (Holder of the Position)

I confirm the correctness of the preceding job description.

☐ The holder of the position has been practising the function since _____

☐ The holder of the position shall practises the function from the _____

....

Date Signature (Head of Division)

Annex 6

I Number of Samples (Anticipation)

Grades		Summertime 01.05. - 30.09.	Winter time 01.12. - 29.02.
Ron 95	Super	50	50
Ron 98	Super	50	50
Ron 91	Normal	50	50
	Diesel	50	50
	Total	**200**	**200**

II Personnel Calculation

Calculation basis :

- Eight working hours per day;
- 220 working days per calendar year;
- annual 400 samplings - taken from 100 filling stations.

II.1 Sample taker

Number (No.) of filling stations	length of the trip in min.	minutes - total	hours	working days
100	90	9,000	150	19
No of samples to be taken	operating time in min.			
1.600[1]	15	24,000	400	50
			Total	**69 (31,25 %)**

II.2 Engines Operator

No of samples to be analysed	length of RON/MON[2] in min.	minutes - total	hours	working days
400	80	32,000	533	**67 (30,45 %)**

II.3 GC-Laboratory (Gas Chromatograph)

No of samples to be analyzed	length of analysis in min.	minutes - total	hours	working days
400	60	24,000	400	**50 (22,73 %)**

II.4 Oil-Laboratory

Ingredients to be analyzed[3]	length of the trip in min.	minutes - total	hours	working days
Vapour pressure / distillation	40	16,000	267	33,0
Lead (recommendation)	30	12,000	200	25,0
Sulphur	15	6,000	100	12,5
Hydrocarbon types	15	6,000	100	12,5
			Total	**83 (37,73 %)**

[1] Every sample drawing includes 4 different samples, so that the total sum of samples to be taken will be 1,600

[2] Research Octane number (RON) resp. Motor Octane number (MON)

[3] The number of samples to be analyzed is 400

3.4 Activity A4. Institutional assessment summary report

This chapter appraises the institutional set-up of the Fuel Quality Management System in Estonia. The report includes all outputs under activities A1 – A3, i.e. relevant overviews, proposals, schemes and flow diagrams for the institutional set-up.

3.4.1 Analyses of tasks and responsibilities, identification of gaps in institutional set-up

The aim of Activity A1 was to get an overview of the status quo of the distribution of the tasks and responsibilities in fuel quality management in Estonia and to identify gaps in the institutional set-up.

The competent authorities in fuel quality control in Estonia are:

- Ministry of Finance (MoF);
- Tax and Customs Board (TCB);
- Ministry of the Environment (MoE);
- Environmental Inspectorate (EI);
- Estonian Environmental Research Centre (EERC);
- Ministry of Economic Affairs and Communications (MoEAC);
- Consumer Protection Board (CPB);
- Energy Market Inspectorate (EMI);
- Oil companies.

In addition, the Environmental Information Centre (EIC) and the Statistical Office of Estonia (SOE) were involved in the process. All authorities were counterparts in performing the analysis of the tasks and responsibilities to identify the gaps in institutional set-up.

3.4.1.1 Outputs

Based on a multitude of meetings with the stakeholders the current job descriptions and distributions of responsibilities as well as the individual functions to operate FQMS and personnel placement were identified. The flow diagram presented in the institutional set-up report describes the interfaces between the institutions at the beginning of the Twinning project.

The status quo could be summarized as follows:

1. No stakeholder carries out the tasks with regard to the FQMS. Insofar, the implementation of the FQMS in Estonia was a new task, which had to be embedded in the present organisation (see also 3.2).
2. The only common task of all stakeholders is sample taking. Competent authorities take different samples on several occasions. All activities of national sample taking follow the principle of occasion and are taken throughout the year, whereas the sample taking according to FQMS requires to be representative of the market and to be taken in appointed seasons:
3. All sampling and analysis was arranged by responsible institutions because of their statutory obligations (see also 3.1.1.1, 3.1.1.2 and 3.1.1.3).
4. The current equipment of laboratories does not meet the requirements qualify for analyses according to FQMS (see also 3.1.2.4).

3.4.1.2 Gaps – found

The data basis to run the FQMS is predominantly available (see also 3.1.2.1).

In activity A1, the requirements for financial and staffing resources, technical equipment as well as legal gaps with regard to the FQMS were formulated. They will be annotated in 3.4.2 and 3.4.3.

3.4.1.3 Benchmarks

The survey on available staff is done.

3.4.2 Recommendations for optimum institutional set up and arrangements to run the FQMS by application of lean management methodology

The project elaborated recommendations for the optimum institutional set up and arrangements to run the FQMS, which were discussed with the counterparts. The competent authorities signed a corresponding letter of approval.

According to section 60 of the Ambient Air Protection Act the Ministry of the Environment (MoE) shall organise and implement the Fuel Quality Monitoring System according to standard EN 14274. The duty of the FQMS - Management will be split in a political (MoE) and an executing (EERC) responsibility.

According to the recommendation provided in 3.2.1.2.3 an annual planning meeting with all stakeholders is needed. The main task of such a meeting is to identify the share of each institution in taking samples and to reach a decision, which samples are suitable for the FQMS. The executive manager of the FQMS will bear the professional and organizational responsibility. All participating institutions should commit themselves to the results of the meeting.

Furthermore, the stakeholders should improve a basic strategy to organize the sampling in a way that several filling stations will not be inspected more than once a year and that the sampling is evenly distributed between all operators concerned.

3.4.2.1 Outputs

The analysis report was optimized and includes the following items:

1. Legal basis (see also 3.2.1.3)

With the entry into force of the Ambient Air Protection Act on 30th September 2004 the most important fuel quality directive: Council Directive 93/12/EEC of 23 March 1993 relating to the sulphur content of liquid fuels (amended by 98/70/EC and 99/32/EC) was transposed into the national law. Also, the Ambient Air Protection Act assigns the responsibility for the monitoring of quality and quantity of motor fuels to the Ministry of the Environment. On the basis of this, recommendations for an optimal institutional set-up the FQMS – Management were elaborated.

The environmental requirements for motor vehicle petrol, diesel fuel, light fuel oil, heavy fuel oil, shale oil and biofuel are established pursuant to subsection (2) §58 of the Ambient Air Protection Act by a regulation of the Minister of the Environment from 19 May 2005. The requirements are established based on the purpose of use of the fuels and environmental requirements according to EN 228 and EN 590, established by a regulation of the Minister of Economic Affairs and Communications from 11 June 2003 (see also the Liquid Fuel Act).

It will be necessary to manage the sampling and analysis based on different responsibilities (environment and economy) in a way that the requirements of the FQMS will be fulfilled and samples are not taken twice (see below: pool of sample taking).

The prosecution mechanism in case of non complying fuels and the proceedings are laid down in the Liquid Fuel Act (Tax and Customs Board, Consumer Protection Board and Energy Market Inspectorate) as well as in the Ambient Air Protection Act (Environmental Inspectorate).

In the case of non complying fuel samples taken only for the purpose of the FQMS, the Environmental Inspectorate should carry out enforcement.

2. Organisational structure, coordination between stakeholders (see also 3.2.1.2)

The initial situation within the sample taking demanded a coordinating strategy. Therefore, a "pool of sample taking" was recommended. The task of sample taking should be performed by all institutions who already take samples.

The new system of sample taking will be prepared and organized by the Estonian Environmental Research Centre on the order of the MoE. Sampling was started in autumn 2005.

In the pooling meeting, the tasks of the institutions concerned need to be agreed among the institutions. In consequence, all institutions shall commit themselves to:

- achieving sample taking as agreed;
- complying with the procedure for sample taking required by EN 14275;
- passing all samples to the EERC for analyses;
- communicating with the manager as required.

The first planning meeting took place in November 2005.

3. Competencies (see also 3.2.1.2)

The system of pooling the samples needs coordination, which will be done by the EERC. The MoE will specify the total amount of samples, which have to be taken with regard to the (new) monitoring.

At present, it appears that the number of samples contributed by the institutions to the pool will not be sufficient to fulfil the monitoring requirements of the FQMS. It is expected that only a minor part of the usual samples will be suitable. Consequently, the Environmental Inspectorate and the EERC should be responsible for taking the remaining samples. Both institutions have skilled staff and required equipment. It has to be guaranteed in terms of financing and staff that they will be capable of sample taking and analysing to fulfil the Estonian duty to report to the European Commission.

In the future, the EERC will be the only laboratory, which will be able to analyse the samples ordered by national institutions. Considering the legislation on procurement it may be necessary to complete invitation to tender in such a manner, that the Estonian standard for the acceptance of bid will be the technical standard of the EERC.

4. Required staff resources (see also 3.2.3)

The staff - capacity depends on the size of the country and the complexity of the system. Considering the increasing costs of work in the middleterm it is strongly recommended to keep the number of staff as low as possible and to recalculate the costs each year, to make sure, that the budget is correctly determined and a sufficient level of sampling and testing is possible and will be possible in the future. In order to fulfil these requirements it was necessary to analyse the different jobs and the work steps, which are linked with the described tasks (results see also 3.3.2 and 3.3.3).

5. Monitoring and reporting (see also 3.2.1.2.5 and 3.2.1.2.6)

The (executive) FQMS-Manager, who is affiliated to the EERC, will be the responsible authority for monitoring and reporting (organisation and preparation).

The workflow for the Fuel Quality Monitoring System is planned as follows:

- MoE requests the EERC to organise the FQMS;
- EERC carries out this obligation in different steps:
    - coordination of the different competitors (contracting, sample-taking, analyses, etc);
    - overall responsibility for the adequate execution of sample-taking and analyses allowing for European Standards (e. g. safety work clothes, required working materials and receptacles, non-polluting disposal of samples[1], etc.);
    - annual planning meetings with the Estonian stakeholders;
    - initiation of prosecution process to be conducted by responsible authorities in case of non-compliance between samples and the European Standards;
- MoE signs the report and sends it to the European Commission.

This procedure was applied for the first time in the context of elaboration the first national Fuel Quality Report for the reporting year 2004 (closing date 30.06.2005).

3.4.2.2 Benchmarks

Draft recommendations were available for discussion with counterparts.

3.4.3 Staff capacity

The existing staff capacity was analysed. The analysis covered the following jobs:

- FQMS-Manager – political and executive (new duty, see also 3.3.2)

[1] Indicates EERC (after closed analysis) as well as the filling-station (disposal of backup sample after analysis has been effected)

- Head of the Laboratory (see also 3.3.3)
- Chemist (see also 3.3.3)
- Engines Operator / Laboratory-Assistant / Sample-Taker (see also 3.3.3).

The only new jobs will be the Executive Manager of the Fuel Management Quality System (FQMS) and the Engines Operator / Laboratory-Assistant / Sample-Taker. In all other cases personnel is available with similar areas of responsibility and corresponding knowledge. It will be possible to fulfil the laboratory- and the sample-taking activities with the existing personnel:

Personnel	Days per Year	%-Rate
Sample-Taker	70	30*
Engines Operator	70	30
GC	50	25
Fuel	80	40

* For the preservation of evidence the samples should be taken by two sample-takers (70 days per year, twice).

The necessary skills of the Engines Operator are still missing in the existing personnel capacity and should be hired, by training existing employee or – if it would not be possible – by fresh engagements.

3.4.3.1 Outputs

All jobs were analysed with regard to the staff resources and their competencies. Therefore, job descriptions were elaborated (see also 3.3 annexes 1-5). The description includes all required qualifications and work steps of the different employees involved in the FQMS (see also 3.3.2 and 3.3.3).

3.4.3.2 Gaps

The duty of the political management of FQMS will be fulfilled by Environmental Management and Technology Department (MoE).

The EERC will appoint a manager to achieve all the tasks required.

Open gaps - job advertisement and appointment:

- Decision, who should carry out the task during transition period between the Twinning project and the ultimate implementation of FQMS;
- The necessary skills of the Engines Operator are still missing in the existing personnel capacity and should be hired, by training existing employee or – if it would not be possible – by fresh engagements.

3.4.3.3 Benchmarks

The staff necessities are evaluated and the information of participants concerned is achieved.

4 Component B. Elaboration of a national fuel quality monitoring programme

4.1 Activity B1. Design of a national fuel quality monitoring programme (environment)

The European Standard EN 14274 "Automotive fuels – Assessment of petrol and diesel quality – Fuel quality monitoring system (FQMoS)" describes the FQMS for assessing the quality of petrol and automotive diesel fuel marketed in the Member States of the European Union. The document was endorsed on 17 September 2003 with the notification being published (EVS-EN 14274:2003) by the Estonian National Standardisation Organisation

The European Standard EN 14272 formulates the requirement to set up a FQMoS in every each Member State and describes the process flowchart (standard annex D).

Since the specifications for automotive fuels contain requirements that are related to climatic conditions, the FQMoS is run twice a year, once during the winter and once during the summer period.

4.1.1 Information required to set up the FQMoS (standard EN 14274 No. 4)

The information specified as a requirement for setting up the FQMoS is basically divided into two sets:

- The first set (EN 14274 No. 4.2) specifies the requirement for a working list, which contains all the locations where the samples are taken;
- The second set (EN 14274 No. 4.3.to 4.6) specifies the need for information about how the dispensed fuel volumes are distributed across the country.

4.1.1.1 Requirement for a working list (EN 14274 No. 4.2)

The European standard EN 14274 demands a list of retail sites[1] and commercial sites where automotive fuels are dispensed. This list shall contain information about the region in which the site is located and shall be updated each year.

Retail site is defined as a site where the general public can purchase the fuel, commercial site as a site that is not open to the general public but where automotive fuel is dispensed.

The list of retail sites in Estonia is available. It contains the names and addresses of filling stations as well as the relevant counties and communities. The situation in Estonia is as follows:

The total number of filling stations in Estonia is about 560 - based on February 2005 statistics (frame of survey: own data entry form[2]).

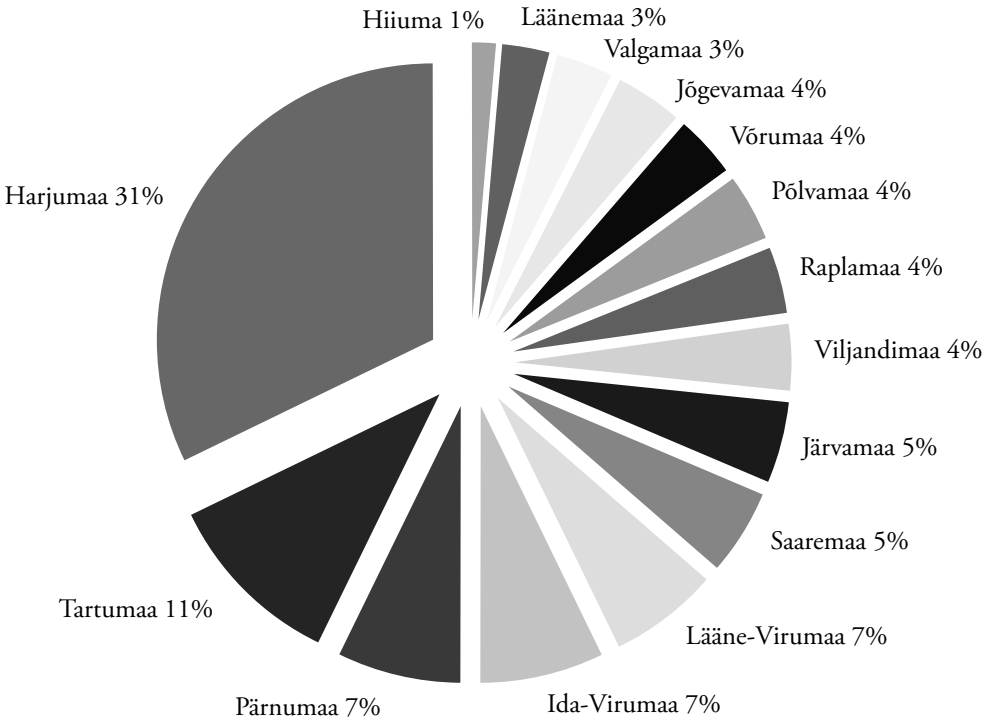
[1] No usable information

[2] The technical requirements to develop a data based annual updating is verified in Twinning Component B, activity B2

Allocation of filling stations

Harju County, including the capital Tallinn, has one third of all filling stations (31%). The second third (32%) is located in the four larger counties in terms of population: Tartu 11%, Pärnu, Ida-Viru and Lääne-Viru with 7 % in each. The last third is evenly distributed in the remaining ten counties.

Distribution of filling-stations



The actual market is uneven. Out of 213 providers about 193 are "small" providers (91 %) with only one to four filling stations and only five "big" providers (2 %) with more than twenty filling stations each. On the other hand, only half of all filling stations (47 %) are in the ownership of 91 % of all providers – 30 % belong to the five biggest providers with about 2 % market share.

The big providers e.g. Statoil, Neste, Lukoil and Alexela are most represented close to the urban centres. This pattern does not apply to whole Estonia, e.g. on the island of Saaremaa the leading company is AS Saare Kütus.

This information is important when deciding the FQMoS model for Estonia (see also 4.1.2.5.4) and the number of samples to be taken.

4.1.1.2 Amounts and regional distribution of automotive fuel dispensed (EN 14274 No. 4.3)

4.1.1.2.1 Total amount of automotive fuel dispensed in the whole country, including regional distribution (EN 14274 No. 4.3.1)

The total amount of automotive fuel dispensed in the whole country is about 720,000 tons (2004). Data about the regional distribution are not available.

The Estonian Ministry of the Environment will be asked to draft relevant legal basis enabling the authority in charge to fulfil the requirements of the FQMoS according to the international requirements.

This means that at least information about:

- the total sales of fuels by grade;
- the market share of companies;
- origin of fuels separated by grade for each company and
- the regional distribution of sales.

shall be made available (see also 4.1.1.2.2, 4.1.1.2.3 and 4.1.1.3).

4.1.1.2.2 Total amount of each grade of petrol dispensed in the whole country, including regional distribution, if available (EN 14274 No. 4.3.2)

The total amount of petrol dispensed in Estonia is about 300,000 tons (2004).

The distribution of the different grades is as follows:

- Regular unleaded petrol (minimum RON = 91): 14, 500 tonnes (5 %);
- Unleaded petrol (minimum 95 < RON < 98): 238,100 tonnes (82 %);
- Unleaded petrol (minimum RON > = 98): 37, 800 tonnes (13 %).

4.1.1.2.3 Total amount of diesel fuel dispensed (EN 14274 No. 4.3.3)

The total amount of diesel dispensed in the whole country is about 420, 000 tons (2004).

4.1.1.3 Sources of the fuel and its supply and distribution pattern, if applicable (EN 14274 No. 4.4)

In Estonia, there are no refineries, thus all needed fuel has to be imported. For this purpose two so-called supply terminals have been established. On the one hand, the supply or import takes place in the north, around the capital Tallinn with harbours and at the frontier between Estonia and Russia. The rest is imported in the south via the frontier between Estonia and Latvia. The deliveries are made by the Scandinavian countries or Russia.

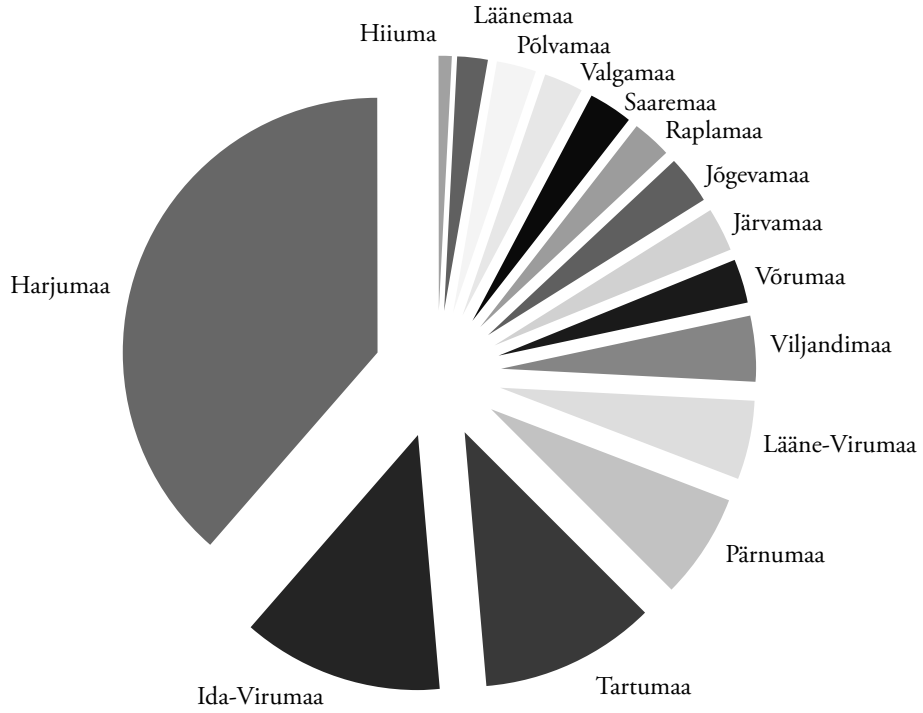
Volume specifications are not available.

4.1.1.4 Population size and regional distribution (EN 14274 No. 4.5)

The area of Estonia amounts to 45, 227 square kilometres. The country is divided into 15 counties (= maakond). About 70 % of the 1, 445,600 inhabitants live in urban centres. The capital Tallinn has a population of 411, 600 inhabitants. Other major towns are Tartu (100,600), Narva (73,800), Kohtla-Järve (66,500) and Pärnu (51,400).

These numbers are reflected in the regional distribution. The four counties with the highest population figure include the inhabitants of the capital as well as the listed major towns (Harjumaa with Tallinn, Ida-Virumaa with Narva and Kohtla-Järve, Tartumaa with Tartu, Pärnumaa with Pärnu):

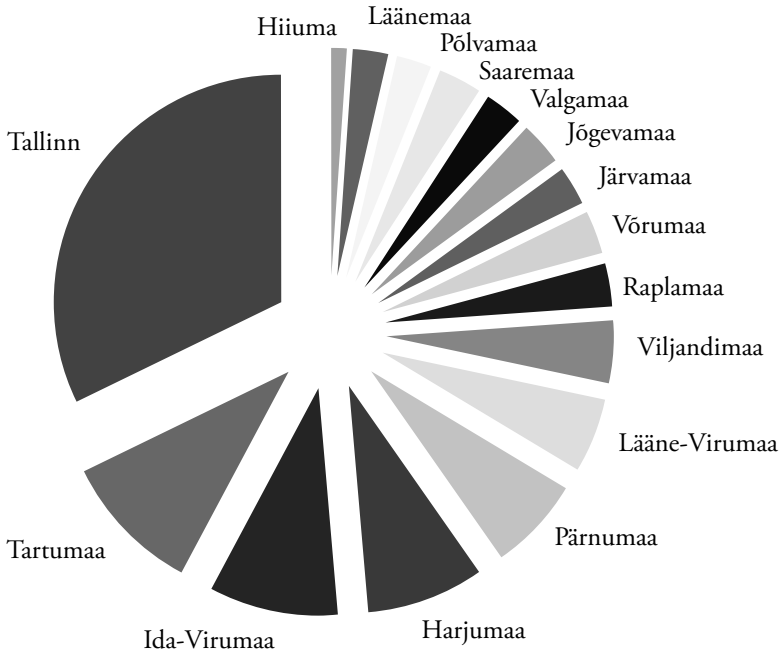
Distribution of inhabitants 01.01.2003



4.1.1.5 Number of vehicles and their regional distribution (EN 14274 No. 4.6)

The total number of vehicles amounts to about 500,000. The concentration of the vehicles follows the distribution of the population (see also 4.1.1.4) as well as the distribution of filling stations (see also 4.1.1.1).

Distribution of vehicle fleet between counties (all motor vehicles on 01.01.2002)



4.1.1.6 Accredited laboratories that will carry out the analytical work (EN 14274 No. 4.7)

The Estonian Environmental Research Centre will be the only accredited laboratory in Estonia, which will be able to carry out the analytical work in regard to the Fuel Quality Monitoring System (see also Twinning Component E).

Samples will be analysed and tested there for the characteristics given in the European Directive 98/70/EC by the methods specified in EN 228 and EN 590.

4.1.1.7 Register of organisations that will take samples (EN 14274 No. 4.8)

The task of sample taking should be carried out by all Estonian competent authorities, which already take samples by pooling all their financial and personal capacities (see also 3.2.1.2.3). The samples will be taken by the following competent authorities:

- Consumer Protection Board (3);
- Estonian Environmental Research Centre (9);
- Environmental Inspectorate (11);
- Tax and Customs Board (18).

The relevant employees of these institutions (number in brackets) were trained as sample takers at a seminar, which took place in Tallinn from the 6th to the 17th of June 2005 in two working stages. The theoretical part took place from the 6th to the 7th June at the EERC and the practical part from the 14th to the 17th in the Port of Muuga. The main aim of the seminar was to introduce EN 14275 to obtain samples for each grade to be sampled from the selected sites in accordance to the prescribed method.

The training concerned Twinning Components C2, C3, C5 and C8. The practical advanced training will be continued in the future.

4.1.2 Setting up the FQMoS (standard EN 14274 No. 5)

4.1.2.1 Country size (EN 14274 No. 5.1)

The determination of the country size is relevant for the minimum number of samples for fuel grades with market shares of 10 % and above in case of summer and winter period – taking in consideration the provisions laid down in clause 5.5 of EN 14274.

According to the statistics of the Statistical Office of Estonia (SOE) less than 1 million tonnes are imported per annum.

Accordingly, Estonia has to be categorized in the sense of EN 14274 as a so called "small-size-country" in which a total of 15 millions tonnes or less automotive fuel is dispensed per year.

4.1.2.2 Regions (EN 14274 No. 5.2)

According to part 5.2 of EN 14274:2003 each country shall define a set of appropriate regions based on either geographic or administrative criteria, taking into consideration the procedures and criteria described in this European standard, such as the amount of fuel dispensed, number of fuel dispensing sites as well as population distribution and vehicle distribution. The detailed provisions to choose the model for the FQMS are given in part 5.5 of EN 14272. Estonia will be categorized as a Non region model (Model C).

4.1.2.3 Minimum number of samples for fuel grades with market shares of 10% and above (EN 14274 part 5.3)

According to part 5.3 of EN 14274:2003 fifty petrol samples per grade and fifty diesel samples in each winter and summer period are the minimum number of samples for a small–size country, which categorizes as a non region model (Model C). In Estonia, three different grades with market shares of 10% and above are available:

- Super 98;
- Super 95;
- Diesel.

Consequently, according to table 1 a, part 5.3 of the standard the FQMS for Estonia requires as minimum 300 samples per year - 150 during the summer-period and 150 during the winter-period.

4.1.2.4 Minimum number of samples for fuel grades with market shares below 10 % (EN 14274 part 5.4)

The only fuel grade with a market share below 10% is the regular unleaded petrol (minimum RON = 91). With a sales figure of 14, 500 tonnes its market share is about 5%.

According to part 5.4.2 of EN 14274:2003 (E) the minimum number of fuel dispensing sites in any country to be sampled shall be calculated proportionally from the number of sampling for the corresponding parent grade.

Unleaded petrol (minimum 95 < RON < 98) with a market share of 82% and 50 samples each winter

and summer period is the parent grade to the regular unleaded petrol RON 91. Following equation is to be used:

Number of $sample_{RON91}$ = 5 ($market\ share_{RON91}$) : 82 ($market\ share_{RON95}$) × 50 ($samples_{RON95}$)

As a result, at least three samples have to be taken each winter and summer period.

Estonia is free to assess more than this required minimum amount of samples (planned 50 in winter- and summer-period each). In this case this should be specified in its national annex to the mentioned European standard.

4.1.2.5 Models for the FQMoS (EN 14274 part 5.5)

There are three different models for the FQMoS. For each model, the number of samples per grade per region or macro region is obtained by setting the number of samples (diesel fuel and petrol separately) to be proportional to the volume sales within each region, macro region, or sub region.

Macro regions are defined as a specific grouping of geographical or political regions within a country formed for efficient design of the FQMoS (EN 14274 part 3.8).

4.1.2.5.1 Model A – macro regions (EN 14274:2003 part 5.5.2)

The regions within a country are grouped (preserving some geographical identity) into macro-regions, so that they have similar total sales volumes relative to each other and also about the same number of different supply sources.

To use this model it is necessary that the appropriate country lists all its principal supply points of patrol and diesel fuel (refineries, in-land terminals and coastal terminals).

4.1.2.5.2 Model B Non – macro region (EN 14274:2003 part 5.5.3)

If the construction of macro-regions (based on fuel supply patterns) is not possible within a country, then the country shall be divided into regions using only geographic and administrative criteria. To ensure that fuel variability is reliably captured, a larger minimum number of samples per grade are required: 100 for small size - countries and 200 for large - size countries.

4.1.2.5.3 Model C – Non region Model (EN 14274:2003 No. 5.5.4)

If the country is small - sized and it can be demonstrated that a division into macro regions or non – macro – regions is not possible, having considered the procedures and provisions given in this European Standard, then the country shall be considered as one region for sampling purposes.

4.1.2.5.4 Determination of the Estonian FQMoS

The preferred model A is based on the principal supply points of petrol and diesel fuel (i. e. refineries, in-land terminals and coastal terminals) and the regional distribution of automotive fuel dispensed. The regions within the country should be grouped into macro regions, so that they have similar total sales volumes relative to each other.

If data of regional volume specifications, which indicates the distribution of supply terminals as well as the automotive fuel dispensed, is missing model A cannot be used for the Estonian FQMoS.

In this case model B shall be considered the next best model: The country shall be divided into regions using only geographic and administrative criteria.

The country is divided into 15 counties with very different population numbers. As referred in 4.1.1.1 and 4.1.1.4 70% of the 1,445,600 inhabitants live in urban centres. Analogically to the distribution of filling stations as well as vehicle fleet, one third of the total population lives in Harju County, including the capital, the second third lives in the four counties including the larger towns and the last third is evenly distributed in the remaining ten counties. These figures suggest that it would be possible to divide the country into three regions and to use model B for Estonia with the consequence of a minimum number of 100 samples to be taken per fuel grade in the winter and summer period – in total 600 samples annually.

Comparing the situation in Estonia with Germany with a fuel consumption of more than 30 million tons of petrol (57.5 million tons including diesel) and 16 administrative regions, it becomes clear that model B cannot be applied to Estonia. One of the 16 German regions - the most northerly province - Schleswig-Holstein has a fuel consumption of 1 million tons of petrol – corresponding to about 75% of the total amount of automotive fuel dispensed in Estonia. Using this pattern Estonia should take 100 samples per fuel grade and period annual more than seventeen times so much as Schleswig-Holstein although the real amount is less than 25%.

Therefore, Estonia should be considered as one region for sampling purposes. This is possible because Estonia is a so-called small country in the sense of part 3.2.1 of EN 14274.

4.1.2.6 Number of fuel dispensing sites to be sampled (EN 14274:2003 part 5.6)

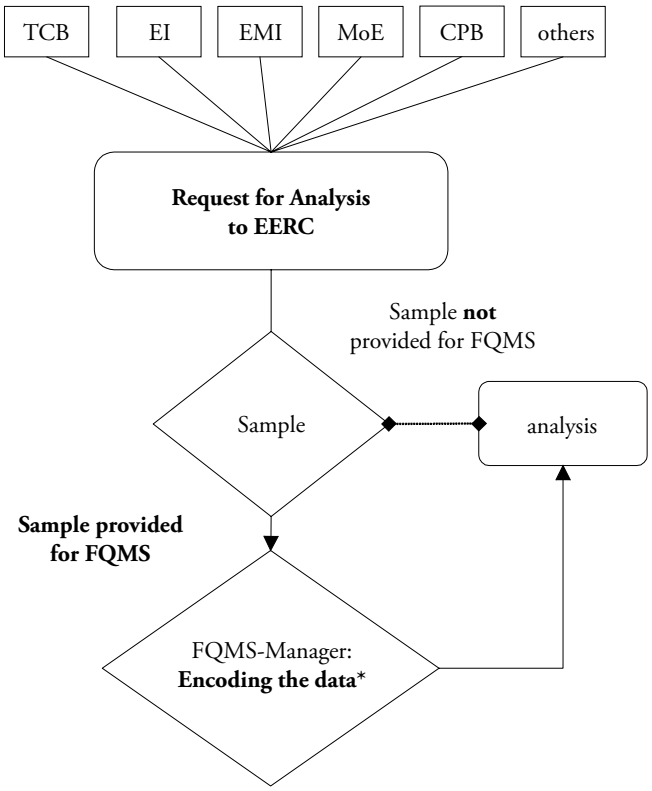
According to table 1 presented in part 5.3 of EN 14274 Estonia should take the minimum number of samples. A small country categorizes in Model C with 50 samples of petrol per grade with a market share of 10 % and above as well as diesel fuel in each winter- and summer-period to be taken.

4.1.2.7 Identification of fuel dispensing sites (EN 14274:2003 No. 5.7)

Each site that is to be monitored shall be given a unique and unmistakable identification number. This number shall appear on all samples drawn from the site and in the analytical reports.

It is being guaranteed that each site that is to be monitored gets a unique and unmistakable identification number, which will be consisting of a unique number of the corresponding filling station and details of the sample taking (year, season, month, organisation, etc.). The details (possible demands for a database, systematic of encoding and decoding, preparation of the annual planningmeetings) will be substantiated in the next work step.

The responsibility for the adequate encoding of the data is the task of the FQMS-Manager.



* Systematic of encoding and decoding is planned in advance.

4.1.2.8 Appointment of organisations (EN 14274:2003 part 5.8)

The qualified organisations or laboratories will be appointed to take the samples named in 4.1.1.7 and based on the results of the annual planning meeting (the first meeting took place in December 2005).

The Estonian Environmental Research Centre will be appointed as the laboratory to carry out the tests (analysis).

The Ministry of the Environment will appoint the Estonian Environmental Research Centre to collect and compile the summary report, containing all necessary information and data to allow the compilation of the final report. The final report will be elaborated by the FQMS – Manager, who is affiliated to the EERC, the MoE will sign the report and submit it to the European Commission.

4.1.3 Procedure (standard EN 14274:2003 No. 6)

4.1.3.1 Selection of the required number of sites to be sampled

According to model C Estonia has to be considered as one region for sampling purposes. Even so the number of fuel dispensing sites to be sampled has to be verified. According to standard annex A "Establishing the number of samples to be taken" it is recommended to design the FQMoS in such a manner that the collected samples give a representative "picture" of fuel variability within the country. Also, a decision on the so-called Volume Factor Model for the region (standard annex D – process flowchart) has to be taken. The first mentioned alternative to use fuel volumes (Factor 1) is not applicable, because corresponding data are still missing. Therefore, Estonia should use the available number of filling stations (Factor 2) to select the required number of sites to be sampled:

Counties	Filling stations	%	Samples	Recommendation
Harjumaa	177	32.01	16.00	**16**
Lääne Virumaa	39	7.05	3.53	**4**
Ida-Virumaa	36	6.51	3.25	**3**
Hiiumaa	8	1.45	0.72	**1**
Läänemaa	16	2.89	1.45	**1**
Raplamaa	20	3.62	1.81	**1**
Järvamaa	24	4.34	2.17	**2**
Saaremaa	31	5.61	2.80	**3**
Pärnumaa	39	7.05	3.53	**4**
Viljandimaa	31	5.61	2.80	**3**
Tartumaa	57	10.31	5.15	**5**
Valgamaa	17	3.07	1.54	**1**
Põlvamaa	20	3.62	1.81	**2**
Võrumaa	19	3.44	1.72	**2**
Jõgevamaa	19	3.44	1.72	**2**
Total	**553**	**100.00**	**50.00**	**50**

The above table includes necessary data to decide, how many samples have to been taken in which county:

1. In order to follow the requirements of the FQMoS the share of filling stations in each county with regard to the total number of 50 samples for each grade has to be determined;

2. The total number of filling stations in one county will be divided by the total number of Estonian filling stations;

3. The resulting percentage rate has to relate to the number of filling stations per county where samples have to be taken.

In a next step the determined number of samples in each county has to be verified to the situation in situ. Therefore, the number of filling stations in each county were prorated to the current owner. The resultant market share forms the basis of the exact planning of sample taking in each county. For example:

- Number of samples to be taken in Hiiumaa: 1;
- Four different providers with a market shares of 13%, 13%, 25% and 49%;
- One filling station of the biggest provider with 49% market share.

The remaining samples are taken on the principle of random.

For the reporting year 2005 the Ministry of the Environment assigned sample taking to the Estonian Environmental Research Centre, the list of sites to be sampled was prepared by the EERC too. The sample taking for the summer period is accomplished, the given information was sufficient to allow the site to be located and uniquely identified.

4.1.3.2 Summary

1. The selection of the individual filling station occurs on the basis of the file (list of all retail sites). The filling stations of companies with high market share have to be selected. Selection should

be balanced among these companies in terms of numbers and sample taking scheduled for each month concerned.

2. Due to the lack of oil-statistics the market shares have to be estimated on the basis of experience and the total number of filling stations per company, which indicates market shares in terms of sales. Presently, the most important companies are Statoil, Neste, Alexela, Lukoil, Hydro Texaco and Krooning. In some counties, there are other filling stations with high market share, which may be also representative in this county.

4.1.4 Final report (standard EN 14274:2003 No. 7)

Up to now in Annex E.2 of the European standard only described the demands of information and did not provide any format, since the administrative details about the conduct of the FQMoS may differ from country to country. This changed in 2005. With the reporting year 2004 the EC requested the report filled in a specific form.

The reporting template 2004 (see also annex 1 in the end of this chapter) is consists of different sections, which include all existing requirements according to parts 7.1 to 7.3 of EN 14274:

1 General:

- Introduction;
- Method and limits;
- Contacts and summary;
- Description of the FQMoS;
- Sales (Total sales of Petrol and Diesel);
- Geographical Availability of Sulphur Free Fuels.

2 Attachments:

Annex I: Sampling;
Annex II: Proportion of Filling Stations with Sulphur Free Grade available by Region;
Annex III: Petrol;
Annex IV: Diesel;
Annex V: Petrol 2005;
Annex VI: Diesel 2005.

4.1.5 Summary

With the completion of this report the Estonian Fuel Quality Monitoring System (FQMoS) is designed and set up.

The FQMoS is based on statistical model C for small country framework established in the European Standard EN 14274:2003. The different working stages are summarized in the enclosed Process Flowchart (see also annex 2 in the end of this chapter).

Annex 1

EU Fuel Quality Monitoring Submissions – 2004 Reporting Template

Introduction, purpose & format

Directive 98/70/EC of the European Parliament and of the Council of 13 October 1998 relating to the quality of petrol and diesel fuels and amending Directive 93/12/EEC, as last amended by Directive 2003/17/EC, sets the environmental specifications for all petrol and diesel fuel marketed in the European Union. These specifications can be found in Annexes I to IV of the Directive. Article 8(1) obliges the Member States to monitor the compliance with these fuel quality specifications according to the analytical measurement methods referred to in the Directive.

By no later than 30 June each year the Member States must submit a summary of the fuel quality monitoring data collected during the period January to December of the previous calendar year. The first report was to be made by 30 June 2002, in the format specified under Commission Decision 2002/159/EC. From 2004 Member States are required to report according to the requirements of the European Standard EN 14274: 2003, unless they are using national fuel quality monitoring systems of equivalent confidence. In addition from 2005 Member States are required to phase in "sulphur free" petrol and diesel fuels on an appropriately balanced geographical basis. To support this revised reporting a 'Common Format for the Submission of Summaries of National Fuel Quality for Petrol and Diesel from 2004' was proposed & agreed with Member States.

Member State submissions providing the results of monitoring for years 2001 and 2002 have been summarised in the EU Fuel Quality Monitoring 2001 and 2002 Summary Reports. In these reports an electronic format for submissions was recommended, together with additional information to assist in the collation and interpretation of results. The common reporting format for 2004 reporting onwards contained herein is proposed to attempt to harmonise reporting submissions across the Member States whether they are using either the European Standard or their own national systems. This format essentially summarises information already required or requested under the Directive and European Standard. The purpose of this extended Excel template based upon the format for reporting from 2004 is to:

- Assist Member States in their data reporting;
- Facilitate the collation and interpretation of Member State submissions, reducing the need to return to Member States for additional information;
- Provide additional guidance to Member States on the provision of information that would assist in the interpretation/understanding of both their national fuel quality monitoring systems and the significance of the results of sample analysis in the annual EU Fuel Quality Monitoring Summary Report.

The format of this template broadly follows that of the common format for reporting from 2004; mandatory requirements outlined in the Directive/European Standard, which are denoted by black text/light blue fields, text and fields in red/orange are additional information requested beyond these (such as specific information on the availability of sulphur free fuels, or the national monitoring system where EN 14274:2003 is not used).

Your assistance in providing submission data using this Excel template is greatly appreciated.

Additional Information Fields

1. Description of fuel quality monitoring system

The additional optional information requested serves several purposes, firstly in clarifying the location/method of sample collection and analysis, second to help put into context/explain the reasons

for differences in national fuel quality monitoring systems; in particular the number of samples taken and location of sampling:

a) The number of sources fuels and distribution pathways (i.e. number of refineries, imported fuel sources and major distribution terminals) will affect the total number of samples needed to ensure a similar degree of statistical confidence in how representative monitoring results are of national fuel quality;
b) Sampling at the end of the distribution chain (i.e. dispensing/refuelling sites) ensures that any contamination is identified before it reaches the vehicle, whilst sampling the whole distribution chain will also help identify at what point any potential contamination might have occurred.

2. Sales and availability

The additional optional information requested serves to help clarify EU picture of the rate of introduction of low (<50 ppm) and zero (<10 ppm) sulphur petrol and diesel.

3. Petrol and Diesel sample analysis reporting tables

- Separate tables are requested for different RON and different sulphur grades in order to identify any particular issues with different fuel types;
- Additional clarifying information is requested to help interpret correctly the significance of any exceedances of the limit values and allow Member States the opportunity to provide information on how such a potential exceedances are followed up.

Help on completing the Form

If you have any queries, regarding this Excel reporting template, please do not hesitate to call or e-mail Nikolas Hill of AEA Technology on: tel: +44 (0)870 190 6490, e-mail: nikolas.hill@aeat.co.uk

Thank you again for your assistance with this work.

Directive 98/70/EC: Test Methods, Limit Values and Tolerance Limits*

Petrol

Parameter	Unit	98/70/EC		Test specified in 98/70/EC or EN 228:1999				
		Limit values		Method	Date	Repro-ducabil-ity, R	Tolerance limits (95% confidence)	
		Min.	Max.				Min.	Max.
Research Octane Number (RON)	--	95		EN 25164	1993	0,6	94,6	
(RON 91 fuel only)	--	91				0,6	90,6	
Motor Octane Number (MON)	--	85		EN 25163	1993	0,9	84,5	
(RON 91 fuel only)	--	81				0,9	80,5	
Vapour Pressure, DVPE								
--summer period (normal)	kPa		60	EN 13016-1	2000	3,0		61,8
--summer period (arctic or severe weather conditions)	kPa		70	EN 13016-1	2000	3,2		71,9
Distillation								
--evaporated at 100 °C	% (v/v)	46		EN-ISO 3405	1988	Depends on test conditions		
-- evaporated at 150 °C	% (v/v)	75		EN-ISO 3405	1988	Depends on test conditions		
Hydrocarbon analysis								
-- Olefins	% (v/v)		18,0	ASTM D1319	1995	4,6		20,7
-- Olefins (RON 91 fuel only)	% (v/v)		21,0	ASTM D1319	1995	4,6		23,7
-- Aromatics	% (v/v)		42,0	ASTM D1319	1995	3,7		44,2
-- Benzene	% (v/v)		1,0	EN 12177	1998	0,10		1,06
				EN 238	1996	0,3		1,2
Oxygen content	% (m/m)		2,7	EN 1601	1997	0,3		2,9
Oxygenates								
-- Methanol	% (v/v)		3	EN 1601	1997	0,4		3,2
-- Ethanol	% (v/v)		5	EN 1601	1997	0,3		5,2
-- Iso-propyl alcohol	% (v/v)		10	EN 1601	1997	0,9		10,5
-- Tert-butyl alcohol	% (v/v)		7	EN 1601	1997	0,6		7,4
-- Iso-butyl alcohol	% (v/v)		10	EN 1601	1997	0,8		10,5
-- Ethers with 5 or more carbon atoms per molecule	% (v/v)		15	EN 1601	1997	1		15,6
-- other oxygenates	% (v/v)		10	EN 1601	1997	0,8		10,5
Sulphur content	mg/kg		150	EN ISO 14596	1998	30		168
				EN ISO 8754	1995			
				EN 24260	1994	18,6		161
Sulphur content (low sulphur, from 2005)	mg/kg		50	EN ISO 14596	1998	20		62
				EN ISO 8754	1995			
				EN 24260	1994	6,8		54
Sulphur content (sulphur free, from 2005)	mg/kg		10	EN ISO 14596	1998	5		13
				EN ISO 8754	1995			
				EN 24260	1994	3,4		12
Lead content	g/l		0,005	EN 237	1996	0,002		0,0062

[1] Based on information provided by the German Environmental Protection Agency, Italy, Irish EPA & CEN

Diesel

Parameter	Unit	98/70/EC		Test specified in 98/70/EC or EN 228:1999				
		Limit values		Method	Date	Repro-ducabil-ity, R	Tolerance limits (95% confidence)	
		Min.	Max.				Min.	Max.
Cetane number	--	51,0	--	EN-ISO 5165	1998	4,3	48,5	
Density at 15 °C	kg/m³		845	EN-ISO 3675	1998	1,2		845,7
Distillation -- 95% Point	°C			EN ISO 12185	1996	0,5		845,3
			360	EN-ISO 3405	1988	Depends on test conditions		
Polycyclic aromatic hydrocarbons	% (m/m)		11	IP 391	1995	3,8		13,2
Sulphur content	mg/kg		350	EN ISO 14596	1998	50		380
				EN ISO 8754	1995			
				EN 24260	1994	42,4		375
Sulphur content (low sulphur, from 2005)	mg/kg		50	EN ISO 14596	1998	20		62
				EN ISO 8754	1995			
				EN 24260	1994	6,8		54
Sulphur content (sulphur free, from 2005)	mg/kg		10	EN ISO 14596	1998	5		13
				EN ISO 8754	1995			
				EN 24260	1994	3,4		12

Contacts & Summary

Details of those compiling the Fuel Quality Monitoring Report

The authorities responsible for compiling the fuel quality monitoring report are requested to complete the table below.

