UI brief #21
APRIL 2013
PUBLISHED BY THE SWEDISH INSTITUTE OF INTERNATIONAL AFFAIRS. WWW.UI.SE

THE EUROPEAN UNION AND THE CLIMATE CHANGE–ENERGY NEXUS

REPORT BY
GUNILLA REISCHL
Research Fellow, the Swedish Institute of International Affairs

INTRODUCTION

Climate change is the most demanding and difficult challenge the world faces today. Substantially reducing greenhouse gas emissions and securing energy supply and access for a growing population must be achieved at the same time. The climate change–energy nexus includes a number of linked issues and challenges, but also opportunities. For example, development of energy systems and energy efficiency could provide an "entry point" for addressing climate change and other pressing challenges (Global Energy Assessment 2012). In addition, the climate change–energy nexus includes a number of issues that best can be described as geopolitical. Security of energy supply is often viewed through the lens of national interests, which also affect what options there are to address climate change. In light of climate change projections and scarcer energy resources, there is a tendency to politicize energy and climate change issues. In addition, we are also experiencing a period of transformation in the form of a technological revolution that might be capable of changing geopolitical relationships. Technological advances make it possible to extract energy from unconventional sources, which may contribute to a shift among producers and consumers. Political developments also affect the supply of energy; the Arab Spring is a prominent example here. Thus, the foundations of the energy landscape are shifting.

Secure and sustainable energy supply is not a new challenge. However, the shifting foundations of the global energy system, climate change and the increasing demand for energy add to the complexity. The EU is dependent on external sources of energy, which makes it vulnerable to availability and price fluctuations. Unmanaged, these factors might have serious implications and they are inherently linked not only to the EU's competitiveness, but also to the welfare of the society. The EU needs to be able to secure supply in a changing geopolitical context and balance the goals of its climate and energy policies. These achievements need to be pursued in a world where competition over resources gets tougher and climate change constitutes a severe constraint for the energy system as it looks today. The EU has been a driving force in international cooperation on climate change, but the issue seems to have lost public and political support in light of failed climate change negotiations and economic turbulence.

This brief explores some of the most critical issues in the area of climate change and energy, and reviews the implications for the EU. Based on the review, the policy brief suggests:

- The energy landscape is changing. It is of great importance to engage new actors in a dialogue, and not to rely on old geopolitical alliances.
- The complex and interconnected issues of climate change and energy cannot be solved unilaterally, global cooperation is vital. Legitimate and effective governance needs to be a priority.
- The potential of energy efficiency must be explored further: already existing policy measures and packages give energy efficiency an important role. Implement and continue to develop policies.
- In order to advance energy efficiency, provide incentives for concrete measures, such as retrofits of old buildings and the use of best available technology.
- Provide incentives for low-carbon energy and renewable energy investments required to combat the consequences of climate change.
- Avoid further politicization of energy and climate change. Lessons could be drawn from cases where the EU has been successful in relying on its market-based approach and export of regulations to overcome politicization.
- The EU needs to regain its leadership in international climate change cooperation and press for both soft law and hard law in this context.

ENERGY TRENDS

As stated in a recent report: "Climate change adds considerable stress to our societies and to the environment. From shifting weather patterns that threaten food production, to rising sea levels that increase the risk of catastrophic flooding, the impacts of climate change are global in scope and unprecedented in scale. Without drastic action today, adapting to these impacts in the future will be more difficult and costly." (United Nations Environmental Programme 2010). Energy plays a dual role when it comes to the climate challenge. Energy could be an entry point to mitigate climate change, while unsustainable energy systems and use are the root causes of global warming. Factors that make the current energy system unsustainable include a growing global demand for energy, limited access and governance challenges, infrastructure needs, changing geopolitical alliances, and security considerations. Fossil fuels (i.e. coal, oil, and natural gas) account for approximately 85 percent of global energy consumption, renewables and nuclear make up the remaining part. The growth in solar and wind power has been enormous in recent years. However, there are significant obstacles to a more widespread utilization of these sources of energy, such as infrastructure challenges (World Energy Outlook 2012).

There are many events and developments that affect the energy landscape. The Fukushima nuclear incident in 2011 and the shale gas revolution stand out as the most important. In the aftermath of the Fukushima accident, Germany decided to decommission nuclear power by 2022, while Austria and Italy have decided not to develop nuclear power as previously planned (Energimyndigheten 2012: 14). Decommission of nuclear power might be understandable from many points of view, but it raises questions of how to compensate for this source of energy. Coal is not a feasible option for the EU member states and renewables have not reached sufficient capacity. Many observers point to natural gas as a "transitional" source of energy, as it is both cleaner and safer. The problem with gas is the access and that it is difficult to transport (Verrastro 2011).

