

# BDF Magazine

*[Regional Perspectives on Energy & Climate]*

Summer 2008



## Dear Reader,

Hardly a day goes by without news stories on energy and climate change. Increasingly, people are aware of the scale of the effects of their energy consumption. They are demanding new ways of using energy in a more environmentally friendly manner. There is no doubt that the green climate revolution cannot be made by politicians alone; we need a cross-sectoral partnership on this. As with the political resolution, it can only come true if it is supported by the general public. The green revolution needs both conscious consumers and a far-sighted innovative industry that is ready to invest in the future.

To be successful we have to consider this challenge positively. Let's focus on the opportunities. Energy business opportunities can be a great solution for those with the know-how and infrastructure to see it through.

Global initiatives are vital. Yet, we also feel that more focus could be directed on these issues at the regional level. The countries, research institutions and companies in the Baltic Sea Region already possess great experience, knowledge and political will to shift the energy market towards alternative energy sources. I believe it would be useful to know more about the regional state of play in order to address the regional challenges and implications of climate change and efforts to redirect our energy consumption. In short, we need to define the regional agenda in order to act coordinated – as a region.

The BDF Summit in Copenhagen and Malmö, 30 November – 2 December, will focus on our regional climate and energy challenges. In order to warm you up for those deliberations, we are in-

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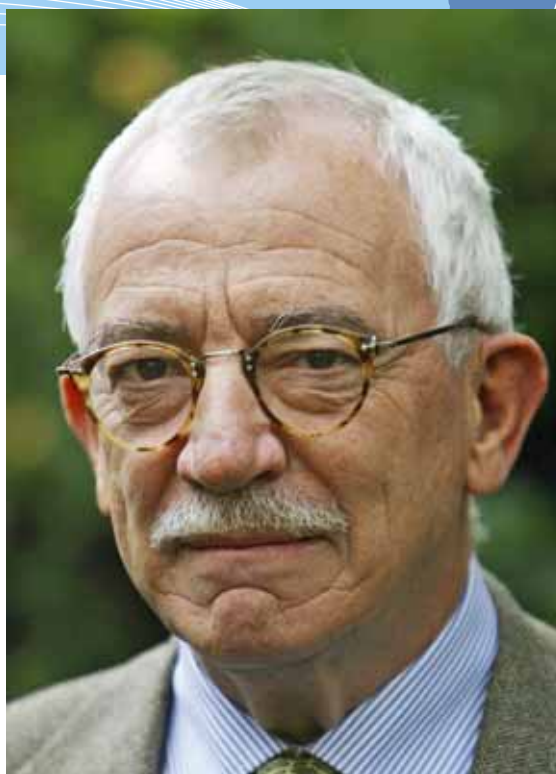


roducing some related themes. We have contributions from some well known actors and researchers, and we are also introducing some less know – but equally important – grass-roots initiatives from the Region.

Enjoy your reading!



*Uffe Ellemann-Jensen*  
*Chairman of Baltic Development Forum*



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# Let's Energize the Climate for Regional



From all perspectives, the Baltic Sea Region is an interesting area when it comes to energy and climate change. This edition of BDF Magazine wants to show why and how - by giving an introduction to, and overview of, these many perspectives.

To begin with, the Region is at the centre of global media attention the next two years due to the UN Conferences on Climate Change in Poznan in December 2008 and in Copenhagen in December 2009. These two UN-Summits are crucial for reaching a post-2012 global agreement on climate change and for the reduction of greenhouse gasses. Both events give unique responsibilities, and a possibility to show to the rest of the world that this region is ready to lead the way. Sweden will have the EU Presidency in the second half of 2009 and thereby head the EU negotiations together with the Commission and its Latvian Energy Commissioner Andris Pie-

balgs on a climate deal with the US and other global partners. Prime Minister Anders Fogh Rasmussen has a key role in achieving a successful COP 15 in Copenhagen. In the interview with BDF Magazine he gives his view on the energy and climate challenge. Pawel Swieboda's article The Baltic Sea Region in the EU – Leading by Example and Initiative also looks closer into some of these issues.

Besides the formal questions, the Region also encapsulates most of the political, economic and environmental aspects related to energy and climate change. The article Energy Perspectives of the Baltic Sea Region gives an overview of the Region's fascinating characteristics, high-lighting both the great diversification of energy sources/mix in the region and the very developed energy market of the Nordic countries.

Therefore, the Region should see the climate challenges as an opportunity and not as a barrier for continued economic progress, argues Erik Rasmussen very convincingly in the article The Climate Crisis Calls for a New Industrial Revolution.

The optimistic tone is not meant to divert attention from the problems we are facing. The common good – the Baltic Sea – has many problems today, and it will be influenced negatively by the consequences of climate change. The sharp increase in oil shipments that have happened over recent years is also alarming. Anne Christine Brusendorff's article Latest Assessments Predict Dramatic Warming in the Baltic Sea Region presents the main problems.

Often, energy policies are closely linked to a nation's sense of economic and political sovereignty. The code words here are energy security and energy dependency. From this perspective, the Baltic Sea Region is also interesting due to the fact that two of the biggest exporters of gas and oil are neighbours and part of the Region. Here, I am thinking of Russia when energy and foreign policy interests are seen together. Today, the Nord Stream gas pipeline in the Baltic Sea almost symbolises the linkage between

# Cooperation in the Baltic Sea Region

energy security and national economic security. We have asked two cool-headed academics – Svend Aage Christensen and Pami Aalto – to address the issue, contributing to more reason and less rhetoric on this matter.

Generally, a real danger exists these years that huge investments in new power plants will be made in order to reduce dependency on Russia, in particular. I believe that the real solution to energy security lies in greater regional integration of the energy markets. Generally, we need more market and less politically driven investments.

For all these reasons, one should expect that energy cooperation in the Region will be very advanced and dynamic – something which the Region is generally renowned for in the rest of Europe. However, a quick surf on the internet to relevant homepages gives a mixed picture as regards the formal intergovernmental cooperation of the region. The situation is difficult to understand, knowing that the EU has decided that an EU Strategy for the Baltic Sea Region should be adopted by December 2009 and that most EU countries of the Region declare that energy should be a key action area in this strategy. It is clearly stated in most of the contributions that have been made to the Commission's work in preparing the EU strategy.

**Generally, the Baltic Sea Region is the strongest region in the world when it comes to competitiveness, innovation and level of skills. The energy sector is a demonstration hereof.**

BDF welcomes very much these timely initiatives. They express new political will that has been lacking for some time on the regional level. BDF has tried to do its part in mobilising the potential of the region by creating a joint energy platform that sets basic common priorities and coordinates the activities of different organisations.

From the same perspective, BDF was co-host for a high-level energy conference in Warsaw 21 May (Global Challenges – Regional Solutions) where we brought 300 stakeholders together in order to promote a greater common understanding. Often countries of the

region take a different view on energy policies. Some underline the environmental challenge of climate change. Others the security of supply and

less dependence of Russian energy. And finally some believe in more liberal energy markets. We need to bring these three starting points closer together. If we succeed in our region, it should be possible elsewhere in Europe and the world.

Furthermore, BDF has initiated a study on the potential of regional cooperation that follows the mentioned demand for further studies. We believe that it is important to create a public-private partnership and to involve different stakeholders, since it is only through such an approach that the challenges linked to energy and climate change can be addressed and implemented efficiently. Business will have to find the solutions to CO<sub>2</sub>-reduction and efficient energy use, and we need an open and transparent process. At least, it is how we intend to present the matter when we invite the Region's main decision-makers from business and politics to discuss these issues at the BDF 2009 Summit 30 November – 2 December.

I have only mentioned some of the articles that you can find in our magazine. I hope you will find all of them interesting.

*Hans Brask*

*Director of Baltic Development Forum*

**If we allow the invisible hand of supply and demand to work through a better infrastructure many of the concerns related to energy security will – if not disappear, then be seriously reduced.**

# “The Baltic Sea Region Can Make Combatting Climate Change”

*Interview with Anders Fogh Rasmussen, Prime Minister, Denmark*

Denmark attracts massive global attention in the coming year as host country for the 2009 UN Climate Summit in Copenhagen. The Summit is expected to finalise a substantial global climate agreement affecting the state of the environment, our way of living, economic growth and future competitiveness. BDF Magazine asked the Danish Prime Minister Anders Fogh Rasmussen to reveal his predictions as to the chances for a successful outcome of the UN Summit and its implications for the future. Further, the Prime Minister shared with us his outlook on the future of the Baltic Sea Region energy market and position in the global economy.

**Q** *The Baltic Sea Region is in a unique position, as two of the world's most important meetings on climate change are taking place within this Region. A successful Summit in Poznan in December 2008 is a prerequisite for a global agreement in Copenhagen 2009. How are the Danish and Polish governments cooperating to secure successful result?*

**A** Given the short time to COP15 in Copenhagen we need Poznan to make a substantial contribution to the process. Denmark and Poland will be in close contact on this common task. Together with Indonesia we have also established a high-level “COP troika” where our plan is to meet regularly, not least to maintain political momentum on the road to COP15 in Copenhagen.

**Q** *What issues are – in your view – vital in order to secure a successful global agreement at the 2009 UN Climate Summit in Copenhagen, and what will be the most important implications of such an agreement?*

**A** Our objective is to strike a deal on a new global, comprehensive, climate-change agreement

in Copenhagen that will reduce global emissions in line with scientific recommendations and still allow nations to develop and prosper. The industrialised countries will need to show leadership. But even if we in the industrialised world reduce emissions to zero it would not solve the climate change problem.

A particular challenge we face is the need to create a mechanism for efficient dissemination of technology. Low-carbon technologies should be made available and put in use everywhere. There is every reason for also developing countries to take advantage of new technology.