Reporting Year:	2004
Country:	Estonia
Date Report Completed:	20. June 2004
Organisation Responsible for Report	Ministry of the Environment of Estonia
Address of Organisation:	Narva 7A, Tallinn, Estonia
Person Responsible for Report:	Viktor Grigorjev
Telephone Number:	(372) 6262 986
Email:	viktor.grigorjev@ekm.envir.ee

Definitions and explanation

Parent fuel grade: Directive 98/70/EC sets the environmental specifications for petrol and diesel fuel marketed in the EU. The specifications in the Directive can be thought of as 'parent fuel grades'. These include (i) regular unleaded petrol (RON > 91), (ii) unleaded petrol (RON > 95) and (iii) diesel fuel.

National fuel grade: Member States may, of course, define 'national' fuel grades which must still, however, respect the specification of the parent fuel grade. For example, national fuel grades may comprise super unleaded petrol (RON > 98), lead replacement petrol, zero sulphur petrol, <50 ppm sulphur petrol, zero sulphur diesel, <50 ppm sulphur diesel, etc.

Zero sulphur or sulphur-free fuels are petrol and diesel fuels that contain less than 10 mg/kg (ppm) of sulphur.

Summary reporting format for petrol & diesel

Member States are requested to provide a brief general summary of the results of the year's monitoring, including information on any:

- other parameters measured;
- exclusions;
- further details on breaches of parameter tolerance limits (i.e. number of samples, values);
- enforcement actions taken as a result of breaches of the limit values/tolerance limits; and
- additional information deemed relevant.

In particular, Member States should provide additional explanatory information on reasoning for exceptional cases where exclusions are made, such as:

- fuel grades marketed in very small quantities;
- mandatory fuel parameters that are not measured;
- geographical areas that are left outside the monitoring programme;
- exceptionally high or low values of analytical results (i.e. outliers).

General Summary of Analysis and Additional Information

Estonia became Member of the European Union on 1 May 2004.The area of Estonia amounts to 45,227 square km. Of the 1.4 Mio inhabitants 70% live in urban centres. The total number of vehicles amounts to about 500,000.The Estonian fuel market is dependent on imports, most of them arrive from Russia and Lithuania. The annual sales amount about 600,000 t; three international and about four medium seized local companies (group A) share about 90 % of the market, the remaining part is divided between about 193 small local companies (group B) operating in rural areas.The total number of filling stations is about 560; the share of group A companies is about 47% and the share of group B companies is about 53%.

Activities to comply with the FQMS were initiated long before accession to the European Union. The transposition of the relevant directives into Estonian law was achieved by the Liquid Fuel Act in 2003 and the Ambient Air Protection Act in 2004. Simoultenously, activities were started to build up the FQMS by a Twinning project accompanied by a supply component to upgrade the laboratory of the Estonian Environmental Research Center (EERC) to comply with the requirements necessary to to analyse fuel quality. Due to some delays the Twinning project started on 9 September 2004; the tendering process for the procurement project has not yet started.

The Tax and Custom Board (TCB) was confronted with numerous cases of tax fraud in connection with different rates for diesel and light heating oil. Therefore, the TCB asked the EERC to procure minimum equipment to analyse some fuel parameters at once. The EERC acquired this equipment and achieved accreditation before accession. Due to accreditation to use this equipment the EERC could take orders from TCB to analyse some hundred samples of diesel and petrol already in 2004. The quality parameters were taken from the FQMS but the samples taken by the TCB were not drawn in a representative way.

With regard to the total amount of filling stations and the total amount of samples an equivalent kind of sample taking may have taken place. The first results of the Twinning project have already lead to determine the set up of institutions to take samples according to the FQMS and the institution to manage the FQMS, which is the EERC. This report inaugurates the relevant activities of the EERC and covers one grade without distinction between summer and winter. The values for sulphur content, benzene, lead and distillation were alll within specification, with regard to RON only one one sample was not complying.

The report on diesel covers one grade with separate tables for winter and summer. The relative high amount of samples reflects the interest of the TCB to identify possible cases of fraud, which is committed in consideration of the contrasting tax rates on diesel and light heating oil. About 100 samples had extraordinary high exceedances of sulphur (400 - 1800 ppm). These cases are not included in the reporting table since they stem from non-representative samples. In all these non-complying cases liability procedures were immediately started.

Fuel Quality Monitoring System

Year: 2004

Description of Fuel Quality Monitoring System

Member States should provide details on the operation of their national fuel quality monitoring systems.

Directive 98/70/EC requires the vapour pressure of petrol to be less than 60.0 kPa during the summer period, which spans 1 May until 30 September. However, for those Member States that experience 'arctic or severe weather conditions' the summer period covers the period 1 June to 31 August and the vapour pressure must not exceed 70 kPa. Member States are requested to define the Summer/Winter periods implemented in their territories and also applying to their fuel quality monitoring system reporting.

Definition of Monitoring System Summer and Winter Periods:

Summer Period	
Start	1 May
End	30 September
Winter Period	
Start	1 Oktober
End	30 April

* Normal = 1st May to 30th September; Arctic = 1st June to 31st August

Member States should indicate whether their monitoring system is set up using the European Standard EN 14274:2003 statistical model A, B or C and whether it is based on the large or small country framework. Alternatively, the Member State should indicate if they are using their own nationally defined system.

Country Size (L = Large, S = Small)	S		
		Minimum number of samples each period (Petrol, per grade, Diesel)	
Fuel Quality Monitoring System model used:	Yes / No	Small Country	Large Country
EN 14274 Statistical Model A		50	100
EN 14274 Statistical Model B		100	200
EN 14274 Statistical Model C		50	--
National System		--	--

If Member States are using the European Standard EN 14274:2003, they should also provide details on the sampling programme by completing the relevant sections of the table in Annex I (as defined in Annexes B and C of EN 14274:2003), plus details of any additional provisions made in the table below.

"If Member States are not using the European Standard EN 14274:2003 and are using their own national system, they should provide a description of the operation of their national fuel quality monitoring systems. This should preferably include the following information, in addition to any additional information that the Member State thinks is relevant (e.g. number of national refineries & distribution terminals):

- Organisations responsible for sampling, analysis and reporting;

- Types of locations at which sampling is carried out (e.g. refineries, terminals/depots, or from refuelling stations);
- Frequency of sampling and selection of sampling points;
- Assessment that shows the monitoring system's equivalency to the CEN system.

Description of National Fuel Quality Monitoring System (give once and up-date if necessary)

The Estonian Environmental Research Center (EERC) is managing the FQMS and reporting the results. The Tax and Customs Board (TCB) has taken all samples throughout the year for this reporting period. The analyses of samples were carried out by the lab of the EERC and other different accredited labs. The test methods applied were in accordance with the directive. The sales data of fuels were provided by the TCB.

Total Sales of Petrol and Diesel

Year: 2004

Member states are requested to complete the following table, as applicable detailing the quantities of each type and grade of petrol and diesel fuel marketed in their territory.

***NB: Please do not report national fuel grade sales under more than one category.**

Fuel Grade	Name of national fuel grade	National sales total		No. Samples Taken
		Litres	Tonnes	
Regular unleaded petrol (minimum RON = 91)[1]	unleaded petrol 92		14 500	
Regular unleaded petrol (minimum RON = 91 & < 50 ppm Sulphur)			N/A	
Regular unleaded petrol (minimum RON = 91 & < 10 ppm Sulphur)			N/A	
Unleaded petrol (minimum RON = 95)[1]			N/A	
Unleaded petrol (minimum RON = 95 & < 50 ppm Sulphur)[2]			N/A	
Unleaded petrol (minimum RON = 95 & < 10 ppm Sulphur)[3]			N/A	
Unleaded petrol (minimum 95 =< RON < 98)	unleaded petrol 95		238 100	123
Unleaded petrol (minimum 95 =< RON < 98 & < 50 ppm Sulphur)			N/A	
Unleaded petrol (minimum 95 =< RON < 98 & < 10 ppm Sulphur)			N/A	
Unleaded petrol (minimum RON >= 98)	unleaded petrol 98		37 800	
Unleaded petrol (minimum RON >= 98 & < 50 ppm Sulphur)			N/A	
Unleaded petrol (minimum RON >= 98 & < 10 ppm Sulphur)			N/A	
Total unleaded petrol (<150 ppm Sulphur)			**N/A**	
Total unleaded petrol (<50 ppm Sulphur)			**N/A**	
Total unleaded petrol (150 ppm Sulphur)	**unleaded petrol**		**290 400**	
Total Petrol	**petrol**		**290 400**	**123**
Diesel fuel[4]	diesel		411 400	
Diesel fuel (< 50 ppm sulphur)[5]			N/A	
Diesel fuel (< 10 ppm sulphur)[6]			N/A	
Total Diesel	**diesel**		**411 400**	**652**

[1] as specified in Annex I of Directive 98/70/EC
[2] as specified in Annex III of Directive 98/70/EC
[3] as specified in Annex III of Directive 98/70/EC except the sulphur content which must be less than 10ppm
[4] as specified in Annex II of Directive 98/70/EC
[5] as specified in Annex IV of Directive 98/70/EC
[6] as specified in Annex IV of Directive 98/70/EC except the sulphur content which must be less than 10ppm

Comments (completeness of data, particular issues, etc.)

Geographical Availability of Sulphur-Free Fuels

Year: 2004

Member States are requested to complete the following tables with basic information on the geographical availability of sulphur free petrol and diesel sold in their territories.

	(Litres/Tonnes)	% Total Petrol/Diesel Sales
Total National sales <10 ppm sulphur petrol		
Total National sales <10 ppm sulphur diesel		

Details of petrol RON grades available with <10 ppm sulphur:
Are <10 ppm sulphur fuels (petrol and/or diesel) labelled differently from regular grades (i.e. can they be easily distinguished from regular/higher sulphur fuels by the consumer)?

Where Member States choose to apply the measures in their national territories, they are also requested to complete, as far as possible, the following tables with detailed information (Options A to D) on the geographical availability of sulphur free petrol and diesel in their territories, as outlined in the Commission Guidance note[1]. Member States should also take into account any specific provisions made for special cases in the Commission Guidance.

[1] The more detailed reporting on geographical availability is not needed until the 2005 monitoring reports, but would be useful if Member States were also able to provide it from 2004.

Where the more detailed information is not available, or additional notes/clarifications are needed or other guidance than that given by the Commission is used, the Member States are requested to provide a description on the extent to which sulphur free fuels are marketed in their territory (i.e. geographical availability). This free form text box should also be used to provide any additional information such as the special cases outlined in the Commission Guidance note.

Description of the geographical availability of sulphur free fuels or additional notes:

Option (A): Proportion of refuelling stations with sulphur free grades available by region

See Annex II for reporting table format.

Option (B): Average distance between refuelling stations with sulphur free grades available

	No. Refuelling Stations		Distance between refuelling stations (km)			
	<10 ppm	All	With <10 ppm grades available			All
	Number	Number	Min.	Max.	Mean	Mean
Petrol						
Diesel						

Option (C): Availability of sulphur free fuels at large refuelling stations

	Petrol	**Diesel**
National criteria for definition of "large refuelling stations" in terms of a minimum volume throughput (in million litres / annum)		
Total number of large refuelling stations nationally		
Number of large refuelling stations with <10 ppm fuel available		
% Total large refuelling stations with <10 ppm fuel available		

Option (D): Availability of sulphur free fuels at highway/motorway refuelling stations

	Petrol	Diesel
Total number of highway/motorway refuelling stations nationally		
Number of highway/motorway refuelling stations with <10 ppm fuel available		
% Total highway/motorway refuelling stations with <10 ppm fuel available		

ANNEX I. Fuel Quality Monitoring System Regional Sampling of Petrol and Diesel[1]

Country:	Estonia
Fuel type (petrol or diesel):	
Statistical Model (A, B or C) [2]	
Reporting Year:	2004
Period (Summer or Winter):	

Min. number of samples per grade:	

Macro / Non-Macro Regions (add extra rows as needed)	**Fuel onsumption (million tonnes)**	**Variability factor**[3]	**Proportion of total samples**	**Min. number of Samples per grade**[4]	**Actual number of samples taken**					
					Grade:	**Grade 1**	**Grade 2**	**Grade 3**	**Grade 4**	**Grade 5**
					Name/ID:					
1			-	-						
2			-	-						
3			-	-						
4			-	-						
5			-	-						
6			-	-						
7			-	-						
8			-	-						
9			-	-						
10			-	-						
11			-	-						
12			-	-						
13			-	-						
14			-	-						
15			-	-						
Remainder	--	--	--							
Total										

[1] As defined in Annexes B and C of EN 14274:2003
[2] Definitions according to those provided in EN 14274:2003.
[3] Only for statistical Model A
[4] For grades comprising <10% total sales, the minimum is calculated as: %sales x min. for parent grade (at least 1 sample)

Additional Notes (e.g. identification of grades comprising <10% total sales)

ANNEX II. Options (A) - Proportion of Refuelling Stations with Sulphur Free Grade Available by Region[1]

Country:	Estonia
Fuel type (petrol or diesel):	
Year:	2004
Period (Summer or Winter):	

Note:
Please fill out the orange sections with the relevant information as far as possible, inserting extra rows for additional regions as needed and with additional comments as necessary for explanation in the relevant section.

Regional Parameters				**% of refuelling stations with sulphur free fuel available[2]**		
NUTS Region Description[2]		**NUTS Code[2]**	**No. of refuelling stations**	**Minimum %**	**Maximum %**	**Mean %**
LEVEL 2 Regions	**Region Names**	--	--	**By (NUTS) level 3 region:**		
Region 1		E.g. XX11				
Region 2		E.g. XX12				
Region 3		E.g. XX13				
Region 4		E.g. XX21				
Region 5		E.g. XX22				
Region 6		E.g. XX31				
LEVEL 1 Regions	**Region Names**	--	--	**By (NUTS) level 2 region:**		
Region 1		E.g. XX1				
Region 2		E.g. XX2				
Region 3		E.g. XX3				
National Total		**E.g. XX**				

[1] According to the Eurostat Nomenclature of territorial units for statistics – NUTS Statistical Regions of Europe (see: http://europa.eu.int/comm/eurostat/ramon/nuts/home_regions_en.html
[2] Additional information on NUTS, including full country code listings, may be found on the Eurostat web site at: http://europa.eu.int/comm/eurostat/ramon/nuts/home_regions_en.html

Additional Comments:

Annex III. Market Fuels used in Vehicles with Spark Ignition Engines (Petrol) in 2004

Country	Estonia
Reporting Year	2004
Period (Summer / Winter)	both
Parent fuel grade	unleaded petrol 95
National fuel grade	unleaded petrol 95
Summer Period*	1st May to 30th September (normal)

* N = 1st May to 30th September (normal) ; A = 1st June to 31st August (arctic).

(1) The limiting values are "true values" and were established according to the procedures for limit setting in EN ISO 4259:1995. The results of individual measurements shall be interpreted following the criteria described in EN ISO 4259:1995.
(2) 91 for unleaded regular grade petrol: See 98/70/EC, Annex I, Footnote 3.
(3) 81 for unleaded regular grade petrol: See 98/70/EC, Annex I, Footnote 3.
(4) 70 kPa for Member States with arctic or severe weather conditions: See 98/70/EC, Annex I, Footnotes 4 & 5.
(5) 21 for unleaded regular grade petrol: See 98/70/EC, Annex I, Footnote 6.

Reporting results

Parameter	Unit	Analytical and statistical results					Limiting Value(1)				Test method (more recent versions may also be used)	
							National Specification, if any		According to 98/70 EC			
		No Samples	Minimum	Maximum	Mean	Standard Deviation	Minimum	Maximum	Minimum	Maximum	Method	Date
Research Octane Number	--	114	92,0	98,8	95,7	0,7		-	9(2)		EN 25164	1993
Motor Octane Number	--								85(3)		EN 25163	1993
Vapour Pressure, DVPE --summer period only	kPa	1				69,4				(4) 60,0	PrEN 13016-1	1997
Distillation												
-- evaporated at 100 °C	% (v/v)	2	54,2	54,8	54,5	0,4		-	46,0		PrEN ISO 3405	1999
-- evaporated at 150 °C	% (v/v)	2	84,7	85,9	85,3	0,8		-	75,0			
Hydrocarbon analysis												
-- Olefins	% (v/v)									18.0(5)	ASTM D 1319	1995
-- Aromatics	% (v/v)									42,0	ASTM D 1319	1995
-- Benzene	% (v/v)	64	0,10	0,83	0,45	0,15	-			1,0	EN 238	1996
Oxygen content	% (m/m)									2,7	"EN 1601 PrEN 13132"	"1997 1998"

Parameter	Unit	Analytical and statistical results					Limiting Value[1]				Test method (more recent versions may also be used)	
							National Specification, if any		According to 98/70 EC			
		No Samples	Minimum	Maximum	Mean	Standard Deviation	Minimum	Maximum	Minimum	Maximum	Method	Date
Oxygenates												
-- Methanol	% (v/v)									3		
-- Ethanol	% (v/v)									5		
-- Iso-propyl alcohol	% (v/v)									10	EN 1601	1997
-- Tert-butyl alcohol	% (v/v)									7	Or	
-- Iso-butyl alcohol	% (v/v)									10	prEN 13132	1998
-- Ethers with ≥5 carbon atoms / molecule	% (v/v)									15		
-- other oxygenates	% (v/v)									10		
Sulphur content	mg/kg	117	28	139	57	21				150	EN ISO 14596 EN ISO 8754 EN 24260	1998 1995 1994
Lead content	g/l	9	<0,0025	<0,0025			-	0,005		0,005	EN 237	1996

Sampling frequency

Number of samples in month			
January	22	July	10
February	19	August	16
March		September	14
April		October	
May	13	November	
June	12	December	17
		Total	**123**

Other notes (optional):
Standard deviation (SD)=SQR VAR. VAR= 1(n-1) SUM (x(i)-x(aver))E2

Test Methods and Analysis

Parameter	Unit	Test specified in 98/70/EC or EN228						Notes on exceedences		
		Method	Date	Reproduca-bility, R	Tolerance limits		Exceeded?	No. samples	Values	Details/action taken
					Minimum	Maximum				
Research Octane Number (RON)	--	EN 25164	1993	0,6	94,6		Yes	3	92-94,4	
(RON 91 fuel only)	--			0,6	90,6					
Motor Octane Number (MON)	--	EN 25163	1993	0,9	84,5					
(RON 91 fuel only)	--			0,9	80,5					
Vapour Pressure, DVPE										
--summer period (normal)	kPa	EN 13016-1	2000	3		61,8				
--summer period (arctic or severe weather conditions)	kPa	EN 13016-1	2000	3,2		71,9				
Distillation										
--evaporated at 100 °C	% (v/v)	EN-ISO 3405	1988		46,0					
-- evaporated at 150 °C	% (v/v)	EN-ISO 3405	1988		75,0					
Hydrocarbon analysis										
-- Olefins	% (v/v)	ASTM D1319	1995	4,6		20,7				
-- Olefins (RON 91 fuel only)	% (v/v)	ASTM D1319	1995	4,6		23,7				
-- Aromatics	% (v/v)	ASTM D1319	1995	3,7		44,2				
-- Benzene	% (v/v)	EN 12177	1998	0,1		1,1	no			
		EN 238	1996	0,3		1,2				
Oxygen content	% (m/m)	EN 1601	1997	0,3		2,9				
Oxygenates										
-- Methanol	% (v/v)	EN 1601	1997	0,4		3,2				
-- Ethanol	% (v/v)	EN 1601	1997	0,3		5,2				
-- Iso-propyl alcohol	% (v/v)	EN 1601	1997	0,9		10,5				
-- Tert-butyl alcohol	% (v/v)	EN 1601	1997	0,6		7,4				
-- Iso-butyl alcohol	% (v/v)	EN 1601	1997	0,8		10,5				
-- Ethers with 5 or more carbon atoms per molecule	% (v/v)	EN 1601	1997	1		15,6				
-- other oxygenates	% (v/v)	EN 1601	1997	0,8		10,5				
Sulphur content	mg/kg	EN ISO 14596	1998	30		167,7				
		EN ISO 8754	1995				no			
		EN 24260	1994	18,6		161,0				

Parameter	Unit	Test specified in 98/70/EC or EN228						Notes on exceedences		
		Method	Date	Reproducability, R	Tolerance limits		Exceeded?	No. samples	Values	Details/action taken
					Minimum	Maximum				
Sulphur content (low sulphur, from 2005)	mg/kg	EN ISO 14596	1998	20,0		61,8				
		EN ISO 8754	1995							
		EN 24260	1994	6,8		54,0				
Sulphur content (sulphur free, from 2005)	mg/kg	EN ISO 14596	1998	5,0		13,0				
		EN ISO 8754	1995							
		EN 24260	1994	3,4		12,0				
Lead content	g/l	EN 237	1996	0,002		0,0062	no			

Annex IV. Market Fuels used in the Compression Ignition Engines (Diesel, winter) in 2004

Country	Estonia
Reporting year	2004
Period (Summer / Winter)	winter
Parent fuel grade	diesel
National fuel grade	diesel

(1) The limiting values are "true values" and were established according to the procedures for limit setting in EN ISO 4259:1995. The results of individual measurements shall be interpreted following the criteria described in EN ISO 4259:1995.
(2) In cases of dispute EN ISO 3675: 1998 shall be used
(3) Polycyclic aromatic hydrocarbons are defined as the total aromatic hydrocarbon content less than the monoaromatic hydrocarbons content, both as determined by IP 391
(4) In cases of dispute EN ISO 14596: 1998 shall be used

Reporting Results

Parameter	Unit	Analytical and statistical results					Limiting value (1)				Test method (more recent versions may also be used)	
							National Specifications		According to 98/70/EC			
		No Samples	Minimum	Maximum	Mean	Standard deviation	Minimum	Maximum	Minimum	Maximum	Method	Date
Cetane number	--	17	48,2	52,5	50,3	1,2	49		51*	--	EN ISO 5165	1998
Density at 15 °C(2)	kg/m³	25	823	840	830	6	820			845	EN ISO 3575 EN ISO 12185	1998 1996
Distillation -- 95-%-Point	°C	5	349	356	352	3				360	PrEN ISO 3405	1998
Polycyclic aromatic hydrocarbons (PAH)(3)	% (m/m)	3	2,3	3,9	3,1	0,8				11	IP 391	1995
Sulphur content	mg/kg	264	9	963	175	156				350	EN ISO 14596 EN ISO 8754 EN 24260	1998 1995 1994

Sampling frequency

Number of samples in month			
January	99	July	
February	92	August	
March		September	
April		October	
May		November	
June		December	104
		Total	**295**

Other notes (optional):
cetane no for winter diesel must be according to national Standard EVS-EN 590:2004 Class 1 minimum value 49,0

Test Methods and Analysis

Parameter	Unit	Test specified in 98/70/EC or EN590						Notes on exceedences		
		Method	Date	Reproducability, R	Tolerance limits		Exceeded?	No. samples	Values	Details/action taken
					Minimum	Maximum				
Cetane number	--	EN-ISO 5165	1998	4,3	48,4		no			
Density at 15 °C	kg/m³	EN-ISO 3675	1998	1,2		845,7	no			
		EN ISO 12185	1996	0,51						
Distillation -- 95% Point	°C	EN-ISO 3405	1988			360,0	no			
Polycyclic aromatic hydrocarbons	% (m/m)	IP 391	1995	3,8		13,3	no			
Sulphur content	mg/kg	EN ISO 14596	1998	50		379,7				
		EN ISO 8754	1995			350,0	Yes	15	378-963	
		EN 24260	1994	42,4		375,2				
Sulphur content (low sulphur, from 2005)	mg/kg	EN ISO 14596	1998	20,0		61,9				
		EN ISO 8754	1995							
		EN 24260	1994	6,8		54,0				
Sulphur content (sulphur free, from 2005)	mg/kg	EN ISO 14596	1998	5,0		13,0				
		EN ISO 8754	1995							
		EN 24260	1994	3,4		12,0				

Annex IV. Market Fuels used in the Compression Ignition Engines (Diesel, summer) in 2004

Country	Estonia
Reporting year	2004
Period (Summer / Winter)	summer
Parent fuel grade	diesel
National fuel grade	diesel

(1) The limiting values are "true values" and were established according to the procedures for limit setting in EN ISO 4259:1995. The results of individual measurements shall be interpreted following the criteria described in EN ISO 4259:1995.
(2) In cases of dispute EN ISO 3675: 1998 shall be used
(3) Polycyclic aromatic hydrocarbons are defined as the total aromatic hydrocarbon content less than the mono-aromatic hydrocarbons content, both as determined by IP 391
(4) In cases of dispute EN ISO 14596: 1998 shall be used

Reporting Results

Parameter	Unit	Analytical and statistical results					Limiting value (1)				Test method (more recent versions may also be used)	
							National Specifications		According to 98/70/EC			
		No Samples	Minimum	Maximum	Mean	Standard deviation	Minimum	Maximum	Minimum	Maximum	Method	Date
Cetane number	--	5	51,8	53,4	52,4	0,6	51		51,0	--	EN ISO 5165	1998
Density at 15 °C(2)	kg/m³	34	820	843	837	4	820			845	EN ISO 3575 EN ISO 12185	1998 1996
Distillation -- 95-%-Point	°C	3	344	350	347	3				360	PrEN ISO 3405	1998
Polycyclic aromatic hydrocarbons (PAH)(3)	% (m/m)	3	3,4	3,6	3,5	0,1				11	IP 391	1995
Sulphur content	mg/kg	321	17	789	198	113				350	EN ISO 14596 EN ISO 8754 EN 24260	1998 1995 1994

Sampling frequency

Number of samples in month			
January		July	49
February		August	60
March		September	92
April		October	
May	77	November	
June	79	December	
		Total	**357**

Other notes (optional):
Standard deviation (SD)=SQR VAR. VAR= 1(n-1) SUM (x(i)-x(aver))E2

Test Methods and Analysis

Parameter	Unit	Test specified in 98/70/EC or EN590						Notes on exceedences		
		Method	Date	Reproducability, R	Tolerance limits		Exceeded?	No. samples	Values	Details/action taken
					Minimum	Maximum				
Cetane number	--	EN-ISO 5165	1998	4,3	48,4		no			
Density at 15 °C	kg/m³	EN-ISO 3675	1998	1,2		845,7	no			
		EN ISO 12185	1996	0,51						
Distillation -- 95% Point	°C	EN-ISO 3405	1988			360,0	no			
Polycyclic aromatic hydrocarbons	% (m/m)	IP 391	1995	3,8		13,3				
Sulphur content	mg/kg	EN ISO 14596	1998	50		379,7				
		EN ISO 8754	1995			350,0	Yes	20	355-789	
		EN 24260	1994	42,4		375,2				
Sulphur content (low sulphur, from 2005)	mg/kg	EN ISO 14596	1998	20,0		61,9				
		EN ISO 8754	1995							
		EN 24260	1994	6,8		54,0				
Sulphur content (sulphur free, from 2005)	mg/kg	EN ISO 14596	1998	5,0		13,0				
		EN ISO 8754	1995							
		EN 24260	1995	3,4		12,0				

Annex V. Market Fuels used in Vehicles with Spark Ignition Engines (Petrol) from 2005

Country	Estonia
Reporting Year	2004
Period (Summer / Winter)	
Parent fuel grade	
National fuel grade	
Summer Period*	1st May to 30th September (normal)

* N = 1st May to 30th September (normal) ; A = 1st June to 31st August (arctic).

(1) The limiting values are "true values" and were established according to the procedures for limit setting in EN ISO 4259:1995. The results of individual measurements shall be interpreted following the criteria described in EN ISO 4259:1995.
(2) 91 for unleaded regular grade petrol: See 98/70/EC, Annex I, Footnote 3.
(3) 81 for unleaded regular grade petrol: See 98/70/EC, Annex I, Footnote 3.
(4) 70 kPa for Member States with arctic or severe weather conditions: See 98/70/EC, Annex I, Footnotes 4 & 5.
(5) 21 for unleaded regular grade petrol: See 98/70/EC, Annex I, Footnote 6.

Reporting results

Parameter	Unit	Analytical and statistical results					Limiting Value(1)				Test method (more recent versions may also be used)	
							National Specification, if any		According to 98/70 EC			
		No Samples	Minimum	Maximum	Mean	Standard Deviation	Minimum	Maximum	Minimum	Maximum	Method	Date
Research Octane Number	--								9 (2)		EN 25164	1993
Motor Octane Number	--								85(3)		EN 25163	1993
Vapour Pressure, DVPE --summer period only	kPa									(4) 60,0	PrEN 13016-1	1997
Distillation -- evaporated at 100 °C -- evaporated at 150 °C	 % (v/v) % (v/v)								 46,0 75,0		PrEN ISO 3405	1999
Hydrocarbon analysis -- Olefins -- Aromatics -- Benzene	 % (v/v) % (v/v) % (v/v)									 18.0(5) 42,0 1,0	 ASTM D 1319 ASTM D 1319 EN 238	 1995 1995 1996
Oxygen content	% (m/m)									2,7	EN 1601 PrEN 13132	1997 1998

Parameter	Unit	Analytical and statistical results					Limiting Value[1]				Test method (more recent versions may also be used)	
							National Specification, if any		According to 98/70 EC			
		No Samples	Minimum	Maximum	Mean	Standard Deviation	Minimum	Maximum	Minimum	Maximum	Method	Date
Oxygenates												
-- Methanol	% (v/v)									3		
-- Ethanol	% (v/v)									5		
-- Iso-propyl alcohol	% (v/v)									10	EN 1601	1997
-- Tert-butyl alcohol	% (v/v)									7	Or	
-- Iso-butyl alcohol	% (v/v)									10	prEN 13132	1998
-- Ethers with ≥5 carbon atoms / molecule	% (v/v)									15		
-- other oxygenates	% (v/v)									10		
Sulphur content	mg/kg									150	EN ISO 14596 EN ISO 8754 EN 24260	1998 1995 1994
Lead content	g/l									0,005	EN 237	1996

Sampling frequency

Number of samples in month			
January		July	
February		August	
March		September	
April		October	
May		November	
June		December	
		Total	

Other notes (optional):

Test Methods and Analysis

Parameter	Unit	Test specified in 98/70/EC or EN228						Notes on exceedences		
		Method	Date	Reproducability, R	Tolerance limits		Exceeded?	No. samples	Values	Details/action taken
					Minimum	Maximum				
Research Octane Number (RON)	--	EN 25164	1993	0,6	94,6		Yes			
(RON 91 fuel only)	--			0,6	90,6		Yes			
Motor Octane Number (MON)	--	EN 25163	1993	0,9	84,5		Yes			
(RON 91 fuel only)	--			0,9	80,5		Yes			
Vapour Pressure, DVPE										
--summer period (normal)	kPa	EN 13016-1	2000	3		61,8				
--summer period (arctic or severe weather conditions)	kPa	EN 13016-1	2000	3,2		71,9				
Distillation										
--evaporated at 100 °C	% (v/v)	EN-ISO 3405	1988		46,0		Yes			
-- evaporated at 150 °C	% (v/v)	EN-ISO 3405	1988		75,0		Yes			
Hydrocarbon analysis										
-- Olefins	% (v/v)	ASTM D1319	1995	4,6		20,7				
-- Olefins (RON 91 fuel only)	% (v/v)	ASTM D1319	1995	4,6		23,7				
-- Aromatics	% (v/v)	ASTM D1319	1995	3,7		44,2				
-- Benzene	% (v/v)	EN 12177	1998	0,1		1,1				
		EN 238	1996	0,3		1,2				
Oxygen content	% (m/m)	EN 1601	1997	0,3		2,9				
Oxygenates										
-- Methanol	% (v/v)	EN 1601	1997	0,4		3,2				
-- Ethanol	% (v/v)	EN 1601	1997	0,3		5,2				
-- Iso-propyl alcohol	% (v/v)	EN 1601	1997	0,9		10,5				
-- Tert-butyl alcohol	% (v/v)	EN 1601	1997	0,6		7,4				
-- Iso-butyl alcohol	% (v/v)	EN 1601	1997	0,8		10,5				
-- Ethers with 5 or more carbon atoms per molecule	% (v/v)	EN 1601	1997	1		15,6				
-- other oxygenates	% (v/v)	EN 1601	1997	0,8		10,5				
Sulphur content	mg/kg	EN ISO 14596	1998	30		167,7				
		EN ISO 8754	1995							
		EN 24260	1994	18,6		161,0				

Parameter	Unit	Test specified in 98/70/EC or EN228						Notes on exceedences		
		Method	Date	Reproducability, R	Tolerance limits		Exceeded?	No. samples	Values	Details/action taken
					Minimum	Maximum				
Sulphur content (low sulphur, from 2005)	mg/kg	EN ISO 14596	1998	20,0		61,8				
		EN ISO 8754	1995							
		EN 24260	1994	6,8		54,0				
Sulphur content (sulphur free, from 2005)	mg/kg	EN ISO 14596	1998	5,0		13,0				
		EN ISO 8754	1995							
		EN 24260	1994	3,4		12,0				
Lead content	g/l	EN 237	1996	0,002		0,0062				

Annex VI. Market Fuels used in the Compression Ignition Engines (Diesel) from 2005

Country	Estonia
Reporting year	2004
Period (Summer / Winter)	
Parent fuel grade	
National fuel grade	

(1) The limiting values are "true values" and were established according to the procedures for limit setting in EN ISO 4259:1995. The results of individual measurements shall be interpreted following the criteria described in EN ISO 4259:1995.
(2) In cases of dispute EN ISO 3675: 1998 shall be used
(3) Polycyclic aromatic hydrocarbons are defined as the total aromatic hydrocarbon content less than the mono-aromatic hydrocarbons content, both as determined by IP 391
(4) In cases of dispute EN ISO 14596: 1998 shall be used

Reporting Results

Parameter	Unit	Analytical and statistical results					Limiting value (1)				Test method (more recent versions may also be used)	
							National Specifications		According to 98/70/EC			
		No Samples	Minimum	Maximum	Mean	Standard deviation	Minimum	Maximum	Minimum	Maximum	Method	Date
Cetane number	--								51,0	--	EN ISO 5165	1998
Density at 15 °C(2)	kg/m³									845	EN ISO 3575 EN ISO 12185	1998 1996
Distillation -- 95-%-Point	°C									360	PrEN ISO 3405	1998
Polycyclic aromatic hydrocarbons (PAH)(3)	% (m/m)									11	IP 391	1995
Sulphur content	mg/kg									50	EN ISO 14596 EN ISO 8754 EN 24260	1998 1995 1994

Sampling frequency

Number of samples in month			
January		July	
February		August	
March		September	
April		October	
May		November	
June		December	
		Total	

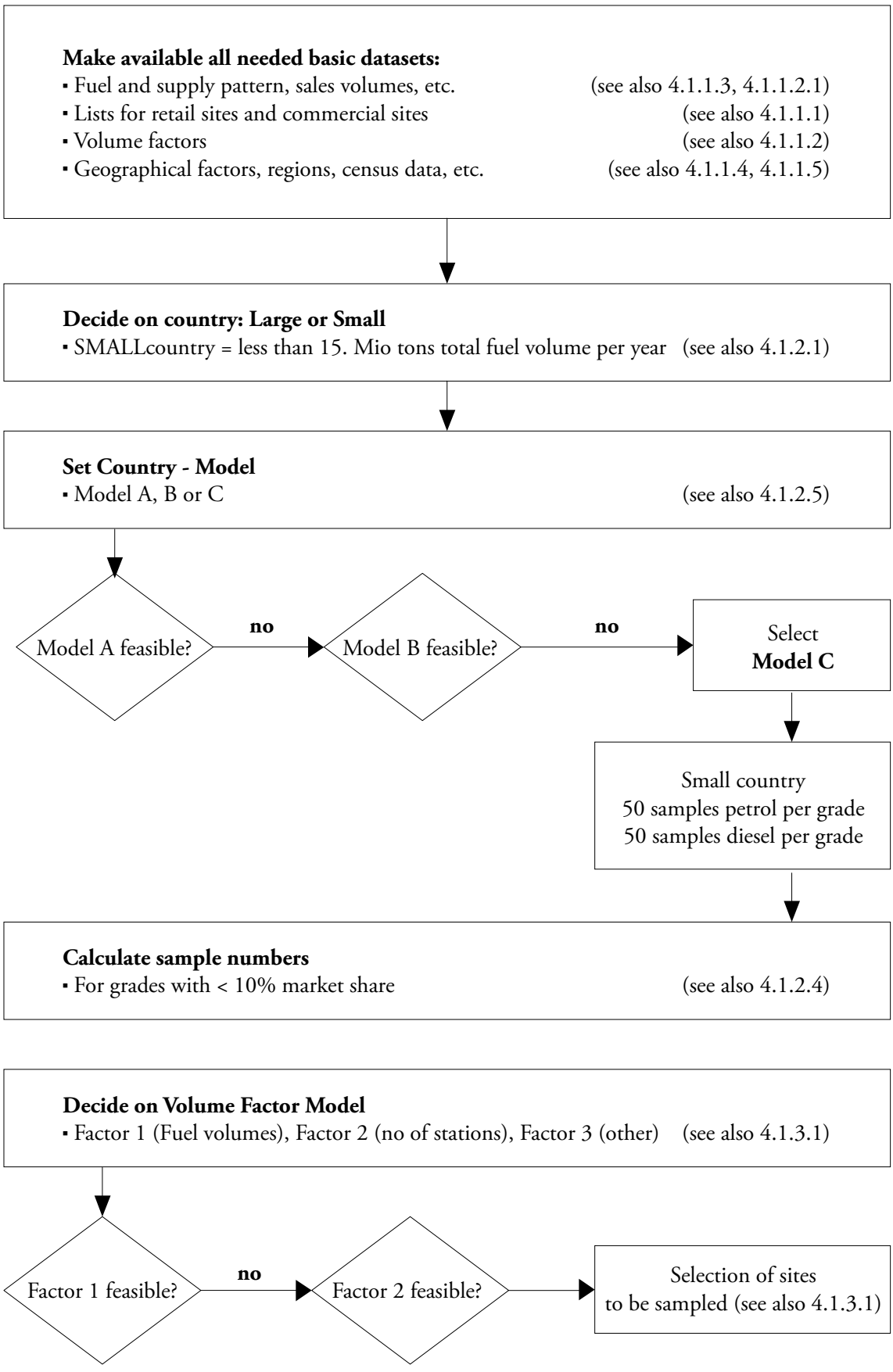
Other notes (optional):

Test Methods and Analysis

Parameter	Unit	Test specified in 98/70/EC or EN590						Notes on exceedences		
		Method	Date	Reproducability, R	Tolerance limits		Exceeded?	No. samples	Values	Details/action taken
					Minimum	Maximum				
Cetane number	--	EN-ISO 5165	1998	4,3	48,4		Yes			
Density at 15 °C	kg/m³	EN-ISO 3675	1998	1,2		845,7				
		EN ISO 12185	1996	0,51						
Distillation -- 95% Point	°C	EN-ISO 3405	1988			360,0				
Polycyclic aromatic hydrocarbons	% (m/m)	IP 391	1995	3,8		13,3				
Sulphur content	mg/kg	EN ISO 14596	1998	50		79,7				
		EN ISO 8754	1995			50,0				
		EN 24260	1994	42,4		75,2				
Sulphur content (low sulphur, from 2005)	mg/kg	EN ISO 14596	1998	20,0		61,9				
		EN ISO 8754	1995							
		EN 24260	1994	6,8		54,0				
Sulphur content (sulphur free, from 2005)	mg/kg	EN ISO 14596	1998	5,0		13,0				
		EN ISO 8754	1995							
		EN 24260	1994	3,4		12,0				

Annex 2

Process flowchart



4.2 Activity B2. Development of the full FQMS

4.2.1 Fuel Quality Management System

4.2.1.1 Estonian Fuel Quality Monitoring System (FQMoS)

The Estonian Fuel Quality Monitoring System was designed and set up with the completion of activity B1. The FQMoS uses the statistical model C described in the European standard EN 14274:2003 and is based on the small country framework.

The Estonian FQMoS was approved by the Ministry of the Environment on 25 November 2005.

4.2.1.2 Monitoring of fuels not covered by the FQMS

4.2.1.2.1 Light and Heavy Heating Oil (obligation of monitoring and reporting)

The MoE is the competent authority to report to the European Commission according to Directive 1999/32/EC of 26 April 1999 relating to a reduction in the sulphur content of certain liquid fuels and amending Directive 93/12/EEC for heavy fuel oil, gas oil and marine gas oil. Monitoring shall be conducted by the Environmental Inspectorate.

4.2.1.2.2 Biofuels (obligation of monitoring and reporting)

The EERC shall report to the European Commission according to Directive 2003/30/EC of 8 May 2003 on the promotion of the use of biofuels or other renewable fuels for transport. The corresponding data will become available in connection with the FQMoS.

4.2.1.2.3 Marine Fuels (obligation of monitoring and reporting)

In December 2005, the MoE informed about a new draft act, which will authorize the Tax and Customs Board to take the samples according to. to Directive 2005/33/EC of 6 July 2005 amending Directive 1999/32/EC as regards the sulphur content of marine fuels.

4.2.1.2.4 Non representative filling station (reporting)

The Environmental Inspectorate as well as the Tax and Customs Board don't have the responsibility to control smaller filling stations, which are not representative in terms of the FQMoS. Cross use of data is proposed.

4.2.1.3 Further activities

The FQMoS according to the European Standard EN 14274 requires inter alia statistical information about the oil market in the country concerned, e.g. total amount of automotive fuel or total amount of diesel fuel. The proposals for an oil data system are elaborated and presented in connection with activity B4 and B6.

A design for labelling of fuels at service stations was also elaborated and presented to the stakeholders (see also 4.4 and 4.6). An announcement campaign is being planned.

The representatives of oil industry are aware of the obligation to meet the quality standards. Several companies sell sulphur free fuels so that at least part of the fuel sold in Estonia is even better than required by the standards (see also 4.5).

4.2.2 Description of sampling and analyses schemes

4.2.2.1 Sampling

The selection of the required number of sites to be sampled based on the number of filling station according to factor 2 of the so-called Volume Factor Model (see also 4.1.3.1). This system was already used for the reporting years 2005 and 2006 (in preparation).

In the first step the total number of filling stations in one county was divided by the total number of filling stations in Estonia. The resulting percentage rate was related to the number of filling stations per county where samples have to be taken.

In the second step the number of samples in each county was verified to the situation in situ. Therefore, the number of filling stations in each county were prorated to the current owner. The resultant market share forms the basis for exact planning of sample taking in each county. The last extracting of the actual site to be sampled occurs on the principle of random.

The annual planning of the FQMS-sampling will be discussed with all stakeholders (see also 3.2.1.2.3).

4.2.2.2 Analyses

The Estonian Environmental Research Centre will be the only accredited laboratory in Estonia, which will be able to carry out the analytical work in regard to the Fuel Quality Monitoring System (see also Twinning Component E).

Samples will be analysed and tested there for the characteristics given in the European Directive 98/70/EC and only those methods specified in EN 228 and EN 590 will be used (see also part 6.4 of EN 14274).

