Fortum Energy Review

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Next generation energy company

Fortum

LIST OF ABBREVIATIONS

API	American Petroleum Institute
CCGT	Combined Cycle Gas Turbine
CCS	Carbon Capture and Storage
CHP	Combined Heat and Power
ENTSO-E	European Network of Transmission System Operators for Electricity
EUA	European Union Allowance
EU ETS	European Union Emissions Trading Scheme
FiT	Feed in Tariff
GHG	Greenhouse Gas
IPCC	Intergovernmental Panel on Climate Change
LCOE	Levelised Costs of Electricity
LNG	Liquefied Natural Gas
MSR	Market Stability Reserve
NBP	National Balancing Point
NER300	New Entrants' Reserve (a programme through which allowances reserved for new entrants into the EU ETS were used for demonstrating innovative RES and CCS projects)
NO_x	Nitrogen Oxides
RES	Renewable Energy Sources
RGGI	Regional Greenhouse Gas Initiative
SO_2	Sulfur Dioxide
UNFCCC	United Nations Framework Convention on Climate Change

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Foreword

"Our first Energy Review highlights key trends in the European power market and focuses on cost-efficient climate policies."

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Dear reader,

Electrification is a persisting trend, both in Europe and globally. The share of electricity in total energy demand is expected to grow further as electricity plays an increasingly important role in the modern society and urbanisation globally.

In Europe, the higher use of electricity for heating and cooling and electrification of transportation increase the share of electricity in energy consumption. While in developing nations, economic growth and the growth in welfare are the main drivers for the increasing demand for energy and, in particular, electricity. Naturally, the supply, reliability, costs and climate impacts of energy are key issues for consumers, industry and decision makers.

Renewable power generation has grown rapidly in Europe in recent years especially due to a strong political direction complemented with extensive support schemes and, hence, the EU is likely to meet its ambitious 2020 target set for the share of renewable energy. An increasing share of renewable energy is a positive trend, but at the same time it is changing the energy sector in ways we were not able to imagine a few years ago.

The strong growth of subsidised energy production and slow power demand growth have lowered wholesale power prices to a level last witnessed over a decade ago. Low power prices have challenged market-based, non-subsidised investments into new generation. Market-driven energy production is struggling with weakened profitability, reducing the ability of companies to invest. Meanwhile, however, the end-customer power prices in several European countries have risen, mainly due to increasing taxes and levies.

The fast growth of renewables together with low power price levels have also raised concerns over the security of supply in the power system that has a growing proportion of intermittent generation. In order to secure adequate generation capacity, some EU countries, like France and the UK, plan to introduce capacity mechanisms in addition to the wholesale markets.

While the complexity of the energy system increases, we also need to mitigate climate change and rapidly transform to a low-carbon energy system, which require investments. In Europe, market-based climate and energy policies, including carbon pricing and markets as the key tools, are a necessity for low-carbon investments. The EU Emissions Trading Scheme (ETS) has long struggled with oversupply and low allowance prices to a large extent due to RES subsidies. Decisions on the 2030 climate targets and a structural reform of the ETS are urgently needed to boost the decarbonisation of society.

Consequently, it is easy to draw the conclusion that energy and climate issues will remain high on the agenda for consumers, industry and decision makers. There is also an increasing need for information and analysis on energy development.

THE FIRST FORTUM ENERGY REVIEW

As a significant actor in the energy sector, Fortum is committed to carrying its responsibility to secure the supply of energy in the future. Our vision is to provide solutions for the needs of future generations.

This report is the first in the Fortum Energy Review series. The first section highlights the key trends in the European power market, while the second section focuses on a cost-efficient climate policy approach. With this report, we want to contribute to the discussion on energy production and consumption in our society.

Fortum Corporation

SECTION 1

Power market outlook for Europe and the Nordics

1.1 Electrification is a persisting trend

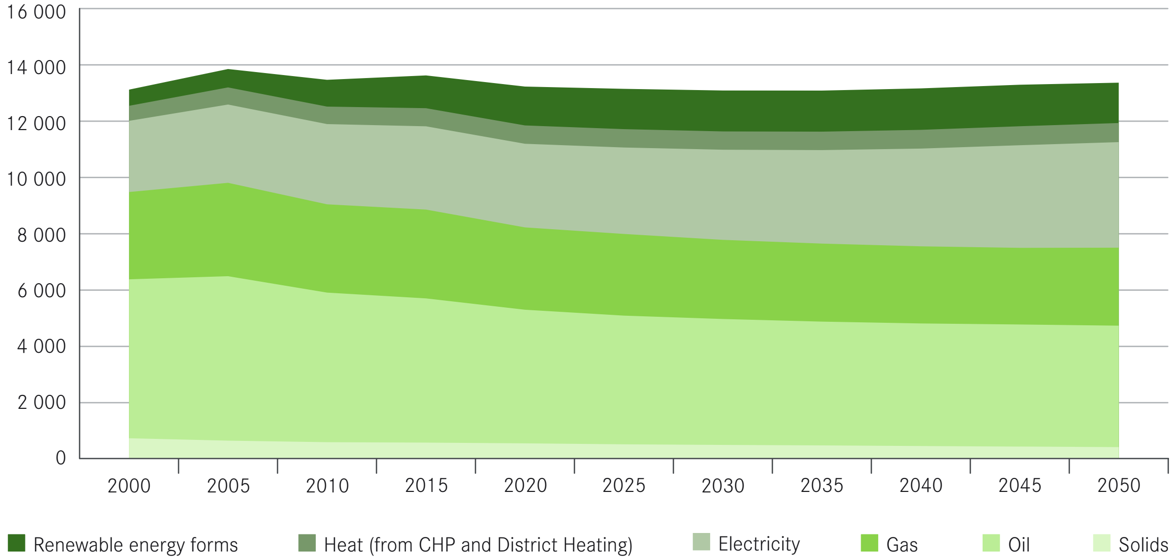
The proportion of electricity in the final energy demand will continue to rise globally. In Europe, the total energy demand is likely to stay fairly unchanged or decrease slightly over the next 35 years. However, the share of electricity consumption will continue to grow and is expected to increase from just over one fifth of the final energy demand in 2014 to almost a third in 2050, replacing the use of oil and gas in the transportation, heating and household sectors.

Globally, electricity consumption is likely to rise at a growth rate that is nearly double compared to the growth of primary energy demand. The electricity demand[1] growth is primarily driven by the increasing electrification of industry, the expanding use of electrical appliances, and more cooling in buildings. Electricity usage is more efficient and environmentally friendly than the direct alternative usage of fossil fuels.

"The share of electricity out of total energy use will increase."

Fig. 1: European total energy demand to remain fairly unchanged with a growing share of electricity

EU 28-Final energy demand by fuel type, TWh



Source: DG Energy, Transport and GHG Emissions Trends to 2050, European Commission

