Dialogue on a RES policy framework for 2030

towards2030

Work Package 6

Summary Report

The Overall Climate & Energy Framework

November 2016

A report compiled within the European IEE project **towards2030**-***dialogue***

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About the project

The aim of **towards2030-*dialogue*** is to facilitate and guide the RES policy dialogue for the period towards 2030. This strategic initiative aims for an intense stakeholder dialogue that establishes a European vision of a joint future RES policy framework.

The dialogue process will be coupled with in-depth and continuous analysis of relevant topics that include RES in all energy sectors but with more detailed analyses for renewable electricity. The work will be based on results from the IEE project beyond 2020 (www.res-policy-beyond2020.eu), where policy pathways with different degrees of harmonisation have been analysed for the post 2020 period. **towards2030-*dialogue*** will directly build on these outcomes: complement, adapt and extend the assessment to the evolving policy process in Europe. The added value of **towards2030-*dialogue*** includes the analysis of alternative policy pathways for 2030, such as the (partial) opening of national support schemes, the clustering of regional support schemes as well as options to coordinate and align national schemes. Additionally, this project offers also an impact assessment of different target setting options for 2030, discussing advanced concepts for related effort sharing.

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This report

Presents summaries of the Issue Papers produced under Work Package 6 'The Overall Climate & Energy Framework'

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See individual summaries

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1 Introduction

This report presents summaries of the Issue Papers produced under Work Package 6 of the Towards2030-dialogue project.

Work Package 6 – 'the overall climate and energy framework' – considers the broader context for EU renewables policy, assessing how selected external developments impact EU renewables policymaking. The topics covered by the work package are as follows:

- Global prospects for fossil fuels, with special reference to CCS and resource rents;
- The role of nuclear power in the EU, covering the current status, outlook, and planned support schemes;
- Climate change policy outside the EU, focussing on carbon pricing in China and the US;
- The evolving carbon price in the EU ETS;
- Global renewable energy source (RES) deployment and cost reductions;
- Interactions between renewable support and climate policies;

In addition, at the Commission's request, the first issue paper produced by Work Package 6 addressed the issue of 'How can renewables and energy efficiency improve gas security in selected Member States'.

The Issue Papers can all be downloaded from the T2030-dialogue project website: http://towards2030.eu/.

The Work Package also produced a Policy Brief which looks at the implications of four of the above topics (global fossil fuel prospects; nuclear; non-EU carbon pricing; and global RES cost development) for the role of RES in achieving the EU's specific climate and energy objectives. This is also available on the project website.

The remainder of this report presents the individual Issue Paper summaries.

2 Issue Paper Summaries

2.1 Global prospects for fossil fuels and CCS

Jaap Jansen (ECN); October 2016

Results of the review of IEA's fossil-fuel related projections in successive World Energy Outlook projections suggest that these – not unlike those of other official purveyors of projections on global energy and energy-related greenhouse gas emissions such as IPCC and EIA – tend to exaggerate inertia in future trends with respect to recent historical trends. E.g. the evolving central scenario is rather slow in integrating disruptive factors in the current and prospective global fossil fuel markets. These are for coal the world-wide rising public opposition against the use of coal for power generation, prompted by — notably urban — air pollution as well as climate change. Furthermore, current central scenario projections of IEA tend to miss the rising momentum for a take-off of oil-replacing technology in road transportation.

International energy policy advisory agencies such as prominently the IEA project that fossil fuels will keep on commanding a dominant role in the world energy mix until well beyond 2050. The implication is that these agencies foresee that a large roll-out of carbon capture and storage (CCS) for fossil-fuelled power generation will be an indispensable component of an effective strategy to avoid catastrophic climate change. Therefore we have set out to assess recent work of major contributors to work of the International Panel on Climate Change, IPCC, and the IEA on the issue of carbon capture and storage (CCS). We reviewed information on inter alia projected unit cost of fossil-based electricity with application of CCS and the associated projected cost per tonne of CO2eq. avoided. Our findings suggest that policy makers cannot take this information for granted. Underlying assumptions on incremental investment and operating costs as well as future cost reduction would seem overly optimistic. In combination with the bleak prospects for coal, we foresee the chances of a wide-scale take-off of CCS for coal-fired power plants to be very small indeed. Moreover, the summary cost information presented by IPCC and IEA to policy makers tends to be rather partial in nature. Typically this information is based on GHG emissions originating from electricity generation at the premises of the power plant only. Fugitive methane emissions in, notably but not only, the natural gas supply chain take on large proportions. Conservative estimates surrounded by large uncertainty suggest that, world-wide, on average fugitive methane emissions along the natural gas supply chain occur on the order of 2%-3% of natural gas production. In a carbon-constrained world the long-term prospects for natural gas are largely dependent on (1) whether the fugitive methane emissions issue will be credibly measured and adequately addressed (2) on acceptable cost performance of CCS power technology applied to natural gas fired power plants and (3) public acceptance of CCS which inter alia depends on proven reservoir integrity. All in all, our findings are that the long-term prospects for use of CCS in fossil fuel plants look appreciably less bright than outlined by the IPCC and IEA.