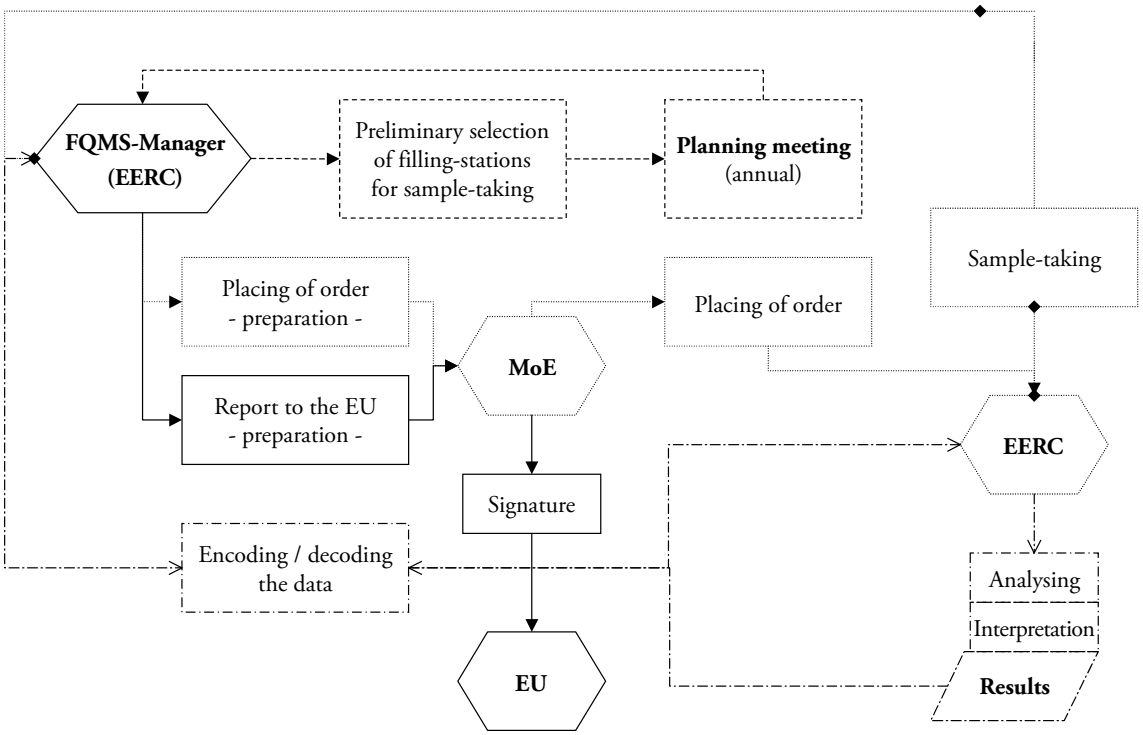
Because of its high standards the EERC should be the only laboratory, which will analyse samples ordered by different national institutions – in medium-term expected at "the costs-by-cause principle".

4.2.3 Inter institutional coordination and synergy (Flowcharts)

The different working stages of inter institutional coordination can be summarized as follows:

1 Preparation of sample taking, including planning meeting (actors: EERC - FQMS-Manager, stakeholders);
2 Placing of an order for sample taking and preparing the report (actors: EERC - FQMS-Manager, MoE);
3 Sample taking (actor: EERC as a rule, possibly third);
4 Encoding / decoding the data and analysis (actors: EERC - FQMS-Manager and - laboratory);
5 Preparation of the report to the European Commission (actors: EERC - FQMS-Manager, MoE).

FQMS – Monitoring (FQMoS): The whole Workflow



4.2.3.1 Sampling

The task of sample taking will be carried out by all these Estonian competent authorities, which already take samples. All financial and staff capacities will be pooled (see also 3.2.1.2.3). The first meeting to organize the sampling 2006 took place on the 6th of December, 2005. The next meeting took place on the 26th of January, 2006.

The samples will be taken by following competent authorities:

- Consumer Protection Board (3);
- Estonian Environmental Research Centre (9);
- Environmental Inspectorate (11);
- Tax and Customs Board (18).

The relevant employees of this institutions (number given in brackets) were be trained as sample takers (see also activity C3).

The Ministry of the Environment finances 200 samples and analyses for FQMoS per each period. The samples will be taken and analysed by the EERC. It is expected that the main synergy may result from the common and efficient use of the data of filling stations as well as the analytical results.

Additionally, it is expected that the Energy Market Inspectorate will not need fuel analyses in the future, because its needs will be fulfilled in connection with the FQMoS. The economic[1] and environmental[2] requirements as well as the samples and analysis under the FQMoS are based on EN 228 and EN 590.

[1] established by a regulation of the Minister of Economic Affairs and Communications from 11 June 2003

[2] established by a regulation of the Minister of the Environment from 19 May 2005

4.2.3.2 Analyses

The results of the samples taken for the purposes of the report to be submitted to the European Commission will be available in the EERC and other stakeholders cannot use them for their purposes. Therefore, a database is recommended, which is subject to all regulations of confidential data and trade secret.

4.2.3.3 General data about the filling station

The information about the number of filling-stations and their regional distribution is necessary to get baseline data to design the national fuel quality monitoring programme (according to EN 14274) and to plan the annual sample taking. Such information was not available at the beginning of 2005 and therefore the data had to be collected. The data were supplied by different departments of the Environmental Inspectorate and are available now in an Excel-format only at the Estonian Environmental Research Centre for the purposes of planning the sample taking. This list shall be updated each year.

Different stakeholders must have information about the number of filling stations in Estonia according to the Liquid Fuel Act:

- The Ministry of Economic Affairs and Communication is the holder of the state register where , pursuant to section 3 of the Liquid Fuel Act, the companies, which are permitted to operate shall be registered. The registration data are substantiated in subsection (2) 15 of the Liquid Fuel Act. The required information includes:

  - the registration number;
  - the date of making the registration;
  - the name, registry code, address of the seat and other details of the company;
  - the area(s) of activity and
  - the address(es) of the place(s) of business.

- The Energy Market Inspectorate as well as the Consumer Protection Board shall verify the registration data (sections 21 and 23 of the Liquid Fuel Act). Furthermore, the Tax and Customs Board shall verify the registration upon import, export and dispatch of fuel from excise warehouses (section 22 of the Liquid Fuel Act). All three actors need information about the filling stations to be able to fulfil their tasks according to the Liquid Fuel Act.

4.2.4 System of cross use of data

Therefore, a database, which would make the general data on filling stations available to all stakeholders, should be developed. Clear benefits of a common database are

- one reliable pool for all stakeholders - all stakeholders use the same data (database consistency);
- no unnecessary duplication of work;
- data will be up to date at any time;
- one work step from one stakeholder – information for all.

A system should be developed, which centralizes the general data on filling stations into one database and makes the data available to different stakeholders (in consideration of defined access rights).The tasks of the future FQMS-Manager (EERC) to plan the FQMoS sample taking as well as the report to the European Comission should also be taken into account.

Interfaces with the intended implementation of a Laboratory Information and Management System (LIMS) at the EERC (see also Twinning Component D) should be used.

4.2.4.1 Determination of requirements - stakeholders

In addition to the mentioned data on filling stations and test results information is available to the different stakeholders. In order to consider the requirements of all stakeholders as much as possible they were asked in November 2005 to fill in a survey about their prevailing needs.

The Environment Information Centre (EIC) as the national coordinator of environmental information did not take part in the survey, because its role is defined in section 60 of the Ambient Air Protection Act. The EIC will be the competent office to collect the relevant data for monitoring the quality and volumes of motor fuels sold in Estonia. They will also need access to the data of the FQMS report as well as an user-defined access to the final results.

A detailed evaluation of the questionnaire survey based on the response. The results can be summarized as follows:

4.2.4.1.1 General data

- Five of seven stakeholders need information about the filling stations;
- Six of seven stakeholders need information about the companies;
- Five of seven stakeholders need information about the sale of fuel per grade;
- The need for information is different (per each filling-station: 3 of 7, per each county: 3 of 7, per each company: 4 of 7);
- Three of seven stakeholders do not have the required information, 3 have the information only in non digital documents;
- Five of seven stakeholders answered, that the required information should be added by user-defined fields.

4.2.4.1.2 Information about the results of chemical analysis

- Four of seven stakeholders need information about the results of chemical analysis in detail:
  - linked to the filling station: 5;
  - linked to the companies: 4;
  - linked to the grades: 3;
  - linked to the counties: 3;
  - only several results: 1.

- Four of seven stakeholders find information about the aggregate data (according to FQMS) essential;
- Five of seven stakeholders would like to get the data of last sample taking (desirable);
- The need for information about the processing status is different (1 essential, 2 desirable, 2 non relevant);
- Four of seven stakeholders prefer additional information to the basic-data of the FQMS.

In summary, the following data will be shared by more than one institution:

- all filling stations;
- filling stations where samples for the FQMS have been taken;
- non-representative filling stations where samples have been taken;
- results of analyses for the FQMS linked to the filling stations;
- data of the EU-report.

4.2.4.1.3 Clarification of (unsettled) questions

- Contents and completeness of the available information on the Internet (EMI, MoE):

  a) Who is the "owner" of this information (administrative body or companies) and who can use the data?
  b) Is consolidation to a database "filling stations" possible?

- Which user defined fields are used in detail? (TCB, EMI, CPB, EI[3], EERC - specification);
- Which user defined reports are used in detail (e.g. memoranda, permission, registration, etc.);
- Which information (parameters) should be added? (EMI, TCB, EERC, EI);
- Who should update the master data of filling stations, e.g. continuous changes in the stock, new entrant / disposals (MoEAC or EI)?
- How should the workflow (different access levels) be organized?
- With whom should the overall responsibility for the database in general lie?

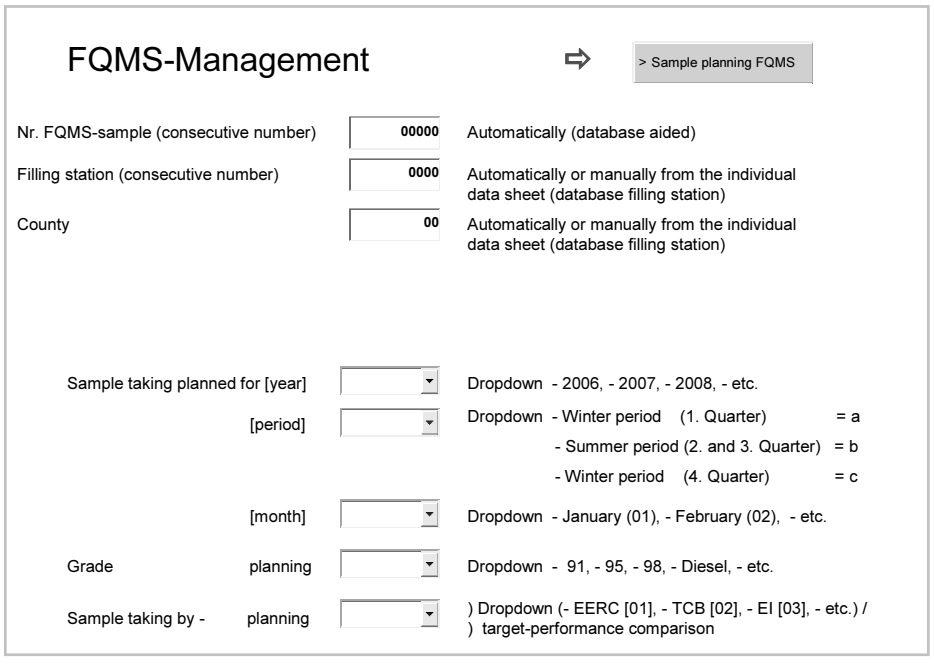
Recommendation: The overall responsibility for the database in general should lie with the EERC (e.g. concept and development of the database including stakeholder participation, administration, etc).

The EERC will be responsible for the development of a laboratory information and management system (LIMS). Professional support by the STE will be given.

This task is linked to Twinning Component D, in which the guidelines of database for all FQMoS parameters should be developed.

Year	Month	Period	Grades	Sample taken by	Number of filling station	County	Number of FQMoS-Sample
2006	09	b	95	01	0022	15	000085

Details are depicted in the following manner:



[3] First specification of EI is available: Ambient air pollution permit No., annual turnover of gasoline (greatest volume of gasoline tanked during a year throughout the last 3 years), information about installation of a gas recovery system (so-called regenerative devices)

4.2.4.3 Interfaces with the Laboratory Information and Management System (LIMS)

According to Twinning Component D "Information Technology" the EERC has placed an order for the development of a Laboratory Information and Management System (LIMS).

Since the (final) FQMS analytical results shall be available in the database of filling stations the need for closer cooperation is evident. On the other hand, it is necessary to provide the decoding and the adequate and orderly accounting sample results to the filling stations.

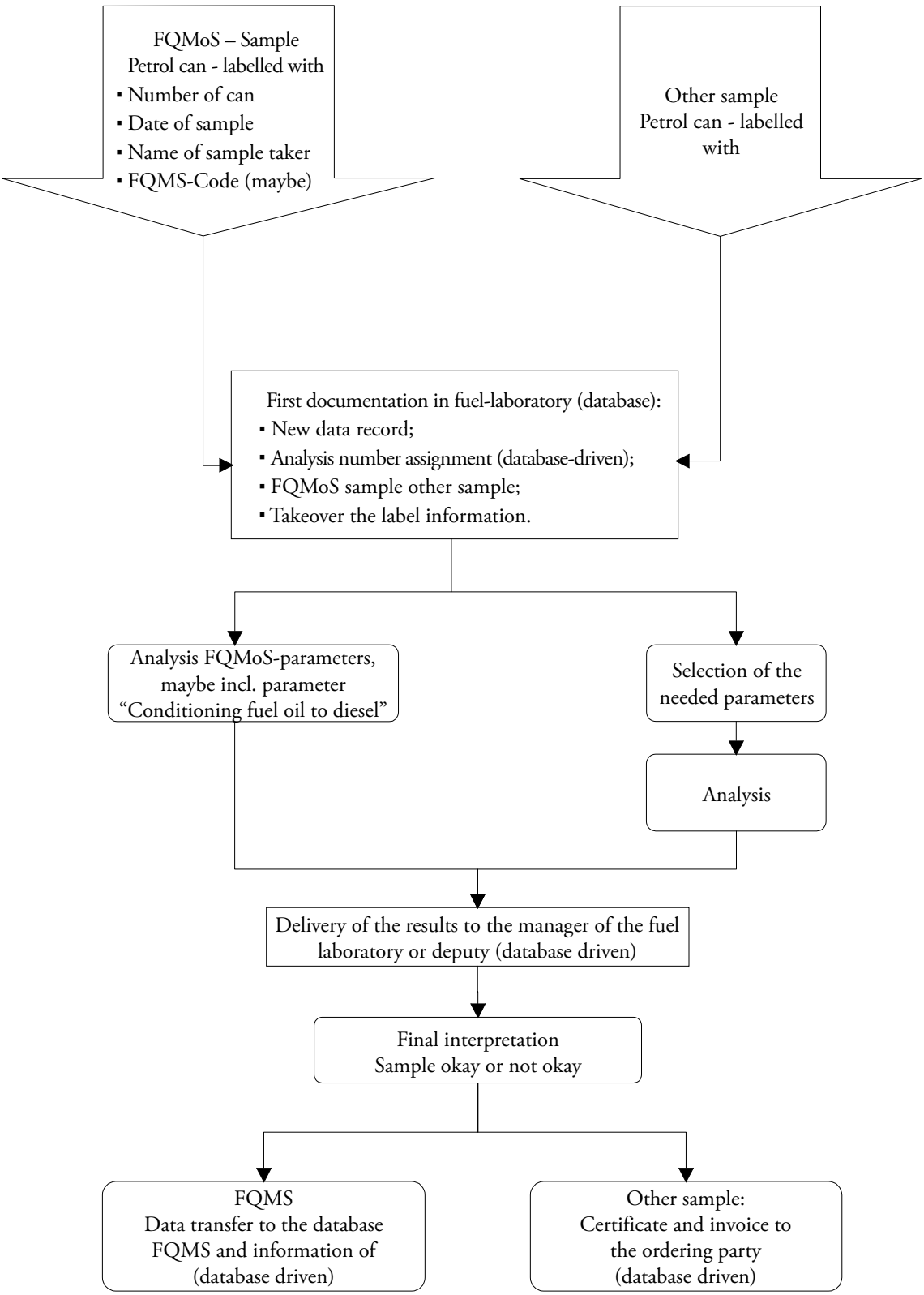
It is already clear that the following issues have to be solved:

- Synchronised, up to date sample taking and the moment of final interpretation this information should be available in the database of filling stations (check mark);
- The responsibility for the updating of master data e.g. European standards, measurement methods, limit and tolerance values have to be assigned;
- In case of non compliance of the sample[4] it has to be discussed and decided, who has to be informed in which cases and in which way as well as which information should be sent and given. The following options could be considered:

    - e.g. information of the FQMS-Manager (database driven) for further action (decision in individual cases);
    - e.g. information of the TCB in case of occurred fraud concerning fuels (database driven by E-Mail-account);
    - e.g. information of the EI (or competent Department) in case of occurred non-compliance with the EC-parameters (database driven by E-Mail-account);

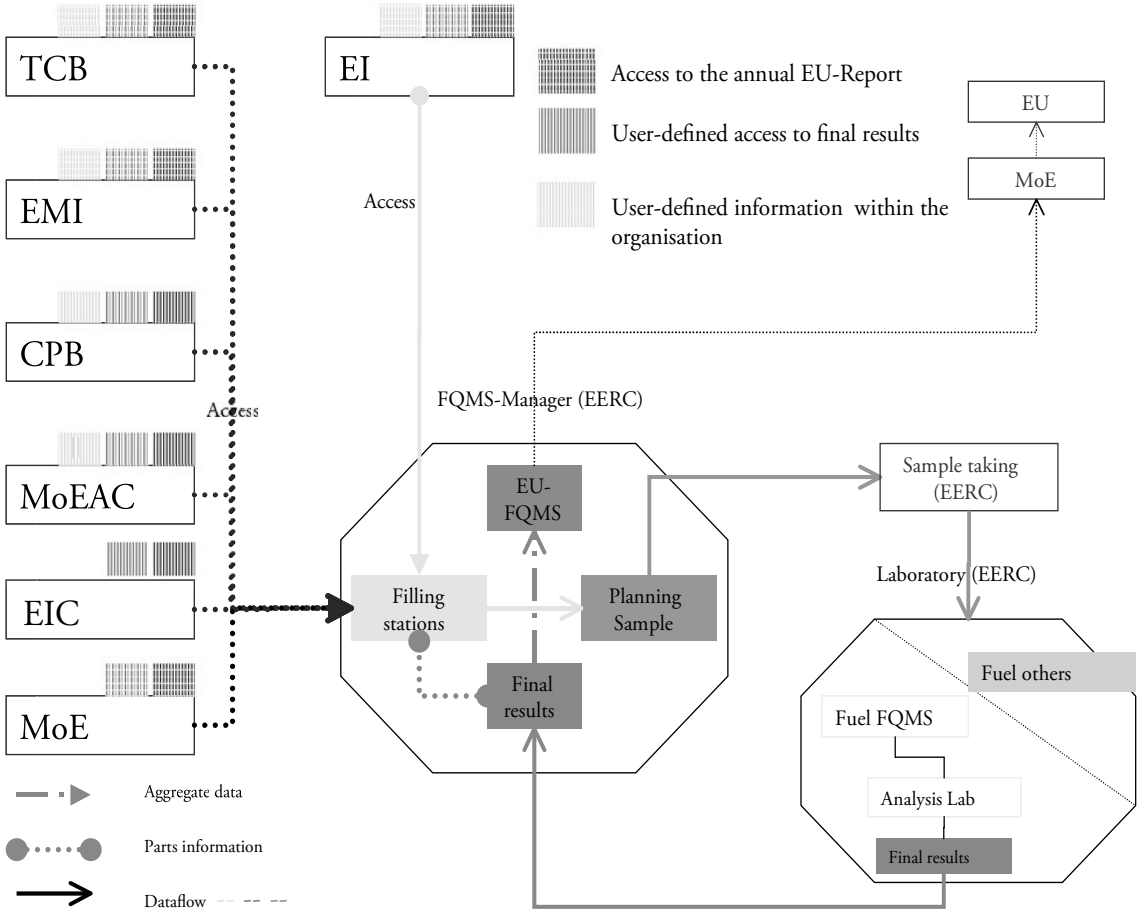
- Shall the whole sample result be available or only information that the sample was compliant/non compliant? Attention: Also, the question of data protection / confidential data should be taken into account!
- The inclusion of the not representative filling stations in the FQMS has to be discussed. In case of inclusion the database had to be adapted (see also the following workflow).

[4] Necessity of regulation in which case a sample is not compliance in the sense of legislation and demands activity of one (or more) of the stakeholders


FQMoS – Sample
Petrol can - labelled with
▪ Number of can
▪ Date of sample
▪ Name of sample taker
▪ FQMS-Code (maybe)
Other sample
Petrol can - labelled with
First documentation in fuel-laboratory (database):
▪ New data record;
▪ Analysis number assignment (database-driven);
▪ FQMoS sample other sample;
▪ Takeover the label information.
Analysis FQMoS-parameters, maybe incl. parameter "Conditioning fuel oil to diesel"
Selection of the needed parameters
Analysis
Delivery of the results to the manager of the fuel laboratory or deputy (database driven)
Final interpretation
Sample okay or not okay
FQMS
Data transfer to the database FQMS and information of (database driven)
Other sample:
Certificate and invoice to the ordering party
(database driven)

4.2.4.4 Exchange of data - workflow

The anticipated workflow between the stakeholders will be as follows:



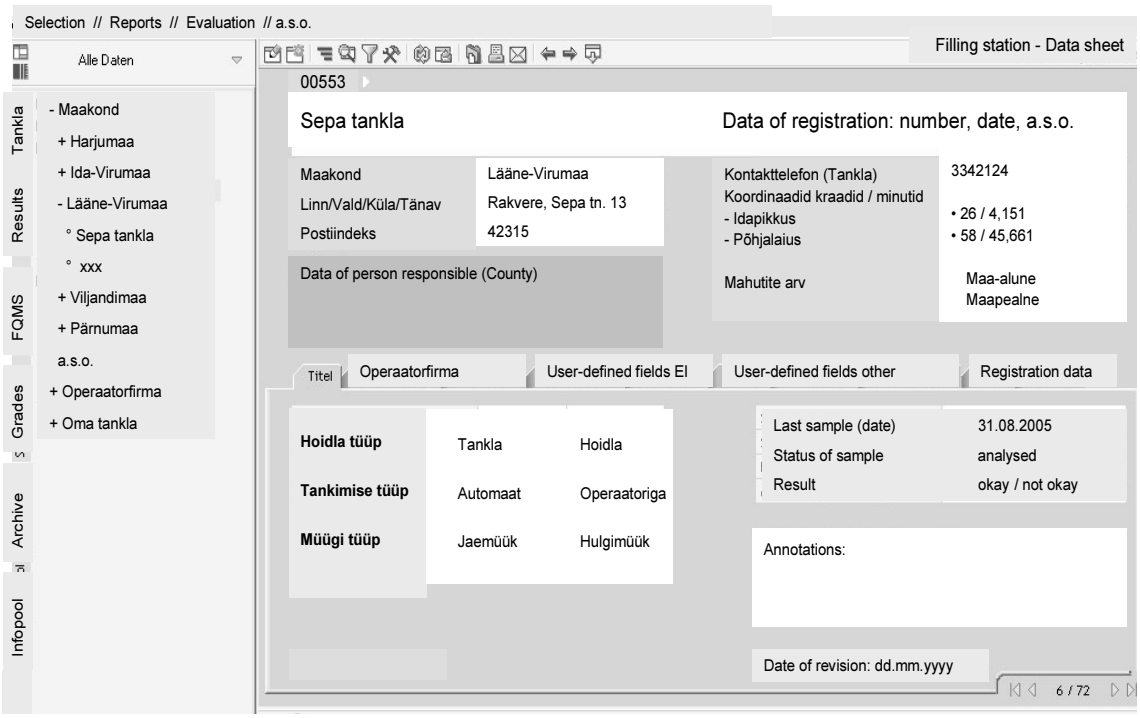
4.2.4.5 Selection of a data bank system

The workflow between the different stakeholder demands consists of:

- different levels of access and views to the database (different application areas);
- differentiated system of access rights;
- database aided internal mailing system to inform the other stakeholders in case of changes;
- extensive and flexible reporting system (with the possibility to create own reports);
- possibility to save the produced reports in other programme (e.g. Excel, Word, html);
- options for requirement-oriented analysis;
- easy operation with only small user training needed and
- modern and comfortable user interface.

The database should be applicable web based.

In any case attention should be paid to the existing and field tested database, which was developed and set in the state ministries of the Free and Hanseatic City of Hamburg for the purposes of political strategic planning. Although not all details of the software will fulfil the described demands the first attempt to “transfer” the needed data resulted in the following table:



4.2.5 Summary

The Fuel Quality Monitoring System is developed on the basis of European standards and the system of implementation was approved by the Ministry of the Environment on the 25th of November, 2005. The inter institutional workflow is up to now arrranged in two agreements, which allow a concerted action and planning, so that maximum synergy between the stakeholdes can be expected:

- The Estonian Environmental Research Centre will be the sole laboratory in Estonia, which will analyse samples in connection with the FQMS, so that the quality of analysis and the adherence to the European standards will be guaranteed;
- The sample taking will be coordinated between the stakeholders. The instrument of an annual planning meeting will ensure efficiency;
- Furthermore, the discussion held with stakeholders clearly shows the necessaty to optimize the transmission of information. Therefore, the main focus of Twinning Component D, activity D3 “Electronic data provision and reporting schemes” will be on the development of a database “Filling stations”.

4.3 Activity B3. Data provision and reporting schemes

4.3.1 Course of the Training measure for workshop about data provision and reporting schemes to the EU

The target of activity B3 was to train people from the CPB, EERC, EMI, EI, MoEC and TCB on data provision according to Directive 98/70/EC amended by 2003/17/EC, Commission Decision 2002/159/EC, European standard EN 14274 and the recommended respective Excel reporting template to the European Commission. Practical training covered the reporting format for petrol to the European Commission.

The training measure consisted of the following elements: presentation or lecture and practical implementation based on training material elaborated by STE Sabine Benkendorf.

The following handouts were handed out to the participants:

- Presentation incl. reporting scheme (see also 4.3.3);
- Directive 98/70/EC relating to the quality of petrol and diesel fuels of 13 October 1998;
- Directive 2003/17/EC of 3 March 2003 amending Directive 98/70/EC;
- Commission Decision 2002/159/EC;
- Report from the Commission about Quality of petrol and diesel fuel used for road transport in the European Union - second annual report (reporting year 2003).

The following information was given:

- The relevant Directive 98/70/EC and amending directive 2003/17/EC in respect to monitoring compliance, reporting and specifications according to Annex III and IV;
- The European Decision 2002/159/EC, which determines the content and the format of the annual report to Brussels and the reporting table for each fuel;
- European standard EN 14274 and main parts, which are necessary for the final report;
- Second EC annual report (reporting year 2003) EU fuels sales proportions by fuel type or average sulphur content of petrol and diesel grades across the EU;
- Information about the EU fuel quality monitoring - 2003 summary report - final report produced for the the European Commission and here in very detail about all ten topics of the recommended or proposed 2004 excel reporting template was given;
- Short information was given about the Directive 99/32/EC of 26 April 1999 relating to the reduction in the sulphur content of certain liquid fuel and about the reporting in this case. The new Directive 2005/33/EC of 6 July 2005, which regards the sulphur content of marine fuels was also mentioned.

Furthermore, the training covered calculation of data from analysing sheets in an Excel table and to filling in these data in the reporting table for petrol. Also, some mistakes had to be found. The total task was solved by the EERC.

4.3.2 Conclusion and recommendations

The participants got an impression which data are needed for the annual report to the European Commission what additional information has to be summarised (e.g. what happened with the exceedances).

After turning the results of Twinning Component B, activities A1, A2 and A4 to practise all necessary information to prepare the annual report will be available. As far as different parameter, methods, reproducibility or tolerance limits are concerned, it was recommended to use the information provided by STE Harald Vogel.

4.3.3 Extract of the presentation

4.3.3.1 Second annual report (Reporting year 2003) to the European Commission, 02.03.2005, COM(2005)69 final

Figure 2: EU Fuel sales proportions by fuel type (%)

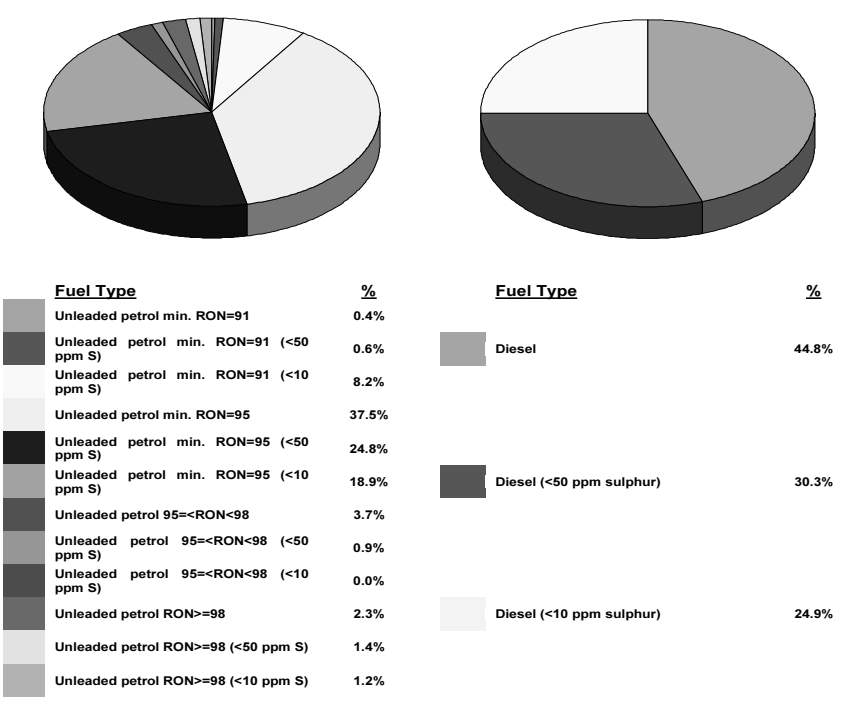


Figure 7: Average sulphur content of petrol and diesel grades across the EU (%)

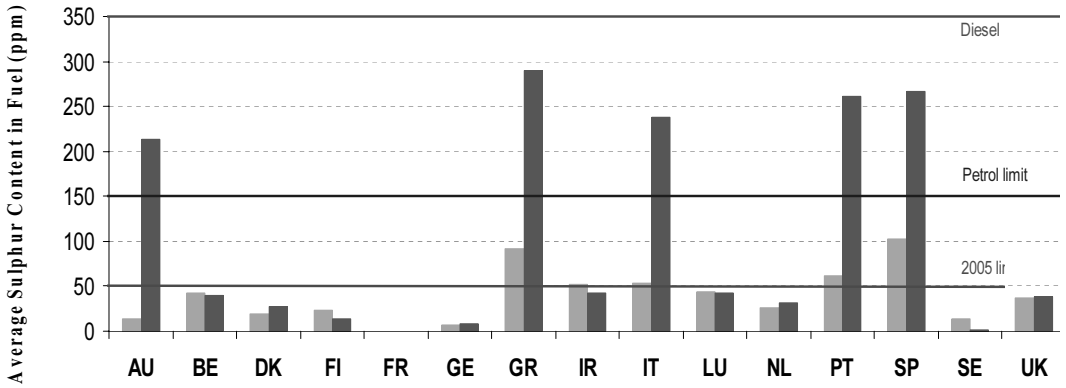


Table 2: Summary of Member State compliance with 98/70/EC for 2003 reporting.

Member State	Limit value non-compliance (95% confidence limits) (1)				Incomplete reporting				Late report (2)	Notes
	Petrol		Diesel		Petrol		Diesel			
Austria	X	6 / 240	X	1 / 100	X	1 / 18			X	(3)
Belgium	X	>10 / 4539	X	>2 / 5045	X	1 / 18			X	(4)
Denmark	X	1 / 52			X	9 / 18				(5)
Finland	X	3 / 207								
France	No report submitted for 2003									
Germany	X	2 / 399	X	1 / 222					X	
Greece			X	2 / 91						
Ireland	X	8 / 80							X	
Italy	X	4 / 192	X	2 / 276						
Luxembourg									X	
Netherlands	X	1 / 100							X	
Portugal					(X)	5 / 18				(6)
Spain									X	
Sweden					X	6 / 18				
UK	X	2 / 3003							X	
Total EU	**8**		**4**		**4**		**0**		**9**	

Notes:

(1) It is not possible to confirm whether limit values have been respected in all samples, where reporting data is incomplete.
(2) Directive 98/70/EC states that Member States should submit monitoring reports by no later than 30th June each year.
(3) Leaded petrol has been banned in Austria since 1993. Random testing of lead content ended in 1998, as samples always complied.
(4) Belgium's submission did not state the total number of non-compliant samples; only the minimum number could be established.
(5) Denmark only measured parameters expected to have significant impact on the environment. For petrol: RON, MON, oxygen content and all oxygenates (except ethers/MTBE) were not measured.
(6) Portugal did not measure oxygenates other than ethers with more than 5 carbon atoms per molecule, stating that no other oxygenates are added to the fuel.

2003 EU fuel sales by fuel type (million litres)

ID No.	Fuel grade	Austria	Belgium	Denmark	Finland	France	Germany	Greece	Ireland	Italy	Luxembourg	Netherlands	Portugal	Spain	Sweden	UK	EU15	EU15
1	Unleaded petrol min. RON=91	0	0	504	0		0	0	0	0	15	0	0	0	0	0	EU	% Total
2	Unleaded petrol min. RON=91 (<50 ppm S)	810	0	0	0		0	0	0	0	0	0	0	0	0	0	519	0.4%
3	Unleaded petrol min. RON=91 (<10 ppm S)	0	0	0	0		10,439	0	0	0	0	0	0	0	0	0	810	0.6%
4	Unleaded petrol min. RON=95	0	1,946	2,062	2,147		0	3,513	1,240	20,894	569	7,404	0	7,932	0	0	10,439	7.2%
5	Unleaded petrol min. RON=95 (<50 ppm S)	1,946	0	0	0		0	0	13	0	0	0	0	0	4,855	24,766	47,707	32.9%
6	Unleaded petrol min. RON=95 (<10 ppm S)	0	0	0	0		23,188	0	872	0	0	0	0	0	0	0	31,580	21.8%
7	Unleaded petrol 95=<RON<98	0	0	0	0		0	1,083	5	0	0	0	1,809	1,772	0	0	24,060	16.6%
8	Unleaded petrol 95=<RON<98 (<50 ppm S)	0	0	0	0		0	0	0	0	0	0	0	0	0	1,166	4,669	3.2%
9	Unleaded petrol 95=<RON<98 (<10 ppm S)	0	0	0	0		0	0	0	0	0	0	0	0	0	0	1,166	0.8%
10	Unleaded petrol RON>=98	0	0	27	322		0	350	0	0	0	344	657	1,183	0	0	0	0.0%
11	Unleaded petrol RON>=98 (<50 ppm S)	0	904	0	0		0	12	0	0	185	0	0	0	683	0	2,882	2.0%
12	Unleaded petrol RON>=98 (<10 ppm S)	127	0	0	0		1,373	0	0	0	0	0	0	0	0	0	1,783	1.2%
	Petrol (regular)	**0**	**1,946**	**2,593**	**2,469**		**0**	**4,945**	**1,245**	**20,894**	**583**	**7,748**	**2,466**	**10,888**	**0**	**0**	1,500	1.0%
	Petrol (<50 ppm sulphur)	**2,756**	**904**	**0**	**0**		**0**	**12**	**13**	**0**	**185**	**0**	**0**	**0**	**5,538**	**25,932**	**55,777**	**38.5%**
	Petrol (<10 ppm sulphur)	**127**	**0**	**0**	**0**		**35,001**	**0**	**872**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**35,338**	**24.4%**
	Total Petrol	**2,883**	**2,850**	**2,593**	**2,469**		**35,001**	**4,957**	**2,129**	**20,894**	**768**	**7,748**	**2,466**	**10,888**	**5,538**	**25,932**	**35,999**	**24.8%**
13	**Diesel**	6,868	0	0	2		0	3,077	0	26,745	0	0	5,712	24,814	0	0	**127,115**	**87.7%**
14	**Diesel (<50 ppm sulphur)**	0	6,970	2,415	2,262		0	48	2,286	0	1,600	8,535	0	0	0	21,306	67,217	37.0%
15	**Diesel (<10 ppm sulphur)**	0	0	0	0		33,591	0	0	0	0	0	0	0	3,799	0	45,423	25.0%
	Total Diesel	**6,868**	**6,970**	**2,415**	**2,264**		**33,591**	**3,124**	**2,286**	**26,745**	**1,600**	**8,535**	**5,712**	**24,814**	**3,799**	**21,306**	37,389	20.6%
																	150,029	**82.7%**

4.3.3.2 Fuel quality monitoring report

European Union Member States should indicate whether their monitoring system is set up using the European Standard EN 14274:2003 statistical model A, B or C and whether it is based on the large or small country framework. Alternatively, the Member State should indicate if they are using their own nationally defined system.

Country Size (L = Large, S = Small)	S		
		Minimum number of samples each period (Petrol, per grade; Diesel)	
Fuel Quality Monitoring System model used:	**Yes / No**	**Small Country**	**Large Country**
EN 14274 Statistical Model A		50	100
EN 14274 Statistical Model B		100	200
EN 14274 Statistical Model C	X	50	--
National System		--	--

If Member State are using the European Standard EN 14274:2003, they should also provide details on the sampling programme by completing the relevant sections of the table in standard Annex I (as defined in Annexes B and C of standard EN 14274:2003), plus details of any additional provisions (see also activities B4 - B6).

ANNEX I: Fuel Quality Monitoring System Regional Sampling of Petrol and Diesel [1]

Country:	Estonia
Fuel type (petrol or diesel):	
Statistical Model (A, B or C) [2]	
Reporting Year:	2004
Period (Summer or Winter):	

Min. number of samples per grade:	

	Macro / Non-Macro Regions (add extra rows as needed)	Fuel Consumption (million tonnes)	Variability factor [3]	Proportion of total samples	Min. number of Samples per grade [4]	Actual number of samples taken					
						Grade:	Grade 1	Grade 2	Grade 3	Grade 4	Grade 5
						Name/ID:					
1				-	-						
2				-	-						
3				-	-						
4				-	-						
5				-	-						
6				-	-						
7				-	-						
8				-	-						
9				-	-						
10				-	-						
	Remainder	--	--	--							
	Total										

(1) As defined in Annexes B and C of EN 14274:2003
(2) Definitions according to those provided in EN 14274:2003.
(3) Only for statistical Model A
(4) For grades comprising <10% total sales, the minimum is calculated as: %sales x min. for parent grade (at least 1 sample)

Additional Notes (e.g. identification of grades comprising <10% total sales)

If Member States are not using the European Standard EN 14274:2003 and are using their own national system, they should provide a description of the operation of their national fuel quality monitoring systems. This should preferably include the following information, in addition to any additional information that the Member State thinks is relevant (e.g. number of national refineries & distribution terminals):

- Organisations responsible for sampling, analysis and reporting;
- Types of locations at which sampling is carried out (e.g. refineries, terminals/depots, or from refuelling stations);
- Frequency of sampling and selection of sampling points;
- Assessment that shows the monitoring system's equivalency to the CEN system.

4.3.3.3 Submission of fuel quality monitoring report

The fuel quality monitoring report should be submitted formally to the following person:

Secretary General
European Commission
Rue de la Loi/Wetstraat 200, B-1049 Brussels

In addition, the report should be submitted in electronic form to the following e-mail address: env-report-98-70@cec.eu.int

4.4 Activity B4. Further activities in the area of compliance

4.4.1 Proposals for an oil data system

A fuel quality monitoring system according to the European standard EN 14274 requires statistical information about the oil market in the country concerned.

The required information is listed in subparagraph 4.3 of the standard. specifies the need for information about total amounts and regional distribution of automotive fuel sales:

- Subparagraph 4.3.1: Total amount of automotive fuel dispensed in the whole country;
- Subparagraph 4.3.2: Total amount of each grade of petrol dispensed in the whole country;
- Subparagraph 4.3.3: Total amount of diesel fuel dispensed.

In addition, according to subparagraph 4.4 the sources of fuel and its supply and distribution patterns are needed.

FQMS shall according to the foreword of the standard be representative of the oil market of the respective Member State. Market shares, regional distribution of fuel sales and supply pattern shall also be taken into consideration.

During the elaboration of the Estonian FQMS several meetings with the representatives of the Statistical Office, the Tax and Customs Board and oil industry were organised. In these meetings, the following regulations providing information about the oil market in Estonia were mentioned:

- § 37 of the Excise Duty Act requires monthly reports on the movement of excise goods and stocks in the warehouses to the TCB;
- The format is established by regulation no 37 of the Minister of Finance (30 March 2004);
- §7 (1) of the Liquid Fuel Act requires that a seller of fuel shall submit a monthly report to the TCB, which sets out information on the fuels handled by the seller and indicates any remaining quantities of fuel. The format is established by regulation no 69 of the Minister of Finance (27 May 2003);
- Transitional provision according to §23 (9) of Liquid Fuel Stocks Act requires that importers shall each month submit the stockholder a statistical summary concerning the stocks at the end of the preceding month until 1 January 2007. The format is established by regulation No 39 of the Minister of Economic Affairs and Communications (28 March 2005);
- Besides, the stockholder needs additional information about the Estonian and international oil market;
- Foreign Trade Statistics from the Statistical Office of Estonia.
  Intrastat: Trading of goods between EU Member States;
  Extrastat: Imports from and Exports to Non-EU-Member countries.

Oil data are published in the annual energy balances of the Estonian Statistical Office but the present data are not fully consistent with international reporting instructions and are not sufficient to cover the requirements of the FQMS e.g. in the oil balance for year 2003 about 211,000 tons of motor gasoline occurs as consumption in the sector of “households” although the consumption of automotive fuels should be reported in the transport sector in category “road” (only 82,000 tons in the Estonian statistics). A breakdown of consumption by grade is not available. “Light fuel oil and diesel oil” are published in a single column. Gross inland consumption of “Light fuel oil and diesel oil” was according to the 2003 energy balance (published in September 2004) 548,000 tons. This figure was increased by about 10 percent to 592,000 tons (source: Internet database of the Statistical Office of Estonia).

The Statistical Office publishes on its homepage import figures by origin, however, these data show only the value of imports for oil, separated by country.

A proposal for an improved oil statistics system, not only meeting the requirements of the FQMS, was elaborated. This chapter gives a detailed overview of the present situation and a proposal for future steps necessary to meet information requirements.

On 12 July 2005 a meeting with Mr. Viktor Grigorjev from the Ministry of the Environment was held. A draft proposal of a consistent oil statistics system meeting not only the data requirement of FQMS but also the information requirements of administration and industry was presented in the meeting. As proposed the statistics could in addition help ensure energy supply security. All parties agreed that it was important to achieve transparency of the national and international oil market. In this context the international initiative to set up a worldwide oil data base JODI (Joint Oil Data Initiative, www.oil-data-transparency.org) was mentioned.

In the meanwhile, the MoE has drafted and amendment to the Ambient Air Protection Act, which enables the MoE to collect oil data.

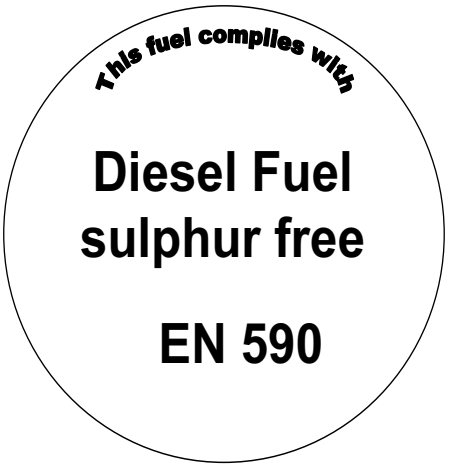
4.4.2 Design for labelling of fuels at service stations

To improve consumer awareness, a design for labelling of fuels at service stations was proposed. For example the oil companies in the UK do market fuels, which comply with the relevant British Standard for a particular fuel. These standards mandate marking requirements for each fuel. It was agreed to standardise pump colours and to improve the clarity of labels for the main retailed fuels. The pump colour of unleaded petrol is green and the colour of diesel is black. A draft standard for biodiesel requires an orange label. For bioethanol blends of >E5 to E85, the suggested mandatory colour would be white.