[1]Source: World Energy Outlook 2013, International Energy Agency

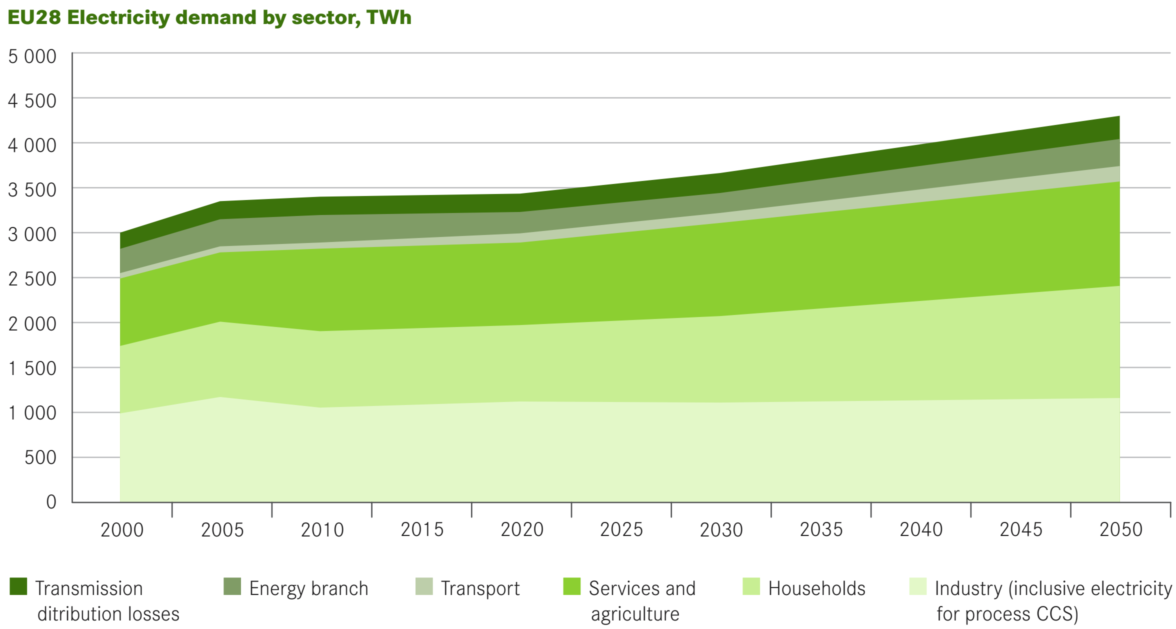
1.2 Electricity consumption growth in Europe is mainly driven by households and the services sectors

The growth in electricity consumption in Europe will be driven by a number of factors. First, the use of electricity for heating and cooling is expected to grow, especially as energy-efficient heat pumps replace fossil-fired heating and provide additional cooling comfort. Secondly, the number of electric appliances in households and the services sectors will likely increase alongside population growth. The number of data centres and electric vehicles will also increase.

In the industrial sector, electricity consumption is likely to stay rather flat in Europe due to a structural shift towards the non-energy-intensive sectors and the improved energy efficiency of production processes.

“Industrial electricity consumption in Europe is expected to stay rather flat.”

Fig. 2: European households and services sectors will increase their share of electricity consumption



Source: DG Energy, Transport and GHG Emissions Trends to 2050, European Commission

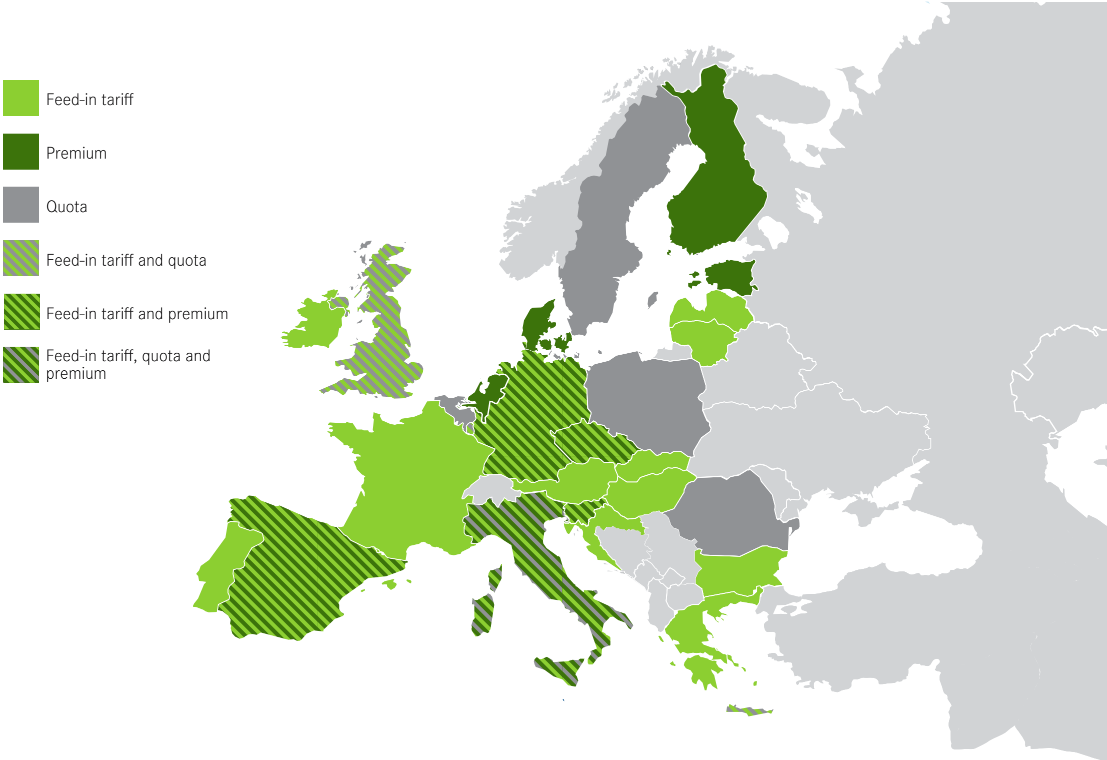
1.3 Rapid increases in renewable power due to support schemes and declining technology costs

The European Union's decision to cover 20% of the primary energy consumption with renewable sources by 2020 has significantly boosted investments into renewable electricity generation, and Europe is on track to meet its 2020 targets. For the power sector, the 20% target translates into a renewable electricity generation share of about 36%. Currently, renewables account for about a quarter of the total electricity generation in the EU.

A European RES target was allocated to national targets and has led to very different national subsidy schemes. In addition to carbon pricing, there is a wide diversity of renewables support schemes in Europe, ranging from feed-in-tariffs to investment subsidies.

Investments into renewable generation are expected to continue strong also after 2020. For 2030, the EU Commission has recently proposed a target to cover 27% of the primary energy consumption with renewable energy. This target corresponds to about 45% of renewable generation in the European electricity mix.

Fig. 3: European countries have introduced a variety of support schemes for renewables



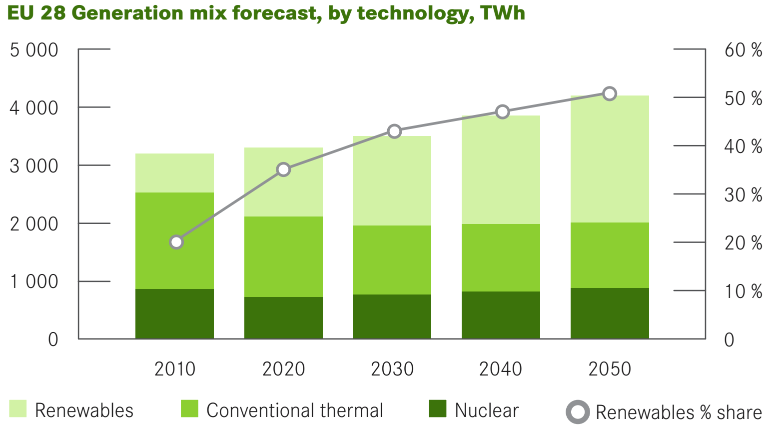
Source: European Commission/Eurelectric

"Focus should be put on integrating renewables into the power market."

In 2050, more than half of the electricity generated in Europe is expected to come from renewable energy sources. This transformation poses big challenges for market functionality and security of supply, and it increases the need for infrastructure investments.

A key question for European competitiveness going further is how to foster the transition to a low-carbon environment without compromising economic competitiveness. Benefiting from European energy market integration, harmonising and gradually phasing out direct generation support schemes while fostering competition and considering energy and climate policies together would be the solutions for a transition with the lowest costs for society.

Fig. 4: The share of renewable energy will continue to grow fast in the EU



Source: DG Energy, Transport and GHG Emissions Trends to 2050, European Commission

1.4 The change enablers: decreasing costs of wind and solar

In the longer term, with further technological development, wind and solar technologies are likely to become generation types that can compete on their own with conventional technologies without any subsidies. Eventually, wind and solar will probably become mainstream technologies.