**Q** *At the BDF Summit last year, commissioner Piebalgs saw real possibilities that the Baltic Sea Region become a world leader in energy efficiency and renewable energies, since countries of the region are frontrunners in these areas and are strong in R&D in general. How do you view the Baltic Sea Region's potential? Could this potential be better branded in the world through joint efforts?*

**A** The challenges related to energy and climate have become more complex and global in nature in recent years. Demand for energy is rising rapidly leading to higher prices. Most of the countries in the Baltic Sea Region are members of the EU and have to comply with the binding targets set by the EU for reduction in GHG emissions and for the share of renewables in their energy mix. They have to improve energy efficiency in order to embark on a low-emission economy with secure energy supplies at affordable prices by 2020.

The Baltic Sea Region can make a significant contribution to combatting climate change. The countries in this region have a vast variety of renewable energy sources and they have already demonstrated will and ability to develop these resources. Cooperation between governments and the private sector is the key to achieve our goals for the use of renewable energy and efficient technologies.

# a Significant Contribution to

There is a broad understanding in the Baltic Sea Region that the preparations for the Summit in 2009 present a unique opportunity to demonstrate resolve and embark on a common path towards a low-carbon society. This necessitates investments in technology with a potential to contribute to economic growth in the Region.

**Q** *In April this year, the Nordic prime ministers agreed to strengthen the Nordic cooperation on climate and environmental policies by way of a joint action plan. Would it be possible to expand such an effort to the whole Baltic Sea Region and in connection with the upcoming EU Strategy for the Baltic Sea Region?*

**A** We agreed to strengthen our cooperation on climate and environmental policies, including in particular energy efficiency and renewables. In connection with the upcoming EU strategy for the Baltic Sea region we also agreed to strengthen cooperation with our neighbouring countries with a view to increasing competitiveness and economic integration in the Baltic Sea Region. Russia is an important partner in this regard and the development of the EU strategy must take place in consultation with Russia.

The Danish presidency of the Council of the Baltic Sea States starting on 1 July 2008 will invite the countries of the region to intensify cooperation to transform the region into a low-carbon but highly energy efficient area. The Danish minister for energy has called a conference of ministers for energy in September in order to deal with the energy perspectives of climate change.

I am grateful for the Danish-Swedish cooperation that led to the decision at the EU Summit in December 2007 to develop an EU strategy for the Baltic Sea Region. The Swedish choice of Baltic Sea cooperation as one of the priorities of the Swedish EU presidency is very timely.



Anders Fogh Rasmussen, Prime Minister, Denmark

**Q** *Innovative energy solutions and renewables will be the future source of competitiveness in the global economy. What should governments do in order to support the development of new energy sources?*

**A** In the face of sharply rising global energy consumption and its effect on GHG emissions we have to accelerate research and development as well as commercialisation of new and clean technologies that reduce GHG emissions. We have to develop technologies that can lower the cost of clean energy. In Denmark, we welcome the EU Strategic Energy Technology Plan as one of the means to build a low-carbon economy. The annual spending on energy research in the EU will increase by at least 50 percent over the next seven years.

In Denmark, we have just concluded a political agreement on energy with very broad support in Parliament. It sets out clear and ambitious targets for renewable energy. In 2020, renewables should cover 20 percent of our national energy consumption. And, in the long term we should free ourselves from fossil fuels.

Finally, we have taken steps to prepare for the next generation of GHG reduction measures. We have established a climate commission which should

propose strategies and solutions to the creation of a fossil-fuel free society in the long term. In short, we have to prepare today, if we want the capacity to act tomorrow.

**Q** *You are a strong advocate of an internal market for knowledge, ideas and research in the EU (the 5th freedom). How do you see the chances of the Baltic Sea Region becoming a model region in this regard, especially within energy and climate change? Would you promote such an idea?*

**A** It is my vision that the EU develop into an actual European research area – an internal market for knowledge, within which ideas, students, teachers and researchers will be able to move freely across borders.

This vision also applies to the region of the Baltic Sea – for example when it comes to the sectors of energy and climate change. The Baltic Sea Region has the opportunity to become a centre of knowledge, ideas and research in the areas where the region has comparative advantages. Energy efficiency and methods to reduce carbon emissions are clearly such areas. We must remove barriers to movement of knowledge. In practical terms this means that people with ideas and knowledge must have the possibility to move easily across borders.

**Q** *You have been very favourable towards greater energy solidarity in the Baltic Sea Region as a way to improve energy security for all. How could the Baltic Sea Region itself improve the situation?*

**A** I strongly support the principle of energy solidarity within the EU. One of the challenges for the Baltic Sea Region is integrating its energy infrastructure; it is a precondition for the free flow of energy across borders. We still have “energy islands” that need to be linked. Increased use of renewable energy also calls for an efficient energy infrastructure in order to integrate electricity and heat based on renewables into the energy supply system.

**Q** *The Nord Stream project has divided the Baltic Sea Region in many ways. What is your standpoint on the Nord Stream project? From a Baltic Sea Region point of view should we reduce energy dependency from Russia?*

**A** Denmark has had an open mind to the Nord Stream pipeline from the very beginning. I note that Commissioner Piebalgs has given the project his full support as a project of general European interest. Also the Baltic pipe project which is planned to run from Norway to Poland is a project with interesting and positive potential.

I am not aware of environmental problems in this regard. A comprehensive Environmental Impact Assessment for Nord Stream will be ready this year. Let us consider the issues on that basis.

I understand very well that some countries fear energy dependency on a single supplier. The solution is:


- not to discourage investments in new supply routes; rather to create
- an internal energy market infrastructure that covers all member states to avoid supply cuts to any individual member of the EU.

At least for the medium term, Russia will continue to be a major supplier of oil and gas to the EU. We depend on Russia, as Russia depends on us. This should be a basis for cooperation, not for conflict.

Energy will be an important element in a new general partnership agreement between EU and Russia. We encourage Russia to ratify the Energy Charter Treaty which is the best framework for dealing with energy on the basis of market principles. The low level of investment in the

Russian energy sector and the tendency to stagnation of production is a considerable worry which must lead us to discuss ways to improve the framework for investments.

**Q** *The Baltic Sea Region is still far from offering a fully integrated electricity market. What should be done in order to secure open competition and sufficient market conditions?*

**A** The Nordic countries have a long tradition for close cooperation in the electricity field. Large parts of the electricity produced in the Nordic countries are traded at the Nord Pool market, and there are a great number of producers on the Nordic market. The Nord Pool market is considered to be the most developed and well-organized trade platform in Europe to great benefit for individuals as well as businesses. 



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# Energy Perspectives of the Baltic

By: Helge Ørsted Pedersen and Anders Kofoed-Wiuff,  
Ea Energy Analyses, Denmark

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.

## 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.

Gross Energy Consumption

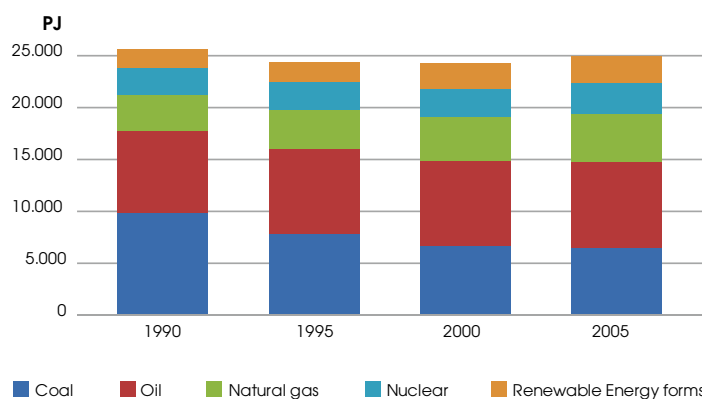


Figure 1: Gross Energy Consumption in the Baltic Sea Region (Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, Norway and Sweden. The graph does not include statistics for North West Russia). Source: DG Tren

# 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

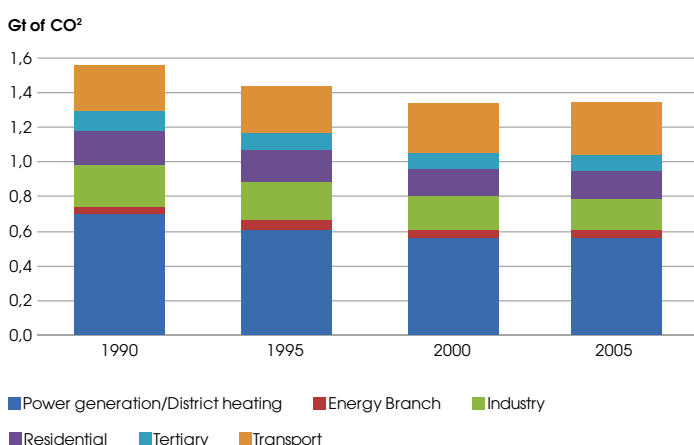


Figure 2: CO<sub>2</sub>-emissions in the Baltic Sea Region by sector (Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, Norway and Sweden. The graph does not include statistics for North West Russia).

Source: DG Tren

### Final Energy Demand Per GDP

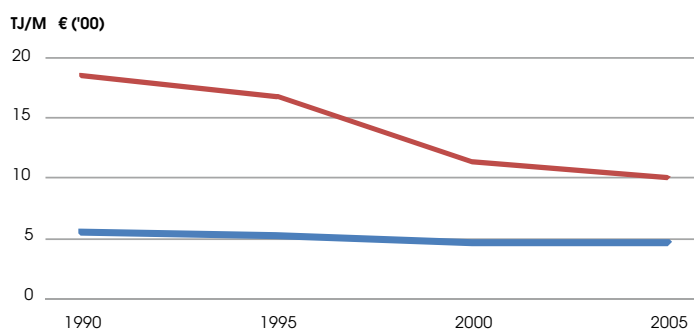


Figure 3: Energy intensity – measured as Final Energy Demand per GDP – in the Baltic Sea Region (Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, Norway and Sweden. The graph does not include statistics for North West Russia). Source: DG Tren

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.



