Report Number 8: Baseline Methodology Report

National baseline and database report

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1. SCOPE

This paper responds to Work Package 4 (WP4) of the BASE-project. It is the final deliverable of WP4 of the BASE project, the National Baseline & Database Report. Its scope is to give an overview on baseline data availability and baseline data requirements for each CEE-partner country.

The report is structured into two sections, namely into

1.1 BASELINE DATA AND DATABASES ON THE ELECTRICITY COMPONENTS OF THE PROPOSED PROJECTS, IN OTHER WORDS ON THE ELECTRICITY SECTOR.

In the context of baselines the term 'national' (see the report's title and scope: 'national baseline and database report') at the moment nearly always refers to the electricity sector. The focus of this report is also on electricity.

1.2 DATA REQUIREMENTS ON THE HEAT COMPONENTS OF THE SINGLE PROJECTS

Heat component data is mostly a question of individual, project-specific analysis although the PCF is trying to develop the basis for national heat baselines as well (district heating in the Czech Republic). Key national data on heat components mainly regard retail prices of energy carriers, national energy or environmental planning and investment cost for boilers. Although the BASE project did not intend to develop national heat baselines heat component related data requirements of the proposed projects are discussed in this paper, split into 'available data' and 'open data requirements'. The above mentioned type of data is provided in tables for some of the BASE projects (the investment cost is one block in the tables and not split into single components such as boilers, network etc.). The Polish project does not have a heat component.

The descriptions of the proposed projects are briefly recalled in section 3 as a text description. Graphical project descriptions have already been published within the BASE project cycle (see the BASE web page) and have not been inserted again here in order to keep this document's size reasonable.

2. ELECTRICITY

This part is on the electricity sector of the BASE partner countries and the relevant baseline data. Its structure reflects the structure of a standard questionnaire of specific questions on the national electricity sector which has been sent out to the CEEC-partners of BASE. The questions have been formulated from the point of view of a project developer who is interested to set up or use an electricity baseline in that country. This is in line with the main goals of the BASE project – to facilitate setting up national baselines.

General conclusions which can be drawn for all countries from the questionnaires are:

⇒ in principle, the necessary data for national electricity baselines seems to be available for all countries. However, data is scattered over various national institutions, databases, yearbooks etc. Only in the Hungarian case all necessary data is united in a single model (ENPEP)

⇒ Governments are very cautious in their statements on the use of an average emission factor as an electricity baseline. No government really commits itself to accepting the use of an average emission factor (even though this seems to be the most probable and practical approach for the future).

⇒ Future political changes (EU accession) and legal influences seem to be decisive for the baseline development of all countries.

2.1 CZECH REPUBLIC

2.1.1 HOW IS ELECTRICITY IN YOUR COUNTRY PRODUCED?

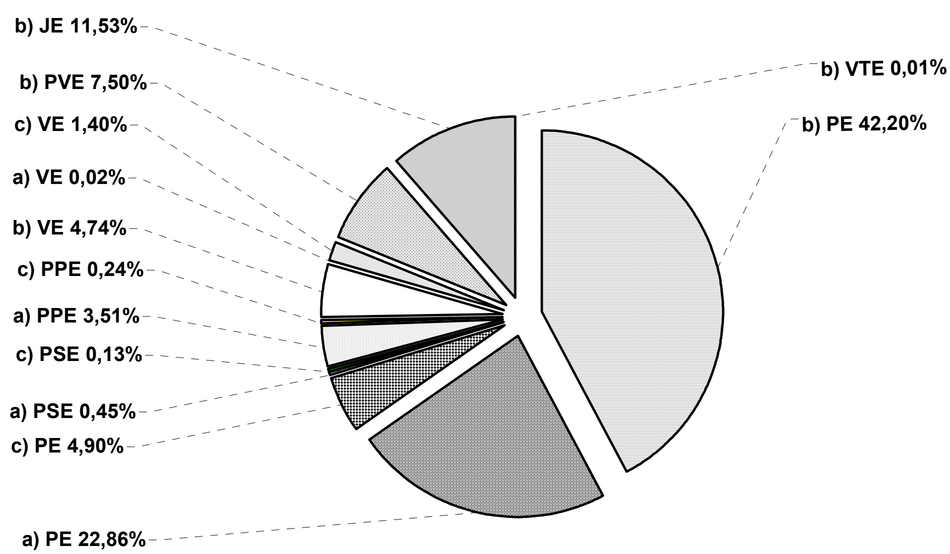

chart 1: Czech Republic: Power production by fuel and plant type

a) IPP up to 50MW b) CEZ c) IPP 5-50MW

PE coal

PSE gas
PPE gas coal combine cycle
JE nuclear
VE hydro
PVE hydro – pumping

The following table provides an overview on the Czech power generation sector:

Installed capacity in the Czech Republic

(31.12.2001)

a) IPP up to 50 MW total install capacity

Name	**install capacity [MW]**		
	XI. 2001	**XII. 2001**	**difer.**
PE - coal CGP			
Aliachem a.s.	75,60	75,60	0,00
ECK GENERATING, s.r.o.	304,90	304,90	0,00
ECS spol. s r. o.	52,50	52,50	0,00
Elektrárny Opatovice a.s.	360,00	360,00	0,00
Energetika Třinec, a.s.	86,00	86,00	0,00
Energotrans a.s.	352,00	352,00	0,00
Frantschach Pulp & Paper a. s.	94,00	94,00	0,00
Chemopetrol, a.s.	310,60	310,60	0,00
Kaučuk, a.s.	60,00	60,00	0,00
Moravskoslezské teplárny a.s.	267,10	267,10	0,00
Nová Huť, a.s.	254,00	254,00	0,00
Plzeňská energetika a.s.	84,00	84,00	0,00
Plzeňská teplárenská, a.s.	105,00	105,00	0,00
Pražská teplárenská a.s.	136,50	136,50	0,00
United Energy, a. s.	236,00	236,00	0,00
Sokolovská uhelná, a.s.	220,00	220,00	0,00
SPOLANA a.s.	76,70	76,70	0,00
ŠKO-ENERGO, s.r.o..	88,00	88,00	0,00
Teplárna České Budějovice, a.s.	66,20	66,20	0,00
Teplárna Ústí nad Labem, a.s.	88,00	88,00	0,00
Teplárny Brno, a.s.	97,20	97,20	0,00
Teplárny Karviná, a.s.	79,00	79,00	0,00
Energetika Vítkovice, a.s.	79,00	79,00	0,00
Total PE	**3 572,30**	**3 572,30**	**0,00**

c) IPP from 5 MW to 50MW total output capacity

Name	**install capacity [MW]**		
	XI. 2001	**XII. 2001**	**difer.**
PE - coal CGP			
Actherm, s.r.o., odštěpný závod Chomutov	18,00	18,00	0,00
BIOCEL, a.s.	41,60	41,60	0,00
CINERGETIKA U/L, a.s.	19,60	15,80	-3,80
Cukrovar a raf. cukru Dobrovice TTD a.s.	14,90	14,90	0,00
Cukrspol Praha a.s.	12,00	12,00	0,00
ČKD Motory, a. s.	6,00	6,00	0,00
DEZA, a.s.	16,00	16,00	0,00
Elektrárna Kolín a.s.	17,00	17,00	0,00
Energetika TATRA, a.s.	24,00	24,00	0,00
	18,00		
ENERGZET, a.s.		18,00	0,00
ESMO Mohelnice, spol. s r.o.	14,60	14,60	0,00
Chemické závody Sokolov, a.s.	6,00	6,00	0,00
JIP - Papírny Větřní, a.s.	24,00	24,00	0,00
JIP - Papírny Vltavský Mlýn Loučovice, a.s.	6,00	6,00	0,00
JITEX Písek a.s.	6,50	6,50	0,00
Lovochemie, a.s.	25,00	25,00	0,00
Moravské teplárny, a.s.	49,30	49,30	0,00
MORAVSKOSLEZSKÉ CUKROVARY, a.s.	12,00	12,00	0,00
Olšanské papírny, a.s.	5,20	5,20	0,00
Ostrovská teplárenská, a.s.	6,00	6,00	0,00
1. Slezská, a.s.	5,25	5,25	0,00
Příbramská teplárenská a.s.	40,00	40,00	0,00
Teplárna Liberec, a.s.	12,00	12,00	0,00
Teplárna Otrokovice a.s.	50,00	50,00	0,00

PSE - Gas CGP			
ECK GENERATING, s.r.o.	66,90	66,90	0,00
Pražská teplárenská a.s.	1,80	1,80	0,00
Total PSE	**68,70**	**68,70**	**0,00**
PPE - Gas coal combine cycle			
PPC Trmice, a.s.	70,00	70,00	0,00
Sokolovská uhelná, a.s.	370,00	370,00	0,00
Teplárny Brno, a.s.	95,00	95,00	0,00
Total PPE	**535,00**	**535,00**	**0,00**
VE - Hydro			
SPOLANA a.s.	2,20	2,20	0,00
Teplárna Ústí nad Labem, a.s.	0,30	0,30	0,00
Total VE	**2,50**	**2,50**	**0,00**
Total	**4 178,50**	**4 178,50**	**0,00**

b) ČEZ, a. s.

Type of production	**install capacity [MW]**		
	XI. 2001	**XII. 2001**	**difer.**
PE	6 517,30	6 517,30	0,00
VE	722,77	722,77	0,00
PVE	1 145,00	1 145,00	0,00
JE	1 760,00	1 760,00	0,00
VTE (větrné elektrárny)	1,18	1,18	0,00
Total ČEZ, a. s.	**10 146,25**	**10 146,25**	**0,00**

Czech Republic total	**instalovaný výkon [MW]**		
	XI. 2001	**XII. 2001**	**difer.**
PE	**10 840,23**	**10 836,43**	**-3,80**
PPE	**591,60**	**591,60**	**0,00**

Teplárna Písek, a.s.	7,80	7,80	0,00
Teplárna Strakonice, a.s.	30,00	30,00	0,00
Teplárna Tábor, a.s.	8,75	8,75	0,00
Velveta a. s.	4,00	4,00	0,00
ŽĎAS, a.s.	12,00	12,00	0,00
ostatní	239,13	239,13	0,00
Total PE	**750,63**	**746,83**	**-3,80**
PSE - Gas CGP			
Králodvorské železárny ENERGO, s.r.o.	10,00	10,00	0,00
Teplárna Týnec s.r.o.	4,90	4,90	0,00
TEREA Cheb s.r.o.	8,00	5,04	-2,96
TERMO Děčín, a.s.	10,30	9,40	-0,90
TON - ENERGO a.s.	7,00	4,00	-3,00
Velveta a.s.	4,80	4,80	0,00
Vězeňská služba České republiky	2,17	2,17	0,00
Total PSE	**47,17**	**40,31**	**-6,86**
PPE			
Krkonošské papírny, a.s.	13,00	13,00	0,00
Olšanské papírny, a.s.	5,20	5,20	0,00
Spalovna průmyslových odpadů, a.s.	6,50	6,50	0,00
Teplárna Kyjov a.s.	23,00	23,00	0,00
Zásobování teplem Vsetín a.s.	8,90	8,90	0,00
Total PPE	**56,60**	**56,60**	**0,00**
VE			
České energetické závody, státní podnik	5,67	5,67	0,00
Elektrárna Kolín a.s.	1,10	1,10	0,00
ENERGO-PRO a.s.	25,80	25,80	0,00
HYDROČEZ, a.s.	14,70	14,70	0,00
Povodí Ohře státní podnik	16,80	16,80	0,00
Povodí Vltavy státní podnik	9,50	9,50	0,00
STE - HYDRO, spol. s r.o.	7,21	7,21	0,00
REAS - JČE, a.s.	1,60	1,60	0,00
REAS - JME, a.s.	28,10	28,10	0,00
REAS - SČE, a.s.	19,50	19,50	0,00
REAS - STE, a.s.	2,10	2,10	0,00

PSE	**115,87**	**109,01**	**-6,86**	REAS - VČE, a.s.	16,88	16,88	0,00
VE	**1 000,23**	**1 000,23**	**0,00**	REAS - ZČE a.s.	10,50	10,50	0,00
PVE	**1 145,00**	**1 145,00**	**0,00**	ostatní	115,50	115,50	0,00
JE	**1 760,00**	**1 760,00**	**0,00**	**Total VE**	**274,96**	**274,96**	**0,00**
AE	**1,18**	**1,18**	**0,00**				
Total	**15 454,11**	**15 443,45**	**-10,66**	**Total**	**1 129,36**	**1 118,70**	**- 10,66**

table 1: Czech Republic: Power and CHP plants and their installed capacity

2.1.2 WHO COLLATES THE DATA FOR THE NATIONAL ELECTRICITY BASELINE IN THE COUNTRY? HOW DOES HE/YOU DO IT?

There doesn t exist any unique institution collecting data for the national electricity baseline. Setting up a baseline requires combining several existing data sources.