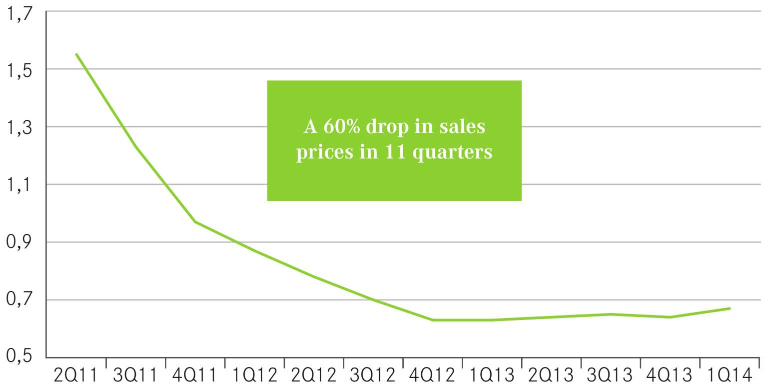
In high-radiation areas, solar generation has already become a mainstream technology following the recent fall in costs. On average, the price of solar photovoltaic modules has fallen by 60% since 2011.

Onshore wind has become a competitive generation technology in some high-wind areas. The investment costs for onshore wind energy have declined by a third since late 2007.

Further reduction of the costs of solar and wind technologies means that they will become competitive on their own without any subsidies. Being very volatile, they will have a great impact on the functioning of the power system as a whole. Therefore, the focus should be on integrating RES into the overall power market. The first steps would include making the subsidy schemes more market-based before withdrawing them altogether, and introducing the normal network and market responsibilities including balancing responsibilities for all RES regardless their size.

Fig. 5: Solar module prices have decreased rapidly in recent years

Solar modules, average selling price, $/W

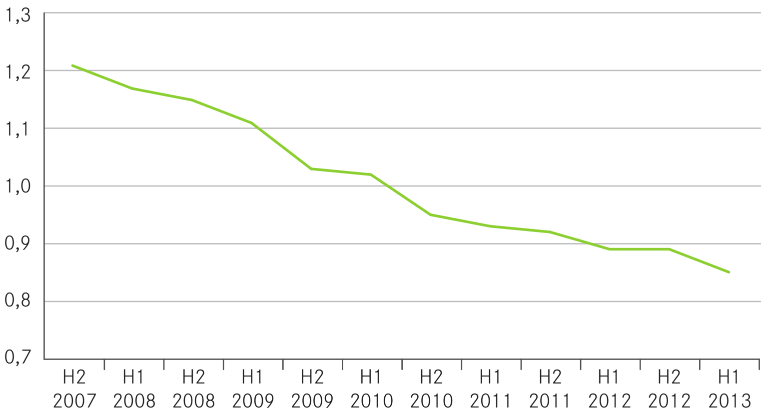


The curve represents an average of the sales prices reported by the following companies: Canadian Solar, Yingli Solar, Hanwha Solar, China Sunergy, Jinko Solar, Renesola, Trina Solar

Source: Company information, May 2014

Fig. 6: Cost of wind power is decreasing and enabling the change

Cost trend of onshore wind turbine prices, by contract date, €/W



Data exclude Asian turbines

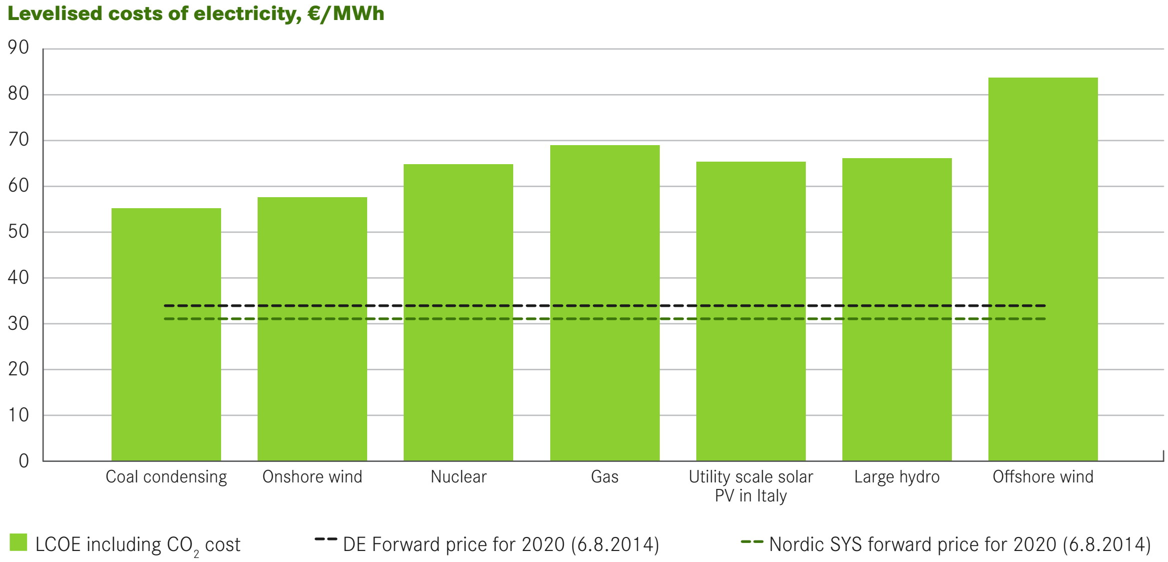
Source: Technology Roadmap. Wind energy. International Energy Agency. 2013

1.5 Wholesale electricity prices too low to attract investments

Forward market electricity prices in the Nordics and Germany are below the levels required to cover the total costs of new generation (including investment cost as well as operational and maintenance cost). In real terms, forward power prices in north-western Europe are currently at the levels last seen over a decade ago. These price levels challenge the operation of even the existing modern gas condensing and combined heat and power (CHP) plants.

While electricity forward prices in Germany for year 2020 stood at €34/MWh in the beginning of June 2014, the lifetime costs for every production hour, including both capital and operational expenditures for new power generation, are above €50/MWh[2].

Fig.7: Lifetime costs for new generation are clearly above current market power prices



DISCLAIMER: The presented figures are calculated based on data from recent public reports and do not represent Fortum's view. The figures are valid for the Nordic region except for the utility scale solar PV which is valid for Italy. Commodity prices are the forward market prices as of June 2014. Real discount rate is assumed at 5%, corporate tax, 20%. Economical lifetime: 30 years for solar, 40 years for nuclear and hydro, 25 years for others. Overnight costs, €/kW 5330 for nuclear, 1840 for gas, 1390 for coal, 1330 for onshore wind, 1880 offshore wind, 2770 for hydro, 1220 for ground mounted solar. Note: there are large variations in the cost of hydro, wind and solar depending on location and conditions.

Sources: Sähkön tuotantokustannusvertailu. Vakkilainen Esa, Kivistö Aija, Tarjanne Risto. Lappeenrannan teknillinen yliopisto. 2012, Re-considering the Economics of Photovoltaic Power. Bloomberg New Energy Finance. 2012, PV Status Report 2013. Arnulf Jäger-Waldau. EC, DG Joint Research Centre, Institute for Energy and Transport. 2013, Connecting the sun. Solar photovoltaics on the road to large-scale grid integration. EPIA. 2012, Projected Costs of Generating Electricity: 2010 Edition. International Energy Agency. 2010, Bloomberg June 2014

[2]LCOE show the generation volume-weighted average electricity price required for an investment into a power plant to break even over the lifetime of the project.

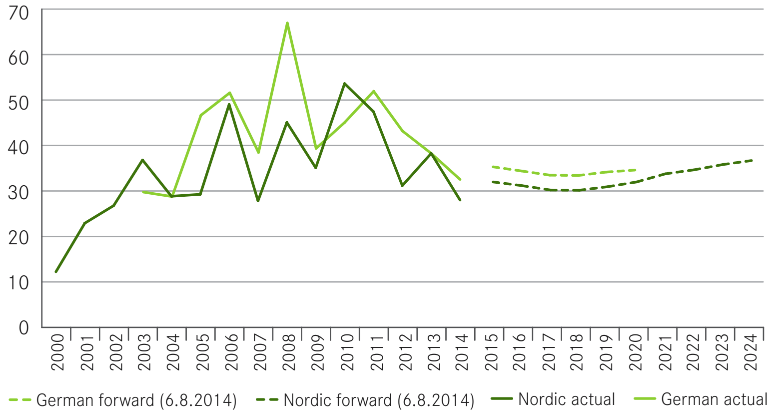
"Today, nearly all investments into power generations are based on subsidies."

