

# Overview Estonian energy policy

RESEARCH PAPER

## Introduction

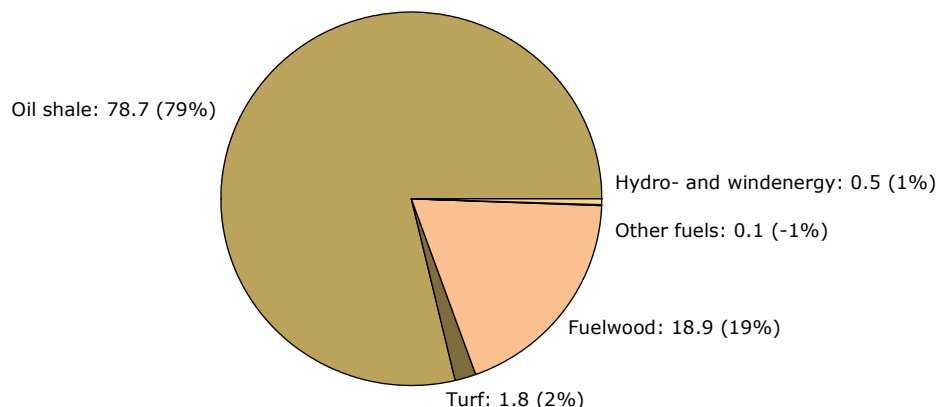
When it comes to energy policy, Estonia is a quite rare country in Europe and in the whole world. Estonia does not have high valued energy sources like oil, gas or even coal, but does have oil shale. This natural resource is mostly not even used because recourses with higher value are preferred. But since Estonia does not have anything else, the oil shale industry has been developed from 1940. By now Estonia hold one of the best know-how in this industry, which is lately expressed by the expansion of the national energy company to the USA.

But beside oil shale, other indicators are important to describe when describing the Estonian energy policy. For that, there will be a look at the total production and consumption of Estonia and also the exports and imports. With that it becomes clear, how large is our own capability to produce energy and what and where Estonia has to import from. Additionally, a brief examination of renewable energy sources will be presented with the possibilities of diversification. To conclude, an analytic quotation from the Estonian National Development Plan of the Energy Sector 2020 will be presented.

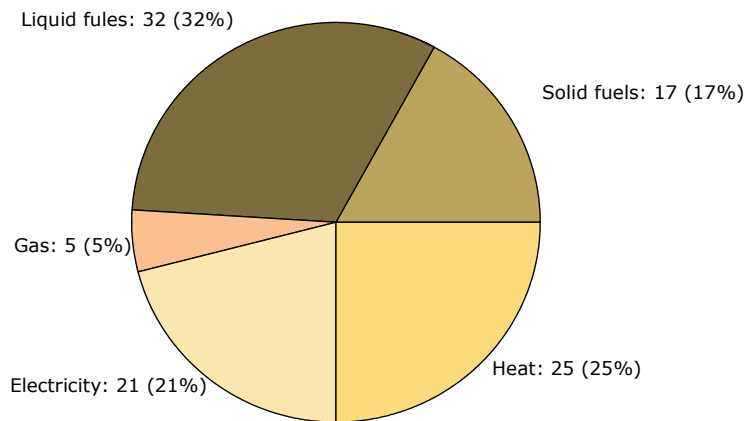
## The energy consumption and sources of Estonia

To examine the energy policies of Estonia, we must first be aware of the total consumption and production of energy. Chart 1 describes the total production of energy differencing types of energy sources. As seen, more than three quarters of the total energy production comes from oil shale and a large part of the rest from fuelwood. So the production is quite unilateral and mostly dependent on non-reproducible resources. Further, the oil share cannot supply Estonia with all the necessary types of energy. To illustrate that, the total consumption of energy is shown in Chart 2.