2.1.3 WHICH ARE EXISITING DATABASES ON THE TOPIC? WHO IS MAINTAINING AND OWNING THEM?

<u>Energy statistics</u>

Czech Statistic Institute
The main official source for overall energy statistics is the Czech Statistic Institute. Several databases are regularly updated and available against a fee or are under free access.

Energy Companies
The main energy companies publish their own statistic year books – publicly available on their web sites (CEZ, CEPS,etc).

INVICTA Bohemica
Each year the INVICTA Bohemica company publishes an analysis of the CZ energy system including data on electricity, heat, gas producers and distributors.

<u>Emissions statistics</u>

The **Czech Hydrometeorological Institute** is responsible for an information system of air protection including two data systems:

1. the emission register and energy sources register **“REZZO”**
2. immission information system **„IIS“**

The database REZZO includes the information about:

- the fuel composition (content analysis)
- the fuel consumption
- the emissions

The REZZO database is divided into the 3 subsystems:
REZZO 1 – stationary burning equipment with heat output up to 5 MW and special technology processes
REZZO 2 - stationary burning equipment with heat output 0,2 - 5 MW and large technology processes
REZZO 3 - stationary burning equipment with heat output less than 0,2 MW and small technology processes, coal mines

Company	Phone	Contact person	E-mail	Web site
CEZ	+420271131111	Jaroslav Mil gen.director	info@mail.cez.cz	cez.cz
CEPS	+420267104463	Ludmila Petranova gen.dir.	petranova@ceps.cz	ceps.cz
Czech statistic inst.	+420274051111	Jarmila Bondyova	-	czso.cz
INVICTA	+224142109	Ing.Jiri Vondras	Invicta_bohemica@ok.cz	-
CZECH hydrom.inst.	+420244032456	Pavel Fott	fott@chmi.cz	Chmi.cz
MoE – admin.center	+420267122328	Ing. Tomas Chmelik	chmelik@env.cz	Env.cz

table 2: Czech Republic: Stakeholders in electricity production and statistics (name, adress, phone number)

The inventory of GHGs is yearly presented to UNFCC secretary in accordance with the IPPC methodology.

2.1.4 WHICH DATA IS STILL MISSING FOR CALCULATING THE EFFECT OF ji PROJECTS ON THE NATIONAL ELECTRICITY MIX?

All data are available is available, however, it is necessary to combine several sources, as mentioned above.

2.1.5 HOW DOES A (FOREIGN) INVESTOR GET ACCESS TO THE DATA WHICH IS NECESSARY FOR A NATIONAL BASELINE?

As can be seen from above, there does not exist any single institution which could serve as a unique data source for setting up a baseline. All data sources are available to everyone, however, the co-operation with a national Czech consultant is advisable to a foreign project developer (baseline author) as long as a standardised baseline has not been officially put into place. The Administrative Center for JI of the Ministry of Environment possesses a list of potential consultants.

2.1.6 IS TEHRE AGREEMENT IN THE GOVERNMENT ABOUT THE CONCEPT OF AN AVERAGE NATIONAL EMISSION FACTOR? (AGREEMENT THAT AN AVERAGE NATIONAL EMISSIONN FACTOR MAY BE USED AS A BASELINE)

Neither does a national electricity baseline methodology exist nor is there a government agreement on the concept of using a sole emission factor.

2.1.7 IN PARTICULAR – WHAT IS THE GOVERNMENT'S OPINION ON THE EXISTING ERUPT EMISSION FACTORS FOR EACH COUNTRY. ARE THEY WELCOMED?

As there is no methodology suggested by the government no comments on the ERUPT guidelines for JI Projects or the respective emission factors can be provided.

2.1.8 IS SOMEONE IN THE COUNTRY IN CHARGE OF CALCULATING SUCH AN AVERAGE NATIONAL EMISSION FACTOR? IF SO – WHO?

No.

2.1.9 WHAT IS THE FORECAST DEVELOPMENT OF THE ELECTRICITY DEMAND?

A study from 2002 for CEPS done by EGU Brno about the scenarios of future development of power consumption. provides the following graph:

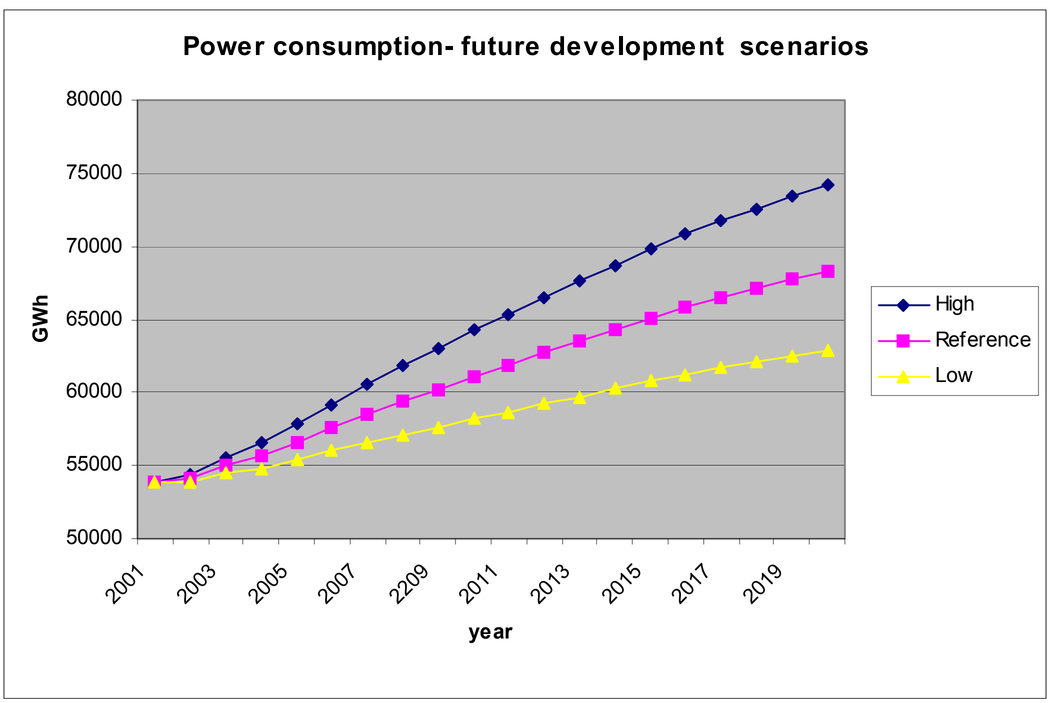

chart 2: Czech Republic: Future power demand (Source: CEPS)

2.1.10 WHAT IS PARTICULAR ABOUT THE COUNTRY REGARDING THE NATIONAL ELECTRICITY BASELINE?

2.1.11 CAN ONE EXCLUDE THE POSSIBILITY OF THE REDUCTION IN OPERATION OF CERTAIN PLANTS OR TYPE OF PLANTS? IF SO – WHY? ARE THERE ANY COMMENTS ON A DISPATCH MODEL?

2.1.12 WHICH REGULATIONS, LAWS ETC. ARE PLANNED OR PENDING IN DECISION WHICH YOU THINK MIGHT INFLUENCE THE NATIONAL ELECTRICITY BASELINE?

The National Energy Policy document will be revised this year. Already now it is clear that some of the assumptions for 2005 will not come true, for example the targeted utilisation of RES (Renewable Energy Sources). That means that the baseline calculation has to be updated according to the updated policy (= 'baseline revision' as part of the Monitoring Plan). It is also clear that many power sources – old coal steam power plants (mainly owned by CEZ company – the main power producer) will have reached the end of their lifetime by 2015. Until that time on should not expect any substantial changes of the power system. There is also new legislation in the preparation which will change the conditions for baseline calculations concerning the period after 2005 including an environmental tax reform and a law for the RES utilization.

2.1.13 IS THE ELECTRICITY MARKET OF YOUR COUNTRY LIBERAISED? IF NOT, IS IT GOING TO BE? AND WHEN? ANY DIFFERENCES REGARDING SMALL AND BIG CONSUMERS?

The opening of the electricity market on base of the Energy Act has started in January 2002 and full opening should be achieved in 2006 when all consumers will become eligible to choose a supplier. In the first step, since 1 January 2002 major consumers with an annual electricity consumption above 40 GWh/a are allowed to choose their individual suppliers. Licensed producers with an installed capacity above 10 MWe have the right of regulated access to the transmission and distribution systems. After 1 January 2003 end consumers with annual consumption above 9 GWh will be also be able to choose their supplier and all licensed electricity producers will have the right of regulated access. Transmission and distribution fees as well as fees for ancillary services for the system are regulated by the Energy Regulatory Office. The maximum heat and electricity prices are regulated by the Regulator.
Participants of the electricity market are:

1. producers
2. operator of the transmission system
3. operators of the distribution systems
4. electricity market operator

5. electricity traders
6. end consumers

Producers, distributors and traders must be licensed and all participants must be registered by the Operator.

There are two forms of electricity trading:
1. Short term trade for 24 hours of the next day organised by the Energy Market Operator
2. Bilateral trade (contracts) for all type of trade except for the above

The market operator is a fully state owned joint stock company. On the short term market the supply and demand is negotiated on hourly basis. The minimum amount of supply is 1 MWh. Bilateral contracts are registered by the Operator who is also in charge of balancing the electricity supply and demand for short, medium and long term period.

date	**required consumption of a customer**
1.1.2002	>40 GWh/year
1.1.2003	> 9 GWh/year
1.1.2005	>100 MWh/year

table 3: Czech Republic: Steps in the liberalisation of the electricity market (dates when customers may choose their individual supplier)

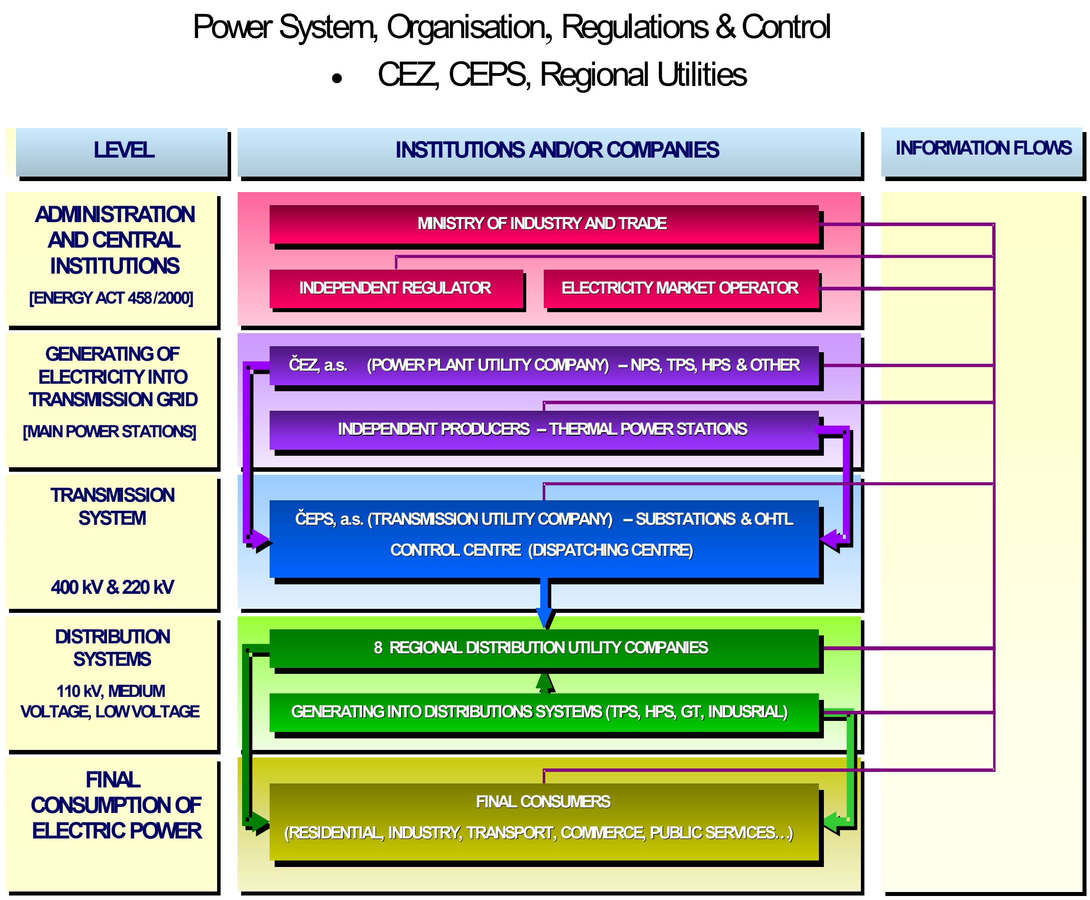

chart 3: Czech Republic: Organisational structure of the national power generation, transmission and distribution

There is a long tradition of a cogeneration district heating systems in the Czech Republic. About 24% of electricity production comes from cogeneration. The liberalisation of power market will not support the CGP, in accordance with the preparation EU Directive for CGP.