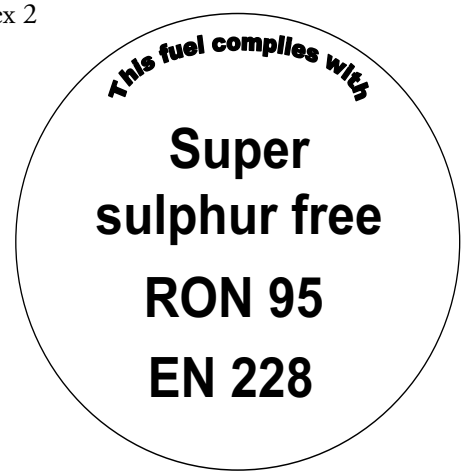
A design for labelling of fuels at filling stations based upon the German Industry Standard (DIN) was developed (diameter 8,5 to 10 cm):

Annex 1

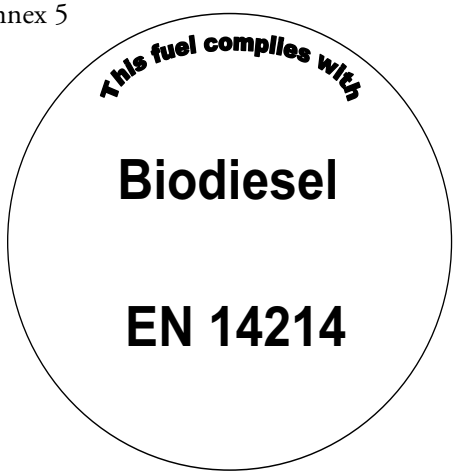
Annex 4



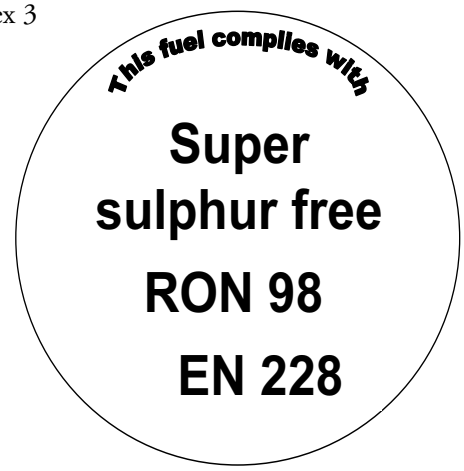
Annex 2



Annex 5



Annex 3



The following pictures of petrol pumps in Germany give an impression about the usage of the labels at filling stations in Germany:

Annex 1

Proposals for an Oil Statistics System in Estonia

1) Need for Oil Statistics

International organisations, including the EU, require statistical information about the oil market. Beside this, the decisions about environmental and energy policy in national administrations are based upon reliable information. In addition, up-to-date statistics are needed in oil companies to decide about the strategy of future investments.

The reporting obligations of the Government of Estonia to the European Commission concerning the monitoring of the oil market are listed below:

a) Fuel Quality Management System
Reporting Obligations to International Organisations

An important target of the EC is to improve and protect the environment. Several reporting obligations affecting the oil industry have been established to monitor the quality of the environment in Member States:

- Commission Decision 2002/159/EC of 18 February 2002 regarding Directive 98/70/EC relating to the quality of petrol and diesel fuels; to fulfil the annual reporting requirements according to the annex of the Decision a Fuel Quality Monitoring System (FQMS) shall be established in accordance with the European norm prEN 14274. This requires a representative selection of samples, taking into consideration geographical supply patterns and market shares;
- Directive 1999/32/EC relating to a reduction in the sulphur content of certain liquid fuels According to the directive Member States shall submit to the Commission each year a short report on the sulphur content of Light Heating Oil and Heavy Fuel Oil used during the preceding calendar year;
- Council Directive 2003/30/EC of 8 May 2003 on promotion of the use of biofuels in transport. According to article 4(1) of the directive Member States shall report to the Commission the total sales of transport fuel and the share of biofuels each year;
- Draft directive on monitoring of sulphur content of marine fuels.

b) International Emergency Management System
Reporting Obligations to International Organisations

An international system for the management of situations of oil supply disruptions was established. The system comprises mandatory stocks, coordinated demand restraint measures and a complex international harmonized data system.

Member States shall contribute to the system and profit from the measures:

- Annual calculation of mandatory stocks according to Council Directive 68/414/EEC of 20 December 1968, art. 1. 90 days of average internal consumption in the previous year;
- Statistical summary of mandatory stocks. Monthly report according to art. 4 of Council Directive 68/414/EEC stock levels by product category.

c) Monitoring the international energy market
Reporting obligations to international organisations

The international organisations (i.e. United Nations, International Energy Agency and EU) have established a set of harmonized questionnaires to monitor the development of the international energy markets.

The following questionnaires affect the oil industry:

- Monthly Oil and Gas Statistics Questionnaire (MOS). Data on supply, consumption, stock levels, imports by country of origin, exports by country of destination;
- Joint Oil Data Initiative (JODI). Simple questionnaire in terms of layout and definitions in order to facilitate the completion of it by as many countries as possible. In the meanwhile JODI-initiative covers about 95% of the world oil market (for each supply and consumption);
- Annual Oil Statistics Questionnaire (AOS). Aggregated MOS-data and additional figures on consumption by sector; base for calculation of energy balances and CO_2-emissions.

Annex 1.1 gives an overview about the typical data flow, summarizing input and information requirements.

2) Recommendations for a Legal Framework

It is efficient to fulfil all the different kinds of information requirements from a single and uniform database.

The existing Estonian Oil Statistics is not sufficient to meet all the requirements and shows shortcomings in the following areas:

- Statistical differences between observed and calculated consumption occur;
- A breakdown of deliveries by fuel quality is not available;
- Information about the use of biofuels is missing.

A comprehensive oil statistics based upon a legal framework could fill the gaps. An Estonian Oil Data Act should answer the following questions:

a) Reporting responsibility

The companies contributing significantly to oil supply in Estonia are obliged to report. This means that all companies with a certain amount of imports or exports of oil products and all producers of oil products should send a report about their activities in the oil market. Pure distributors and consumers should in general not report.

Associated companies should send only one aggregated report.

Retailers (incl. for example filling stations) should send their own reports. Deliveries of wholesalers (Reporting Companies) to retailers are counted as “Inland Consumption”.

b) Reporting date

The report is collected each month.

The deadline for the transmission of company reports to the Estonian authority in charge of collection the data is the 20th day of the following month.

c) Enforcement

The authority should have the possibility to take punitive measures against the companies, which do not submit reports, submit faulty reports or submit their report with delay.

d) Confidentiality of data

Only aggregated data are published and sent to international organisations. Single data are protected and not available to the public.

3) Recommendations for a Company Reporting Form

Based upon the needs of data users a standardized questionnaire for the collection of data from oil companies has to be developed taking into consideration the peculiarities of the situation in Estonia. The burden on data providers has to be minimized.

A draft of an integrated and balanced questionnaire covering all physical activities on the oil market is enclosed (annex 1.2). The form was developed taking into consideration the following conditions:

- The questionnaire is balancing. Total receipts in one month shall equal to the total deliveries of the same month;
- The questionnaire covers all physical activities on the oil market;
- Definitions are consistent with the instructions of international organisations to avoid "trade discrepancies" and enable international comparability of data. The internationally agreed reporting unit is metric tons;
- Different types of questionnaires have to be designed for different groups of companies;
- Additional information from custom authorities could be used for the verification of data and the recognition of newcomers;
- The structure of the questionnaire should be able to support accuracy and reliability of data. Additional organizational measures like an automatic checking system and detailed reporting instructions (annex 1.3) are also necessary to ensure the quality of statistics;
- An option for electronic transmission of reports must be developed.

4) Existing Reporting Obligation for Oil Data in Estonia

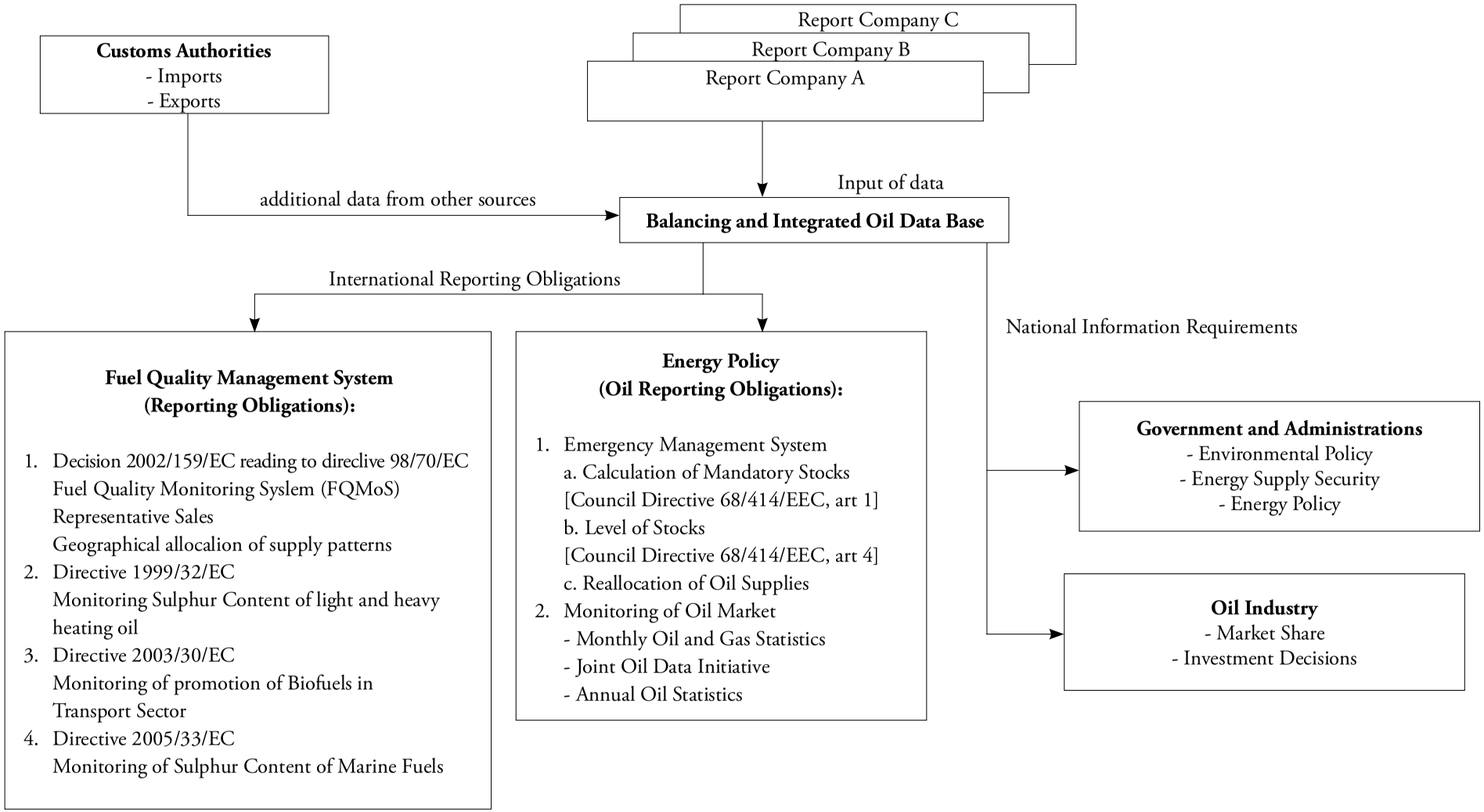
In several meetings with representatives from Estonian authorities and from oil companies the following statistics providing information about the oil market in Estonia were mentioned (see also 4.4.1).

5) Data Requirements according to the FQMS

According to the preface of standard EN 14274 a FQMS has to take into consideration statistical information. The sampling must be designed to be representative. To ensure a representative fuel quality monitoring, sufficient information about supply pattern (origin of fuels) and market share of each company are necessary. Total sales separated by fuel quality are necessary to choose the appropriate model according to Annex C of the European standard. The annual final report to the European Commission requires in his general part the same information. All required information should be available in the statistics mentioned before).

In order to make all necessary information available for the authority in charge of the FQMS an additional paragraph in an appropriate law is needed. The Liquid Fuel Stocks Act (see also annex 1.6) contains comparable paragraphs, which make available data from TCB to the Estonian stockholding agency. In the context of the FQMS foreign trade statistics and the data according to the Excise Duty Act and according to the Liquid Fuel Act from the TCB are of special interest.

Annex 1.1 Data Input and Information Requirements in Oil Statistics



Annex 1.2 Company Reporting Format

Company:

Month: MM/YYY

		LPG	Naphta	Motor Gasoline	Kerosine	Transport Diesel	Heating Oil	Heavy Fuel Oil	Other Oil Products (1)	Total Oil Products
		[1]	[2]	[3]	[6]	[4]	[5]	[7]	[8]	=[1]+...+[8]
Opening stocks (2)	+									
Receipts										
Import	+									
Own Production (3)	+									
from other Reporting Companies	+									
from Non-Reporting Companies	+									
Sales										
Export	-									
Intern. Marine Bunkers	-									
to other Reporting Companies										
to Non-Reporting Companies	-									
Statistical Differences (Losses,...)	+									
Closing stocks	=									
Stock Change (Opening-Closing)	=									

Memo items: Breakdown of Sales to Non-Reporting Companies by Quality

Motor Gasoline	Transport Diesel	Heavy Fuel
Unleaded, 91	< 50 ppm sulphur	< 1% sulphur
Unleaded, 95	< 10 ppm sulphur	≥ 1% sulphur
Unleaded, 98	From Biomass	
From Biomass		

(1) Lubricants, Petroleum Coke, Bitumen, ...
(2) must equal closing stocks of previous month
(3) Transformation of Oil Shale, Supply by Oil Products

Annex 1.3 Draft reporting instructions

1. General Remarks

Associated companies send only one aggregated report.

Deadline

Reports shall be sent to the Estonian authority by the 20th day of the following month.

Unit

Report all figures in whole numbers of metric tons.

2. Definition of Oil Products

Classification of oil products should be consistent with the Combined Nomenclature.

Oil Shale

Production and direct use (i.e. without transformation) of Oil Shale should be reported in coal statistics (Lignite). According to the classification of international organisations products from the liquefaction of Oil Shale should be reported in the oil statistics questionnaire.

Liquefied Petroleum Gas (LPG)

LPG mostly consists of Propane or Butane or a mixture of the two.
LPG is normally liquefied under pressure for transportation or storage.

Naphtha

Naphtha is a feedstock destined for the petrochemical industry (e.g. ethylene manufacture or aromatics production)

Motor Gasoline

Motor Gasoline consists of a mixture of light hydrocarbons distilling between 35 and 215 degrees Celsius. It is mainly used as a fuel for land based ignition engines. Motor Gasoline may include additives, oxygenates and octane enhancers including lead compounds.
[2710 11 41, 2710 11 45, 2710 11 49, 2710 11 51, 2710 11 59]

Kerosene Type Jet Fuel

Kerosene is a distillate used for aviation turbine power units.
[2710 19 21]

Transport Diesel

Medium distillate distilling between 180 and 380 degrees Celsius; on road diesel oil used for diesel compression ignition (cars, trucks, etc.), usually of low sulphur content.
[2710 19 29, 2710 19 41]

(Light) Heating Oil (and other Gas Oil)

Medium distillate distilling between 180 and 380 degrees Celsius; Light heating oil for industrial and commercial uses; marine diesel and diesel used in rail traffic; other gas oil including heavy gas oil used as petrochemical feedstock.
[2710 19 45]

(Heavy) Fuel Oil

This covers residual (heavy) fuel oils. Cinematic viscosity is always above 10 cSt at 80 degrees Celsius. The flash point is always above 50 degrees Celsius and density is always more than 0.90 kg/l.
In Estonia, only heavy fuel oils with a sulphur content not exceeding 1 % by weight are allowed.
[2710 19 61]

Other Oil Products

All other oil products including ethane, petroleum coke, bitumen, lubricants, white spirit, paraffin waxes and others.

3. Descriptions of Flows

Opening Stocks

Stocks held in the national territory at the beginning of the month. Opening stocks must equal to the closing stocks of previous months.

Imports and Exports

Data should reflect the amounts having crossed the national territorial boundaries, whether customs clearance has taken place or not. Transit trade, international marine and aviation bunkers are excluded are.

Own production

Supply of shale oil (secondary product) from the transformation of oil shale in liquefaction plants, supply by oil product.

Receipts from Reporting Companies

Reporting companies are defined according to the annual list (see also annex 1.1.1) of the Estonian authority. To avoid double counting of deliveries between reporting companies, trade between resellers is eliminated in aggregates.

Receipts from Non-Reporting Companies

All Estonian suppliers not listed as Reporting Companies.

Sales to Reporting Companies

Reporting companies are defined according to the annual list of the Estonian authority. To avoid double counting of deliveries between Reporting Companies trade between resellers is eliminated in aggregates.

Sales to Non-Reporting Companies

All sales to recipients not listed as Reporting Companies and final consumers.

Statistical Differences

Differences between receipts and deliveries of one month, normally only small amounts caused by rounding errors or unit conversion.

Closing Stocks

Stocks held in the national territory at the end of the month. Closing stocks must equal to the opening stocks of the following months.

Memo items: Breakdown of Sales to Non-Reporting companies

To monitor fuel quality and to fulfil reporting obligations to international organisations a breakdown of deliveries to inland consumption by quality is needed for selected oil products.

Deliveries of Motor Gasoline must be separated by RON (91, 95 and 98). Deliveries of Diesel Oil must be separated by Sulphur Content (<10 ppm and 10 to 50 ppm). A separation of deliveries of Heave Fuel Oil between low (<1%) and high (≥ 1%) sulphur content is also needed.

Part of deliveries for inland consumption of Motor Gasoline and Diesel Oil originating from biomass must be reported separately.

Annex 1.1.1 List of Reporting Companies to the Estonian Oil statistics

1. Lukoil Tallinn;
2. Neste Oil Tallinn;
3. Statoil Tallinn.

Annex 1.4 Oil Data according to the Liquid Fuel Act

§ 7. Report on fuel handling

According to subsection 1 a seller of fuel shall by the 15th day of each month submit a report to the TCB, which sets out information on the fuels handled by the seller during the preceding calendar month and indicate any remaining quantities of fuel.

A keeper of an excise warehouse shall submit a report on fuel handling pursuant to the procedure arising from the Excise Duty Act.

According to subsection 2 the form of the report on fuel handling and the procedure for the completion and submission shall be established by a regulation of the Minister of Finance. The format of the report is established by Regulation No 69 of the Minister of Finance (27 May 2003).

Annex 1.5 Oil Data according to the Excise Duty Act

§ 1 Nomenclature

According to subsection 2 the nomenclature of excise goods is based on the Estonian Nomenclature of Commodities.

§ 19. Definitions of Fuel

- subsection 2: 'unleaded petrol' - fuel with a lead content not exceeding 0.013 g/l, falls under commodity codes 2710 11 41 34, 2710 11 45 35 or 2710 11 49 00;
- subsection 3: 'leaded petrol' - fuel with a lead content exceeding 0.013 g/l, falls under commodity codes 2710 11 51 34, 2710 11 51 35 or 2710 11 59 00;
- subsection 6: 'diesel fuel' falls under commodity codes 2710 19 29 36 or 2710 19 41.

§ 37. Reporting

According to subsection 1 a keeper of an excise warehouse shall submit a report on the movement of excise goods and stock in the warehouse to the Customs Inspectorate by the 15th day of the following month. According to subsection 2 the form of reports on the movement of excise goods and stock in a warehouse and the procedure for completing the form shall be established by a regulation of the Minister of Finance. The reporting form is established by Regulation No 37 of the Minister of Finance (30 March 2004).

Annex 1.6 Statistical information according to the Estonian Liquid Fuel Stocks Act

The Estonian Liquid Fuel Stocks Act provides the legal base for the establishment and holding of mandatory oil stocks to fulfil Council Directive 68/414/EEC of 20 December 1968. Statistical information is collected on the basis of the following provisions of this act.

§3

(1) Stocks in each of the categories specified in § 2 of this Act shall be maintained at all times at a level corresponding to at least the average volume consumed during 90 days based on the total volume of internal consumption in the corresponding category during the preceding calendar year.

Internal consumption is calculated excluding international marine bunkers.

§7 (7)

In the event of difficulties in supply, the stockholder shall make a sales offer to the persons in whose name fuel has been placed on the market within the meaning of the Alcohol, Tobacco and Fuel Excise Duty Act (RT I 2003, 2, 17; 48, 345; 88, 591; 90, 602; 2004, 84, 569) in Estonia during the four quarters preceding the offer. The volumes of fuel offered for sale shall be equal to the market share of the above persons and shall be calculated based on the quantities of fuel placed on the market in the name of such persons during the four quarters mentioned above.

§ 8 (1), (2)

(1) Establishment of stocks shall be covered from the state budget by increasing the share capital of the stockholder and using funds received from the sale of the stocks.

(2) The costs for holding the stocks shall be covered out of the stockpiling fee to be paid by importers of stocks (hereinafter importers).

§9 (2), (3)

(2) The obligation to pay stockpiling fee is created for an importer at the moment that a fuel included in the list specified in § 2 of this Act is placed on the market in the name of the importer.

(3) Payment of stockpiling fee shall be made to the bank account of the stock-holder without a prior request for payment no later than by the fifteenth day of each month in an amount corresponding to the volume placed on the market in the name of an importer during the previous calendar month, and the current rate for stockpiling fee. The explanation contained in the payment order shall set out the size of the stockpiling fee per each category of stocks, and the total volume of fuel placed on the market in each category.

§ 12 (1), (2)

(1) In order to determine the market share of the importers specified in subsection 7 (7) of this Act, to ensure preparedness for commencement of use of stocks and to verify payment of stockpiling fee, the Tax and Customs Board shall submit to the stockholder a monthly report on behalf of the importers, which sets out data on the volumes of fuel placed on the market during the previous calendar month.

(2) The data specified in subsection (1) of this section shall be submitted by CN code specified in subsection 2 (2) of this Act separately for each importer. Data concerning each calendar month shall be submitted not later than by the fifteenth day of the calendar month following the month of reporting.

§ 18 (1), (2)

(1) The stockholder is required to analyse the situation in supplying fuel to the state together with the sellers of fuel and, in the event of difficulties in supply, immediately inform the Minister of Economic Affairs and Communications thereof.

(2) Sellers of fuel are required to provide information needed for the analysis specified in subsection (1) of this section at the demand of the stockholder.

§ 19

The stockholder has the right to obtain information necessary for performance of the duties arising from this Act from the Tax and Customs Board.

§ 23 (9)

(9) Until the date specified in subsection (8) of this section[1] , the importers shall submit the stockholder a statistical summary concerning the existing stocks as at the end of the preceding month by the fifth day of each month. The format of statistical summaries shall be established by the Minister of Economic Affairs and Communications.

The format was established by Regulation No 39 of the Minister of Economic Affairs and Communications (28 March 2005).

[1] until 1 January 2007

4.5 Activity B5. Co-operation with the oil industry in Estonia

Fuel Quality Management System is part of the Auto Oil programme of the European Commission, which has the objective to reduce pollution from car emissions by introducing new environmental specifications applicable to fuels. The targets were a ban on the marketing of leaded motor gasoline and an obligation to make available sulphur-free fuels.

On the one hand, it is the obligation of the Estonian Government to implement and monitor the quality standards in Estonia. The Estonian Government is obliged to inform the European Commission of the country's compliance with EU standards related to fuel quality and about the total quantities of fuels sold each year.

On the other hand, it is the obligation of all companies, which are active in the Estonian oil market to supply consumers with fuels complying with the standards according to the Community legislation and to provide the Estonian Government with the relevant information to fulfil international reporting obligations.

As already mentioned in section 3.2.1.3.2, the oil sold in the Estonian market has to fulfil minimum standards. According to section 58 of the Ambient Air Protection Act the Ministry of the Environment shall establish a regulation with the purpose to limit the emission levels of pollutants. Additional requirements shall according to subsection (1) 8 of the Liquid Fuel Act be established by a regulation of the Ministry of Economic Affairs and Communications. These requirements are based on the purpose of the use of fuels as well as environmental requirements. According to subsection (2) 8 of the Liquid Fuel Act it is not allowed to handle fuels, which do not meet the established quality standards. The requirements for automotive fuels were established by the regulation of the Ministry of Economic Affairs and Communications from 11 June 2003. The regulation is based upon European standards EN 228 and EN 590.

Industry cooperation is essential for any FQMS to function properly. The Estonian Oil Companies are quite aware of the obligation to supply the consumers with oil in conformity with the European standards and national regulations.

Separate meetings were held with the representatives of the Estonian Oil Association and Lukoil. The reporting obligations arising from the FQMS were presented. The oil industry was informed in detail about the need for information about supply pattern and about the market share of the involved companies to ensure representative design of the sampling procedure for the FQMS and to fulfil the annual reporting obligations to the European Commission.

The oil industry representatives confirmed that the oil companies are aware of the obligation to meet the quality standards. In addition, it was stated that several companies sell sulphur free fuels. Consequently, at least partly the fuel sold in Estonia is even better than required by the standards.

No further activities to raise awareness to improve fuel quality or to elaborate a schedule for upgrading product quality as mentioned in the Twinning Covenant are necessary.

4.6 Activity B6. Transparency of fuel product quality

4.6.1 Transparency of fuel quality on the import level

Transparency of fuel quality at the import level is a precondition to ensure the quality of products delivered to the national market.

To get an overview on the availability of information about the origin of fuels consumed in Estonia a meeting was held with Mr. Lauri Aasmann from the Tax and Custom Board.

The Statistical Office of Estonia publishes in its homepage data about (www.stat.ee) imports and exports, which enable to analyse the imports by country of origin on a value basis for all oil products in total (chapter 27. of the Combined Nomenclature). According to the foreign trade statistics the breakdown of oil imports by country of origin in year 2004 was as follows:

Oil imports

Country	Mio EEK	Percentage
Russian Federation	2.674	38.09 %
Lithuania	2.340	33.34 %
Belarus	825	11.75 %
Finland	447	6.36 %
Latvia	380	5.41 %
Sweden	152	2.17 %
Others	202	2.87 %
Total	**7.02**	

Provisional data give an indication that the sources of oil supply were almost unchanged in 2005.

This information is definitely not sufficient to meet the requirements of the FQMS and to achieve transparency. The figures include the imports of other oil products than petrol and diesel (e. g. kerosene and heavy fuel). What is needed is the volume (in tons if possible) of imports by country of origin separate for each grade of petrol and diesel.

4.6.2 Transparency of fuel quality on the delivery level

4.6.2.1 Statistical review of the oil market

A monthly statistical publication based upon the data collected according the statistical system as proposed in 4.4.1 could improve the transparency of the Estonian oil market.

A first draft of the publication is enclosed in annex 1 in the end of this chapter. The publication should contain at least an oil balance sheet, consumption data by grade, comparison with previous years, consumption, matrix of imports and a report on oil stocks.

4.6.2.2 Implementation of an improved labelling system

A company selling fuels to consumers has to guarantee that only fuels meeting the minimum requirements of the European Standard are sold. The standard mandates to mark the fuel (part 4 of standard EN 228). The design of the labels shall be in accordance with the requirements of national standards or regulations.

Article 3.5 of Directive 2003/30/EC on the promotion of biofuels includes a requirement for Member States to ensure specific labelling at sales points. Biofuel blends in excess of 5 percent should be clearly labelled. This is to protect consumers from unknowingly filling their vehicles with fuel that may be unsuitable for their vehicle and that could invalidate their warranty.

Without an appropriate labelling, consumers could fill their vehicles with wrong fuel. Using regular grade where premium is required can affect vehicle performance, whereas putting petrol into a tank instead of diesel, can be quite hazardous and cause potential engine damage.

Oil companies could market petrol grades other than regular and premium. Improved grades of petrol could be advertised as having higher octane, lower benzene or lower sulphur. It is important that the consumer is getting the qualities being advertised. To raise consumer awareness it is proposed to introduce a labelling system.

For example the oil companies in the UK market such fuels, which comply with the relevant British Standard for a particular fuel. These standards mandate marking requirements for each fuel. It was agreed to standardise pump colours and to improve the clarity of labels for the main retailed fuels. The pump colour of unleaded petrol is e.g. green and the colour of diesel is black. A draft standard for biodiesel requires an orange label. For bioethanol blends of >E5 to E85, the suggested mandatory colour is white.

A design for labelling of fuels at filling stations, based upon the German Industry Standard (DIN), was developed. In a meeting held on 12 July, the labels were presented to Mr. Viktor Grigorjev from the Ministry of the Environment. A proposal for a legal basis for the implementation of a labelling system was drafted:

§1 Contents and design of labelling for automotive fuels at filling stations

A company selling fuels to consumers is obliged to make the guaranteed quality of the fuel visible at the pump or somewhere else at the filling station in the following manner:

1. Sulphur free petrol meeting at least the requirements of EN 228 shall be labelled with:

- ’91 EURO’ and a label according to annex 1 (from 4.4.2);
- ’95 EURO’ and a label according to annex 2 (from 4.4.2);
- or ’98 EURO’ and a label according to annex 3 (from 4.4.2).

2. Sulphur free diesel oil meeting at least the requirements of EN 590 shall be labelled with ’D EURO’ and a label according to annex 4 (from 4.4.2).
3. Methyl-ester for use in diesel engines meeting at least the requirements of EN 14214 shall be labelled with ’Biodiesel’ and a label according to annex 5 (from 4.4.2).

§ 2 Supervision of Labelling

The responsible authority shall inspect whether the seller of automotive fuels has made the guaranteed quality visible at the pump or somewhere else at the filling station in conformity with this regulation and whether the quality of a fuel does meet the requirements of EN 228 or EN 590.

The filling stations, which shall be inspected are chosen according to a random procedure. Similar paragraphs could be added to an existing Estonian regulation.

The Ministry of the Environment (MoE) has to decide about the implementation of this labelling system in Estonia. The proposal was forwarded to the MoE by e-mail. The draft was presented to the representatives of the oil industry by the ministry.

The oil industry objected to the proposal, referring to the existing marking according to the Estonian fuel standards. Nevertheless, a letter to the MoE was drafted to ask for a final decision about the implementation of the labelling system in Estonia. The letter is enclosed as annex 2 in the end of this chapter.

Annex 1 Oil Statistics of Estonia

Table 1: Oil Balance

Reporting Month: April 2006, Tons

		LPG	Naphtha	Motor Gasoline	Kerosene	Transport Diesel	Heating Oil	Heavy Fuel Oil	Other Oil Products	Total Oil Products
		[1]	[2]	[3]	[6]	[4]	[5]	[7]	[8]	=[1]+...+[8]
Import	+	12 500	65 000	186 430	40 700	34 700	112 000	29 760	12 300	493 390
Export	-	11 700	78 000	203 430	38 900	51 200	100 000	28 000	12 350	523 580
Marine Bunkering	-									0
Production	+									0
Products Transfered	+									0
Stock Change (Clos. - Open.)	-	-800	13 000	17 000	-1 800	16 500	-12 000	-1 760	50	30 190
Gross Inland Consumption (Calc.)	=	**1 600**	**-26 000**	**-34 000**	**3 600**	**-33 000**	**24 000**	**3 520**	**-100**	**-60 380**
Statistical difference	+	-1 600	26 000	34 000	-3 600	33 000	-24 000	-3 520	100	60 380
Gross Inland Consumption (Obs.)	=	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Table 2: Deliveries to Inland Consumption

Reporting Month: April 2006, Tons

Fuel	April 2005	April 2006	Change (%)	January to April 2005	January to April 2006	Change (%)
	[1]	[2]	=[2] / [1]	[4]	[5]	=[5] / [4]
LPG	12 500	15 000	20,00%	40 700	70 000	71,99%
Naphtha	32 317	51 000	57,81%	142 456	200 540	40,77%
Motor Gasoline	62 317	65 000	4,31%	240 700	234 700	-2,49%
Kerosene	12 317	15 000	21,78%	24 070	27 900	15,91%
Transport Diesel	72 500	65 000	-10,34%	240 700	34 700	-85,58%
Heating Oil	62 317	65 000	4,31%	240 700	234 700	-2,49%
Heavy Fuel Oil	12 500	25 000	100,00%	40 700	56 457	38,71%
Other Oil Products	12 500	11 745	-6,04%	40 700	41 700	2,46%
Total Oil Products	**279 268**	**312 745**	11,99%	**1 010 726**	**900 697**	-10,89%

Table 3: Breakdown of Consumption by Grade

Reporting Month: April 2006

Motor Gasoline

Fuel	April 2006	Jan. - Apr. 2006
Regular 91, unleadad		
Super 95, unleaded		
Super 98, unleaded		
Total		

of which from Biomass		

Transport Diesel

Fuel	April 2006	Jan. - Apr. 2006
10 to 50 ppm sulphur < 10 ppm sulphur		
Total		

of which from Biomass		

Heavy Fuel

Fuel	April 2006	Jan. - Apr. 2006
< 1% sulphur >= 1% sulphur		
Total		

Table 4: Imports by country of origin

Reporting Month: April 2006, Tons

Country of origin	LPG	Naphtha	Motor Gasoline	Kerosene	Transport Diesel	Heating Oil	Heavy Fuel Oil	Other Oil Products (1)	Total Oil Products
	[1]	[2]	[3]	[6]	[4]	[5]	[7]	[8]	=[1]+...+[8]
Azerbaijan	0	0	0	0	2	0	0	0	2
Austria	0	0	0	0	2	0	0	0	2
Belarus	0	0	0	0	447	0	0	0	447
Belgium	0	0	0	0	8	0	0	0	8
China	0	0	0	0	8	0	0	0	8
Denmark	0	0	0	0	60	0	0	0	60
Finland	0	0	0	0	80	0	0	0	80
Germany	0	0	0	0	18	0	0	0	18
Kazakstan	0	0	0	0	64	0	0	0	64
Latvia	0	0	0	0	116	0	0	0	116
Lithuania	0	0	0	0	1419	0	0	0	1419
Netherlands	0	0	0	0	10	0	0	0	10
Norway	0	0	0	0	33	0	0	0	33
Poland	0	0	0	0	2	0	0	0	2
Russian Federation	0	0	0	0	2025	0	0	0	2025
Sweden	0	0	0	0	33	0	0	0	33
Ukraine	0	0	0	0	30	0	0	0	30
United Kingdom	0	0	0	0	6	0	0	0	6
Others	0	0	0	0	2	0	0	0	2
Total Imports	**0**	**0**	**0**	**0**	**4365**	**0**	**0**	**0**	**4365**
Jan. - Apr. 2006	**1**	**1**	**1**	**1**	**16700**	**1**	**1**	**1**	**8280**
Jan. - Apr. 2005	**1**	**1**	**1**	**1**	**15800**	**1**	**1**	**1**	**24972**
Change 2006/2005	0,00%	0,00%	0,00%	0,00%	5,70%	0,00%	0,00%	0,00%	-66,84%

Table 5: Exports by country of destination

Reporting Month: April 2006, Tons

Country of destination	LPG	Naphtha	Motor Gasoline	Kerosene	Transport Diesel	Heating Oil	Heavy Fuel Oil	Other Oil Products (1)	Total Oil Products
	[1]	[2]	[3]	[6]	[4]	[5]	[7]	[8]	=[1]+...+[8]
Azerbaijan	0	0	0	0	0	0	0	0	0
Austria	0	0	0	0	2	0	0	0	2
Belarus	0	0	0	0	447	0	0	0	447
Belgium	0	0	0	0	8	0	0	0	8
China	0	0	0	0	8	0	0	0	8
Denmark	0	0	0	0	60	0	0	0	60
Finland	0	0	0	0	80	0	0	0	80
Germany	0	50	0	0	133	0	0	0	183
Kazakstan	0	0	0	0	64	0	0	0	64
Latvia	0	0	0	0	116	0	0	0	116
Lithuania	0	0	0	0	1419	0	0	0	1419
Netherlands	0	0	0	0	10	0	0	0	10
Norway	0	0	0	0	33	0	0	0	33
Poland	0	0	0	0	2	0	0	0	2
Russian Federation	0	0	0	0	2025	0	0	0	2025
Sweden	0	0	0	0	33	0	0	0	33
Ukraine	0	0	0	0	30	0	0	0	30
United Kingdom	0	0	0	0	3	0	0	0	3
Others	0	0	0	0	2	0	0	0	2
Total Exports	**0**	**50**	**0**	**0**	**4475**	**0**	**0**	**0**	**4475**
Jan. - Apr. 2006	**1**	**100**	**1**	**1**	**16700**	**1**	**1**	**1**	**8502**
Jan. - Apr. 2005	**1**	**1**	**1**	**1**	**15800**	**1**	**1**	**1**	**25194**
Change 2006/2005	0,00%	9900,00%	0,00%	0,00%	5,70%	0,00%	0,00%	0,00%	-66,25%

Annex 2

Letter to the
Ministry of the Environment

Twinning Project Development of the Estonian Fuel Quality Management System
Reference No. EE03-IB-EN-03

Implementation of a Fuel Quality Labelling System

A company selling fuels to consumers has to guarantee that the fuels sold are meeting the minimum requirements set out in the European standard are sold. Of course, the seller has to make visible the guaranteed quality of the fuel to the consumer. The standard mandates to mark the fuel (e. g. paragraph 4 of standard EN 228). The design of the labels shall be in accordance with the requirements of national standards or regulations.

Article 3.5 of Directive 2003/30/EC on the promotion of biofuels includes a requirement for Member States to ensure specific labelling at sales points. Biofuel blends in excess of 5 percent shall be clearly labelled. This is to protect consumers from unknowingly filling their vehicles with fuel that may be unsuitable for their vehicle and that could invalidate their warranty.

Without an appropriate labelling, consumers could experience problems with filling the vehicle with the wrong fuel. Using regular grade where premium is required can affect vehicle performance, whereas putting petrol into a tank instead of diesel, as well as causing potential engine damage, can be quite hazardous.

Oil companies could take the chance to market the petrol grades other than regular and premium. Improved grades of petrol could be advertised as having higher octane, lower benzene or lower sulphur. It is important the consumer is getting the qualities being advertised.

To assist consumer awareness and to help not to get the wrong fuel, it is proposed to introduce a labelling system.

For example the oil companies in the UK do market fuels, which comply with the relevant British standard for a particular fuel. These standards mandate marking requirements for each fuel. It was agreed to standardise pump colours and to improve the clarity of labels for the main retailed fuels. The pump colour of unleaded petrol is green and the colour of diesel is black. A draft standard for biodiesel requires an orange label and for boethanol blends of >E5 to E85 the suggested mandatory colour is white.

Twinning Component B, activity B4 of the Twinning Covenant requires the development of a design for labelling of fuels at filling stations based upon the German Industry Standard (DIN).

In a meeting on 12 July 2005, a draft of a set of labels (see also 4.4.2) was presented to Mr. Viktor Grigorjev from the Ministry of Environment. Photos gives an impression of the usage of the corresponding labels at filling stations in Germany.

Twinning Component B, activity B6 of the Twinning Covenant requires that measures ensuring the transparency of fuel quality on the delivery level shall be implemented. 4.6.2.2 gives a proposal of a text for the implementation of such a labelling system. A similar paragraphs could be added to an existing Estonian legislation.

The Ministry of Environment has to decide about the implementation of a labelling system in Estonia.

4.7 Activity B7. Description of the FQMS and final report

4.7.1 Summary and general introduction

The current Twinning project is consists of five components (A - E), each with a couple of activities:

A. Analysis of tasks and responsibilities, identification of gaps in institutional set-up;
B. Design of a national fuel quality monitoring programme (environment);
C. Training needs assessment and general project training plan;
D. Electronic data provision and reporting schemes;
E. EERC quality manual for accreditation and certification.

In brief, the activities of components A and B have been:

- A1 to get an overview of the status quo of the distribution of the tasks and responsibility for fuel quality management in Estonia and to identify gaps in the current institutional set-up;
- A2 to provide recommendations, which base on the results of A1 for optimum institutional set up and arrangements to run the FQMS by application of lean management technology;
- A3 to analyse the existing staff capacities and to make a gap analysis of required additional capacities in order to operate the FQMS;
- A4 to elaborate an institutional assessment summary report, which includes all relevant overviews, proposals, schemes and flow diagrams for the institutional set-up of the FQMS;
- B1 to design the national fuel quality monitoring programme;
- B2 to develop the full FQMS and elaborate the description of sampling and analysing scheme;
- B3 to determine necessary data and develop reporting schemes for the European Commission;
- B4 to elaborate a systematic design of energy reporting system, especially oil data system and the design of the labelling of fuels at service stations;
- B5 to cooperate with the oil industry in Estonia to raise the awareness on the need to upgrade fuel products and
- B6 to ensure the transparency of fuel product quality on import and delivery level.

The aim of these activities has been to elaborate the Estonian Fuel Quality Management System (FQMS). Therefore, several meetings and workshops with the representatives of stakeholders were organised to obtain all needed information to run the FQMS. The activities have been finished with reports.

This activity B7, description of FQMS and final report, involves the main results of activities A1 to B6 with the following emphases:

- Initial position (4.7.2);
- Estonian Fuel Monitoring System (4.7.3);
- Inter institutional coordination (4.7.4);
- Statistical display (4.7.5);
- Labelling (4.7.6);
- Fuel Quality Management System (4.7.7).

Conclusions are provided in 4.7.8.

4.7.2 Initial Position

Activity A1 gives an overview of the status quo of the distribution of tasks and responsibilities in fuel

management in Estonia and identifies gaps in institutional set-up. The final report covers in 4.7.2.1 the tasks and responsibilities of the involved authorities, which are very closely connected with the need to build up the FQMS. More details and information about the staff of each stakeholder, interfaces and overlapping tasks are provided in chapter 3. In 4.7.2.2 the cooperation with the oil industry is addressed, which is essential for any FQMS to function properly.

4.7.2.1 Involved authorities

The main tasks and responsibilities of the competent authorities in regard to the FQMS are as follows:

- The Ministry of Finance (MoF) has general budgetary tasks with regard to the FQMS;
- The Tax and Customs Board (TCB) shall fulfil the tasks laid down in the Liquid Fuel Act and the Excise Duty Act, which concern statistical information. The TCB shall also check the compliance of the quality of fuels according to ISO standards. For this purpose ca 1,000 samples are taken per year, which are analysed by the Estonian Environmental Research Centre;
- The Ministry of the Environment (MoE) shall implement EC-legislation: Directive 98/70/EC, which regards to FQMS. According to the Ambient Air Protection Act the MoE shall establish a regulation with the purpose of limiting the emission levels of pollutants. The task of the MoE is also to supervise the Environmental Inspectorate and the Estonian Environmental Research Centre;
- Environmental Inspectorate (EI) shall monitor the quality of heavy fuel oil;
- The Estonian Environmental Research Centre (EERC) analyses the FQMS samples;
- The Ministry of Economic Affairs and Communications (MoEAC) shall transpose the EC-legislation of fuel quality and establish requirements / regulations according to the Liquid Fuel Act. These requirements are based on the purpose of the use of the fuels and environmental requirements. The regulation is based upon the standards EN 228 and EN 590. The monitoring activities are carried out by the Consumer Protection Board and the Energy Market Inspectorate;
- The Consumer Protection Board (CPB) shall protect private consumers and represent their interest. It shall also inspect the quality of fuels;
- The Energy Market Inspectorate (EMI) shall supervise fuel and energy market at the national level. It shall secure that all fuel and energy suppliers will have equal conditions for participation on the energy market.

In addition to the authorities named in the Project Covenant, the Environmental Information Centre and the Statistical Office of Estonia need to be involved.

- The Environmental Information Centre (EIC) has the role of a national coordinator for environmental information activities;
- The Statistical Office of Estonia (SOE) is responsible for creating the energy balance according to the Eurostat-Scheme on an annual basis.

So far, no mentioned stakeholder carries out the tasks with regard to the FQMS. Different fuel samples are taken on different occasions as required by current legislation and the statues of these authorities/companies. The total number of samples amounts to ca 1,000 per year. No remarkable synergy effects can be observed.

The competent authorities and the different working stages in fuel quality control in Estonia are presented in the process flowchart presented in chapter 3.1 annex 1.

4.7.2.2 Oil Industry

Registration of statistical data with regard to the FQMS is needed. Therefore, cooperation with the

industry is essential for any FQMS to function properly. The Estonian oil companies are quite aware of the obligation to supply the consumers with oil in conformity with the European standards and national regulations. Several companies already sell sulphur free fuels. No further activities to raise awareness to improve fuel quality or to elaborate a schedule for upgrading product quality as mentioned in the Twinning Covenant are necessary.

In order to fulfil international reporting obligations the oil industry has to provide the Estonian Government with relevant information. More information about oil data and statistics is provided in 4.7.5.

