

# Energy Perspectives of the Baltic

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Europe is facing a number of energy challenges in the future. Greenhouse gas emissions will have to be reduced significantly in spite of a growing demand for energy services; global oil demand is forecasted to grow against an uncertain supply situation in a medium-term future, and the increasing demand for natural gas call for an extension of the natural gas infrastructure among European countries and its neighbouring regions.

In March 2007, EU leaders agreed on three key targets for 2020: improving energy efficiency by 20 per cent, reducing greenhouse gases by at least 20 per cent and increasing the share of renewable energies in the energy consumption to 20 per cent.

This article presents an overview of the energy situation in the Baltic Sea Region and describes options for further cooperation between the countries and industry in the regions to deal with the challenges facing the energy sector.

## Energy Consumption

Energy consumption in the Baltic Sea Region has been fairly stable during the last 15 years. Today the most important sources of energy are oil, coal and natural gas in the aforementioned order. Since 1990,

the role of coal has declined whereas particular natural gas and renewables have come to play a greater role. In the new democracies in the region the reduction in coal consumption has mainly taken place in the industrial sectors.

The stabilisation of energy consumption since 1990 has taken place in spite of a significant increase in GDP for the Region (28 per cent increase since 1990). This reflects an improvement in the energy intensity of the economy, that is, the amount of energy used per economy output. As indicated in Figure 3, this development is particularly profound in the new democracies, which have succeeded in almost halving their energy intensity since their transition to market based economies.

This change depends on decreasing production from energy intensive industries as well as on energy efficiency improvement in all parts of the economy.

CO<sub>2</sub>-emissions from the energy and transport sectors have decreased by approximately 13 per cent from 1550 Mt in 1990 to 1340 Mt in 2005. This reflects the shift in energy consumption towards natural gas and renewables – as indicated in figure 1 – as well as the slightly decreasing total energy consumption.

### Gross Energy Consumption

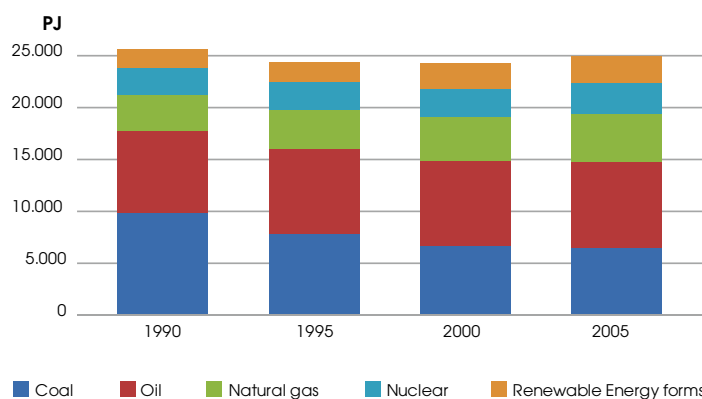


Figure 1: Gross Energy Consumption in the Baltic Sea Region (Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, Norway and Sweden. The graph does not include statistics for North West Russia). Source: DG Tren

## Energy Resources

The countries surrounding the Baltic Sea are rich in resources for energy production – both fossil fuels and renewables. Significant gas reserves are available in Norway and Russia. Germany and particularly Poland hold substantial coal resources, and Norway has large oil reserves.

As regards renewable energy, hydropower and biomass cover the largest part of the technical potential. Moreover, wind power already plays an important role in Denmark and Germany and could play a much greater role in the region in the years to come. In the longer term, solar power and heating and geothermal energy may also provide notable contributions to the overall energy supply.



# Sea Region

Some 45 per cent of total final energy consumption in the Region is supplied through grids (electricity, gas or district heating).

The physical infrastructure is well developed in the Baltic Sea Region. Members of the EU are required to implement the deregulation of the electricity and gas sector as stated in EU regulation. This implies minimum requirements on accounting and legal separation of transmission and distribution system operators. In the third legislative package that EU Electricity & Gas markets put forward in September 2007, the EU Commission wants to go even further by requiring ownership unbundling of electricity and gas transmission.

## Electricity

All countries surrounding the Baltic Sea are electrically connected – directly or indirectly. Still, power is primarily traded on a country level or within smaller regions, though this may change in the future.

The Nordic countries form a common power exchange (Nordpool) jointly owned by the transmission system operators; in Germany, power is exchanged through the European Energy Exchange and in Poland by the Polish Power Exchange. The three Baltic States still have separate exchanges. Recently, however, negotiations have been launched between Nordpool and electricity companies of the Baltic Countries to establish a joint Elspot market in one or more of the Baltic countries. This would allow for a more market oriented utilization of the Estlink cable linking Finland and Estonia.

Similarly, in September 2008, the exchanges of Nordpool and the European Power Exchange will be linked through so-called market coupling to ensure efficient use of existing cross-border interconnections.

## Gas

Northern Europe and large parts of the Baltic Sea Region are equipped with an extensive gas transmission

infrastructure. Moreover, important extensions of the infrastructure are being planned focusing mainly on linking the gas reserves in the North Sea and in Russia with the large consumption centres in Central Europe.

## District heating

Compared to other regions of Europe, the Baltic Sea Region has a well developed district heating system.