2.1.14 PLEASE PROVIDE AN IDICATION OF RETAIL PRICES (in Euro/kWh or in Euro/kg etc. Anyway - in Euro) ON THE FOLLOWING FUELS:

Type of fuel	Large consumers EUR/MWh	Inhabitants EUR/MWh
coal	4	12
coke	10	17,6
gas	15	20,11
oil	28	35
biomass	12 (wood chips)	18,83 (brickets)

table 4: Czech Republic: Fuel prices

2.2 ESTONIA

2.2.1 CURRENT ELECTRICITY BASELINE

The current baseline assumes that emissions from the Baltic CHP are substituted by electricity from the project. Reasons for this assumption are the following:

1. Existing CHP plants have competitive production price of electricity only if operating in co-production mode of heat and power. Therefore their power production share is limited by economical reasons and is mostly heat-driven, i.e. on climate conditions. Limitation of their production share (due to hereby Tartu CHP or other renewable energy project) is therefore impossible.
2. From the two biggest power plants – Estonian and Baltic PP the main power load is on the Estonian PP, which is due its higher average efficiency and its advanced production cost.
3. The Estonian Energy Ltd already considers the reduction of Baltic PP condensing power production due to forthcoming renewable energy projects. The production capacity of Baltic PP will be reduced in any case and the existing capacities to be refurbished.

The decrease in electricity output will affect the refurbished Baltic CHP, namely its new circulating bed boilers (FBCs). The carbon emission factor (CEF=29.1 tC/TJ) for a pulverised combustion of oil shale was taken from IPCC Guidelines (IPCC Guidelines, 1996). The CEF for FBC (Unit 11) was calculated (CEF = 28.76 tC/TJ).

The calculated CO2 emission reductions with the implementation of the project are estimated as follows:
1st period: 2004(6^{th} month)-2007: 255,866 tons
2ndperiod (2008-2012): 346,564 tons
Total: 602,430 tons CO2.

2.2.2 HOW IS ELECTRICITY IN YOUR COUNTRY PRODUCED?

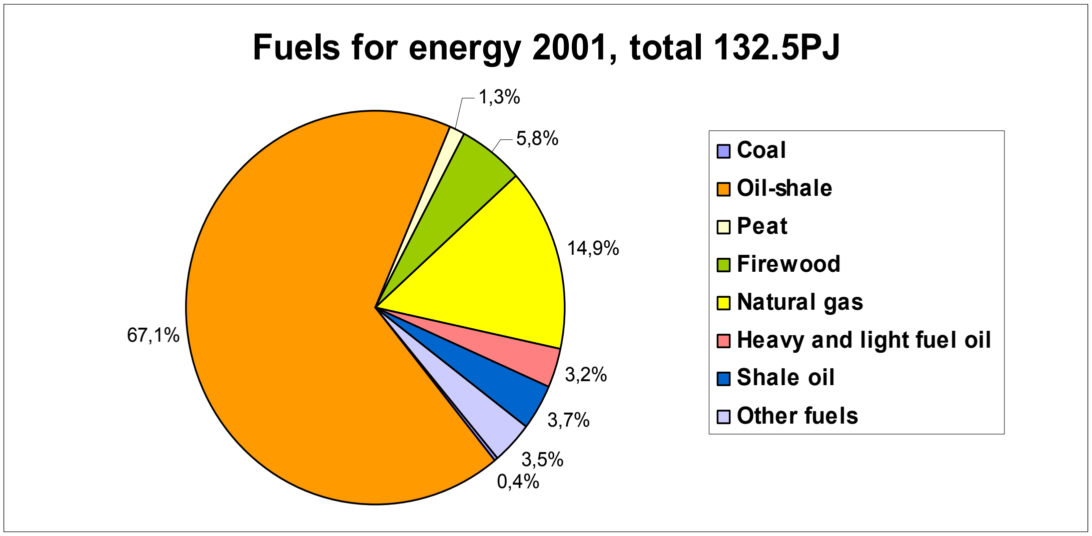

chart 4: Estonia: Total fuel consumption by fuel type

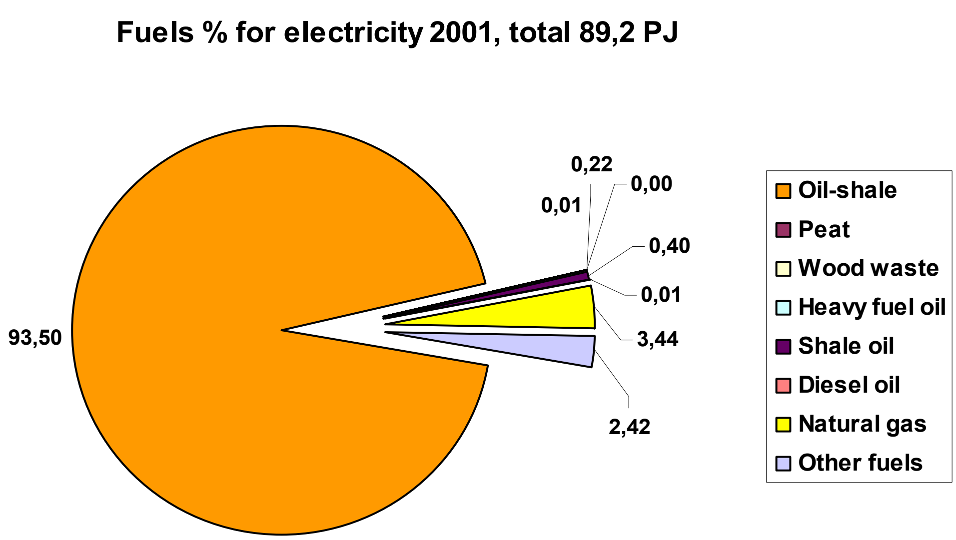

chart 5: Estonia: Power production by fuel type

Estonian power producers (power plants)

Name	Type	Capacity	Date of construction

	(PP = Power Plant, CHP = Combined Heat and Power Plant)		
1.Eesti	PP	1600Mwe	installed 1968-1976
2. Balti Power Plant	CHP	900MWe + 224/500 MWe/MWth	installed 1958 – 1966
3.Iru	CHP	190 / 320 MWe/MWs	1980 – 1982
4. Kohtla-Järve	CHP	27 / 70 MWe/MWs	1954 - 1958
5.Ahtme	CHP	20 / 37 MWe/MWs	1953
6.Viru Energia	CHP	8 / 22 MWe/MWs	turbin 1997
7.Sillamäe Silmeti	CHP	4,5 / 12 MWe/MWs	
8.AS Tootsi Turvas	CHP	5 / 14 MWe/MWs	
9.AS Sangla Turvas	CHP	2,5 / 7 MWe/MWs	1998
10.AS Kunda Nordic Tsement	CHP	3,1 / 3,3 MWe/MWs	1998-1999
11.AS Grüne Fee	CHP	2 / 2,4 MWe/MWs	1997-1998
12.AS Põlva Soojus	CHP	0,92 / 1,25 MWe/MWs	1999
13. AS Narva Vesi	CHP	0,5 / 0,7 MWe/MWs	1999
14.AS Kristiine Kaubanduskeskus	CHP	0,5 / 0,7 MWe/MWs	2000
15.AS Terts Pääskülas	CHP	0,84 / 1 MWe/MWs	2002

table 5: Estonia: Power and CHP plants and their installed capacity

2.2.3 WHO COLLECTS THE DATA FOR THE NATIONAL ELECTRICITY BASELINE IN THE COUNTRY? HOW DOES HE/YOU DO IT?

There doesn t exist a unique institution collecting data for the national electricity sector baseline. The electricity baseline has been calculated only for one power plant - the Baltic PP. In other words – the electricity output from the Tartu project (from the built CHP) isassumed to substitute the Baltic PP only. Setting up a baseline requires combining several existing data sources.

2.2.4 WHICH DATA IS STILL MISSING FOR CALCULATING THE EFFECT OF JI-PROJECTS ON THE NATIONAL ELECTRICITY MIX?

Missing is data an the energy output of some IPP plants (co-produced heat and electricity), the unit cost of electricity per plant, the political and entrepreneurial preferences for closing down some plants, etc. Though most data is principally available, however, it is necessary to combine several sources, especially when considering the share of CHP-s power/heat. As a rule the fuel consumption data is given for the whole CHP sector, including also some heat only boilers. Although the heat production data is summarised, there is no indication which share of this heat is produced by the combined heat and power processes.

2.2.5 HOW DOES A (FOREIGN) INVESTOR GET ACCESS TO THE DATA WHICH IS NECESSARY FOR A NATIONAL BASELINE?

Again, there does not exist any single institution which could serve as a unique data source for setting up an electricity sector baseline. An average emission factor approach can be used, but it bears the risk of uncertainties regarding the oil-shale burning technologies and the fuel data of CHP. All data sources are available to everyone, however, the co-operation with a national Estonian consultant is advisable to a foreign project developer (baseline author) as long as a standardised electricity sector baseline has not been officially put into place. The electricity sector baseline shall be worked out by Estivo Ltd. during the current Base project.

2.2.6 IS THERE AGREEMENT IN THE GOVERNMENT ABOUT THE CONCEPT OF AN AVERAGE NATIONAL EMISSION FACTOR? (AGREEMENT THAT AN AVERAGE NATIONAL EMISSION FACTOR MAY BE USED AS A BASELINE)

Neither does a national electricity baseline methodology exist nor is there a government agreement on the concept of using a sole emission factor.

2.2.7 IN PARTICULAR - WHAT IS THE GOVERNMENT'S OPINION ON THE EXISTING ERUPT EMISSION FACTORS FOR EACH COUNTRY. ARE THEY WELCOMED?

As there is no methodology suggested by the government no comments on the ERUPT guidelines for JI Projects and the respective emission factors can be provided.

2.2.8 IS SOMEONE IN THE COUNTRY IN CHARGE OF CALCULATING SUCH AN AVERAGE NATIONAL EMISSION FACTOR? IF SO - WHO?

There was no need for this work so far. Several obstacles (2.2.4) are linked to this task.

2.2.9 WHAT IS THE FORECAST DEVELOPMENT OF THE ELECTRICITY DEMAND?

A new “Energy Development Plan” up to year 2015, to be realised in 2003 by the Tallinn Technical University, proposes two scenarios of future development of power consumption: average increases of 2%/year and of 3,5%/year.

2.2.10 WHICH ARE EXISTING DATABASES ON THE TOPIC? WHO IS MAINTAINING AND OWNING THEM?

The Inventory Report for 2001 is available from the web page of the Ministry of Environment. The database of GHG is owned and maintained by Institute of Ecology.

Energy statistics

- Estonian Statistic Office

The main official source for overall energy statistics is the Estonian Statistic Office. Several databases are regularly updated and available against a fee or are under free access.

- Energy Companies
  The main energy companies publish their own statistic year books – publicly available on their web sites (Eesti Energia).

Emissions statistics

Only fuel data is collected for the national GHG Reports. The data is collected by Information and Technology Centre of Ministry of Environment and by Estonian Statistical Office. Inventory of GHG is provided by Institution of Ecology of Tallinn Pedagogic University , using the average emission factors (OECD recommendations).

2.2.11 What is particular about the country regarding the national electricity baseline?

Incomplete and partly lacking statistics about independent power and heat producers, lack of data about their future development plans.

