

BASE

Baselines for **A**ccession **S**tates in **E**urope

Estonia

**National Electricity Sector
Baseline**

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Background in Estonia

- Ministry of the Environment is the national authority co-coordinating Climate Change issues in Estonia. Climate Change group of Environmental Technology Department is the UNFCCC focal point. In 1995 the Government has established Interministerial Commission to implement the UNFCCC in Estonia.
- The Institute of Ecology has been designated to be charge of preparing the national Communications (the first NC has been submitted to the UNFCCC Secretariat in 1995, the second in 1998 and the third in 2001) and the annual greenhouse gases inventories.
- Since spring 2001 Ministry of the Environment has been negotiated with Netherlands, Germany, Finland, Denmark and Switzerland to conclude a bilateral treaty. The first treaty is signed with Finland in 2003.
- Two small JI fuel switch HOB projects implemented, two projects (a HOB and a Wind park) ongoing (ERU financing by Finland).
- The baselines for above projects were project based, calculated by a Finnish company. AS Estivo took part in validation process, also in the Wind park baseline calculation.
- Work already carried out on electricity sector modelling by Tallinn Technical University (Markal model).
- Baseline methodology: Up to now the Project-by-project – Investment/Least-cost Analysis approach have been used.
- No requirements/guidelines for baseline development exists, but there are special instructions to calculate CO₂ emissions for domestic oil-shale fuel.

Government Preferences

- Government experience in JI and baseline definition as well in baseline assessment (in terms of responsibility and methodology) is lacking so far, but Government participates in ongoing “Baseline” project.
- There is mild interest of key national stakeholders on JI
- The criteria were worked out by Est. Country Team but no official project selection criteria for JI has yet been established by government
- New oil-shale burning technologies, CHP, wind turbines, fuel switch are likely to succeed under JI
- Due to our economical situation, our oil-shale-only oriented power production and extremely liberal market policy the main criterion for any Energy project is economy, competitiveness of the produced energy.
- Therefore the GHG reduction potential will be considered only in cost analysis as the share of possible carbon financing on the total invest sum. Increase of carbon tax is not determining factor so far

Model Selection

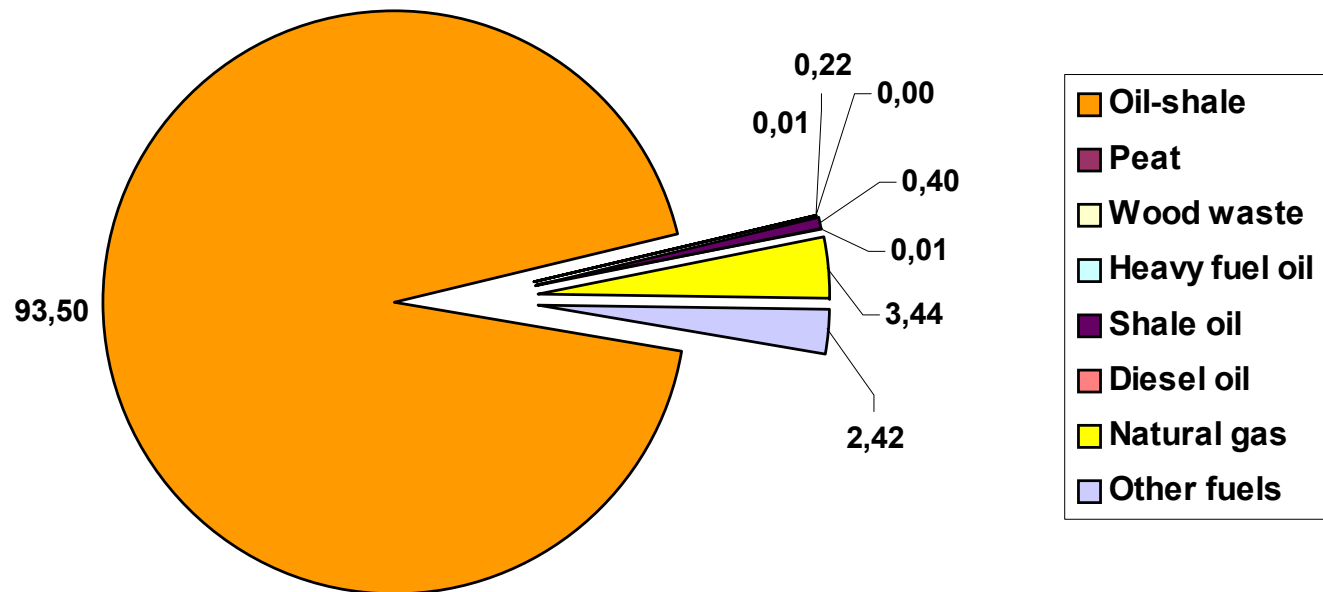
- First the Gemis model was investigated, this is because access to the model is easy and available from Internet free of charge. The Gemis is used by many countries.
- As it cleared out, the Gemis model was not well suitable for oil shale due to following reasons:
 - the chemical composition of Estonia's main fuel, oil-shale, is lacking in its operative memory ;
 - the chemical composition of oil shale is not stable and the average composition varies year by year;
 - there are specific calculation formulas that have been approved by the Estonian Ministry of Environment for emissions from oil-shale for everyone to follow
 - The number of power and CHP plants is very limited in Estonia
- A simple spread sheeting approach has been used for Estonia and the calculation methodology is based on the IEA/OECD recommendations, considering the specific fuel, oil shale.
- With this quite simple Excel model the national electricity sector baseline was calculated