# BALTIC DEVELOPMENT FORUM SUMMIT 2008



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## ENERGIZING THE CLIMATE FOR BUSINESS



## SUMMIT THEMES

### ENERGY AND CLIMATE

Europe is still far from offering an integrated and competitive energy market. Baltic Development Forum, together with major business stakeholders from the energy sector, will strive to make a regional contribution to the European energy and climate objectives. Elements necessary to improve the regional energy co-operation will be presented and discussed at the Summit.

### EU BALTIC SEA STRATEGY

The European Strategy for the Baltic Sea Region is the most important and concrete step forward for the Region since the EU-enlargement in 2004. The Baltic Development Forum Summit will offer strategic high-level input to the process, which is to be presented in June 2009.

### LABOUR MARKET AND TALENTS

The Region is presently performing well economically but a vital component in further strengthening the economies is to improve labour market structures and prerequisites for a resourceful talent base. The Summit will continue to address how the competitiveness of the Region can be enhanced by increasing labour mobility, improving innovation-systems and supporting the 5th freedom in the EU. The Øresund Region is in this respect a showcase of successful labour market integration across borders.

For further Summit information, please visit our website:

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# The Baltic Sea Region in the EU

*By: Paweł Świeboda, President of demosEUROPA –  
Centre for European Strategy, Poland*

It is clear that there will be multiple sources of political and economic leadership in the future European Union. Diversity which comes with size and the pressures of globalisation will mean that our collective objectives will be realised in tailor-made fashion by member states and regions. The European Union will be inspired by more localised examples of excellence. It will be driven by team-based sources of initiative.

It is tempting to assume that in a Union of 27 members, it is primarily the big member states that have the potential and responsibility to show leadership. This is not the whole picture. In the EU which is increasingly shaped by power of example and rivalry for ideas, there should be no limit as to who sets the tone.

In many ways, the Baltic Sea Region is a microcosm of the challenges that the European Union faces as the process of globalisation takes another span. We have a variety of political traditions and experiences as well as a whole spectrum of methods of economic governance in the region. The new EU member states – Poland, Lithuania, Latvia and Estonia – are exerting the kind of pressure on the more developed Scandinavian and German economies which can be seen as the softer version of the Chinese and Indian challenge. In turn, they need to benefit from the know-how of their Western and Northern neighbours to prepare for moving up the innovation ladder.

## Energy and Climate in the EU Microcosm

Energy and climate change is the area where the global microcosm parallel is most evident. The way that we square the circle of economic competitiveness and the new climate change objectives will be one of the most important tasks in the years to come. The January energy and climate change package of the European Commission is one of the most ambitious projects ever launched in Europe, comparable to the creation of the single market in the 1980s and the common currency in the 1990s. As such it has generated a fierce discus-

sion in which Member States, industry, environmental groups and consumers attempt to come to terms with the Commission's approach. It is also asymmetric in its impact as countries with more stakes in the eco-technology market, such as Germany, or a stronger potential in nuclear energy such as France, will find it easier to put up with the burden. Global partnership for sustainability should therefore start inside the EU by helping the new member states meet their obligations. It can then be taken onto the wider arena when Poland chairs the UN Climate Convention and post-Kyoto meeting in Poznań this December and Denmark hosts the final meeting in 2009.

There is an ongoing discussion in the European Union over the optimal set of instruments to fight climate change and enhance energy security. A number of experts believe that a broad-based carbon tax would be a more efficient measure than precise targets, which send mixed signals to the market. However, the political train has left the station and it remains to make the best out of the approach that has been agreed. The EU also faces the challenge of preserving the global competitiveness of its industry which will be affected by the proposed solutions, including the extension of the emissions' trading scheme.

It is becoming a mainstream view that the energy and climate change challenge will not be resolved without major advances in research and development. The global market for eco-technology is expected to grow by around 500 billion euro by 2010, triple the size of the global aerospace industry. The potential of that market has to be captured in a cohesive manner, without creating pockets of high and low specialisations. Countries with little or no share of the eco-technology market's cake will be persistently less interested in meeting ambitious environmental targets. Clean coal is an example of an area which could prove an attractive example of a Baltic lead market initiative. Poland heavily relies on coal from which a vast part of its electrical energy comes from. Clean coal is also a golden opportunity when one takes into account the

# – Leading by Example and Initiative

scale of Chinese and Indian investment in coal-based power generation. Similarly, development of carbon capture and storage would benefit from a political commitment of countries in the region.

## Liberalisation Without Real Competition

The Commission's January 2008 proposals aim at advancing liberalisation of the energy market. Earlier legislative packages have not been entirely successful because of insufficient focus on the development of network capacity. In the EU, there are mostly national markets dominated by national champions, linked only bilaterally. There are national grids, designed to serve national interests. There has been formal liberalisation but no real competition. The European Commission should have treated the wave of mergers among European firms from the point of view of the European rather than the national markets. Those inadequacies should be corrected in the years to come. There has to be a conscious effort to construct a European grid in a top-down fashion going down to the existing structures. The European Union needs to complete energy networks, improve the strategic gas storage and adopt a single voice in relations with supplier nations, including, by means of sharing information about contracts, supplies and supply-demand balances. The European market will emerge only as a result of there being regional markets first. The Baltic Sea Area should give an example of how regional alignment should play out.

Clearly, innovation is the key ingredient of dealing successfully with the pressures of globalisation. It is crucial for increasing productivity and underpinning industrial competitiveness. Innovation policy in the EU has been mostly focused on the supply-side and on improving access of innovative firms to finance and services. The demand-side of the equation has been under-exploited as a result of the fragmented condition of European markets. The potential of systemic policies, regulation and public procurement




has not been fully explored. As a result, European businesses have been lagging behind in their R&D and other innovative activities.

The Baltic Sea Region should be leading the way towards recalibrating the supply and demand-driven innovation policy. The demand-driven innovation policy should then be focused on the specification and purchase of innovative goods and services, systemic policies aimed at improving relationships between actors. Examples of this could be by means of promoting clusters, regulation which defines the parameters of the competitive space, especially in such markets as environmental technologies, procurement where the purchaser specifies goods and services in terms of a function which offers higher performance and hence requires innovative steps to achieve it.

## Need for “Lead Users”

The Baltic Sea Region countries should jointly look at ways of encouraging “lead users” of new technologies and methods of linking them up to create “lead markets”. This could be made through sufficiently widespread use of an innovation or through a single user with a significant purchasing power.

No doubt, the Baltic Sea Region can and should strengthen its “identity” within the European Union, serving as the source of best practices, but also provide leadership on issues of concern to it. If the Baltic countries can agree on their policy initiatives, they will find it easier to convince other member states of the virtues of their thinking. It is time to set that train in motion. 

# Nord Stream – the Great Divide

The planning of the Nord Stream gas pipeline through the Baltic Sea has caused political uneasiness and controversy among the countries around the Baltic Sea Region. Some countries welcome the pipeline, while others take a firm stand against it. BDF Magazine asked two renowned researchers; Dr. Pami Aalto, Jean Monnet



## The Nord Stream Gas Pipeline Exposes the Problems of Pan-European Energy Politics

*By: Pami Aalto, Jean Monnet Professor, University of Tampere, Finland*

The Nord Stream natural gas pipeline project from Russia to Germany via the Baltic Sea shelf has told us a lot about what energy policy is all about. Yes, infrastructure projects like pipelines are part of it, but in the future they will rarely be informed simply by technocratic concerns or rational calculations of energy economics.

The events surrounding the project give a very welcome lesson to the business communities, policy-makers and academic researchers interested in energy questions. There are at least three sets of issues that each of these groups should pay attention to, and prospectively, discuss jointly. Only in this manner can the problems that the project exposes in pan-European energy politics be amended.

### Repairing Brotherhood

First, in terms of infrastructure, the Nord Stream project is one more manifestation of Gazprom's attempt to build more export routes to the European market. This is somewhat strangely done in conditions where neither Gazprom's production nor its European exports are increasing particularly rapidly.

It is conceivable that upgrading the old Brotherhood (Bratstvo) gas pipeline running through Ukraine would have been considerably cheaper. This could have helped to increase the volumes transited through the pipeline from the some 115 billion cubic meters per annum to its theoretical maximum of some 175 billion cubic meters. This would have made the projected 55 billion cubic

meters final capacity of the Nord Stream pipeline redundant. However, it is understood that Ukrainian–Russian–German talks on repairing Brotherhood came to nothing back in 2002. Added to this is the very real character of the problems that Gazprom and Russia have had with Ukraine's unreliability as a transit state, including its unpaid high debts. The same goes for the problems with another transit state, Belarus, which is nothing like the steady partner many in Russia hoped for at the turn of the millennium when the two states' unification project was agreed.

In short, at issue is the lack of a transparent agreement among the gas consumers, transit states and producers in the pan-European area. The failed Energy Charter Treaty is no answer – there needs to be a joint understanding of the responsibility for the whole gas trade chain, incorporating the concerns for the security of supplies, transit and markets.

### Historical Wounds

Second, in terms of regional security policy, the Nord Stream project has contributed to the re-opening of historical wounds between Russia, the Baltic states and Poland. Yet, it is true that the Balts and Poles were alerted too late. The first feasibility studies were conducted in the 1990s, but only in recent years have protests been raised against the environmental impact of the pipeline's building and maintenance, and of its capacity to further underline the eroding Baltic and Polish grip of Russia's energy transit. For long, the Balts enjoyed the good profits from Russian oil transports, and the Poles continue to benefit from the gas and oil transit through the Yamal–Europe and Druzhba






# in the Baltic Sea Region?

Professor, University of Tampere, Finland, to outline the arguments against, and Dr. Svend Aage Christensen at the Danish Institute for International Studies, to outline the arguments in favour of the project. The arguments do not necessarily reflect the authors' own views.

pipelines. However, now a major element of positive mutual economic interdependence seems to be withering away.

