There is a long-standing commitment in Denmark to move towards a green economy by focusing on renewable energy, energy efficiency and environmental protection. This has led to remarkable results in the Danish energy system and the consequent emergence of a world-leading energy industry.

Today, the whole of Europe is moving towards a green economy – following the Danish path. Europe is the biggest market for the export of Danish energy solutions, representing over 60% of Danish exports of energy technology. Europe's green transition presents major opportunities for export growth in the Danish energy industry.

The EU is also the source of most regulation governing the Danish energy sector, which naturally has a keen interest in making sure that energy is planned and regulated throughout Europe in harmony with Danish needs and practices. And vice versa – that Danish energy regulation harmonises with wider European principles and rules.

We are moving towards a common European energy market. Energy and energy technology are increasingly being exchanged between countries across Europe. Research and development take place across countries. More and more companies see the EU, rather than one member state, as their home market.

At present, EU energy policy is guided by targets for 2020. In March 2013, the EU Commission launched a Green Paper entitled “A 2030 framework for climate and energy policies”. The Danish Energy Industry Federation warmly welcomes this paper. We need long-term clarity for the energy sector in order to plan and contribute optimally to realizing the vast potential in the green transition.

In this booklet, we engage in the debate. We believe that the green transition of the European economy is necessary and desirable. For this transition to take place in a balanced way and add to Europe’s competitiveness, it must be designed in accordance with the needs of the energy industry, the overall business community and society at large.

Hans Peter Slente
Director, DI Energy
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DI ENERGY
RECOMMENDATIONS
An ambitious energy and climate policy that ensures security of energy supply and competitiveness is a prerequisite for maintaining the momentum in the green transition of Europe.

Jørgen Mads Clausen
Chairman of the Board, DI Energy

To prepare the energy industry for the market opportunities on the short term and beyond 2020 DI Energy recommends that the EU and its member states take the following actions:

1. **Coherent policy goals**
   Ensure better policy coherence in order to realize a market where sustainability and competitiveness work together.

2. **ETS as the central tool for 2030**
   Ensure long-term policies aimed at 2030 with a well-functioning EU Emissions Trading System (ETS) as the central tool.

3. **Realise goals for 2020**
   Realise the full potential of EU targets for renewable energy and energy efficiency in the short term, and in the long term ensure that targets concerning specific technologies or countries should work in harmony with the ETS.

4. **Common energy market**
   Create a common European energy market through a pan-European approach and more uniform regulation.

5. **Common energy infrastructure**
   Strengthen the common European energy infrastructure.

6. **Ambitious Research and Innovation Agenda**
   Create an ambitious European approach to research and development in the green economy. Make research initiatives flexible and open to business participation.

7. **Harmonisation**
   Ensure stronger harmonization and remove trade barriers within EU for green products and services. Ensure free and rules-based trade with third countries in the green economy.

8. **End stop-go-practice**
   Energy policy, including policies related to planning, support schemes, research and development funding should be transparent and characterized by predictability and long time horizons.
REAFFIRMING THE CORE PRINCIPLES OF EU ENERGY POLICY

The current EU energy policy is centered on competitiveness, security of supply and sustainability, each of equal importance. Too often, the three principles are treated in an unbalanced way due to incoherent policies.

The three objectives are not opposites: An intelligent approach to sustainability will increase the competitiveness of Europe’s industrial base. A coordinated and flexible policy regarding security of supply will reduce the costs of modernizing the energy system and thus also improve the effectiveness of the energy system.
**Sustainability**

It must be ensured that production of renewable energy, especially bioenergy, does not have negative impact on the environment. Therefore, sustainability criteria for liquid and gaseous biofuels have been formulated, setting out minimum standards for greenhouse gas reductions and defining so-called “nogo areas” in order to protect biodiversity and soil carbon stocks.

Sustainability criteria are necessary in order to ensure security of supply for bioenergy investors, and necessary for the credibility of EU climate and energy policies. It is therefore important that sustainability policies are stable, predictable and based on solid scientific evidence.

**Security of Supply**

Security of supply is essential for an efficient economy. It entails both the availability of energy and the question of energy costs. Security of supply has generally been high in Europe, but the increased use of renewable energy sources, like solar and wind power, risk causing internal bottlenecks and increased demand for balancing power.

A developed European infrastructure, in combination with a well-functioning internal energy market, flexible consumption and energy storage ought to enhance Europe’s security of energy supply in the future. New interconnectors are necessary to reach the required infrastructure, and a number of existing grids need to be strengthened. Energy must be able to flow freely across national borders to maintain a high level of security of supply.