2.2.12 CAN ONE EXCLUDE THE POSSIBILITY OF THE REDUCTION IN OPERATION OF CERTAIN PLANTS OR TYPE OF PLANTS? IF SO - WHY?

The National Energy Policy documents (Electricity Market Act and District Heating Act) will be revised and approved by parliament this year. A key question is if the measures proposed in these acts are adequate to guarantee the national target of RES (Renewable Energy Sources) up to 5% for 2010. In Jan. 2003 the share of RES was only 0,2%. In addition there are huge investments to be made for the rehabilitation of existing power blocks fuelled by oil-shale, which also reduces remarkably environmental impact.

This means that the baseline calculation has to be updated according to the updated policy and project implementations. It is also clear that many power sources – old oil-shale steam power units (mainly owned by Estonian Energy company – the main power producer) will have reached the end of their lifetime by 2015. Until that time quite substantial changes in the power system can be expected. In view of this expected development the baseline assumptions will have to be revised for the period after 2005.

2.2.13 WHICH REGULATIONS, LAWS ETC. ARE PLANNED OR PENDING IN DECISION WHICH YOU THINK THAT MIGHT INFLUENCE THE NATIONAL ELECTRICITY BASELINE?

Due to the 93% share of oil shale based electricity, the most influencing factors in Estonian energy sector are linked with development of the oil shale fuelled power plants.

<u>Treaties and directives</u>

First of all, there is the Finnish-Estonian Bilateral Treaty concerning the SO_2 pollution from Estonian oil shale fuelled power plants. According to the treaty the SO_2 emissions must be reduced from 2005 by 80% compared to the level of 1990. To fulfil the Treaty, two 200 MW_{el} power units are going to be reconstructed to circulating fluidized bed combustion and production of power plants has already dropped by more than 50%.

The second influencing factor is the EC LCP Directive, which limits the SO_2 emissions even more from the year 2008. It means that all polluting power units, not satisfying the set SO_2 limits, might be shut down or reconstructed using the best available technology. To fulfil the Directive, at least two additional 200 MW_{el} power units must be reconstructed. There is also a “softer” option in limited use of polluting power units and step-by-step shutdown until year 2015.

The third influencing factor is the Estonian Government obligation in EU accession process to increase the share of renewable electricity from 2010 up to 5,1%. Today’s RES level is 0,2%. If the measures in Electricity Market Act are sufficient to satisfy this obligation, will only become clear in the oncoming years.

<u>Electricity purchase obligation</u>
According to the Electricity Market Act the grid is obliged to buy electricity produced by renewable energy sources (RES), at a price 1,8 times the average marginal production price of Eesti Energia.

2.2.14 IS THE ELECTRICITY MARKET OF YOUR COUNTRY LIBERALISED? IF NOT, IS IT GOING TO BE AND WHEN? ANY DIFFERENCES REGARDING SMALL AND BIG CONSUMERS?

<u>Market liberalization</u>
As a result of EU accession negotiations Estonia has prolonged its terms of electricity market liberalisation. The market is free for the following consumers at the following dates

Terms	Annual consumption over	Market share
already now	40GWh	ca. 10%
From 01.01.2009	10GWh (estimated)	> 35%
From 01.01.2013*)	All business consumers	ca. 60%

*) The date depends on results of final EU accession negotiations.

table 6: Estonia: steps in the electricity market liberalisation

2.2.15 PLEASE PROVIDE AN INDICATION OF RETAIL PRICES (IN EURO/KWH OR IN EURO/KG ETC. ANYWAY - IN EURO) ON THE FOLLOWING FUELS

Type of fuel	Large consumers €/MWh	Small consumers €/MWh
coal	6,5	7,8

oil shale	3,8	-
gas	10	13-22 (depending on purpose)
oil	10,5 (heavy fuel oil)	20 (Light fuel oil)
peat	2,9 (milled peat);5,6 (sod peat)	8,3 (peat briquettes)
biomass	5 (wood chips)	6,5 (firewood)

table 7: Estonia: Fuel prices

2.3 HUNGARY

2.3.1 CURRENT ELECTRICITY BASELINE

To be assessed.

2.3.2 HOW IS ELECTRICITY IN YOUR COUNTRY PRODUCED?

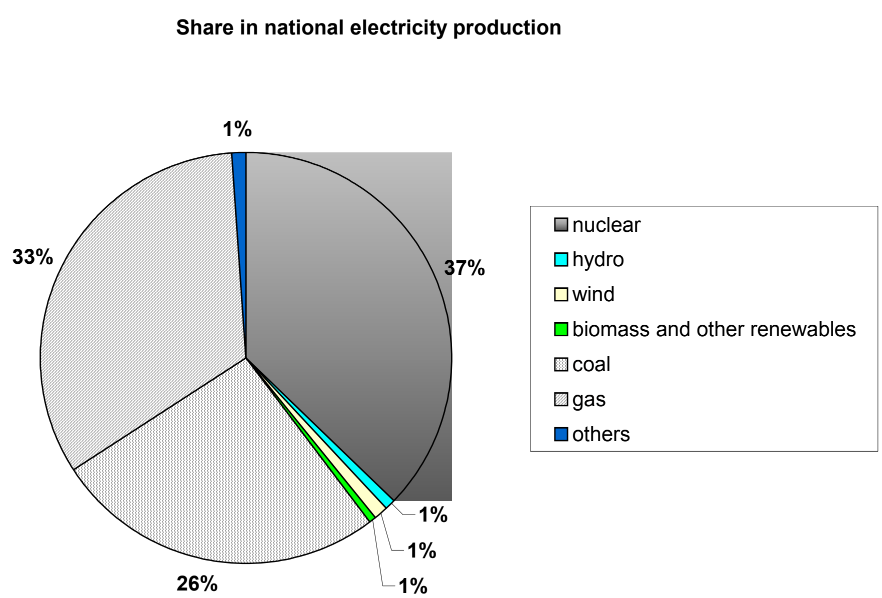

chart 6: Hungary: Power production by fuel type

Plant name	CHP, power only	fuel	Capacity	annual output	
Unit->			MW	GWh	
AJKA	power only	coal	132		
INOTA	CHP	gas	170		

INOTA	power only	coal	52		
BORSODI	power only	coal	137		
TISZAP	power only	gas	250		
TISZAII	power only	coal	860		
KELENFOLD	CHP	gas	229		
KOBANYA	CHP	gas	21,9		
UJPEST	CHP	gas	9,6		
ANGYALFOLD	CHP	gas	9,7		
KISPEST	CHP	gas	24		
DUNAMENTI	power only	oil&gas	2206		
PAKS	power only	nuke	1840		
MATRA	power only	coal	812		
PECS	power only	coal	190		
SAJOSZOGED	power only	gas	120		peaking
LITER	power only	gas	120		peaking
BANHIDA	power only	coal	100		
OROSZLANY	CHP	coal	235		
TATABANYA	CHP	coal	33,7		

table 8: Hungary: Power and CHP plants and their installed capacity

2.3.3 WHO COLLECTS THE DATA FOR THE NATIONAL ELECTRICITY BASELINE IN THE COUNTRY? HOW DOES HE/YOU DO IT?

Name of the institution	Adress (incl. Website and email)	Relevant publications of the institution in the field, type of Information the institution provides
Systemexpert Ltd.	sysexp@sysexpert.com, www. sysexpert.hu	Nat. Communications I-II-III, ENPEP Baseline in Power Sector
Ministry of Economics	www.Gm.gov.hu	Annual Energy Statistics
Hungarian Power Companies	www.mvm.hu	Electric Energy Statistics Yearbook
Hungarian Energy Office	www.meh.hu	Electric Energy Statistics Yearbook
Ministry of Environment		Nat. Communications I-II-III

table 9: Hungary:Main data sources (institutions) for electricity baselining

2.3.4 WHICH ARE EXISTING DATABASES ON THE TOPIC? WHO IS MAINTAINING AND OWNING THEM?

The only public databases are the above mentioned Annual Energy Statistics and the MVM Yearbook (with similar, sometimes overlapping contents). Electronic databases on the national baseline are only those results which were generated during previous calculations, this is available at MVM Rt.

2.3.5 DOES A NATIONAL DISPATCH MODEL EXIST? WHO OWNS IT?

Yes, there exists a national dispatch model, the owner is MVM Rt.

2.3.6 WHICH DATA IS STILL MISSING FOR CALCULATING THE EFFECT OF JI-PROJECTS ON THE NATIONAL ELECTRICITY MIX?

Data availability (availability in principle – not seen from a point of view of " availability to the public") is very good and no major data is missing. Data is available on power plant capacities, load factors (peak and average), scheduled maintenance time, operation lifetime and fuel mix is available, together with macroeconomic data such as the energy balance, energy imported, power produced, trade balance of electricity. Data forecasts are mostly for internal use, not available to the public. However, data is partly accessible in the public databases (efficiencies, fuel) and can be acquired. The forecast values are also available (scheduled retrofits, fuel switch, plant closures, etc.). Some other factors and parameters are confidential and were used in the baseline development process. They might be acquired if confidentiality is guaranteed.

2.3.7 HOW DOES A (FOREIGN) INVESTOR GET ACCESS TO THE DATA WHICH IS NECESSARY FOR A NATIONAL BASELINE?

Presently the easiest way is to contact the private consultant Systemexpert. Otherwise, officially MVM and the Ministry of Environment have to be contacted for this purpose. Systemexpert plays an eminent role because it was the main research agency for developing the baseline and emission scenarios for the above mentioned institutions. In the case of a national baseline development, an investor might have problems acquiring the data from the legal entities. In Systemexpert's opinion there is no reasonable point for an investor to develop a national baseline. The task of realising project specific baseline development is not put under official control yet meaning that an investor may develop project specific baselines on his own - no Hungarian rules apply (by now).

2.3.8 IS THERE AGREEMENT IN THE GOVERNMENT ABOUT THE CONCEPT OF AN AVERAGE NATIONAL EMISSION FACTOR? (AGREEMENT THAT AN AVERAGE NATIONAL EMISSION FACTOR MAY BE USED AS A BASELINE)

An expert group is working on this issue, with the coordination of Systemexpert, on behalf of the Ministry of Environment.

2.3.9 IN PARTICULAR - WHAT IS THE GOVERNMENT'S OPINION ON THE EXISTING ERUPT EMISSION FACTORS FOR EACH COUNTRY. ARE THEY WELCOMED?

For certain types of JI projects, the ERUPt emission factors are accepted from the government's side temporarily, until the official emission factors are developed.

2.3.10 IS SOMEONE IN THE COUNTRY IN CHARGE OF CALCULATING SUCH AN AVERAGE NATIONAL EMISSION FACTOR? IF SO - WHO?

See 2.3.8. The recalculation of the base and 1990 emissions inventory is also in progress.

2.3.11 WHAT IS PARTICULAR ABOUT THE COUNTRY REGARDING THE NATIONAL ELECTRICITY BASELINE?

There aren't any simplifying assumptions, except that the share of renewables is very low, and the Paks Nuclear PP has a significant share.

2.3.12 CAN ONE EXCLUDE THE POSSIBILITY OF THE REDUCTION IN OPERATION OF CERTAIN PLANTS OR TYPE OF PLANTS? IF SO - WHY? ARE THERE ANY COMMENTS ON A DISPATCH MODEL?

This is highly probable in Hungary, since the Paks Nuclear PP is a stabile base load unit, and remains like that on the long run due to the lifetime extension.

2.4 SLOVENIA

2.4.1 HOW IS ELECTRICITY IN YOUR COUNTRY PRODUCED?

Shares of installed capacities of power plants by fuel type are as follows
Thermal 33,5%
Hydro 29,3%
Nuclear 37,1%

The current use of renewable energy resources in primary energy in Slovenia is about 4,5% of hydro energy (small hydro), 4,5 % biomass and 'other renewables' of ca. 0,2%.

Name of power plant	Installed power (MW)	Electricity production (GWh/a)	Share (% of the total production)
HPP River Drava	575	2.822	
HPP River Sava	124	330	
HPP River Soča	108	361	
HPP small hydro	18	74	
Hydro PP	**825**	**3.587**	**29,3**

CHP Šoštanj	745	3.064	
TPP Trbovlje	188	599	
TPP Brestanica	95	28	
CHP Ljubljana	114	401	
Thermal PP	**1.142**	**4.092**	**33,5**
Nuclear PP Krško	**707**	**4.540**	**37,1**
Total	**2.684**	**12.231**	**100**

table 10: Slovenia: Power and CHP plants and their installed capacity and annual production

2.4.2 WHO COLLECTS THE DATA FOR THE NATIONAL ELECTRICITY BASELINE IN THE COUNTRY? HOW DOES HE/YOU DO IT?

Data for the national baseline is collected by
- the Energy office
- the Ministry of the Environment and
- the Spatial planing and Energy

These institutions are responsible for the area of energy supplies, mainly electric power and natural gas and published official statistics with the necessary data.

