



CONSEIL FRANÇAIS DE L'ÉNERGIE
WORLD ENERGY COUNCIL

3rd European Energy Forum

What policy measures for energy transition in Europe?

Paris, 24-25 April 2014

CONSEIL FRANÇAIS DE L'ÉNERGIE
COMITÉ FRANÇAIS DU CONSEIL MONDIAL DE L'ÉNERGIE



2030

FRAMEWORK for CLIMATE & ENERGY
#EU2030

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3rd European Energy Forum

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Thursday

24 April

▶ **Session I:**

**EUROPEAN ENERGY POLICY TO SUPPORT
TRANSITION**

▶ **Session II:**

CO₂ FRAMEWORK AND EMISSION TRADING SYSTEM

▶ **Session III:**

ENERGY SECURITY AND CAPACITY MECHANISMS

Welcome and introduction

Olivier Appert, Chairman of the Conseil Français de l'Énergie



Good morning and welcome to Paris. As Chair of the French Energy Council, it is a pleasure for me to open this Forum – the third WEC Forum to be organised in Paris. The focus of this Forum will be European energy policy to support transition. This is a topical issue, with more and more people criticising European energy and environment policy, in particular the 3x20 directive. Some have even stated that this is a triple failure: a failure on energy security, a failure on economic competitiveness, and a failure on the environment. I am therefore sure that this Forum will be of great interest as to what must happen in the near future for the energy sector in the Europe.

I would like to thank Leonhard Birnbaum, WEC Vice-Chair for Europe, who was very active in organising this Forum. I would also like to thank Slav Slavov and Einari Kisel, from WEC, Stephan Ulreich from E.ON and Jean Eudes Moncomble from the French Energy Council and all those who have helped prepare those two days.

We will kick-off the Forum with two short presentations of recent work by the World Energy Council.

Session I: European energy policy to support transition

- ▶ Joan MacNaughton, World Energy Council
- ▶ Jean Eudes Moncomble, Conseil Français de l'Énergie

WEC agenda for change

Joan MacNaughton, Executive Chair, WEC Trilemma



My presentation will focus on 3 areas: the World Energy Trilemma, the Energy Sustainable Index, and engagement with the financial community.

World energy Trilemma

The trilemma consists of the three goals of sustainable energy policy: energy security, energy equity (affordability and access to energy), and environmental sustainability. We believe that if these 3 goals are not considered together, there will be a lack of balance and sustainability in all energy policies. It is not possible to neglect any one of the 3 goals. For example, China has performed brilliantly in bringing energy to its population and on energy security, but it has ignored environmental sustainability. This is impacting on its GDP at a level of up to 2% per year, and also has considerable health impacts.

Energy sustainability index

The Energy Sustainability Index (ESI) SI measures how well countries measure up in this context. It covers 129 countries for which data is available, ranking them according to their performance. This year, for this first time, countries have been given a balanced score: countries that are in the top quartile for all 3 elements obtain a AAA rating. Only 10 countries received a AAA rating, and only 5 are in the Top25 countries on all three elements. That shows that countries struggle to perform well on all 3 dimensions because there are inherent conflicts and trade-offs to be made. In addition, this is a new area for policy makers and they are not familiar with all the aspects. The triangle is particularly distorted in the Eastern European countries, and is quite well balanced in the Northern countries. The Index is aimed to be a support – and stimulus – for policy makers. The index does not provide all the answers but it does pose some interesting questions.

If we consider the top performers for each dimension, we can see that very few countries manage to be on top in all areas. France is ranked 10. It is slightly lower on energy security than the other two dimensions. That is partly due to the fact that the rate of energy consumption growth is compared to prospects for GDP growth. France's energy consumption growth has been outpacing GDP growth, and its energy intensity has therefore been going down. Nevertheless, it has a good overall performance.

As well as the Index, we carry out a policy review and a consideration of the dialogue between the energy business and policy makers. We surveyed energy businesses and took the results of their analysis to policy makers. We summarised our findings in a 2012 report, Agenda for Change. Overall, business needs policy makers to provide consistent and predictable policy, conditions that will attract investment, and collaboration on R&D and innovation. The policy makers broadly accepted those requirements, and called on energy businesses to help them drive more consistent policy, to invest more in innovation, and to chart a more sustainable path for developing countries.

Engagement with the financial community

We brought the energy business and policy makers together in Paris last summer and produced our Agenda for Change as the result of those discussions. Two of the vital issues to emerge were, first, the need for market reflective, dynamic pricing and, second, the understanding of the financial community and its willingness to invest in clean technologies and infrastructures. This year we have embarked on an exploration of those two issues in particular, and they will be at the core of our 2015 Report.

Investment is the key challenge for the future. The current trend rate of investment is not sufficient but we know that it will be difficult to increase those investment levels. Traditional investors such as the utilities no longer have the necessary funds, and governments have been severely damaged by the financial downturn.

The main deterrents to investment include, first, policy/regulatory complexity and a general lack of credibility. Second, a lack of consistency, which makes decision making difficult. Third, unpredictable or opaque legal frameworks. Part of this is reality; a large part of it is perception. There is a tendency by policy makers to ignore the fact that there is a competition for investment, and that investors consider risk-adjusted returns. Policy makers are therefore creating risk through some of their pronouncements even without carrying them through. Another significant issue is the long time scale need for implementation, during which situations can change dramatically. It is important to understand the need for cost recovery and for price signals that determine the investment.

We have seen that the fall-off in investment for clean technologies after the financial downturn was much greater in Europe. It is considered that there is simply too much policy in Europe, which discourages investors from making good investment decisions.

Conclusion

What does this mean for Europe? First, there is a need for single rather than multiple targets. Second, it is necessary to clarify the distinction between EU versus national policies. Third, we must ensure that we achieve stable and transparent frameworks. Fourth, the major issue of climate/energy goals and competitiveness must be

addressed. There will be tensions between the two, but they should not be in complete conflict.

These are some the issues that are raised within this topic. I hope that we can come to the agreement that this is an opportunity as well as a necessity. This must be done in a sustainable manner, not only from the point of view of the climate but also from the point of view of the sustainability of our economies.

WEC recommendations to the EU policy framework

Jean Eudes Moncomble, Chair of the Specified WEC Task Force



The Task Force came to light on the basis of a questionnaire of 25 European countries carried out in July 2013. The key messages to emerge from that survey were, first, that the three-target system was over-determined. The majority of countries preferred a system with two targets, at most.

Second, a majority of countries preferred a CO₂ target. Energy efficiency was seen as a possible second target. Renewable targets were the least preferred.

Third, there was a broad range of objectives for each possible target. It was very difficult to establish a single target because it was necessary to include all the different correlations between targets.

Task Force

During the Daegu meeting in October 2013, the decision was made to set up a Task Force from November 2013 to January 2014. It was made up of 7 countries representing the European member states (Czech Republic, France, Germany, Italia, Poland, Romania and Sweden). The inputs for the Task Force included the major findings of current WEC studies (mainly Trilemma), recommendations from the World Energy Congress in Daegu, and written contributions from the 23 European WEC Member Committees.

Challenges for Europe

In terms of the challenges for Europe, we selected 3 key issues from the Trilemma, adapting them to Europe: security of supply, climate change, and energy prices. We felt that energy prices were a good way to deal with energy equity, as they were key to the issue of fuel poverty. In addition, they relate to competitiveness, which itself relates to economic growth, employment and, ultimately, equity.

WEC had 3 key messages to make in this area.

- ▶ First, it was necessary to set up a unique CO₂ reduction target for Europe, beyond 2020. This was considered the most important message.
- ▶ Second, a number of conditions are necessary to reach the CO₂ reduction targets: cost effectiveness, technological neutrality and global commitment. These 3 elements are of paramount importance.

- ▶ Third, there is a new order of priorities, with competitiveness clearly at the top of the list. We did in fact hesitate between competitiveness and security of supply as the top priority. However, we believe that competitiveness is now a major issue for all European countries.

We have a number of sine qua non conditions for success. First, we need a greater focus on energy efficiency. We believe that this is an important way of reaching CO₂ reduction targets, although we do not need to set targets in this area. Increasing efforts on energy efficiency is a major issue, far more important than discussing about energy. Second, it is necessary to set up a favourable framework to encourage investment in Europe. For that, it is necessary to have a clear, predictable and sound framework. Third, we have to mobilise private capital for investment in this area because of insufficient household income and constrained public deficits. Fourth, R&D, which is a key factor to improve European energy policy, both on the demand and the supply side.

This position has been sent in January to European Commission: José Manuel Barroso (President), Günther Oettinger and Connie Hedegaard (Commissioners) and Dominique Ristori (DG Energy).

Roundtable debate

- ▶ Mechthild Wörzdörfer, European Commission
- ▶ Leonhard Birnbaum, E.ON
- ▶ Luc Oursel, AREVA
- ▶ Jean-Marie Dauger, GDF SUEZ
- ▶ Laurent Michel, DGEC
- ▶ Joan MacNaughton, WEC

Moderator: Olivier Appert, Chairman of IFP Energies nouvelles

Mechthild Wörzdörfer, European Commission



On 22 January 2014, the European Commission presented its proposals for an Energy and Climate Policy Framework 2030, together with a number of other initiatives, including an in-depth report on energy prices and costs. The 3 objectives that were noted above – sustainability, competitiveness, security of supply – are all important. When the 2020 objectives were set in 2008/2009, this was very much led by sustainability. Today, because of the financial crisis in many European countries, competitiveness and affordability (both for industry and for households) are back on top of the agenda again. In the past few weeks, the Ukraine-Russia crisis has meant that energy security is also very topical again.