**Competitiveness**

Well-functioning energy markets with a high degree of competition will assure real market prices and add to the security of supply. Competitive energy markets can only be reached through a fully integrated European market and a strengthened energy infrastructure.

Smaller regional energy markets, such as the North Pool Spot, have already proven the value of well-functioning markets in regard to competition. The European gas and electricity markets are still separated into several markets. Integration is necessary to achieve an energy market where prices are the result of supply and demand.
LOGSTOR: A level playing field for all technologies

LOGSTOR invented the pre-insulated pipe system more than 50 years ago and is today the world’s largest and also technologically leading supplier. Today the systems ensure an efficient and reliable transmission and distribution of district energy with low service life costs. The latter enables a reduction of energy consumption and thereby CO₂ emissions.
Europe is already a core area for district energy and for LOGSTOR, but has a huge potential for further growth. The EU energy efficiency directive sets the scene for the EU countries regarding increasing energy efficiency among others by increasing the use of district energy. It is however up to each member state to implement a suitable regulatory approach to energy efficiency.

Implementation of district energy in connection with power production (combined heat and power) can increase energy efficiency of the plant from less than 40% with power stand alone production to more than 90% with combined production of power and heat. Therefore district energy must be taken into account in the local energy plans of European cities. A good example of a targeted regulatory approach is the decision of the German government to double the use of district heating in connection with power production from 12% in 2009 to 25% by 2020.

Competition in the market for heating and cooling comes from big players as natural gas companies, power producers and oil companies. Initial total investments for supplying heating and cooling from i.e. individual gas or oil boilers are lower, but the overall energy efficiency in using fossil fuels or power for individual heating and cooling is very low. The lack of long term targets and long term commitment from policy makers who are often also the investors in district energy is a disadvantage for the proliferation of district energy.

In order to improve the market opportunities of District Energy, we need full implementation of the directive on energy efficiency in all member states, which would extend the use of combined heat and power as well as the future usage of the district energy concept to store energy from renewable energy production (the smart grid concept). In addition, we need to create a more level playing field with regard to support for other energy sources – be it fossil or renewable, making district energy and other energy technologies able to compete on equal footing with national champions.

Claus Brun
EVP Sales & Marketing
LOGSTOR

About district energy: District energy is a generic term for district heating and cooling. District energy is mainly based on using the waste heat from power production to produce hot or cold water for heating or cooling purposes.

The water is distributed to all kinds of premises in a local area and heats or cools the indoor facilities improving quality of life for people. The smart grid concept can be extended to include district energy as district energy makes it possible to store energy from other sources – ex. power from windmills or solar panels – when the production of power from these sources exceeds the demand. This will be a requisite as the future power production will shift more from conventional power plants to renewable sources.
Germany’s Energiewende, the British government’s Heat Strategy and Denmark’s Energy Agreement are all examples of new market opportunities for Europe’s energy industries. They are the products of internal negotiations in cabinets and parliaments. While the overarching purpose is to drive the transition towards a green economy, such plans also reflect national industrial priorities.

While these plans constitute a national element in the European energy and climate policy, they remain important drivers for the creation of market opportunities for both local and foreign suppliers.

The end result is exciting new market opportunities across Europe on the one hand – and a patchwork of national policies and markets on the other.
EU IS THE MOST IMPORTANT ENERGY MARKET TO ITS MEMBER STATES

The biggest market for European producers of energy technology is the internal EU market. Non-EU markets have however become increasingly important and the difference between EU and non-EU markets has narrowed. Today 44% of energy technology is exported to non-EU markets compared to 39% in 2007.

EU-15 exports to both EU and non-EU markets consist mainly of “other energy technology”, but the share of green energy technology has seen substantial growth since 2000. Back then the green share was 25%. By 2012 it has grown to make up 37% of total energy technology exports to the EU market and 32% to non-EU markets.

Exports fell significantly in 2009, reducing exports to the EU and non-EU markets by 21% and 14% respectively. The recovery took two years; by 2011 exports to both EU and non-EU markets had returned to a level just above that of 2008. The growth in total exports from the two recovery years continued in 2012, but only due to growth on non-EU markets. From 2011 to 2012 exports to the EU fell by 5%, causing total exports to remain at the level of EUR 312 billion in 2011. Hence, the growth in exports of energy technology has lost the momentum it gained in the past decade.

Note: Other energy technology primarily consists of energy technology related to fossil fuels, e.g. offshore technology and production technology for electricity. Technology related to electricity distribution and transmission is also included, since electricity is mainly produced using fossil fuels (70%). Production technology related to renewable energy is included in green energy technology.