2.4.3 WHICH ARE EXISTING DATABASES ON THE TOPIC? WHO IS MAINTAINING AND OWNING THEM?

Energy statistics

As stated above the Energy office, the Ministry of the Environment and the Spatial planing and Energy are the owners and maintainer of the official statistics. They work together with the Institute Josef Stefan and the Institute Milan Vidmar.

Emissions statistics

The Energy office, the Ministry of the Environment and the Spatial planing and Energy are responsible for the information system on air protection.
The Inventory of GHG was presented to UNFCC secretary in accordance with the IPPC methodology.

2.4.4 DOES A NATIONAL DISPATCH MODEL EXIST? WHO OWNS IT?

The energy office is responsible for the energy transmission, for the balance of production and consumption. They own the dispatch model working together with the Institutes Josef Stefan and Milan Vidmar.

2.4.5 WHICH DATA IS STILL MISSING FOR CALCULATING THE EFFECT OF JI-PROJECTS ON THE NATIONAL ELECTRICITY MIX?

All data are available.

2.4.6 HOW DOES A (FOREIGN) INVESTOR GET ACCESS TO THE DATA WHICH IS NECESSARY FOR A NATIONAL BASELINE?

The energy office can serve as a data source, but with the co-operation with local consultant could be more effective. At the moment only the ISPO consulting company is working in this field.

2.4.7 IS THERE AGREEMENT IN THE GOVERNMENT ABOUT THE CONCEPT OF AN AVERAGE NATIONAL EMISSION FACTOR? (AGREEMENT THAT AN AVERAGE NATIONAL EMISSION FACTOR MAY BE USED AS A BASELINE)

The national electricity baseline methodology does not exist yet, thus a government agreement for using an emission factor does not exist (yet).

2.4.8 IN PARTICULAR - WHAT IS THE GOVERNMENT'S OPINION ON THE EXISTING ERUPT EMISSION FACTORS FOR EACH COUNTRY. ARE THEY WELCOMED?

They are welcomed but there is no official opinion of the Slovenian government on the ERUPT guidelines for JI Projects and the emission factor.

2.4.9 IS SOMEONE IN THE COUNTRY IN CHARGE OF CALCULATING SUCH AN AVERAGE NATIONAL EMISSION FACTOR? IF SO - WHO?

No.

2.4.10 WHAT IS THE FORECAST DEVELOPMENT OF THE ELECTRICITY DEMAND?

A preliminary scenario of future development of the electricity demand was prepared.

2.4.11 WHAT IS PARTICULAR ABOUT THE COUNTRY REGARDING THE NATIONAL ELECTRICITY BASELINE?

2.4.12 WHICH REGULATIONS, LAWS ETC. ARE PLANNED OR PENDING IN DECISION WHICH YOU THINK THAT MIGHT INFLUENCE THE NATIONAL ELECTRICITY BASELINE?

The National Energy Program – NEP is in its final stage and will be adopted this year. The baseline calculation will then be updated according to the new NEP. In the NEP long term energy sector plans will be taken into consideration, liberalisation of the market and sustainable development of the country.

Long term energy sector plans

1. The coal mine Trbovlje, which provides fuel to the TPP Trbovlje will be closed in 2007 (a decision on the operation of the TPP Trbovlje after the closure of the mine has not been taken yet)
2. Additional exploitation of the hydropotential (river Sava)
3. Increasing the exploitation of renewables (biomass CHP, wind)
4. Energy recovery of waste
5. Upgrading of existing thermal PPs to CHPs

Energy sector investments till year 2012

1. CHP - DH Ljubljana 1: fuel switch from coal to gas
2. CHP - DH Maribor: adding CHP equipment, enlarging the DH network
3. Additional exploitation of hydropotential , till year 2012
   In this context the expansion plan for the river SAVA in terms of new hydro power plants is as follows:

Location	**Capacity**	**Year**
Boštanj	32,5 MW	2004
Blanca	42,5 MW	2006
Krško	39,5 MW	2008
Brežice	41,5 MW	2010
Mokrice	31,5 MW	2012

table 11: Slovenia: Expansion plan for the river SAVA (new hydro power plants by capacity and year of installation)

2.4.13 PLEASE PROVIDE AN INDICATION OF RETAIL PRICES (IN EURO/KWH OR IN EURO/KG ETC. ANYWAY - IN EURO) ON THE FOLLOWING FUELS

The Prices Of The Main Fuels In Slovenia (SIT = Slovenian Tolar)

Fuel	**Price-SIT**	**Price-EURO**	**Price-SIT/kWh***
Fuel oil	93,2 SIT/l	0,41 EURO/l	9,3
Natural gas	87,6 SIT/Sm3	0,38 EURO/Sm3	9,24
Liquid gas	95,4 SIT/l	0,42 EURO/l	13,82
Coal	24.900 SIT/t	108,7 EURO/t	4,45
Firewood	9.500 SIT/m3	41,5 EURO/m3	3,95
DH coal Ljubljana			7,8
DH biomass			9,0 - 10,0
Electricity - average household			17,3

* Prices SIT/kWh are without boilers efficiency

table 12: Slovenia:: Fuel prices

2.5 POLAND

2.5.1 CURRENT ELECTRICITY BASELINE FOR THE BASE PROJECT

To be assessed.

2.5.2 HOW IS ELECTRICITY IN YOUR COUNTRY PRODUCED?

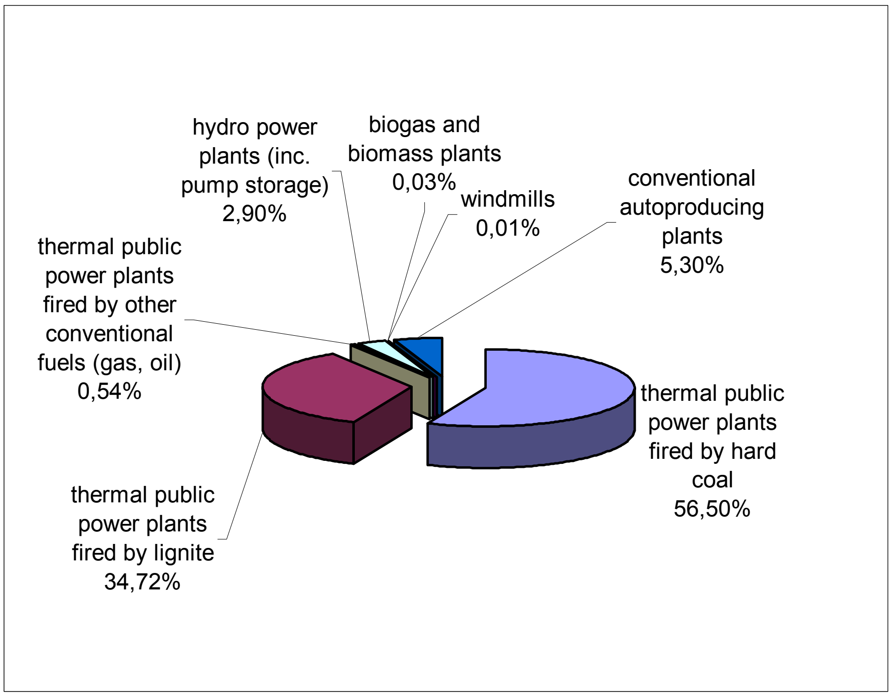

chart 7: Poland: Power production by fuel and plant type in 2001

Source: ARE, Electric energy statistics, 2001

The following table on Polish power plants reflects the predominance of coal (hard coal, lignite) in power production already (which can be seen also in chart 7).

Power plant	CHP, power only	Fuel	Installed capacity MWel	Electric Energy production gross, 2001, GWh
Elektrownia Bełchatów S.A.	power only	lignite	4390	28118
Elektrownia Turów S.A.	power only	lignite	2105	9555
Elektrownia P□tnów	power only	lignite	1600	7004
Elektrownia Adamów	power only	lignite	600	3406
Elektrownia Konin	power only	lignite	538	2473

Południowy Koncern Energetyczny S.A.				
Elektrownia Jaworzno 2	power only	hard coal	290	1339
Elektrownia Jaworzno 3	power only	hard coal	1320	5951
Elektrownia Łaziska S.A.	power only	hard coal	1155	5282
Elektrownia Łagisza S.A	power only	hard coal	840	3216
Elektrownia Siersza S.A.	power only	hard coal	763	2619
Elektrownia Blachownia S.A.	power only	hard coal	165	843
Elektrownia Halemba	power only	hard coal	200	1201
Elektrociepłownia Katowice	CHP	hard coal	135,5	855
Elektrownia Kozienice S.A.	power only	hard coal	2760	7997
Elektrownia Połaniec S.A.	power only	hard coal	1600	7213
Elektrownia Rybnik S.A.	power only	hard coal	1760	7263
Elektrownia Dolna Odra	power only	hard coal	1600	5482
Elektrownia Opole S.A.	power only	hard coal	1450	7939
Elektrownia Ostroł□ka B	power only	hard coal	600	2072
Elektrownia Skawina S.A.	power only	hard coal	590	1856
Elektrownia Stalowa Wola S.A.	power only	hard coal	340	1040
Elektrociepłownia Siekierki	CHP	Mostly hard coal	622	2611
EC Kraków S.A.	CHP		460	1943
EC Pozna□ Karolin	CHP		275,5	1528
Elektrociepłownia □era□	CHP		250,2	1444
EC Wrocław	CHP		255	1369
EC Gda□sk 2	CHP		243	1051
Elektrociepłownia Łód□ 4	CHP		215	936
Elektrociepłownia Łód□ 3	CHP		198,5	809
EC Bydgoszcz 2	CHP		224	664
EC Białystok S.A.	CHP		173	603
Elektrownia Pomorzany	power only		120	604
Zespół Elektrociepłowni Bytom S.A.	CHP		133,8	295
EC Gorzów S.A.	CHP		127,5	607
Elektrociepłownia Łód□ 2	CHP		128,1	341
EC Czechnica	CHP		132	423
EC Gdynia 3	CHP		110	554
EC Bielsko-Biała	CHP		107,7	284
EC Nowa Sarzyna Sp. o.o.	CHP		112,8	788
EC Zabrze S.A.	CHP		106	279
EC B□dzin S.A.	CHP		81,5	413
Elektrociepłownia Szczecin	CHP		88	278
Elektrociepłownia Ostroł□ka A	CHP		93,5	298

Elektrownia Chorzów S.A.	power only		81,5	230
EC Bielsko-Północ	CHP		55	312
EC Elbl□g Sp. Z o.o.	CHP		49	169
EC Tychy S.A.	CHP		40	292
Elektrociepłownia Powi□le	CHP		67	33
EC Zielona Góra S.A.	CHP		23,3	110
EC Bydgoszcz 3	CHP		21,4	2
EC Bydgoszcz 1	CHP		14	38
EC Kalisz Piwonice S.A.	CHP		8	28
Elektrociepłownia Pruszków	CHP		6,3	27
EC Pozna□ Grabary	CHP		6	5
Elektrociepłownia Łód□ 1	CHP			
EC VICTORIA Sp. Z o.o.	CHP		113,1	198
EC Zofiówka	CHP		70,4	495
EC Energetyka Boruta Sp. z o.o.	CHP		36,3	34
EC Moszczenica	CHP		36	158
EC Marcel Sp. Z o.o.	CHP		34,5	239
EC D□bie□sko	CHP		33,5	189
EC EC-WSK-Rzeszów Sp. z o.o.	CHP		12	45
EC Suszec	CHP		2,7	17
EC PZL-Mielec Sp. z o.o.	CHP		10	36
EC Zdu□ska Wola S.A.	CHP		6,6	26
EC GIGA Sp. Z o.o.	CHP		6	17
EC „Energotor – Toru□" S.A.	CHP		6	20
EC OPEC Grudzi□dz Sp. z o.o.	CHP		6	26
EC Knurów	CHP		5,5	20
EC Andropol –EC Sp. Z o.o.	CHP		4,7	5
EC ENERGOCENTRUM H.Ciegielski Sp. z o.o.	CHP		4,2	7
EC Kosarzyn s.c.	CHP		0,6	2
ENEGRO-ZACH Sp. Z o.o.				
EC Toru□ S.A.				
Total power plant and CPH fired by hard coal			**20450,5**	**82278**
Hydro pump storage plants	power only	hydro	1330	1800
Zespół Elektrowni Wodnych Por□bka □ar S.A.		hydro		
Elektrownia Wodna □arnowiec S.A.		hydro		
Elektrownia wodna □ydowo				

Other hydro power plants	power only	hydro	830	2243
Small hydro plants	power only	hydro	47,77	174
Biogas and biomass installations	power only/CHP	biomass and biogas	12,83	42
Windmills	power only	wind	18,04	14
Autoproducing plants	power only/CHP	mostly coal	2665,2	7716
TOTAL			**55172,54**	**227893**

table 13: Poland: Power plants (installed capacity, production) in 2001

Source: based on ARE statistical data from "Electricity Sector in Poland 2001"

2.5.3 WHO COLLECTS THE DATA FOR THE NATIONAL ELECTRICITY BASELINE IN THE COUNTRY? HOW DOES HE/YOU DO IT?

There are several organisations collecting statistical data for electricity baselining. Two of them (Central Statistical Office and Energy Market Agency) have the widest range of data on the energy sector available to the public. The Central Statistical Office GUS is an official body responsible for statistics in Poland (including energy and emission statistics). GUS publishes a Statistical Yearbook of the Republic of Poland and other branch statistic publications (Energy statistics, Environmental protection statistics). The Energy Market Agency (ARE S.A.) - whose owners are the main polish power, gas and heat companies (Polish Grid Company, Polish Oil and Gas Company, Power Plants, Energy Distributors, Ministry of Treasury and others) is a company realising statistical analyses as well as forecasts concerning the Polish energy sector.