Chart 1 Energy production 2010



**Chart 2 Energy consumption 2010**



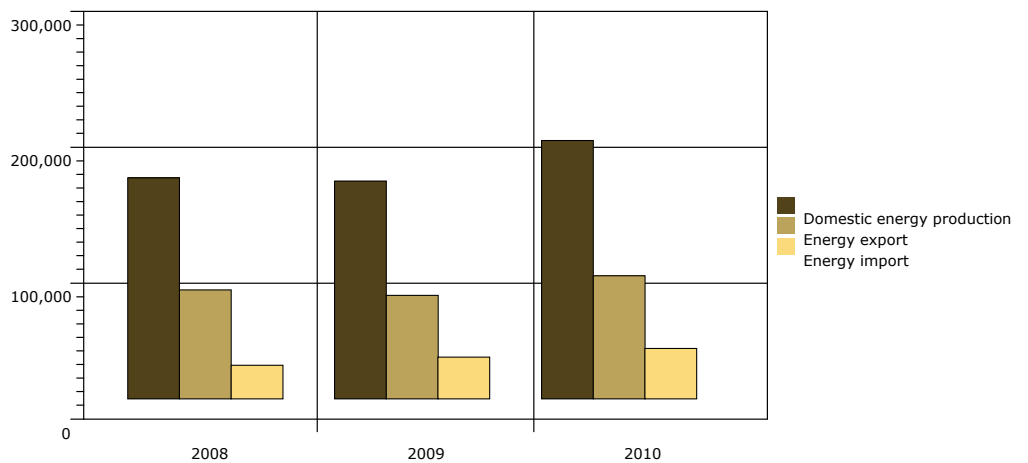
Source: Estonian Statistical Office<sup>1</sup>

Liquid fuels constitute almost a third of the total consumption, following heat, electricity, solid fuels and gas. As almost all of Estonia’s own production consists of solid fuels mainly used to produce electricity and heat, the need for import is obvious. But since liquid fuels and gas consists only a third from the overall consumption the proportion of import should not be that high. What makes it a threat to Estonia’s energy security is the homogeneity of imported energy sources, which is examine closer below.

**Import and export**

First, to illustrate, Chart 3 shows the proportions of production, import and export in the last 3 years and Chart 4 and Chart 5 the proportions of different types of energy sectors in import and export.

**Chart 3 Energy production, export and import**



Source: Estonian Statistical Office

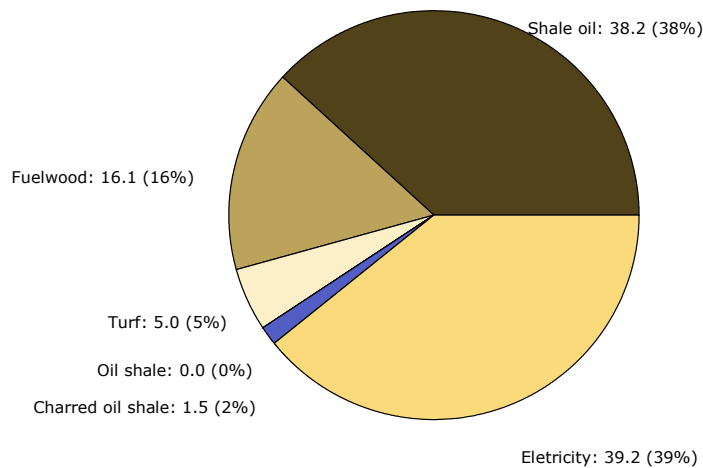
Energy production was stable in years 2008-2009 but had a significant growth in 2010, reaching 205 080 TJ. Import on the other hand decreased in 2009 but increased again in

<sup>1</sup> <http://www.stat.ee/34168>

2010, consisting of 74 693. Export conversely has been increasing, reaching 39 939 TJ in 2010, which makes the growth level 85% in comparison to 2008. The large proportion of domestic production enables Estonia to keep the proportional level of imports lower and in recent years even gain some growth in exports.