Exports of energy technology from EU to the EU and non-EU markets

<table>
<thead>
<tr>
<th>Year</th>
<th>EU</th>
<th>Non-EU</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>200</td>
<td>150</td>
</tr>
<tr>
<td>2001</td>
<td>220</td>
<td>190</td>
</tr>
<tr>
<td>2002</td>
<td>240</td>
<td>210</td>
</tr>
<tr>
<td>2003</td>
<td>260</td>
<td>230</td>
</tr>
<tr>
<td>2004</td>
<td>280</td>
<td>250</td>
</tr>
<tr>
<td>2005</td>
<td>300</td>
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</tr>
<tr>
<td>2006</td>
<td>320</td>
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<td>2007</td>
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<td>2008</td>
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<td>330</td>
</tr>
<tr>
<td>2009</td>
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<td>350</td>
</tr>
<tr>
<td>2010</td>
<td>400</td>
<td>370</td>
</tr>
<tr>
<td>2011</td>
<td>420</td>
<td>390</td>
</tr>
<tr>
<td>2012</td>
<td>440</td>
<td>410</td>
</tr>
</tbody>
</table>

Source: Statistics Denmark and DI-calculations
Europe risks losing its momentum experiencing lower growth in energy exports compared to the growth in total exports of goods. Exports of European energy technology have stagnated and need to be invigorated in order to exploit the market opportunities lying ahead.

Since 2007, energy technology’s share of total exports has decreased, and while some countries have managed to maintain growth, others are falling still further behind.

Denmark maintains its position as the biggest exporter of energy technology compared to total exports of goods, but is losing momentum due to a fall in export share over the past five years. Austria and Germany are moving ahead, seeing a net growth in the export share while having an energy export share above the EU15 average. Spain and Portugal are catching up, but energy export shares remain below the EU15 average.

France, Belgium and Ireland are falling behind, having lost between 7% and 12% export share since 2007, while having an export share below the EU15 average.
HOW TO PREPARE EUROPEAN ENERGY INDUSTRIES FOR THE MASSIVE GROWTH IN GLOBAL DEMAND FOR RENEWABLE ENERGY?

If we are capable of maintaining momentum, vast market opportunities lie ahead. According to IEA World Energy Outlook 2012, the total primary demand for renewable energy will increase by 2.4% annually in the period 2010-2035. OECD countries are expected to see an annual growth of 3.3%, while non-OECD countries will grow by 2.1% annually. The US is expected to grow by 3.9% annually and Japan by 5.2%, while the Middle East (not shown in the graph), will see an annual increase of over 10% for the entire period.

Africa is the largest consumer of renewable energy and will remain so, due to reliance on decentralized, off-the-grid renewable energy sources such as bioenergy. Of the remaining regions, the EU has the largest share of renewable energy today, and is expected to continue its expansion with an annual growth in primary demand for renewable energy of 3%. The EU will thus maintain its position as the third largest consumer of renewable energy after Africa and China.

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Total primary demand for renewable energy

<table>
<thead>
<tr>
<th>Region</th>
<th>2010</th>
<th>2035</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>100</td>
<td>150</td>
</tr>
<tr>
<td>Asia Oceania</td>
<td>50</td>
<td>70</td>
</tr>
<tr>
<td>Japan</td>
<td>20</td>
<td>30</td>
</tr>
<tr>
<td>China</td>
<td>300</td>
<td>500</td>
</tr>
<tr>
<td>India</td>
<td>250</td>
<td>400</td>
</tr>
<tr>
<td>Africa</td>
<td>300</td>
<td>500</td>
</tr>
<tr>
<td>Latin America</td>
<td>150</td>
<td>200</td>
</tr>
<tr>
<td>EU</td>
<td>1200</td>
<td>1800</td>
</tr>
</tbody>
</table>

Note: The forecast for 2035 is based on the “New Policies Scenario”

DONG ENERGY:
We need an EU 2030 policy framework that creates the right incentives and drives lowcarbon investment decisions.

DONG Energy is one of the leading energy groups in Northern Europe and is working actively to reduce its CO2 emissions per kWh by 60% in 2020 compared to 2006 by constructing more offshore wind farms and replacing coal with biomass in electricity and heat production. The group employs nearly 7,000 people and in 2012 generated EUR 9 billion revenue, of which approximately 60 per cent is earned outside of Denmark.
Today major markets in the EU, especially UK and Germany play a vital role in DONG Energy’s strategy. Approximately half of DONG Energy’s investments are located in these countries.