Apart from the national FQMS activities it is also the matter of the oil industry to control fuel quality for the purpose of selling or buying fuel (samples have to be taken at storehouses and can be disregarded for the FQMS, which demands samples from the retail site).

4.7.3 Fuel Quality Monitoring System

4.7.3.1 Introduction

The European standard EN 14274 "Automotive fuels – Assessment of petrol and diesel quality – Fuel quality monitoring system (FQMoS)" describes FQMoS for assessing the quality of petrol and automotive diesel fuel marketed in the Member States of the European Union. This document was endorsed on the 17th of September, 2003, with a notification being published in the official publication of the Estonian national standardisation organisation (EVS-EN 14274:2003).

4.7.3.2 Basic data

It was also necessary to determine the basic figures concerning:

1. fuel and supply pattern, sales volumes, etc.;
2. lists of retail sites and commercial sites;
3. volume factors and
4. geographical factors, regions, census data, etc.

At the initial stage it was important to select a certain FQMS model for Estonia and the numbers of samples, which have to be taken.

4.7.3.2.1 Fuel and supply pattern, sales volumes, etc.

There are no oil refineries in Estonia. Consequently all needed fuel has to be imported. For this purpose two supply terminals have been established. The supply or import takes place in the north around the capital Tallinn visa harbour and the frontier between Estonia and Russia as well as in the south over the frontier between Estonia and Latvia. The deliveries are made by the Scandinavian countries or Russia. Volume specifications are not available.

4.7.3.2.2 Lists for retail sites and commercial sites

The total number of filling stations in Estonia is about 560 (based on February 2005 statistics). The distribution of filling stations in each county between providers is provided in chapter 4.1. The actual market has an uneven distribution.

Out of 213 suppliers more than 90 % are small companies and only the rest are "big" providers like Statoil, Neste, Lukoil and Alexela with more than 20 filling-stations each. The big providers are most represented close to the urban areas.

In Harju County, including the capital Tallinn, there are 31% of all filling stations. 32% are situated in the four larger counties in terms of population: Tartumaa with 11%, Pärnumaa, Ida-Virumaa and Lääne-Virumaa with 7 % in each case. The last third is evenly distributed between the remaining ten counties.

4.7.3.2.3 Volume factors

According to the statistics of the Statistical Office of Estonia (SOE) about 1 million tons of fuel is imported per year. The total amount of automotive fuel sold in the whole country is about 720,000 tons (2004). The distribution of different grades is as follows:

Regular unleaded petrol (minimum RON = 91): 14, 500 tons (5 %);
Unleaded petrol (minimum 95 < RON < 98): 238,100 tons (82 %);
Unleaded petrol (minimum RON ≥ 98): 37, 800 tons (13 %).

The total amount of petrol sold is about 300,000 tons (2004). Data about the regional distribution are not available - neither for automotive fuel nor petrol.

It was possible to design the Estonian FQMS without the missing data on the volume factors, because Estonia is a small country in the sense of standard EN 14274. Nevertheless, in connection with Twinning Component B, activity B4 the Estonian MoE is asked to draft a legal basis, which would enable them to get as minimum information about:

- the total sales of fuels by grade;
- the market share of companies;
- origin of fuels separated by grade for each company and
- the regional distribution of sales.

A proposal for an improved oil statistics system, not only meeting the requirements of the FQMS, was elaborated. Annex 1 of chapter 4.4 gives a detailed overview of the present situation and a proposal on the future steps necessary to meet information requirements. In the meanwhile, the MoE has drafted an amendment to the Ambient Air Protection Act, which enables to collect oil data.

4.7.3.2.4 Geographical factors, regions, census data, etc.

The area of Estonia is 45, 227 square kilometres. The country is divided into 15 counties. About 70% of the population of 1,445,600 inhabitants live in urban areas. The capital Tallinn has a population of 411,600 inhabitants. Other major towns are Tartu (100,600), Narva (73,800), Kohtla-Järve (66,500) and Pärnu (51,400).

One third of the population lives in Harju County, including the capital. The second third lives in the four counties including the larger towns and the last third is evenly distributed between the remaining ten counties. The concentration of vehicles as well as the distribution of the filling stations follows the distribution of the population.

4.7.3.3 Design of the Estonian Fuel Quality Monitoring System (FQMoS)

According to standard EN 14274 there are three different models, which can be applied for the FQMoS. For each model (A, B or C), the number of samples per grade per region or macro region is obtained by setting the number of samples (diesel fuel and petrol separately) proportional to the volume of sales within each region, macro or sub region.

The Estonian FQMoS uses the statistical model C specified in the European standard EN 14274:2003 and is based on the small country framework.

4.7.3.4 Number of samples to be taken

In regard to the fuel grades with market shares of 10 % and above (including Super 98, Super 95 and Diesel) the Estonian FQMoS requires a minimum number of 300 samples per year - 150 during the summer-period and 150 during the winter-period.

With an amount of petrol of 14,500 tonnes the market share of regular unleaded petrol (minimum RON = 91) is about 5 %. This demands an extra method of calculation to determine the minimum number of samples for fuel grades with market shares below 10 %. As a result, at least three samples have to be taken each period.

Estonia is free to assess more than this required minimum (the planned volume is 50 samples each period). In this case this should be specified in the national annex to the European standard.

4.7.3.5 Verification of the number of fuel dispensing site to be sampled

According to model C Estonia has to be considered as one region for sampling purposes. Even so the number of fuel dispensing sites, which have to be sampled has to be verified. According to standard EN 14272 annex A "Establishing the number of samples to be taken" Estonia should use the available number of filling station to select the required number of sites, which have to be sampled.

The determined number of samples in each county has to be verified to the situation in situ. Therefore, the number of filling stations in each county is prorated to the current owner. The resulting market share forms the basis for precise sampling plans in each county.

Next, the share of filling stations of each county with regard to the total number of 50 samples for each grade has to be determined. Therefore, the total number of filling stations in one county will be divided by the total number of Estonian filling stations. Finally, the resulting percentage rate has to relate to the number of filling stations per county where samples have to be taken. The last extraction of the actual sites to be sampled occurs on the principle of random.

For the reporting year 2005 the MoE assigned the EERC to take the samples. The list of the sites, which have to be sampled was prepared by the EERC, too. The sample taking for the summer period 2005 is accomplished. The given information was sufficient to allow the site to be located and uniquely identified.

4.7.3.6 Process flowchart

The arbitrations and determinations during the different working stages to design the Estonian FQMS are summarized in the Process flowchart (according to standard EN 14272 annex D) chapter 4.1 annex 2.

4.7.3.7 Final report to the European Commission

According to article 8.3 of Directive 98/70/EC Member States shall report to the Commission no later than the 30 June each year a summary of fuel quality monitoring data collected during the period January to December of the previous calendar year. The reporting format has been established in Commission Decision (2002/159/EC) of 18 February 2002. The common format for the submission of summaries of national fuel quality data includes:

1. Introduction;
2. Details of those compiling the FQMoS report;
3. Definition and explanation;
4. Description of FQMoS;
5. Total sales of petrol and diesel;
6. Geographical availability of sulphur-free fuels;
7. Definition of summer period for petrol volatility;
8. Reporting format for petrol;
9. Reporting format for diesel fuel and
10. Submission of FQMoS report.

The data provision and reporting schemes for the EU are worked out in activity B3. An older report is given in Annex E, which includes all existing requirements according to parts 7.1 to 7.3 of standard EN 14274.

The revised Excel reporting template of the EU fuel quality monitoring – 2003 summary report assists Member States in their data reporting. It broadly follows that of the common format that was already used by Estonia in 2005.

The MoE will appoint the EERC to collect and compile the summary report, containing all necessary information and data to allow the preparation of the final report. The final report will be written by the FQMS – Manager, who is affiliated to the EERC. The MoE will sign the report and submit it to the European Union.

4.7.4 Inter institutional coordination

4.7.4.1 Situation at the outset

One of the results of the analysis of tasks and responsibilities (activity A1) was that at the beginning of the project none of the stakeholders carried out any tasks with regard to the FQMS. It was necessary to establish a system, which would give reason to fulfil the requirements of standard EN 14274 and to work together without unnecessary duplication of work and human and financial resources.

In addition, it appeared necessary to improve the sampling strategy in a way that several filling stations will not inspected more than once a year and that the sampling will be evenly distributed between all operators.

4.7.4.2 Inter institutional coordination – principles

The set up of the Estonian FQMS is based on:

1. The EERC as a central institution in charge of sample taking and analyses;

2. The FQMS-Manger, affiliated to the EERC, as the central contact point of the FQMS;
3. The annual planning meeting;
4. The central database, which can be accessed by all stakeholders – for information as well as for fulfilling own statutory responsibilities.

The political responsibility lies with the MoE.

4.7.4.2.1 The Estonian Environmental Research Centre (EERC)

It is provided that the MoE, acting in the capacity of the political FQMS-Manager, will assign the EERC to take samples and make analyses (for the first time realized in 2005). This central responsibility will guarantee a consistent quality according to the requirements of standard EN 14274.

The task of sample taking should be carried out by all Estonian competent authorities, which already take samples, i.e.:

- The Consumer Protection Board (3);
- The Estonian Environmental Research Centre (9);
- The Environmental Inspectorate (11);
- The Tax and Customs Board (18).

The relevant employees of these institutions (number in brackets) were trained as sample takers in connection with the two stage seminar, which took place from the 6th to the 17th of June 2005 in Tallinn.

The EERC will be appointed as the laboratory to carry out the tests (analysis), because it will be the only public laboratory, which fulfils the requirements of the relevant European standards.

4.7.4.2.2 FQMS-Manager

The FQMS-Manger is a new task and will be organizationally affiliated to the EERC. It will be the central contact point in connection with all queries related to the FQMS. The FQMS-Manger will carry out the following tasks:

- preparation the sample taking according to the standard;
- organisation of the conduct of sample taking (incl. encoding);
- appointing the laboratory to analyse the samples;
- conduct of the planning meeting (professional and organizational) and
- preparation of the final report for signature by the MoE.

Short ways of communications between management, sample taking as well as analysing are essential for work efficiancy.

The manager will furthermore be responsible for activities related to the FQMS database in cooperation with the EIC.

4.7.4.2.3 Planning meeting

For successful implementation of the FQMS it is necessary to determine an optimal flow path between the different stakeholders. This applies to the process of coordination of planning as well as to the actual co-operation.

Therefore, an annual planning meeting, where all stakeholders need to participate, will be established. The Manager of the FQMS will bear the professional and organizational responsibility. The first meeting took place in December 2005. The targets of the annual planning meeting were:

- to achieve the highest degree of efficiency of the laboratory;
- to find out, how many and which kind of samples will be taken by stakeholders in the following year (planning base);
- to clarify, who will be able to take how much samples (quantity depends on the availability of money and staff);
- to clarify, which samples are suitable for the FQMS.

4.7.4.2.4 Database

A database needs to be set up, which makes the general data of filling stations available to all stakeholders. Clear benefits of a common database are:

- one reliable pool for all stakeholders - all stakeholders use the same data (database consistency);
- avoidance of double work;
- data will be up to date;
- one work step from one stakeholder – information for all participants.

Therefore, a system should be developed, which centralizes the general data of filling stations, resulting in one database and providing the information to the stakeholders (considering the defined access rights). The future FQMS-Manager (EERC) will organize FQMS sampling and prepare the fuel quality report to the European Commission.

In addition to the mentioned data on filling stations and test results, information will be made available by different stakeholders relating to their respective responsibilities. In order to take the needs of all stakeholders into consideration as much as possible they were asked to fill in a questionnaire about their prevailing needs in November 2005.

The anticipated workflow between stakeholders is given 4.2.4.4.

4.7.4.3 Estonian legislation

Estonian law

The Estonian legislator has established the legal framework. Council Directive 93/12/EEC relating to the sulphur content of certain liquid fuels (amended by 98/70/EC and 99/32/EC) was transposed into national law by the Ambient Air Protection Act, which entered into force on 30 September 2004.

Chapter 3 of this Act regulates the requirements for fuel including the responsibility for the monitoring quality and quantity of motor fuels (sections 58 – 60).

The environmental requirements for motor vehicle petrol, diesel fuel, light fuel oil, heavy fuel oil, shale oil and bioful are, based on subsection (2) §58 of the Ambient Air Protection Act, established by regulation no 38 of the Minister of the Environment from 19 May 2005: “Environmental Requirements for Liquid Fuels”,The established requirements are distinguished between the purpose of use of the fuels and base on environmental requirements according to EN 228 and EN 590, established by regulation no 97 of the Minister of Economic Affairs and Communications from 11 June 2003 “Requirements for Liquid Fuels” (see also Liquid Fuel Act).

The Liquid Fuel Act, which entered into force on 1 July 2003 provides, for the purpose of guaranteeing the accrual of fuel excise duty and the quality of more widely used motor fuels, the legal basis and procedure for handling liquid fuel as well as liability for the violation of this Act and lays down enforcement provisions

The requirements for motor vehicle petrol, diesel fuel, light fuel oil and heavy fuel oil are established according to subsection (1) 8 of the Ambient Air Protection Act by regulation 97. of the Minister of Economic Affairs and Communications from 11 June 2003 "Requirements for Liquid Fuel" The requirements are established based on the purpose of use of the fuels and environmental requirements according to EN 228 and EN 590 (see also the Ambient Air Protection Act[1]).

The form of report on fuel handling and the procedure for the completion and submission thereof is established by a regulation of the Minister of Finance from 1 July 2003.

The Liquid Fuel Stocks Act entered into force on 9 March 2005. The Estonian Liquid Fuel Stocks Act provides the legal base for the establishment and storage of mandatory oil stocks to meet the obligation laid down in Council Directive 68/414/EEC of 20 December 1968.

According to subsection (9) 23 of this Act the format of statistical summaries is established by a regulation of the MoEAC of 28 March 2005. It forms the basis of the data for the final report, section general data too.

4.7.4.4 Staff capacities

As a result of the analysis performed by the project experts it can be said that the implementation the FQMS requires 2 new workplaces: the FQMS-Manager and the Engines Operator.

For laboratory- and the sample-taking activities there is existing personnel with similar areas of responsibility and corresponding knowledge. Based on eight working hours per day as well as 220 working days per calendar year the following manpower requirements results from this:

- about one third of the job Sample Taker (31,25%);
- about one third of the job Engine Operator (30,45%);
- about one fourth of the job in the GC-laboratory (22,73%) and
- about 40 % of the job in the oil-laboratory (37,73%).

For the preservation of evidence the samples should be taken by two sample-takers, so that the manpower requirement for this part of FQMS will be two thirds.

The estimated expenditure of time for the Head of the Laboratory with regard to the FQMS will be 40 - 50 percent of his/her whole working time. This working place is already existing.

The necessary skills of the Engines Operator are still missing in the existing personnel capacity and should be hired, by training existing employee or – if it would not be possible – by new engagements.

4.7.5 Statistics display

The Member States have reporting obligations to the European Commission concerning the monitoring of the oil market. Also, international organisations require statistical information about the

[1] Suggestion: Agreement between Ministry of the Environment and Ministry of Economic Affairs and Communications, how to manage the sampling and analysis in a way that the requirements of FQMS will be fulfilled and samples shall not be taken twice

oil market. The obligations are listed in chapter 4.4 annex 1. Furthermore, the transparency of fuel quality at the import level is a precondition in order to ensure the quality of products delivered at the national market. This question is tackled in chapter 4.6.

The SOE publishes on its homepage (www.stat.ee) data about imports and exports, which enables to analyse the imports by country of origin on a value basis for all oil products in total. According to the Foreign Trade Statistics the breakdown of oil imports by country of origin in 2004 are presented in chapter 4.6.1.

Provisional data indicate that the sources of oil supply were almost unchanged in 2005.

The information that can be obtained from the SOE is not sufficient to meet the requirements of the FQMS and to achieve transparency. The figures include imports of other oil products than petrol and diesel (e. g. kerosene and heavy fuel). What is needed is the volume (in tons if possible) of imports by country of origin separate for each grade of petrol and diesel.

A monthly statistical publication based upon data collected according to a statistical system as proposed in chapter 4.4 could improve the transparency of the Estonian oil market.

The proposal gives recommendations for a legal framework. A comprehensive oil statistic based upon a legal framework could fill the gaps. An Estonian Oil Data Act should answer questions like reporting responsibility, reporting date, enforcement and confidentiality of data. Recommendations for a company re-porting form have been provided. A draft questionnaire covering all physical activities in the oil market has also been developed. It is based on the needs of data users and considers the peculiarities of Estonia.

According to the preface of standard EN 14274 a FQMS has to take into consideration statistical information. Sampling must be designed to be representative. To ensure a representative fuel quality monitoring, sufficient information about supply patterns (origin of fuels) and market shares of each company is necessary. Total sales separated by fuel quality are necessary to choose the appropriate model according to Annex C of the European standard. The annual fuel quality report to the European Commission requires in this general part the same information.

All required information should be available in the statistics mentioned in chapter 4.4. In order to make all necessary information available to the authority in charge of the FQMS additional legal basis is needed. The Liquid Fuel Stocks Act contains comparable paragraphs, which make the data from the TCB available to the Estonian stockholding agency. Foreign trade statistics and the data according to the Excise Duty Act and the Liquid Fuel Act from the TCB are of special interest in the context of the FQMS.

4.7.6 Labelling

A company selling fuels to consumers has to guarantee that only the fuels meeting the minimum requirements of the European standard are sold. Of course, the seller has to make the guaranteed quality of the fuel visible to the consumer. The standard mandates to mark the fuel (e.g. part 4 of standard EN 228). The design of the labels shall be in accordance with the requirements of national standards or regulations. Also, article 3.5 of Directive 2003/30/EC on the promotion of biofuels includes a requirement for Member States to ensure specific labelling at sales points.

Without appropriate labelling, consumers could experience problems filling the vehicle with the wrong fuel. Using regular grade where premium is required can affect vehicle performance and putting petrol

into a tank instead of diesel, which can cause potential engine damage can be quite hazardous. Therefore, it is proposed to introduce a labelling system.

Furthermore, oil companies could take the chance to market the petrol grades other than regular and premium. Improved grades of petrol could be advertised as having higher octane, or lower benzene, or lower sulphur. It is important that the consumer is getting the qualities being advertised.

Chapter 4.4 shows a set of labels at filling stations based upon the German Industry Standard (DIN). Activity B6 of the Twinning Covenant requires the implementation of measures to ensure transparency of fuel quality at the delivery level. A proposal for the implementation of a labelling system has also been drafted.

4.7.7 Fuel Quality Management System (FQMS)

In addition to the Fuel Quality Monitoring System covers:

- Light and Heavy Heating Oil (obligation of monitoring and reporting);
- Biofuels (obligation of monitoring and reporting);
- Marine fuels (obligation of monitoring and reporting) and
- Non representative filling stations (reporting);
- Supervision and cooperation between different institutions.

The responsibilities are all settled, unnecessary duplication of work is not expected. Several stakeholders will intercommunicate through the annual planning meeting.

4.7.8 Summary

The first target of the Twinning Component A was to get an overview of the status quo of the distribution of tasks and responsibilities in fuel quality management in Estonia. This has been achieved. Based on these results recommendations for optimum institutional set up and arrangements to run the FQMS by application of lean management technology have been presented.

An institutional assessment summary report, which includes all relevant overviews, proposals, schemes and flow diagrams for the institutional set-up of the FQMS has been provided.

Necessary laws have been adopted:

- Ambient Air Protection Act;
- Regulation by the Minister for the Environment" Environmental requirements for liquid fuels" (based on subsection (2) §58 of the Ambient Air Protection Act);
- Liquid Fuel Act.

The existing staff capacities are determined and a gap analysis is performed. The only new workplaces will be the FQMS-Manager and the Engines Operator. For analytical work and sample taking it is be possible to use the existing staff.

Based on the institutional assessment summary report and in consideration of European standard EN 14274 "Automotive fuels – Assessment of petrol and diesel quality – Fuel quality monitoring system (FQMoS)" an Estonian Fuel Quality Monitoring System (FQMoS), including the description of sampling and analysing schemes has been designed.

The institutional set up of the Estonian FQMoS was finalised with the completion of activity B1.

The Estonian FQMoS was approved by the Ministry of the Environment on 25 November 2005.

The main parts of the Estonian FQMoS are:

1. The EERC as a central institution in charge for sample taking and analyses;
2. The FQMS-Manager, organizationally affiliated to the EERC, as the central contact point in connection with all queries of FQMS;
3. The annual planning meeting;
4. The central database "Filling-stations", which can be accessed by all stakeholders.

The political responsibility lies with the MoE.

The described cooperation between the participating authorities will make it possible to organize the sampling in such a way that several filling stations will not be inspected more than once a year and that the sampling will be equally distributed between all operators.

The database "Filling stations" will be one of the most modern in Europe and would set a good example for a deregulated state.

5. Component C. Training

Component C covers the training activities of the Twinning project.

5.1 Activity C1. Training general

The European Parliament and the Council have in Directive 98/70/EC of 13 October 1998 relating to the quality of petrol and diesel fuels set requirements to sampling and analysis as well as reporting, which shall be met by member states. In addition two fuel quality standards EN 14274:2003 must be met by member states.

In order to implement the directive and the standards a Twinning project between Estonia and Germany was agreed.

The aim of the project was to create a functional Fuel Quality Management System (FQMS) in Estonia to perform fuel analyses for EC compliant environmental and customs control.

The project started in September 2004 and lasted for 18 months.

One of the project components focused on training existing and new staff of relevant Estonian institutions to become familiar with the recommendations of the FQMS in theory and practice.

5.1.1 Training needs assessment report and general project training plan

Within the project the following activities related to training were foreseen:

1. Training needs assessment report and general project training plan;
2. Training on general principles of fuel directives implementation and management of the FQMS;
3. Training on fuel sampling;
4. Training on generation of good fuel quality data;
5. Training on interpretation of fuel test results;
6. Training on management of fuel test facilities;
7. Training on multifunctional lab equipment, certification/classification of fuels;
8. Training on implementation of Directive 94/63/EC;
9. Future training system.

The training measures were addressed to the staff of the following institutions, which are directly involved in the implementation of the Fuel Quality Management System in Estonia:

- Ministry of Finance (MoF);
  Tax and Customs Board (TCB);
- Ministry of the Environment (MoE);
  Environmental Inspectorate (EI);
  Estonian Environmental Research Centre (EERC);
- Ministry of Economic Affairs and Communication (MoEC);
  Consumer Protection Board (CPB);
  Energy Market Inspectorate (EMI).

5.1.1.1 Identification of training needs

The meeting between different counterparts of Twinning project on 2 December, 2004 focused on the following topics, which are related to the different requirements of the FQMS:

- Management;
- Sample taking;
- Analysis.

The central element of the management system is the monitoring system as designed in Directive 98/70/EC and amended by the Directive 2003/17/EC.

The monitoring system is composed of three parts:

Part 1: Management, which is described in standard EN 14274 "Automotive fuels – Assessment of petrol and diesel quality – Fuel quality monitoring system (FQMoS)";
Part 2: Sample taking, which is described in standard EN 14275 "Automotive fuels - Assessment of petrol and diesel quality – Sampling of retail site station pumps and commercial site fuel dispensers";
Part 3: Analysis according to standard EN 228 "Automotive fuels – Unleaded petrol – Requirements and test methods" and EN 590 "Automotive fuels – Diesel – Requirements and test methods". The analysis part is supplemented with DIN EN ISO 4259 "Petroleum products – Determination and application of precision data in relation to methods of test" and DIN EN ISO/IEC 17025 "General requirements for the competence of testing and calibration laboratories".

The training was enlarged also to other fuel relevant themes such as:

- DIN EN ISO 3170 "Petroleum liquids – Manual sampling";
- DIN 51750 "Sampling of petroleum products";
- DIN EN 14214 "Automotive fuels – Fatty acid methyl esthers (FAME) for diesel engines Requirements and test methods".

With regard to fuel management the content of Directive 94/63/EC on limitation of volatile organic compounds of storage facilities for patrol was also included.

In view of the current Estonian knowledge on fuels, especially biofuels, the missing availability of certain technical devices and the permanent challenges to secure foreign trade procedures, several study visits were also conducted.

In accordance with the Twinning Covenant and in agreement with the different Estonian counterparts training was divided into different units.

At first, a two week long seminar in June 2005 to give a general overview of fuel related themes took place that was supplemented by a practical sampling course other different training units were directly related to the practical work at the new fuel lab.

Additionally, the above study visits were conducted. The following chapters outline the training seminars as well as the study visits and give short descriptions of content of the training.

5.1.1.2 Approval of training plan

The following training plan, separated into a seminar and individual training units at the laboratory, was approved by the stakeholders:

Seminar

Theoretical part

Activity C2: Training on general principles of fuel directives implementation and management of FQMS

In this unit, two seminars on the general principles of fuel directives implementation and the FQMS were organised. The specific topics addressed were:

- General introduction of principles of fuel directives implementation Presentation concerning the implementation of fuel directives in 1 - 2 member states and present status in Estonia;
- General introduction into the FQMS;
- Overview and present status in Estonia.

Activity C5: Training on interpretation of fuel test results

Under this unit, relevant data for fuel quality control under EN228, EN590 and also EN14214 were analysed. Also, statistical issues (DIN EN ISO 4259) were presented.

Activity C8: Training on implementation of Directive 94/63/EC

Directive 94/63/EC: general overview and practical part.

Activity C3: Fuel sampling

In this section a practical workshop on manual sampling methods of fuel products was performed. The Estonian target groups from the EERC, TCB, EMI, CPB, EI were trained in manual sampling techniques of petroleum liquids (practical exercise). There are different standards (see above), which give a general overview of sampling techniques in the field of petroleum liquids (e.g. EN ISO 3170 (2004), EN 14275 and the German guideline series DIN 51750). Knowledge of taking samples according to EN 228 and EN 590 is necessary. Biofuels, as specified in EN 14214 has also become of interest. The related aspects in this field were also covered. In principle, the general sampling techniques are specified in prENISO 3170 and the techniques for sampling from fuel stations in EN 14275.

The practical course covered the following subjects:

- Practical course in sampling from fuel stations;
- Practical course in sampling from tanks: storage tanks, ships, rail cars (tank wagon), road vehicle tanks.

General aspects of prENISO 3170 about safety precautions, different sampling devices, sampling techniques as well as handling of samples and sampling plans were discussed.

The participants were provided with training materials (in German and Estonian language) both under the theoretical and practical part. At the end of the seminars certificates were granted.

Activity C7: Training on multifunctional lab equipment: certification/classification of fuels

This training unit will focus on the determination of octane- and cetane numbers.

Activity C4/C6: Training on generation of good fuel quality data/ Training on management of fuel test facilities

Activities C4 and C6 are combined as practical seminars to be held at the new oil lab of the EERC. The following themes will be covered: fuel laboratory management; quality control; accreditation, standard operating procedures, control cards; analysis of fuel samples in minimum under consideration of the methods asked for the FQMS; interpretation of data.

Activity C9: Future training system

The aim of this unit is to provide recommendations for building up the future training system.

5.1.1.3 Additional training activities and time schedule

In view of the existing Estonian knowledge on fuels, the availability of certain technical devices, etc. the German experts expressed their opinion that trainings abroad in the form of study visits, in addition to the trainings arranged in Estonia would be necessary.

Directive 2003/30/EC on the promotion of biofuels requires some training on the properties of biofuels, blending procedure of biofuels, etc. The theoretical training for a group of Estonian colleagues was covered by attending the 6th annual European Fuels Conference in Paris on 15 -16 March, 2005 with the following main topics:

- Overview of global refining trends and markets;
- Current capacity, supply and distribution challenges faced by the European refining industry;
- Development within the European marine fuel sector;
- Introduction of biofuel within European refining;
- Update on current issues within autofuels sector;
- The European emissions trading scheme (EU ETS) in practice;
- Advances in European refining technology;
- Future challenges and opportunities faced by the European refining industry.

The practical part with regard to biofuels monitoring was covered in a lab training course, which dealt with all test methods to control compliance with fuel quality parameters. This traineeship took take place in a special fuel lab in Karlsruhe, Germany. Relevant security measures to were shown in the Port of Hamburg.

The advanced training took place from 12 - 16 September, 2005 and from 19 - 22 September, 2005. The schedule for the training was as follows:

Time schedule	Activity
12 September	Travel to Karlsruhe
13 - 15 September	Traineeship, organised by the Petrolab oil laboratory, Speyer: organisation of measuring procedure, data handling, data processing; routine measuring tasks, blending with biofuels; quality control and quality assurance
16 September	Travel to Tallinn
19 September	Travel to Hamburg
20 - 22 September	Traineeship, organised by the OFD, Hamburg, in e.g. safeguarding of the free harbour; customs clearance of imports of mineral oil products; product validation importing mineral oil products; mineral oil product classification; control of product during transit; control of ship bunkering and future control
23 September	Travel to Tallinn

5.1.1.4 Time schedule for training activities C2 to C9

The time schedule for the training activities C2 to C9 was as follows:

Covenant component C: "Training needs assessment report and general project training plan" Aspects of sampling and quality of fuels: FQMS Estonia"		
Part 1:	Meeting	06 - 10 June 2005
Part 2:	Practical sampling taking course	14 - 17 June 2005
Part 3:	Practical work at the new EERC oil laboratory	03 - 14 October 2005 (second part for octane number is not fixed)
Part 4:	Future training system	23 - 27 January 2006

Part 1 and part 2 covered the above mentioned seminar in June. Part 3 covered the practical and theoretical work at the fuel laboratory. Part 4 covered further needs.

Part 1 and part 2 took place according to schedule. These parts did not depend on the existing of the new fuel lab. Parts 3 and 4 have to be more flexible due to the fact, that the fuel equipment has not arrived yet.

5.1.2 Training plan for training activities C2 to C9

5.1.2.1 Training plan for training activity C2

Part 1: Theory		
Day 1: 6 June Activity C2		Chairman: RTA Peter Möller
10:00 - 10:30	Opening of the meeting Introduction and keynotes by responsible persons Chairman Peter Möller: Welcoming remarks	
10:30 - 12:00	General principles of fuel directives implementation and management of FQMS: Part 1	
12:00 - 12:15	Discussion Speaker: Mrs. Benkendorf	
12:15 - 13:30	Lunch break	
14:30 - 15:00	General principles of fuel directives implementation and management of FQMS: Part 2	
15:00 - 15:15	Discussion Speaker: Mrs. Benkendorf	
15:15 - 15:45	Coffee break	
15:45 - 17:00	General principles of fuel directives implementation and management of FQMS: Part 3 Discussion Speaker: Mrs. Benkendorf	

5.1.2.2 Training plan for training activity C3

Day 4: 9 June		Chairman: Mrs. Benkendorf
Activities C5 and C3		
9:00 - 10:30		Interpretation of fuel test results EN 14214
		Speaker: Mr. Vogel
10:30 - 11:00		Coffee break
11:00 - 12:00		Interpretation of fuel test results EN 14214
12:00 - 12:30	end of C5	Discussion
		Speaker: Mr. Vogel
12:30 - 14:00		Lunch break
14:00 - 15:30	start of C3	Sampling of fuels: General aspects
15:30 - 15:45		Discussion
		Speaker: Mr. Vogel, Mr. Kropf

Day 5: 10 June		Chairman: Mr. Möller
Activities C3 and C8		
9:00 - 10:30		Sampling of fuels: Practical aspects; security aspects
10:30 - 10:45	end of C3	Discussion
		Speaker: Mr. Vogel, Mr. Kropf
10:45 - 11:15		Coffee break
11:15 - 12:30	start of C8	Directive 94/63/EC: general overview
		Speaker: Mrs. Nymcik
12:30 - 14:00		Lunch break
14:00 - 15:30		Directive 94/63/EC: general overview
15:30 - 16:00		Discussion
		Speaker: Mrs. Nymcik
End of the meeting part 1		

Part 2: Practice	
Day 1 to Day 4: 14 - 17 June 2005	Accompagning persons: RTA Peter Möller and Priit Alumaa
Activity C3	
Experts: Mr. Kropf, Mr. Weis	
The practical training course on fuel sampling starts every day at 9:00 am at the EERC in Tallinn. Transportation of participants to the different sampling sitesing Tallinn. The number of participants is fixed to 25. The participants will be divided into two groups and trained simultaneously at each site. Every participant has to bring his / her personal safety outfit. The following training units are foressen, but the sequence is not strictly fixed.	

Day 1: 14 June	
09:00 - 09:10	Welcoming remarks and organisation
9:10 - 10:00	General aspects of fuel sampling: briefing
10:00 - 17:00	Practical sampling: fuel station (tank, fuel dispenser), truck tank, car tank
2 hours	Lunch break and two times coffee break

Day 2: 15 June	
9:00 - 9:30	General aspects of fuel sampling: briefing
9.30 - 17:00	Practical sampling: storage tanks
2 hours	Lunch break and two coffee break

Day 3: 16 June	
9:00 - 9:30	General aspects of fuel sampling: briefing
9.30 - 17:00	Practical sampling: ship tanks, including bunker of the ship
2 hours	Lunch break and two coffee break

Day 4: 17 June	
9:00 - 9:30	General aspects of fuel sampling: briefing
9.30 - 12:00	Practical sampling: tank wagon
12:00 - 12:30	Final discussion
end of the meeting part 2	

5.1.2.3 Training plan for training activity C4

The training activity C4 is combined with the training activity C6 and will be held at the new fuel lab. The time schedule is not yet fixed since the new fuel laboratory does not exist.

5.1.2.4 Training plan for training activity C5

Day 2: 7 June	Chairman: Priit Alumaa
9:00 - 10:30	Interpretation of fuel test results EN 228 Speaker: Mr. Vogel
10:30 - 11:00	Coffee break
11:00 - 12:15	Interpretation of fuel test results EN 228
12:15 - 12:30	Discussion Speaker: Mr. Vogel
12:30 - 14:00	Lunch break
14:00 - 15:30	Interpretation of fuel test results EN 228
15:30 - 16:00	Discussion Speaker: Mr. Vogel

Day 3: 8 June Activity C5	Chairman: Priit Alumaa
9:00 - 10:30	Interpretation of fuel test results EN 590 Speaker: Mr. Vogel
10:30 - 11:00	Coffee break
11:00 - 12:15	Interpretation of fuel test results EN 590
12:15 - 12:30	Discussion Speaker: Mr. Vogel
12:30 - 14:00	Lunch break
14:00 - 15:30	Interpretation of fuel test results: Quality assurance and statistics
15:30 - 16:00	Discussion Speaker: Mr. Vogel

Day 4: 9 June Activities C5 and C3	Chairman: Mrs. Benkendorf
9:00 - 10:30	Interpretation of fuel test results EN 14214 Speaker: Mr. Vogel
10:30 - 11:00	Coffee break
11:00 - 12:00	Interpretation of fuel test results EN 14214
12:00 - 12:30	End of C5 Discussion Speaker: Mr. Vogel
12:30 - 14:00	Lunch break
14:00 - 15:30	Start of C3 Sampling of fuels: General aspects
15:30 - 15:45	Discussion Speaker: Mr. Vogel, Mr. Kropf

5.1.2.5 Training plan for training activity C6

The training activity C6 is combined with training activity C4.

Part 3: Training at the EERC oil lab
Time not established yet
Experts: Mr. Tschersch, Mr. Vogel, Mr. Wilcken
Participants: Staff from the new oil lab

Practical course: Training on generation of good fuel quality data and Training on management of fuel test facilities activities C4/C6		No fixed data, individual coordination
Experts:	Mr. Tschersch, Mr. Vogel	
9:00 - 17:00	In practice daily work will be done together with the Estonian staff	
	Themes: Oil lab management; Quality control; Accreditation, standard operating procedures, control cards; Analysis of minimum fuel samples in view of the FQMS methods (EN 14274); Interpretation of data.	

5.1.2.6 Training plan for training activity C7

Practical course: Training on multifunctional lab equipment, certification/classification of fuels activity C7	No fixed data, individual coordination but two one week parts
Expert: Mr. Wilcken In part 1 the expert shall be at the Estonian new oil lab when the motors are delivered and installed. After sucessfull installation and test through the deliverer first analyses of retain samples can be conducted. Part 2 of this training unit shall take place two weeks later. This training activity is to discuss problems, staff has when analysing samples without the trainer and to reanalyse the samples again, to compare the results.	
Part 1: Practical course: Training on multifunctional lab equipment: certification/classification of fuels	
9:00 - 17:00	Supervising installation of the new motors together with the responsible Estonian staff Analysis of first retain samples and standard fuel samples Quality control Accreditation, standard operating procedures, control cards Analysis of minimum fuel samples under consideration of the methods asked for the FQMS Interpretation of data
Part 2: Practical course: Training on multifunctional lab equipment: certification/classification of fuels	
9:00 - 17:00	Deepening of experience including all points from part 1 Problems Maintanance Reanalysis of retain samples All relevant points for QS/QC

5.1.2.7 Training plan for training activity C8

Day 5: 10 June Activities C3 and C8	Chairman: Mr. Möller
9:00 - 10:30	Sampling of fuels: Practical aspects; security aspects
10:30 - 10:45	end of C3 Discussion Speaker: Mr. Vogel, Mr. Kropf
10:45 - 11:15	Coffee break
11:15 - 12:30	start of C8 Directive 94/63/EC: general overview Speaker: Mrs. Nymczyk
12:30 - 14:00	Lunch break
14:00 - 15:30	Directive 94/63/EC: general overview
15:30 - 16:00	Discussion Speaker: Mrs. Nymcik
End of the meeting part 1	

5.1.2.8 Training plan for training activity C9

Final discussions with the relevant institutions: Future training system Activity C9	February 2006
Experts: Mr. Vogel	
Under this activity the general tasks are: Elaboration of recommendations for future training system and attesting rules for fuel sampling staff; Determination of responsible authorities and institutions. Discuss the training plans, attesting; Examination of training plans with all stakeholders and have them approved.	

5.1.3 Conclusion

The training plan as well as the extended study visits and seminars for the Twinning Component C were planned and agreed by the stakeholders. It was agreed to split the training into two principal parts: one, which gives a general overview of relevant fuel themes: management, analytical details and sampling (covered in a two week seminar in June 2005) and second, in fuel laboratory related trainings. The latter will start when the new fuel lab has been equipped. Additional study visits to a German oil laboratory are also planned.

The outputs, related documents as well as closer descriptions of the training activities are described in the reports of these activities.

For the June-seminar the speakers prepared accompanying documents, which were translated in Estonian. Numerous Estonian colleagues can now use these documents to become familiar with new and different tasks around the main theme “FQMS” and “Fuel”.

Activity / month	03/2005	04/2005	05/2005	06/2005	07/2005	08/2005	09/2005	10/2005	11/2005	12/2005	01/2006	02/2006	03/2006	No. of partici-pants
Additional: "Requirements for fuel/biofuel in the FQMS" 6th Annual European Fuels Conference in Paris[1]	15./16.03.2005													3
C 2: Training on general principles of fuel directives implementation and management of FQMS			07.06.2005											19
Additional: FQMS-Management Customs / Companies - Hamburg							19. – 23.09.2005							11
C 3: Training on fuel sampling			09./10.06.2005 14.-17.06.2005											38
C 4: Training on generation of good fuel quality data										Not fixed: combined with the training to be conducted under C 6; will be held at the new fuel lab				

[1] Main topics: Overview of global refining trends and markets; current capacity, supply and distribution challenges faced by the European refining industry; development within the European marine fuel sector; introduction of biofuel within European refining; update on current issues within autofuels sector; the European emissions trading scheme (EU ETS) in practise; advances in European refining technology and future challenges and opportunities faced by the European refining industry

Activity / month	03/2005	04/2005	05/2005	06/2005	07/2005	08/2005	09/2005	10/2005	11/2005	12/2005	01/2006	02/2006	03/2006	No. of participants
C 5: Training on interpretation of fuel test results (Traineeship in Karlsruhe)	15./16.03.2005			Seminar 1: 07.-09.06.2005			Seminar 2: 12. – 16.09.2005							25
C 6: Training on management of fuel test facilities										Not fixed: combined with the training to be conducted C 6; will be held at the new fuel lab				
C 7: Training on multifunctional lab equipment: certification / classification of fuels (octane number counter engine)										Not fixed: will be held at the new fuel lab; two one week parts				
C 8: Training on the implementation of Directive 94/63/EC				10.06.2005										30
C 9: Future training system											Planned February 2006			
D 4: Information Technology - Training										Not fixed: will be held at the new fuel lab;				

5.2. Activities C2, C3, C5 and C8

These activities are training on general principles of fuel directives implementation and management of FQMS, training on fuel sampling, training on interpretation of fuel test results and training on implementation of Directive 94/62/EC.

According to the training needs assessment report (activity C1) a seminar for training activities, except for training on laboratory equipment, was scheduled for 6 to 17 June, 2005. It covered several activities of the project:

- Training on general principles of the implementation of fuel directives and management of the FQMS (activity C2);
- Training on fuel sampling (activity C3);
- Training on interpretation of fuel test results (activity C5);
- Training on implementation of Directive 94/63/EC (activity C8).

Invitations to the seminar with the schedule and supplementary information were sent out to all relevant institutions in April 2005. The seminar was held at three different locations in Tallinn in the time indicated above. In total, 42 representatives from different institutions participated in the mentioned exercises.

The remaining training activities with regard to laboratory equipment will be held after the supply part of the project has been accomplished, latest at the end of April 2006. The report on this last part of training activities will be available at the end of August 2006 and cover:

- Training on generation of good fuel quality data (C4);
- Training on management of fuel test facilities (C6);
- Training on multifunctional lab equipment (C7);
- Recommendations on future training system (C9).

The current report covers the training activities C2, C3, C5 and C8.

Activity C2 was dedicated to general principles of fuel directives implementation and the management of the FQMS. The relevant fuel directives are:

- Directive 98/70/EC amended by Directives 2003/17/EC and 2003/30EC;
- Directive 1999/32/EC.

Directive 98/70/EC is the basic regulation on fuel quality monitoring. In order to achieve comparable and consistent results in all Member States the directive establishes common standards to cover all tasks:

- Management of the monitoring procedure to follow: EN 14274;
  One element of management was furthermore dealt with in Decision 2002/159 on the content and format of the annual report to the European Commission on the results of fuel quality monitoring;
- Sample taking procedure instructions: EN 14275;
- Analyses methods: EN 228 and EN 590.

These methods determine whether fuel quality is complying with the quality parameters set in the directive or not.

Directive 2003/17/EC requires availability of some amounts of sulphur free fuels in the markets of Member States starting from 2005.

Directive 2003/30/EC covers the promotion of biofuels in MS. Biofuels have to be available to an amount of 2% calculated on the basis of energy content of all petrol and diesel for transport purposes placed on the market by 31 December 2005.

Directive 1999/32/EC deals with non-standardised monitoring of light and heavy heating oil with regard to sulphur content.

The principles of managing procedures for fuel quality monitoring due to EN 14274 were elaborated. Due procedures require:

- determination of representative sample taking;
- appointment of appropriate sample taking bodies;
- appointment of a fuel laboratory having accreditation for the analyses needed;
- preparation of the annual report on fuel quality monitoring results to the European Commission;
- initiation of prosecution in cases of incompliance with the established requirements.

In the light of these requirements the first results of the project with regard to the content of management procedures to meet were reviewed:

- Most statistical information, except those on required fuel sales, are available;
- A list of all filling stations is compiled;
- The procedure of the determination of representative fuels has been developed to overcome the lack of fuel sales information in an adequate way. This principle was replaced by representative fuel stations. Representative fuel stations were determined by setting the number of fuel stations in a county in relation to the relevant figure for whole Estonia;
- Last but not least, only those filling stations were involved, which belong to the companies with a market share in total of 90 %.

The total number of samples per year is determined by the size of the country's sales. Since the sales are lower than 15 million t/y Estonia has to take 400 samples, which is equivalent to 100 samples per grade.

Due to the present market situation this system for the determination of representative samples leaves more than 50% of all filling stations beyond representative monitoring. To overcome the gap the importance of supplementary monitoring was emphasized. Furthermore, the need to also monitor light and heavy heating oil and to report to the European Commission was stressed.

With regard to sample taking institutions further results of the current project were shown. According to the proposal made under activity A2 all sampling institutions should pool their capacities to take the required amount of samples for the FQMS. Consequently, no new sampling institution was found.

Sample taking procedure is the subject of a different training component. The remaining fuel monitoring could be covered by those institutions, which already have relevant tasks.

Activity A1 concluded that the EERC should become the fuel laboratory due to lack of any collision of interests. This appointment can be made only after accreditation. Accreditation procedure is covered by the reports on Twinning Component E.

The obligation to report annually on the results of fuel quality to the European Commission was also pointed out. This issue has largely been covered by activity B3 (Twinning Component B).

The importance to prosecute all cases of incompliance of fuel quality with the parameters was finally

raised. Required legislation and competent institutions are in place. Due to low attendance this training this activity was not repeated.