Methodology Selection

- The methodology employed is best suited for Estonia's small electricity sector due to:
 - Simplicity and transparency of calculations
 - Acceptability to Government, because it considers Estonia's non-traditional fuel; oil-shale
 - Accuracy of emission reductions, provided according to the existing rules
 - Availability of data, including the ability of the Excel model selected
 - Ability to consider macroeconomic developments (2 development scenarios have been elaborated)
- Using the adopted methodology it is possible to assess:
 - *Average emissions rate (all plants excluding hydro and wind)*
 - *Marginal plant only (Least cost dispatch analysis)*
 - *Direct Assessment of each JI project within the model*

Fuels for electricity

Fuels % for electricity 2001, total 89,2 PJ



Overview of Electricity Sector

Structure of supply side

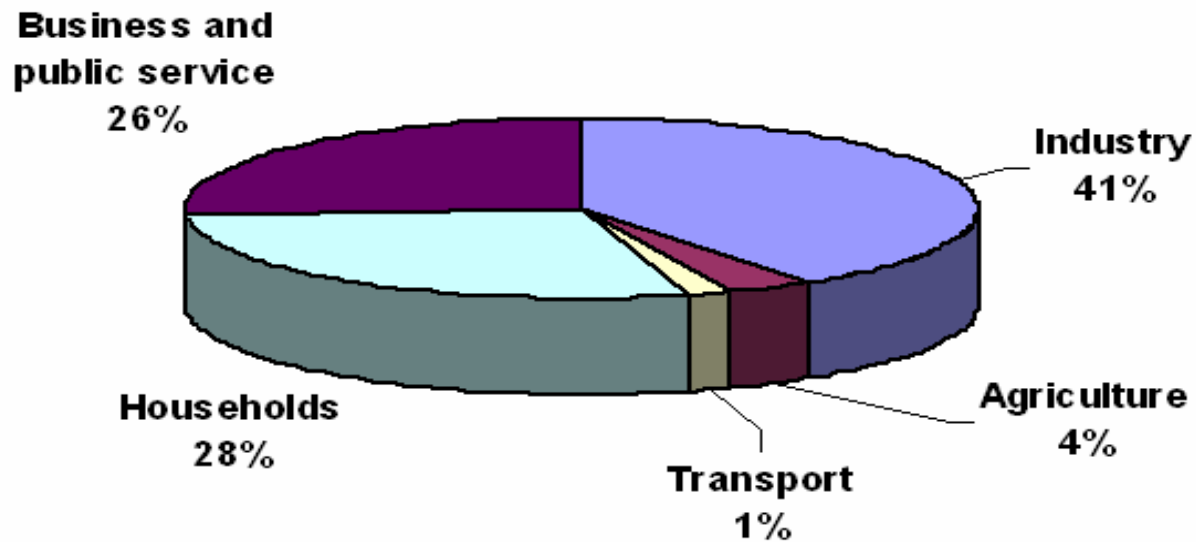
- Fossil fuels prevailing (oil shale and imported fuels)
- Domestic fuels share in energy balance 93%
- Renewable fuels share 0,2%