By not opting for a land route for the Nord Stream pipeline, an excellent opportunity to reduce the East and Central European irritants in the EU–Russia relations has been lost. The very real transit fee problem could, again, have been avoided by agreeing on no or very low fees in return for a long-term transparent agreement.

## European Reliance on Non-Renewable Resources

Third, in terms of sustainability, the Nord Stream gas pipeline project further underwrites the European reliance on non-renewable hydrocarbon resources. In the future, the real competitive edge on the global energy market will not be pipeline supplies of hydrocarbons but renewables, and energy efficiency and savings technologies, coupled with the positive environmental impact and the industries and jobs they can help to generate domestically. 

## Dispersing the Fog of the Past in the Baltic

*By: Svend Aage Christensen, DIIS – Danish Institute for International Studies*

Originally a relatively unheeded commercial and technical project, Nord Stream has moved into the limelight of high politics and the arguments around the project have mushroomed. They often overlap but basically there are three types: technical and commercial arguments, the security policy argument, and the political arguments.

Nord Stream is a 1,200 km long sub-sea gas pipeline in the Baltic from Vyborg in Russia to Greifswald in Germany. The consortium in charge of the construction consists of one Russian and two German companies and will be joined by a Dutch company as well. →



Dr. Pami Aalto is a Jean Monnet Professor, University of Tampere, Finland, and Dr. Svend Aage Christensen is at the Danish Institute for International Studies (DIIS).

## The Technical and Commercial Arguments

**No encirclement.** One of the more heated arguments presented against Nord Stream is the idea that Russia and Germany are determined to encircle, cut off and put pressure on the three Baltic republics and Poland – and one might add Belarus and the Ukraine. This argument neglects the fact that the gas imports in Europe are predicted to rise substantially in the coming years. Nord Stream is planned to have a maximum capacity of 55 billion cubic meters per year (Bcm). This will meet only 25 percent of the expected increase. Nord Stream will not operate in place of, but in addition to existing and future energy supply projects.



Other new supply routes will also be needed to close the import gap and – what is often overlooked – the existing routes through Poland and the Ukraine will continue to be of major importance. Poland will still have the transit through the Yamal and Druzhba pipelines. Likewise, the Brotherhood pipeline through the Ukraine normally carries 115 Bcm/y of gas but has a higher theoretical maximum. However, even if renovated in order to bring it closer to its maximum, this would not be enough to cover the capacity gap. The mutual economic interests and the positive aspects of interdependence created by all these pipelines will still be important.

**Competitive costs.** It has been claimed that as a result of the high construction costs for a sea route, the end users would pay a higher price for the gas. This argument does not take into account the lower operating costs of the off-shore solution. Calculated over 25 years, total capital and operating costs for an off-shore link are estimated to be 15 pct below those of an on-shore pipeline.

Neither does the argument consider the differing mechanisms of price formation on gas. In some places we have an operating market with a gas exchange where supply and demand are decisive factors, in other cases the gas price is linked to the oil price.

Take for instance one of the sea pipelines, Langeled, which brings Norwegian gas to the UK. Like Nord Stream it is 1,200 km long. The gas from this connection has to compete with other gas supplies to the UK market irrespective of the construction cost.

**Added geographical diversification and flexibility of the overall gas transmission system from Russia to Europe.** Nord Stream has a favourable location in relation to the resource base which consists of the fields Yuzhno-Russkoye, Yamal, Tazovskaya guba and Shtokman. From a security point of view, a certain geographical spread of strategic high value assets, such as pipelines, can be considered advantageous.

**Proven technology.** The building of sub-sea pipelines has a long history. One of the latest examples is Langeled, which started operations in 2007. The last subsea welds were completed in April 2007, so that Langeled became a continuous pipe system from Nyhamna to Easington.

The dimensions of Langeled and Nord Stream are approximately the same. The bigger the pipeline the cheaper the transmission measured in price/capacity. Nord Stream has a diameter of 48", whereas Langeled is 42" from Norway to Sleipner and 44" from Sleipner to the UK. As a rule of thumb, capacity grows with diameter  $d^2$ , while construction costs are proportional with diameter. Under equal conditions, transportation costs in Nord Stream would thus be slightly lower in Nord Stream than in Langeled.

**Poland, itself, will build an off-shore pipeline in the Baltic. Double standards?** The arguments against an off-shore pipeline in the Baltic, especially from the Polish side, do not tally with

the Polish plan of building the Baltic Pipe, a sea pipeline bringing Norwegian gas from Copenhagen to Poland. Whereas there has been considerable Polish opposition to Nord Stream based on the alleged drawbacks of a sea-line, similar resistance has not been voiced on the Polish side about the Baltic Pipe.

This could obviously be construed as an example of double standards. The same might be said about the sea cable between Sweden and Lithuania and a gas pipeline project between Finland and Estonia. This is of course not characteristic of the Baltic. Also in other parts of the world, parties will intone environmental and legal arguments when they are opposed to a project and will try to ignore or play down the same arguments when used in favour of pipeline construction.

## The Security Policy Argument

**Vulnerability.** Some participants in the debate have said that certain kinds of Russian presence for purposes of maintenance and protection of Nord Stream could eventually create a kind of *droit de regard* for Russia in the affected areas, for instance in the proximity of Sweden.

However, it is nothing peculiar to sea lines that they have a dark side of vulnerability. This is true for many transit arrangements and goes for the on-shore pipelines between Russia and Europe as well. Providing territory for the strategic high-value assets of on-shore pipelines linking big neighbours creates a hypothetical risk for the transit countries in situations when the balance between their influence and vulnerability is disturbed for some reason.

If the dependence on on-shore pipelines of Russia and Western Europe can be somewhat reduced it could be seen as an advantage from a security policy perspective for the transit countries and in general, help to prevent excessive “securitization” of the transit industry.

Highly hypothetical as such security policy risks are, it is hardly possible to give a plausible assessment of the relative weight of these arguments for on-shore and off-shore pipelines respectively. But the point is that there are security policy vulnerabilities in both cases.

As a general observation, some of these vulnerabilities will be reduced as clear and transparent

## The Sound Toll

Tolls were exacted in Øresund going back to approximately 1429. Ships from many nations and trading cities made more than a million and a half passages through the Sound from the late fifteenth to the nineteenth century, leaving information on their cargoes in the Toll records.

From the sixteenth to the second half of the eighteenth century the Dutch were the leading maritime nation and their trade in bulk commodities with the Baltic was fundamental to the prosperity of the country, surpassing the more exotic and well-known spice trade with the East Indies. Later on, other nations, Great Britain in particular, surpassed the Dutch and in the nineteenth century the growing commercial power of the United States was signalled by the arrival of the first American ships in the Sound records. It was to be the Americans who sounded the death knell of the Toll, exerting diplomatic pressure to have it abolished. This finally occurred in 1857 after a history spanning some 360 years.

...

Not only did the revenues from the Sound Toll vary considerably through the years, depending on trade conditions, war, economic developments and high politics, but also the distribution of the toll amounts among the different nations changed considerably over time, reflecting developments in political power and economic conditions in Europe.

Source: Ole Degn, *Tariff Rates, Revenues and Form of Account of the Sound Toll, 1497-1857* (2006) and Publisher's Preface in *Guide and Concordance to the Sound Toll Registers*.

rules for transit become articulated. Thus, there are good reasons to further develop the Energy Charter Treaty process.

The ECT process has potential and can be reinvigorated. It might also help to transform the perennial debates on Russia's so-called gas weapon and instead concentrate all minds on measures to stabilise production and prevent further irritations along the transit routes. →

## The Political Arguments

**Influence and vulnerability.** The present configuration of the main transmission pipelines between Russia and the EU creates a high degree of interdependence between all countries involved, including the transit countries. Interdependence has its costs and benefits. The essence of interdependence is influence and vulnerability. Both influence and vulnerability apply to all states in the configuration.

This double face has been characteristic of many transit and transport corridors in history; in the Baltic area, suffice it to mention the transit corridors in the Danish straits of the Sound (Øresund) and the Great Belt, which have given Denmark influence and income but certainly also constituted a vulnerability and a security risk – not only during the centuries of the Sound Toll but also during the cold war, for instance.

The long history of the Sound Toll illustrates, for better or for worse, how dependent a country can become on its transit arteries and how easily it may be exposed to undesirable external influence (see box). For instance, the Sound Toll generated animosity against Denmark and contributed to the permanent dismemberment of the Danish realm with the final loss of the east coast of the Sound in 1660. From then on, the great powers would intervene in Danish-Swedish conflicts in order to prevent that both shores of the Sound would once again be commanded by a single state.

In some of the transit countries, the argument has been heard that Nord Stream takes away one of their political tools, that is, some of their influence, in relation to Russia and the consumer nations of Western Europe, primarily Germany. However, as we have seen, a lot of transit will still take place through these countries. In other words we are talking about degrees. That in itself reduces the weight of the argument.

On the other side of the equation, the diversification of the transit system somewhat reduces the inherent vulnerabilities for all participants in the present non-diversified system. These general vulnerabilities can be further reduced by developing a competitive and integrated gas market. This would help to create de facto solidarity between countries and to hedge against supply disruptions.

Consequently, both Nord Stream and other diversification and flexibility measures on the energy scene can be considered a welcome contribution to


the relaxation of that tension which is structurally and mentally present in the existing non-diversified system. Outbreaks of tension do not necessarily occur in all systems of this kind, but the tension is obviously felt in some parts of the Baltic and East European systems where the shadows of the past are real and suspicions and animosity easily crop up.

This more relaxed atmosphere could be used constructively to further develop trust and cooperation along the existing pipelines which are not going to lose their significance.