The training was supplemented by a study tour to Hamburg. This activity was expected to provide background information on the issues of concern for all Estonian institutions involved in fuel quality management.

The following institutions participated:

- Ministry of the Environment;
- Ministry of Economic Affairs and Communications;
- Tax and Customs Board;
- Energy Market Inspectorate;
- Consumer Protection Board;
- Environmental Inspectorate;
- Estonian Environmental Research Centre.

Ministry of Environment of the State Hamburg

A representative of the Ministry of Environment of the State Hamburg received the Estonian delegation and introduced the German environmental policy in different areas of concern.

Consumer Protection Agency

The pro and contras of splitting consumer protection between a private and government body were discussed. Moreover, different ways of meeting the established requirements were shown.

Oiltanking

Oiltanking is a private company operating among other ports also in the Port of Hamburg. Operation in a port requires special flexibility in terms of workload and timeframe as well as good cooperation with other private companies and the Customs. All requirements to monitor fuel quality in private trading and storage activities were covered. The system of measurement of cargoes and tanks was explained. The organisation of measurements by private companies was emphasized.

German Customs Authority

The German Customs Authority hosted the Estonian delegation in its regional finance office *Oberfinanzdirektion Hamburg*.

A presentation of German import procedure with regard to mineral oil was given. Some details of that procedure were intensively discussed.

Special attention was paid to ship bunkers and biofuels with regard to taxation and tax exemptions.

A visit to the Customs lab disclosed all areas of activity. Classification of goods according to the EC harmonized and combined system applying relevant test methods was one of the most important tasks of the lab.

The evaluation conducted at the end of the study tour concluded that the tour improved the knowledge of fuel management and raised efficiency with regard to different issues.

The next training activity, under activity C3, concerned sample taking procedures

The requirements for sample taking are determined by:

- EN 14275 dealing with sample taking according to the monitoring system;
- EN ISO 3170 concerning all sample taking beyond the monitoring system.

Both issues required some theoretical introduction and had to be trained in practise.

Standard 14275 specifies a procedure for drawing petrol and diesel samples from fuel dispensers to be used for the assessment of fuel quality in accordance with EN 14274.

Since this standard does not cover safety instructions for sample drawing these concerns are addressed by EN ISO 3170, which supplements standard 14275. Standard EN ISO 3170 deals with any other sample taking procedure, which varies between the shape of tank and the fuel in the tank.

Basic procedural elements for both kinds of sample taking are:

- safety requirements;
- equipment for sample drawing;
- containers and transport of samples;
- representative sample drawing;
- handling of samples;
- documentation.

Safety requirements start with personal outfit (helmet, clothing and shoes). Containers should be produced of appropriate metals and be secured by a tool preventing static charges.

When taking samples from different kinds of tanks the risks deriving from toxic and explosive vapours should be considered seriously. Shore tanks filled with petrol require special precaution since above the liquid part of the fuel in tank there is extending explosive vapour. Before starting with sample drawing all vapour must be lifted by opening access facilities.

Equipment for sample taking is different depending on the shape and type of tank and on the kind of sample that needs to be taken. Several tools were shown.

The properties of different containers are determined by the properties of the product that needs to be sampled. Metal containers were recommended due to their multiple–use possibility. When transporting and storing fuels cooling facilities should be operating.

Representative sample drawing depends on the type and shape of the tank. For shore tanks sample drawing should cover different layers of the fuel. The same procedure also applies to railway tank wagons or truck tank cars. The sample taking method from ship tanks depends on whether the fuel circuit within the ship is closed or open. Sample drawing from filling stations is similar to normal car tanking.

When handling samples the identity and quality of samples shall be maintained from drawing to analysing. Documentation of sample drawing from other sources than filling stations should comprise general information on tank, product, etc. Details about sample drawing concern the description of

the procedure and objective (spot sample, tap sample etc.). This information should be including in a protocol, which should be supplemented by confirmation of sample receipt of the owner or operator of the tank facility. A specified documentation has to be applied by sample taking from filling stations. The requirements are covered by EN 14275.

Practical part of sample drawing started at a Statoil filling station in Tallinn. The project experts pulled over safety outfits and blocked one pump of the filling station. Fuel sample was taken from the pistol and the containers were filled to ¾ of the volume. Relevant information was attached at the container and the container was sealed. Then a protocol according to EN 14275 was filled. This procedure was repeated by several Estonian participants.

Sample drawing from a shore tank was practised at tank farm of Oiltanking company at the Port of Muuga near Tallinn. Samples were drawn from the top of a 20 meter high tank. This procedure was demonstrated to all attendees.

Next exercise was carried out at railway tank wagon, which differs only with regard to dimension. Sample taking from ship bunkers is different. In the engine room of ship the supply pipeline of the engine has to be identified. This kind of sample taking was also shown to all participants.

On the last day of the sample drawing training floor was opened to questions. This enabled to assess the knowledge acquired by the participants. This question and response exercise concluded the training on sample taking.

Training on interpretation of fuel test results and management of fuel test facilities activities C5 and C6 provided background information about the parameters set in Directive 98/70/EC. This part was completed with a presentation of test methods for analyses of fuel quality according to standards EN 228, 590 and 14214 (fatty acid methyl esters).The presentation started with general remarks on different fuel properties. The importance of aromatics for boosting octane number was emphasized. Density of fuel raises the efficiency, vapour pressure reconciles the consequences of different temperatures with the performance of the engine. The existent gum content and copper corrosion are the parameters, which help prevent the wear and tear of the engine. Low sulphur level extends the lifetime of car and reduces acid precipitation. For diesel engines the cetane number indicates that good ignition in winter and summer time is guaranteed. Other parameters mentioned above with regard to gasoline also apply to diesel.

The next issue to raise was the accuracy of test values according to EN ISO 4259. Since two or more identical tests have not identical results, statistical methods limit the range of exceedings. Round robins are used to determine limit values and tolerances. Limit values and tolerances decide on the quality of laboratory test results. After intercalibration and accreditation, test results are acknowledged.

The test methods, which determine the compliance or incompliance of fuels with fuel quality parameters described in EN 228 and 590 were explained. The FQMS quality parameters are:

- Research octane number RON;
- Motor octane number MON;
- Lead content;
- Sulphur content;
- Hydrocarbon analysis;
- Benzene;
- Oxygen content;
- Oxygenates;
- Vapour pressure;
- Distillation.

Each parameter has a special test method.

The same procedure was undertaken to present the test methods for diesel parameters according to EN 590. Although some of the diesel parameters are different than gasoline most of them have common characteristics. One important distinction was already raised: cetane number, which indicates that the fuel cannot be challenged at low temperatures.

Due to new requirements stemming from Directive 2003/30/EC biofuels must be promoted and blended with fuels. During the training EN Standard 14214, which describes the test methods for biofuels was also explained. Biofuels can be produced of plant oil or other sources. Currently, only plant related biofuels will be promoted, however, plant oil must undergo special treatment to become useful for biofuels. The name of the final product is fatty acid methyl ester (FAME). Relevant test methods to identify this quality were explained.

A slide show depicting all different pieces of test equipment terminated this presentation.

This training on laboratory issues was supplemented by a study tour to Karlsruhe and Speyer in Germany. This training was meant to be complementary to the training on multifunctional lab equipment (activity C7). It was carried out in the labs of UMEG Karlsruhe, MiRO refinery Karlsruhe, OmniTank Speyer and PetroLab Speyer from 13 – 15 September 2005.

The training started with a general overview on quality assurance and was continued by a presentation on the daily quality management work at UMEG Karlsruhe.

At the refinery, focus was given to the octane number counting engine. Relevant procedures to operate the engine and to identify the compliance with octane and cetane parameter was demonstrated.

OmniTank Speyer presented their management procedure for product flow in tank storage facilities, which has an impact on adequate sample taking.

PetroLab Speyer showed the operation of their fuel lab. Test methods for fuel quality assessment were demonstrated.

This visit provided a first glimpse of fuel tests according to the requirements of the FQMS.

The final presentation was dedicated to the implementation of Directive 94/63/EC (activity C8). This directive deals with the limitation of volatile organic compounds (VOC) at storage facilities for fuels. The objective of this directive is to reduce the creation of ground level ozone and dangerous vapours.

At first the principles of the directive were explained. The most important VOC emissions are caused by emissions of vapour from:

- solvents (35%);
- transport activities (40%);
- turnover of fuels (7%).

Fuel vapour emissions can be reduced by applying fuel vapour return units (VRU). These units are in use at filling stations, shore tanks and tank trucks. The design of VRU varies depending on the shape of tank facility.

The details of VRUs at shore tanks were also presented. Two levels of VRU – PSA-Pressure Swing Adsorption and Gas Adsorption – were described. With regard to tank trucks and railway tank wagons

the selection of a VRU depends on bottom loading or top loading. Details were shown on pictures or diagrams. The limit value of vapour emissions amounts to 35 g/m^3 per hour.

The efficiency of a VRU was demonstrated by example of a German shore tank. The emissions from the tank before launching the VRU were 400 t/y and afterwards the emission was reduced to 121 t/y, although the turnover of petrol had quadrupled.

Finally, the VRUs used at filling stations were describe. Two sources of emissions were identified:

- tank below surface;
- dispenser.

A pump attached to the dispenser will recover the vapour caused by car filling. Details were shown on pictures.

Finally, the control systems to identify the failures of VRUs were shown and the mechanism was explained. All relevant emissions should have be reduced by 90% by year 2005. This information concluded that training.

At the end of all training activities certificates were issued. Since the participation was active and all trainees were well prepared to carry out their relevant tasks, the coaches decided that all participants whose attendance was recorded should be granted a certificate.

Eventually, the participants evaluated the quality of the seminar in a special evaluation form and gave the training high scores.

This concludes the report on training activities.

6. Component D. Information Technology

Twinning Component D consisted of four activities. To adjust the activities to the extended schedule and the updated needs of the EERC it was decided to cancel activities D1, D2 and D4 in the frame of Twinning project. Guaranteed results targeted by the Twinning Covenant (Article 1) were not changed because activities D1, D2, D4 will be accomplished by the Supplier of fuel laboratory equipment and the EERC with some advisory assistance and support from the German expert. The laboratory IT system is one lot of the supply contract for the laboratory equipment and the beside laboratory equipment, the Supplier shall deliver all necessary hardware and software components to support the work in the fuel laboratory. Also, the Laboratory Information Management System (LIMS) application shall be developed by the Supplier, which would enable to carry out the laboratory administrative tasks and the reporting based upon the FQMS.

6.1. Activity D3. Electronic data provision and reporting schemes

Activity D3 covered technical support for the supply part, which involves programming data requirements, electronic data provision and reporting schemes. It was achieved by STE Mrasek, expert for IT issues, in cooperation with STE Stoff-Isenberg involved in the identification of data requirements for the FQMS reports and data flows to stakeholders. In this context, a draft data model on general information, analysis and the FQMS-system was developed in terms of special tables structured according to common features (a CD with the draft data model was given to the EERC). The features are: Key - Field - Definition - Meaning/List of values. The model was amended by a Data Flow Diagram.

6.3.1 Guidelines of database development for all FQMS parameters

The application shall support all data processing necessary for the FQMS. Recommendations for the completion were elaborated, which covered the following items:

- User/stakeholders and their data requirements,
  right to access data (rolls),
  identification by username/password and/or identity card;
- Data catalogue,
  which data / volume of data,
  history,
  considerations about samples taken beside the FQMS (e.g. TCB fraud prevention form);
- Reports (only EU or others),
  statistical reports to the European Commission,
  reports about filling stations, statistics by county, operators,
  standardised letters (e.g. letters to customers with results of analyses),
  activities if incomliance occurs;
- Data input (laboratory user interfaces, input manual or automatic interface),
  input when all analyses completed or at each single laboratory equipment,
  repeated analyses of the same sample,
  data coherence checks;
- Identification of samples (barcode reader),
  the code used in the FQMS database should correspond to the code used in the laboratory.

6.3.1.1 Data requirements of users/stakeholders of FQMS database

The stakeholders who need information contained in the FQMS database are listed in the following section:

EERC – FQMS-Manager

Unlimited access to all data; including samples and administrative data (e.g. register of filling stations).

The external users are:

Consumer Protection Board (CPB)

Access to samples taken and analysed on behalf of the CPB.

Environmental Inspectorate (EI)

Access to samples taken and analysed on behalf of the EI.

Energy Market Inspectorate (EMI)

EMI has the following duties:

1. Verification of registration data (§ 15 of the Liquid Fuel Act);
2. Inspection of conformity of fuel and fuel handling (§ 3 of the Liquid Fuel Act);
3. Approval of acts involving non-conforming fuel (§ 16 of the Liquid Fuel Act).

To fulfil these tasks access is needed to:

- Register all filling stations including operators and trademarks;
- Provide access to the samples taken and analysed on behalf of the EMI.

Tax and Customs Board (TCB)

TCB is responsible for the control of import and exports of goods, compliance of the quality of fuels with the ISO standards according to § 22 of the Liquid Fuel Act and the handling of turnover tax for fuels.

- Provide access to samples taken and analysed on behalf of the TCB and aggregated reports.

Environment Information Centre (EIC)

Aggregated statistics will be made available by the EEIC, which will get each year a statistical summary about the FQMS (no individual data). The report will be similar to the annual report to be submitted to the European Commission.

- The EIC will make information about fuel quality in Estonia available to the general public.

Oil industry

Filling stations, operators and oil companies will not have access to samples taken and analysed at their own filling stations.

The CPB, TCB, EI and EMI will receive a report about samples analysed on behalf of them. The head of the fuel laboratory will send an automatically generated report with the results to the customer by e-mail. The report has to be confirmed by an electronic signature. A copy of the report will be sent to the operator of the filling station. All the above stakeholders will have access to his respective data. Access must be protected by username/password and an identity card. The supplier has to build a data model, which supports the administration of users and individual rights (roles) to access and analyse data.

6.3.1.2 Database

After all users of FQMS have been identified, in the next step the data must be defined, which will be processed in the system. The data depends on the supported processes and the different questions of participating users (see above). Reports and statistics for the Estonian Government and the European Union are the third element.

With present knowledge the primary function of the FQMS-System is the generation of the reporting templates about the quality of fuels for the European Union. Therefore, the following three groups of data will be processed in the system as minimum.

- General Information
  Filling stations, counties, operators, companies, stakeholders, fuels;
- Laboratory Analyses
  Samples (general info), canisters, petrol analyses and parameters, diesel analyses and parameters, etc.;
- FQMS Management
  Sample planning, contacts summaries, total sales, petrol values, diesel values.

Data should be stored in a relational database system, which can be extended easily in case of adventitious conceptual formulations. Possible database systems for the FQMS are Microsoft SQL Server or Oracle Database, which already is in use within the EERC.

Current quantity structure of data:

- approx. 600 filling stations;
- 15 counties;
- 1 laboratory;
- 4 sample taker (stakeholders);
- approx. 400 samples each year;
- 4 fuels;
- etc.

The following unsettled questions have to be resolved by the Supplier and the EERC before implementing the database:

- How long will data be stored?
- Is there a need for different versions (history)?
- How will these samples be processed, which are taken outside the FQMS system (e.g. Tax and Custom Board)?

Another part of questions concerns the processes and the workflow inside the laboratory.

6.3.1.3 Reporting

The following reports will be generated within the scope of the annual reporting to the European Commission according to European standard EN 14274 using the FQMS:

- Contacts & Summary plus Description of Estonian FQMS;
- Total Sales of Petrol and Diesel per year;
- Market Fuels used in Vehicles with Spark Ignition Engines: Petrol Regular – fuel grade 92;
- Market Fuels used in Vehicles with Spark Ignition Engines: Petrol Regular – fuel grade 95;
- Market Fuels used in Vehicles with Spark Ignition Engines: Petrol Regular – fuel grade 98;
- Market Fuels used in the Compression Ignition Engines: Diesel.

Further reports should be provided within the system, depending on the requirements and specifications of the participating users mentioned in activity 6.3.1.1. Some possible reports are listed in the following:

- List of filling stations by county including operators and companies;
- Statistics by counties, operators and companies;
- List of customers with samples taken;
- List of samples by date;
- Detailed information on samples.

It's the task of the Supplier to determine all existing requirements for reports in cooperation with the EERC and to make a proposal for the technical implementation.

The required reports can be generated as Excel charts for example, because they are usually statistical analyses. Reading access to the database will be done within Excel macros using "Visual Basic for Applications" (VBA). Also, a possibility exists for the users to enter selection parameters such as year, month or costumer number.

The use of Excel charts offers the advantages of a standard product (no other licence costs), E-Mail transmission and the subsequent electronic processing. Another possibility is the realisation of reports in the XML standard format (XML = Extensible Markup Language).

In any case the data confidentiality has to be guaranteed. This means that any user/stakeholder will have access to his sensitive data only. Access to the FQMS reporting tool must be controlled by an authentication process (e.g. username/password, identity card).

There are two categories of reports with regard to data confidentiality:

- Reports with descriptive or aggregate data and arbitrary access for the general public;
- Reports with confidential data such as sample analysis results, which have limited (controlled) access only by the original owner.

In addition to reports the FQMS system should generate standard formal letters (e.g letters to customers with the results of sample analyses or information of activities in case of non conformity) automatically. It can be carried out using Word documents in combination with dot-templates and assignments of database values by fields.

The implementation of parameterised SQL-queries or the use of a report generator (standard product) are additional facilities. The decision should depend on the reporting requirements of the participating users.

6.3.1.4 Data input, data coherence checks

Data Input

A LIMS system will be able to support the automatic transfer of analysis data to the FQMS database. At this stage laboratory equipment is not available and interfaces between database and equipment are not defined or unknown. Thus, it is recommended to enable manual input of data. It must be decided whether analysis data will be transferred to the database at each station or when all analyses are finished. The decision is dependent upon the workflow in the laboratory. This decision could influence the data model. The results of analyses could be stored in one database table or in a specific table for the specific equipment. A decision is necessary if additional information like date of analysis and responsible person are needed.

Repetition of Analyses

The result of an analysis could be invalid e.g. for technical reasons. If a sample is not compliant, a repetition of analysis is necessary to confirm the result. This causes more than one result for the same sample. A decision is needed if only the last and valid result must be stored or if all analyses are inserted into the database. If more than one result for the same sample is available in the database an additional sign is needed to mark the valid data set.

Data Coherence Checks

Before data will be stored validation is necessary. If data are transferred into the database manually, typing mistakes could occur. But even if the data are transferred to the database automatically a malfunction is possible.

One possibility to reduce the possibility of such mistakes is that a supervisor has to confirm data before they are finally stored into the database. If this option is chosen the application has to support this step. Another possibility is that at least some verification of the data is done automatically. These check procedures can be executed before the transfer of the data to the database takes place. Those procedures could also be started when necessary to check the data stored in the database.

Some possible data coherence checks could be:

- Number of negative numbers allowed;
- Specific quality parameter can only lie in a specific range of values, it must be contained in a list of values or must have a specific format; other entries are rejected;
- Correlation between specific quality parameters.

6.3.1.5 Identification of samples

Samples will be identified by barcodes within the laboratory. The barcode will be assigned by the laboratory personnel during registering the samples at the beginning of the analyses.

This barcode used in the laboratory should correspond to the code used in the FQMS database.

Thereby it is guaranteed that the analysis results can be assigned to the sample data in the FQMS system. Furthermore, the existing lab software will be able to support the automatic transfer of analysis data to the FQMS database.

This means that the FQMS manager is responsible for the specification of FQMS sample codes and laboratory barcodes. At least coordination with the laboratory personnel is required.

A draft proposal for a barcode is "2005-09-S-01-0002-03-92-12345" with the following meanings:

- 2005 - year;
- 09 - month;
- S - period (summer);
- 01 - stakeholder number;
- 0002 - filling station number;
- 03 - county number;
- 92 - fuel code;
- 12345 - number of the FQMS sample.

6.3.2 Guidelines for data exchange and security requirements

In the process of developing the FQMS system, data confidentiality, availability and integrity are to be observed, especially in respect of IT-security. The elaborated recommendations coverer the following items:

- Necessity of protocol about changes;
- Database administration,
  data backup,
  export and import of data (selective),
  user rights (specific roles);
- Interfaces,
  Internet, E-Mail,
  later: to other IT-systems.

6.3.2.1 Protocol about changes

Modern database systems dispose of protection mechanisms at several levels to prevent the use of databases by trespassers. Those mechanisms involve e.g. access controls, roles and authorisations as well as logging of accesses and occurrences.

In a multi user environment like the FQMS system, data changes and deletions of data records should be logged, as well as changes of roles and authorisations. Otherwise the causes are not reproducible in case of a safety-related event.

Thus, the following unsettled questions have to be resolved by the Supplier and the EERC before implementing protocol procedures:

- What actions (e.g. addition of sample) and what data (e.g. name of the user, date and time, what change happened) are to be logged?
- Where should protocol data be stored (database or external data file)?

- Who will be able to analyse or change the protocol data (protection from unauthorised access)?
- How long will protocol data be stored (automatic deletion after a period fixed or deletion by the administrator)?
- What legal acts exist in Estonia regarding access logging?

6.3.2.2 Database administration

The support of the database inside the FQMS application includes several administrative activities, which concern the theme IT-security in certain cases.

These activities include:

- Data saving and backup;
- Export and import of data;
- User rights.

The administration of the FQMS database demands both professional know-how (FQMS system, laboratory processes) and technical know-how, depending on selected database system. If the technical know-how is not available inside the EERC at a sufficient level, the technical support must be provided by external experts/developers (e.g. of the Supplier).

Data saving and backup

In addition to the purchase of any adequate backup software a backup concept should be elaborated to serve the FQMS application.

The following topics are to be specified and decided respectively in the backup concept:

- Automatic generation of backups;
- Generation of logical/physical complete copies;
- Selective extract of data to be saved responding date of creation or modifying;
- Logging of backup and recovery processes as well as information of the administrator;
- Which data will be backed up?
- When will data be backed up?
- On which medium will data be backed up?
- Where will the medium be stored?
- How will the data be backed up (incremental, differential, strategy)?
- How will data be restored?

Export and import of data

The FQMS system is a multi user application with several participating organisations (see also 6.3.1.1) who run their own IT-systems. Therefore, the FQMS application should provide functions or tools for easy data exchange with these organisations.

The administrators and accordingly qualified users must have the possibility to both export data from the database and import data into the database. The application should provide menu items and options for the selection of exporting or importing amounts of data. During the process, access authorisations naturally have to be considered. The export/import functions can also be used for backing up and restoring user data.

In the second step the provided standard formats are to be defined for data exchange between all parties concerned. The following formats are possible and should be supported:

- XLS- and CSV-files (Microsoft Excel) for data exchange;
- XLM-standard files for data exchange;
- Text files (ASCII format) for data exchange;
- PDF-files for mailing of unchangeable documents.

In case of Oracle databases DMP-files are a practical and advisable alternative.

User rights

In a multi user environment like the FQMS system high standards exist in terms of data confidentiality and integrity since varying end-users access the data using different interfaces (e.g. local network, Internet).

Therefore, the processed data must be classified in terms of inserts, updates, deletes and even analyses.

The following classes of data may exist:

- Key fields, updates only by the administrator;
- Descriptive data like names or addresses, public access;
- Private data like sales figures or analysis results, only for use by the data owner;
- Aggregate data (reports) for the European Commission and for public use.

With the realisation of the FQMS system the role and authorisation concept should be developed and implemented in the database. In this concept all access roles will be described and implemented later, which will be derived from the requirements of different user groups according the above data classes above. Every end-user will be assigned to one or more roles according to his/her duties and responsibilities in the FQMS environment. Thereby, the principle counts only to as many rights as essential. According to 6.3.2.1 changes of authorisation rights are to be logged.

The precondition for the described technique is that every end-user is registered in the FQMS database. It's the administrator's task to create and manage the user accounts in the application (username, original password, roles). Every user must authorise himself/herself against the database by entering his/her username and password, even when data are only analyzed data. Only in this way data confidentiality and integrity can be guaranteed in the complex FQMS system.

6.3.2.3 Interfaces

Internet, e-mail, later: to other IT-systems.

7 Component E. Quality Assurance and Accreditation

7.1 Activity E1. User manuals for the analysis and sampling equipment

The European Commission has established fuel quality standards that must be met by all Member States. Member States have already introduced monitoring systems based on common procedures for samples and testing.

The EU is financing the equipment for a national fuel laboratory within the Estonian Environmental Research Centre (EERC). This new laboratory shall be able to analyse relevant Fuel Quality Management System (FQMS) parameters. To fulfil the requirements of FQMS those laboratories shall have an EN ISO/IEC 17025 accreditation. The EERC holds already EN ISO/IEC 17025 accreditations but those are not including all relevant FQMS methods. One component of the Twinning project therefore is to prepare further relevant test methods including analytical methods and sampling procedures as standard methods and standard operating procedures.

7.1.1 Tasks and methods: User manuals for the analysis and sampling equipment

The Estonian Environmental Research Centre has the future task to analyse relevant parameters of gasoline and diesel in the field of quality control as part of the national FQMS of Estonia. The EERC holds accreditations where some of the necessary methods are already accredited. That means that for such methods so-called "Standard Operation Procedures (SOPs)" were already available. Also manuals and further information about the test methods including description of equipment were well described and documented. The necessity of precise documentation of procedures in this field is an EN ISO/IEC 17025 requirement. Under the activity E1 for proposed methods so-called "Standard Operating Test Method Handbooks (SOTs)" were prepared. Under this task, together with the standard operating procedures (SOPs) prepared under activity E2, basic documents useful for the daily work of the future fuel lab are made available. Prepared documents are regarded as starting documents that will be completed by Estonian colleagues once the fuel lab is put into operation.

Task of the activity E2 of the twinning project was to enlarge the list of test methods/SOPs according to relevant methods of FQMS. EERC prepared a list which contains those test methods for which SOPs are now available. The list is given below:

1. FAAS Analyser for detection of lead content in gasoline
   Standard: EN 237
   Equipment: Varian model AA240FS, SPS-3 autosampler, Spectra AA Pro software
2. GC analyser for hydrocarbon type content in gasoline
   Standard: EN 14517, ASTM D6293, 6839
   Equipment: Varian CP3800 PIONA+ system, Varian Galaxie workstation software with integrated PIONA+
3. GC analyser for detection of benzene content in gasoline
   Standard: EN 12177
   Equipment: Varian CP3800, Varian CP-8400 autosampler, Varian Galaxie Chromatographic software
4. GC analyser for detection of oxygen content and oxygenates in gasoline
   Standard: EN 13132
   Equipment: Varina CP3800, Varian CP-8400 autosampler, Varian Galaxie Chromatographic software

5. HPLC analyser for determination PAH in diesel
   Standard: EN 12961
   Equipment: Varian ProStar HPLC system with Varian ProStar 210 pump, RI detector
6. Wavelength dispersive X-ray spectrophotometric Sulphur analyser
   Standard: EN ISO 20884
   Equipment: Oxford Instruments MDX1060, MD17P, Oxford Instruments Expertase software
7. UV Fluorescense analyser for determination of sulphur
   Standard: EN ISO 20846
   Equipment: Antec model 9000LLS
8. Density measurement equipment
   Standard: EN ISO 12185
   Equipment: Anton Paar model DMA 4500, model SP-3m autosampler
9. Bath and hydrometers equipment for density measurement acording to EN ISO 3675 test method
   Standard: EN ISO 3675
   Equipment: Selecta model Digit-Cool constant temperature bath and general fuel laboratory equipment
10. Automatic apparatus for distillation of gasoline
    Standard: EN ISO 3405
    Equipment: Herzog model HDA628
11. Automatic apparatus for destillation of diesel fuel
    Standard: EN ISO 3405
    Equipment: Herzog model HDA628
12. Automated vapour pressure measurement apparatus
    Standard: EN 13016-1
    Equipment: Herzog model HVP972
13. Apparatus for determination of oxidation stability of gasoline
    Standard: ISO 7536
    Equipment: Petrotest model OBA-1
14. Copper strip corrosion apparatus
    Standard: ISO 2160
    Equipment: Petrotest
15 Gum content in gasoline apparatus
    Standard: ISO 6246
    Equipment: Herzog model HGT917
16. Automatic flash point apparatus
    Standard: ISO 2719
    Equipment: Herzog model HFP360
17. Apparatus for carbon residue in diesel
    Standard: ISO 10370
    Equipment: Alcor model MCRT 160
18. Apparatus for determination of ash content in diesel
    Standard: ISO 6245
    Equipment: general fuel laboratory equipment
19. System for measuring of water content in diesel
    Standard: ISO 12937
    Equipment: ISL model KFP 5G2 Karl Fischer titrator
20. System for determination of contamination in diesel
    Standard: EN 12662
    Equipment: general fuel laboratory equipment
21. Apparatus for measuring of oxidation stability of diesel
    Standard: ISO 12205
    Equipment: Stanhope-Seta 16900-4 Seta oxidation bath with Oxflo controller

22. Diesel lubricity apparatus
    Standard: ISO 12156
    Equipment: PCS Instrument
23. Automatic Viscometer
    Standard: EN ISO 3104
    Equipment: Herzog model HVU481
24. Apparatus for measurement of diesel cold flow plugging point (CFPP)
    Standard: EN116
    Equipment: ISL model CPP97-2 with CFPP heads
25. Apparatus for determination of cloud point of diesel fuels
    Standard: EN 23015
    Equipment: ISL model CPP97-2 with 2 CP measuring heads
26. FTIR analyser for FAME content in diesel fuels
    Standard: EN 14078
    Equipment: Shimadzu model IPPrestige-21
27. Equipment for measuring Octane number (RON/MON)
    Standards: EN ISO 5164 and 5163
    Equipment: Waukesha model F1/F2 CFR F-2U combination method octane rating unit
28. Equipment for measuring Cetane number
    Standards: EN ISO 5165
    Equipment: Waukesha model CFR5 CFR F-5 cetane method diesel rating unit
29 General sampling equipment for the collection of fuel samples from various sampling points
    Standards: EN ISO 3170, EN ISO 3171

Under activity E1 for the above mentioned methods the related technical manuals, the so-called SOTs, were prepared.

7.1.1.1 User manuals for the analysis and sampling equipment

Standard operating test manuals (SOTs) are structured as follows:

1 Test method
1.1 Guideline
1.2 Standard operating procedure (SOP)
1.3 Standards and reference materials
1.4 Solvents and chemicals
1.5 Calibration/Quality assurance
1.6 Intercalibration/Round robin test
1.7 Safety procurements
2 Equipment
2.1 Manual
2.2 Operation advices/Instructions
2.3 Spare parts and consumables
2.4 Service and maintenance

SOTs are normally prepared by staff of the organisation unit e.g. from the working areas they operate the test methods or the equipment or sampling. As it is shown in the SOT structure it is clear that some chapters cannot be finished until the laboratory is working. Thus it will be done by EERC staff.

As an example of SOT for an analytical test method "12. Automated vapour pressure measurement apparatus; Standard: EN 13016-1; Equipment: Herzog model HVP972" is described. See annex 1 in the end of this chapter.

The other SOTs are following these scheme.

Overview about processed SOTs

No	Title	SOT processed
1	FAAS Analyser for detection of lead content in gasoline Standard: EN 237	X
2	GC analyser for hydrocarbon type content in gasoline Standard: EN 14517, ASTM D6293, 6839	X
3	GC analyser for detection of benzene content in gasoline Standard: EN 12177	X
4	GC analyser for detection of oxygen content and oxygenates in gasoline Standard: EN 13132	X
5	HPLC analyser for determination PAH in diesel Standard: EN 12961	X
6	Wavelength dispersive X-ray spectrophotometric Sulphur analyser Standard: EN ISO 20884	X
7	UV Fluorescense analyser for determination of sulphur Standard: EN ISO 20846	X
8	Density measurement equipment Standard: EN ISO 12185	X
9	Bath and hydrometers equipment for density measurement acording to EN ISO 3675 test method Standard: EN ISO 3675	X
10	Automatic apparatus for distillation of gasoline Standard: EN ISO 3405	X
11	Automatic apparatus for destillation of diesel fuel Standard: EN ISO 3405	X
12	Automated vapour pressure measurement apparatus Standard: EN 13016-1	X
13	Apparatus for determination of oxidation stability of gasoline Standard: ISO 7536	X
14	Copper strip corrosion apparatus Standard: ISO 2160	X
15	Gum content in gasoline apparatus Standard: ISO 6246	X
16	Automatic flash point apparatus Standard: ISO 2719	X
17	Apparatus for carbon residue in diesel Standard: ISO 10370	X
18	Apparatus for determination of ash content in diesel Standard: ISO 6245	X
19	System for measuring of water content in diesel Standard: ISO 12937	X
20	System for determination of contamination in diesel Standard: EN 12662	X
21	Apparatus for measuring of oxidation stability of diesel Standard: ISO 12205	X
22	Diesel lubricity apparatus Standard: ISO 12156	X
23	Automatic Viscometer Standard: EN ISO 3104	X
24	Apparatus for measurement of diesel cold flow plugging point (CFPP) Standard: EN116	X
25	Apparatus for determination of cloud point of diesel fuels Standard: EN 23015	X

No	Title	SOT processed
26	FTIR analyser for FAME content in diesel fuels Standard: EN 14078	X
27	Equipment for measuring Octane number (RON/MON) Standards: EN ISO 5164 and 5163	X
28	Equipment for measuring Cetane number Standards: EN ISO 5165	X
29	General sampling equipment for the collection of fuel samples from various sampling points Standards: EN ISO 3170, EN ISO 3171*	X

* EN ISO 3171: Pipeline sampling was not considered because of no experience in this

7.1.2 Conclusion

The output of activity E1 "User manuals for the analysis and sampling equipment" was achieved under the given circumstances (no running fuel laboratory). For the required test methods so-called "Standard Operating Test Method Handbooks" as well as the "Standard Operation Procedures" (see activity E2) are available. With this documentation the Estonian colleagues have basic standard documentation to proceed and to adopt other relevant test methods in a similar form.

Because the fuel lab is not running up to now basic data for documentation is still missing (e.g. calibration, validation). Once when this data are available the Estonian colleagues can complete the SOTs. During training units that will take place at the new fuel lab (see Twinning Component C, activity C1) data will be produced in such a way that all present imperfections can be removed.

Annex 1.

Standard operation test method handbook - SOT

According to EVS – EN ISO / IEC 17 025

Liquid petroleum products – Vapour pressure – Part 1 :

EVS – EN 13 016 – 1

Determination of the air saturated vapour pressure

(ASVP)

EVS – EN 13 016 – 1:

Determination of the air saturated vapour pressure (ASVP)

Content:

A.3 operational advices
A.4 calibration
A.5 standards and reference materials
A.6 solvents and chemicals
A.7 intercalibrations / Round Robins
A.8 safety precautions

B equipment / instrument manual
B.1 technical data
B.2 manual
B.3 operational advices / instructions
B.4 spare parts and consumables
B.5 service and maintenance

A Test method

According to EVS – EN ISO / IEC 17 025

Liquid petroleum products – Vapour pressure – Part 1 :

EVS – EN 13 016 – 1

Determination of the air saturated vapour pressure (ASVP)

A.1 Guideline: EVS EN 13 016 – 1

Append the latest standard

A.2 Standard operation procedure SOP

Liquid petroleum products – Vapour pressure

EVS – EN 13 016 – 1: Determination of air saturated vapour pressure (ASVP)

Contents:

1. Scope
2. Principle
3. Standards and chemicals
4. Apparatus
5. Analytical procedure
6. Data handling and processing
7. Test report
8. Environmental and safety regulations

1. Scope

The method specifies the determination of the total vapour pressure, exerted in vacuo, by volatile, low viscosity petroleum products or components, containing air.

It is suitable for testing air-saturated samples that exert an air saturated vapour pressure of between 9,0 and 150,0 kPa at 37,8 °C (= 100 °F).

2. Principle

A cooled, air-saturated sample of known volume is injected into an evacuated chamber or into a chamber, formed by a piston at time of injection of the sample. The sample is kept in a thermostatically controlled environment at the required vapour-to-liquid ratio of 4 : 1. The resulting total pressure is equivalent to the sum of vapour pressure of the sample plus partial pressure of the dissolved air. It is measured by using a pressure sensor and indicator.

3. Standards and chemicals

3.1. Calibration material

The pressure sensor is calibrated by using two reference points: zero pressure and ambient barometric pressure, which has to be corrected for temperature. For details see EN 13 016 – 1, chapter 9.1.1.. This has to be done monthly or when required.

3.2.Reference material

The performance of the device is checked daily by testing a pure hydrocarbon of known vapour pressure. Possible materials are:

	ASVP in kPa	**DVPE in kPa**
	at 37,8 °C	at 37,8 °C
n-pentane	112,1	104,4
cyclopentane	72,7	66,4
2,2-dimethylbutane	73,4	67,1
2,3-dimethylbutane	57,4	51,6
methanol*	38,9	33,6
toluene	12,9	8,7

* When using methanol as test-material, rinse the device very carefully several times to avoid false results.

There are no defined mixtures for the determination of vapour pressure. Round Robin samples can only be used, if the intention of running this determination is known ahead, so that samples are stored (cooled conditions) for this purpose.

After opening the container, Round Robin samples can only be used once. Furthermore lifetime of these samples is limited.

3.3. Solvents, chemicals

Clean, unleaded fuel for preliminary purification

Acetone, technical grade, no residue

4. Apparatus

Type of instrument: Herzog HVP 972

The test chamber with the provision for the sample injection shall be vacuum-tight. It shall be capable of containing between 5 ml and 15 ml of liquid and vapour with an accuracy of 1 %.

5. Analytical procedures

5.1. Sampling

Samples shall be drawn in accordance with EN ISO 3170. Do not use water displacement technique. EN ISO 3171 is recommended with a variable volume sample receiver for sampling and for transportation only.

The recommended container has a volume of 1 litre, with a minimum level of 70 % (V/V).

A separate container for the determination of the vapour pressure is recommended, but further analysis after this analysis is possible. If the determination of the vapour pressure of a customers sample is ordered after other analysis this has to be mentioned in the test report. Then the analysis is not carried out according to the standard (see 5.2.).

5.2. Sample preparation

The vapour pressure shall be the first test on a sample. Before opening a sample container, it has to be cooled down to between 0 °C and 1 °C product temperature. After cooling and before opening, wipe the container dry. No (liquid) water shall come into the sample.

Open the container carefully and examine the sample appearance and the product level. The level has to be between 70 % (V/V) and 80 % (V/V). If it is more than 80 % (V/V), you can pour out the excess. If it is less than 70 % (V/V), the sample can not be used for an analysis according to the standard.

If the level is within the specification, reseal the container and cool it again down to between 0 °C and 1 °C product temperature.

Remove the container from the cooling equipment, dry it, unseal it (careful, no water), reseal it, shake it vigorously, and return to cooling again. Repeat 2 times to achieve a air-saturated sample.

5.3. Measuring

Rinse the instrument at least once or twice with product to avoid effects form former samples.

Start measuring (automatic sampling and running the test sequence).

Check the sample for irregular behaviour (i.e. not clear and bright sample or phase separation)

6. Data handling and processing

6.1. Expression of results, precision

Report the value to the nearest 0,1 kPa.

Repeatability: r = 0,388 x {ASVP}
Reproducibility: R = 0,776 x {ASVP}

6.2. Further calculations

If required, an equivalent dry vapour pressure equivalent can be calculated by the following equation:

DVPE = (0,965 x ASVP) – 3,78 all values in kPa ,

using the measured, non corrected ASVP value.

The Vapour Lock Index can be calculated with the values:

DVPE in kPa and volatility at 70 °C in %(V/V), (E70, EN ISO 3405) by the equation:

VLI = 10 x {DVPE} + 7 x {E70}

7. Test report

According to EN 13 016 – 1, the test report shall contain:

- Product type and label of the tested sample;
- A reference to this European standard;
- The sampling procedure;
- The result of the test;
- Any deviation from the procedure described;
- Date of the test.

For further details please see QMH.

8. Environmental protection and job safety

- Mind the general instructions of laboratory practice and the instructions for handling with hazardous material;
- Gasoline and gasoline vapour are highly flammable;
- Gasoline vapour can be narcotic;
- Gasoline vapour is heavier than air and can accumulate at the bottom;
- Benzene is a carcinogenic compound.

A.3 Operational advices

- Cool the sample in a refrigerator for a sufficient long time or in an ice-water bath to achieve a product temperature of between 0 °C and 1 °C;
- In case of more than one point of analysis: Vapour pressure first!

A.4 Calibration

A.4.1 Calibration material

The pressure sensor is calibrated by using two reference points: zero pressure and ambient barometric pressure, which has to be corrected for temperature.

Temperature in °C	Pressure correction to measured value in kPa
10 – 19	- 0,1
20 – 29	- 0,2
more than 30	- 0,3

Calibration frequency: monthly or on demand

A.4.2 Reference material

The performance of the device is checked daily by testing a pure hydrocarbon of known vapour pressure. Possible materials are:

	ASVP in kPa	DVPE in kPa
	at 37,8 °C	at 37,8 °C
n-pentane	112,1	104,4
cyclopentane	72,7	66,4
2,2-dimethylbutane	73,4	67,1
2,3-dimethylbutane	57,4	51,6
methanol *	38,9	33,6
toluene	12,9	8,7

Test frequency: daily or on demand

A.4.3 Thermometer check

Temperature measuring devices are to be checked every 6 months against a calibrated device.

A.4.4 Values off limit

Test results have to be with the range of the repeatability of the nominal value.

In case of values off limit follow the listed steps:

1. Carry out the test again.
2. Carry out with a different operator to exclude personal effect.
3. Test a different standard / testing material to exclude effects of a defect standard.
4. Check your instrument according the trouble shooting advices of the manufacturer.
5. Service by the manufacturer or authorized service man.

Daily Test, Nominal Value – Actual Value

Pressure values in kPa

Date	n-pentane	Cyclo-pentane	2,3-DM-butane	2,2-DM-butane	Methanol	Toluene	Signature
Nominal value	**112,1**	**72,7**	**73,4**	**57,4**	**38,9**	**12,9**	

Calibration, Nominal Value – Actual Value

Pressure values in kPa

Date	Nominal value	Measured value	Barometric value	Measured value	Calibration successful yes / no	Service yes / no	Signature
	< 0,1						
	< 0,1						
	< 0,1						
	< 0,1						

Thermometer check, Nominal Value – Actual Value

Values in °C

Date	Nominal value	Actual value	Check success-ful yes / no	Signature

A.5 Standard and reference material

Product	purity	supplier
n-pentane	purity min. 99 %	
cyclopentane	purity min. 99 %	
2,2-dimethylbutane	purity min. 99 %	
2,3-dimethylbutane	purity min. 99 %	
methanol	purity min. 99 %	
toluene	purity min. 99 %	

Due to the bad long-running stability Round Robin samples and hydrocarbon-mixtures are not recommended as standards.

A.6 Solvents and chemicals

Product	purity	supplier
Clean, unleaded fuel	for preliminary purification	
Acetone	technical grade, no residue, for purification	
Water	tab water, no settling, for purification	
Compressed air	free of oil and water, for purification	

A.7 Intercalibrations / Round Robins

To be appended when available

A.8 Safety precautions

- Mind the general instructions of laboratory practice and the instructions for handling with hazardous material;
- Gasoline and gasoline vapour are highly flammable;
- Gasoline vapour can be narcotic;
- Gasoline vapour is heavier than air and can accumulate at the bottom;
- Benzene is a carcinogenic compound.

B Equipment / Instrument manual

According to EVS – EN ISO / IEC 17 025

Liquid petroleum products – Vapour pressure – Part 1 :

EVS – EN 13 016 – 1

Determination of the air saturated vapour pressure (ASVP)

B.1 Technical data

Instrument label:	HVP 972	
Instrument manufacturer:	Walter Herzog GmbH www.walter-herzog.com	
Serial-Number:	To be appended when available	
Technical data:	Resolution:	0,1 kPa
	Accuracy:	0,2 kPa
	Pressure Range:	0 – 1.000 kPa
Power supply:	100 – 240 V / 50 – 60 Hz 100 W	

Short description by the manufacturer:

- Compact and self-contained instrument for precise vapour pressure measurement;
- ASTM D 5191; D 6378; EN 13016; IP 394; IP 481;
- Simple, low-cost operation;
- Fast and fully automated measuring cycle;
- Standard or user-selected operation parameters;
- Detailed on-screen report and integral result database.

Provides quick, accurate results of vapour pressure up to 1,000 kPa (145 psi) within a temperature range of 0°C (32°F) to 100°C (212°F). Backed by state-of-the-art technology and highest quality design, the HVP 972 increases test productivity with perfect repeatability and reproducibility. Calibration history and quality-check tracking assure complete results traceability and meet rigorous quality assurance requirements.