After publishing a Green Paper and undertaking public consultation, with regard to 2030 the European Commission decided to come up with one clear target for GHG emissions reduction of 40%. We have also made a proposal for a renewables target, which is an EU-level target of at least 27% in energy consumption. This has not been broken down into legally-binding national targets. This is new, and reflects the lessons learned from the 2020 package. With respect to energy efficiency, the Commission will make a proposal during Summer 2014. This is also a key element and involves

many different sectors, amongst which the efficiency potential of building and transport sectors is crucial.

These targets have all been guided by the concept of cost effectiveness. We evaluated different scenarios and different levels of ambitions, and we are convinced that if agreed, three targets – 40% GHG emissions reductions, 27% for renewables, and a possible forthcoming energy efficiency target – would be cost effective and provide the certainty and predictability required by investors and governments.

The Commission has also proposed to have a new system of governance from 2020 onwards where we ask member states to come up with national plans. Some countries already have plans in place to 2030; other member states have launched post-2020 strategies. However, over half of the member states have no post-2020 strategies in place. Our aim is to promote the coordinated development of national plans to ensure an effective energy policy for 2030. This gives member states a certain level of flexibility.

The March European Council meeting provided positive feedback on this work. We have a clear timeline for the European Council to decide on that package – by October at the very latest. France, the UK and Germany support the approach; other countries such as Poland are more sceptical, in particular with respect to the 40% greenhouse gas emissions target. We are working to try and obtain agreement on all objectives as we see this as a package.

Also on 22 January, we made a recommendation on safe exploitation of unconventional hydrocarbons and proposed a market stability reserve for the ETS. We are well aware that ETS is a key factor in reaching the 2030 objectives. To address the problems that have been experienced with ETS to date, the market stability mechanism complements the existing rules so as to guarantee a more balanced market with stable expectations encouraging low-carbon investments. This should kick in after 2020.

We are working very hard to make progress, and we are confident that we will obtain the go ahead from member states in October. The European Parliament's Report proposes a 40% target for greenhouse gas reductions, 30% for renewables, and 40% for energy efficiency. That is a political signal that energy efficiency is perhaps less disputed than the renewables target. The issue of security of supply will be discussed later in this meeting. However, security of supply will also help to drive the 2030 discussion, as it is related to energy efficiency, diversification of supply, and so on. The key objective is to have the 2030 package in discussion with member states and stakeholders, and to have it agreed at the latest by October.

Leonhard Birnbaum, E.ON, WEC Vice-Chair Europe



Whenever we discuss the critical points related to policies, we should begin by acknowledging the fact that energy markets in Europe have been driven in a good direction by the EU. The internal market was a major benefit for Europe, and most of the problems encountered have been driven by national policies and not by the EU framework. That tends to be forgotten. We also tend to forget the extent to which societies and economies have benefited from the common market. Germany, for example, would not have achieved as much as it has without the support of a European internal market.

The European Parliament proposal highlights the issues involved with such targets, and there is indeed an issue with the 3 targets. Quantitative targets have to be defined for each target, and it is necessary to understand the correlations between those targets. Without a dynamic correlation between the targets, the system will be inefficient. That is why there was such an overwhelming push for a single target. In macroeconomic terms, that is clearly the most efficient way of setting up the system. What the European Parliament is proposing may be a strong signal but, in macroeconomic terms, it will be expensive.

Why is competitiveness at the top of the agenda? First, because competitiveness was neglected in the past. We had a one-sided policy and we thought we could afford that because the baseline of business as usual would also increase very steeply. Today, the baseline for competitiveness actually shows a flat cost development. A target that does not consider cost competitiveness as an issue becomes a very difficult policy to accept. That new situation has to be reflected in the new policy.

The trilemma means that we need to re-balance our thoughts. However, it does not mean we should not have climate targets; it means that we have to accept that we cannot be one-sided.

Finally, in addition to being balanced, we also have to be very open to solutions. If we want to have clear targets and clear priorities, we have to be open to all possible solutions and combinations thereof. There is no single, simple answer to the issues we face.

Luc Oursel, AREVA



My comments relate primarily to power, but they should also be relevant to the other energies. A few weeks ago, I participated in a debate on renewables. I was somewhat surprised to see that all the speakers referred to kilowatt-hours only rather than price or CO₂ emissions. I firmly believe that good energy policy has to work on the basis of the 3 pillars already described. Competitiveness is clearly crucial and I do not see enough on competitiveness in the EU's latest proposals. Regarding CO₂ emissions, I welcome the fact that there is a global objective for CO₂ reduction. Regarding security of supply, I again believe that the EU does not go far enough in its formulations.

I would also include a fourth pillar: job creation. Competitiveness has to be used to create or maintain jobs in a certain number of sectors, including those that are energy intensive. In the past, we were able to provide energy at competitive levels in order to help develop those activities. Looking at the suppliers' side, the energy market is an enormous market and all the investments made should also contribute to the development of European champions that are able to fight all over the world. This fourth aspect of job creation has been neglected to date.

Two other points that I consider important are, first, that we should avoid the tendency to privilege one energy over another. Instead it is necessary to find a balance. However, balance does not mean a homogenous situation throughout Europe. In contrast, the variety of energy mixes is a strength and asset for Europe and should be maintained. Second, 2020 is too close as a horizon, and we need to think to 2030 at least. Many of the energy choices we are making today are already too late to impact on 2020. It is therefore necessary to have a longer-term view and avoid taking a stop-and-go approach. We must be able to define a stable framework that will make it

possible to make the – enormous – investments that are necessary to address our energy challenges.

Jean-Marie Dauger, GDF SUEZ, WEC Chair of Communications and Outreach Committee



My first point is that energy demand is low in Europe today, but probably not for the right reasons. Energy demand is low due to the slowdown in the economic situation. In addition, since 2008, power generation from coal has increased while, at the same time, gas demand has dropped dramatically.

Second, energy prices are high compared to other parts of the world, at least for the customer. This is largely due to the imposition of levies and taxes that are used to finance many other elements, including renewables. There is therefore a growing concern as to the competitiveness of Europe, which is becoming a crucial issue in the current economic environment. The implementation of the European internal market is well advanced but there is still much to be done.

Third, Europe is on track to reduce its greenhouse gas emissions. However, this is largely due to the economic slowdown. The ETS is completely flawed and has not delivered on its promises. Coal has become an attractive fuel in Europe, which is quite a paradox given the amount of money that has been spent on reducing CO₂ emissions.

To sum up the present situation, we can say that Europe today is paying a high price for energy, and this has become a significant issue for competitiveness. Security of supply is also once again on the agenda, due to the lack of back-up capacity and interconnection. Last but not least, there are some concerns about black outs, and investors may be deterred by the current energy regulations. The reductions in CO₂ emissions achieved through renewables have, to a large extent, been offset by an increased use of coal.

I would suggest that there are 6 main ways in which we can support energy transition.

- ▶ First, we need more market and less regulation. Regulation has become a risk for investors and we need much greater visibility and predictability to address that situation.
- ▶ Second, we need an economy-wide vision for all of these issues, and not one that is limited to the energy sector.
- ▶ Third, a single target is preferable to multiple targets.
- ▶ Fourth, to be successful EU-climate action has to be part of a much more global effort. Europe should define its negotiating position in the Global Climate Agreement that will be addressed in 2015. Until an equitable global agreement is reached, the competitiveness of the EU economy should be a key point.
- ▶ Fifth, renewables should be developed but in a much more sustainable manner. For example, existing support schemes for major renewables such as onshore wind should be gradually phased out. However, this should not be done in a retroactive manner. We should reconsider the way we bring public money into major or emerging technologies.
- ▶ Sixth, we urgently require capacity mechanisms for power generation in Europe. As far as possible, these should be pan-European in nature.

Laurent Michel, Ministry for Ecology, Sustainable Development and Energy, France

The French Ministry of Ecology, Sustainable Development and Energy shares the view that it is important to redefine energy and climate policy to include both ambitious and balanced 2030 framework. The European Commission's proposals are a good basis for discussions but there are a number of issues that have to be tackled before we can reach agreement. Energy is not only concerned with electricity and gas; and between others it is also concerned with GHG emissions in ETS and non-ETS sectors. A more robust ETS would require structural reforms. Again, the Commission's proposal provides a good starting point for discussions. The idea that the stability mechanism would be more predictable is also very important. The French government has been in favour of back-loading, but this can only be a one-shot opportunity.

We need investment to support innovation for low carbon technologies in order to reduce GHG emissions and to promote energy efficiency. In this area, we need both EU and national policies. We also need to support our European champions.

In terms of the competitiveness of industry, it is important to prevent carbon leakage and it is also important to address the question of energy prices, especially for major consumers. This is a question for the 2030 framework but is also a question for today. We therefore welcome the Commission's proposals. The EU must be on a level playing field.

Beyond the question of a single target, a systemic approach is required for energy efficiency, shifting from fossil fuels to non-carbon technologies in transport for example. Energy efficiency may not need a binding target for each country and many tools are available to help promote this area. It should also be remembered that energy efficiency – as well as renewables - are parts of the answer to ensuring security of supply.