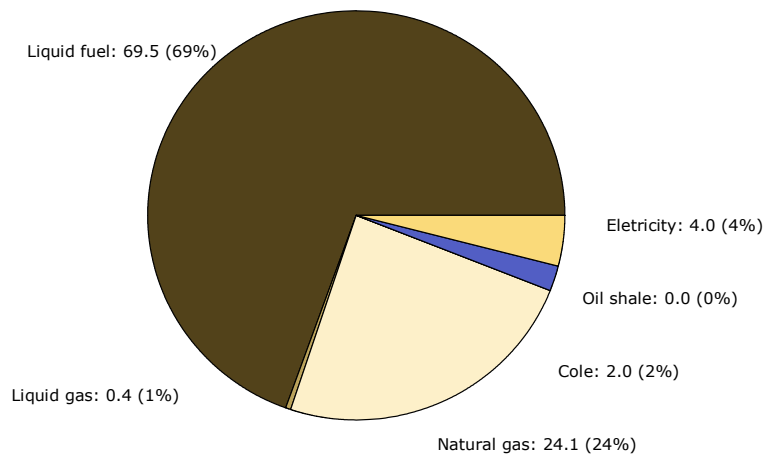
But as seen in Chart 3 the gap between import and export is still quite large and a surplus is not be expected. But concerning energy security the diversification of energy sources is also necessary - Chart 5 and Chart 6 illustrate the proportions of different energy sources in export and import.

**Chart 4 Energy exports 2010**



Source: Estonian Statistical Office

**Chart 5 Energy import 2010**



Source: Estonian Statistical Office

When it comes to energy export from Estonia, the main part of it consists of shale oil, which is the alternative product from the oil shale industry besides electricity and heat, and electricity which consists 39% from the total exports. The other export sources are fuelwood

and turf with 16% and 5% respectively. Estonia does not export oil shale as a raw material, but only processed products - this shows the development of the oil shale industry.

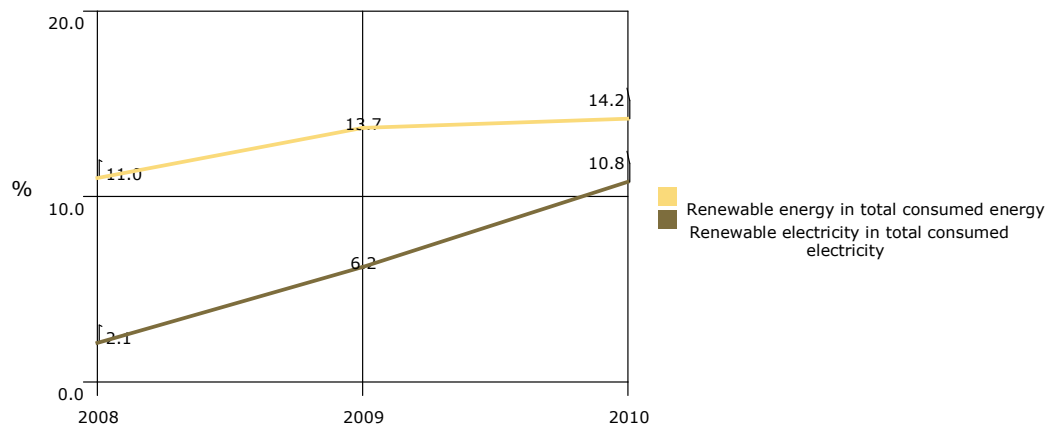
When looking at imports, the huge proportion of liquid fuel is imminent. Together with natural gas they consist of 93% of Estonians import, which makes it a very vulnerable aspect in energy security. Additionally, as almost all liquid fuel and natural gas is imported from Russia, the dependency among these two energy sources is extremely high.

The overall dependency of the Estonian energy sector is however quite small<sup>2</sup> - due to the large proportion of domestic production. Also, the dependency of natural gas from Russia is 100% but considering the small proportion of it in the energy balance the overall dependence is again not so large as in most of European countries<sup>3</sup>. So Estonia is perhaps not so overly dependent on imports from Russia considering our energy balance, but since there almost does not exist another way to import natural gas and liquid fuels to Estonia, further diversification and expansion of supply networks is necessary.

### Proportions and types of renewable energy

One of the possibilities of diversification is the exploitation of renewable energy sources. At the moment the largest renewable energy source in use is fuelwood. But the restoration of wood is quite slow so that source cannot be excessively exploited. Also, turf is a quite widely spread energy source for creating heat, but the recuperation of it takes even longer than fuelwood. The perspective to create hydro energy in Estonia is quite faint due to lack of large rivers. Together with wind energy, it consists of 0.5% of the total energy production in Estonia. But it cannot be said that there is no perspective to it.