Wholesale prices notably below the levelised costs of electricity signal that the market does not require new investments. Today, nearly all investments into new power generation in Europe are based on various support mechanisms. Subsidised investments, that are less or non-price-sensitive, press the market price even further down.

However, despite the current challenging investment climate, extensive investments in low carbon generation will be needed already before 2030 to replace aging power plants and plants that have to be shut down due to tightening emissions standards.

Fig. 8: Wholesale power prices are back at levels witnessed in early 2000s

Annual wholesale electricity prices in the Nordics and Germany, €/MWh



Source: Bloomberg, August 2014

1.6. Rising end-user prices due to higher taxes and levies

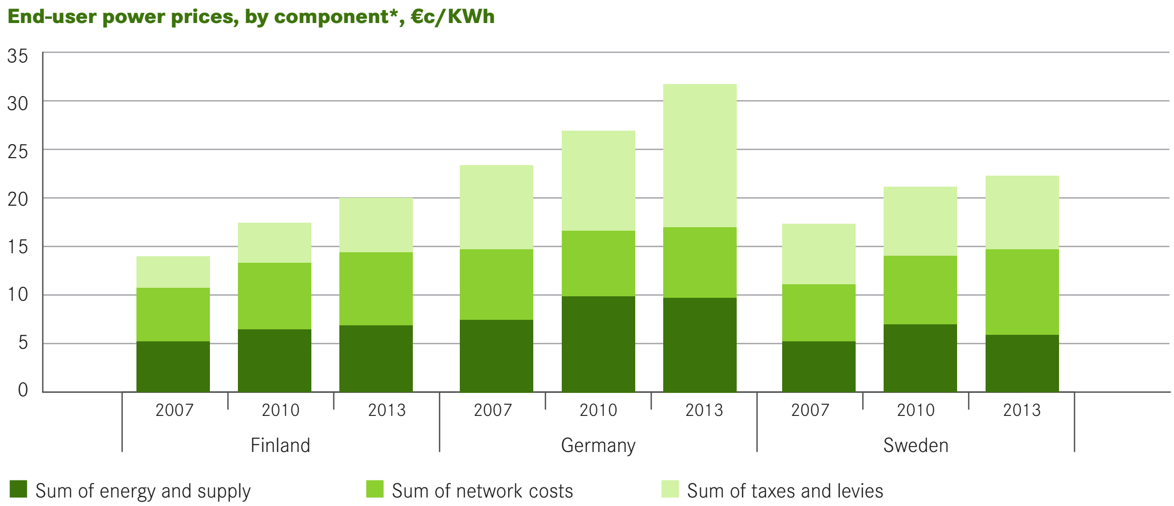
Despite the decreasing wholesale prices, the electricity prices paid by end users have been increasing over the past six years mainly due to a rise in the non-energy price components, such as network fees and taxes. End-user prices have stopped increasing in the Nordics in the past three years, but electricity consumers in Germany continue to pay higher electricity bills due to increasing taxes and levies, especially subsidies for RES.

In recent years, comparing European and US energy prices has been an area of increasing interest. The wholesale power prices in both markets have been on a decreasing trend, driven by falling fossil-fuel prices and moderate demand development.

However, the differences are larger when comparing end-user prices. Small-scale industry[3] in Europe generally pays a higher electricity bill than its counterpart in the US, despite a small difference in wholesale electricity prices. The explanation is found in the differences in taxes and levies.

"European industry pays higher prices than US peers despite wholesale price parity."

Fig. 9: Household end-user prices are increasing, driven by rising taxes and levies

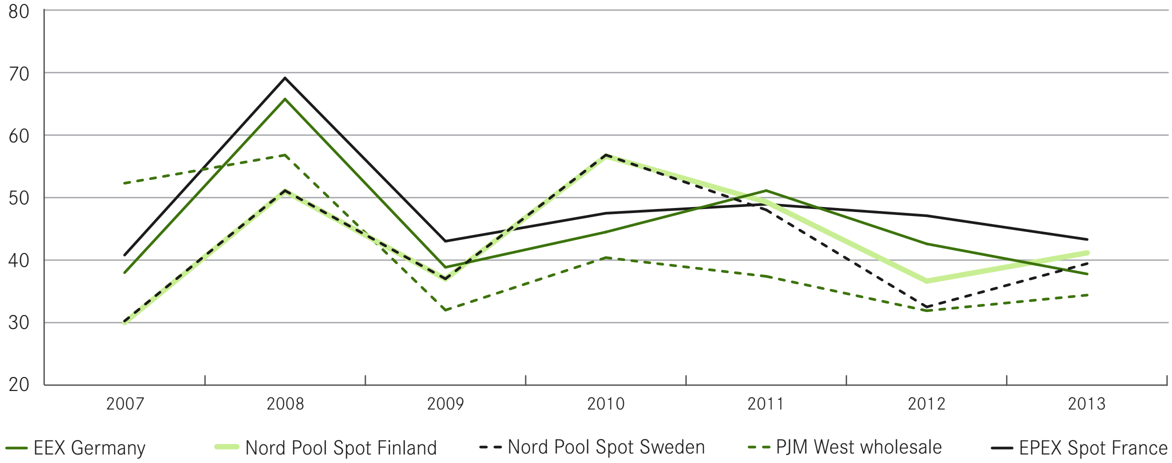


For a household consuming between 1000 and 2500 KWh/year. Source: Eurostat

[3]Annual electricity consumption 20-70 GWh

Fig. 10: European wholesale prices are in parity with the US

Wholesale electricity prices, €/MWh

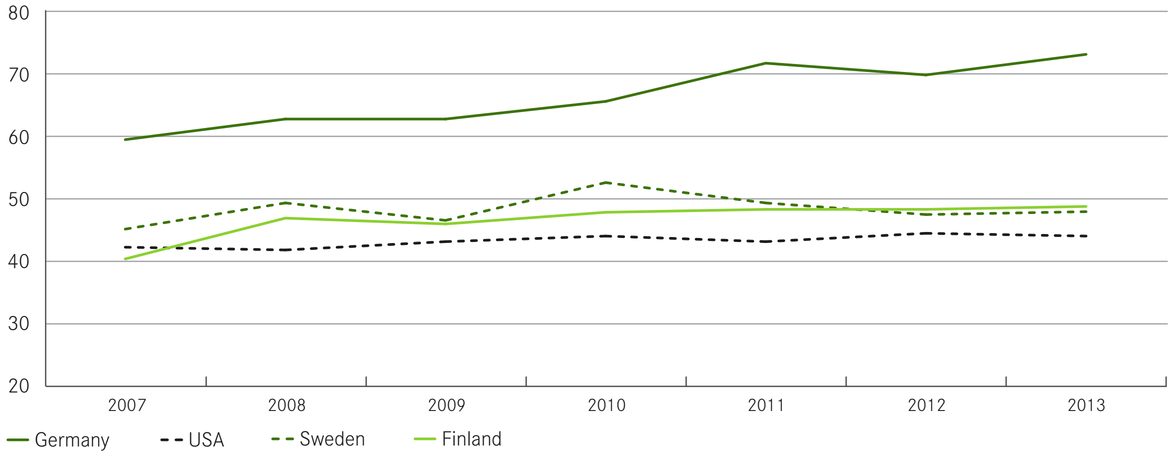


The US price here excludes capacity component. Capacity component raises total cost of purchase of electricity from the US wholesale market close to the same level as in Europe.