Joan MacNaughton, WEC

I would like to make 2 additional points that have emerged from my 35 years in government. When the pendulum swings away from the centre, we all have to push very hard to move it back. However, when it swings back, it very rarely stops in the centre. We therefore have to be very careful not to over-correct. I would like to illustrate that with two points.

First, the emissions trading scheme (ETS), which has met with significant problems. At the time it was introduced in 2005, the United States could not believe that the European Union could introduce such a scheme across sovereign nations. We did succeed in introducing the scheme perhaps with not enough data and perhaps with too much politics. We were then hit by the downturn in demand, which impacted on renewables and the demand for allowances. The main self-inflicted wound was the renewables target, which we could have avoided. That illustrates a move away from a market-based approach, which has undermined prices and caused many other issues related to security of supply. As a result, we are mothballing our most efficient CCGT plants. Nevertheless, the EU deserves huge credit for the ETS. With the planned reforms to introduce a more market-based approach, it could be turned into a competitive advantage for Europe.

Second, regarding competitiveness and security, I believe that we have to carefully watch our position on competitiveness. The EU is still the largest exporter of manufactured goods in the world. That should give cause for comfort not complacency. To sustain that position, we cannot tackle only one aspect of the problem – particularly one that is not in our control: energy prices. The EU has historically been at a disadvantage on energy prices. We could try to give comfort on prices but that would damage many of our other goals. However, that does not mean there is nothing we can do. We can retain our competitive advantage in energy: the quality of our electricity supply. However, the path we are on now risks turning that advantage into a disadvantage.

We should not overstate the competitiveness issues. We must pay much more attention to energy efficiency, but not by means of a target that interacts in unforeseen ways with our major market-based target. Rather, through other tools such as financing mechanisms and incentives, as well as information campaigns for consumers.

My message is therefore, first, that we should rely on the markets as far as possible. The ETS has not done all that we would have wanted but some of that was due to factors that were beyond our control. We now have the opportunity to turn that into a real advantage for us. Second, security is an absolutely essential part of competitiveness, and we must pay close attention to that balance as well as to environmental sustainability.

Olivier Appert



I would like to make 3 comments. First, we should not forget COP21, which will put strong political pressure on the energy sector.

Second, some believe that the current issues could be resolved by 3 silver bullets: interconnection, storage technologies, and capacity markets. Unfortunately, I am not convinced that any of these will occur in reality. The France-Spain interconnection, for example, took 20 years to be built. With respect to storage technologies, the battery principle first emerged in 1805, and the emergence of new breakthroughs is quite a challenge. Similarly, it will be very difficult to build efficient and successful capacity markets.

Third, we should not ignore a key challenge: an increasing energy dependence on foreign supply. Today, the EU imports 50% of its natural gas. In 2030, we will produce only 25% of our natural gas supply internally. The future EU energy policy should consider ways to increase local production, for example, through shale gas. However, there is no shale gas in France today, because we consider that the earth is flat!

Roundtable questions

Olivier Appert

I will now turn to the questions that have been posed for our roundtable speakers.

How to achieve a stable and transparent regulatory framework?

Laurent Michel

The European Commission's proposals form a good basis for discussion. We call for a well-documented and frank discussion between the European Commission and Member States, with a focus on the main issues rather than on the details. A global agreement could perhaps be reached in October, and it will then be necessary to undertake legislative transposition of the principles. For example, the reform of the ETS will have to be drafted and this represents an enormous amount of work. An agreement will have to be reached on the legislative proposals to create the stable and transparent regulatory framework that we all seek. The new framework will also have to address transition periods, renewable support schemes, back-loading, and so on. Finally, we must be cautious with respect to exemptions. They must be transparent and non-distortive, and that is quite a complex issue.

Joan MacNaughton

First, a global climate framework is absolutely crucial and there is huge hope for COP21 in Paris. Past COPs have led to a huge amount of disappointment, but this one could be different. The French are very good at managing such diplomatic situations, and that should lead to a more productive outcome for this COP. In addition, the US and China are now talking to each other about climate goals. We also need EU-China engagement, and EU-US engagement, and we need to close that loop. In that way we can avoid a situation where the EU has many good policies and ideas, but is not at the centre of the final decision making process.

Second, the European Commission has achieved a huge amount with respect to the 2030 package. I understand why the indicative EU-wide 27% target has been set. I would prefer not to have such a target but I understand why it is necessary in political terms. With respect to energy efficiency, much can be done without a binding target. If a target is ultimately agreed upon, I would hope that it is non-binding and that it is set at the EU level. The key to energy efficiency also lies in the relationship between what member states do and what the Commission has set out in the 2030 plan. If the action plans are properly exposed, that can help in driving a more coherent approach across the EU. I would urge some countries to start publishing their action plans on a voluntary basis, without waiting for 2020. That would help the business community in understanding where individual countries and the EU are heading as a whole.

Leonhard Birnbaum

We cannot achieve a stable regulatory framework by predicting the future. The only way we can do that is by having a clear framework of principles. One principle is that we need balanced target setting. The other principles are those that the European Commission is trying to establish: we must be European-based, we must be market-based, and we must consider the systemic interdependencies between heat, power, gas and so on. If we could agree that our regulations will follow those principles, that would be a very good start.

Olivier Appert

I believe that stability is key. Even more importantly, the credibility of that stability is crucial. Industry will not invest if it is not convinced that the framework will remain stable for a number of years.

What went wrong with previous EU energy and climate policy measures?

Jean-Marie Dauger

Energy policy is a long-term issue and, for many reasons, it is extremely difficult to tackle at the European level. It is therefore not surprising that it takes much time to make decisions on the long-term objectives.

The 2000 EU objectives were based on a balance of the 3 pillars of competitiveness, security of supply, and sustainability. The objectives were to be reached on the basis of 3 main tools: a European carbon market, the development of renewables, and the promotion of energy efficiency. Since that time, the world has changed dramatically, and that has not been taken into consideration in the development of European and national energy policies.

The changes have been various. US shale gas represents a tremendous change in terms of the competitiveness of the US, the price of gas, and the availability of resources. It is also a change in terms of the reduction in US involvement in these matters. In addition, the role of Asia has also dramatically changed. The growth in Asian demand has been much greater than expected resulting in increased competition, including competition for access to resources.

We have not sufficiently taken these major changes into consideration. CO₂ prices have failed to deliver on our expectations. The carbon market is sluggish and has not delivered a real CO₂ price signal that is consistent with the objectives that were set. The development of renewables has been pursued without their impact on the network or on consumer prices being taken into account. The development of renewables has lacked control and coherence at the European level. The consequences of that development were insufficiently anticipated.

Energy efficiency is an essential part of future energy policy but that objective is falling behind in our energy policies. Regarding risk and security of supply, this is increasing notably due to the fact that power stations (in particular gas power stations) are being increasingly closed due to a lack of competitiveness.

There are many elements of the policy that was defined 10 years ago that have proved not to be fully adequate to the changes in the energy world. Some of the instruments we defined have not delivered on expectations. Going forward, this may become a question of governance. That is, the possibility of coming to agreement on major issues at the European and national levels at a speed that is in line with speed at which the world is changing. We are still combatting on a battlefield that has dramatically changed.

Luc Oursel

I share the views on the failure of the CO₂ system. Re-establishing the visibility and predictability of that system is clearly a major task. I would add 3 further comments. First, the global objectives were initially focused on CO₂ reduction and market integration. Progressively we have seen contradictions appear between these objectives. For example, the European Commission has become more and more reluctant with respect to long-term agreements between consumers and suppliers. This was considered an obstacle to market integration and competition. At the same time, there was a greater acceptance of national systems that guaranteed long-term tariffs to renewable producers. That type of contradiction has to be resolved in the future.

Second, in the field of renewables, investment has been too rapid and too excessive. In terms of job creation, the amount of investment in renewables has failed to create jobs, as illustrated by the photovoltaic industry, for example.

Finally, the financial situation of all players has been weakened in the past 10 years, and the energy sector has become less attractive for investors. We therefore have to re-establish a new framework to make the players in this sector more robust.

Mechthild Wörsdörfer

In terms of the 2020 Framework and targets, we are currently at a level of approximately 17% reduction in CO₂ emissions compared to 1990. We are therefore confident that we will reach and even overshoot the 20% target in 2020. On the renewables side, we are currently at a level of a 14% share of renewables in the energy mix. Again, we are confident that we will reach the 20% target by 2020. Regarding energy efficiency, however, we will most likely not reach the 20% target. On the target side, therefore, we are rather confident that we will reach the 2 binding targets. Nevertheless, there are definitely some lessons to be learned.

With respect to renewables, the European Commission has set out global targets, and it was up to the member states to introduce national support schemes or not. That is the main reason we did not opt for national binding targets. The current target is a European-wide one of 27%. The state aid guidelines for environment and energy foresee a number of measures coming into place for renewables: they have to be market-based, and feed-in tariffs have to be changed to feed-in premiums. The right steps have therefore been taken to take into account the lessons learned.

Regarding the ETS, the carbon prices were not reached for various reasons, notably due to the economic crisis. It has also proved difficult to improve the system. For example, it was quite a challenge to get the back-loading proposal through European Parliament, and the market stability reserve is in the legislative process. The development of US shale gas was also unexpected and it has made the price differential between the US and EU even more pronounced.

Olivier Appert

We would all agree that a new paradigm has emerged in the energy sector and this has not been adequately taken into account. The worldwide energy situation is so different today from what it was in the 90s, when the first Directive was adapted. The dramatic game changers that occurred also include the Arab revolution, which has a major impact on the energy sector overall.