The biggest challenge for gaining a hold in these markets is that the energy sector is capital-intensive and characterized by long-term investments. As a consequence, stable framework conditions that provide guidance for major investments are essential for the energy sector to expand and support sustainable growth.

Today, long-term guidance for investments in the energy sector is uncertain, which induce considerable risk not only for potential new investments but also existing assets. The current inability of the EU Emission Trading System to guide investment and ensure that, for example, existing efficient gas fired power plants can replace in-efficient coal-fired power plants is an example of this.

In the short term, an ambitious revision of the EU-ETS that results in a clear and more stable price signal will go a long way to improve framework conditions for the European energy sector. In the long term an EU 2030 policy framework is required that creates the right incentives and drives low carbon investment decisions in the short and long term, and is resilient to significant fluctuations in demand and provides stability and security for investors.

If the status quo prevails, it will become increasingly difficult to maintain an ambitious business strategy, and an investment gap may occur.

Knud Pedersen
Vice President
DONG Energy
The current 2020 framework sets out targets for renewable energy, biofuels and energy efficiency. It creates incentives for investments in green technologies and provides predictability for investors. Today the primary objective of the EU emission trading system is to facilitate cost efficient CO2 reductions.

The key challenge for investors is that the current EU regulatory framework ends in 2020. This is not aligned with long-term horizons for investments in energy- and climate technology solutions. It is therefore essential to give a clear indication of ambitions for a post-2020 policy framework. A health check of existing instruments is needed together with a discussion on how to place Europe’s industry at the core of a competitive, low-carbon economy.

This discussion also has to involve budgetary issues, including infrastructure funds, research and innovation funding, the role of the European Investment Bank, the involvement of private investors in Public Private Partnerships, the role of structural funds and a greening of the common agricultural policy. Just as coherence must be ensured in the interplay between energy and climate change policies, coherence must also be ensured between budgetary posts across policy areas.

There is a need for long-term policies aimed at 2030, where political ambitions and policy instruments are closely aligned and serve as clear signals to investors.
ETS
The EU Emissions Trading System (ETS) is a cornerstone of the European Union’s policy to address climate change and its key tool for reducing industrial greenhouse gas emissions cost-effectively. As a market based system, ETS regulates more than 11,000 heavy energy-using installations in the power generation and manufacturing industry. From 2013 onwards ETS will be harmonized and thus aligned with an internal EU energy market. ETS companies are embedded in a common 21% 2020 CO2 reduction target regardless of their nationalities.

Renewable energy
In order for the EU to reach its 2020 target of a 20% share of renewable energy in the energy mix, member states have agreed on a burden-sharing methodology. The target for each member state has been defined according to existing share of renewables and potential, i.e. the natural resource base and economic basis for expanding the share of renewable energy. This means there is no immediate reward for countries who have already invested in renewable energy.

Energy efficiency
The 2012 energy efficiency directive establishes a common framework, paving the way towards the 2020 target of a 20% cut in Europe’s primary energy consumption. It lays down rules designed to remove barriers in the energy market and overcome market failures that impede efficiency in the supply and use of energy, and provides for the establishment of indicative national energy efficiency targets for 2020. The directive has yet to be implemented by EU member states.

Sustainable bioenergy
In addition to the main renewable energy target, a specific target for the transport sector has been set. By 2020, member states are required to have 10% renewable energy in the transport sector.

Oil companies are required to reduce well-to-wheel emissions by 6% by 2020. It is still unclear when this requirement will come into effect and how reductions are to be calculated.

Discussions are under way as to whether sustainability criteria should be extended to all types of bioenergy – and whether the methodologies for calculating emissions should be amended to include indirect effects such as deforestation in third countries.

Revisions, delays and uneven implementation of current regulation create considerable uncertainty for both investors and operators.
BWE: We need to overcome the fragmented character of the European market in relation to fiscal rules, emission standards, incentive schemes and sustainability criteria for biomass sourcing.

Burmeister & Wain Energy is one of the oldest manufacturers of steam boilers in the world, having supplied steam generating plants for industry and power stations since 1852. In 2002 BWE became a member of the Italian STF S.p.A. Group, and today employs around 150 people generating a turnover of EUR 40 million pa. The company, originally present mainly in the Scandinavian market, is now focusing on other countries, European (mainly for biomass power plants) and also extra-European.

Europe is important to BWE, because we need a market larger than Denmark in order to grow, but going out entails enormous risk because of unclear and unpredictable regulations on for example fiscal and labour matters. If we need to learn new rules every time we enter a new country, then there is no internal market.