Source: Bloomberg, August 2014

Fig. 11: Industrial end-user energy prices give a competitive advantage to US companies

Industrial consumer electricity price*, €/MWh



* For industrial consumers of 20 - 70 GWh/a

Source: Eurostat, US Energy Information Administration, May 2014

1.7 Current market conditions favour coal generation

Fig. 12: Coal prices are currently low in Europe[4]

Coal (API 2) and gas (NBP) historical and forward prices, €/MWh

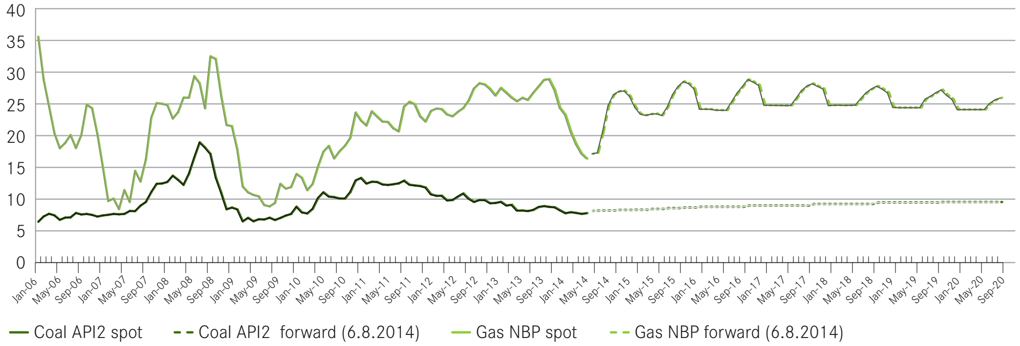
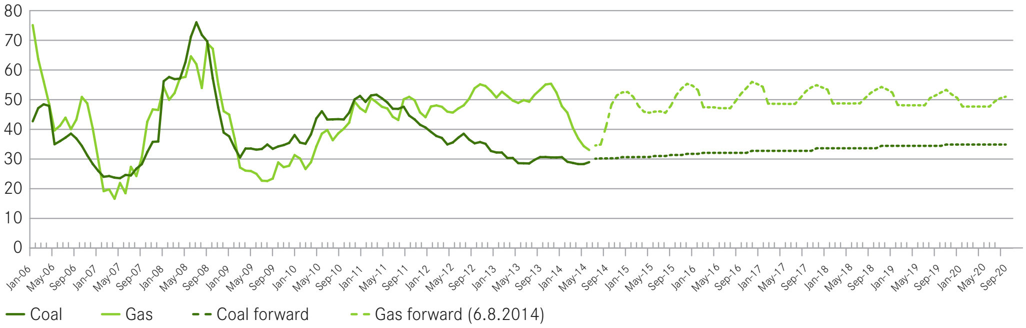


Fig. 13: Marginal costs of coal generation remain at a premium to gas generation

Variable cost of coal and gas-condensing generation in Germany, €/MWh



Parameters used in calculation: carbon intensity for coal 342 kg/MWhf, carbon intensity for gas 205 kg/MWhf, efficiency for coal 38%, efficiency for gas 55%, other costs for coal €3/MWh, for gas €1/MWh

Source: Bloomberg, August 2014

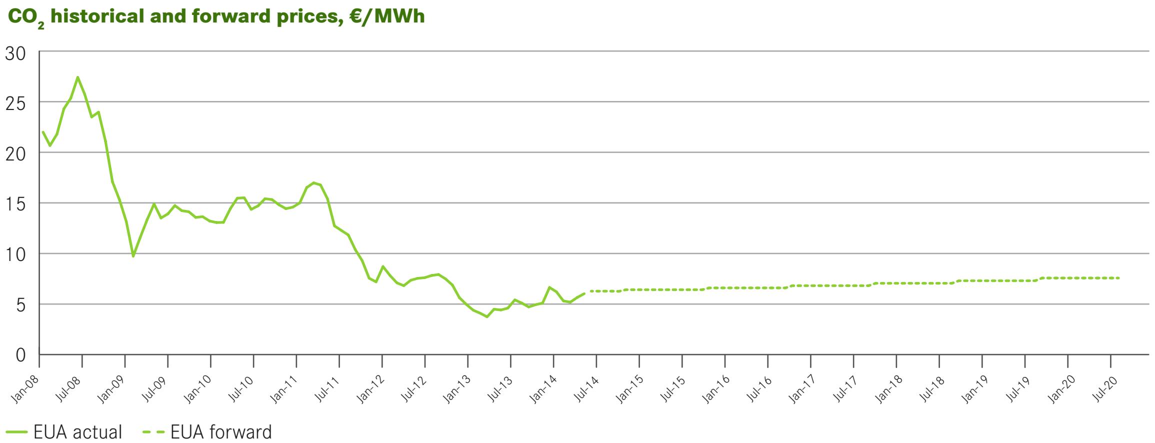
[4]Coal API2 is the benchmark price reference for the coal imported into north-western Europe. NBP (National Balancing Point) is a virtual trading location for natural gas in the UK; it is used as a price index proxy for spot natural gas in north-western Europe.

The rapid entry of shale gas into the US market has increased the use of gas, improved the country's energy self-sufficiency and reduced the consumption of coal. Meanwhile, Europe has received a steady stream of more economically priced coal and its use has increased. This trend, coupled with the low prices of emission allowances, has caused a renaissance of coal generation in Europe.

Low CO_2 and power prices favour coal over gas-fired generation in Europe.

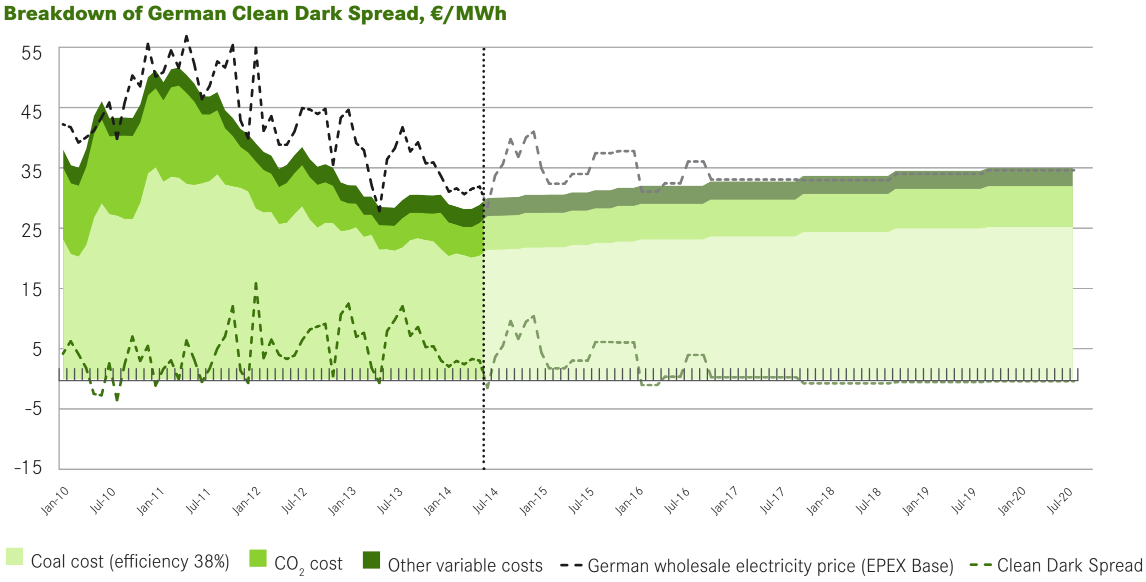
In addition to cheaper coal prices during the past three years, carbon prices also have fallen from €25/t in 2008 to €5/t in the first half of 2014, due to the economic crisis and overlapping climate policies.