Implementation of energy and climate policy has been negatively impacted by external events, including the economic crisis. A significant part of the failure was also generated by the national policies. What was missing in the energy policy was a link with industrial policies. In France, for example, in the 60s we had an energy policy as well as an industrial policy to create jobs, and that is sorely missing at the EU level.

In order to succeed in our future energy policy, we have to be pragmatic. We can learn much from UK energy policy in recent years as it addressed the drop in oil production in the North Sea.

Joan MacNaughton

There are some very strong and worthwhile elements in the UK policy and we all hope they will deliver a much more coherent approach. However, part of the drop in oil production in the North Sea was caused by very ill-advised tax changes, which deterred much investment. In addition, elements of electricity market reform – particularly the contracts for difference – have taken a very long time to be developed. They were first proposed in a June 2010 Green Paper and we still do not have the final form of the regulations. Nor have we implemented the machinery that will deliver the contracts for difference. That lack of speed in execution has, in itself, created uncertainty. This illustrates the tendency of government to pay much less attention to planning than business, and to take much longer at implementation than business.

Leonhard Birnbaum

The UK was once the leader in market-based regimes. Today, no one would want to invest in the UK. To have a predictable framework, we need guidelines and principles that are adhered to over time, and that has been lost entirely today. Currently the UK is compensating this with a CfD-mechanism, which at least has some competitive elements.

Luc Oursel

The situation in the UK today is the result of excessive de-regulation and increase of the use of gas to produce power. The concept of contracts for difference, however, shows signs of a good way forward. It will be necessary to see the reaction of the European Commission to the first practical cases of investment under this model this year.

Why one target is more effective than several targets?

Leonhard Birnbaum

It is clear that by optimising for one result there will be fewer boundary conditions and, thus, better results. For example, to achieve a reduction in the kilowatt-hours produced, reducing kilowatt-hours may not be a constructive goal. It could be preferable to instead convert that power into heating, using the inertia of the heating system to stabilise the volatility of the power grid. That would also reduce dependency on gas, and so on. The more targets that are introduced, the less freedom there will be for optimisation, and the more expensive the overall system will be.

There is, however, an implicit assumption that we are clear as to the function of the target: a reduction in CO₂ emissions. From a political standpoint, the target is a different one. In Germany, the real target is to shift from nuclear to renewables; CO₂ is irrelevant in that debate. From a macroeconomic point of view, therefore, the preference is for fewer targets. From a political or societal point of view, there is a tendency to introduce more.

Olivier Appert

Delivering the message to the public is therefore key but, unfortunately, the energy sector does not have a very good record on its communications in the past.

Mechthild Wörsdörfer

There is a clear central target on greenhouse gas emissions. We have sent a signal on renewables by proposing the EU-binding target. One argument in favour of a renewables target at the EU level was that, without such a target, there would be no further investment in renewables today. However, it is an EU-binding target and not a national one, and member states therefore have the flexibility to focus more on renewables, or energy efficiency, or other low carbon sources as they see fit.

The EU proposal also includes a number of indicators. For example, there is an indicator on the interconnection rate for electricity capacity: 10% cross-border interconnections. Most member states are not at that level today but we believe that, under the projects of common interest (PCI) being set up in electricity and gas, most member states will go above that 10% level. We also have an indicator of diversification of routes and sources. We clearly need greater diversification, and that also includes the need to increase indigenous resources. Another aspect is the price differential. There are huge differences in retail prices for industry and consumers within the EU. However, wholesale prices have been relatively stable in the past 10 years. It is the taxes and levies that have increased significantly in most Member States.

Finally, it is necessary to invest much more in R&D and innovation. The 2030 paper provides for at least €26 billion in structural funds for investments in low carbon technology and energy efficiency.

The European Commission therefore has a whole package composed of targets, indicators and messages to ensure that competitiveness and security of supply are also high on the agenda.

Jean-Marie Dauger

The more targets that are set, the more room there is for inconsistencies. We may need fewer targets than in the past as some of the sources of energy we wanted to promote – in particular renewables – have now reached the necessary level of competitiveness. Onshore wind no longer requires subsidies, and solar is reaching competitiveness much more rapidly than expected. For those technologies that still require support, there are many other ways of providing support, for example, through efforts on R&D rather than on tools that distort the market. The additional issue of market distortion by a multitude of objectives also needs to be considered.

How to move forward on low carbon technologies?

Laurent Michel

We have to move forward on low carbon technologies at both the EU and international levels. If a global agreement is reached in 2015 at COP21, that will create an appetite for low carbon technologies in many countries. We have to support R&D at all levels including the territorial level. In terms of the link with industry, it is also necessary to provide appropriate conditions for exportation. The question of financial and regulatory frameworks must take into account the need for stability for investors. The aim here is not to create too much uncertainty.

Other regulatory frameworks also exist for the automobile industry, for buildings and so on. These also have to be stable and visible. For example, in France, a 2010 law

planned to set certain energy efficiency targets for buildings. Four years later, all the relevant regulations have not yet been issued. This creates uncertainty for investors who want to promote solutions in this area.

Finally, it is important to pay attention to implementation, for example, through the simplification of procedures or access to finance. This is not only a question of money but also a question of information.

Luc Oursel

2014 will be a critical year in the evolution towards low carbon technologies. I also believe that it is time for a more enthusiastic stance from the European Commission vis-à-vis nuclear energy. Today, nuclear represents 29% of the electricity mix in Europe. I do not envisage the European Commission setting a target for nuclear energy, but this is clearly an energy source that corresponds to all the agreed requirements: competitiveness, security of supply, and lower CO₂ emissions. There are countries in Europe such as the UK, Poland or the Czech Republic that would like to build more nuclear power plants, and it is time to promote nuclear energy more unambiguously.

Regarding renewables, we would all agree that it is time to change the way we develop these energies. The existing subsidies have to be progressively reduced – and harmonised – across Europe. We would prefer a slower but more stable development as opposed to the stop-and-go approach taken in many countries. In some countries, development has outpaced market needs by far. It is also necessary to demonstrate that the investments made will create jobs.

R&D is necessary to increase the competitiveness of European supply. And we have to re-establish the possibility of making long-term contracts between suppliers and producers. That is another way of providing visibility, and of consolidating Europe's industrial base.

Joan MacNaughton

Laurent Michel spoke about the value of long-term signals in driving innovation and the need to be pragmatic. That is why we need action plans. The long-term signals are extremely important in getting people to think about innovation. However, it is also necessary to have the detail in the form of country action plans. A long-term signal that is not delivered will not be helpful to industry.

Regarding low carbon technologies, we have not yet mentioned the value of our universities and research. Some countries in the EU are much better than others in establishing the link between their universities and their industrial policy. This is important because we need to convert our intellectual capital into technology, and goods and services, that create jobs. We seem to be very good at potentially having an industrial lead, and then losing it. We currently risk that situation with respect to carbon capture and storage. A few years ago, Europe was in the lead on carbon capture and storage, both in policy terms and in terms of our technology advantage. Today, we are not moving forward in this area and we have not realised the opportunities we had in supporting demonstration projects that could have led to deployment. This is an area that is now moving ahead much more rapidly in North America and China. There are other examples of large-scale demonstrations that are too great for individual companies or consortia, and that need support at the national

or European level. For example, the smart grid. The €23 billion in structural funds that will become available could be sufficient if correctly focused.

On a brighter note, research in the US has been undertaken on the way in which different states responded to the economic downturn. The evidence indicates that those countries that were ahead in terms of the deployment of low carbon technologies saw their employment rates recover more quickly.

Olivier Appert

Europe has very efficient research capabilities. However, the European economic and regulatory context is not very favourable to industry. As a result, industry is reluctant to take risks in this market. There is a market for low carbon technologies at the international level. However, we need to encourage demonstrations in Europe in order to sell our technologies worldwide. We must learn the lessons of the disastrous European solar industry in recent years. That concerns the link between energy policy and industrial policy.

I'm skeptical about the power to gas concept. It is the wrong answer to the real problem of negative prices in Europe. For an economist, negative prices are totally abnormal and must be resolved. That is my personal view. Gas to power makes sense; however, power to gas does not make any sense at all.

Regarding carbon capture and storage, 10 years ago this was considered as a silver bullet. It also had a very good business model at that time, when CO₂ was priced at €20 per tonne and was anticipated to increase. Today, the price has declined to €5, and this technology has totally disappeared from the European scene. CCS is now being developed in North America and China, and the UK seems to be the only country in Europe where progress has been made on this technology.

Open discussion

From the floor

It would be possible to reach the 40% target by de-industrialisation. That may be an intended or unintended consequence of such a target. Does anyone know what reaching that target, plus the 27% target on renewables, would do for Europe's competitiveness? CCS was discarded in Germany, for example, because of the cost per tonne of CO₂ avoided. At the same time, we have developed the solar industry, which is even more expensive per tonne of CO₂ avoided. We have not sufficiently analysed how we can most efficiently reduce CO₂, and this has not been taken into account when setting targets.

Leonhard Birnbaum

We have much to gain from understanding that energy policy is less concerned with environmental policy than with economic policy. We are using energy policy to drive economics. If those economics are good, we can then afford much more on the environmental side.