The Herzog HVP 972 is ideal for volatility specification compliance testing, refining streams quality follow-up, fuel blending, research or mobile applications, for both automotive and aviation gasoline, turbine fuels, other light distillate petroleum products, light crude oil, hydrocarbon solvents and chemical compounds.

Appendix: Calibration certificate by the manufacturer.

B.2 Manual

To be appended when available.

Enclosure or reference to external file.

B.3 Operational advices / instructions

To be appended when available.

B.4 Spare parts and consumables

To be appended when available.

B.5 Service and maintenance

To be appended when available.

According to guidelines of the manufacture.

7.2 Activity E2. Preparation of standard methods for the equipment to be procured under the project

7.2.1 Tasks and methods: prepare standard methods and standard operation procedures for the laboratory and sampling equipment to be procured under the Twinning project

Under activity E1 of the Component E user manuals for the analysis and sampling equipment have been prepared. The combination of all this information resulted in a so-called "Standard Operating Test Method Handbook (SOT)".

Task of the activity E2 of the twinning project was to enlarge the list of test methods and SOPs according to FQMS. Therefore those methods and SOPs which are combined under activity E1 in the SOT were prepared.

EERC prepared a list which contains the test methods that are now available (see also list in 7.1.1).

7.2.1.1 Prepare standard methods and standard operation procedures for the laboratory and sampling equipment to be procured under the project

The following table shows the processed SOPs. Single chapters that complete the documentation when the EERC fuel lab is equipped and able to deliver e.g. data or other relevant details will be added by EERC staff later on. Parts where theoretical examples are added by the German experts and that shall be exchanged later on when the laboratory is running are written in red letters. The SOPs are available at EERC as printouts and in electronical version. At the moment they are not translated into Estonian language. This should be done when the laboratory is put into operation and remarks and laboratory hints are added.

As a muster for a SOP the standard operation procedure for "1. FAAS Analyser for detection of lead content in gasoline; Standard: EN 237; Equipment: Varian model AA240FS, SPS-3 autosampler, Spectra AA Pro software" is described. See annex 1 in the end of this chapter.

Overview about processed SOPs

No	Title	SOP processed
1	FAAS Analyser for detection of lead content in gasoline Standard: EN 237	X
2	GC analyser for hydrocarbon type content in gasoline Standard: EN 14517, ASTM D6293, 6839	X
3	GC analyser for detection of benzene content in gasoline Standard: EN 12177	X
4	GC analyser for detection of oxygen content and oxygenates in gasoline Standard: EN 13132	X
5	HPLC analyser for determination PAH in diesel Standard: EN 12961	X
6	Wavelength dispersive X-ray spectrophotometric Sulphur analyser Standard: EN ISO 20884	X
7	UV Fluorescense analyser for determination of sulphur Standard: EN ISO 20846	X
8	Density measurement equipment Standard: EN ISO 12185	X
9	Bath and hydrometers equipment for density measurement acording to EN ISO 3675 test method Standard: EN ISO 3675	X
10	Automatic apparatus for distillation of gasoline Standard: EN ISO 3405	X
11	Automatic apparatus for destillation of diesel fuel Standard: EN ISO 3405	X
12	Automated vapour pressure measurement apparatus Standard: EN 13016-1	X
13	Apparatus for determination of oxidation stability of gasoline Standard: ISO 7536	X
14	Copper strip corrosion apparatus Standard: ISO 2160	X
15	Gum content in gasoline apparatus Standard: ISO 6246	X
16	Automatic flash point apparatus Standard: ISO 2719	X
17	Apparatus for carbon residue in diesel Standard: ISO 10370	X
18	Apparatus for determination of ash content in diesel Standard: ISO 6245	X
19	System for measuring of water content in diesel Standard: ISO 12937	X
20	System for determination of contamination in diesel Standard: EN 12662	X
21	Apparatus for measuring of oxidation stability of diesel Standard: ISO 12205	X
22	Diesel lubricity apparatus Standard: ISO 12156	X

No	Title	SOP processed
23	Automatic Viscometer Standard: EN ISO 3104	X
24	Apparatus for measurement of diesel cold flow plugging point (CFPP) Standard: EN116	X
25	Apparatus for determination of cloud point of diesel fuels Standard: EN 23015	X
26	FTIR analyser for FAME content in diesel fuels Standard: EN 14078	X
27	Equipment for measuring Octane number (RON/MON) Standards: EN ISO 5164 and 5163	X
28	Equipment for measuring Cetane number Standards: EN ISO 5165	X
29	General sampling equipment for the collection of fuel samples from various sampling points Standards: EN ISO 3170, EN ISO 3171*	X

* EN ISO 3171: Pipeline sampling was not considered because of no experience in this field

7.2.2 Conclusion

The output of activity E2 "Standard methods and standard operation procedures for the laboratory and sampling equipment to be procured under the project" was achieved under the given circumstances (no running fuel lab). The required SOPs are available. With this documentation the Estonian colleagues have basic standard documentation to proceed and to adopt other relevant test methods in the same form.

Because the fuel lab is not running up to now basic data for documentation is still missing (e.g. calibration, validation). During training units that will take place at the new fuel lab (see component C, activity C1) data will be produced in such a way that all present imperfections can be removed. At the end the SOPs shall be translated into Estonian.

Annex 1

Standard operation procedure - SOP

Liquid petroleum products – Petrol – Determination of low lead concentrations by atomic absorption spectrometry

EVS – EN 237: Liquid petroleum products – Petrol – Determination of low lead concentrations by atomic absorption spectrometry

Contents:

9. Scope

The method specifies an atomic spectrometric test method for the determination of the lead content of petrol in the range 2,5 mg/l to 10,0 mg/l. The test method is independent of the lead alkyl type.

10. Principle

The sample, diluted to the tenth (V/V) with methyl isobutyl ketone and treated with iodine, is aspirated into the air/acetylene flame of an atomic absorption spectrometer. The absorbance is measured at a wavelength of 217,0 nm and is compared with that of calibration solutions of known lead concentrations.

11. Standards and chemicals

11.1. Calibration material

For calibration certified reference material which certified lead content is available and shall be used. Traceability assumed, calibration is also allowed by using self made calibration solutions.

11.2. Reference material and standards

Lead(II)-acetate-3-hydrate, $Pb(CH_3COO)_2$ 3 H_2O pro analysis.

Intercalibration retain samples with specified lead content.

Secondary working standard shall be used. Make sure that the materials are contamination free handled and stored and that the storage conditions are appropriate.

11.3. Solvents, chemicals

Further details and further chemicals please refer to the guideline.

- acetic acid (purity min. 99%)
- toluene (purity min. 99%)
- 2-propanol (purity min. 99%), remark: don´t use technical isopropanol!
- acetone
- methyl isobutyl ketone
- iso-octane (ASTM grade)
- iodine crystals doppel sublimated
- gases: acetylen and compressed air (oil free)

12. Apparatus

Only the atomic absorption spectrometer is described. For further information about normal laboratory equipment refer to the guideline.

Make sure that you are familiar with the use of compressed gases in this case especially with acetylene!

- Atomic spectrometer: Varian AA 240 FS

General description is given below; see also manifacturers handbook and www.varianinc.com.

About the AA 249 FS:
The Varian AA240 is a mid-range instruments which offer a high level of automation and easy-to-use software. The PC-controlled true double beam AA240 AA system combines the rugged and reliable hardware of the SpectrAA 50/55 with our acclaimed Windows based worksheet software, using multi-tasking capabilities to start today's analysis while simultaneously preparing a report on yesterday's results.

Full automation is possible:
- Fully automatic wavelength and slit selection simplifies operation, even for new users;
- Four fixed lamp positions that make lamp changes quick and reliable;
- A 'next lamp' warm-up facility that saves analysis time.

Background correction:
- The high intensity deuterium background corrector features:
  - A fast 2 ms response time, ensuring accurate correction of transient background signals;
  - The ability to adjust or replace the lamp without removing the instrument covers.

Flame atomization system:
The Varian AA140/AA240 are fitted with the Mark 7 flame atomization system as standard. The Mark 7 spray chamber is extremely simple to use, with 'twist and lock' assembly and plastic components for durability. The Mark 7 burner continues Varian's long tradition of burner excellence.

Working environment:
No matter what your environment, the Varian AA140/240 has features to suit:
completely sealed optics with quartz overcoated mirrors offer protection in dusty or corrosive environment the air purge system is fitted inside the instrument, eliminating the chance of corrosion in rugged or corrosive environments.

13. Analytical procedures and quality assurance

13.1. Sampling

Samples shall be drawn in accordance with EN ISO 3170 and EN ISO 3171.

13.2. Sample preparation and procedure

The relevant details are described in the guideline. Make sure that the recommendations of the guideline are strictly followed. In a short form the sample preparation is repeated:

For analysing test samples the original sample is diluted by a factor of 10 using mainly methyl isobutyl ketone and a mixture from toluene and iso-octane. The same dilution step will be made with the calibration standards. Once the AAS is properly working a sample sequence will be measured. To check

system performance during a sequence a control sample with a known amount of lead (e.g. 2 mg/l) shall be analysed. With this control sample the stability of the system during the measuring cycle can be controlled. All results have to be documented accurately.

Here some notes are repeated:

- Note and record the temperature at which all volumetric measurements are made. Usually volumetric glassware is calibrated at 20°C. Volumetric measurements shall be done at temperatures between 18 °C to 22 °C. Prepare solutions first, when they are thermostated;
- The concentrated lead standard stock solution (1000 mg/l) can be stored in the refrigerator for 6 month. Document the day of production and the expiry day on the bottle and in paper form;
- The diluted lead standard stock solution (100 mg/l) can be stored in the refrigerator up to 6 month. Document the day of production and the expiry day on the bottle and in paper form;
- The lead standard solutions (several concentration levels up to 10 mg/l) can be stored in the refrigerator up to 14 days. Document the day of production and the expiry day on the bottle and in paper form;
- Prepare the calibration solutions and the test solution on the same day and measure on that day. This dilutions of the lead standard solutions as well as the dilution of the test sample shall not be stored and measured on the next day. Document the preparation, to show, that it is traceable, that standards are freshly diluted on the same day as the measurement of the test sample is performed;
- Be sure, that your results are within the linear working range of the method;
- If you used the AAS for measurements of aqueous samples, you have to fit it to the organic matrix, when measuring lead in gasoline. Condition the sample introduction and the burner firstly with acetone and secondly with isopropanol for several minutes. At the same time adopt the gas flow to the needs of organic matrix;
- If you used the AAS for measurements of aqueous samples, you have to fit it to the organic matrix. Change the waste container;
- If you have no stabile zero-point, check the level of gas in the acetylen gas-bottle.

13.3. Quality assurance

Responsible for calibration or the system check is the head of the organisation unit were the method is adopted.

Make sure that responsibilities are clear and a solution for a personal representative is lead down.

Check intervals:

- During every sequence a control standard is measured. The concentration of this control standard is 2 mg/l (which means for a sample with dilution factor 10 : 20 mg/l). Fill in the result in a control sheet. The tolerance is max. 10 %. If you find a out of control situation, prepare a new control standard and check the result. If the out of control situation is confirmed, prepare new lead calibration calibration standards, as described in the guideline. Repeat procedure still you know, that your standards fulfil the requirements;
- If the results does not conform tolerance requirements and a SWS has been used for the verification, examine the apparatus. Inform the head of the organisation unit, to decide about the further steps;
- Make sure that all documentations are well done and allow traceability;
- Make sure that all balances and pipettes are tested in regular time frames and document the results.

14. Data handling and precision

Calculation is done as described in the guideline. The results were expressed in milligrams per litre. Make sure that the mathematical temperature correction is done.

Report the lead concentration to the nearest 0,1 mg/l.

On a basis of intercalibration study the precision statement is given. With lead samples with an average lead content of 5 mg/l the intercalibration was performed.

Repeatability and reproducibility

Mass concentration of lead in sample in mg/l	Repeatability r in mg/l	Reproducibility R in mg/l
Between 2,5 and 10,0	0,12	0,62

15. Test report

According to EVS-EN 237, the test report shall contain:

- Product type and label of the tested sample;
- A reference to this European standard;
- The result of the test;
- Any deviation from the procedure described;
- Date of the test.

For further details please see QMH.

16. Environmental protection and operational safety

- Mind the general instructions of laboratory practice and the instructions for handling with hazardous material;
- Gasoline and gasoline vapour are highly flammable;
- Gasoline vapour can be narcotic;
- Gasoline vapour is heavier than air and can accumulate at the bottom;
- Benzene is a carcinogenic compound;
- Take care of measures of safety (e.g. safety glasses, closed exhauster windows, etc.);
- Be sure you are familiar with handling pressurised gas bottles.

7.3 Activity E3. EERC quality manual for accreditation and certification

The EU is financing the equipment for a national fuel laboratory within the Estonian Environmental Research Centre (EERC). This new laboratory shall be able to analyse relevant Fuel Quality Management System (FQMS) parameters. To fulfil the requirements of FQMS those laboratories shall have an EN ISO/IEC 17025 accreditation. The EERC holds already EN ISO/IEC 17025 accreditations, but those are not including all relevant FQMS methods. One component of the twinning project therefore is to update the existing accreditation (accreditation enlargement) with FQMS relevant methods.

7.3.1 Analyse the chapter on fuel in the general quality manual of the EERC and give relevant amendments

The EERC holds accreditation since more than ten years and runs an established quality management. According to this the EERC fulfils the requirements of the guideline EN ISO/IEC 17025. The task of the unit E3 was mainly to give amendments to the existing Quality Management Handbook (especially the chapter of fuel) of the EERC that should give hinds to the responsible staff of EERC to

revise the Quality Management Handbook (QMH) in such a way that the new fuel lab is integrated and the QM e.g. the QMH can be prepared for upgrading. In the general parts of the QMH only few corrective actions are necessary.

A table with amendments to the different chapters of the QMH was prepared. The amendments were classified in facultative and obligatory. Obligatory modifications of the QMH are related to those chapters that have to be revised due to the fact, that the new Fuel lab will have new tasks and responsibilities. The head of the EERC decided earlier that the structure of the revised QMH should be in the same way than that of the Customs laboratory which is included in the accreditation by Estonian Accreditation Center (EAS). On the basis of this QMH the amendments were made.

During the revision of the QMH attention should be paid that mostly general QM information is described in the level 1 document. Details that can change quickly should be described/regulated in level 2 and level 3 documents. The advantage is that it is not necessary to revise the level 1 document very often. An easy example for that is section 03 chapter 3.3.1: Within this chapter a link is given within the QMH citing page numbers, which means, that when ever changes are made in the QMH the document have to be proofed if such a link is further on valid which might be overlooked.

The following remarks/amendments should be considered merely as suggestions. The table gives an overview about the amendments to the different section of the QMH (CSL version). Before giving the amendments the content of the main part of the QMH of the EERC is shown. The fully documentation with all related further documents that build up the quality management of the EERC consists of several hundred pages.

CONTENT of the main part of the quality manual of the EERC

Section 4 EERC Management

General

4.1 Duties and responsibilities of Management
- 4.1.1 Managing Director
- 4.1.2 Vice director A
- 4.1.3 Vice director B
- 4.1.4 Technical Manager
- 4.1.5 Quality Manager (Head of Methodical Dept.)
- 4.1.6 Finance Director
- 4.1.7 Heads of Laboratories and Groups

4.2 Qualification and training of personnel
- 4.2.1 Training of new employees
- 4.2.2 Retraining of personnel

Section 5 Accommodation and Environmental Conditions

5.1 Accommodation and environmental conditions
5.2 Housekeeping
5.3 Destination of the rooms, charts of sites and floors

Section 6 Analytical Methods in the EERC

6.1 Definitions, abbreviations and symbols
6.2 General considerations in choosing analytical systems
6.3 Directory of analytical methods in EERC (Environmental chemistry)
6.4 Introductions of new analytical methods

Section 7 Validation of Performance Characteristics of Analytical Systems

7.1 General
7.2 Performance characteristics
- 7.2.1 Selectivity
- 7.2.2 Specificity
- 7.2.3 Range
- 7.2.4 Linearity
- 7.2.5 Sensitivity
- 7.2.6 Limit of Detection
- 7.2.7 Limit of Quantification
- 7.2.8 Accuracy
- 7.2.9 Precision
- 7.2.10 Repeatability
- 7.2.11 Reproducibility
- 7.2.12 Evaluation of method bias using the t-test
- 7.2.13 Measurement uncertainty

Section 8 Quality Control in EERC analytical Laboratories

8.1 Quality Control (QC) definitions
8.2 Quality Control activities
- 8.2.1 Internal Quality Control (IQC)
  - 8.2.1.1 Control of trueness (X-chart, blank control chart, recovery control D-, d%-charts)
  - 8.2.1.2 Control of precision (range control charts: replicate analyses R-, r%-charts)
- 8.2.2 Measures to be taken in out-of-control situations
  - 8.2.2.1 Elimination of gross errors
  - 8.2.2.2 Elimination of systematic errors

8.2.3 Plausibility Control
8.2.4 Criteria for the revision of control charts
8.2.5 External QC. Between laboratory QC.

Section 9 Sampling, sample handling, and preparation. Test report
9.1 General principle
9.1.1 Sampling
9.1.2 Requirements for sampling containers (for Customs)
9.1.3 Preservation, transportation and storage of samples
9.2 Reception and registration of samples
9.2.1 Reception
9.2.2 Registration of the results
9.3 Report generation. Database of the results
9.4 Disposal of sample residues
9.5 Preservation of samples

Section 10 Reference materials and Chemicals
10.1 General
10.2 Reagents
10.3 Chemical standards and Reference Materials
10.4 Certified standards
10.5 Disposal of chemicals and test samples

Section 11 Equipment and facilities
11.1 Registration of equipment
11.2 Purchase and maintenance of equipment
11.3 Installation and release of new equipment
11.4 Storage of defective equipment
11.5 Calibration of equipment

Section 12 Calibration
12.1 General
12.2 Programmes of calibration /verification
12.3 Measuring standards and calibrating solutions
12.4 Registration of calibration. Guidelines
12.5 Calibration of testing instruments
12.6 Control of the working ambient

Section 13 Use of computers
13.1 Introduction
13.2 Computer network
13.3 Database system for sampling and analyses
13.4 Computer supplied instrumentation
13.5 Quality control sofware
13.6 Microprocessor controlled instruments
13.7 Confidentiality measures in the EERC's network

Section 14 Health and fire protection
14.1 General
14.2 Requirements of health safety and fire protection
14.2.1 Health safety instructions
14.2.2 Responsibilities for safety and instructing

Section 15 Documentation

15.1 General
15.2 Document and Data Approval and Issue
15.3 Document and data changes
15.4 Records of analytical results
15.5 Retention periods for documentation

Amendments to the existing QMH of EERC under special consideration of the extension of business in the Fuel lab.		
Chapter in EERC QMH (Custom lab version)	**Implementation**	
	Facultative	**Obligatory**
Section 00	Amendment 1	
Section 01		
Section 02		
Section 03		Amendment 2
Section 04		Amendment 3
Section 05		Amendment 4
Section 06		Amendment 5
Section 07		
Section 08	Amendment 6	
Section 09		Amendment 7
Section 10	Amendment 8	
Section 11		
Section 12		
Section 13	Amendment 9	
Section 14	Amendment 10	
Section 15		

Amendment 1

Add a table (conversion table) at the end of the section 00 “Content” which allows (EERC staff and clients) to find in a more comfortable way the implementation of requirements of the EN ISO/IEC 17025 in the EERC QMH.

Implementation of the requirements to a quality system according to DIN EN ISO /IEC 17025

Requirements DIN EN ISO /IEC 17025	**Implementation in section of the QMH (CSL)**
4 Management requirements	
4.1 Organization	Statue of the EERC Section 1 Section 3 Section 4 Section 13.7 Annex 5 Guideline KJ-11 Guideline KJ-12

4.2 Quality system	Section 1 Section 2 Section 4 Section 6 Section 7 Section 8 Section 9 Section 10 Section 11 Section 13 Section 15 Annex 2 Annex 3 Guideline KJ-2 Guideline KJ-3 Guideline KJ-6 Guideline KJ-7 Guideline KJ-10 Guideline KJ-12 Guideline KJ-15
4.3 Document control	Guideline KJ-12
4.4 Review of request, tenders and contracts	Section 6 Section 7 Section 15 Guideline KJ-12
4.5 Subcontracting of tests	Guideline KJ-12
4.6 Purchasing services and supplies	Section 1 Section 10 Section 11 Guideline KJ-6 Guideline KJ-7 Guideline KJ-12
4.8 Complaints	Section 2 Annex 3 Guideline KJ-12
4.9 Control of nonconforming testing and/or calibration work	Section 2 Guideline KJ-12
4.10 Corrective action	Section 8 Guideline KJ-2 Guideline KJ-3 Guideline KJ-10 Guideline KJ-12 Guideline KJ-15
4.11 Preventive action	Section 7 Section 8 Guideline KJ-10

4.12 Control of records	Section 9 Section 13 Section 15 Guideline KJ-12
4.13 Internal audits	Section 2 Annex 2A, 2 B, 2C, 2D, 2E Guideline KJ-12 Guideline KJ-15
4.14 Management reviews	Section 2 Annex 2A, 2 B, 2C, 2D, 2E
5 Technical requirements	
5.2 Personnel	Section 1 Section 4 Annex 4 Annex 6 Guideline KJ-11
5.3 Accomodation and environmental conditions	Section 5
5.4 Test methods and method validation	Section 5 Section 6 Section 7 Section 9 Section 11 Section 12 Section 13 Guideline KJ-6 Guideline KJ-12
5.5 Equipment	Section 11 Section 12 Annex 15 Annex 16 Annex 17 Annex 18 Guideline KJ-6
5.6 Measurement traceability	Section 10 Section 12 Annex 17 Annex 19 Guideline KJ-7 Guideline KJ-9
5.7 Sampling, sampling handling and preparation	Section 9 Guideline KJ-5 Guideline KJ-12
5.8 Handling of test items	Section 9 Annex 11 Annex 12 Annex 13
5.9 Assuring the quality of test results	Section 8

5.10 Reporting the results	Section 9 Section 15 Annex 14

This table reflects that some of EN ISO/IEC 17025 required information can be found in different level 1,2,3 documents of the EERC QMH. The table helps to identify these documents. An alternative to this table is to add to every level 1 main chapter document at the end an overview about "further applicable documents".

In general a chapter can than be structured as follows:

Aim of the QM-element;
Task of the QM-element;
Terms and definitions;
Area of application;
The different subchapters that are noted in the EN ISO/IEC 17025;
Further applicable documents.

Example for the subchapters of EN ISO/IEC 17025, Management requirements, Implementation:

Aim of the QM-element;
Task of the QM-element;
Terms and definitions;
Area of application;

Subchapters: Personnel and resources;
Impartiality;
Protection of client´s confidential information;
Incorruptability;
Independency declaration;
Technical management, Structure of the organisation;
Quality manager;
Responsibility.

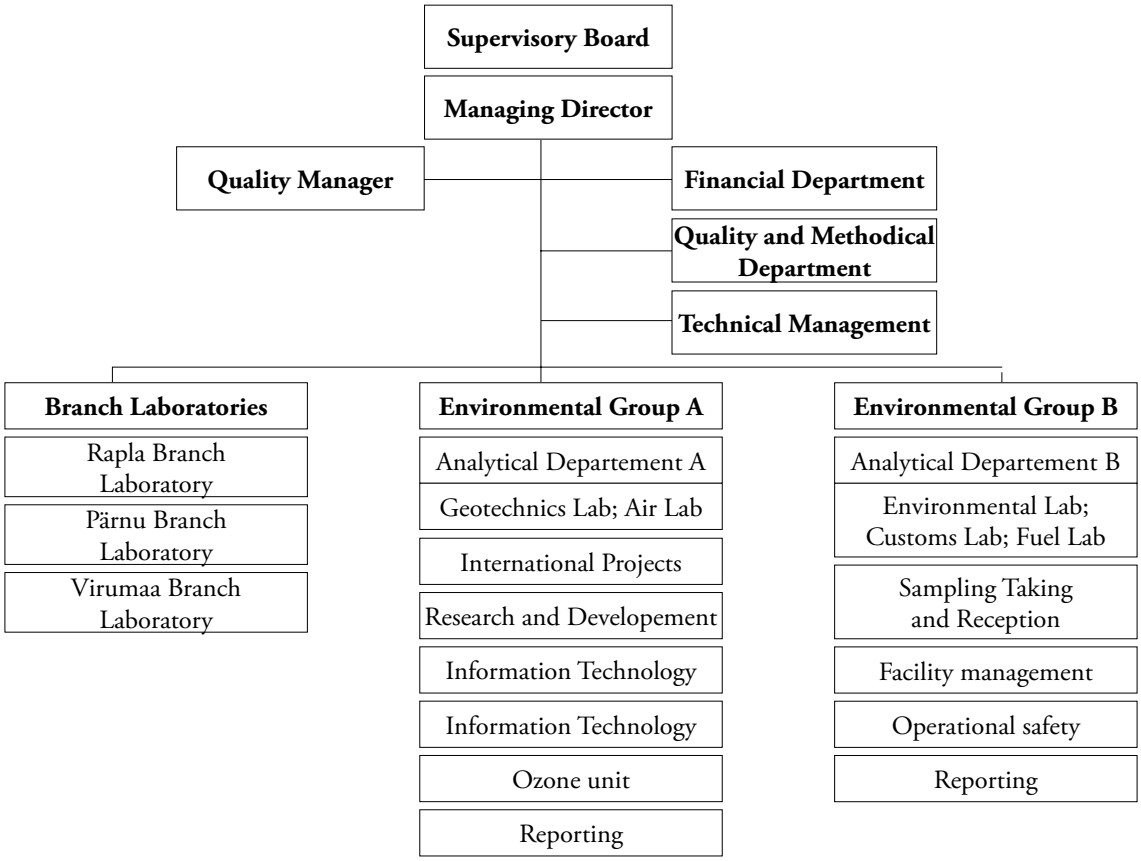
Further applicable documents

Fill in here the other level 1,2,3 documents, that are linked with these theme.

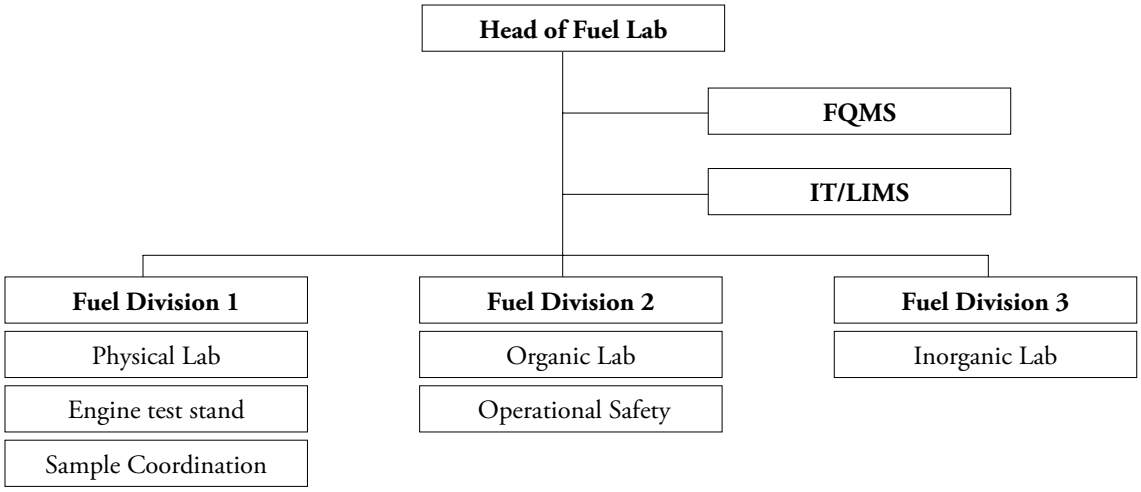
Amendment 2

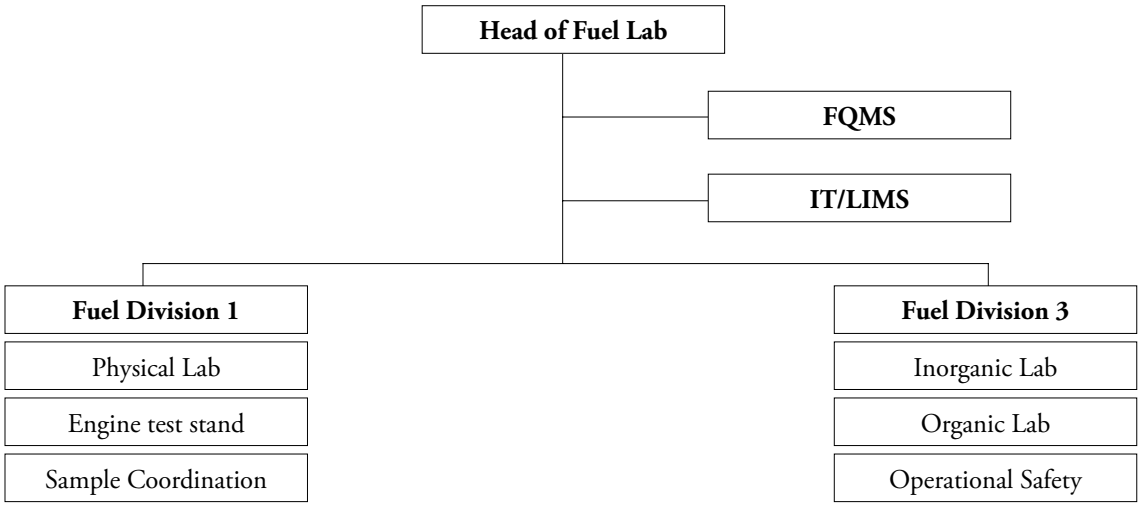
Adopt the relevant chapters of section three to the needs of the new fuel lab e.g. QMH Chapter 3.1 Location, 3.2 Objectives and range of activities of EERC Fuel Laboratory, 3.3 Organisation (proposal is given below).

Structural proposal for EERC



Structural proposals for EERC Fuel Lab





Amendment 3

Adopt section 4 to the requirements for the new fuel lab: personnel, duties, responsibilities and delegation in general and detail.

Amendment 4

Adopt section 5 to the specific conditions of the new fuel lab including building/room plan.

Amendment 5

Adopt section 6 to the requirements of the new fuel lab. Enlarge the Directory of analytical methods in EERC (level 2 document KJ4) by the methods that are foreseen for the fuel lab. A list is given below. The expert has the opinion, that the section 6 should be revised in a way described in the proposal given below. This new chapter can be combined with the chapter 6.4 – 6.6 of the QMH (CSL).

List of also FQMS relevant methods that are obligatory for the new EERC fuel lab:

Comparison between the necessary methods to fulfil the FQMS and the listed guidelines in the fuel specification guidelines EN228 and EN590 and the accredited methods at the EERC (CSL)

Consecutive No According to EN228	Parameter	Necessary for FQMS		Accredited method at EERC	Guideline latest actual version	Accreditation of the international guideline at the EERC for FQMS data reporting
EN228 (petrol)						
1	Research octane number RON	Yes	No		EN 5164	Not accredited
2	Motor octane number MON	Yes	No		EN 25163	Not accredited
3	Lead content	Yes	Yes	EVS-EN 237	EN 237	Accredited
4	Density at 15°C	No	Yes	 EN ISO 12185	EN ISO 3675 EN ISO 12185	
5	Sulfur content	Yes	Yes	EVS EN ISO 8754, ASTM D 4294-98	EN ISO 20846 EN ISO 20847 EN ISO 20884	Not accredited check alternative Method Not accredited Not accredited
6	Oxidation stability	No	No		EN ISO 7536	
7	Evaporation residue	No	No		EN ISO 6246	
8	Copper corrosion	No	No		EN ISO 2160	
9	Appearance	No			Visual	
10	Hydrocarbon analysis; PIONA	Yes Yes	Yes	Homemade method	ASTM-D 1319-95a EN 14517	Not accredited
11	Benzene	Yes	Yes	EN 12177	EN 12177 EN 238 EN 14517	Accredited
12	Oxygen content	Yes	No		EN 1601 EN 13132	Not accredited
13	Oxygenates Methanol Ethanol 2-Propanol, Iso-propyl-Alcohol (IPA) 2-Methyl-1-propanol, Isobutyl-Alcohol (IBA) 2-Methyl-1-propanol, Tertbutyl-Alcohol (TBA) Ether (5 or more C-atomes) Other Oxygenates	Yes	No		EN 1601 EN 13132	Not accredited Not accredited
14	Vapour pressure (DVPE)	Yes	Yes	EN 13016-1	EN 13016-1	Accredited
15	Distillation	Yes	Yes	EVS-EN ISO 3405	EN ISO 3405	Accredited
16	VLI (10 VP + 7 E70)	Informative				

Consecutive No According to EN590	Paramter	Necessary for FQMS (according to EN 14274)		Accredited method at EERC	Guideline latest actual version	Accreditation of the international guideline at the EERC for FQMS data reporting
EN 590 (diesel fuel)						
1	Cetane number (CFR)	Yes	No		EN ISO 5165	Not accredited
2	Cetane index	No	Yes	EVS-EN ISO 4264	EN ISO 4264	Accredited
3	Density at 15°C	Yes	Yes	EN ISO 12185	EN ISO 3675 EN ISO 12185	Accredited
4	Polycyclic aromatic hydrocarbons	Yes	No		EN 12916	Not accredited
5	Sulfur content	Yes	Yes	EVS EN ISO 8754, ASTM D 4294-98	EN ISO 20846 EN ISO 20847 EN ISO 20884	Not accredited Accredited Not accredited
6	Flame point	No	Yes	EN 2791	EN ISO 2719	
7	Carbon residue (in 10 % distillation residue)	No	No		EN ISO 2719	Not accredited
8	Ash content	No	No		EN ISO 6245	Not accredited
9	Water content	No	No		EN ISO 12937	Not accredited
10	Total impurities	No	No		EN 12662	Not accredited
11	Copper corrosion (3 h at 50°C)	No	No		EN ISO 2160	Not accredited
12	Oxidation stability	No	No		EN ISO 12205	Not accredited
13	Lubricity, corrected „wear scar diameter“ (wsd 1,4) ati 60°C	No	No		ISO 12156-1	Not accredited
14	Viscosity at 40°C	No	No		EN ISO 3104	Not accredited
15	Distillation[3]	No	Yes	EVS-EN ISO 3405	EN ISO 3405	Accredited
16	Fatty acid methylester content (FAME)	No	No		EN 14078	Not accredited
17	CFPP	No	No		EN 116	Not accredited

Text proposal (can be write out in full by staff of EERC) for section 6 chapter 6.5 as an alternative for the existing section (additional applying documents level 2,3 has to be adopted):

6.5 Standard operating test methods handbook (SOT) and validation

6.5.1 Standard operating test methods handbook (SOT)

Only those methods will be used that are listed in the accreditation certificate.

For all necessary methods of the EERC laboratories appropriate test methods and test specifications are available.

If a test method proposed from a customer is stated as obsolete or inexpedient, the cus-tomer will be informed.

For every test method a standard operating procedure that is normally related to an inter-national standard or if such one is not available to a national standard is prepared by the laboratory staff together with the head of the organisation unit. The SOP is part of a test method handbook. Every staff shall update the SOPs as well as the test method handbook and keep it in an actual, the state of the art representing, state. Changes will be made together with the responsible head of the organisation unit and the quality management unit. Only the QM department is allowed to finish the changes of the electronic versions of these documents. The QM department releases the changes and makes sure, that changed documents will be exchanged in the different working unit of the company.

To every test method that is in the scope of the accreditation a test method handbook (SOT) exists that has the following content:

1 test method
1.1 guideline
1.2 standard operating procedure (SOP)
1.3 calibration
1.4 standards and reference materials
1.5 solvents and chemicals
1.6 intercalibrations
1.7 safety procurements
2 equipment
2.1 manual
2.2 operating advices/instructions
2.3 spare parts and consumables
2.4 service and maintenance
3 quality assurance
3.1 control charts
3.2 intercalibrations

All advices or test method handbooks or further relevant documents that are necessary for the work of the company are administrated in the actual version by the QM department. The QM department has to make sure that the documents are accessible.

Laboratory staff is responsible by name for those test method handbooks they are allowed to handle the test methods. Especially for the observance of calibrations and maintenance intervals of equipment. This has to be checked in intervals by the quality management department (e.g. two times a year).

The company makes sure, that it works with test methods that are based on actual versions of guidelines. In this field the quality department check the actuality of the guidelines several times a year and informs the organisation units about the results. If necessary the Quality management department exchanges the guidelines. By membership in different (national and international) standardisation committees the company tries to guarantee the state of the art.

6.5.2 Standardised test methods

If possible the EERC fuel laboratory uses standardised test methods. These methods are validated by the organisation unit before use, to demonstrate that the method can be used according to the rules.

6.5.3 Non standardised test methods/modified test methods

Non standardised methods (e.g. homemade methods, special customer methods) or modified standardised methods are validated by the relevant organisation units of the EERC.

6.5.4 Self developed test methods

Self developed methods that has to be validated by the EERC in an very timeconsuming validation process, are not used at the moment.

6.5.5 Validation of test methods and documentation

The validation of test methods of the EERC includes if possible the following characteristic parameters:

- precision (repeatability/comparability);
- accuracy;
- uncertainty;
- linearity and working range;
- detection rate.

To perform validation e.g. the following procedures are used:

- measurement of (certified) reference materials and documentation in control charts;
- participation in interlaboratory calibration studies and intralaboratory intercalibrations as well as national and international round robin test;
- multiple measurements of standard solutions (RM, CRM) e.g. pool samples with known parameters (natural samples);
- comparability examinations with independent methods that are validated.

At the end of a validation procedure (as a result) it will be determined, if the test method fulfils all requirements and is robust enough for a routine measurement in the necessary working range.

All validation data has to be archived in a traceable way that the obtained validation results can be easily reconstructed.

6.5.6 Measuring uncertainty

For standardised test methods (international or national guidelines), that includes data for measuring

uncertainty, those data were taken. If it is necessary to estimate the measuring uncertainty the information of guideline of DIN EN ISO 4259 is taken into account.

The estimation of a test method refers to the time of the examinations, the laboratory develops the data. To make sure that the uncertainty does not changes with time, quality assurance parameters are defined that controls out of range situation (control charts).

Amendment 6

Section 8: Control charts: Which control charts should be used for the different methods in the fuel lab will be discussed later together with the help of the trainers during the second part of seminar (see also continuing activities in chapter 2 Introduction and chapter 5.1).

Section 8: Chapter 8.2.5 and amendment 8: Intra-/interlaboratory studies will be conducted for QS of fuel analyse. These new studies will be (automatically) added to the list of amendment 8 (QMH).

For the accreditation process successful participations on intercomparison studies are necessary. A complete check of all relevant methods of the new Fuel lab can be performed as a participant in the FAM intercomparision studies. The FAM "Fachausschuss Mineralöl- und Brennstoffnormung" is located in Hamburg, Germany: http://www.fam-hamburg.de. Within the organisation ISO and CEN groups are working on the standardisation of methods in the relevant field. A contact person at FAM is Ms. Kunckel Tel: 0049 40 63900462. On the homepage of the laboratory Petrolab: http://petrolab.de de-tailed information about this intercomparison study is given (see here "FAM Ringver-such").

The EERC CSL took part in a study organised by the institute for interlaboratory studies, Netherlands: http://www.iisnl.com.

With this alternative the head of the EERC fuel lab in agreement with the QM can decide their preferable institute.

To get an impression about intercalibration studies oil/fuel labs in Germany take part, the text proposal describing the subchapter: "Intercomparision programmes" is given below. Some statements are described in the chapter 10 of the EERC QMH (CSL). The text proposal can be combined with the existing one of the EERC QMH (CSL).

In the text the name of the EERC fuel lab is added.

Traceability in the field of analytical examinations

Traceability

The complete calibration procedure is conducted in a way that all measurement can be related to national or international standards or references (SI: International System of Units).

If this is not possible, also the participation in intercalibration studies are allowed, that shows the correlation for the accuracy of the results. In detail this is laid down in the standard operating test method handbooks (SOT).

Analytical devices or other relevant equipment is normally basic calibrated to national or international scale by an unbroken chain of calibrations or comparisons linking them to relevant primary

standards. This can also be done e.g. by a national body. A typical example is a weighing machine: The weighing machine has to be calibrated e.g. once a year by the national responsible institute and has to be controlled (with control weights) from laboratory staff according to the rules laid down in the manual for weighing machines. All results have to be documented. Also the used test equipment has to be supervised according to quality factors and all results has to be documented, e.g. in the SOT. Equipment without calibration sheets, e.g. thermometers can be proofed by using a calibrated thermometer.

In the SOT or SOP the relevant part of equipment and or the relevant unit of examination that influences the result significantly should be indicated. All circumstances that are influencing the results shall be noted: e.g. draught during weighting or running laboratory hoods during flame point measurements. If special room climatisation or temperature conditions for equipment or chemicals is recommended it shall be listed and documented. Details are listed in the SOPs or manuals for the different test methods.

Responsible for the correct (also under the view of QS) use of primary standards is the staff that has the release to operate the method. If out of control situations occur during operating methods staff has to inform the head of the organisation unit to decide further proceedings. If questions occurs to calibration, system maintenance or any other handling, that are possibly influencing the results, staff has to contact the responsible head of that organisation unit or inform the QM department. Especially in case of calibration where reference standard are necessary those materials shall be stored at a suitable side e.g. QM department. The safekeeper is responsible for these reference materials or primary standards. He has to assure that those materials are available and keep under safe conditions after use. Further one he has to assure that those materials are in good order and conditions.

Use of reference material

An other possibility to demonstrate traceability is the use of validated reference materials. These could be:

- certified reference materials (CRM);
- reference material with manufactures instructions (RM);
- round robin test samples.

The existing reference materials and primary standards are used only for calibration. The are kept safe (access by permission) and handled in a way that contamination can be excluded (see QM document: storage and handling of calibration standards, reference material and calibrated test and/or measuring equipment).

Reference materials are compared/adjusted with certified reference materials. Another possibility is the use of round robin test materials as reference materials. In that case it has to be sure, that the round robin tests are national or international accepted and the documentation and reporting is in accordance with national or international standards. All reference materials have to be protected against contamination e.g. it is not allowed to fill back used liquid reference materials in the original containers. Results of those comparisons (RM/round robin test materials) are documented in the relevant chapters of the SOT.

Participation in round robin tests

The different organisation unit of the EERC takes part in round robin test. In case of the fuel lab the FD 1, FD 2 and FD 3 (FD - Fuel division. See also structural proposals in chapter 7.3.1 amendment 2) of the EERC takes part in intercomparisons to compare the results under the view of quality assurance: To show their verification of performance in comparison with other laboratories and to control the used methods to get data about the precision of the relevant testing methods. Another

point is to get the intercomparison test samples in a relevant amount, because they are used to check system performance of testing methods, whenever CRM materials are not available.

Coordination, Interpretation and documentation of the achieved results are under responsibility of the head of the organisation unit in agreement with the QM department.

Details for intercomparisions (date, parameters, etc.) are documented. The results and if necessary a comment about the results are added to the relevant level 2 or level 3 document (at the moment amendment 8 of the QMH).

Beside the participation in official intercalibrations (external quality assurance) the QM department organises an internal quality assurance: The QM department organises the analyses of anonymous retain samples. Only such parameters are analysed that remain stable over a long time period (in case of fuel e.g.: Pb-amount, S-amount). The internal quality assurance will be conducted several times a year.

Remark:

The EERC shall take part as often as possible in intercomparisons for octane-numbers and cetane-numbers.

The EERC persons in charge will be responsible for the decision which intercalibration studies shall be carried out from the EERC fuel lab and how the QS has to be applied. Because of the upgrade of the accreditation in the fuel part the expert proposes to take part as soon as possible. On the basis of the QMH (CSL) documents (amendment 8 version January 2004) consigned to the expert for the revision, it results evident that in year 2002 was conducted an extern intercalibration test in the sector oil/fuel of the CSL organized by the "Institute of Interlaboratory Studies (IIS), Netherlands " with the test parameters Density, Distillation, Flash Point, Sulphur.

Amendment 7

Section 9: The section 9 "Sampling, sample handling, and preparation" shall be revised and adopted to the special requirements of the tasks of the fuel laboratory. The chapter now describes the relevant proceeding for the CSL and some general aspects. As stated earlier time the QMH of the EERC shall be only one document (see also www.dasmin.de/download_labor.html#Mineralöl: QM-VA 0900-25: Accreditation of laboratories with several settlements).

Special details for new requirements, structures or working fields, can be added to the relevant chapter of the general EERC QMH to describe this new working areas to fulfil the requirements of EN ISO/IEC 17025 (see http://www.dap.de: e.g. Dokument DAP-TM-22).