A TECHNOLOGICAL REVOLUTION

Recent technological advances have made it possible to extract unconventional oil and gas resources. Shale gas is the most discussed topic in this context. Shale gas is natural gas stored deep underground in fine-grained sedimentary rocks. The extraction process of shale gas is commonly known as "fracking", which is hydraulic fracturing. Advocates argue that exploiting the world's potentially vast shale gas deposits will help keep energy affordable and cut consumption of dirtier coal. But skeptics claim fracking is dangerous and polluting, and that tapping into extra natural gas supplies will boost rather than reduce planet-warming carbon emissions. The most high-profile controversy surrounding shale gas is the risk for fracking to contaminate drinking water with methane or drilling chemicals (The Guardian 2012).

The consequences of the "shale revolution" are not clear. Some observers point out that this phenomenon has the potential for creating a new energy reality. The US has been able to expand on these resources and has since 2007 increased its own production and reduced its imports of natural gas (Kuhn and Umbach 2011). In some scenarios the shale revolution will make the US a global leader in oil and gas production and change its role in the global energy trade (see e.g. World Energy Outlook 2012; Verrastro 2011). Others argue that these predictions and scenarios are most uncertain, and the estimates of reserves vary widely and keep changing (Kuhn and Umbach 2011). Whatever the size of the reserves, actual rates of extraction in each region will depend on economics and politics as well as technology. The potential for a similar development in Europe is surrounded by even more uncertainty. A recent report concluded that there would be no shale gas revolution in Europe, due to factors such as higher population density and stronger environmental regulations (Deutche Bank 2011).

THE POTENTIAL OF ENERGY EFFICIENCY

The shale revolution features uncertainties and could be hugely problematic from an environmental perspective, and also have a negative impact from a climate change perspective. The challenge of creating access to clean, reliable and affordable energy is most likely not met by the shale revolution. So, what can be done to meet the challenge of reducing emissions from fossil fuels, securing energy supply

for a growing population and sustaining economic development?

In the 2012 edition of The World Energy Outlook energy efficiency is discussed as key to overcome many challenges: energy efficiency can improve energy security, spur economic growth and mitigate pollution, but current and planned efforts fall well short of tapping its full economic potential (World Energy Outlook 2012). Many of the largest energy-consuming states have adopted new policy packages and measures for energy efficiency over recent years, (e.g. China, Japan, the US, and the EU). The WEO states that "progress towards their implementation is projected to contribute to a reduction in global energy intensity (energy consumption per unit of GDP) of 1.8% a year through to 2035 in the New Policies Scenario, a major improvement compared with only 0.5% per year over the last decade. Nonetheless, a significant share of the economic potential of energy efficiency remains untapped" (World Energy Outlook 2012).

According to the Global Energy Assessment, necessary changes will require significant investment in new energy infrastructure, major improvements in energy efficiency (particularly in the building and transport sectors), decarbonization of fossil-fuel based energy systems, and investment in the development and use of renewable energy sources. The GEA analysis indicates that a rapid transformation to clean energy technologies would require an increase in annual investments from present levels of approximately USD 1.3 trillion to USD 1.7 trillion, about two percent the world's gross domestic product. The difference corresponds roughly to the current energy subsidies that are often impeding the needed transformational change (Global Energy Assessment 2012).

According to these influential studies, energy efficiency has a huge potential in, if not overcoming these problems, at least helping us to a transition towards a more sustainable path. However, to accomplish this there is a need of political will. Many of the policy packages and measures that have been adopted by the largest energy consuming countries put energy efficiency in a prominent place. However, so far little real progress has been achieved. Therefore it seems vital to put policy into practice and start to tap into the promising field of energy efficiency to help societies to achieve a more climate friendly path.

THE EU AND CLIMATE CHANGE AND ENERGY NEXUS

The projected consequences of climate change are grave indeed. Despite the seriousness of the problem, cooperation to mitigate and adapt to the consequences of climate change faces difficulties and rifts among countries. The EU has played a progressive role in international cooperation on climate change. However, this leadership appears to have been weakened, and Europe's turbulent economic situation has reduced ambition and the priority given to climate change.

The EU has developed a large body of legislation, policies, action plans and other instruments in the areas of climate change and energy. One important part of the EU's climate and energy policy is the 2020 Climate- Energy Package, a set of binding legislation which aims to ensure the European Union meets its ambitious climate and energy targets for 2020. These targets, known as the "20-20-20" targets, set three key objectives for 2020: a 20% reduction in EU greenhouse gas emissions from 1990 levels; raising the share of EU energy consumption produced from renewable resources to 20%; and a 20% improvement in the EU's energy efficiency. This is said to represent an integrated approach to climate and energy policy that aims to combat climate change, increase the EU's energy security and strengthen its competitiveness (European Commission 2012). Achieving these goals will, however, be difficult. In 2009, 52 percent of the total EU energy production was produced by fossil fuels and 18.3 percent by renewable energy. Nuclear power plays an important role in the energy mix. But as mentioned above, after Fukushima in 2011 some member states decided to decommission nuclear power (European Commission 2012).