Mechthild Wörsdörfer

I agree, and that was the focus of our 2030 Framework where we came back to the issue of competitiveness and security of supply, while still maintaining the ambition on sustainability. A clear majority of member states were in favour of the 40% target; only 3 or 4 were more sceptical. In our scenarios, 40% plus 27% is cost-effective without leading to de-industrialisation, which we clearly do not want. We are in fact working very closely with our colleagues in industry policy, and we believe that the Framework will create many opportunities for jobs.

Joan MacNaughton

I agree that we need to ground the debate in the evidence much more. That is absolutely vital. Business has a major role to play here, in particular in getting the relevant messages across to the public. Regarding which of the 3 pillars are the most important, I believe that none of them should come first. By neglecting any single one of the pillars, we risk having a much more costly system. For example, Europe's energy intensity is 0.16 kilograms of oil equivalent per US dollar of GDP. The US is at 0.17. Any advantage we thought we had due to energy efficiency no longer exists. China has a high level of intensity but has now set incredibly ambitious targets on energy intensity in its current 5-year plan. Carbon prices will increase in the future, and it makes sense to tackle that.

All three aspects matter. We have given a lower priority to competitiveness in recent years but the answer does not lie in slowing down the work on carbon and energy. Rather the answer lies in thinking about energy intensity and other aspects of competitiveness such as R&D and infrastructure.

Pierre Gadonneix

As international chairman of the WEC I was impressed by the discussions. It would seem that everyone agrees on the 3 aspects of energy policy that have been discussed. The real question is at what speed the energy transition should be implemented. Speed has a cost. In developing countries, the development of new capacities with new technologies is obvious. In developed countries such as Europe, we have an over-capacity in energy. Two unanticipated events were mentioned earlier: the role of shale gas in the US and the role of Asia. A third event was the economic crisis, which was also not anticipated and which led to an over-capacity in Europe. If we want to develop new capacities, we have to close existing facilities that were already competitive. The issue for Europe is therefore the speed at which we implement that transition. We should adapt our speed and our costs to those of other countries. In that context, the COP21 meeting next year represents a great opportunity. There the challenge will be at what speed we implement our strategy. Clearly China and the United States are asking themselves what speed Europe will adopt. Should we perhaps not adapt our objectives to the outcomes of that meeting?

I was in Copenhagen 3 years ago, and it was a disaster in terms of negotiation. Europe's attempt to teach the world lessons did not go down very well. The risk for Paris next year is that Europe will be doubly disadvantaged. First, if Europe has higher costs than other countries, this will reduce the buying power of European consumers. Second, those other countries will be more competitive leading to further destruction of jobs in Europe. The international process is therefore important and Europe should be aware that it is part of a global game.

Michael Grubb

The fundamental lesson to be drawn from the UK is that it arguably went too far on market liberalisation. We are now seeing that the politicisation of the energy debate in the UK breeds instability. Regarding competitiveness, this is more clearly a sectoral concept than a macro one. A number of energy intensive industries in Europe face major problems, and Europe does not have a credible strategy on this in a de-carbonisation context. However, energy prices have no real impact on European macroeconomic competitiveness. The World Economic Forum does not even mention energy prices as a factor in national competitiveness. What it does stress is innovation. Innovation in the energy sector is concerned with building industrial capacity. This morning's discussion highlighted the confusion between targets as opposed to instruments. We are clearly not being realistic if we rely on a carbon price to drive all the innovation required – that is a fantasy!

Arthur Riedacker

To be successful, we need to work on energy intensity. The US and China could come to an agreement on this. However, if we do not set caps we will not reduce CO₂ emissions sufficiently.

Etienne Beeker

Should security of supply not be our top priority – not only because of the Ukraine crisis, but also because of the intermittency of renewable supplies? The back-up may not be sufficient due to the lack of profitability of CCGTs. The only objective of US energy policy, for example, is security of supply.

From the floor

Everyone is in favour of renewables but nuclear energy is a much more controversial technology, even though it has a major role to play in Europe's current and future energy policy. In terms of the security of uranium supply, in many of the countries where uranium extraction is increasing (such as in Africa) the human and environmental costs are very high. The current supply of uranium is in the hands of a small number of countries that are not necessarily worthier business partners than Russia for gas.

Olivier Appert

My personal view is that relying on Canada or Australia for uranium is more secure rather than relying on the Middle East for oil or on Russia, Iran and Qatar for gas.

From the floor

In March, the European Commission called for a binding target on electricity interconnections. Has the Commission considered setting a binding target for natural gas interconnections? If so, at what level? We invest in gas pipelines that have a lifespan of 40-50 years. How can we make such long-term investments in the absence of a real gas policy?

Roundtable conclusions

Jean-Marie Dauger

The world has changed since the 1990s, and Europe's position within that world has also changed. That has to be taken into account in rebalancing the weight and priority of the 3 pillars that have been mentioned. Second, we believe that energy is in transition, and there will be no way back to the former situation. There is therefore no question of not changing the model. The real question is the speed of that change in particular when technologies are pushed back from the market because of decisions that we take to promote non-competitive sources. The European steel industry was a disaster because of the fact that Europe was less competitive. It took 20 years to resolve that problem. Europe has capacity in electricity and gas – a capacity that is competitive. However, we are closing that capacity because we are injecting money too rapidly relative to the slowdown in the economy. We are thereby destroying a tremendous amount of capital and labour. The fact that we have closed thousands of megawatts of capacity has an impact on capital destruction and has an impact on job destruction. This question of speed is therefore very important, as is the fact that the world has changed. We have to take that into account.

Laurent Michel

We need a balanced approach – everything is possible but it has a cost. For example, interconnection and security of supply are achievable but they have a cost. I share the comments that were made on speed, which goes together with a balanced approach. With respect to energy efficiency and intensity, this is not only a cost and a burden but also an investment and an opportunity. However, it is a long-term investment, which raises questions of how it should be financed. The public money that usually finances long-term investments is scarce. It is therefore necessary to be inventive to ensure that we remain competitive.

Joan MacNaughton

Europe needs to have a negotiating position as it enters the COP. That requires a conversation among the 28, and that conversation cannot be kept secret from our partners. It may be necessary to have some conditionality on that position or a higher target if others go further. Regarding pace and speed, we should not fight the last battles of competitiveness. The situation in the steel industry is largely due to higher prices, which have persisted for some time. Even before we started thinking about CO₂, energy intensive industries were located near plentiful sources of energy. We have to consider what the competitiveness challenges will be in the next 10 to 30 years will be, as this is what we can actually influence. The whole ecosystem of what happens in Europe can make us less attractive for investment. We therefore have to look at all of these matters.

I would also add that there is no reason to believe that the 40% target will be way ahead of the targets of others post-COP21. Nor was our 20% target way out of line with the Copenhagen pledges. The assumption that we are always ahead is a dangerous one. We need to think about how we manage the transition at the optimal cost. That does not require placing enormous amounts of renewables in an electricity system too rapidly. However, it does involve starting early to think about the replacement of our existing capital stock. A planned approach to that is necessary, on the basis of a prime CO₂ target. Underneath that, it is necessary to have instruments

that are compatible with that target and do not undermine it. This must be done according to agreed principles and pre-determined criteria as to when changes will take place and the basis on which they will take place.

Mechthild Wörsdörfer

I have four main points. First, there is sense of urgency, not only because we have to position ourselves in the climate negotiations but also in terms of predictability and stability. The EU should show where it is going to enable the post-2020 investments to be made. There is a signal to be given today, and that is why we would prefer to have the overall backing of heads of state and government, as soon as possible. It will then take time to translate that into concrete legislative proposals. We need to come to the Ban Ki-moon Summit in New York in September 2014 with some idea of where the EU is heading. The question of the conditionality of the CO₂ target was discussed and the Commission considered that it did not work out in the Copenhagen Summit. That is why we have made a clear 40% proposal.

Second, regarding energy sources, the European Commission is convinced that all energy sources are needed in 2030: gas, nuclear, renewables, oil and gas, energy efficiency, etc. Oil probably has the most difficult transition post-2030, mainly due to the electrification of the transport sector.

Third, regarding the three objectives, we could have a debate on which is most important today. All three are important although I agree that competitiveness and security of supply are the driving forces today, for example... If we combine nuclear and renewables, we end up with a low carbon, indigenous source that also contributes to security of supply and job creation.

Fourth, industry is absolutely essential. We analysed the energy intensive industries in the Energy price & cost Report, and they were fairly well treated in the state aid guidelines – 65 sectors have been exempted from the renewable charges. Industry plays a key role in ensuring that the 2030 framework – the whole package – is approved by all member states.

Leonhard Birnbaum

How can we implement a stable, regulatory framework? That requires a foundation of constant principles: an efficient or market-based system, that is not over-determined, that is European-based, and that considers the systemic connections between heat, power, gas, transport, and so on. Within such a framework, the instruments provide the way to achieve that. We should not confuse a target discussion, a basic principles discussion, and an instruments discussion. We cannot start discussing individual instruments unless we are clear about the overall vision.

Luc Oursel

Regarding the comments that were made on uranium, we apply the same standards in Africa today that we do in the rest of the world. 60,000 tonnes of uranium are marketed every year. That is a limited volume compared to other energy sources, and it allows detailed inventories to be established. There is a good diversification of countries producing uranium, and an increasing number of countries are able to produce uranium due to the exploration that has been undertaken. There are also two other sources of uranium: the destruction of nuclear weapons and the reprocessing of spent fuel.