The key arguments that reduction of EU demand for oil and gas has benign impacts for global sustainable development relate to a suite of externalities. These include notably reduced global climate change externalities, reduced local environmental externalities along the global fossil-fuels supply chains and reduced (geo)political stability externalities though reduced resource rent creation in oil and gas producing countries. World-wide the EU trading block is a very large net importer of fossil fuels, among which foremost crude oil and natural gas. We have made an assessment of the geopolitical externality associated with the high EU import dependency with regard to crude oil and gas, based on case studies of two foremost external producer countries, Russia and Saudi Arabia. **A key conclusion for EU energy policy making is that the resource rent created by European demand for oil and natural gas has negative externalities regarding the internal political and economic stability in oil and gas producing countries and negative wider geopolitical externalities.** By sheer weight of the EU trading block the resource rent of EU demand for fossil fuels is further amplified by its impact on global fossil fuel prices. Higher fossil fuel prices will, in turn, also negatively affect the terms of trade for the EU in its overall external trade portfolio. Furthermore, dwindling resource rents tend to strengthen the drivers in oil & gas exporting countries as well to introduce reforms towards genuinely sustainable development of their entire population. Their reduced capacity to control constituencies through windfall resource rent revenues makes autocratic regimes more receptive towards introducing rational economic restructuring and investment reforms, among others to harness the potential benefits of foreign trade. Moreover, it forces autocratic governments to be more receptive to the demands of fledgling grass-root civil rights movements and ethnic minorities in rentier petro states.

Table 1 below summarizes in a highly stylised, qualitative fashion, major impacts of global energy and notably fossil fuel demand trends on the performance regarding the EU climate and energy framework criteria.

Medium/long-run global trends	EU climate and energy perspective			
	Achieving a low-carbon economy	Competitiveness of the EU economy	Economic growth and job opportunities	Energy security / Reduced import dependence
Sustained global energy growth + high oil/gas/coal in the global energy mix + strong take-off of CCS + modest growth renewables share	**-/-** (CCS inadequate)	**-/-** (EU is large net FF importer)	**-/-** (Worsening terms of trade)	**-/-** (exposure to fuel price risk and geopolitical risk ↑)
Lacklustre global energy growth + marked decline coal and oil demand + weak growth nat. gas demand + modest take-off of CCS + strong growth of renewables share in world energy mix	**+/+** (RES + EE ↑)	**+/+** (EU has poor fossil fuel endowments + much better opportunities in RES and EE areas)	**+/+** (EU has more opportunities to build comparative advantage in EE + RES technology and implementation	**+/+** (exposure to fuel price risk and geopolitical risk ↓)

Table 1 A qualitative comparative assessment of impacts of the IEA's WEO2015 global energy central scenario and a global energy scenario consistent with this paper's normative back-casting perspective on the performance regarding the EU climate and energy framework criteria

For the full issue paper see:

http://towards2030.eu/sites/default/files/Towards2030-dialogue%20Issue%20Paper%20on%20Global%20prospects%20for%20fossil%20fuels-with%20special%20reference%20to%20geopolitical%20externalities%20and%20CCS-Issue%20Paper%20%239%202016.pdf

2.2 The role of nuclear power in the EU

Christoph Zehetner, Lukas Liebmann, Gustav Resch (TU Wien / EEG); November 2015

While there is a wide consensus about the necessity to reduce greenhouse gas emissions, the European Union is still divided on the appropriate technologies to reach that target. Renewable energies (RE) and nuclear power are both classified as low carbon energy technologies, characterised by zero to low carbon emissions within their use. The question of whether to use renewables or nuclear power to achieve climate goals is highly controversial.