**Overcoming the shadows of the past.** It is deplorable but can hardly be totally avoided that grievances and traumas of the past will spill over into concrete policy areas without apparent justification from time to time. In these situations let us turn to Søren Kierkegaard's dictum: "It is quite true what philosophy says: that life must be understood backwards. But then one forgets the other principle: that it must be lived forwards" (Journals, IV A 164).

And let us also not forget that very often we draw misleading or one-sided lessons from history, lessons that fit our immediate purposes and preconceived notions. Currently, in the European debate, labels like "München" and "appeasement" are en vogue, whereas other parts of the historical experience – such as "Versailles" and "CSCE" are often forgotten. The ease with which these labels are applied is all the more remarkable since often it is not obvious that they fit the character and proportions of the phenomena we are dealing with today.

The Baltic Sea Region is a small player in the global economy. We can ill afford not to develop our area to its full potential. Let us not resign ourselves to low trust globalisation, as one of the alternatives in the Shell Global Scenarios was called, where an inordinate amount of energy is spent on lamenting about the past and putting obstacles in the way of each other.

Let us instead move forward to the Open Doors scenario of high trust and use its enormous capacity in order to reap the high rewards of bridge-building, reconciliation and cooperation in our region. In practical energy terms this means creating an integrated and competitive gas market. That would be an effective way to increase supply security and to reinvigorate the cooperation, trust and solidarity of all parties in the Baltic Sea Region. 





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# Latest Assessment Predicts Dramatic Warming in the Baltic Sea Region

*Anne Christine Brusendorff,  
HELCOM Executive Secretary, Finland*


Projections for future climate change in the Baltic Sea Region indicate that atmospheric temperatures will continue to rise during the course of the 21st century, according to a HELCOM assessment on climate change in the Baltic Sea Area.

The HELCOM assessment has been produced to serve as a background document to the ambitious Baltic Sea Action Plan to restore the health of the marine environment by 2021, which was adopted by HELCOM in November 2007. The report is based on the Assessment of Climate Change for

the Baltic Sea Basin Project (The BACC Project), which integrates the available knowledge of historical, current, and expected future climate change. The BACC Project is a joint venture of the BALTEX (Baltic Sea Experiment) Programme and HELCOM.

An average warming of the mean annual air temperature near the surface in the order of 3°C to 5°C is projected as for the whole region during this century. A warming of such magnitude would lead to a lengthening of the growing season by as much as 20 days to 50 days for northern areas, and 30 days to 90 days for southern areas, by the late 21st century. The mean surface temperature of the sea is projected to increase by between 2°C and 4°C. This would result in a marked decrease in the extent of sea ice by the end of the 21st century. The ice season would shorten by 1–2 months in the northern waters of the Baltic Sea, and by 2–3 months in its central parts.

In relation to the programmes of HELCOM, it is clear that climate change will affect the attainment of all the goals for the Baltic Sea Action Plan. The greatest effect would be on biodiversity, but clear effects could also be anticipated on eutrophication.

In relation to climate change, the HELCOM Baltic Sea Action Plan aims to limit or mitigate adverse impacts, as well as to enhance the resilience of the Baltic marine environment by improving its capacity to cope with the stresses generated by climate change. Therefore the plan focuses on: (1) reducing inputs of nutrients, heavy metals and persistent or hazardous organic pollutants; (2) reducing emissions from maritime transport and prevent ballast water releases; and (3) enhancing the protection of marine and coastal landscapes and habitats, and particularly the conservation of native Baltic species. 





International Scientific Congress on

# CLIMATE CHANGE

Global Risks, Challenges & Decisions

COPENHAGEN 2009, 10-12 March

**The main findings of this Congress will be included in the official material for the COP15**

"The Organisers of the UN Conference on Climate Change (COP15) to be held in Copenhagen at the end of 2009 have asked IARU to organise this Congress as part of the run-up to the COP15. The purpose of the Congress is to try and capture some of the enormous research energy currently being devoted to the elucidation, mitigation and adaption to climate change.

Thus, the focus of the Congress is on providing a picture of the "big issues" that the scientific community feels it is necessary that policy makers are aware of in order to make enlightened decisions with respect to the balancing of adaptation and mitigation in the societal response to climate change."

Prof. Katherine Richardson,  
Chair of The Scientific Steering Committee

## Confirmed Key Note Speaker:

**Dr. Rajendra K. Pachauri, Chairman of the IPCC**

## Confirmed Plenary Speakers:

**Prof. Thomas Homer Dixon, University of Toronto**

**Prof. Amanda Lynch, Monash University**

**Prof. Diana Liverman, Oxford University**

**Prof. Nebojsa Nakicenovic, The International Institute for Applied Systems Analysis (IIASA)**

**Prof. William D. Nordhaus, Yale University**

**Prof. Stefan Rahmstorf, Potsdam Institute for Climate Impact Research**

**Prof. John Schellnhuber, Potsdam Institute for Climate Impact Research**

### 10 March: Framing The Issues

*Opening Session: Global Warming: How to Solve an Intractable Problem?*

*Theme 1: Exploring the Risks: Understanding Climate Change*

*Theme 2: Sharing The Burdens and Opportunities: Equity Issues*

### 11 March: From Knowledge to Action

*Theme 3: Reducing the Risks of Climate Change: Opportunities for Mitigation*

*Theme 4: Preparing for Impacts: Adapting to the Inevitable*

### 12 March: From High-end Scenarios to Sustainable Solutions

*Theme 5: Managing the Planet*

*Theme 6: Mobilising the Populace: Human Dimensions of Climate Change*

*Closing Session: Synthesis and Summary*

Detailed programme, registration and submission of abstracts/posters are available at [www.climatecongress.ku.dk](http://www.climatecongress.ku.dk)



# The Climate Crisis Calls for a New

*By: Erik Rasmussen, Editor-in-Chief, founder and member of the Copenhagen Climate Council, Denmark*

In order to succeed in combating climate change, we have no choice but to view climate change as a tempting offer to go back to the drawing board and start thinking innovatively. When, 50 years from now, we look back at the start of the millennium and the looming climate crisis, it is to be hoped that we will have learned to love climate change. Because this was the wake-up call we needed, a call that kick-started the next industrial revolution.

It takes a whole range of innovations to deal with the problem of climate change and win the ongoing climate battle; innovations so numerous and so truly epic that they will change the way we live and the way our societies function. In reality, the innovation potential inherent in global warming is at least equivalent to that of two world wars. The greatest innovations are often born out of critical and stressful situations.

Thus far, the world has experienced four industrial revolutions. The first started around 1800 with the invention of the steam engine, the development of the first industries, and the advent of rail transport. The second industrial revolution arrived towards the beginning of the 20th century with the spread of electricity, the production line, automotive production, and the launch of the radio as a key news medium.

The end of World War II saw the beginning of the third industrial revolution, which was distinguished by the invention of new materials including plastic and nylon, the introduction of supply chains in the business community, the expansion of air transport, and the growing dominance of the TV-medium. At this time, important conditions for the creation of the global village were approaching fulfilment.

Around 1980, we embarked upon a new era in the history of the industrial society, an era which saw the world being bound even more tightly together

and the breakthrough of completely new technologies, in particular the explosive growth of information technology, the spread of the personal computer and the advent of the Internet. This period can be described as the fourth industrial revolution.

## **The Battle Against Climate Change May Trigger New Industrial Growth**

A common trait of all these revolutions is their contribution to the creation of modern civilisation. However, they have also created the greatest challenge and threat to that same civilisation. Climate change is currently the most serious side effect of more than 200 years of industrial development.





# Industrial Revolution

This is the message from the UN climate panels and the majority of the leading climate researchers and experts in the world. For this reason, a fifth revolution is now imperative, a revolution with the exclusive objective of making our civilisation sustainable at all levels.

The new revolution is shaped by strong driving forces:

**It is driven by time pressure.** We are already several years behind in our efforts to repair the damage. Some damage is already irreparable. That is why the revolution must, by necessity, have a relatively rapid effect.

**It is driven by innovation.** The time pressure per se makes high demands on innovation. It is not simply a question of coming up with completely different types of solutions. For example, developing new automotive and transport concepts, new, sustainable housing, office buildings, etc. demands close partnerships across the borders of segment boundaries and public and private sectors. Inter-sector knowledge sharing and collaboration will be required at a level never seen before. In addition, the solutions must be developed quickly. For this reason it is necessary to make the best possible use of all existing technologies as quickly as possible.

**It is planned.** The fifth industrial revolution will be the first in history to have been planned. The previous four have either taken the form of a reactive process in which the revolutions were the result of a range of random circumstances, or they were simply the expression of logical future-oriented development. It is only from a historical perspective that we view them as industrial revolutions. The market is a key driver of development, but it cannot shoulder the burden alone. Therefore, a wide range of players need to work together to achieve a common goal. This demands co-ordination and planning.

**It is global and total.** The climate revolution will only succeed if, from the very start, it involves all major nations in the world and includes all groups

of society – be they politicians, business leaders, scientists or general climate consumers: the general populations.

**It is value-driven.** The previous industrial revolutions have been forged by new technologies. This one is driven by values, that is, by the objec-

**This time, we are obliged to plan the revolution extremely carefully. Not only because this is essential, but also because it is the only way for us to ensure optimal impact within a short period.**

tive of ensuring the greatest possible security and life quality for present and future generations. Our generation has a dual responsibility: to clean up after itself and to accept the challenge of creating a platform for new progress. If climate change sparks a new industrial revolution, it will create a societal and economic win-win situation with remarkably far-ranging perspectives. In the best-case scenario, the benefits can be measured in three dimensions:

**Creation of new industrial development and economic growth.** In the long term, solving climate problems will prove to be a benefit rather than a cost. Naturally, a range of investments will have to be made, but a common trait of all previous revolutions is that they have generated new welfare. This will also hold true of the climate revolution.