Name of the institution	Address	Relevant publications of the institution in the field, type of Information the institution provides
Central Statistical Office GUS	*Statistical publication of GUS are assessable through:* Zakład Wydawnictw Statystycznych, 00-925 Warszawa, al. Niepodległo￿ci 208 tel. +48 22 608 31 45, 608 32 23; Fax: +48 22 608 38 67 e-mail: zws-sprzedaz@stat.gov.pl lub a.marchewka@stat.gov.pl	"Energy Statistics" "Statistical Yearbook of the Republic of Poland" "Environmental Protection. Statistics" – emission data

	www.stat.gov.pl	
Energy Market Agency ARE	ul. Żurawia 8 Warsaw Tel: +48 22 62228 07.02 Tel/Fax +48 22 6222814 www.are.waw.pl Publication can be ordered also thorough web page www.cire.pl	"Electricity Sector in Poland. Statistics 2001"

table 14: Poland: Main data sources (institutions) for electricity baselining

2.5.4 WHICH ARE EXISTING DATABASES ON THE TOPIC? WHO IS MAINTAINING AND OWNING THEM?

Existing databases concerning the electricity sector are usually connected with others, so GUS bases some of their statistical tables on ARE data, and ARE, in turn, in their publications reference information from GUS databases. The statistical information is regularly updated. Generally, there is a fee for the latest and complete statistical data. It can be ordered in paper version and some data also on CD. Older and more general information on the energy sector is free of charge and available on the web sites mentioned in table 14.

2.5.5 DOES A NATIONAL DISPATCH MODEL EXIST? WHO OWNS IT?

There is no official national dispatch model. However, some of the institutions have their own type of model:

- Polish Grid Company PSE uses their own modelling instruments
- ARE used the ENergy and Power Evaluation Program model (ENPEP, which is also used in Hungary) during their works on the "Assumption of the Energy Policy for Poland by 2020" in the years 1999-2000.
- The Analytical Forecasting System for studies in the energy sector is based on the 3 models and was created and permanently developed by the expert group from the "EnergSys – System Research" (formerly : Energy Problems Department of IPTT PAN). The System was used during the work on short-term actualisation of the "Assumption of the Energy Policy for Poland by 2020".
- The SAFIRE model was used for the working-up scenarios of renewable energy development by 2020 by EC BREC

2.5.6 WHICH DATA IS STILL MISSING FOR CALCULATING THE EFFECT OF JI-PROJECTS ON THE NATIONAL ELECTRICITY MIX?

Rather all data are available, it is necessary to combine several sources.

2.5.7 HOW DOES A (FOREIGN) INVESTOR GET ACCESS TO THE DATA WHICH IS NECESSARY FOR A NATIONAL BASELINE?

There are few contact sources to obtain necessary information for establishing an electricity baseline in Poland:

- Ministry of Environment, Department of Investment and Technological Development or JI Secretariat in National Fund for Environmental Protection might recommend Polish sources of information
- Energy Market Agency ARE (It could be necessary to combine several publications and the branch statistical yearbook)
- Central Statistical Office (it might be necessary to combine several publications and the branch statistical yearbook).
- Co-operation with local consultant (EC BREC for example, may obtain all data needed for calculation of national baseline)

2.5.8 IS THERE AGREEMENT IN THE GOVERNMENT ABOUT THE CONCEPT OF AN AVERAGE NATIONAL EMISSION FACTOR? (Agreement that an average national emission factor may be used as a baseline)

There is no official position of government concerning an average national emission factor

2.5.9 IN PARTICULAR - WHAT IS THE GOVERNMENT'S OPINION ON THE EXISTING ERUPT EMISSION FACTORS FOR EACH COUNTRY. ARE THEY WELCOMED?

There is no official position of government on this issue

2.5.10 IS SOMEONE IN THE COUNTRY IN CHARGE OF CALCULATING SUCH AN AVERAGE NATIONAL EMISSION FACTOR? IF SO - WHO?

There is no officially accepted information available on this topic.

2.5.11 WHAT IS THE FORECAST DEVELOPMENT OF THE ELECTRICITY DEMAND?

“Assumption of the Energy Policy for Poland by 2020” (published in 2000) is the main document on the Polish energy policy and includes a long-term prognosis of the energy sector development. The projected electricity demand according to different macroeconomic scenarios in year 2005-2020 is presented in table 15. However, important internal and external macroeconomic changes as well as the new programme included in the “Government Development Strategy” causes a need for revision of the “Assumptions”.

Scenario name	1997	2005	2010	2015	2020
	TWh				
“Survival”		161.8	175.9	187.7	201.9

“Reference”	140.5	167.6	186.9	204.4	233.2
“Progress”		161.5	184.4	204.8	236.4

table 15: Poland: Projected electricity demand up to 2020

2.5.12 WHAT IS PARTICULAR ABOUT THE COUNTRY REGARDING THE NATIONAL ELECTRICITY BASELINE?

2.5.13 WHICH REGULATIONS, LAWS ETC. ARE PLANNED OR PENDING IN DECISION WHICH YOU THINK THAT MIGHT INFLUENCE THE NATIONAL ELECTRICITY BASELINE?

As stated above, the present ““Assumption of the Energy Policy for Poland by 2020” needs to be revised. Similar to the Czech Republic many power plants – old coal steam power plants - will be at the end of their lifetime around 2015. Accession to European Union and harmonisation with European Law (including the Directive on Renewable Energy and other environmental regulations) have to be taken into account by Poland. The European Commission has set indicative targets for share of the electricity produced from renewable energy sources for accessing countries. For Poland this figure amounts to 7,5% of RES in electricity production in 2010. There are no specific regulations on the reduction of the operation of specific plants due to implementation of JI projects in electricity sector.

2.5.14 IS THE ELECTRICITY MARKET OF YOUR COUNTRY LIBERALISED? IF NOT, IS IT GOING TO BE AND WHEN? ANY DIFFERENCES REGARDING SMALL AND BIG CONSUMERS?

The process of liberalisation and privatisation of electric energy sector is progressing gradually. Practice shows that the finalisation of the privatisation of particular energy enterprises takes longer than originally planned. Since the beginning of 1999 electricity producers may specify heat retail prices taking into account their real production and distribution costs. The Energy Regulation Office only supervises the reliability of their calculations. However, energy prices in long-term contracts are not yet fully market exposed. Liberalisation of the energy market also includes securing access to the grid to third parties (‘Third Party Access principle’). Depending on the quantity of energy purchased, particular consumer groups will get access to the grid between 1999 and 2005.

2.5.15 PLEASE PROVIDE AN INDICATION OF RETAIL PRICES (IN EURO/KWH OR IN EURO/KG ETC. ANYWAY - IN EURO) ON THE FOLLOWING FUELS

	EURO/ton	**EURO/ton**
	Min.	Max.
Fossil fuels prices 2000		

Hard coal - energy	29	72
Hard coal - coking	38	89
Lignite	11	22
Coke	78	100
Light fuel oil	319	372
Heavy fuel-oil	121	191
Gas - LPG	316	617
Gas - high CH_4	114	202
Gas - nitrified	69	147
Biomass prices 2001		
Wood waste	2,5	12,5
Fire wood	12,5	15
Wood chips	17,5	25
Straw	20	27,5
Wood briquettes	45	50
Wood pellets	95	852,5

table 16: Poland Minimum fuel prices

Sources according to fuel type: GUS Energy Statistics 1999,2000 for fossil fuels, EC BREC for biomass (exchange rate: 1EURO – 4 PLN)

3. HEAT

The following part regards data issues of the heat sector. Heat components are relevant for the BASE projects of Czech Republic, Estonia, Slovenia and Hungary (in other words - all BASE partner countries except Poland which proposed a wind project – electricity only). The main data requirements for the heat component baselines are – first of all - a proper project description. The graphical parts of these descriptions have been published on the BASE website (http://base.energyprojects.net) - at the beginning of each country section of the following text each project is briefly described. Further data requirements regard mainly the cost data of the single units – boilers and networks - (fuel cost, investment, operation cost etc.) and their emission behaviour. The focus on cost data (and thus on individual project-specific data) results from methodology of investment analysis which has been used in the majority of cases of the BASE project namely for Estonia, Slovenia and Hungary. Cost data is provided in standardised calculation tables for those three countries. A special case is the Czech project where the control group methodology has been chosen. Here data requirements regard parameters of the control group such as the fuel mix and the criteria which make the control group similar to the project group[1] (cost data is rather irrelevant in this case)

In the following for each country the required data is split into:

1. available data

[1] 'project group': the group which is affected by the project, where the project takes place.

2. required but not available data (not available within this project)

The discussion of project-related data requirements is preceded by the following paragraph on project-independent data requirements (national baseline data requirements):

3.1 GENERAL DATA REQUIREMENTS, RECOMMENDATIONS ON 'STANDARDISED' DATA

Satisfying the following country-specific project-independent data requirements would be helpful to future baseline developers and thus contribute to establishing possible national heat baselines. In order to promote heat projects these data should be assessed for each country and provided for free or against small fees to baseline developers/investors and be updated regularly (on an annual basis or in case of dramatic changes).

Required data for national heat baselines are:

1.) Development over time of fuel prices (and the included relevant taxes which might be subject to country specific changes).
Fuel prices are one of the key influences on the customer's choice of his heating system. By correlating fuel price and the choice of heating system ('fuel mix') on the basis of past data one might be able to project a baseline on the basis of fuel price forecasts.
2.) Cost of relevant heating units (boilers).
Data on boilers should be categorised by fuel and boiler capacity (size). Together with the fuel prices this data helps to quickly construct baseline scenarios and assess their economic performance (in case of scenario or investment analysis).
3.) Energy, environmental, action, tax plans, laws, policies etc. (planned, pending and existing ones)
Policies, especially action plans can strongly influence the heating supply system of a country or of regions. (However, estimating how likeable it is that an action programme will have a real effect is up to the baseline author and – if part of the JI process – eventually to the validator: non-compliance with legislation may also be a baseline assumption.)
4.) Current and planned tracks of gas pipelines across the country.
Knowing about the planned tracks of gas pipelines one can determine how probable it is that a region will have access to gas supply. One might exclude gas from the baseline if it is quite sure that gas will not be available in the project period.
5.) Consumer behaviour studies and data bases on the fuel mix developments (trends in the past, extrapolations), studies on consumer satisfaction with certain heating systems etc.

The above information ready at hand does not dispense a project developer from a due analysis of the individual situation of the project. But he would start off from a much better starting position because his tool-box of arguments is larger and he can focus on individual aspects of the project right from the beginning.