As of today, nuclear power plays a significant role in the European power system and provides more than one quarter of the EU's electricity supply and accounts for approximately one eight of the EU's gross inland energy consumption. The outlook for the future development of nuclear power in the EU is quite diverse. The vast majority of the European nuclear reactors have been built before 1990 and therefore, the average reactor age is already above 30 years (Schneider et al. 2014). Despite plans of some European countries to develop and build new reactors it appears unlikely, that they can compensate the shutdown of old reactors, which reach the end of their life time, and the politically decided phase out of nuclear power in Germany and other European Member States. Lifetime extension of old reactors, which are very common in Europe, can postpone this development, but without further investments in new reactors the proportion of nuclear power in the European energy mix will diminish. While today (2015) about 120 GW nuclear power plants are operable, a drop below 20 GW can be expected by 2043 if the technical lifetime and political decisions are considered.

When nuclear power was first used for electricity production it was accompanied by high expectations: there was a hope for a cheap, clean and safe technology which would produce enough energy for economic growth and avoid the need for smog-producing coal plants. Since that time major accidents and the still unsolved question of what to do with radioactive waste have challenged the dogma of a safe and clean technology. Lately, also the nimbus of nuclear power being a cheap source of energy has, at least in Europe, severely been threatened by massive cost increases of the currently constructed power plants in Flamanville (France) and Olkiluoto (Finland). Over the last two decades nuclear power and renewable energies have faced opposite developments in the total electricity generation cost. While renewable technologies have seen a steady decline in electricity generation cost due to technological learning and the fast deployment all over the globe, nuclear power has experienced the opposite. Already today some renewable technologies, especially solar PV, biomass and onshore wind power, can compete with nuclear power on a cost level in all European countries. This fact was underlined with the publication of the support scheme for Hinkley Point C, which is more expensive than comparable support schemes for certain renewable technologies.

Another advantage of renewable technologies over nuclear technology is their comparatively short construction time. The enormous number of new installations of solar PV plants and onshore wind farms over the last two decades led to a knowhow gain and standardized construction processes. Nowadays, the average construction time of solar PV plants and onshore wind farms is around one year (IEA, 2015). These short construction times and the small, modular character of renewable energies allows for a flexible, quick adaptation to a changing power demand and a manageable project risk.

Finally, it has to be questioned if nuclear power fits to the existing climate and energy targets of the EU. Until 2030 a 27% share of renewable energies in gross final energy demand shall be reached (European Commission, 2014), which implies an even higher target for renewables in the electricity sector: according to recent studies (e.g. (Knopf et al., 2015) a renewables share in electricity demand of about 50% corresponds to the overall 2030 RES target. Even though nuclear power is able to contribute to the decarbonisation of the electricity sector, it is not an appropriate complimentary technology for an electricity system that builds massively on renewables. The variable nature of renewable energies demands for complimentary technologies that are flexible and dispatchable, as they have to ramp up and down relatively quickly in order to balance generation and demand at any given moment. Nuclear power plants in particular are considered as base load units and do not easily ramp up and down instantaneously.

For the full issue paper see:

http://towards2030.eu/sites/default/files/The%20role%20of%20nuclear%20power%20in%20the%20EU.pdf

2.3 Climate change policy outside the EU: the role of carbon pricing

James Rawlins (ECN); March 2016

Carbon pricing schemes are being considered or implemented in a range of countries outside the EU. Around 40 countries and 20 sub-national regions are putting a price on carbon. The introduction of such schemes has implications for renewables policy in the EU, because of potential interactions with the goals of EU renewables policy: decarbonisation, competitively priced energy, growth and jobs, and security of supply). These occur in various ways, for example, the introduction of carbon pricing schemes in major trading partners of the EU creates a more level playing field for EU industry, reducing the competitive advantage of firms whose home markets were not subject to carbon pricing (this also is likely to reduce lobbying against carbon pricing in the EU); carbon leakage is reduced; renewable energy and other low carbon technology development is boosted by increased global demand, lowering the costs of decarbonisation for the EU; and global demand for fossil fuels is reduced, easing supply challenges. A number of factors determine the degree to which non-EU carbon pricing schemes impact the EU. The most important are the level of pricing that exists in the scheme, and the proportion of national emissions that are covered by the scheme. A scheme with a low price, or which covers only a small proportion of emissions, will be less impactful, and less relevant to the EU. Other important aspects are the level of compliance, and the strength of political support for a scheme.

The evolution of the carbon pricing schemes in China and the US is of particular importance to the EU. These two countries account for almost 40% of global emissions, receive 25% of EU exports and provide 28% if its imports. They also make interesting and complementary case studies, as they represent very different states of development and political systems.