**Chart 6 Proportion of renewable energy 2010**



Source: Estonian Statistical Office

Chart 4 illustrates the proportions of renewable energy in total consumed energy and in total consumed electricity. In total consumed energy the proportion is quite high due to the use of fuelwood and turf. But the developments in recent years have mostly been focused on producing electric energy with windmills. At that can be seen on the chart as well - in three years the proportion of renewable electricity has multiplied five times and consisted 10.8% in 2010. As the other 90% comes still from only one source, the tendency is positive but there is still a long way to go.

<sup>2 3</sup> Estonian National Development Plan of the Energy Sector 2020.  
[https://valitsus.ee/UserFiles/valitsus/et/valitsus/arengukavad/majandus-ja-kommunikatsiooniministeerium/Energiamaajanduse\\_riiklik\\_arengukava\\_aastani\\_2020.pdf](https://valitsus.ee/UserFiles/valitsus/et/valitsus/arengukavad/majandus-ja-kommunikatsiooniministeerium/Energiamaajanduse_riiklik_arengukava_aastani_2020.pdf)

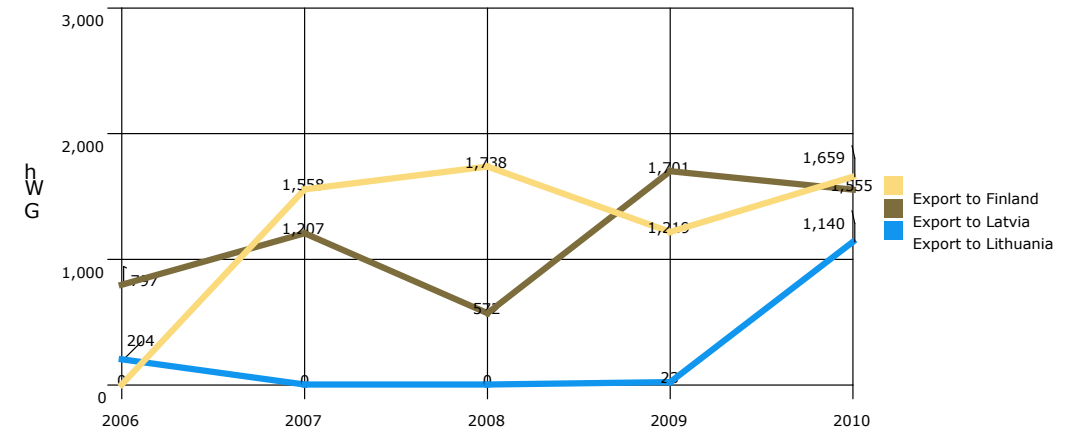
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In order to assure a firm energy security diversification of energy sources is necessary. The first step in that direction was made in 2007 with the opening of EstLink I. The electric cable between Estonia and Finland was built to stabilize the supply of energy and to establish a common market situation with the northern neighbors. Since then, the export of electricity to Finland has fluctuated around 1500 GWh per year which is in the same magnitude with Latvia (Chart 7). Also, the building of EstLink II in progress to assure an even more powerful connection.

**Chart 7 Electric energy export**

Source: Estonian Statistical Office

**Possibilities of nuclear energy**

In Estonia nuclear energy is still seen as one of the most economically efficient possibility to cover the energy necessity in the future. But the environmental issues with that are remarkable and need a thorough discussion in the society. The recent accident in Japan and developments in Europe have not influenced Estonia to give up all plans to build a nuclear plant. The first thought to create a new plant with Latvia, Lithuania and Poland to replace the Ignalina plant in Lithuania have been mostly forsaken due to little interest among partners. So according to the Energy Sector Development Plan 2020 Estonia is currently preparing its own legal framework to constitute the conditions and processes of creating a nuclear plant in Estonia by 2012, irrespective of the final decision. Additionally, study programs about nuclear energy in Estonian Universities were created in 2010.