### CO<sub>2</sub> - emissions by sector

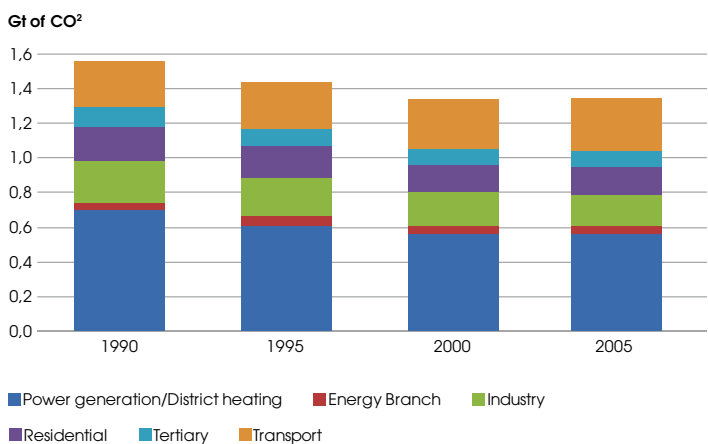


Figure 2: CO<sub>2</sub>-emissions in the Baltic Sea Region by sector (Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, Norway and Sweden. The graph does not include statistics for North West Russia). Source: DG Tren

### Final Energy Demand Per GDP

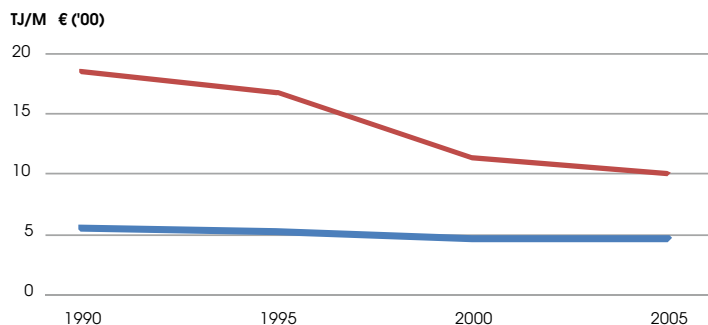


Figure 3: Energy intensity – measured as Final Energy Demand per GDP – in the Baltic Sea Region (Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, Norway and Sweden. The graph does not include statistics for North West Russia). Source: DG Tren

From an energy resource point of view, this implies huge benefits, as combined heat and power generation may increase the fuel efficiency of power plants from 40-50 per cent (electricity only) to approx. 90 per cent (electricity and heat). For example the district heating systems will allow for a very efficient utilization of the bioenergy resources in the Region.

Moreover, district heating systems can provide a valuable storage medium for wind power, by using possible surplus electricity for heating purposes through electric boilers and heat pumps. Finally, district heating gives consumers a high level of security of fuel supply, as multiple fuels may be used for the production.

## Initiatives for Cooperation

Since the early 1990s several initiatives have been taken to stimulate cooperation between energy stakeholders in the countries surrounding the Baltic Sea. These initiatives include among others Baltic 21, Basrec, Baltrel, Union of the Baltic Cities.

### EU Strategy for the Baltic Sea Region


In December 2007, the European Council invited the Commission to present an EU Strategy for the Baltic Sea Region at the latest by June 2009. The strategy will be one of the key objectives for the Swedish EU Presidency in the second half of 2009. According to the Swedish Prime Minister, the strategy should be a concrete, action-oriented instrument intended to help the EU and the EU members in the Baltic Sea Region to set joint priorities, for instance concerning investments in infrastructure, to speed up joint implementation of EU decisions, and to better harmonize national regulations so as to create a genuinely single and thus bigger regional market.

The energy companies of the Baltic Sea Region have experience in using low carbon technologies, for example, hydro power, biomass, wind power and nuclear power as well as technologies for energy efficiency, including combined heat and power production (CHP) and demand side technologies. Furthermore, the region possesses key industrial companies for producing energy efficient end-use equipment as well components of energy production facilities.

With respect to research and development, some of the most prominent research institutions and IT companies are located in the Region.

Against this background, the Baltic Sea Region has significant potential for further developing regional projects that could benefit the region as a showcase for comprehensive sustainable energy systems.

For example, the Region could facilitate demonstration of new technologies for energy efficiency, integration of large amount of wind power and other fluctuating energy production, new technologies in the field of biomass (including biogas), the use of Carbon Capture Storage in connection with large power plants. Also, the use of district heating and combined heat and power production is a key technology in environmentally sustainable cities and metropolises. On the demand side, the Region holds the key industries manufacturing energy efficient equipment for industries and households, heat pumps and insulation.

In the future, the Region could play a special role by showing how long-term climate goal may be met in an intelligent way creating growth and prosperity. This vision would benefit from the Region's capacity within information technology, exploiting the opportunities for improving the communication between all players in the energy markets as well as energy consumers and appliances. 

### Invigorated Energy and Climate Coordination in the Baltic Sea Region

In order to meet the demand for coordination of the activities, avoid unnecessary repetitions, and define joint priorities, BDF has taken the lead in a regional co-ordination body for energy and climate issues. On 6 February, nine Baltic Sea organisations endorsed the idea of joint coordination of activities in the field of energy. The newly formed platform will help the organisations to move in one common direction and avoid duplicating their activities.

All organisations agreed that more knowledge exchange and cooperation is needed in order to speak with one voice concerning European and global challenges in the field of energy and climate change.

The initiative of the **Joint Platform on Energy** came from BSSSC, and BDF has taken the lead by hosting the second coordination meeting. BDF is also pushing for an analysis of energy cooperation in the Baltic Sea Region, as very few analyses/reports exist on the regional dimension of energy challenges.