An example: We are currently involved in constructing a new straw-fired plant in Emlichheim, Germany, which was delayed due to uncertainty over emission regulations and thus on how to design the boiler. While the EU’s “Large Combustion Plant Directive” applies to installations over 50 MW thermal capacity, German subsidies only relate to smaller plants. This means that there are incentives to stay out of common European rules, which makes little sense. And when you add unclear national standards you get uncertainty, delays and higher costs.

The long-term consequences of this are delays in projects, and the inability of investors to finance projects is an immediate consequence of this unclear regulatory framework on client side. On our side the risk is associated with the inefficiency of commercial activities and unpredictable risks in contract execution.

We therefore need uniform implementation of, for example, emissions regulations where today we have 27 standards in the EU rather than one. We furthermore need to give investors certainty of stable revenues. Credible and predictable incentives can ensure this. And we need to consolidate sustainability criteria for biomass sourcing on a European, or preferably global level. This is key in order to ensure security of supply, which is also key for investors.

Paolo Danesi
Group Business Development Director
BWE
**An internal market for energy**

The 2009 liberalization package for electricity and gas markets has yet to be fully implemented in many member states. In 2011 this prompted leaders to propose further initiatives in order for the “Internal Market for Energy” to be fulfilled in 2014.

Failing to create an internal market for energy will harm Europe’s global competitiveness. In order for the integration of energy markets to succeed, we need increased competition.

While specific regional and national regimes may be necessary in special cases, the Commission and member states must work towards common market regulations to ensure effective operating systems.

More effective and transparent permission procedures will increase investor confidence and boost the development of necessary interconnections.

**Research & Development**

European leaders have agreed to cut emissions by 80-95% in 2050. However progress towards a competitive low carbon economy can only be made by investing heavily research, development and innovation.

New and innovative energy technologies will have to be developed and deployed.

One objective of the EU framework programme for research and innovation, Horizon 2020 is to stimulate the growth potential in European companies. European business and industry will play a key role in the development of new clean energy technologies and it will be the main contributor to innovation, growth and employment.
Kamstrup A/S serves energy companies and utilities with metering solutions for electricity, heat, cooling, water and natural gas. Solutions include Smart Grid applications, Smart Metering systems, energy meters and water meters. Kamstrup was founded in 1946; is wholly owned by the Danish Oil company OK and has representations in more than 60 countries. 83% of the 2012 turnover made in the Kamstrup Group is with EU countries (Denmark included).

KAMSTRUP: Lack of binding action plans and common standards pose a barrier to trade.
With subsidiaries and agents across the continent, Europe is Kamstrup’s home turf. The majority of the exports of intelligent electricity, heat, cooling and water meters and system solutions for intelligent energy is directed towards the European market.

There is a broad, European consensus that the deployment of intelligent meters is a precondition for an intelligent energy system and thus for the achievement of the political targets set in the area. The EU decision that intelligent meters shall constitute 80% of all meters in 2020 is a brilliant foundation for Kamstrup’s business.

A barrier to growth is, however, that many countries still have to implement this decision. This is due to local uncertainty regarding standards and public acceptance. Furthermore, there are examples of countries where political decisions are jeopardized by renewed political uncertainty regarding regulations and time frames. This creates uncertainty among the potential customers.

In other markets, a certain conservatism remains where concrete technical solutions are ascribed by the authorities. Instead, a framework describing tasks should be established, leaving technical choices to suppliers.

The lack of political clarity results in some utilities postponing decisions, meaning that they – and society as a whole – miss out on the rewards of implementing solutions facilitating smart grid and intelligent energy. Furthermore, national legislation favouring certain solutions functions as barriers to trade for Kamstrup.

Overcoming these barriers requires making binding decisions on concrete action plans, as well as speeding up the often slow-paced standardization processes. Common European standards in the area of smart grids would be preferred – as we know it from the Internet.

Despite these barriers, Europe remains an interesting and large market. Removing barriers could make Europe even more attractive with higher growth rates for companies like Kamstrup.

Henrik Bæk Jørgensen
Senior Product Manager,
Smart grid solutions
Kamstrup
Denmark is home to some of the world's leading companies within energy technology and production.

The Danish Energy Industries Federation is an independent business organization. Our members are engaged in the energy sector in a variety of ways, including developing and manufacturing energy technology, offering advisory services, producing and distributing energy as well as extracting energy resources.

Our overall aim is to ensure the best possible framework for growth and development for the energy sector. We promote our member's interests at national and international level. We propose and carry out initiatives towards this objective at home and abroad.

The Danish Energy Industries Federation is an organization within the Confederation of Danish Industry.