The 2020 Climate- Energy Package was adopted in 2007 in order to integrate energy and climate change

policies. It was also decided that the EU's energy policies should rest on three pillars: sustainability, competition, and security of energy supply. Today, the focus of the EU's energy policy has to some extent shifted from climate change and development of the internal market towards security of energy supply and infrastructure (Energimyndigheten 2012). The 2020 Climate-Energy Package gives energy efficiency a prominent role, but there has been little progress and energy efficiency has remained a subordinated priority. There is a need for more stringent efforts. Measures such as retrofits of old buildings, use of the best available technology in industry, and stringent codes for new buildings are all economically viable and feasible with existing technologies (World Energy Outlook 2012, Europe's World 2013: 106). There is great potential in increasing energy efficiency, and there are both short- and long-term economic benefits to be gained. There are also opportunities for a worldwide advance in related technology and patents, and for new domains of excellence and export worldwide (Behrens and Egenhofer 2011: 231). Unfortunately, the EU appears to be falling behind in constructing a more comprehensive and integrated approach to energy policy (Birchfield and Duffield 2011: 272).

THE EU'S EXTERNAL ENERGY RELATIONS

Even though energy policy is one of the most central issues for the EU, it is not the most successful field of EU-cooperation. The energy policy field is still quite fragmented within the EU with a complex pattern of different goals, such as market integration, infrastructure, energy efficiency, renewable energy and the relation to external energy producing countries and transit countries. The external relations are extremely important to the EU, in particular in light of growing import dependency.

However, the EU has not been able to take a strong role in its external energy relations. The lack of coordination among member states and between the EU's energy policy and security policy is viewed as deeply problematic. Within the EU, there are a number of different perspectives on the more general direction of the EU's energy policy, whether to focus on security of supply or competitiveness and sustainability. Some member states stress the importance of issues of extraction and transport of fossil fuels, and the need for diversification to give the EU leverage against producer countries. Infrastructure is also an important question in this context, e.g. investments in the Southern corridor as a potential strategy for diversification. Other member states emphasize that the issue of security of supply is a question of becoming less dependent on imported fossil fuels. From this perspective integrated, well-functioning markets, energy efficiency and investments in renewable energy are crucial for achieving security of supply (Council of European Union 2011).

The EU is affected by many factors, but some challenges stand out as particularly relevant. The EU's dependency on Russian natural gas is central for understanding the EU's external actions. The relationship between Russian foreign, security and energy politics is quite apparent and the gas crises in 2006 and 2009 exposed the vulnerability of a number of EU member states. Russia views energy export as a power tool, which has been used quite frequently, even though not always as an effective instrument. Russia continues to be a big supplier of energy to the EU, and will be even more so when the gas pipeline South Stream has been built. However, it is not clear if it will be so to the same extent from a longer perspective. The uncertainty hinges on problems with investments by Russia, and on how the politics might develop (Energimyndigheten 2012).

Despite the tensions, it is important to understand the EU-Russia relationship as interdependent, i.e. Russia depends on European customers in the same way the EU depends on Russia for energy supply. Some analysts suggest market-based solutions as a promising way to overcome or avoid politicization in this area. According to these views the EU could provide a model for market integration, which is one of the EU's fortes. It is vital to export this model through market integration and rules, in the first instance to candidate countries and countries in the energy community (European Commission 2011). This could lead to closer partnerships with Russia and other actors. Many of the existing energy partnerships have a market integration perspective. However, these need to be made tangible by real projects, e.g. the project of producing solar energy in Sahara (Energimyndigheten 2012).

In light of climate change, growing European import dependence, increased international competition for energy, and energy markets marked by economic and political turbulence, it is imperative that the EU take a stronger role on the international arena. The internal coordination in these areas needs to be strengthened. The EU needs to speak with one voice in climate change negotiations, with producer and transit countries and other actors. Climate change and energy security cannot be looked at through the lens of narrow, national interests.