During the seminar held in June 2005 (see also chapter 5) a lot of helpful and necessary information about sampling of mineral oil products, sample handling including storage, security aspects, report forms etc. were presented including labeling, sealing of sample containers etc. So, if necessary a proposal for this section can be prepared by EERC staff including chapter 9.2 and relevant level 2 and level 3 documents. The proposals can be revised together with the expert.

Regarding chapter 9.3 "Report generation" an example report are available from the abovementioned seminar. Chapter 9.4 a: Regulation has to be made how to submit data within the new structure. This is also laid down in the level 2 document KJ 12.

Reporting the results (see in detail EN ISO/IEC 17025)

Reports that will be performed by the EERC are test reports that are well structured and clearly arranged. The test report contains in minimum:

- title;
- address of the testing unit and the location, where the test were conducted;
- unique identification of the test report; unique page identification of the test report (footnote: title of the report and running page number of total page number);
- the name and address of the client;
- description and identification of the test item;
- amount of test item and or bundle;
- test item number;
- date of receipt/date of testing;
- reason of testing (in case it is useful);
- testing method (national or international guideline) or SOT or SOP;
- description of sampling taking or cross reference to guidelines/other QM documents (if useful);
- deviations from, additions to, or exclusions from test methods;
- general information which test methods were used;
- if useful add tables, graphs, photos or other relevant documentation like building plan or sketches;
- details about measuring uncertainty;
- name, functions and signatures authorizing the test report and if relevant name, function and signature of that person that are responsible for the organisation unit, the test results are achieved;
- date when the test was finished and date when the test report was finished;
- where relevant, a statement that the results relate only to the items tested or calibrated;
- advice, that it is forbidden without permission (written form) to reproduce parts of the test report (except in full).

Any changes after delivering the report to the customer that have to be performed have to be signed by the head of the organisation unit. It is not allowed to make this correction in the original test report. The original test report shall remain unique. The customer has to be informed and the corrections have to be sent out.

Corrections will be performed on a separate paper which is clearly linked to the original test report e.g. „correction/changes to test report xxxxx“. In principal a test report interpretation are not included (exceptions are allowed see EN ISO/IEC 17025 5.10.3 d). Normally interpretations or advices shall be given within a separate paper.

If subcontractors delivers parts of test results and these are part of a test report this shall be marked. The procedure shall be carried out in agreement with the customer. In the test report security-/confidentiality- and data protection aspects related to the customers requirements have to be taken into account.

Whenever electronic versions of test report are send out or stored in a central database it shall be proved, that manipulations or illicit changes including other reasons by mistake can be avoided (pass word protection).

Amendment 8

The storage of petrochemical products may cause a special chapter that should be added as a subchapter 10.6 Storage and disposal of petrochemical products.

Amendment 9

In chapter 13 the use of computers is explained. If necessary add a subchapter that describes the relevant procedures for the fuel lab. Part of the tender are e.g. software packages, a link should be given.

Amendment 10

In chapter 14 relevant criteria for health and fire protection are described. The fuel samples are stored over a longer period in a special storage room. If necessary add a subchapter with relevant security aspects.

7.3.2 Conclusion

The EERC holds EN ISO/IEC 17025 accreditations (DAP, Germany and EAS - Estonian Accreditation Centre, Estonia). The quality management handbook and the related documents therefore fullfill the requirements of the guideline. Under special consideration of the future "Fuel Quality Monitoring System" and the therefore needed test methods, the accreditation has to be enlarged. Some methods, that will be used in future in the new fuel lab are part of the accreditation (EAS), therefore they also fulfil the requirements of EN ISO/IEC 17025. That means, that the general part of the QMH in the EAS-version (which includes methods of the customs laboratory – CSL) can be easily extended to the needs, special tasks and new test methods of the new Fuel lab. Amendments were made how to perform this changes.

7.4 Activity E4. Intercalibration

One activity of the twinning project is to prepare and carry out the intercalibrations of the quality and accreditation system. The task will include required reference materials.

The new fuel laboratory is up to now only existing in theory. This circumstance treats the experts who are prepareing the Twinning Component E "Quality Assurance and Accreditation" to proceed different activities in more theoretical way at the beginning.

7.4.1 Tasks and methods: prepare and carryout the intercalibrations of the quality and accriditation system

According to the benchmarks and outputs of activity E4 a intercalibration procedure was developed. Finally the EERC shall have documents and certificates to demonstrate that the new fuel lab is working well. These documents were also needed for accreditation.

There are different intercalibration studies available that can be used for quality assurance of Oil/Fuel Labs. In section 8 of the EERC QMH also intercalibration in general is listed. In the amendment 8 of the EERC QMH a list of intercalibration studies is given. New studies will automatically be added. In the activity E4 of the Covenant the following tasks are foreseen: "Experts will prepare and carry out the intercalibrations of the quality and accreditation system. The task will include required reference materials". The benchmark is: "Reference materials procured before intercalibrations". The reference materials were part of the tender and the new materials were automatically added to the list that is part of the quality manual handbook. A principal way how to achieve the reference material or other materials for quality assurance is given in QMH chapter 4.1.2 Reference material as well as links to suppliers.

As proposed a complete check of all relevant methods of the new Fuel lab can be performed as a participant in the FAM intercomparision studies. The FAM "Fachausschuss Mineralöl- und Brennstoffnormung" is located in Hamburg, Germany: http://www.fam-hamburg.de. Within the organisation ISO and CEN groups are working on the standardisation of methods in the relevant field. On the homepage of the laboratory Petrolab: http://petrolab.de detailed information about this intercomparison study is given (see here "FAM Ringversuch"). The EERC CSL took part in the past in a study organised by the institute for interlaboratory studies, Netherlands: http://www.iisnl.com.

7.4.2 FAM membership

In according to the output of the activity E4: "Intercalibration with German laboratories using referencial fuels conducted; Intercalibration protocols sufficient for accreditation" the EERC fuel laboratory is in the meantime a member of the FAM and takes part in the so called FAM intercalibration study. The study is performed once a year. Before taking part in the complete program of this study, the new fuel lab must exist and must be familiar with the relevant methods. After that, with the successful participation in this study, the laboratory will have certificates/ documents also to use for the accreditation. At the moment the fuel lab can take part with the methods that are already accredited and are valid according to the guidelines of the intercalibration study.

7.4.3 Sample exchange programmes and samples from the Estonian FQMS 2005 as test samples

During 2005 it was organised, that the EERC gets retain samples from older FAM intercalibration studies. These samples can be reanalysed and the results can be compared with the value, that is laid down in the intercalibration documentation. In the second quarter of 2006 it will be arranged that the EERC fuel lab gets retain samples from FQMS programmes from Germany including the anonymous analytical reports of these samples. The fuel lab can use the samples as test samples for training to become more familiar with all the new methods. The analytical results to compare with are produced from an accredited laboratory. This will be conducted before participation in the next extended FAM intercalibration study in 2006. It is known that some parameters are not stable and will change during storage. This must be taken into consideration if the results are compared.

A further procedure is proposed, that the EERC takes some extra samples (5 petrol and 5 diesel) from the 2005 Estonian FQMS programme (start August/September 2005) at the foreseen fuel stations. The procedure should be in that way, that the sample takers are taking at this sides one canister more as foreseen. These samples will be analysed for all parameters listed in the EN 228 and EN 590 by an accredited laboratory. The results can be used for quality assurance for those parameters that are also analysed at the EERC CSL. These samples and the retain samples shall be stored and used later for training purposes. The retain samples from the FQMS programme can be disposed after a couple of month (normally 3 month).

The samples from the sample exchange programme and those extra samples from the Estonian FQMS 2005 as well as retain samples from FAM studies will be used for training purposes. During the training units in the EERC fuel lab (see also continuing activities in chapter 2 Introduction and chapter 5.1) the laboratory than will get extra experience with those parameters that are affected by storage. The analytical results can be discussed during the training units under respect of the uncertainty budget of the methods. The data will be documented. So they can be used as QS-relevant data to document the performance of the new fuel lab.

7.4.4 Intercalibrations with German laboratories using referential fuels conducted

In the following list the fuels from Germany that are already transported to the EERC are given:

The samples in this parcel are for analytical purpose only! **No use in engines or heaters!**

Total amount:	15	litres	FAME / Biodiesel
	10	litres	heating oil EL
	15	litres	diesel or diesel/FAME
	3	litres	gasoline

Sample list:

No	Amount / container	Product	Label, description
1	1 x 5 litres in tin can	FAME / biodiesel	HN - 2
2	1 x 5 litres in tin can	FAME / biodiesel	HN - 6
3	1 x 5 litres in tin can	FAME / biodiesel	SG - 1
4	2 x 2,5 litres in tin can	heating oil EL	70. FAM Round Robin 2004 / 2005, sample No. 707
5	2 x 2,5 litres in tin can	heating oil EL	70. FAM Round Robin 2004 / 2005, sample No. 708
6	1 x 2,5 litres in tin can	diesel fuel	67. FAM Round Robin 2001 / 2002, sample No. 674
7	1 x 2,5 litres in tin can	diesel fuel	69. FAM Round Robin 2003 / 2004, sample No. 694
8	1 x 2,5 litres in tin can	diesel fuel	70. FAM Round Robin 2004 / 2005, sample No. 703
9	1 x 2,5 litres in tin can	diesel fuel	70. FAM Round Robin 2004 / 2005, sample No. 704
10	1 x 2,5 litres in tin can	diesel / FAME	70. FAM Round Robin 2004 / 2005, sample No. 705
11	1 x 2,5 litres in tin can	diesel / FAME	70. FAM Round Robin 2004 / 2005, sample No. 706
12	1 x 2,5 litres in tin can	gasoline	70. FAM Round Robin 2004 / 2005, sample No. 701
13	1 x 100 ml in crimp vial	gasoline	70. FAM Round Robin 2004 / 2005, sample No. 702
14	1 x 100 ml in crimp vial	gasoline	70. FAM Round Robin 2004 / 2005, sample No. 702

As mentioned above, the EERC gets fuel retain samples from a FQMS program from a federal state of Germany. Because these fuel samples are from an actual sampling program of winter 2005 they have to be stored for three month before they can be send to Estonia. Sample labeling and the data sheets will be in a way that data protection is secured (Note: not all relevant FQMS parameters will be analysed).

7.4.5 Intercalibration protocols sufficient for accreditation

FAM intercalibration

After participating in the official FAM intercalibration study successfully the EERC gets the relevant certificates for accreditation.

Fuel exchange programs

The EERC gets a lot of fuel samples together with the analytical results of these samples. These are FAM intercalibration retain samples and on the other hand fuel samples from FQMS programs from Germany. The analytical results for the FAM studies are already available and added. The data for the FQMS samples will be delivered later. Once the new fuel lab has analysed the samples they can prepare a comparison table which shows the conformity of the results.

Analytical results of FAM retain samples (from the FAM report):

Sample: 67. FAM Round Robin 2001 / 2002, sample No. 674, diesel fuel 2

Parameter	Method	Standard	Dimension	Value
Density, 15 °C		EN ISO 4259	kg/m³	829,37
Sulphur	XFA-wd	DIN 51 400 – 11	mg/kg	8,16
	Microcoulometer	DIN 51 400 – 7	mg/kg	8,03
	ICP-OES	DIN 51 400 – 10	mg/kg	7,84
	UV	ASTM D 5433	mg/kg	8,29
Cetaneindex	calculated	ASTM D 4737		55,03
Cloudpoint		DIN EN 23 015	°C	-6,50
CFPP		DIN EN 116	°C	-11,01
PAHs	HPLC	E DIN EN 12 916		
Monoaromatics			% (m/m)	17,63
Diaromatics			% (m/m)	2,935
Tri-+-aromatics			% (m/m)	0,481
Polyaromatics			% (m/m)	3,448
Total aromatics			% (m/m)	21,10
Lubricity	HFRR at 60 °C	ISO 12 156 – 1	µm	598,0
Kin. viscosity	at 40 °C	EN ISO 3104	mm²/s	2,696
Nitrogen	chemoluminescence	ASTM D 4629	mg/kg	18,87
Flash point	P.M.	EN 22 719	°C	82,25
Distillation		DIN EN ISO 3405		
	IBP		°C	198,1
	5 % (v/v)		°C	214,4
	10 % (v/v)		°C	220,8
	20 % (v/v)		°C	231,5
	30 % (v/v)		°C	241,9
	40 % (v/v)		°C	252,8
	50 % (v/v)		°C	264,0
	60 % (v/v)		°C	275,7
	70 % (v/v)		°C	287,9
	80 % (v/v)		°C	301,3
	90 % (v/v)		°C	319,9
	95 % (v/v)		°C	337,1
	FBP		°C	351,4
Evaporated	up to 250 °C		% (v/v)	37,7
	up to 340 °C		% (v/v)	95,8
	up to 350 °C		% (v/v)	97,3
	gain		% (v/v)	98,0
	residue		% (v/v)	1,48
	loss		% (v/v)	0,43
Cetane number	CFR-engine	ISO 5165 / ASTM D 613		54,78
	BASF-engine	DIN 51 773		55,46

Sample: 69. FAM Round Robin 2003 / 2004, sample No. 694, diesel fuel 2

Parameter	Method	Standard	Dimension	Value
Density, 15 °C		EN ISO 12 185	kg/m³	834,53
Sulphur	XFA-wd	pr EN ISO 20 884	mg/kg	6,88
	UV	prEN ISO 20 846	mg/kg	6,87
	Wickbold	EN 24 260	mg/kg	7,40
	Microcoulometer	pr EN ISO 16 591	mg/kg	7,11
	ICP-OES	E DIN 51 400 – 10	mg/kg	5,29
Cetaneindex	calculated	ASTM D 4737		54,62
Cloudpoint		DIN EN 23 015	°C	-2,68
		ASTM D 5772	°C	-2,79
CFPP		DIN EN 116	°C	-17,44
PAHs	HPLC	prEN 12 916, Rev. 01		
Monoaromatics			% (m/m)	18,75
Diaromatics			% (m/m)	1,559
Tri-+-aromatics			% (m/m)	0,219
Polyaromatics			% (m/m)	1,815
Total aromatics			% (m/m)	20,59
Lubricity	HFRR at 60 °C	ISO 12 156 – 1	µm	363,9
Kin. viscosity	at 40 °C	EN ISO 3104	mm²/s	3,038
Nitrogen	chemoluminescence	ASTM D 4629	mg/kg	1,66
Flash point	P.M.	EN 22 719	°C	70,57
Water content	K.F., coulometric	EN ISO 12 937	mg/kg	19,1
	K.F., direct	DIN 51 777 – 1	mg/kg	34,0
Cetane number	CFR-engine	ISO 5165 / ASTM D 613		54,42
	BASF-engine	DIN 51 773		54,44

Sample: 69. FAM Round Robin 2003 / 2004, sample No. 694, diesel fuel 2

Parameter	Method	Standard	Dimension	Value
Distillation	GC-SimDist	DIN 51 435 - 2		
	begin		°C	125,8
	5 % (m/m)		°C	176,7
	10 % (m/m)		°C	196,3
	20 % (m/m)		°C	223,1
	30 % (m/m)		°C	244,4
	40 % (m/m)		°C	261,7
	50 % (m/m)		°C	278,2
	60 % (m/m)		°C	296,7
	70 % (m/m)		°C	315,3
	80 % (m/m)		°C	336,6
	90 % (m/m)		°C	362,8
	95 % (m/m)		°C	380,6
	FBP		°C	419,3
Distillation		DIN EN ISO 3405		
	IBP		°C	181,4
	5 % (v/v)		°C	206,5
	10 % (v/v)		°C	218,1
	20 % (v/v)		°C	234,3
	30 % (v/v)		°C	248,2
	40 % (v/v)		°C	261,6
	50 % (v/v)		°C	274,4
	60 % (v/v)		°C	287,7
	70 % (v/v)		°C	302,5
	80 % (v/v)		°C	319,3
	90 % (v/v)		°C	340,1
	95 % (v/v)		°C	355,5
	FBP		°C	364,7
Evaporated	up to 250 °C		% (v/v)	31,4
	up to 350 °C		% (v/v)	93,5
	gain		% (v/v)	98,0
	residue		% (v/v)	1,56
	loss		% (v/v)	0,47

Sample: 70. FAM Round Robin 2004 / 2005, sample No. 703, diesel fuel 1

Parameter	Method	Standard	Dimension	Value
Density, 15 °C		EN ISO 12 185	kg/m³	824,69
Sulphur	XFA-wd	EN ISO 20 884	mg/kg	13,08
	UV	EN ISO 20 846	mg/kg	12,74
Cetaneindex	calculated	ASTM D 4737		60,22
Cloudpoint		DIN EN 23 015	°C	-20,57
CFPP		DIN EN 116	°C	-21,14
PAHs	HPLC	prEN 12 916, Rev. 01		
Monoaromatics			% (m/m)	16,64
Diaromatics			% (m/m)	1,292
Tri-+-aromatics			% (m/m)	0,060
Polyaromatics			% (m/m)	1,347
Total aromatics			% (m/m)	18,21
Lubricity	HFRR at 60 °C	ISO 12 156 – 1	µm	418,3
Kin. viscosity	at 40 °C	EN ISO 3104	mm²/s	3,038
Flash point	P.M.	EN 22 719	°C	93,20
Water content	K.F., coulometric	EN ISO 12 937	mg/kg	29,3
	K.F., direct	DIN 51 777 – 1	mg/kg	50,2
Electric conductivity	at 20 °C	ASTM D 2624	pS/m	188,3
Cetane number	CFR-engine	ISO 5165 / ASTM D 613		55,21
	BASF-engine	DIN 51 773		54,48

Sample: 70. FAM Round Robin 2004 / 2005, sample No. 703, diesel fuel 1

Parameter	Method	Standard	Dimension	Value
Distillation	GC-SimDist	DIN 51 435 - 2		
	IBP		°C	166,4
	5 % (m/m)		°C	196,1
	10 % (m/m)		°C	219,4
	20 % (m/m)		°C	240,2
	30 % (m/m)		°C	252,8
	40 % (m/m)		°C	263,0
	50 % (m/m)		°C	273,3
	60 % (m/m)		°C	284,9
	70 % (m/m)		°C	297,0
	80 % (m/m)		°C	311,3
	90 % (m/m)		°C	331,2
	95 % (m/m)		°C	345,9
	FBP		°C	376,7
Distillation		DIN EN ISO 3405		
	IBP		°C	219,1
	5 % (v/v)		°C	234,4
	10 % (v/v)		°C	240,5
	20 % (v/v)		°C	249,2
	30 % (v/v)		°C	256,6
	40 % (v/v)		°C	263,2
	50 % (v/v)		°C	269,4
	60 % (v/v)		°C	276,1
	70 % (v/v)		°C	284,1
	80 % (v/v)		°C	294,3
	90 % (v/v)		°C	309,2
	95 % (v/v)		°C	321,0
	FBP		°C	329,4
Evaporated	up to 250 °C		% (v/v)	21,2
	gain		% (v/v)	98,0
	residue		% (v/v)	1,54
	loss		% (v/v)	0,53

Sample: 70. FAM Round Robin 2004 / 2005, sample No. 704, diesel fuel 2

Parameter	Method	Standard	Dimension	Value
Density, 15 °C		EN ISO 12 185	kg/m³	824,58
Sulphur	XFA-wd	EN ISO 20 884	mg/kg	7,99
	UV	EN ISO 20 846	mg/kg	8,72
Cetaneindex	calculated	ASTM D 4737		50,47
Cloudpoint		DIN EN 23 015	°C	-14,37
CFPP		DIN EN 116	°C	-25,89
PAHs	HPLC	prEN 12 916, Rev. 01		
Monoaromatics			% (m/m)	21,82
Diaromatics			% (m/m)	4,51
Tri-+-aromatics			% (m/m)	0,403
Polyaromatics			% (m/m)	4,95
Total aromatics			% (m/m)	26,08
Lubricity	HFRR at 60 °C	ISO 12 156 – 1	µm	348,0
Kin. viscosity	at 40 °C	EN ISO 3104	mm²/s	3,038
Flash point	P.M.	EN 22 719	°C	61,23
Water content	K.F., coulometric	EN ISO 12 937	mg/kg	30,2
	K.F., direct	DIN 51 777 – 1	mg/kg	47,9
Electric conductivity	at 20 °C	ASTM D 2624	pS/m	180,1
Cetane number	CFR-engine	ISO 5165 / ASTM D 613		50,95
	BASF-engine	DIN 51 773		50,05

Sample: 70. FAM Round Robin 2004 / 2005, sample No. 704, diesel fuel 2

Parameter	Method	Standard	Dimension	Value
Distillation	GC-SimDist	DIN 51 435 - 2		
	IBP		°C	117,2
	5 % (m/m)		°C	159,0
	10 % (m/m)		°C	173,5
	20 % (m/m)		°C	195,7
	30 % (m/m)		°C	215,0
	40 % (m/m)		°C	231,0
	50 % (m/m)		°C	247,3
	60 % (m/m)		°C	262,0
	70 % (m/m)		°C	278,5
	80 % (m/m)		°C	299,6
	90 % (m/m)		°C	326,1
	95 % (m/m)		°C	349,7
	FBP		°C	408,3
Distillation		DIN EN ISO 3405		
	IBP		°C	167,7
	5 % (v/v)		°C	186,4
	10 % (v/v)		°C	194,0
	20 % (v/v)		°C	206,8
	30 % (v/v)		°C	219,0
	40 % (v/v)		°C	231,3
	50 % (v/v)		°C	243,5
	60 % (v/v)		°C	256,0
	70 % (v/v)		°C	269,4
	80 % (v/v)		°C	285,1
	90 % (v/v)		°C	308,3
	95 % (v/v)		°C	329,1
	FBP		°C	345,2
Evaporated	up to 250 °C		% (v/v)	55,4
	gain		% (v/v)	98,0
	residue		% (v/v)	1,60
	loss		% (v/v)	0,42

Sample: 70. FAM Round Robin 2004 / 2005, sample No. 705, diesel fuel + 5 % FAME 1

Parameter	Method	Standard	Dimension	Value
Density, 15 °C		EN ISO 12 185	kg/m³	840,58
Sulphur	XFA-wd	EN ISO 20 884	mg/kg	6,72
	UV	EN ISO 20 846	mg/kg	6,90
Cetaneindex	calculated	ASTM D 4737		52,21
Cloudpoint		DIN EN 23 015	°C	-4,99
CFPP		DIN EN 116	°C	-17,01
PAHs	HPLC	prEN 12 916, Rev. 01		
Monoaromatics			% (m/m)	18,23
Diaromatics			% (m/m)	1,888
Tri-+-aromatics			% (m/m)	0,657
Polyaromatics			% (m/m)	2,540
Total aromatics			% (m/m)	20,78
Lubricity	HFRR at 60 °C	ISO 12 156 – 1	µm	188,2
Kin. viscosity	at 40 °C	EN ISO 3104	mm²/s	3,038
Flash point	P.M.	EN 22 719	°C	66,77
Water content	K.F., coulometric	EN ISO 12 937	mg/kg	31,4
	K.F., direct	DIN 51 777 – 1	mg/kg	46,6
Micro-conradson		EN ISO 10 370	Gew. %	0,015
FAME – content		EN 14 078	% (v/v)	4,75
Fatty acid distribution		EN 14 331		
Palmitic acid (C 16:0)			% (m/m)	4,24
Stearic acid (C 18:0)			% (m/m)	1,46
Olenic acid (C 18:1)			% (m/m)	57,91
Linoleic acid (C 18:2)			% (m/m)	21,22
Linolenic acid (C 18:3)			% (m/m)	11,58
Arachidic acid (C 20:0)			% (m/m)	0,59
Gadoleinic acid (C 20:1)			% (m/m)	1,50
Cetane number	CFR-engine	ISO 5165 / ASTM D 613		51,49
	BASF-engine	DIN 51 773		51,64

Sample: 70. FAM Round Robin 2004 / 2005, sample No. 705, diesel fuel + 5 % FAME 1

Parameter	Method	Standard	Dimension	Value
Distillation	GC-SimDist	DIN 51 435 - 2		
	IBP		°C	126,4
	5 % (m/m)		°C	169,6
	10 % (m/m)		°C	190,7
	20 % (m/m)		°C	219,7
	30 % (m/m)		°C	241,7
	40 % (m/m)		°C	260,8
	50 % (m/m)		°C	278,9
	60 % (m/m)		°C	298,7
	70 % (m/m)		°C	317,5
	80 % (m/m)		°C	341,8
	90 % (m/m)		°C	359,8
	95 % (m/m)		°C	379,9
	FBP		°C	420,7
Distillation		DIN EN ISO 3405		
	IBP		°C	175,5
	5 % (v/v)		°C	201,2
	10 % (v/v)		°C	213,9
	20 % (v/v)		°C	232,1
	30 % (v/v)		°C	248,1
	40 % (v/v)		°C	262,8
	50 % (v/v)		°C	276,9
	60 % (v/v)		°C	291,4
	70 % (v/v)		°C	306,6
	80 % (v/v)		°C	322,5
	90 % (v/v)		°C	340,8
	95 % (v/v)		°C	355,8
	FBP		°C	364,9
Evaporated	up to 250 °C		% (v/v)	31,4
	up to 350 °C		% (v/v)	93,5
	gain		% (v/v)	97,8
	residue		% (v/v)	1,62
	loss		% (v/v)	0,56

Sample: 70. FAM Round Robin 2004 / 2005, sample No. 705, diesel fuel + 5 % FAME 1

Parameter	Method	Standard	Dimension	Value
Density, 15 °C		EN ISO 12 185	kg/m³	840,53
Sulphur	XFA-wd	EN ISO 20 884	mg/kg	3,46
	UV	EN ISO 20 846	mg/kg	3,58
Cetaneindex	calculated	ASTM D 4737		52,57
Cloudpoint		DIN EN 23 015	°C	-9,46
CFPP		DIN EN 116	°C	-30,45
PAHs	HPLC	E DIN EN 12 916		
Monoaromatics			% (m/m)	20,30
Diaromatics			% (m/m)	3,358
Tri-+-aromatics			% (m/m)	0,867
Polyaromatics			% (m/m)	4,22
Total aromatics			% (m/m)	24,05
Lubricity	HFRR at 60 °C	ISO 12 156 – 1	µm	195,5
Kin. viscosity	at 40 °C	EN ISO 3104	mm²/s	3,038
Flash point	P.M.	EN 22 719	°C	80,62
Water content	K.F., coulometric	EN ISO 12 937	mg/kg	31,7
	K.F., direct	DIN 51 777 – 1	mg/kg	45,6
Micro-conradson		EN ISO 10 370	Gew. %	0,026
FAME – content		EN 14 078	% (v/v)	5,07
Fatty acid distribution		EN 14 331		
Palmitic acid (C 16:0)			% (m/m)	4,90
Stearic acid (C 18:0)			% (m/m)	1,62
Olenic acid (C 18:1)			% (m/m)	55,37
Linoleic acid (C 18:2)			% (m/m)	24,26
Linolenic acid (C 18:3)			% (m/m)	10,83
Arachidic acid (C 20:0)			% (m/m)	0,51
Gadoleinic acid (C 20:1)			% (m/m)	1,28
Cetane number	CFR-engine	ISO 5165 / ASTM D 613		52,24
	BASF-engine	DIN 51 773		52,39

Sample: 70. FAM Round Robin 2004 / 2005, sample No. 705, diesel fuel + 5 % FAME 1

Parameter	Method	Standard	Dimension	Value
Distillation	GC-SimDist	DIN 51 435 - 2		
	IBP		°C	152,2
	5 % (m/m)		°C	178,8
	10 % (m/m)		°C	195,0
	20 % (m/m)		°C	218,6
	30 % (m/m)		°C	244,3
	40 % (m/m)		°C	263,3
	50 % (m/m)		°C	279,7
	60 % (m/m)		°C	296,5
	70 % (m/m)		°C	312,4
	80 % (m/m)		°C	331,0
	90 % (m/m)		°C	353,9
	95 % (m/m)		°C	362,7
	FBP		°C	405,2
Distillation		DIN EN ISO 3405		
	IBP		°C	193,6
	5 % (v/v)		°C	210,4
	10 % (v/v)		°C	218,9
	20 % (v/v)		°C	233,4
	30 % (v/v)		°C	248,8
	40 % (v/v)		°C	264,1
	50 % (v/v)		°C	277,4
	60 % (v/v)		°C	289,5
	70 % (v/v)		°C	301,6
	80 % (v/v)		°C	314,3
	90 % (v/v)		°C	329,0
	95 % (v/v)		°C	340,5
	FBP		°C	349,2
Evaporated	up to 250 °C		% (v/v)	30,9
	up to 350 °C		% (v/v)	97,4
	gain		% (v/v)	98,0
	residue		% (v/v)	1,56
	loss		% (v/v)	0,47

Sample: 70. FAM Round Robin 2004 / 2005, sample No. 707, heating oil EL 1

Parameter	Method	Standard	Dimension	Value
Density, 15 °C		EN ISO 12 185	kg/m³	850,66
Sulphur	XFA-wd	EN ISO 14 596	mg/kg	1883
Cloudpoint		DIN EN 23 015	°C	-3,07
CFPP		DIN EN 116	°C	-11,73
Nitrogen	chemoluminescence	ASTM D 4629	mg/kg	86,0
Flash point	P.M.	EN 22 719	°C	67,94
Red dye	cartridge process	DIN 51 426	mg/kg	4,89
	glass column process	DIN 51 426	mg/kg	4,79
Yellow-marker 2	cartridge process	DIN 51 426	mg/kg	7,07
	glass column process	DIN 51 426	mg/kg	7,11
Cetane number	CFR-engine	ISO 5165 / ASTM D 613		45,29
	BASF-engine	DIN 51 773		46,28

Sample: 70. FAM Round Robin 2004 / 2005, sample No. 708, heating oil EL 2

Parameter	Method	Standard	Dimension	Value
Density, 15 °C		EN ISO 12 185	kg/m³	840,25
Sulphur	XFA-wd	EN ISO 14 596	mg/kg	1732
Cloudpoint		DIN EN 23 015	°C	3,96
CFPP		DIN EN 116	°C	-11,97
Nitrogen	chemoluminescence	ASTM D 4629	mg/kg	403,5
Flash point	P.M.	EN 22 719	°C	58,97
Red dye	cartridge process	DIN 51 426	mg/kg	6,24
	glass column process	DIN 51 426	mg/kg	6,07
Yellow-marker 2	cartridge process	DIN 51 426	mg/kg	8,47
	glass column process	DIN 51 426	mg/kg	8,52
Cetane number	CFR-engine	ISO 5165 / ASTM D 613		49,88
	BASF-engine	DIN 51 773		51,19

Sample: 70. FAM Round Robin 2004 / 2005, sample No. 701, gasoline 91

Parameter	Method	Standard	Dimension	Value
Density, 15 °C		EN ISO 12 185	kg/m³	734,87
Vapour pressure	ASVP	DIN EN 13 016 – 1	kPa	79,41
	DVPE		kPa	72,80
Sulphur	XFA-wd	EN ISO 20 884	mg/kg	7,46
	UV	EN ISO 20 846	mg/kg	7,12
Water content	K.F., coulometric	EN ISO 12 937	mg/kg	447,5
	K.F., direct	DIN 51 777 – 1	mg/kg	478,7
ETBE	GC-CST	EN 13 132	% (v/v)	2,60
Ethanol	GC-CST	EN 13 132	% (v/v)	4,77
Oxygen content	GC-CST	EN 13 132	% (m/m)	2,344
ETBE	GC-OFID	DIN EN 1601	% (v/v)	2,55
Ethanol	GC-OFID	DIN EN 1601	% (v/v)	4,89
Oxygen content	GC-OFID	DIN EN 1601	% (m/m)	2,383
Benzene	GC-CST	EN 12 177	% (v/v)	0,428
	IR	EN 238	% (v/v)	0,368
ETBE	PIONA-GC-CST	EN 14 517	% (v/v)	2,65
Ethanol	PIONA-GC-CST	EN 14 517	% (v/v)	4,94
Oxygen content	PIONA-GC-CST	EN 14 517	% (m/m)	2,433
Benzene	PIONA-GC-CST	EN 14 517	% (v/v)	0,426
Saturated HC	PIONA-GC-CST	EN 14 517	% (v/v)	60,35
Olefines	PIONA-GC-CST	EN 14 517	% (v/v)	7,53
aromatics	PIONA-GC-CST	EN 14 517	% (v/v)	23,89
Octane number	RON, CFR-engine	DIN EN ISO 5164 / ASTM D 2699		91,65
	MON, CFR-engine	DIN EN ISO 5163 / ASTM D 2700		83,36

Sample: 70. FAM Round Robin 2004 / 2005, sample No. 702, gasoline 95

Parameter	Method	Standard	Dimension	Value
Density, 15 °C		EN ISO 12 185	kg/m³	724,35
Vapour pressure	ASVP	DIN EN 13 016 – 1	kPa	89,00
	DVPE		kPa	82,15
Sulphur	XFA-wd	EN ISO 20 884	mg/kg	7,13
	UV	EN ISO 20 846	mg/kg	6,69
Water content	K.F., coulometric	EN ISO 12 937	mg/kg	104,5
	K.F., direct	DIN 51 777 – 1	mg/kg	120,9
ETBE	GC-CST	EN 13 132	% (v/v)	4,21
Ethanol	GC-CST	EN 13 132	% (v/v)	3,63
Oxygen content	GC-CST	EN 13 132	% (m/m)	2,145
ETBE	GC-OFID	DIN EN 1601	% (v/v)	4,02
Ethanol	GC-OFID	DIN EN 1601	% (v/v)	3,72
Oxygen content	GC-OFID	DIN EN 1601	% (m/m)	2,110
Benzene	GC-CST	EN 12 177	% (v/v)	0,594
	IR	EN 238	% (v/v)	0,577
ETBE	PIONA-GC-CST	EN 14 517	% (v/v)	4,14
Ethanol	PIONA-GC-CST	EN 14 517	% (v/v)	3,80
Oxygen content	PIONA-GC-CST	EN 14 517	% (m/m)	2,206
Benzene	PIONA-GC-CST	EN 14 517	% (v/v)	0,599
Saturated HC	PIONA-GC-CST	EN 14 517	% (v/v)	58,79
Olefines	PIONA-GC-CST	EN 14 517	% (v/v)	9,59
aromatics	PIONA-GC-CST	EN 14 517	% (v/v)	23,95
Octane number	RON, CFR-engine	DIN EN ISO 5164 / ASTM D 2699		95,33
	MON, CFR-engine	DIN EN ISO 5163 / ASTM D 2700		85,55

7.4.6 Reference materials

For every method in the field of fuel analysis in the relevant international guideline a link about reference or standard material is given. In the report of activities E1 and E2 details about calibration are described.

For calibration procedures or performance checking in principal also handmade solutions can be used (the measurement traceability must be warranted):

I. Hand made mixtures made from p.a. quality chemicals

Example GC-analyse

It the need is to have a test solution for proofing performance of analytical devices it is possible that one can compose his one checking solution by mixing the pure chemicals. The following description is made for a checking solution in the field of gasoline, aromatic content or oxygenates.

The way to do this: Take a petrolether 60/95 which is free of olefines, aromatic compounds and oxygenates and add pure chemicals in a defined way, e.g. for routine tasks a typical gasoline handmade mixture consists of:

ca. 1 % benzene
ca. 10 % toluene
ca. 8 % ethylbenzene and xylenes
ca. 8 % higher aromatic compounds

ca. 5 % MTBE
ca. 5 % ETBE
ca. 3 % EtOH
ca. 1 % tBa

The solution can be used as control samples and for performance checking. During automatic running sequences they can be positioned after a number of real samples for documentation of relevant parameters like drift, sensitivity, chromatografic checks.

1. Distillation

Also in distillation mixtures can be made. The procedure is described in the guideline.

2. RON/MON

RON/MON will be determined in comparison with volumetric mixtures of reference material.

II. Use of pure chemicals

Checking or calibrating the analytical devices for the measurement of density, flame point or vapour pressure the use of pure chemicals is foreseen. The chemicals should be of high purity in minimum of “p.A. quality”.

III. Use of round robin retain samples

For viscosity, oxidation stability and gum content usually round robin samples were used. In that case the data of the retain samples are validated by the intercalibration study.

IV. Some (special) suppliers

A list of suppliers is given below.

Pure chemicals can be ordered for instance from:

Merck;
Fluka;
Riedel-de-Haen;
Sigma-Aldrich.

Calibration material for octane/cetane number determination can be ordered for instance from the company Haltermann in Hamburg (Dow-Chemical-group) see: www.dow.com/facilities/europe/germany/stand/halter

Prepared mixtures can be ordered from:

Company Conostan that delivers special oil standards (see: www.conostan.com);
Company Fragol that delivers Santoterm (for distillation group 4 – middle destil-late) www.fragol.de.

Calibration material

I. EN 228, gasoline

1. RON, MON

prEN 5164: RON
prEN 5163: MON

1.1. Defined volumetric composition of n-heptane, 2,2,4-trimethylpentane ("iso-octane") and toluene, all ASTM – Grade,
e.g. from Haltermann Hamburg (Dow-Chemicals)

1.2. Round Robin samples (intercalibration samples)
e.g. FAM

2. Lead content

EN 237: AAS
EN 13 723: XRA (not in EN 228)

2.1. Parent solution of lead chloride in Aliquat 336-MibK.
Aliquat 336: tricapryl-methyl-ammoniumchloride

2.2. Lead(II)acetat-3-hydrate, $PB(CH_3COO)_2 \times 3\ H_2O$
e.g. Merck, 1 g / kg

2.3. Finished standards, i.e. lead-standard, oil-dissolved
e.g. Conostan (certified standard)

2.4. Round Robin samples

3. Density

EN ISO 3675: Areometer
EN ISO 12 185: Quartz Oscillation

3.1. Water bidest., dried air or humidity corrected
toluene and methanol p.A. grade
Merck, Riedel-de-Haen, Fluka, ..

3.2. Round Robin samples

4. Sulfur

EN ISO 20 846: ultraviolet fluorescence
EN ISO 20 847: energy-dispersive X-ray fluorescence spectrometry
EN ISO 20 884: wavelength-dispersive X-ray fluorescence spectrometry
EN 24 260: Wickbold-burner

4.1. XRA: Solution of di-n-butylsulfide, Fluka 34 840
octa-soligen-zirconium, Borchers 90 347
UV, Wickbold: dihexyl-disulfide, p.A.

4.2. Round Robin samples

5. Oxidation stability

EN ISO 7536: oxidation stability

5.1. Round Robin samples

6. Residue, gum

EN ISO 6246: Gum content in fuels by jet evaporation

None

7. Copper corrosion

EN ISO 2160: copper corrosion

None

ASTM Copper strip corrosion standard, ASTM D 130

8. Volatility = vapour pressure + distillation range

Vapour Pressure

EN 13 016 – 1 : ASVP, Air Saturated Vapour Pressure

8.1. ASVP in kPA DVPE in kPa

n-pentane	112,1	104,4
cyclopentane	72,7	66,4
2,2-dimethylbutane	73,4	67,1
2,3-dimethylbutane	57,4	51,6
methanol	38,9	33,6
toluene	12,9	8,7

all p.A. grade

8.2. Round Robin samples

Distillation range

8.3. reference material according DIN 51 751, 1996:

(See addendum A of the guideline DIN 51751: reference liquids)

8.4. Round Robin samples

9. Hydrocarbon types in liquid petroleum products

ASTM D 1319: Fluorescent Indicator Adsorption or by
EN 14517: multidimensional GC

9.1. Composition of saturates hydrocarbons (n-paraffines and naphthenes), aromatics and olefins, all p.A. grade
e.g. n-hexane + iso-octane + 1-pentene + 1-hexene + cyclohexane + benzene + toluene + xylene

9.2. Round Robin samples

10. Benzene

EN 12 177: GC-CST
EN 14 517: multidimensional GC

10.1. Composition of defined paraffin-gasoline (free of aromatic compounds) and benzene, all p.A. grade

10.2. Round Robin samples

11. Oxigenates

EN 1601: GC-OFID
EN 13 132 : GC-CST
EN 14 517: multidimensional GC

11.1. Defined composition of oxigenate-free gasoline plus
all C1- to C4-alcohols
(MeOH, EtOH, IPA, NPA, NBA, SBA, IBA, TBA), 2-pentanol
(SAA), the ethers MTBE, ETBE, TAME, ETAE, acetone und
butanone, all p.A. grade

11.2. Round Robin samples

II. EN 590, diesel

1. Cetane number

EN ISO 5165: Cetane number of diesel fuel oils, CFR - Motor
DIN 51773: Cetane number of diesel fuel oils BASF-Motor

1.1. For calibration: Defined volumetric composition of cetane, n-hexadecane (CN = 100) and 1-Methylnaphthalin (CN=0) or 2,2,4,4,6,8,8 heptan-methylnonane (HMN) (CN=15).
all ASTM-Grade

1.2. For testing the knock engine: Round Robin samples

2. Cetane index

Calculated value, no calibration

3. Density

EN ISO 3675: Areometer
EN ISO 12 185: Quartz Oscillation

3.1. Water bidest., dried air or humidity corrected
toluene and methanol p.A. grade
Merck, Riedel-de-Haen, Fluka etc.

3.2. Round Robin samples

4. PAH, polycyclic aromatic hydrocarbons

4.1. SKS 1 (system-calibration-solution 1) contains:
cyclohexane, 1-phenyldodecane, 1,2-dimethylbenzene, hexamethylbenzene, naphthalene, dibenzothiophene and methylanthracene.

4.2. SKS 2 (system-calibration-solution 2) contains:
FAME and chrysene
Finished standards are available

4.3. Round Robin samples

5. Sulphur

EN ISO 20 846: ultraviolet fluorescence
EN ISO 20 847: energy-dispersive X-ray fluorescence spectrometry
EN ISO 20 884: wavelength-dispersive X-ray fluorescence spectrometry
EN 24 260: Wickbold-burner

5.1. XRA: Solution of di-n-butylsufide, Fluka 34 840
octa-soligen-zirconium, Borchers 90 347
UV, Wickbold: dihexyl-disulfide, p.A.

5.2. Round Robin samples

6. Flashpoint

EN ISO 2719 Flashpoint, Pensky-Martens

6.1. CRM (certified reference material)

Hydrocarbon	**Flashpoint in °C**
n-decane, n-C 10	53
n-undecane, n-C 11	68
n-dodecane, n-C 12	84
n-tridecane, n-C 13	109
n-tetradecane, n-C 14	134 (133,9)
1-hexanol	60,0
p-xylene	27,2

6.2. SWS (secondary working standard)

6.3. Round Robin samples

7. Carbon residue

EN ISO 10 370: carbon residue (micro method)

7.1. Round Robin samples

8. Ash

EN ISO 6245: Ash from petroleum products

8.1. Round Robin samples

9. Water

EN ISO 12 937:water content, coulometric titration acc. Karl Fischer

9.1. water bidest

9.2. reference material, Merck, Fluka etc.

10. Particulate contamination

EN 12 662: Particulate contamination in middle distillate fuels by laboratory filtration

11. Copper corrosion

EN ISO 2160: copper corrosion

11.1. None

11.2. ASTM Copper strip corrosion standard, ASTM D 130

12. Oxidation stability

EN ISO 12 205: Oxidation stability of distillate fuel oil

12.1. Round Robin samples

13. Lubricity (HFRR)

prEN ISO 12 156 – 1: Evaluating lubricity of diesel fuels by the high-frequency reciprocating rig (HFRR)

13.1. Round Robin samples

14. Viscosity

EN ISO 3104: determination of the kinematic viscosity and calculation of the dynamic viscosity

14.1. secondary standard ex Round Robin calibratingwith certified Ubbelohde-viscosimeter

15. Distillation range

15.1. reference material according DIN 51 751, 1996:
(See addendum A of the guideline DIN 51751: reference liquids)
Santotherm 66
e.g. Fragol Industrieschmierstoffe
Reichspräsidentenstraße 21 – 25
45470 Mülheim an der Ruhr

15.2. Round Robin samples

16. FAME – content

EN 14 078: FAME – content in diesel, IR-Methode

16.1. Volumetric composition of FAME-free diesel and FAME

16.2. Round Robin samples

17. CFPP + CP

EN 116: Cold filter plugging point of diesel and heating fuels (CFPP)
EN 23 015: cloud point (CP)

17.1. Round Robin samples

12. Phosphorus

ASTM D-3231: Phosphorus in Gasoline

12.1. Finished standards, i.e. phosphorus-standard, oil-dissolved

e.g. Merck 1.15072.0100

7.4.7 Conclusion

At the end of the sample exchange programmes and the successful participation on the FAM intercalibration study the output of the activity E4 “Intercalibration with German laboratories using referencial fuels conducted; Intercalibration protocols sufficient for accreditation” should be achieved.