More generally speaking, the upcoming European elections highlight the growing divide between citizens and the European parliament, as can be seen in the high level of abstention for these elections. A recent public opinion poll showed that competitiveness and price were the major priorities for European citizens. When establishing policies at the European level, we therefore have to ensure that citizens understand that we are addressing their concerns. We have an important role to play in explaining how European policies to reduce CO₂ emissions will address their concerns. That can only be done if it also creates jobs.

Olivier Appert

I will close with a few comments. First, it is interesting to note that in a Forum on energy challenges we did not refer at all to oil. Is it due to the fact that no one knows what to do about the oil sector. However, we should not under-estimate the challenges of the oil sector in the context of the Arab revolution. We also need to refer to the US and Chinese positions on this sector.

Second, the energy and environment sectors are quite unique. They are both sectors in which decisions can be taken without measuring cost. In the future, cost efficiency will be key and has to be taken into account in all decisions made at the European and national levels.

Third, there is a consensus within the Forum as to the challenges faced by the energy sector. There is also a consensus on the ways to move forward. However, I believe that the most important concern is the mismatch between what this audience of experts is discussing, and the perceptions of policy makers and citizens. A key challenge for the energy industry is how to deliver this message on the way to move forward.

Session II: CO₂ framework and emission trading system

- ▶ Polona Gregorin, European Commission
- ▶ Erik Delarue, University of Leuven
- ▶ Michael Grubb, University College London

Moderator: Stefan Ulreich, E.ON SE

Reform of the EU emissions trading system

Polona Gregorin, European Commission

Achievements to date



necessary.

I will begin with an overview of the achievements of the EU ETS since it was established in 2005, and of the EU package on climate and energy measures introduced in 2008. We can see that much has been achieved since that time. Emissions have been reduced by over 18% since 1990 while, at the same time, EU GDP has grown by 45% in real terms. This clearly illustrates that a trade off between climate and energy policies, and economic growth is not

The European carbon market has existed since 2005, creating Europe-wide carbon prices covering over 11,000 installations. It has created a liquid market with growing volumes of allowances and derivative instruments that are traded on a day-to-day basis. Since the onset of the crisis in 2008, there has been a weakening price signal in the carbon markets, and a growing surplus of emissions allowances. That has led to a discussion on how to address this situation. The first step in that direction was the so-called back-loading of auction volumes which started on 12 March 2014.

Experience has shown that the ETS has worked well from a technical point of view. A number of improvements were introduced last year, including an EU-wide cap. This replaces the bottom-up cap that consisted of the 27 member state caps. Auctions of carbon allowances have become a daily routine. This has accompanied a large-scale move towards auctioning as the predominant method for the allocation of emissions allowances compared to free allocation, which was the predominant method in the past. Free allocation remains available to address competitiveness issues and any risk of carbon leakage. The method for those free allocations has also been harmonised at the European level.

A single registry is now operational, recording the holding of emissions allowances and their transactions. Rules have been established for recognising international credits. Finally, we have improved protection against fraud and other forms of misuse such as the covering of allowances themselves in the financial market rules – the new MiFID. This ensures that emissions allowances receive the same protection as traditional financial instruments.

Problems and issues

On the more negative side, the advent of the recession has led to the emergence of a large and persistent imbalance in emissions allowances in the EU ETS. In 2012, this amounted to over 2 billion emissions allowances. This is roughly equivalent to annual emissions allowances issued by the ETS. There is therefore a 1-year surplus of emissions allowances in the EU ETS – which is not a negligible amount. That has led to a weakening of the prices signal, with a steady decline in carbon prices from over 20€ to approximately 5€.

The back-loading of auction volumes is only a first – and insufficient – step in addressing this issue. It still leaves us with a persistent surplus in Phase 4, which begins in 2021.

The European Commission has proposed the creation of a market stability reserve to increase the flexibility of supply of allowances coming to the market. Experience has shown that there is a mismatch between demand for emission allowances (which is impacted by economic cycles, fuel prices, etc.) and supply of those volumes (which is, to a large extent, fixed). The idea is therefore to introduce some flexibility on the supply side. If the surplus in the market is above an upper end of the range, a certain amount of allowances are placed in the reserve. If the surplus is below the range, a certain amount of allowances are released from the reserve.

Market stability reserve

This proposal responds to the views of stakeholders and the key messages they provided during stakeholder consultation. One of those key messages was the need for clarity in the market, and the need to provide market participants with sufficient lead time to adjust to the new measures. The reserve will therefore only be introduced as of Phase 4 of the EU ETS in 2021. This provides regulatory certainty during Phase 3 and provides market participants with the necessary lead time before the rule changes apply.

The reserve is rule-based with no leeway for discretion in its implementation. There is no need for new institutions to be set up or new data to be collected, as the reserve can be fully embedded in the existing framework. The reserve is volume-based and therefore captures all changes in demand for allowances, regardless of the factors leading to those changes. It includes interaction with complementary policies such as renewables, energy efficiency and so on.

Due to its automatic nature, there will be an early review of the key parameters of the reserve in 2026. If any issues are identified, the system can be adapted appropriately. At the end of each trading period, allowances held in the reserve are carried forward into the next phase. They are not cancelled in any way, and this ensures cap neutrality in the system. Finally, the measure only affects allowances that would be auctioned; it does not affect free allocation to industry.

In the proposals for the 2030 Framework published by the European Commission in January 2014, the key target is the 40% reduction in greenhouse gas emissions by 2030. To achieve that, the current linear reduction factor of 1.74% will have to be increased to 2.2% as of 2021. This will ensure that the proposed 40% reduction target in greenhouse gases can be reached by 2030. This is not part of the legal proposal in the market stability reserve. Nor is it sufficient to reduce the imbalance in the ETS in the mid-term to any material level. Other measures will therefore also be necessary to address the market imbalance in the short-term.

Next steps

From the point of view of the Commission – and of market participants – the most important point is to have a decision on the reserve as early as possible. The reserve is seen as a “no regrets” measure that can be decided independently of what the rest of the 2030 Framework rules will look like. This is a co-decision procedure that needs to be adopted by both the European Council and the European Parliament. The Council has already held several Working Party discussions on this point, with the next meeting is forecast in June. The Parliament has held a first exchange of views in the Environment Committee, which is the lead committee on the file. However, the formal timetable can only be fixed after the elections.

CO₂ emission abatement in the power sector

Erik Delarue, University of Leuven



I will focus on the interactions that we have observed in practice between the cap-and-trade system in the power sector and the policies on renewables.

Europe climate policy on greenhouse gas emissions

In Phase 2, we observed a decrease in carbon prices, with prices now ranging between €4 and €6 per tonne in the third period. This is far too low to provide a significant CO₂ price signal to encourage low carbon investment. The current problems include low prices, which have been triggered by the economic recession, by the high inflow of international credits, and by other policies such as the renewable targets. The renewables target clearly has an impact on the price of CO₂ emissions allowances. In addition, the transfer of allowances from one period from another has a self-reinforcing effect that has triggered a build-up of the surplus of allowances. The total amount of the surplus present in the market today is equivalent to one year of emissions.

The options for reform include an increase in demand for allowances (or a reduction in supply). The temporary withdrawal of allowances (or back-loading) is currently being executed, and the market stability reserve has also been proposed.

CO₂ abatement in the power sector

There are three drivers of emissions in the power sector.

- ▶ First, the existing portfolio of power plants – the fuel mix and the technical parameters of the plants – which can only change in the long-term.

- ▶ Second, the residual load, which is equivalent to electricity demand minus the in-feed of renewables generation. This driver could change in the medium-term.
- ▶ Third, generation costs, which refer to the marginal generation costs of conventional units. This is a strictly operational factor that can be changed in the short-term.

The 3 drivers are all affected by general economic principles and policies, and by explicit CO₂ policies. The conventional portfolio is affected by changes in the levelled cost of electricity, making low carbon technologies more competitive. Similarly, they can be affected by policy changes: if a country opts for a nuclear phase-out, that will have an impact on the existing portfolio. The residual load is affected by economic growth (or downturns). It is also affected by renewable policies. An increase in electricity prices will reduce demand in electricity or investments in renewables might be triggered by pushing them into the market. Generation costs are mainly determined by fuel prices, affecting the marginal costs.

A CO₂ price can trigger fuel-switching, for example, by making gas more competitive than coal. At the current levels of coal and gas prices, it would be necessary to have a CO₂ price of approximately €40 per tonne to trigger a fuel switch from coal plants to CCGTs. CO₂ prices are clearly far below that level today.

Interaction between the EU ETS and renewables

The target for renewables has triggered a sharp increase in the deployment of renewables. The EU ETS covers both the power sector and other ETS sectors (such as energy intensive industries). The ETS sets a cap and triggers a price for CO₂ emissions. The renewables target results in CO₂-free generation in the power sector. That CO₂-free generation will have an impact on emissions within the sectors of the EU ETS. However, the cap set by the ETS is fixed, and renewables will not have an impact on the final emissions although they will have an impact on the CO₂ price.

What would be the impact on CO₂ prices if we took away the renewables that have been deployed? We could consider 2 extremes. First, the ETS price assumption: if we remove renewables from the power sector, we assume that the other ETS sectors can cover for the emissions reduction triggered by the renewables at the same CO₂ price. Second, the ETS-cap assumption: the other ETS sectors face difficulties in additional abatement, and we impose the same cap on the power sector. That is, we remove the renewables, we impose the same emissions levels, and we calculate the required CO₂ price to achieve that.