3.2 ESTONIA

The Estonian project consists of the construction of a biomass-fired CHP as a supply for the main existing district heating network of the town of Tartu. The heat from the new CHP is fed into this network. The emission reduction of 26.000 t/a regarding the heat component[2] results from the substitution of the operation of two types of existing boilers

1. Peat/wood boilers:
   Four boilers which can be fired with wood and/or peat[3] and are supplying heat to the district heating network. Emission reductions result only if the existing boilers' peat combustion is reduced (if peat combustion is part of the baseline) because only peat is a non renewable fuel - wood is renewable (-> assumed baseline = peat firing). The assumption on the baseline's fuel choice – the peat alternative for the peat/ wood boilers - is an assumption for estimating the emission reductions in advance, mainly for the planning of the project's financing. This assumption has to be monitored during the project period (-> MVP).

- Gas/oil boilers
  These boilers may be fired either with gas or oil ('bi-fuel type'). The baseline assumption is gas firing. Firing the boilers with heavy fuel oil is seen as a technical alternative should the gas price rise and the marginal cost be in favour of firing heavy fuel oil. The fuel choice for the gas/oil boilers during the project period should also (peat/wood) be monitored.

In peak demand periods the operation of both the peat/wood boilers and the gas/oil boilers is indispensable.

For the sake of completeness of the project description and as a prerequisite for understanding chart 8 it has to be said that currently there are also coal boilers supplying district heat to Tartu - but their operation won't be affected by the project. They are also owned by the project operator, Tartu Energia, but they are not connected with the main DH network which is supplied only by the above peat/wood and the gas/oil boilers.

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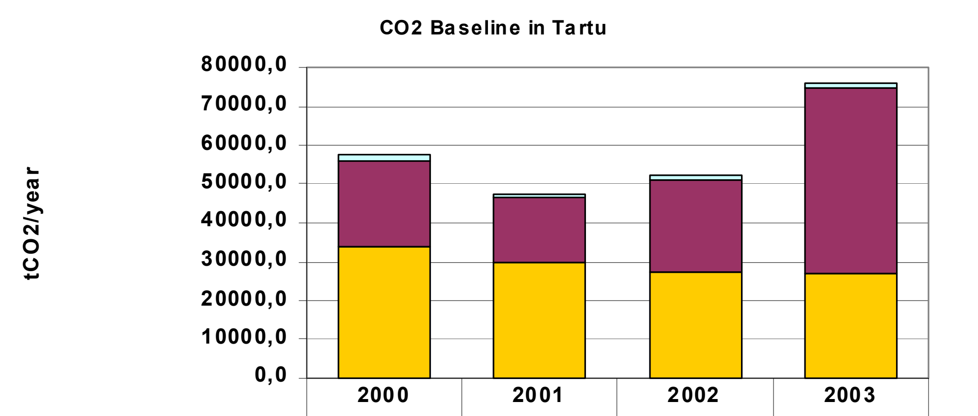
[2] One should bear in mind that the project's main emission reduction, 137.000 t/a of a total of 163.000 t/a, results from the electricity output to the Estonian grid.

[3] These four boilers have been converted from gas/oil firing to peat/wood firing in another recently finished project.



	2000	2001	2002	2003
Coal t CO2	1465,6	810,2	822,5	793,8
Wood chips t CO2	0,0	0,0	0,0	0,0
Peat t CO2	21855,7	16740,8	23589,6	47750,0
Gas t CO2	33953,6	29754,4	27661,3	27021,9

chart 8: Estonia: Assumed baseline fuel mix

Two baseline scenarios have been examined (scenario/investment analysis) and compared to each other on the basis of their IRRs (Investment Analysis):

1) Continuation of status quo
2) ERU-free CHP project

The reference scenario for carrying out the investment analysis is (the cash flows of) the existing status quo.

Once agreement has been reached that the baseline is the “Continuation of the status quo” the key question for the emission reduction forecast is: how much peat combustion is avoided by the project (in other words: how much peat is combusted in the baseline? See 0).

3.2.1 CURRENT BASELINE

To be completed after email response from ESTIVO.

3.2.2 AVAILABLE DATA (COST)

Name of scenario	**BAS, HOB**	**Boilers 80MW**
Country	**Estonia**	
Project - ERU free		
Cost data		
invest cost CHP 15/45MWe/MWth	Euro	10897435
invest cost other (DH network)	Euro	
total invest cost	Euro	10897435
annual operating cost	Euro/a	1 694 196
annual fuel cost fuel 1 (biofuel mix, total 455GWh)	Euro/a	2 111 000
specific fuel cost	Euro/MWh_{inp}	3,80
(insert other fuels if necessary)		
Energy sales and revenues		
retail price heat	Euro/MWh	13,46
retail price electricity	Euro/MWh	44
sales heat	MWh/a	386 700
sales electricity	MWh/a	0
revenues heat	Euro/a	5 204 982
revenues electricity	Euro/a	0
total revenues	Euro/a	5 204 982
Financing structure		
grants	Euro	0
equity capital (30%)	Euro	3 269 231
loans (70%)	Euro	7 628 205
loan: interest rate	%	11,3%
loan: pay back period	years	10
other	Euro	0
sum	Euro	10 897 445
check with invest cost	Euro	10 897 435
Lifetime of the project	years	25
IRR (Internal Rate of Return)	%	10,0%

table 17: Estonia: Cost data of the scenario “ Continuation of status quo”

The scenario in table 18 is equal in design to the original project as proposed but does not include carbon financing (“ERU-free”). The cost for the CHP has been assumed on the lower end of the data bandwidth which is a conservative assumption (lowering the cost increases the scenarios’ probability of resulting as the baseline).

Name of scenario	**ERU - free**	
Country	**Estonia**	
Project - CHP (ERU free)		
Cost data		
invest cost CHP 15/45MWe/MWth	Euro	20800000
invest cost other (DH network)	Euro	980000
total invest cost	Euro	21780000
annual operating cost	Euro/a	2 540 000
annual fuel cost fuel 1 (biofuel mix, total 470,6GWh)	Euro/a	2 111 000
specific fuel cost	Euro/MWh_{inp}	4,48
Energy sales and revenues		
retail price heat	Euro/MWh	13,46
retail price electricity	Euro/MWh	44
sales heat	MWh/a	300 000
sales electricity	MWh/a	100 000
revenues heat	Euro/a	4 038 000
revenues electricity	Euro/a	4 400 000
total revenues	Euro/a	8 438 000
Financing structure		
grants	Euro	0
equity capital	Euro	6 534 000
loans	Euro	15 246 000
loan: interest rate	%	11,3%
loan: pay back period	years	10
other	Euro	0
sum	Euro	21 780 010
check with invest cost	Euro	21 780 000
Lifetime of the project	years	25
IRR (Internal Rate of Return)	%	14,8%

table 18: Estonia: Cost data of the scenario “ERU-free project”

This third table, for completeness, shows the cost data of the project when taking into account carbon financing. This cost calculation is equivalent to the project design as it would be described in the PDD if presented as a JI project:

Name of scenario	**ERU considered**	
Country	**Estonia**	
Project - CHP (ERU 3 Euro/t)		
Cost data		
invest cost CHP 15/45MWe/MWth	Euro	20800000
invest cost other (DH network)	Euro	980000
total invest cost	Euro	21780000
annual operating cost	Euro/a	2 540 000
annual fuel cost fuel 1 (biofuel mix, total 470,6GWh)	Euro/a	2 111 000
specific fuel cost	Euro/MWh$_{inp}$	4,48
Costof CO2 (total 163000t CO2 annually)	Euro/t CO2	3
Energy sales and revenues		
retail price heat	Euro/MWh	13,46
retail price electricity	Euro/MWh	44
sales heat	MWh/a	300 000
sales electricity	MWh/a	100 000
revenues heat	Euro/a	4 038 000
revenues electricity	Euro/a	4 400 000
revenues CO2	Euro/a	489 000
total revenues	Euro/a	8 927 000
Financing structure		
grants	Euro	0
equity capital	Euro	6 534 000
loans	Euro	15 246 000
loan: interest rate	%	11,3%
loan: pay back period	years	10
other	Euro	0
sum	Euro	21 780 010
check with invest cost	Euro	21 780 000
Lifetime of the project	years	25
IRR (Internal Rate of Return)	%	16,9%
IRR increased compared with ERU-free option by	%	2,1

table 19: Estonia: Cost data of the scenario "Project"

3.2.3 KEY OPEN DATA REQUIREMENTS

Fuel mix (peat↔wood) in the four existing peat/wood boilers

The actual fuel mix in those four existing boilers which can be fired with both, wood and peat, depends strongly on the price ratio of the two fuels or, put differently, on the availability of cheap wood. The future availability of cheap wood (the development of the biomass market) or of cheap peat for Tartu is the key uncertainty of the emission reductions of the heat component of the project. The share of fired peat depends very much on the weather conditions in the previous summer. After a hot summer such as in 2002 the share is bigger and after a wet and rainy summer such as in 2000 the share is lower. The peat comes from different peat fields, including new peat fields right near Tartu, belonging to the project operator (and owner of the district heating system), Tartu Energia.

Wood chips and different leftovers – sawdust, bark, wood shavings – are expected to be delivered from different sawmills in the southern part of Estonia, some of the wood choppers belonging to the same private owner. However, this wood from the ‘cheap end’ (left end) of the curve in chart 9 has a limited availability:

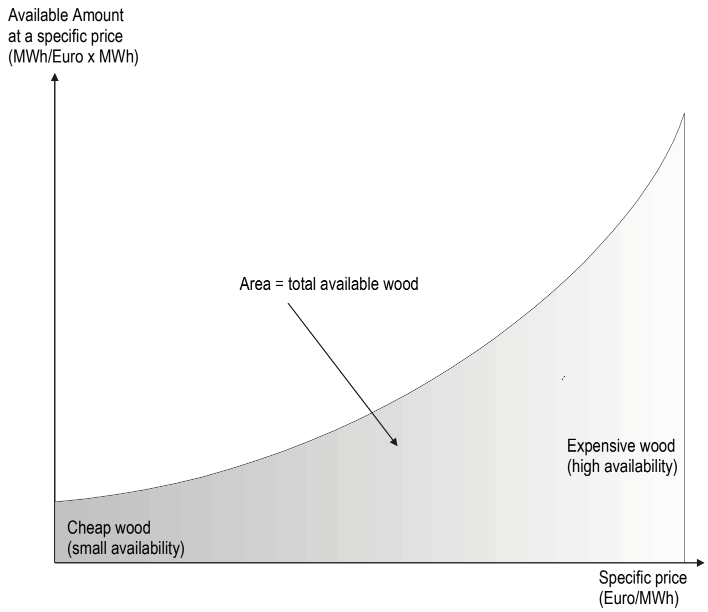


chart 9: Illustration of the problem of biomass’ availability related to the specific price for biomass

(The curve should merely give an idea on the situation and is completely fictitious.)

⇒ The actual mix peat↔wood combusted in those four wood/peat boilers (in the baseline as well as in the project) is a key parameter to be observed in the **Monitoring Plan**. The operator’s decision on the fuel mix peat↔wood depends on a simple calculation which fuel choice is more economic at a current point in time. If he uses wood, the fuel cost (/kWh) is probably higher than for peat, but he generates ERUs and thus receives the carbon financing. If, on the other hand, he uses peat he looses the carbon financing but reduces the fuel cost. Thus, the choice of the operator which will depend on the agreed ERU-price and the current fuel prices of wood and peat. However, this choice could be limited by including an obligation into the ERPA (Emission Reduction Purchase Agreement) to use renewables as a fuel in any case. According to the actually used fuel mix peat/wood which will be measured “ex post” (usually after each year of project operation) the actually avoided emissions will be calculated in the Monitoring and Verification process. However, an “ex ante” (before project implementation) forecast must be carried out according to current data availability as an best estimate input to the project’s finance planning (carbon financing).

Development of the DH-customer stock

Another question - common to district heating projects in general (see 0, 3.3 SLOVENIA)– is: is the DH-customer stock (DH demand) stable over time or will the district heating company loose or win customers to the competing individual gas heating system? Again this question should be dealt with in the Monitoring Plan.

3.3 SLOVENIA

The Slovenian project establishes a new district heating system supplied by installing new central biomass boilers in the town of Vransko (2.500 inhabitants). Currently there is no district heating network in Vransko at all ("greenfield project"). Thus, the construction of a DH-network itself is also part of the project as well as the erection of the biomass boilers. Emission reductions result from the replacement of the current individual heating systems of those customers in Vransko which will be connected to the future district heating network (household stoves, municipal buildings and some industrial consumers). Per year about 5.400 MWh of heat will be fed into the network from the biomass boilers.