PROBLEMS AND PROSPECTS

This brief has reviewed some of the most important trends in the climate change–energy nexus. There is an apparent tension between securing energy supply and combating climate change, which is reflected both at the global level and at the EU level. Most analysts agree that climate change must be addressed, the current energy system is unsustainable, and global cooperation is needed to tackle these problems. But at the same time, most countries prioritize economic growth and achieving energy security at the lowest possible cost, even when there are severe risks of environmental degradation. Furthermore, global cooperation processes on issues related to the climate change-energy nexus are rarely leading to concrete results. Technological advances have made the shale gas revolution possible. The result might contribute to a transformation to cleaner energy, but not to a reduction of fossil fuels. But it gives rise to cautious optimism regarding what could be achieved through technological development. As mentioned above, development of a new energy infrastructure and improvements of energy efficiency have huge potential in, if not overcoming these problems, at least helping us to a transition towards a more sustainable path. However, to accomplish this there is a need of political will to make the necessary investments. There are difficult challenges ahead, but they could be turned into opportunities, if approached wisely.

REFERENCES

Behrens, Arno and Egenhofer, Christian, 2011. Rethinking European Climate Change Policy. In: Birchfield, Vicki L. & Duffield, John S. (eds.), 2011 *Toward a common European Union energy policy: progress, problems, and prospects.* 1st ed. New York: Palgrave Macmillan

Birchfield, Vicki L. & Duffield, John S., 2011. Taking Stock of the EU Energy Policy: Problem, Progress and Prospects. In: Birchfield, Vicki L. & Duffield, John S. (eds.). *Toward a common European Union energy policy: progress, problems, and prospects.* 1st ed. New York: Palgrave Macmillan

Council of European Union, 2011. Council Conclusions 4 February 2011. EUCO 2/1/11

REV 1. Brussels. Avaiable at: http://register.consilium.europa.eu/pdf/en/11/st00/st00002-re01.en11.pdf. Accessed 23 January, 2013.

Deutsche Bank, 2011 European Gas: a First Look at the European Prospects. Available at:

http://www.shalegas-europe.eu/en/docs/Deutsche_Bank_Report.pdf. Accessed 15 January 2013.

Energimyndigheten, 2012. Globala enerigfrågor och svensk säkerhetspolitik. ER 2012: 16. Statens Energimyndighet.

European Commission, 2011. On security of energy supply and international cooperation - "The EU Energy Policy: Engaging with Partners beyond Our Borders". COM(2011) 539 final. Brussels, 7.9.2011. Available at:

http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2011:0539:FIN:EN:PDF. Accessed 23 January, 2013.

European Commission, 2012. The EU climate and Energy Package. Available at:

http://ec.europa.eu/clima/policies/package/index_en.htm). Accessed 15 January 2013.

Europe's World 2013. Europe's energy crossroad is dangerously close. Europe's World, 23, Spring 2013.

Global Energy Assessment, 2012. Global Energy Assessment - Toward a Sustainable Future, Cambridge University Press, Cambridge, UK and New York, NY, USA and the International Institute for Applied Systems Analysis, Laxenburg, Austria.

The Guardian, 2012. Shale Gas and Fracking. Available at:

http://www.guardian.co.uk/environment/2012/apr/17/shale-gas-fracking-uk. Accessed 24 January 2013.

Kuhn, Maximilian and Umbach, Frank, 2011. Strategic Perspectives of Unconventional Gas. EUCERS Strategy Paper, volume 010101.

United Nations Environment Programme, 2010. Climate Change. Working Paper. Paris: UNEP

Verrastro, Frank, 2011. The Role of Unconventional Oil and Gas: A New Paradigm for Energy. Center for Strategic and International Studies. Washington. Available at: http://csis.org/files/publication/120417_gf_verrastro.pdf. Accessed 22 January 2013.

World Energy Outlook, 2012. International Energy Agency. Paris: OECD/IEA.

UI Occasional papers

WOULD YOU LIKE TO KNOW MORE ABOUT UI?

The Swedish Institute of International Affairs (UI) is an independent platform for research and information on foreign affairs and international relations.

The institute's experts include researchers and analysts specialized in the field of international affairs. While maintaining a broad perspective, research at UI focuses on unbiased scientific analysis of foreign and security policy issues of special relevance to Sweden. UI as an organization does not take a stand on policy issues.

The UI research department produces a number of publications to facilitate engagement with policy and research communities in Sweden and beyond. Each type of publication is subject to an in-house planning and approval process including quality control. UI Occasional Papers are reviewed by senior staff at the institute. They solely reflect the view of the author(s).

Please contact our customer service, or visit our website: www.ui.se, where you will find up-to-date information on activities at the Swedish Institute of International Affairs (UI). Here you can also book event tickets, become a member, buy copies of our magazines, and access research publications. Also, join us on Facebook! You can get in touch with us through email: **info@ui.se** or **+46-8-511 768 05**

SWEDISH INSTITUTE OF INTERNATIONAL AFFAIRS
Visiting Adress: Drottning Kristinas väg 37, Stockholm
Postal Adress: Box 27 035, 102 51 Stockholm
Phone: +46 8 511 768 05 Fax: + 46 8 511 768 99
Homepage: www.ui.se