**Reduction of the risk of a protracted economic recession.** A global investment boom in climate solutions and the associated economic growth may prove to be an efficient counter-measure against the threat of long-term recession in the global economy. There are precedents for industrial revolutions pulling the world out of deep economic crises – in the aftermath of World War II, for example.

**Narrowing of the gap between rich and poor nations.** No efficient climate solutions will be possible without the active participation of the developing countries, which are both part of the problem and part of the solution.

For these reasons, the fifth industrial revolution provides an excellent opportunity to reduce the social and economic gulfs between rich and poor nations.

## **Beneficial for Both Society and the Economy.**

Naturally, all this will certainly not occur of its own accord. It is conditional upon politicians, business leaders and the world of science recognising the growth potential inherent in the climate crisis, and making proactive use of it, that is, carefully planning the fifth industrial revolution.

The Copenhagen Climate Council represents an ambitious plan for kick-starting this essential revolution. The immediate occasion is the UN climate meeting in Copenhagen in December next year. At this summit, global heads of state will attempt to reach agreement on how the world is to combat climate change in the immediate future by setting clear targets for the reduction of CO<sub>2</sub> emissions. An international agreement in Copenhagen would lay down the necessary political framework for the industrial “climate leap”, and ensure from the start that the revolution can be both global and total.

The Copenhagen Climate Council has set itself the task of mobilising the international business community to join forces with the scientific community, to document which solutions the business community has the capacity to deliver, and to propose a form that the climate agreement could take if it is to stimulate companies to commit to the necessary investments.

Five hundred of the leading global companies are to take the lead in this initiative. Within the coming months, the Copenhagen Climate Council will identify the international climate pioneers and gather them together in a single forum – a forum which is to demonstrate innovative solutions to climate issues, both internally and towards the outside world. The criteria for membership of Climate 500 are currently being finalised, but they are sure to include the development of new business models, clean tech products and climate-friendly work processes; that is, the individual companies’ capacity to reduce CO<sub>2</sub> emissions themselves.


## **A Working Laboratory**

The first 20 or so members have already been inducted, namely the members and partners of the Copenhagen Climate Council. In other words, Climate 500 is to function as a working laboratory in the area of climate solutions, and will be linked together through an international Web-platform set up to facilitate the exchange of ideas and experience. In addition to leading the way and highlighting opportunities in the field of climate solutions, the project has two overriding purposes:

Firstly, to challenge politicians – primarily at the UN climate summit in Copenhagen in 2009 – to innovate legislation as well. If companies are to succeed in their climate revolution, they will need active backing from politicians. The work within Climate 500 will therefore also produce concrete input for the hosts of the UN summit, the Danish Government.

Secondly, to hammer home the message that combating climate change is not about increasing costs, but increasing earnings. Understanding this aspect may prove to be crucial in securing broad backing for a global climate campaign, particularly in the light of the looming crisis in the global economy.

## **Global Communication**

This initiative is part of an international communication strategy. To combat climate change we need more than technology and political frameworks – we need the ability to communicate properly. If we want to succeed we must acknowledge that we have to involve the public society and communicate to them what it means if they make slight changes in their behaviour. These changes will only happen if people can see the advantages of changing their behaviour. They must be aware that this is not a question of a change for the worse – but a change for the better. All industrial revolutions are about developing new movements in our society and create changes for the better. It is one of those movements that the Copenhagen Climate Council will try to kick start. The new industrial revolution has begun. 

This article is an edited version of an article published in the Danish journal weekly Monday Morning on 31 March 2008.



# THE POTENTIAL OF BIOINNOVATION: DECOUPLING RESOURCE CONSUMPTION FROM ECONOMIC GROWTH: MAKE MORE WITH LESS

History has shown that economical growth always has an environmental impact: The more we produce and spend, the more we exploit our planet. A new approach is called for if we are to continue to prosper. Around the globe, forward-looking companies have discovered the unique potential of bioinnovation. From effective cold-water detergents to tomorrow's sustainable biofuels, their bioinnovation-driven solutions help minimize our environmental footprint. These companies challenge traditional thinking with feasible solutions that can reduce the steepening curve of resource consumption. It's all about making more with less.

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# How to Resolve Market Failures – A Sustainable Energy Mix Needs to be Clean,

*By: Prof. Dr. Claudia Kemfert, Humboldt University Berlin,  
Deutsches Institut für Wirtschaftsforschung, Germany*

Today's society faces, as no generation before it, two main energy related threats: first, to guarantee secure and affordable energy supply and second, to reduce and abolish environmental and climate harms caused by energy consumption. Over 80 per cent of today's primary energy consumption is coming from non-renewable fossil fuels, as coal, oil and gas. If we do not change our behaviour, our future share of fossil fuel resources will remain as high as it is today.

When major oil and gas reserves are located in only a few areas of the world, importing countries become vulnerable to supply disruptions and energy price shocks. Increasing energy prices especially for oil and gas and recent geopolitical events remind us of the essential role affordable energy plays in economic growth and human development, and of the vulnerability of the global energy system to supply disruptions.

Today, the major share of primary energy demand comes from fossil fuels; oil, gas and coal. The main suppliers of oil are the OPEC region, Russia and the USA. If the oil demand continues to grow as fast as in the last decades, the demand for oil will

**The current pattern of energy supply carries the threat of severe and irreversible environmental damage – including changes in the global climate.**

be higher than the supply 15 years from now (depletion point). The oil price would also rise with increasing demand, and other oil reserves as oil shale or tar sands would be financially attractive to exploit further. Yet, oil

still remains the most scarce fossil resource on earth, followed by gas. The world's largest gas reserves are in Russia, followed by Qatar and Iran. The supply of coal is more widely spread in many countries of the world, the coal reserves will last over 200 years.

Energy forecasts demonstrate that the share of fossil fuel supply will remain high if no policy to

reach a sustainable energy future is formulated. The enormous economic and fuel consumption growth in developing countries, especially China followed by India, is leading to higher energy supply scarcity and energy prices, but also to higher CO<sub>2</sub> emissions. If no sustainable policy is adopted, global energy-related carbon-dioxide (CO<sub>2</sub>) emissions will increase by 55% between 2004 and 2030, with developing countries accounting for over three-quarters of the increase in global CO<sub>2</sub> emissions.

## Inherent Threat of Irreversible Damage

Reconciling the goals of energy security and environmental protection requires strong and coordinated government action and public support. As a consequence, the decoupling of energy use and economic growth, a diversification of energy supply and the mitigation of climate change causing emissions is more urgent than ever. A future energy system cannot rely on one energy source only, but must be as broad as possible. Energy security means also that energy imports are reduced and diversified from many different supply countries, and that domestic energy sources should be making a major contribution. A sustainable energy future must be CO<sub>2</sub> free, environmental friendly and secure – technology is the key to solve market failures.

## A Sustainable Eenergy Future

Many domestic energy sources are not sustainable as coal emits climate harming carbon- dioxide emissions, and nuclear energy cause high environmental risks. Conventional nuclear energy can therefore only be a technology that bridges the gap between fossil fuel and carbon free technology. Three main pillars contribute to a sustainable energy future:

1. Energy efficiency. Economic growth and energy consumption growth needs to be decoupled. Many developed nations as Europe and Japan have been




# Clever and Competitive



quite successful in this, others can improve (for example. USA) or need to start soon (for example. China and India). Global energy consumption and emissions can be reduced by 24 per cent by 2050 primarily by energy efficiency measures.

2. Increasing the share of renewable energy for electricity production, as alternative fuel and for heating. For electricity production, renewable energy can increase from five to 16 per cent globally; the share of biofuels can also be increased drastically: up to ten per cent globally (IEA (2006)).
3. Carbon Capture and Sequestration: coal power plants can be made more environmental friendly ("CO<sub>2</sub> low power plant") by capturing and storing the CO<sub>2</sub> emissions. However, both environmental and financial risks are not sufficiently explored yet. If the technology becomes available in the future, production costs may double (IPCC (2005), IEA (2005)).

The main aim is to make future energy systems sustainable by, on the one hand, increasing energy efficiency and, on the other hand, establishing innovative, carbon free and environmental friendly technologies. In 100 years, the share of renewable energy can increase up to 80 per cent. In the meantime, carbon capture and storage technology can play a dominant role. 

## References

- International Energy Agency (IEA) (2007): The World Energy Outlook 2007, Paris 2007.
- IPCC (2005): Intergovernmental Panel on Climate Change: Special Report on Carbon Dioxide Capture and Storage, Cambridge University Press 2005.
- Kemfert, C (2008): The Dream and the Reality: Germany as Pioneer of Climate Protection. In: European Energy Review (2008), January / February, S. 38–41
- Kemfert, C. (2007): The European Electricity and climate policy: Complement or substitute? In: Environment and Planning / C 25 (2007), 1, S. 115–130

# The University of Copenhagen takes

*By: Professor Katherine Richardson,  
Vice Dean at the Faculty of Science, University of Copenhagen,  
and Professor of Biological Oceanography, Denmark*

University of Copenhagen focuses on groundbreaking research that covers a broad spectrum of topics ranging from actually describing the natural processes leading to climate change to how ecosystems and human societies cope with climate change. The research also covers how agricultural production systems can be expected to respond to climate change, renewable energy forms, and legal and governing issues and potential health and security threats related to climate change.



As Denmark's largest research institution<sup>1</sup> it should come as no surprise that many of the individual researchers employed at the University's different faculties and institutes focus their energies on trying to answer questions that relate to climate change. This groundbreaking research covers a broad spectrum of topics ranging from actually describing the natural processes leading to climate change over how ecosystems and human societies cope

with climate change, to how agricultural production systems can be expected to respond to climate change, renewable energy forms, legal and governing issues and potential health and security threats related to climate change ([www.climate.ku.dk](http://www.climate.ku.dk)). In addition, researchers from the University are active in international committees and networks relating to climate change, including the UN International Panel on Climate Change (IPCC) – the group that shared the 2007 Nobel Peace Prize with Al Gore. Traditionally, most universities – including Copenhagen – would probably be content just knowing that internationally recognised research was being carried out in the various departments of the university but, with respect to climate change, the top management of the University of Copenhagen has established a number of initiatives that focus on bringing together, coordinating and communicating the University's climate-change related activities.