The results of the first ETS price assumption are as follows. If we remove renewables and keep the CO₂ price at the same level, emissions by the power sector will increase from 10% to 15%. That shows that the impact of renewables is quite significant. Under the ETS-cap assumption, we can see that we would need a very high CO₂ price to achieve the same cap. In 2009 it would not in fact be possible to reach the historical emissions under this assumption, if we would have fuel switching only.

The 2 extremes can be plotted on an impact curve, which can then be intersected with the marginal abatement cost curve (MACC) of the other ETS sectors (energy intensive industry). If the other ETS sectors can easily abate CO₂ emissions at low cost, we see a high CO₂ displacement triggering a low increase in CO₂ prices. If, on the other hand, the other ETS sectors face difficulty in abating CO₂ emissions, we would see a high

CO₂ price change and a very minor CO₂ displacement between the power sector and the other ETS sectors.

Conclusion

The model looks at the interaction between renewables on the one hand, and a cap-and-trade system on the other. The simulations show that taking renewables out of the system has a significant impact on both CO₂ emissions displacement and on CO₂ prices.

What does that mean for the 2030 Framework? If Europe wants the EU ETS to be the primary instrument for climate action, it must ensure that other policies do not impact on the system. High targets for renewables will clearly have an impact on prices. Back-loading is a good first step but its impact is limited. The current ETS price is far too low to trigger coal to gas fuel switching. The impact of the market stability reserve remains to be seen. Regarding renewables, it is important to be aware of the interaction effects described above. Bringing renewables into the system does not decrease CO₂ emissions if you have the same cap, but they do decrease the ETS price. Finally, we should aim for a more market-based support for renewables. If the current renewable targets are pursued, this will lead to higher costs.

Three pillars for integrating the objectives and instruments of energy-climate policy

Michael Grubb, University College London, Institute of Sustainable Resources



I will be speaking in my capacity as an academic, drawing quite significantly on my 2014 book, *Planetary Economics*. I will focus on three domains of processes and the associated policy pillars.

An uncomfortable challenge

Much of the academic literature on climate change in the past 5 years has demonstrated the enormous complexity of this problem: the “perfect moral storm”, a “super wicked” problem, the “biggest market failure in history” and so on. Reality has confirmed that analysis, and it cannot be said that we are doing very well in addressing this issue at the global level. 10 days ago, the IPCC reported that global emissions have actually risen faster in the last decade. In Europe, the energy debate is dominated by bills, competitiveness and security concerns. To a certain extent, we made a historical mistake in separating climate change out from a more holistic debate on energy in the Europe economy. We now face a real risk of reacting to concerns about energy bills or security of supply while neglecting the overarching systemic risk. In principle, energy security is easier to resolve than climate security. Energy security requires a strategy whereby countries exporting to you will suffer more from any interruption than we would. It is much more difficult to deal with climate related security concerns.

The situation is not totally without hope. However, we have to change the way we think about these issues. Prices do matter, but they do not necessarily drive energy bills in the long-term. The average national expenditure on energy as a percentage of GDP has been remarkably constant, as shown by data across different industrialised countries for the period 1990 to 2005. Countries that have energy prices that are twice as high also have a level of energy efficiency that is twice as high. The national

energy bill per GDP is therefore identical: Japan, Germany and the United States are all on the same line despite radically different energy prices. Interestingly, the countries that did most to subsidise electricity for social and industrial development reasons have ended up spending much more of their GDP on energy. The Russian scientist Bashmakov's "constant of energy expenditure" shows indeed that the proportion of national income spent on energy has remained surprisingly constant for more than a century in most countries despite huge variations in energy prices. This cannot be explained through the classical measures of in-country consumer price response or elasticities. To explain this it is also necessary to refer a) to energy efficiency regulations and related policy responses, and b) to innovation throughout the energy supply and product chains.

It is not possible to generate stability through policy design in itself, if that is likely to change with political winds. We can only achieve stability through a clear framework of thinking that is widely accepted. That has to recognise multiple concerns and processes. It is not possible to prioritise among the 3 elements of the trilemma because political environments are not stable. They will be influenced by a crisis in Ukraine or by extreme weather events, and so on. The objectives of energy security, climate security and affordability all matter in a business that makes investments over a number of decades.

Three domains of economic processes

My reference to 3 different domains is not a reference to the 3 components of the trilemma. Rather, there are 3 different areas of economic behavior that need to be considered. They each operate on different time scales and on the basis of different decision makers.

First: well developed behavioural and organisational economics that show that many people and organisations are not 'rational optimisers', particularly with respect to incidental costs and risks. The idea of a perfectly optimising decision maker is a figment of classic economic theory's imagination. The real world contains many different types of structural imperfection, and they have a significant impact on the way that people use – and waste – energy. This tends to involve time scales of 1 to 3 years, and decisions made by relatively small units.

Second: neoclassical and welfare economics. This is based on decision makers that are rational and optimising, and that engage in trade offs. The time scale here is 2-3 years to 2-3 decades. The social scale is that of a sector, a market or a whole national economy.

Third: evolutionary and institutional economic processes are concerned with how complex systems adapt and evolve over extended periods of one decade to one century. This typically goes beyond the nation state to consider global trends of technological diffusion and institutional changes.

These 3 economic processes are quite distinct and one instrument cannot deliver on the 3 different levels. Unless policy recognises this, it will lead to an incomplete mix of instruments. What does this imply in terms of policies?

- ▶ Markets and prices are the best way of allocating resources provided that you have optimising decision makers and reasonably fixed technologies and infrastructures. That means that such instruments have maximum impact in the

optimising domain, driving decision makers to choose cleaner products and process.

- ▶ However, in the area of “satisficing”, standards have proved to be extremely effective in leading consumers to make smarter choices. Prices play a lesser role in this area.
- ▶ If the aim is to transform the entire energy system over the long-term, it is necessary to understand strategic investment. That is, investment that has a longer-term return that cannot be fully captured by any individual decision maker in the economy. This allows one to deliver on innovation and infrastructure.

Experience and theoretical reasoning on each pillar shows that there are multiple lines of evidence that all 3 domains are of comparable importance in transforming the global energy system. They are each of comparable importance. Only approaches that integrate all three domains have the potential to generate ‘green growth’.

An important supplementary observation is that the dominant neoclassical theories emphasise the instrument (pricing) that, unfortunately, maximises political opposition. That was the case in Australia, the US and Canada – carbon pricing is hard politics unless it is nested in the complementary triad that also offers hope of containing energy bill impacts.

First and third pillar policies can (and have) delivered multiple benefits, but no pillar on its own can credibly solve the problem. Energy efficiency, on its own, is limited by the scale of intervention required. Pricing, on its own, is limited by increasing political resistance to rising fuel bills. Innovation, on its own, is limited by the lack of demand-pull incentives, the scale and risk of investment costs, and political failure in the absence of rising market feedbacks.

Structural problems of the EU ETS

To date, EU ETS has been considered quite separately from the other elements in the package. The ETS has been periodically unstable due to the fact that the supply curve is completely vertical while the demand curve is very steep. The introduction of emissions banking was a brave attempt to flatten the demand curve and stabilise prices. However, it only works within a certain range; outside of that range it actually amplifies risk. Introducing other policy pillars further amplifies the difficulties by reducing the space for the carbon price and increasing net uncertainty and volatility.

This in turn undermines other potential attributes of an ETS. With a fixed cap, no finance ministry can effectively budget for a revenue stream based on a price between €3 and €30. Similarly, with a fixed cap, energy efficiency programmes do not save carbon. Finally, successful innovation and strategic deployment programmes risk exacerbating their own downside investor risks. They have no identifiable sunset time scales because the carbon price is too fundamentally uncertain.

Price stabilisation mechanisms are therefore essential for credibility and for linkages to other domains. They help cap-and-trade systems deal with deep uncertainties and maintain a reasonable balance between price and quantity objectives. The mechanisms are most simply illustrated with respect to price floors and ceilings, leading to a likely region of price and quantity even if a system develops substantial surplus allowances. The same principle could, however, apply to other threshold triggers, for example those based on the level of cumulative surplus.

How does a market behave when the volume is fixed but the market knows that there is potentially unlimited additional volume that can enter the system for free should the surplus volume sink below a certain level? We are creating quite an odd market structure and no one really knows how it will behave in practice. Given that it is indexed on quantity and not on price, it may or may not stabilise the situation. The drawback is that investors are not able to use the stability mechanism to build into their spread sheets. Whilst recognising legal and political concerns in Europe, a reserve price would seem to be a much better option from the standpoint of industrial investors.

An integrated package

It is necessary to have the 3 policy pillars: standards and engagement; markets and prices; and strategic investment. In addition, they reinforce each other. Standards and engagement can help people manage bills and increase consumer responsiveness to the second pillar in which carbon prices play a key role. The carbon price element will then help to generate revenues that can help fund innovation programmes and provide the market context for the phasing out of subsidies. In turn, the innovation programmes can provide people with the options to respond to carbon prices, and give people tools to gain more understanding and control over – and hence also pay more attention to - the first pillar: their energy behaviour.

The key is to integrate and synergise across all 3 domains. They make it politically feasible and affordable to have rising carbon prices. Carbon pricing has to be designed in the right way with the right kind of leakages and the right kind of objectives.