Fig. 14: European Union Allowance prices at low levels[5]



Source: Bloomberg, August 2014

Fig. 15: German coal-fired generation has a small positive difference between the wholesale electricity prices and variable cost

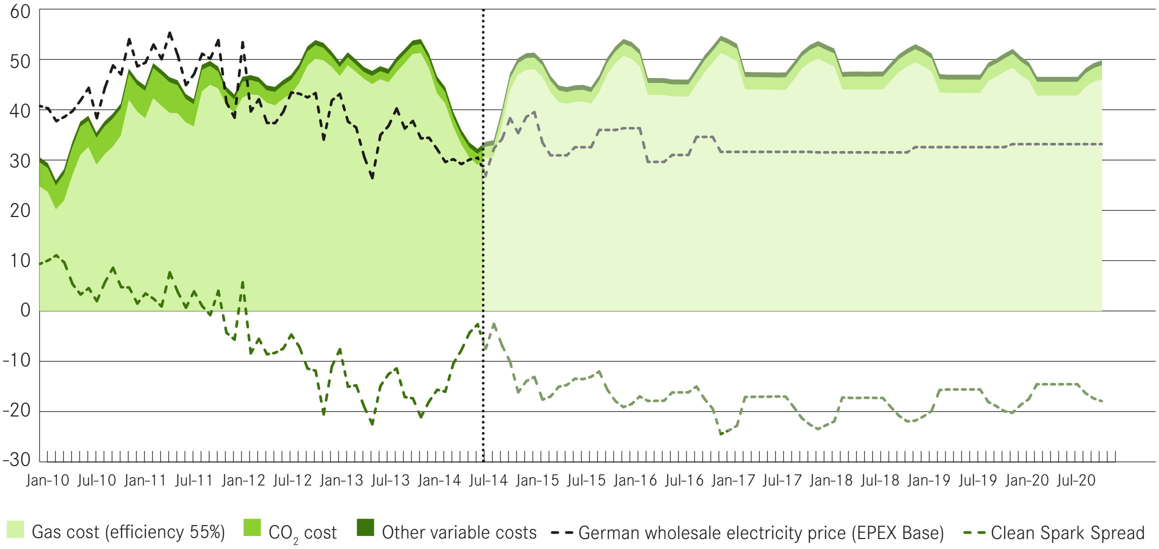


Source: Bloomberg, August 2014

[5]EUA (European Union Allowance) is a carbon credit equivalent to one tonne of CO_2. It is traded on the spot and forward markets.

Fig. 16: German gas-fired generation has a negative difference between wholesale electricity prices and variable cost

Breakdown of German Clean Spark Spread, €/MWh



Source: Bloomberg, August 2014

European spot gas prices increased during 2009-2013 despite falling European gas demand, due to decreasing domestic gas production and an increasing share of LNG imports being diverted to Asia.

Carbon and fuel prices have been over the past two years and are expected to remain over the coming years at such a level that variable costs of coal generation are clearly below the variable costs of cleaner gas-fired alternatives. Current carbon forward prices do not indicate any notable carbon price increase in the coming years.

The clean spark spread (the difference between the electricity price and the variable cost of gas condense) been negative over the past two years, meaning that most Combined Cycle Gas Turbine (CCGT) plants have been loss-making, while the Clean Dark Spread (the difference between the electricity price and the variable cost of coal condense) has stayed barely positive. The reason for this is the combination of the low carbon price, relatively low coal price and high gas price.This current spread differential is favouring coal-fired generation and damaging the economic performance of gas generation. Gas generation has higher efficiency and emits much less CO_2 compared to coal generation and would thus be the preferred choice from an environmental standpoint.

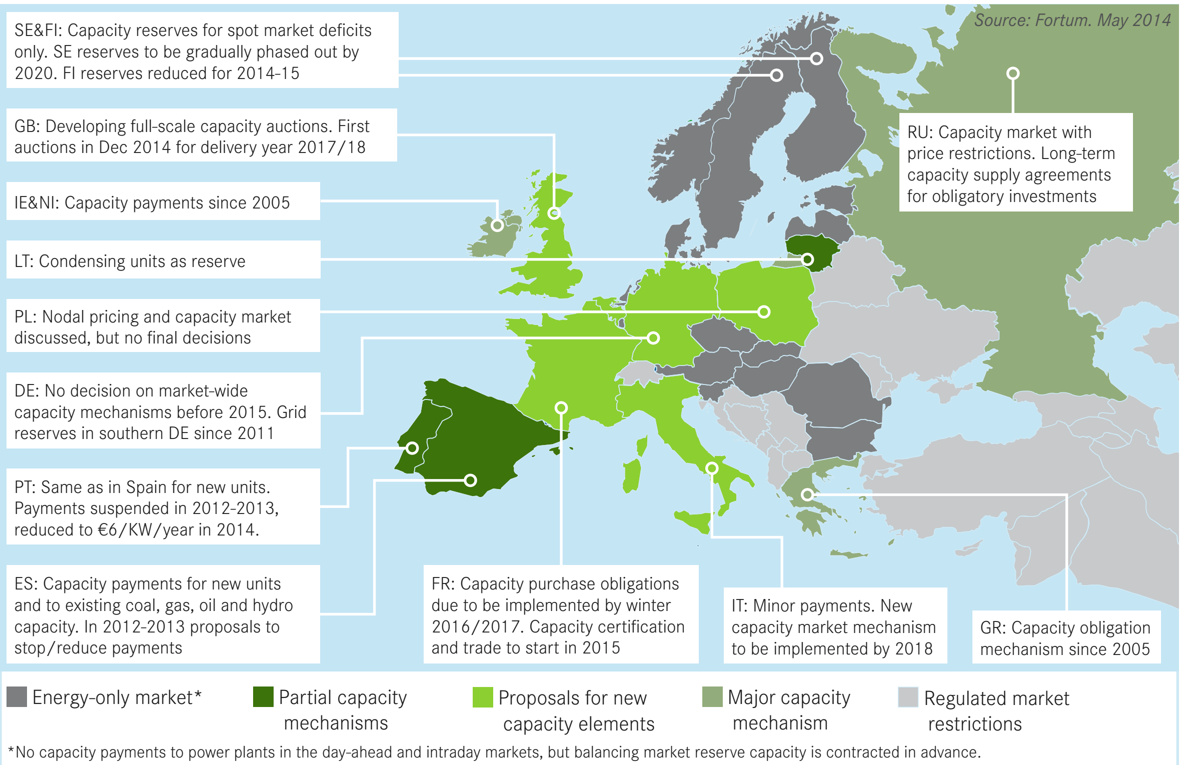
While current market conditions favour existing coal-fired generation, the Industrial Emissions Directive, in effect from 2016, will add restrictions on the use of especially older coal power plants. This directive will set additional limitations on SO_2, dust and NO_x emissions. Consequently, many of the European coal-fired power plants will need to be either upgraded or gradually shut down before the end of their technical lifetime.

1.8 Concerns over adequacy of generation capacity have risen

As a result of all these developments, there are concerns about whether a mainstream energy-only power market model is able to guarantee adequacy of generation capacity[6] in the long run. In the energy-only power market model, producers and sellers only trade energy for every hour and hedge the future deliveries based on the hourly energy price. In contrast, several power markets (e.g. Russia and many US markets) have also a separate capacity market to ensure availability of power capacity prior delivery.

Maintaining generation adequacy has become more challenging with the increased share of variable renewable generation, the still undeveloped demand response, and the threat of existing power plant closures. Consequently, establishing national capacity mechanisms to keep the necessary thermal generation online is under discussion in many European regions. In a longer run, capacity mechanisms will have an impact on the location of investments and thereby they will spread to other countries too.