The investment comprises the following actions:
1. construction of the new boiler house
2. construction of the storage silo for the waste wood,
3. installation of two new modern biomass fired boilers, with a total capacity of 4,0 MW, including the ancillary equipment;
4. construction of approximately 2 km of pre-insulated district heating pipelines, the heat substations and the control and monitoring system.

Mostly oil as a heating fuel in the individual stoves and boilers of the potential consumers will be replaced. The CO_2 reductions will sum up to about **2.000** tons per year. Other positive environmental impacts are reductions in emission categories such as SO_2, NO_x, C_2H_2 (hydrocarbons) and CO.

	Installed capacity (kW)	Energy demand (MWh)
Industry,	2.482	504
Municipal buildings	2.138	1.602
Individual houses	3.240	2.438
Total	7.860	4.544

table 20: Slovenia: Customers to be connected to the district heating network and their heat demand

3.2.1 CURRENT BASELINE

The baseline is the continuation of the Status Quo: individual household stoves and individual boilers. The fuel mix is assumed to be constant over time.
To be completed for quantitative data after response from ISPO.

3.2.2 AVAILABLE DATA (COST)

	Type of costs	Total
I.	FIXED ASSETS	
1.	Construction works	40,000
2.	Wood biomass fired boiler with accessories	186.700
6.	Heat distribution network	96.415
7.	Heat stations	53.610
8.	Design and engineering	40,000
9.	Contingency provisions for extra works	5.075
II.	CURRENT ASSETS	0
	TOTAL I + II	421.800

table 21: Slovenia: Project cost data (investment)

	Financial Sources		
I.	Subsidy from Ministry for Environment	25 %	105.000
II.	Loan (ECO Fund)	50 %	210.000
III.	Own funds	25 %	106,800
	T o t a l	**100**	**421.800**

table 22: Slovenia:: Financing plan

Cost item	**SIT**
Biomass / MWh	1.450
Labour costs (boiler house and pipeline network)	2,000,000
Boiler house maintenance	2,000,000
District heating network and heat station maintenance	1,500,000
Chimney sweep	200,000
Other costs (various insurance arrangements)	1,000,000
Heat retail price, incl. VAT	**10,0 SIT/kWh**

table 23: Slovenia:: Operation & Maintenance cost and resulting heat retail price

For a survey on the fuel cost in Slovenia see 2.4.13

3.2.3 KEY OPEN DATA REQUIREMENTS

The current baseline is assumed to be constant over time continuing the Status Quo (the current mix) One might take a change in the fuel mix into consideration but even without deeper analysis the current assumption of no major shifts in the mix seems plausible. The most frequent international trend, namely individual customers switching to gas stoves, can be excluded to a high certainty for the Vransko case because of the lacking availability of gas in the near and mid term future: The distance to the nearest gas pipeline in Žalec is about 20 km.

3.4 HUNGARY

The project consists of capturing landfill gas of a landfill in the Budapest district of Kobanya and recovering the energy content in new gas motors (their construction is as well part of the project). The gas motors' heat output will be fed into the Kobanya district heating network thereby reducing the operation of existing district heating boilers of this network. The electricity will be fed into the Hungarian grid. The heat related emission reduction results from this reduction of the district heating's boiler operation. The other non-electricity reduction contribution is from the avoided methane emissions (landfill gas).
As a baseline the continuation of the status quo was chosen. It is also the reference scenario for the Investment Analysis. Only one baseline scenario has been analysed, namely the "ERU-free project scenario" which is the original project scenario but without carbon financing. Its IRR of max. 14% was deemed too low to be seen as an economic driver for implementing the project. Beyond that other barriers of ownership exist: the current owner does not want to sell the land at the price the Budapest municipality as possible investor would be willing to pay. Thus, the continuation of the status quo was chosen as the baseline.

3.4.1 CURRENT BASELINE

The baseline is
- regarding the landfill: no gas capturing at the site. Methane is escaping to the atmosphere
- regarding the district heating network: gas fired boilers are providing heat to the network.

3.4.2 AVAILABLE DATA (COST)

Name of scenario	II, w/o ERU		
Country	HUNGARY		
Cost data			
invest cost unit 1 (example: biomass boiler)	Euro	2332000	
invest cost unit 2, etc.. (insert rows if necessary)	Euro	5432000	
invest cost other (specify)	Euro	1252000	Further drillings, research, measurements
total invest cost	Euro	9016000	Preparatory works (organization of financing, planning, legal work, etc.)
annual operating cost	Euro/a	444 960	
annual fuel cost fuel 1 (specify fuel type, e.g. coal)	Euro/a	0	
specific fuel cost	Euro/MWh$_{fuel}$	0	
(insert other fuels if necessary)			
Energy sales and revenues			
retail price heat	Euro/kWh	0,01	2 Eu/GJ
retail price electricity	Euro/kWh	0,04	
sales heat	kWh/a	37168600	
sales electricity	kWh/a	29660000	
revenues heat	Euro/a	260 180	
revenues electricity	Euro/a	1 186 400	
total revenues	Euro/a	1 446 580	
Financing structure			
grants	Euro	2 705 000	
equity capital	Euro	2 726 000	
loans	Euro	2 705 000	
loan: interest rate	%	0 %	
loan: pay back period	years	6	
other	Euro	880 000	
sum	Euro	9 016 000	
check with invest cost	Euro	9 016 000	
Lifetime of the project	years	15	
IRR (Internal Rate of Return)	%	11,2-13,9 %	

table 24: Hungary: Cost data of the "ERU-free project scenario"

Name of scenario	III. w ERU			
Country	HUNGARY			
Cost data				
invest cost unit 1 (example: biomass boiler)	Euro	2332000		
invest cost unit 2, etc.. (insert rows if necessary)	Euro	5432000		
invest cost other (specify)	Euro	1252000	Further drillings, research, measurements	
total invest cost	Euro	9016000	Preparatory works (organization of financing, planning, legal work, etc.)	
annual operating cost	Euro/a	444 960		
annual fuel cost fuel 1 (specify fuel type, e.g. coal)	Euro/a	0		
specific fuel cost	Euro/MWh [illegible]	0		
(insert other fuels if necessary)				
Energy sales and revenues				
retail price heat	Euro/kWh	0,01		2Eu/GJ
retail price electricity	Euro/kWh	0,04		
sales heat	kWh/a	37168600		
sales electricity	kWh/a	29660000		
revenues heat	Euro/a	260 180		
revenues electricity	Euro/a	1 186 400		
total revenues	Euro/a	1 446 580		
Revenues from ERUs	Euro/a	861 000		7E/kt CO2
Financing structure				
grants	Euro	2 705 000		
equity capital	Euro	2 726 000		
loans	Euro	2 705 000		
loan: interest rate	%	0 %		
loan: pay back period	years	6		
other	Euro	880 000		
sum	Euro	9 016 000		
check with invest cost	Euro	9 016 000		
Lifetime of the project	years	15		
IRR (Internal Rate of Return)	%	19 %		

table 25: Hungary: Cost data of the "project scenario"

3.4.3 KEY OPEN DATA REQUIREMENTS

1.) District heating baseline: What fuel is substituted?
Due to a secretive company policy of the local district heating company it is has not been possible to assess the fuel mix of the existing district heating boilers which are going to be reduced in operation by the project. For the current calculations of emission reductions the average situation of the Budapest district heating system has been used which is mostly (almost in 100%) based on gas fired units. Thus, the substitution of gas boilers has been assumed for calculating the baseline.

2.) Landfill baseline: How does Hungary respond to the EU Directive?
It is not yet clear what effects the EU Landfill Directive will have on the Hungarian legislation on landfill standards. This latter question is a key question for a possible standardised elements of a landfill baselines in Hungary (national baseline)

3.5 CZECH REPUBLIC

The planned project is a heat only project targeting several small individual heat consumers (households) in the region of South Bohemia. The project is part of South Bohemia Region Energy Concept, hence, the regional Government is responsible for project implementation.
Project measures are threefold:

1. installation of individual biomass stoves replacing individual fossil fuelled stoves
2. installation of solar panels (heat only)
3. thermal insulation of houses

No actual project site (towns) has yet been selected for the implementation of the project because the regional Energy Concept has not specified yet which towns are to be included in the plan. As a baseline methodology the control group methodology has been chosen because the (counterfactual) behaviour of numerous individual customers has to be assessed (H(+-) project according to project categorisation introduced in the BASE project).
A typical town/village which is representative for the type of town in the project region, the control town, has already been chosen, the municipality of Jilovice. Its development has to be monitored in terms of fuel mix of the houeseholds. This control town has to fulfil the following conditions

1. it must not be affected by the project measures
2. it has to be representative for the type of town in the project region.

Jilovice is representative of the affected project region while not being affected by the project at the same time:
The square area of the project region is 10 056 km^2 , which is 12,8% of total Czech Republic area. The number of inhabitants is about 624 000 with 62,7 person per km^2 . 1/3 of habitants live in 5 large cities, the rest in 623 villages. This is a reason why the projects are oriented to the villages and projects have to be grouped.

	By population						
Nb of municip.	under 200	200-499	500-999	1000-4999	5000_19999	20000-49999	50000 and over
623	258	194	78	74	14	4	1
Population							
625874	28993	60732	53734	152389	117445	114395	98186

table 26: Czech Republic: Towns in the project region in categories of population and number of inhabitants

The control group Jilovice includes average size villages with the average structure of types of buildings and the level of services characteristic for the project region. The Jilovice area is presently without natural gas supply (supply is planned for the year 2022), heat and hot water is prepared individually.

Jilovice is located 27 km from Ceske Budejovice (south-east direction). The area of the Jilovice municipality covers 8 communities: Jilovice, Kramolin, Lipnice, Kojakovice, Salmanovice, Vlachnovice, Nepomulin, Jeleni ves.
Since the municipality covers several communities all typical building types can be found: single family houses, apartment houses (panel houses) and public houses (school, post office etc.) The buildings are not insulated. The assumed project measures in the field of insulation include the insulation of family houses only. Apartment houses are usually owned by Municipality and the assumption is that the regional energy plan is more oriented towards private houses.

The basic statistic data of Jilovice Municipality is as follows:

ID number	6014
Number of individual localities	8
Square area	4431 ha
Number of habitants	856
Average age	40,8
Sea level	494 m
Supply drink water system and waste water system	Yes
Natural gas	No (planned in 2002)

table 27: Czech Republic: Basis statistical data of the control group Jilovice

Jilovice	Municipality Jilovice with 7 satelits	
	permanent	tempor.
Nb of habitants	856	860
	buildings	flats
Total	492	616
family houses	466	559
appartment houses	8	46
mix - flats and service	6	11
services	12	

Type of fuel	Nb of flats	Brown c.	Black c.	Coke	Wood	Propan	Electric.	Total
for heating	%	41,07%	8,93%	6,17%	29,71%	1,30%	12,82%	100,00%
for hot water prearation	%	14,12%	3,08%	2,11%	10,23%	0,49%	69,97%	100,00%
heating	Nb of flats	253	55	38	183	8	79	616
Hot water	počet bytů	87	19	13	63	3	431	616
Heat consumption		Brown c.	Black c.	Coke	Wood	Propan	Electric.	Celkem
for heating	MWh	4884	1062	734	3533	124	1220	11556
for hot water	MWh	202	44	30	146	7	998	1427
total	MWh	5086	1106	764	3679	131	2219	12983
heat consumptio/m2	kWh/m2	193	193	193	193	154	154	188
hot water cons./m2	kWh/m2	23	23	23	23	23	23	23

table 28: Czech Republic: Energy relevant statistic data of the control group Jilovice

Current emissions (including also non greenhouse gases) of the control group Jilovice are:

Air polution									
Option [t]	TOPP-Equivalent	SO2 Equivalent	SO2	NOx	HCl	HF	Particulates	CO	NM VOC
Option 1	36,696	36,711	31,663	6,348	0,702	0,007	19,381	90,230	18,987
Greanhouse gases									
Option [t]	CO2 Equivalent	CO2	CH4	N2O	HFC-23	HFC-32	HFC-43-10mee	HFC-125	HFC-134
Option 1	3 953	3 839	3	0	0	0	0	0	0

table 29: Czech Republic: Emission data of the control group Jilovice

3.1.1 CURRENT BASELINE

The current baseline is a control group based baseline – see above.