## Why Focus on Climate Change?

The fact that human activities actually appear to be capable of altering the natural climate development has only recently been recognised and would not have been so without the efforts of the international scientific community which, of course, includes scientists not just from the University of Copenhagen but also many other universities from Scandinavia and around the world. Just as it was not possible to identify the existence of climate change without research, it will not be possible to meet the challenges of climate change without a better knowledge base – and new knowledge comes from research. Thus, universities have a unique responsibility in terms of keeping policy makers and the general public informed about the growing knowledge base relating to climate and climate change.

<sup>1</sup> with approximately 37,000 students, 1,800 Ph.d. students and 7,500 employees

<sup>2</sup> Australian National University, ETH Zurich, National University of Singapore, Peking University, University of California – Berkeley, University of Cambridge, University of Copenhagen, University of Oxford, University of Tokyo, and Yale University. Read more about the IARU-Alliance here [www.iaruni.org](http://www.iaruni.org).

# on Climate Change

## Communicating to Policy Makers

Researchers from the University of Copenhagen are communicating to policy makers on a wide range of climate change issues. One example is researchers from the Niels Bohr Institute at the University of Copenhagen who are well-known all over the world for their efforts to describe past climate by removing and retrieving information from ice cores taken from the ice cap covering Greenland. Polar regions, such as Greenland, are predicted to be the most heavily impacted by climate change. The base camp where an ice core is currently being drilled in the Greenland ice cap has become a popular site for politicians from various nations who are interested in learning more about climate processes, in general, and the situation in Greenland in particular.

It is these politicians and their colleagues who, ultimately, are responsible for negotiating an international agreement concerning the reduction of greenhouse gas emissions at the UN Conference on Climate Change (COP15) in Copenhagen in 2009. Researchers from the University of Copenhagen are helping to give politicians the best possible knowledge base upon which to base their input to COP15. That the work Professor Dorthe Dahl-Jensen and her team from the Niels Bohr Institute does is important, is also demonstrated by the two prestigious awards they have received this year. The two awards are the European Descartes prize and the Vega medal from the Swedish Society of Anthropology and Geography. The University of Copenhagen, as part of the International Alliance of Research Universities (IARU)<sup>2</sup>, has also been tasked by the organisers of the COP15 to arrange an international scientific congress on climate change from 10-12 March 2009 ([www.climatecongress.ku.dk](http://www.climatecongress.ku.dk)). The purpose of the Congress is to synthesise the newest research results relating to climate change, including how to mitigate its effects and in what ways society will have to adapt in response to a changing climate. Thousands of the world's top experts on issues relating to climate change, including the Chairman

of the IPCC, Dr. Rajendra K. Pachauri, will gather in Copenhagen for the Congress. All findings will be compiled in a book on climate change, and an executive summary will, after agreement with the Danish Government, be handed over to policy makers at the COP15 in Copenhagen at the end of 2009.

**The societal challenge of dealing with climate change is enormous.**

## Communicating to the Public

The University of Copenhagen has initiated a series of public Climate Lectures (see [www.climate.ku.dk](http://www.climate.ku.dk) for information on coming lectures) where important actors on the climate stage take the floor. In addition to giving a lecture, the speakers take questions from the audience. Some of the lectures are held by world renowned scientists, others by policy makers or other societal leaders. Speakers to date have included the Danish Prime Minister, the President of Yale University, USA, and the President of the European Parliament and the Executive Director of Shell. Coming speakers include an IPCC vice-chair, international researchers, and CEOs of large companies. Another public climate debate was recently held at the University in connection with an annual event called "Research Day", the purpose of which is to arouse public interest in and enhance public understanding of the methods, processes, and outcome of research. The University of Copenhagen, naturally, participates in the annual event. This year, six scientists gave short presentations of their research area and answered questions from an engaged audience. The debate can be seen at [www.virtuel.ku.dk](http://www.virtuel.ku.dk). The University has also hosted various groups, including both secondary school teachers for a "climate day" and school children for different types of climate related activities. In addition, the University is working together with a network of secondary schools to help make teaching materials about climate change available to these schools. Last but not least, →



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it will soon be possible via a WEB portal to ask questions about climate change directly to researchers at the University.

## Green Campus

The University of Copenhagen is not, however, just talking about what others should do about climate change. It has also established a number of “green campus” initiatives that are designed to reduce the University’s own CO<sub>2</sub> emissions. The flagship of these initiatives is called Green Lighthouse. Buildings are some of the largest CO<sub>2</sub> emitters and the University is, therefore, building a whole new house - Green Lighthouse – which is climate friendly. In this manner, the University takes the lead and shows that it is possible to have a climate friendly building, which at the same time is both a modern

and comfortable working environment for students and staff.

## After the Copenhagen Climate Change Conference in 2009

All climate interested eyes are and will be on Copenhagen until after the 2009 UN Climate Conference and, inevitably, many of the climate-related activities happening these days at the University of Copenhagen also have a focus on COP15. However, the University expects to continue reaping benefits from the investments being made in establishing both internal and external networks relating to climate issues and, not least of which, the initiation of a process leading to a green campus well into the future. Climate change and the challenges we face in coping with this change will not disappear in 2009. 

# Kalmar County – How to Become a Fossil Fuel Free Region by 2030


*By: Erik Ciardi, Project Manager  
The Regional Council in Kalmar County, Sweden*

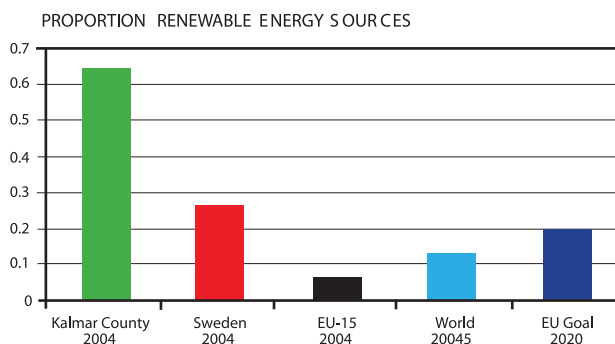
In Sweden, Kalmar County intends to become a pioneer in the work to reduce the negative impact on the climate caused by emissions while simultaneously achieving sustainable growth.

By 2030, Kalmar County intends to become a fossil fuel free region. We have assembled various interested parties – private and academic sector as well as different political bodies from within the county to

participate in this work. In 2004, 65 % of the energy consumed by Kalmar County came from renewable energy sources. Activities are already performed and underway within many different areas, as part of ongoing operations as well as project work. A climate commission with representatives from business and public sector has set up 17 challenges for various parties within Kalmar County.

Many concrete activities have been undertaken, some examples:

- Joint tender for the procurement of eco-cars in all local municipalities in the region.
- Increased electricity production from renewable energy sources such as wind power and biomass.
- Use of zero emission/plug-in vehicles in municipal service.
- The regional public bus transport uses more than 50 % of the renewable energy fuels.
- 83 % of the public district heating comes from renewable energy sources. 



In 2004, 65% of energy consumption for Kalmar County was from renewable energy sources. During the same period, the proportion of energy consumption from renewable energy sources in the EU was approximately 6%. For the rest of the world, it was 13%. The EU goal for 2020 is to have 20% of energy consumption from renewable energy sources – an interesting comparison to the 65% already achieved by Kalmar County in 2004.

Source: Energy Balance 2004 Kalmar County, Energy Agency of Southeast Sweden

The work is led by the Regional Council in Kalmar County, more information on [www.kalmar.regionforbund.se](http://www.kalmar.regionforbund.se).

# The Challenge of Turning Advanced Cutting-Edge Technology into Commercial Products

By: Mats Eliasson, CEO, Watreco AB  
– Water Treatment Corporation, Sweden

Watreco, Water Treatment Corporation, was established 2004 in Malmö by five private founders. It develops, sells and implements energy efficient and sustainable water treatment solutions, based on the self-developed and patented Vortex Generator. If the conditions are right, the solutions can be implemented based on solar- and wind driven pumps.



Working in harmony with nature, the Vortex Process Technology functions by a continuous process cleaning water by setting water in a powerful three dimensional and rotational movement that works with pressure and counter-pressure, which affects and changes the inner characteristics of water, all the way down to molecular and atomic level. The same effect is used in its offspring REALice-system

that saves energy and increases ice quality for ice rinks. These effects can, in return, be used and applied in different areas such as aeration, mixing, degassing and separation. The spectra of application areas for this technology are extensive.

## Energy Efficient Aeration

Currently Watreco are focusing on energy efficient aeration in ponds – municipal, private gardens and golf courses – but sees the big potential in solutions for fish breeding and waste water treatment, where aeration is directly linked to production output.

Initial tests and rough calculations show that energy consumption can be lowered by a factor of four in

a waste water treatment plant. More tests are under way, and Watreco are also looking for cooperation with established players in the waste-water treatment sector both on the supplier and the customer side.

## De-gasing

In parallel, de-gasing shows big potential within irrigation. The lowered viscosity effect that it accomplishes enables water to better penetrate the soil and increase water uptake in plants leading to “more crop for every drop”. As said, the same effect is used in the offspring system that saves energy and increases ice quality for ice rinks. An energy efficient ice rink can, on average, save energy equivalent to 52 tons of CO<sub>2</sub> per year which is equal to CO<sub>2</sub>-emissions from 34 medium size cars. After several years of testing and development, the REALice system now makes its entrance on the global market with installations in Europe, North America and Australia. This will create the initial revenue flow and a base for putting in more development efforts into other application areas where the potential is even bigger.