These plans were not largely influenced by the decision in Germany to abandon nuclear energy. Although it started a minor debate about the overall necessity of nuclear energy in Estonia no harsh decisions were made and the government continues with its preparations for the possibility. The strongest argument against it have been the environmental issues (disposing of the waste, possible accidents) and the strongest for the plant the high dependence on non-reproducible resources which will run out at some point and the already existing danger due to the proximity of plants in Finland and Russia.

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To conclude, there is shown a SWOT analysis of the Estonian energy sector in the development plan until 2020

**Strengths:**

1. Slight dependence on import of energy sources
2. Diverse set of energy sources in energy production
3. Domestic production is powerful enough to satisfy domestic demand
4. Existence of unique know-how in the energy sector
5. Well operating liquid fuel markets.
6. An attractive transit route for liquid fuels.
7. Possibilities to use alternative energy sources
8. Sufficiently developed natural gas network (considering the possibility to store it in Latvia)
9. Strong energy companies
10. Large resources of renewable energy
11. Operating judicial system and market monitoring

**Weaknesses:**

1. Low energy efficiency in buildings, transport, district heating systems and in the oil shale industry.
2. The domination of oil shale in the energy balance.
3. Small and easily influenced electricity market.
4. Insufficient funding of education and research.
5. The domination on a single supplier of natural gas.
6. Harmful conditions in natural gas contracts.
7. Small amount of biofuels used.
8. The security stock of liquid fuels has not been completed.
9. Politically influenced transit/supply of liquid fuels
10. The national analytic base for the energy sector is weakly developed.
11. Insufficient/absent electrical and gas network connections between the Baltic region and the rest of EU

**Possibilities:**

1. With more clearer political signal a framework to regulate a efficient and long-term energy supply can be created.
2. With advocate market prices an attractive investment environment can be created.
3. With a more flexible tax system it is possible to increase the state's profits from the international energy market.
4. The utilization of the current potential energy conservation decreases the demand and producing capacity.
5. The utilization of domestic renewable energy sources will decrease the dependency.
6. With new network connections the risk of supply interruptions can be decreased
7. The modernization of district heating system to develop possibilities to produce heat and electricity together.
8. The well-timed utilization of new energy sources and technologies.
9. The possible construction of a natural gas terminal in the Baltic region.
10. The expansion of the utilization of alternative fuels.
11. The efficient use of liquid fuel storages.

**Dangers:**

1. The aggravation of the reliability of energy supply.
2. The insufficiency of the state stimulus.
3. The disunity of the European energy policy.
4. The opposition of locals and local authorities to new energy facilities.
5. The increase of energy prices and the vulnerability of energy systems due to global tendencies.
6. The slow modernization of district heating systems.
7. The lack of qualified specialists.
8. The danger of suspension in the natural gas supply.
9. The higher dependency of the Baltic region on natural gas after the closure of Ignalina nuclear plant.
10. The converging of the liquid fuel market.
11. Possible suspensions in supply with crude oil.
12. The possible negative environmental effect of the transit of liquid fuels or energy facilities near Estonia.

Source: Estonian National Development Plan of the Energy Sector 2020.

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## **Conclusion**

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The energy policy of Estonia relies mostly on oil shale, which enables a large domestic production and self-sustained energy sector in areas like electricity. But it also led to a total dependence on gas and liquid fuel products, which mostly come from Russia. That is mainly due to the lack of network to other parts of Europe and the simple fact that most of the gas and oil resources in Europe come from Russia.

Despite the dependency of natural gas, the oil shale industry grants independence of the electricity market. Since the production of EstLink to connect to Finland Estonia has become a country, that export quite a lot of electricity while not needing to import it.

But since this important industry is build upon a non-reproducible resource which will run out some day, diversification is needed. In recent year wind energy has been more widely used to produce electricity. The climatic situation in Estonia makes it the most reasonable comparing to hydro or solar energy for example. The proportions of wind energy are still around 10% so these developments must continue. Also, nuclear power is not totally neglected due to recent event in the world and some little steps are taken to bring that possibility closer.