Fig. 17: Several European countries are considering the introduction of various types of capacity mechanisms



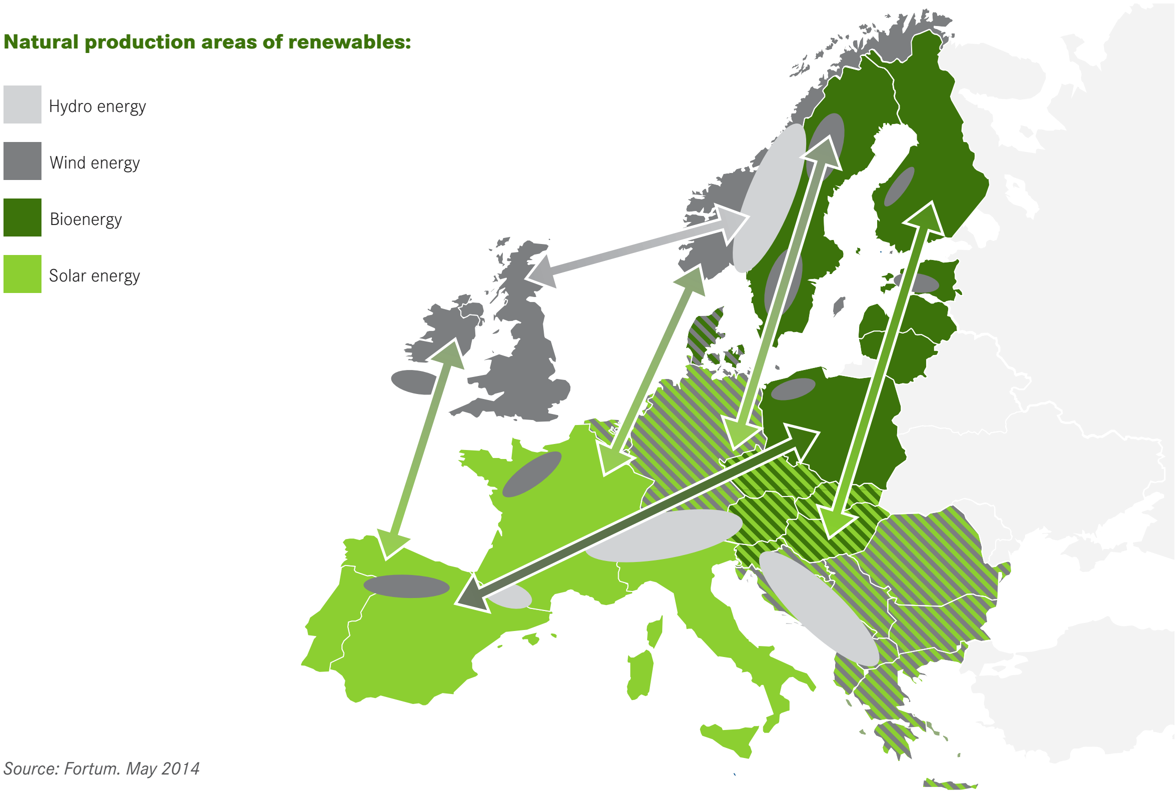
[6]Generation adequacy means that there is enough generation capacity to secure the matching of power demand and supply at any point in time

1.9 Increasing renewable generation requires system-wide transformation

The European power market development is currently based on the EU Internal Energy Market targets and the related legislation, as well as on the environmental and climate targets for year 2020. In addition, in January 2014, the European Commission proposed an energy and climate policy framework up to 2030.

Stronger integration of the national and regional markets into a single European power market would enable efficient competition and utilisation of all resources within the available transmission grid capacity. The day-ahead spot markets, setting the hourly electricity prices for each day, are already connected through market coupling of most of the European power exchanges. A similar development is under way for the intraday markets and the real-time balancing markets, which will be essential for covering the short-term fluctuations of the increasing wind and solar power generation.

Fig. 18: Growing share of renewables requires efficient and integrated European power markets



Source: Fortum. May 2014

“The rising share of variable generation leads to higher price volatility.”

Efficient utilisation of renewable energy resources requires major investments in the European power transmission grid in order to enable the exports of surplus power during high wind and solar generation and the imports of hydro and thermal power during other periods. According to the ten-year plan by the European Network of Transmission System Operators for Electricity (ENTSO-E), over €100 billion should be invested into increasing the cross-border grid capacities by 2022.

As renewable power generation is based on natural geographical resource regions, power transmission needs across Europe are increasing. Through new grid interconnections, Nordic hydropower and biomass resources can be used to cover wind power variations around the North Sea and solar power variations in Continental Europe. Import possibilities through added grid capacity also contribute to Nordic supply adequacy during dry years and cold spells in the winter.

Energy storage technologies offer flexible alternatives for covering the variations of wind and solar power generation and for meeting the power, heat and cooling demand during peak-load hours. Pumped-storage hydropower, as well as heat accumulators in district heating systems, have been long used in storing surplus energy.

Through technological development, new storage solutions are also becoming competitive. Battery storages can be used in connection with distributed generation and in distribution grid congestion management. The batteries of electric vehicles can already be charged flexibly during the cheapest power price hours. In cooling and freezing applications, ice storage enables similar optimisation. “Power-to-gas” solutions with electricity-based hydrogen production would be suitable for longer-term energy storage, but technology development is still needed to reach competitiveness.

Availability of hourly (or even more discrete) energy metering and also hourly energy billing motivates both industrial users and private customers to be more active in demand response, that is, in adjusting their electricity consumption according to the spot market price.

A rising share of variable generation in the European power mix leads to higher electricity price volatility (e.g. hourly price differences). The higher the electricity price volatility, the bigger the incentive to participate in demand response. Demand response, of both industrial and household consumers, will be a growing phenomenon over the coming years. It will contribute to the needed increase for power system flexibility alongside energy storage technologies and more flexible generation.

SECTION 2

Special focus: climate and energy policies in Europe

2.1 Curbing climate change requires rapid action

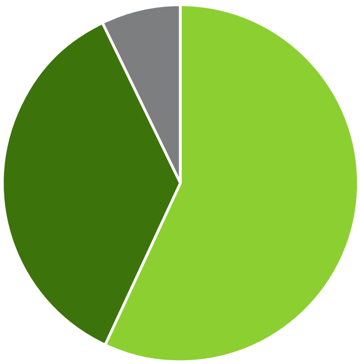
The scientific basis of climate change is evident: according to the Intergovernmental Panel on Climate Change (IPCC), the warming of the earth's climate system is unequivocal. The global average temperature has increased 0.85°C since the pre-industrial era. The probability for human activity as the main cause of warming since the 1950s is at least 95%.

To prevent the most severe impacts of climate change, the international community has agreed to limit the now inevitable rise in temperature to 2°C above the pre-industrial level. To achieve this, the CO_2 concentration in the atmosphere should be below 450 ppm. In 2013, it surpassed 400 ppm for the first time in human history.

The increase in GHG emissions has accelerated, despite reduction efforts, and the 2°C emission budget is expected to be exhausted in the 2040s. Emissions totalled 49 $GtCO_2eq/a$ in 2010 – the highest in human history. Decoupling economic growth and emissions has not yet succeeded. To reach the 2°C target, worldwide emissions have to be reversed by 2020 at the latest and reduced by at least 50-80% from 1990 levels by the middle of this century.

If emissions continue unabated, the world's carbon budget for a likely chance of reaching 2°C target will be spent entirely already in 2040s

Carbon budget for 2°C target



THE GROWING GLOBAL CONCERN OVER CLIMATE CHANGE IS NOT TRANSLATING TO ACTION

Cumulative emissions from the developing world soon exceed those from developed countries. By 2020, nearly two-thirds of global emissions will originate from developing countries. A balance between the legitimate right of the developing world to economic growth and welfare and the reduction of emissions is a major question in principle.

Concern over the changing climate is increasing globally, but the world is not yet taking action at the level required to change the course. The international negotiations under the UNFCCC on a global climate deal have been crawling and the emission reduction pledges so far are entirely insufficient.

"To be effective, action to combat climate change should be global."

At the moment, regional climate policies vary both in terms of ambition and policy tools. To be effective, action to combat climate change needs to be global.

Along with the UN negotiations, solutions could and should be sought also in other international forums. As an example, emissions of the 17 major economies of the world represent 85% of global emissions. A deal among the G20 countries might be much more straightforward to reach. The key players are China and USA, their emissions cover almost half of the world's emissions.