Ownership

- Oil shale mining state-owned;
- Other indigenous fuels (shale oil, generator gas from shale oil processing, peat, wood and forestry leftovers) private producers.
- Power utility Eesti Energia (over 95%) and power transmission state owned
- Distribution networks are prevailingly state owned, only three small networks have been privatised.
- IPP-s or industries share is 3,5% in power production

Market structure for electricity

Internal consumption of electricity by sectors, 2001.y.



Main characteristics of energy policy

Energy policy

- The Ministry of Economics and Communication is Responsible for Energy policy. In developing the energy policy for Estonia, Estonian government will take into account certain strategic goals to follow

National energy/electricity plan

- The new national [Fuel and Energy Development Plan up to year 2015](#) has been worked out in 2003. This is rather [an indicative energy plan](#) . The yearly consumption increase 2-3,75%/year

Renewable energy strategy or target

- The Estonian target (due to EU accession) for renewable electricity has been set up for year 2010 to be 5,1%. At the moment the share of RES is 0,2%... Up to now there is no plan or strategy to fulfil this target. The only measure to support RES is the feed in tariff for renewable electricity as well the grid obligation to purchase it. But the set price subsidy is not sufficient to develop all potential RES projects.

CHP strategy or target

- There is no target or strategy to implement CHP, but yet there are two paragraphs in the new Electricity Market Act (the feed in tariff for renewable electricity and the grid purchase obligation), supporting the implementation of CHP on renewable fuels. Nothing is supporting the CHP as such so far.

Electricity Baseline Scenario

The following has been considered

- Already planned closures and investments and future prognoses, based on “Fuel and Energy Development Plan up to Year 2015”;
- Existing Least cost developments plans
- The national energy strategy
- The national climate change strategy
- National environmental requirements
- European accession requirements e.g. Large Combustion Plant Directive
- Bilateral SO₂ treaty between Estonia and Finland

Baseline Projections

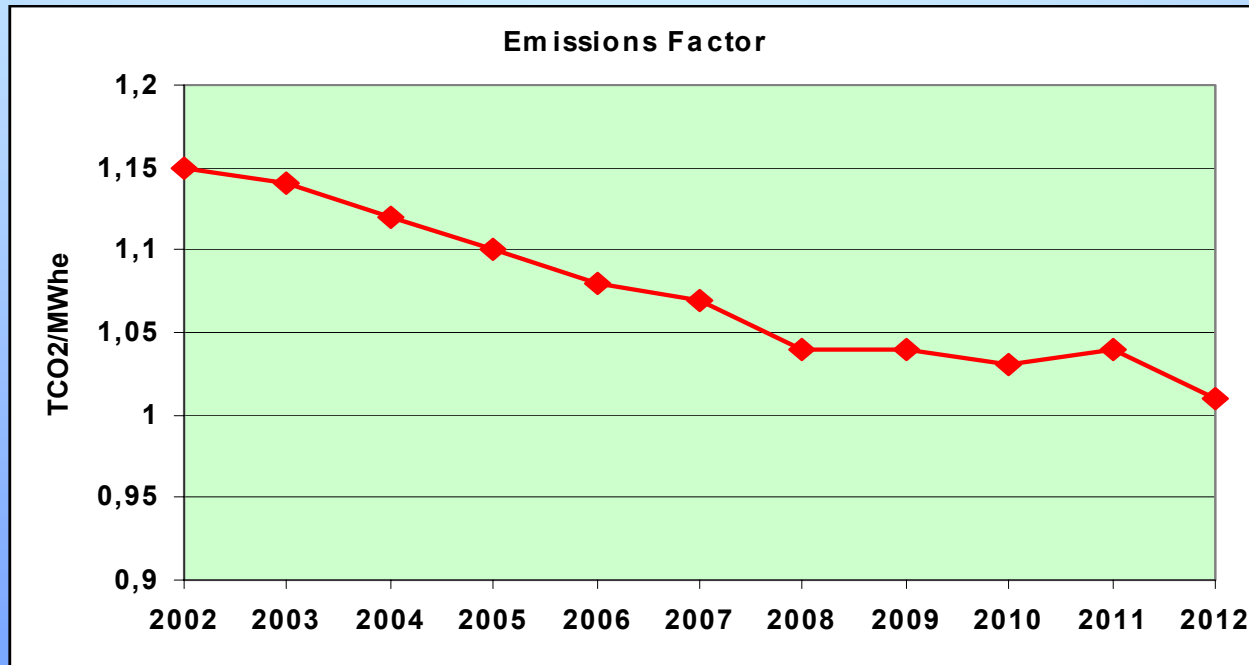
Installed Capacity (MW)