China is moving quickly from a standing start on carbon pricing. There are 7 carbon trading pilot schemes in operation across the country (covering five cities and two provinces), which were approved in 2011 and commenced trading between June 2013 and June 2014. It is currently planning the introduction of a nationwide emissions trading scheme, now scheduled for 2017. The pilot schemes cover around 1.2bn tonnes of CO2, making them the second largest scheme in the world, after the EU ETS. Prices so far in the Chinese pilots have been low, at below 5 USD per ton, and trading levels have been relatively light.

The US has a long and successful history of the use of emissions trading (starting with sulphur dioxide), and has two sub-national schemes in place (in California, and in the nine north eastern states covered by the Regional Greenhouse Gas Initiative), but the prospects for the implementation of a nationwide scheme are highly uncertain, as there is very strong political opposition to carbon pricing schemes in many Republican states, and also in Congress. President Obama's flagship domestic climate change initiative, the Clean Power Plan, contains provisions to encourage and enable states to use carbon pricing as a mechanism, but it remains unclear how widely these will be adopted and to what degree they can pave the way for a national scheme.

How the carbon pricing schemes evolve in these two countries will be determined by a range of 'enabling factors' that will influence the pricing levels seen and the extent of scheme coverage. The most important of these factors are: the overall level of ambition in national climate policy; the strength of political support for carbon pricing at the national level; the country's prior experience with market mechanisms and the capacity of domestic financial institutions; the level of transparency and data reliability; and the degree of alignment between broader economic policymaking and use of market mechanisms.

The relative strength of these factors in China and the US is very different. Both China and the US have sufficient overall climate policy ambition to support effective carbon pricing. But where China has made very strong statements about the launch of its national scheme (including in 2015's joint Presidential statement with the US), the US is far from able to do the same, given domestic opposition. Strong political support however does not mean that the resulting scheme will be effective, which is influenced by the other factors. And here, the US is in a much stronger position: it has successful prior experience with market mechanisms; it has world class financial institutions; it already publishes transparent and robust emissions data at the facility level and at the national level; and the state does not intervene in energy pricing. China faces considerable challenges on these issues. It has not used market mechanisms at the national level, and the track record in the carbon trading pilots is mixed. It financial sector lacks capacity and has relatively weak legal and regulatory standards. Emissions data at both national and facility levels are of inconsistent quality and transparency is low. Finally central price setting in energy and other industries poses a challenge for the functioning of a carbon market.

Against this backdrop, it is hard to predict how carbon pricing will evolve in either China or the US. One country has given strong political commitment to launching a national scheme (and few would doubt that it will do so), but faces substantial challenges in making its scheme effective, while the other has all the necessary ingredients of a successful national carbon pricing scheme except the political space to make it happen. In China the main uncertainty (that is relevant to the EU) is therefore about how pricing will evolve. In the US, the uncertainty also extends to whether or not a national scheme is put in place, or whether the current 'patchwork' approach continues. In neither country does a wholesale retreat from the use of carbon pricing seem likely, and thus at least moderate growth in the role of carbon pricing can be expected.

The introduction of meaningful carbon pricing schemes (in terms of price and coverage) in key trading partners of the EU (especially China and the US) has generally positive implications for the EU's climate and energy policy. It supports the decarbonisation of the global economy, and limits the potential for carbon leakage. It creates a more level playing field for EU industries, which reduces the incentive for lobbying against further decarbonisation in the EU, and makes the passage of ambitious climate policy easier. The inclusion of carbon pricing in the energy prices faced by firms in overseas trading partners makes EU energy pricing more competitive (to the extent that prices are equivalent). Higher carbon pricing supports innovation in low carbon technologies, contributing to further cost reductions in low carbon technologies. Increased global demand for low carbon technologies, resulting from expanded carbon pricing outside the EU, creates growth opportunities for EU technology firms (though it may also strengthen their international competitors). Demand for fossil fuels should reduce as low carbon sources are made more attractive by carbon pricing. This may increase their availability for the EU, though it may increase competition for 'transition' fuels such as natural gas.

The use of carbon pricing looks set to grow, not only in China and the US, but in many other countries too. These are positive developments for the EU. They should make it easier for the EU to achieve the goals of its climate and energy policies, and thus are supportive of continued ambition in EU climate policymaking.