## New Innovative Desalination Technology

Based on the separation effects in the Vortex Process Technology, Watreco aims to move into desalination making usable water out of sea water. Initial test show very interesting results but more resources and financing along with cooperation with Universities, field experts and other R&D supporting organization like Vinnova, are needed in order to move forward.

## Accelerating Development and Time-to-Market through Cooperation and Support


Since the start Watreco has worked closely with the City of Malmö and their representatives in several



# Water Treatment

test projects that quickly have generated valuable feedback on how the technology and systems have performed in real full-scale operational situations. This strategy has proven very successful in accelerating the time-to-market process. Being located at MINC – Malmö Incubator ([www.minc.se](http://www.minc.se)), a start-up support facility, has also given us valuable business coaching and support.

Since March 2008, Watreco has been one of the companies in Project HEIDI – Hands-On Environmental & Industrial Development Initiative ([www.projectheidi.eu](http://www.projectheidi.eu)) – an EU-Financed trial project where small companies are given access to industrial facilities at Malmö University for development, testing and prototyping. The City of Malmö and Sustainable Business Hub (a regional network for cleantech related companies) is also supporting partners in the project.

Other valuable support has come through the membership in Sweden Cleantech Incubators ([www.scti.se](http://www.scti.se)), a virtual incubator focusing on supporting cleantech companies. The screening process that each company has to pass, from a sustainable and cleantech definition perspective as well as a business perspective, gives good credit and feedback to the company. 



Kuva: Kalle Pruudenin veistoksen pystytys Kitiörun taidepolulle / Peeter Laurits / Focus.ee

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# Oslo Renewable Energy and

*By: Jan Carsten Gjerløw,, Deputy Director OREEC,  
Norway*

Although the Norwegian oil and natural gas industry has a strong international position and at present dominates the picture, Norway has a strong tradition within renewable energy. A century ago, waterfalls were utilised for hydropower. Over the last few years, Norway has turned into a major supplier of solar cells for the world market, and the ambitions are strong in the fields of Carbon Capture and Storage.

A large number of the Norwegian companies, research institutions and universities that are prominent within renewable energy are located in the greater Oslo region. However, the degree of cooperation between them has so far been limited. Therefore, Lillestrøm Centre of Expertise (LCE) is organising cooperation between research institutions, educational institutions, companies and municipalities in parts of the Oslo region involved with renewable energy and the environment. In 2005, LCE thus invited all regional parties concerned with renewable energy to join in a cluster initiative. The initiative was coordinated with other initiatives from Oslo Teknopol and Innovation Norway and resulted in the establishment of Oslo Renewable Energy and Environment Cluster (OREEC) – one of five clusters in the Oslo region.

OREEC's main mission is to increase the commercial opportunities for the companies. From the very beginning, it was clear that one of the most important

things to do was to focus on the possibilities and challenges between the different target areas of the cluster. There was some discussion in the board about how to reach this goal most effectively. For example, OREEC could have chosen to narrow its scope and prioritise harder among both the themes and range of its activities. The participants, however, have emphasised the value of a cross-sectoral approach.

– Meetings with several companies and trade organisations, together with a broad survey among companies in the field of renewable energy in the region, told us that our initiative was needed and welcomed, states senior adviser at the Institute for Energy Technology and chairman of the board of OREEC, Mr. Arne Råheim.

## Recruitment for Future Needs

Education and competence are emphasised by all companies as one of the most important areas of cooperation in OREEC. They are already struggling to meet their needs for personnel with adequate competence. This will be a major challenge for the Norwegian industry in the years to come. Far too few choose to pursue an education in science and technology, while the number of companies in the field is growing. OREEC has invited the universities (3) and university colleges (8) in the greater Oslo region to join forces in strengthening cooperation and linkages between industry and universities. The aim is to promote career-focused studies within the fields of renewable energy and environment to the youth of the region and to coordinate and improve related educational programs in the larger Oslo region. This cooperation should result in improved relevance of the academic training offered for the industry, and, as a result, enhance its competitiveness.

Professor Trine Hvoslef-Eide at the Norwegian University of Life Sciences (UMB) leads the Educational Forum of OREEC. She is enthusiastic about the initiative:

– To be honest, the universities and university





# Environment Center

colleges have not been very active in cooperating with each other. Thus, we were a bit anxious as to how the different institutions would respond to the suggestion of an Educational Forum. I believe that by working together we will be able to offer the students more relevant studies that will ensure them interesting jobs after graduation.

## The Importance of an Interdisciplinary Approach

*Lindum Recycling* cooperates with other companies within recycling and waste management both on a national and an international level. For Lindum, the cross-sectoral approach is the main reason for their engagement in OREEC.

– We know all the companies within our own sector, and there are collaborative organisations for this industry. The reason why Lindum has chosen to participate in OREEC is the possibility of interesting cross-sectoral commercial projects, says Bjørn Øivind Østlie, Deputy Managing Director at Lindum Recycling, and a member of the board of OREEC.

Lindum Recycling is not unique in their multi-disciplinary interest. For OREEC it is important to stimulate the companies' abilities and interests to exploit these possibilities, which may give a basis for innovation and growth. One of the most important tasks for OREEC is to arrange meeting places, conferences and seminars, where cross-sectoral issues may be promoted and discussed, and where companies can find interesting partners.

## Public Support – a Matter of Necessity

OREEC also aims to contribute to solve some of the challenges society faces in the areas of renewable energy and environment. The introduction of renewable energy sources, energy efficient housing solutions and emission-reducing technologies is very dependent on framework conditions and public policy. Fees

OREEC (Oslo Renewable Energy and Environment Cluster) was established early in 2007, and is the result of a strategic endeavour undertaken by Lillestrøm Centre of Expertise (LCE), Innovation Norway and the counties of Oslo and Akershus to develop cluster initiatives in the Oslo Region. The secretariat of OREEC is located at LCE, and the initiative is financed through a private-public partnership. OREEC is facilitating cooperation between industry, research, education and public authorities, and the aim is to increase the commercial opportunities for companies. The cluster comprises most of the counties of Oslo, Akershus, Hedemark, Oppland, Buskerud, Telemark, Vestfold and Østfold, which represent about half of the Norwegian population.

OREEC is focussing on these thematic areas:

- renewables – sun, wind, water, and hydrogen as energy carrier
- climate technology, emissions, Carbon Capture and Storage (CSS)
- waste management and recycling
- energy efficiency and energy systems analyses
- bio-energy, stationary and in the transport sector
- an interdisciplinary approach is important for OREEC. The work is focussed on areas such as;
  - competence and education
  - research and development
  - international cooperation
  - national and international profiling
  - contact with political authorities
  - conferences and networking
  - initiating industrial projects

associated with pollution and/or supportive grants for application of environmentally friendly solutions or introduction of new technology are needed. In the field of energy efficient housing, OREEC has

arranged meetings for municipalities and county administrations focusing on the need for official requirements and standards.

– I believe it is a matter of necessity that the public sector be strongly engaged in the development of a cluster such as OREEC”, says Arne Råheim. Both financial support and the necessary framework conditions to promote the use of renewable energy and environmental friendly solutions are needed.

## Stimulating Research, Development and Innovation

Surveys show that the companies within the Oslo Region want to put more effort into research and development. The degree of commercialisations is presently too low.. It is also important to have necessary seed money and venture capital available for new business cases. OREEC has initiated cooperation collaboration between five commercialisation companies of the region. The goal of these companies is to promote innovation and help bringing in good ideas, often from research institutions, through R&D to create prospering enterprises.

– First of all, OREEC has brought these five companies together for closer cooperation, says Vidar Sannerhaugen, managing director of Campus Kjeller AS (CK).

CK is located in Lillestrøm, working in the fields of Energy, Environmental Technologies and Societal Safety and in close cooperation with the research institutes in the region.

**Constantly aiming at getting better, OREEC already has support from public actors at different levels, and this has been crucial and will be even more crucial for further development of the cluster.**

– We have learned that we are working on slightly different thematic areas and are using different methods. Some of the companies are more oriented towards research, some towards the industry. The biggest gain from this cooperations should be increased access to interesting ideas within the area of renewable energy and environment. By utilising the strength and mutual support of the different commercialisation companies, , we will surely be able to help more creative persons reach their ambition to create new products, services and companies. We also

have close cooperation with venture companies and investors, and I believe that a more focussed approach within these thematic areas will be welcomed also by these parties. We are thus very enthusiastic about the cooperation with OREEC, says Mr. Sannerhaugen.

## International Cooperation


A cluster initiative on the regional level focuses primarily on strengthening linkages within the region. However, as many of the participants are national and international leaders in their field, there is also an emphasis on looking for strategic partners for individual participants and groups of companies. OREEC also aims to support the international activities of the companies in the region. Therefore, the cluster is active in international cooperation.

– We see that there are several possibilities for international cooperation for OREEC, and we want to utilise these possibilities, both for individual companies and for the cluster itself”, says Mr. Arne Råheim.

## The Way Ahead

In 2007, the focus of OREEC turned from strategy work and plans to implementing concrete project activities. For OREEC there are several challenges ahead. How to organise the cluster and how to finance the activities are important questions. During the first two years, OREEC has been organised as a project, but the model of organisation is subject to discussions within the board.

What then about exploiting the cooperation within the Baltic Se Region? Does Mr. Råheim see the possibilities for a “Baltic Renewable Energy Cluster”?

– Sure! It is just a question about how this should be implemented. Together, the clusters of the Baltic Sea Region would form a very powerful “Mega Cluster”. I think such cooperation would be of great interest, and it could be of great importance for the whole region. The ability to increase the use of renewable energy sources, and decrease the CO2-emissions would strongly contribute to a sustainable development for the whole region. However, this would also make the companies and research institutes of the region better equipped to compete on the international arena, where we know there will be a huge demand for technology and services, concludes Mr. Råheim. 

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## **Baltic Development Forum 10<sup>th</sup> Anniversary**

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