GHG reduction targets of the EU (compared to 1990)

By 2020: - 20%

By 2030: - 40% (proposal)

By 2050: - 80...95% (political ambition)

THE EU AT THE FOREFRONT OF INTERNATIONAL EFFORTS

The European Union has been a forerunner in the global climate policy. The greenhouse gas (GHG) emissions of the EU have, however, a diminishing role globally, accounting for less than 10% in 2030. Despite that development, Europe should continue its active role and commitment. Decarbonisation and reduced dependency of imported fossil fuels serve also other interests of the EU and its citizens.

The EU has established a set of policies to combat climate change. The Community-wide emissions trading scheme (ETS) covering about half of the emissions is the most extensive operational system in the world. Other important policy measures include promotion of renewable energy sources and energy efficiency. In the 2020 framework, the EU has targets in all three policy areas – and those targets are partly overlapping with each other.

MANY COUNTRIES ARE INTRODUCING CARBON MARKET SCHEMES

Despite the EU's commitment and leadership, the real global solutions must be found elsewhere: by the major emitters China, the USA, India and Russia. The recent proposal by President Obama for federal regulation on CO_2 emission cuts from fossil-fuelled power plants is a promising spur for others and may have an impact that extends far beyond the United States.

Mitigation actions based on market-driven solutions are evolving in more and more countries. Carbon pricing programmes already regulate nearly 6 billion tonnes CO_2 – about 12% of annual global GHG emissions.

For example, China has launched several regional trading schemes covering about 1.1 billion tonnes of emissions annually. California and Quebec have linked their schemes under the Western Climate Initiative, and a carbon market is expected to start in Korea. Other markets in operation include New Zealand, the city of Tokyo, Switzerland and RGGI (nine states in the north-eastern US).

However, policies and measures are still different from one country and region to another. The key question for the future is whether the EU model will serve as a basis for the rest of the world or will the EU have to start to follow the others.

2.2 Better policies are needed to lower the costs of decarbonisation

As said, the EU 2020 framework is based on triple and partly overlapping targets: emissions reduction, renewables and energy efficiency. Diverging national renewables targets and policies have resulted in vast financial support for renewables, roughly EUR 40 billion annually. In Germany alone, the support totalled EUR 25 billion in 2013.

The significant oversupply of allowances in the EU ETS has built up mostly during 2008-2012. According to the analysis by Greenstream Network Ltd (2013), the contributions of the economic recession and the overlapping policy instruments to the oversupply are almost equal. Targets and policies for renewable energy, energy efficiency and greenhouse gas reduction all are essentially aiming for the same goal, but are overlapping or even conflicting with each other.

Increasing the use of renewable energy sources with significant financial subsidies does increase renewable electricity production and, consequently, reduce emissions. At the same time, it reduces the demand for CO_2 emission allowances and their price. This, in turn, makes the use of high-carbon energy sources more profitable and may finally increase emissions – as has happened in many parts of Europe over the past few years.

“Overlapping climate and energy targets and measures lead to high costs.”

The design flaws of the 2020 policy – the overlapping and even conflicting nature of targets and measures leading to inefficiency and high cost – should not be repeated. The promotion of renewables should focus on research and development, innovations and demonstration as well as market integration of renewable energy, not on production subsidies. The focus should be on technology development that also improves European competitiveness. This would be the most effective way to ensure future investments, speed up the adoption of clean technology and, as a result, create green growth in Europe.

2.3 Single emission reduction target with enforced ETS is the solution

In accordance with the EU 2050 aspiration, the European electricity industry has taken a proactive approach to climate change mitigation and is committed to becoming virtually decarbonised by 2050. Market-based climate and energy policies along with carbon pricing and markets are the key drivers for investments in a low-carbon economy.

AMBITIOUS TARGET FOR 2030 TO BE FIXED SOON

As European competitiveness is a key concern, we need a cost-efficient climate policy in order to minimise the costs of decarbonisation for society. Therefore, the EU must focus on the emissions reduction target only and strengthen the role of the ETS.

The 40% emissions reduction target for 2030 in line with the 2050 ambition should be fixed as soon as possible. An early decision on the 2030 target would bring positive and constructive momentum to international climate negotiations. For investors, it would also be an important political signal on increasing the stability and predictability of the climate policy.

The 40% target could be complemented with an additional 10% option for the international credits. The continued recognition of international offsets would be important for the global negotiations and could ease the linking of the ETS with other regional trading schemes.

TRUST IN THE ETS MUST BE RESTORED

The ETS promotes the competitiveness of clean technology by creating demand and market pull for such technologies. However, the EU ETS currently does not deliver the required price signal for low-carbon investments and is in urgent need of revision. Trust in the system has to be restored and a price signal to invest in low-carbon generation has to be re-established.

Backloading is an important first step, and after a long decision making process there is finally an indication of the political will to reinforce the ETS. Backloading should be followed by the establishment of a market stability reserve (MSR) in order to stabilise the market and to improve the predictability of the system. Backloaded allowances have to be transferred into the reserve instead of releasing them back to the market. Otherwise, unnecessary market turbulence would follow, as first backloaded allowances would be released to the market and then soon after withdrawn back to the reserve. Therefore an MSR should be implemented as soon as possible, preferably starting in 2017. If an early launch of an MSR[7] is not possible, backloading should be followed by a permanent set-aside of allowances.

"Backloading of emissions rights should be followed by a market stability reserve."

Additionally, based on the 2030 target, the revision of the ETS cap, i.e. the annual linear emissions reduction factor, should be implemented sooner rather than later, but at the latest from 2020 onwards.

CARBON LEAKAGE NEEDS TO BE TACKLED

Competitiveness of European industry is a genuine concern, and the success of the EU climate policy requires proper tackling of carbon leakage[8]. The carbon leakage list of industrial sectors post-2020 is central to the anti-leakage provisions in the EU ETS.

[7]MSR is a mechanism adjusting supply of emission allowances to avoid extreme oversupply or deficit situations
[8]Carbon leakage means an increase in carbon dioxide emissions in one country as a result of an emissions reduction by a second country with a stricter climate policy

As long as we lack a global regime and carbon constraint, European industry, which faces global competition, must be compensated for the cost of the European climate policy. This compensation should be handled so that the functioning of the ETS itself is not distorted. Ideally, it should be based on EU level criteria and measures using auction revenues or VAT on electricity as these revenues increase together with rising CO_2 and electricity prices. An EU level fund similarly to NER300 that has been used to finance innovative demonstration projects on RES and CCS could be one option.

The Commission's proposal for the 2030 energy and climate package indicates that it has taken competitiveness seriously. Setting an emissions reduction target only and fully exploiting the carbon market would be the way to address competitiveness concerns without compromising the climate goal.

CLIMATE CHANGE WON'T WAIT FOR BETTER ECONOMIC TIMES

We need a cost-effective, but rapid, transition towards a low-carbon energy future, as climate change won't wait for better times. Acting now against global warming is less costly than dealing with the consequences of the change later on. The carbon market and emissions trading, with its efficient and sophisticated reporting and penalty system, is an ideal tool to enable this transition and it has a triple effect: in addition to emissions reduction, it promotes the use of renewable energy sources and energy efficiency.

"A functioning CO_2 market would promote renewables and energy efficiency too."

An ambitious and clear climate policy would also improve the EU's energy security, as the CO_2 price would shift consumption from high-carbon imported fossil fuels towards domestic CO_2-free electricity and other low-carbon sources. Making energy markets function would also improve energy efficiency and thus eliminate the need for a separate energy-efficiency target.

Fortum's position on the EU 2030 climate and energy policy framework

Set a CO_2 reduction target only

Decide as soon as possible on an ambitious reduction target, at least -40%

Set a target for renewable energy for non-ETS sectors

Implement a Market Stability Reserve for ETS as soon as possible, preferably from 2017

Transfer 900 million backloaded allowances directly into the Market Stability Reserve

Increase the annual linear emissions reduction factor of the ETS as soon as possible, at the latest from 2020 onwards

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