For the full issue paper see:

http://towards2030.eu/sites/default/files/Carbon%20Pricing%20Outside%20the%20EU.pdf

2.4 The evolving EU ETS carbon price

Cristina Peñasco, Pablo del Río (CSIC); October 2015

The price signal is a main element in the decarbonisation strategy of the EU. However, as a quantity-based climate policy instrument, the level and trends in carbon prices are difficult to know a priori. There is significant uncertainty over future carbon prices. The aim of this issue paper is to identify plausible carbon prices in the EU ETS in the short and medium term (2020 and 2030) using different information sources.

Therefore, we rely on four different sources of information:

I) *Expert surveys*.
II) *Endogenous results from models*.
III) *Input in models*.
IV) *Forward prices*.

The different approaches show quite different levels of carbon prices expected in 2030 and beyond, and also different trajectories of those prices, even within a single approach (i.e., endogenous modeling). These approaches are hardly comparable, given the different data and information sources they rely on and the frequently different timeframes considered. However, plausible ranges can be inferred. These ranges are arguably very wide (see Table 2 below). Furthermore, they refer to € for different years. Therefore, they have to be taken with caution. It seems clear that the carbon prices in expert surveys and forward markets can hardly encourage the uptake of the more expensive renewable energy technologies, whereas the upper part of the range in the other two sources of information would do so.

Method	Timeframe		
	2020	2030	2050
(I) Expert surveys	10.8 – 16.8	18	-
(II) Endogenous results from models.	0 - 200	11 - 250	30-1200
(III) Input in models	15 – 35	25 - 95	-
(IV) Forward markets	9	-	-

Table 2 Plausible EU ETS carbon price ranges in different timeframes and different methods (€)

For the full issue paper see:

http://towards2030.eu/sites/default/files/The%20evolving%20EU%20ETS%20carbon%20price%20-%20Issue%20paper%20%2310.pdf

2.5 Global RES deployment and cost reductions

Francesco Dalla Longa (ECN); December 2015

This paper elaborates on the effects of global deployment of renewable electricity production technologies on the 2030 EU energy policy objectives of GHG emissions reduction, competitiveness and energy security. The main focus is on the evolution of production costs of wind and solar technologies on a global scale, and its possible impact on the 2030 goals.

In the last decade a rapid growth in installed capacity is observed for both wind and solar technologies. Photovoltaics has surpassed the 175 GW threshold in 2014, while Concentrating Solar Power, a still emerging technology, has reached 4 GW in the same year. Similarly Onshore Wind has grown to 350 GW in 2014, while its emerging counterpart, Offshore Wind, has reached 8 GW in the same year. Europe is the leading economy in terms of installed RES capacity, with the North American and Asian markets quickly catching up. Interestingly the deployment of Offshore Wind has virtually only occurred in Europe, with the Asian market just starting to emerge.

The increasing levels of global deployment of Photovoltaics are accompanied by a steady reduction in production costs, mainly driven by technology learning. For wind technologies, while a similar overall costs trend can be observed, during the first decade of the 21st century externalities such as high oil prices and high steel prices have put upward pressure on the production costs.

The deployment and cost reduction trends are expected to continue in the period leading to 2030. These trends will likely lead to lower RES costs, the development of (breakthrough) technological innovations and the application of novel targeted regulation schemes on a global scale. This in turn will facilitate the deployment of a wider range of low-cost, low-carbon technologies in the EU, thereby having a positive impact on the achievement of EU 2030 energy policy objectives.

Finally we observe that policy at EU and global level can have a significant influence (positive as well as negative) on global RES cost reduction and deployment trends. In particular policy measures targeted at supporting technology innovation, and creating stable and transparent regulatory frameworks for RES investments will both help RES technologies move forward along the learning curve. A proactive attitude by policy makers in these areas is therefore key to unlocking the full potential benefits of global RES deployment.

For the full issue paper see:

http://towards2030.eu/sites/default/files/Towards2030-dialogue%20Issue%20Paper%20on%20Global%20RES%20and%20Technology%20Learning%20-%20Issue%20Paper%20%2312.pdf

2.6 Analysis of interactions between renewable support and climate policies

Vicki Duscha, Anne Held (Fraunhofer SI), Pablo del Rio (Consejo Superior de Investigaciones Cientificas); April 2016

The EU climate and energy policy landscape is characterised by a combination of instruments to reach the EU 2020 and 2030 targets. This combination might be necessary in order to tackle different market failures and to meet different policy goals. However, while needed, a combination of instruments is not a panacea and generally leads to conflicts due to the interactions between the instruments. As those interactions can be considered an inherent feature of the climate policy mix in the EU, their analysis is required in order to mitigate conflicts and design consistent policy packages. Some of the most relevant interactions between RES-E support and a wide array of other climate and energy policies in the EU have been analysed qualitatively considering different economic variables and economic assessment criteria.