Plant/ Technology	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Balti CHP	1090	1090	815	415	415	215	215	450	450	450	450
Eesti PP	1400	1400	1615	1615	1615	1615	1615	1415	1415	1565	1565
Iru CHP	190	190	190	190	190	190	190	190	190	190	190
Kohtla- Järve CHP	27	27	27	27	27	27	27	0	0	0	0
Ahtme CHP	20	20	20	20	20	20	20	40	40	40	40
Prangli DE	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2
Saarte DE	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2
Fortum Viru CHP	8	8	8	8	8	8	8	8	8	8	8
Silmet CHP	4,5	4,5	4,5	4,5	4,5	4,5	4,5	4,5	4,5	4,5	4,5
Tootsi CHP	5	5	5	5	5	5	5	5	5	5	5
Sangla CHP	2,5	2,5	2,5	2,5	2,5	2,5	2,5	2,5	2,5	2,5	2,5
Horizon CHP	8,5	8,5	8,5	8,5	8,5	8,5	8,5	8,5	8,5	8,5	8,5
Kiviõli CHP	8	8	8	8	8	8	8	8	8	8	8
Kunda CHP	3,1	3,1	3,1	3,1	3,1	3,1	3,1	3,1	3,1	3,1	3,1
Grüne Fee CHP	2	2	2	2	2	2	2	2	2	2	2
Põlva CHP	0,9	0,9	0,9	0,9	0,9	0,9	0,9	0,9	0,9	0,9	0,9
Narva Vesi CHP	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5
Kristiine CHP	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5
Terts Ltd. CHP	0,8	0,8	0,8	0,8	0,8	0,8	0,8	0,8	0,8	0,8	0,8
Subtotal	2771,7	2771,7	2711,7	2311,7	2311,7	2111,7	2111,7	2139,7	2139,7	2289,7	2289,7
New plants	0	2	6	25	45	70	95	120	135	150	165
Total	2771,7	2773,7	2717,7	2336,7	2356,7	2181,7	2206,7	2259,7	2274,7	2439,7	2454,7

Baseline Projections

Baseline Emissions Factors (tCO₂/MWh)

2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
1.15	1.14	1.12	1.10	1.08	1.07	1.04	1.04	1.03	1.04	1.01



Validity and Update of Baseline

Validity of the baseline

- The baseline should be valid to 2012.
- There must be revisions on 2005 and after 2008.
- Events that might trigger the revision of the baseline:
 - international treaty's (SO₂ treaty between Finland and Estonia) and EU directives (LCPD)
 - the results of ongoing reconstruction.

Baseline update

- The baseline should be updated in 2005 and 2008, depending on:
 - Results of reconstructions of the 200MW power blocks (Eesti Energia);
 - Plans for the following reconstructions (Eesti Energia);
 - Plans for the closures of old power blocks (Eesti Energia);
 - Plans to implement new power (or CHP) plants including RES, (Eesti Energia and IPP);
- The updates should be carried out by the Ministry of Economic Affairs and Communication or by Ministry of Environment.
- It is presumed that government accepts this baseline