Major interactions exist between renewable energy support and the EU emissions trading scheme (EU ETS), but also between renewable energy support and the Energy Efficiency Directive. With regard to the EU ETS and renewable support, effectiveness of both instruments is found to be strengthened in a combined application. However, efficiency, support costs, distribution of costs and acceptance can be negatively affected from a combined application. In case of interactions between RES-support and the energy efficiency directive, again effectiveness is strengthened. Effects on efficiency and policy costs are minor; however, the distribution of costs is heavily affected. The existence of a RES support system is likely to increase the acceptance for the energy efficiency directive as higher energy prices increase the competitiveness of energy efficiency measures.

Other policies analysed in this paper show a very limited interaction with renewable energy support, such as the support for CCS from the NER 300 reserve or the Energy Performance of Building Directive. Our analysis suggests that the results of the interactions are not only policy-specific, but also depend on the choice of instruments and their specific design elements. This allows policy makers to choose design elements helping to limit the negative interactions or to support positive interactions if possible. A precondition is, a proper ex-ante coordination of the instruments and also of the targets. Analysing interactions of instruments and targets at the overall system level is left for further research.

For the full issue paper see:

http://towards2030.eu/sites/default/files/Analysis%20of%20Interactions%20between%20Renewable%20Support%20%26%20Climate%20Policies.pdf

2.7 How can renewables and energy efficiency contribute to gas supply security in selected Member States?

Borbála Tóth, Adrienn Selei, László Szabó, Péter Kaderják (REKK);
Gustav Resch, Lukas Liebmann, Christoph Zehetner (TU Wien / EEG);
Jaap Jansen, Piet Boonekamp, Bronia Jablonska (ECN);
Mario Ragwitz, Sibylle Braungardt (Fraunhofer ISI); November 2014

The first issue paper produced by the T2030 project seeks to identify recent trends in natural gas use and import dependencies in 12 vulnerable EU Member States (Bulgaria, Czech Republic, Estonia, Croatia, Latvia, Lithuania, Hungary, Poland, Romania, Slovenia, Slovakia, and Finland) and to analyse the potential to reduce insecurity of external gas supplies of these countries in the short and longer term up to 2030. In doing so, the potential contribution of renewables and energy efficiency to reduce gas import dependency are assessed. Two reasons underline the importance of this assessment: first gas-based energy services currently play an essential societal role in most of the focus countries, whilst secondly the lion's share of their gas imports tends to be pipeline gas from Russia. In short term, no easy alternatives are at hand rendering these countries vulnerable to serious gas supply risks.

The applied methodology was a coordinated modelling assessment in which European energy efficiency and renewable policies are integrated with two potential gas market development scenarios, differing only with regard to the level of gas contract re-negotiations with the Russian supplier.

The results of this model based assessments could be summarised as follows:

- Energy efficiency measures can reduce the gas demand of the assessed Member States on the eastern border of the EU by 14 % while resulting in average net savings of € 3.5 billion per year.
- A strong deployment of renewables as anticipated in the alternative policy scenarios leads to increases in system costs and support expenditures at EU-28 level but for the assessed 12 Member States this may even lead to savings in support expenditures for renewables in range of € 2.0-2.1 billion per year in the period post 2020, which is mainly due to improved framework conditions (i.e. removal of non-economic barriers).
- The increase in renewables and energy efficiency comes along with benefits related to Europe's trade balance due to a (significantly) decreased demand for fossil fuels and related imports from abroad. Thus, natural gas demand can be reduced by more than 20% in the assessed countries.
- From the detailed gas market modelling we can conclude that it seems feasible to reduce Russian dependency on natural gas supply to a very low level without causing skyrocketing natural gas prices in any of the EU member countries.
- Security of supply benefits of the EU renewable and energy efficiency policies can only be achieved, if the infrastructure development policy of the EU is realised in a consistent manner – this concerns in particular the gas infrastructure but also the power grid.
- There are important impacts not only on the 12 Member States as results show, but also on the whole EU. This means that there are important drivers for a general EU involvement, opening up opportunities to achieve a win-win situation for all European countries in the case of a coordinated intervention.

For the full issue paper see:

http://towards2030.eu/sites/default/files/Towards2030-dialogue%20Issue%20Paper%20on%20the%20Contribution%20of%20Renewables%20and%20Energy%20Efficiency%20to%20Gas%20Security%20-%20Issue%20Paper%20No%201%202014.pdf