Open discussion

Issues for debate:

- ▶ Why does the EU ETS need to be reformed?
- ▶ To what extent do the ambitious CO₂ objectives influence the EU economy, in the absence of global commitments?
- ▶ Can we achieve the 2030 objectives only through renewables and energy efficiency?
- ▶ How can we move forward with low carbon technologies?

Stefan Ulreich

The EU has always been very proud of the ETS, and has tried to sell it to other parts of the world. What has been the reaction of the rest of the world to the new proposals on ETS?

Polona Gregorin

Our negotiations on back-loading were closely followed by our international partners, for example, Australia, although their carbon pricing mechanism is now likely to be withdrawn. Some argue that the system has failed because carbon prices are so low. However, I do not believe that we can say that the EU ETS has failed. The objective was to contribute to emissions reductions in a cost-effective manner. It has indeed led to a reduction in emissions, and that would have been the case even if we did not face

a decline in our economies. However, given the low carbon price signal, it faces challenges for the future. The perception issue has to an extent been a hurdle in trying to convince international partners to take up the system. Nevertheless, e.g. China has implemented several pilot schemes and has committed to moving to a national scheme in the mid-term.

Stefan Ulreich

The fuel switching price is currently at €40 per tonne. How can we improve this situation?

Erik Delarue

Fuel switching will occur progressively. One of the limitations of our modelling is that we only consider either renewables or fuel switching. In reality, certain options will come in gradually, triggered by CO₂ prices. The situation is therefore not entirely black and white. It remains to be seen how the market (and prices) will react to the market stability reserve and back-loading.

From the floor

Has the system failed because low prices are not acceptable as they do not trigger a change in behaviour? At the same time, the prices that are necessary to trigger changes in the energy mix are completely unacceptable for industry in the absence of a global CO₂ agreement. It therefore seems that we either fail because we do not trigger a change on the price side or we will fail because we need to take everyone out of the power sector. How can we hope to resolve that problem?

Polona Gregorin

That is indeed the political reality. However, when the package was being discussed the expected price was €30+ per tonne. That was acceptable to industry and policy makers, provided that measures were introduced to address potential dangers of carbon leakage – namely the free allocation of emissions allowances. To date, those measures have proved to be effective in addressing carbon leakage. However, we now have a much lower carbon price than was anticipated. The costs of climate change and climate action are costs that will not differ substantially regardless of what happens because of the need to renew the energy system. When discussing the cost of the EU ETS, it is necessary to discuss the costs of alternatives, and doing nothing is not an alternative. The first course of action proposed in the 1990s was the carbon tax, which was not accepted. The second course, proposed by industry itself, was the emissions trading system.

From the floor

You stated that it was important to embed all of this in an international agreement. Do you mean a European agreement or a global agreement? Second, to what extent is the system affected by euro-dollar exchange rates?

Michael Grubb

The debate on whether or not we can have appropriate price levels has to be preceded by a debate on the impact on energy intensive industries. I believe viable solutions are possible but they need to be developed on a sector specific basis, in

particular for the Big6. They have to involve some mix of protected carbon costs, some equalisation of carbon costs among competitors, and some assistance in helping these sectors innovate more extensively and more rapidly. Carbon revenues should be part of that. The structural problems of the European steel industry are not primarily driven by carbon prices. Some of our policies have made it more difficult for industry to make the strategic investments in innovation they require to ensure their future competitiveness.

We have avoided a real discussion on carbon price levels by focusing on volumes or quantity. If carbon pricing plays a role in investment decisions, we have to be willing to consider the price levels we are expecting, or intending. If we are serious about climate change we have to migrate out of coal towards gas, renewables and other low carbon sources. All the scenarios show that that is where the power sector should be heading. The question then is how quickly that will be achieved and how central is the carbon price to that process. We therefore need to decide at least a minimum price level that should be targeted in the coming years. A price level of €20 by 2020 would probably help us to move seriously out of coal towards gas, in a safe and secure manner. Increases during the 2020s may then also be sufficient to phase onshore wind energy off direct subsidies, depending somewhat on local contexts. To date we have failed to have a serious discussion on what prices levels are required for what purposes and over what time scales. That is the basis on which we should re-visit the stability mechanism, which could be turned more into a mechanism like the Californian price corridor where investors know what the rules of the game are.

With respect to the international agreement, energy is a long-term business and the worst issue it could face is instability. Unfortunately, individual nations have a problem with promising stability, and it is easier to achieve a greater level of stability in an international agreement. We did achieve some stability in the renewables area, and Britain would not have adhered to its promises on renewables without the European Renewables Directive. If we could achieve something in Paris that would enable a comparative indicator of what we are expecting to deliver, that could contribute significantly to achieving the necessary stability.

Didier Bosseboeuf, ADEME

You have analysed the impact of the EU ETS on renewables, and vice versa. Did you also analyse the impact of ETS on energy efficiency? A European project that I am coordinating has demonstrated that the ETS has not delivered energy efficiency on the demand side, even though this is a crucial option for CO₂ abatement. In the future, 60% of the CO₂ abatement will be achieved through energy efficiency. Has the European Commission taken that into account in its new design?

From the floor

We tend to attribute any reduction in emissions at the EU level to the success of the EU ETS but has this actually been demonstrated? Current CO₂ levels are much lower than the spread between lignite and the CCGTs. Rather than trying to guess what the price of carbon will be given a certain quantity of tradable emissions units, we should perhaps consider setting a carbon price that would provide investors with the long-term visibility they need to make their decisions.

James Marshall

We have been talking about investments, markets, trading systems, and so on. Have the current or proposed trading systems ever been evaluated by traders or market makers, who are not necessarily opposed to volatility?

Erik Delarue

We did not look at energy efficiency specifically but we could apply the same methodology in that case. As to establishing a price for carbon, this would be the preferred option but we have to consider what is politically feasible at the European level. It would appear not to be feasible at this point in time.

Polona Gregorin

In terms of the translation of carbon prices into electricity prices, there is no statistically significant correlation between the carbon price and retail electricity prices. That is one of the reasons why it may have not led to significant improvements in energy efficiency concerning electricity demand. As to setting a carbon price, there are 2 schools of thought. During our stakeholder consultation, a broad consensus emerged for price discovery to be maintained in the market, as it would be difficult for policy makers to determine appropriate price levels. In addition, it is not politically feasible to set a carbon price. As this is considered a taxation issue, it requires unanimity. It is difficult to imagine a carbon price on which all member states could agree.

The European Commission is in close contact with all stakeholders and has run its proposal by traders. For the financial players, having volatility in the carbon price is not necessarily negative. However, we have also seen many banks closing their carbon trading desks due to low carbon prices and low returns. Their business may be based on volatility but a more stable and higher carbon price is nevertheless seen also by traders as a step in the right direction.

Michael Grubb

Regarding energy efficiency, the vast majority of energy use is governed by first domain economic behaviour and not by second domain optimisation. It was therefore fanciful to imagine that the EU ETS would have a radical impact on end use energy efficiency. The industrial setting may be somewhat different, but few people in the building sector would suggest that energy price is the dominant driver of structural efficiency.

Regarding carbon prices, I am not suggesting we should return to a carbon tax, which at EU level was a political disaster in the 1990s. If carbon prices are to play a useful role in decarbonisation, the current price is too low. However, no one specifies what exactly is meant by "too low". Price discovery is very valuable, and I support the EU ETS. However, it is not delivering on one of its key promises. It will not be able to deliver until we have an effective discussion on what we mean by "too low" and what we might mean by "too high". This – and also associated use of EU ETS revenues – could also help it deliver on strategic investment and innovation, which contribute to both security and the environment.

Stefan Ulreich

I would like to make 2 concluding remarks. At times it seems that the ETS will become a permanent construction site, based on an ongoing revolution rather than stability. It will become a challenge to find the right balance between the necessary changes and the stability of the system.

Second, research that is currently underway is aimed at understanding the relationship between renewables and CO₂ emissions. It may be preferable to begin learning with a simple, 1-target system rather than beginning with a fully-fledged 20-target system that implies much interference.

Session III: Energy security and capacity mechanisms

- ▶ Inge Bernaerts, European Commission
- ▶ Carlos Battle, Comillas University and MIT
- ▶ Thomas Veyrenc, RTE

Moderator: Einari Kisel, WEC

Einari Kisel

This session will be devoted to energy security. We have now realized in the EU that energy markets do not always deliver what they were expected to deliver, and that includes energy security.

Energy security in the EU internal energy market

Inge Bernaerts, European Commission



Energy security has always been an important component of the triangle of the 3 objectives of European energy policy and is today, once again, at the forefront of the agenda not only in the electricity sector but also in the gas sector. This is particularly so in the context of the Ukraine crisis. A previous speaker stated that security of supply is probably easier to resolve than the climate change dilemma, and it is true that when it comes to energy security we have more instruments at our disposal than is the case for the global climate change dimension. However, even with respect to energy security, this is not a case of one silver bullet. Instead, we need to adopt a series of measures and strategies both with respect to the gas sector and with respect to the electricity sector.

The European Commission will publish a strategy on energy security in June 2014, specifically in the background of the Ukraine crisis. One of the features of that strategy is the diversification of sources of supply and the diversification of technologies of supply. Being rational about how we use and save energy, and having industrial processes, appliances and buildings that are as energy efficient as possible is also an important strategy from the energy security point of view. Using potential indigenous sources is another obvious trend, as is removing bottlenecks in infrastructure within and across European countries, both with respect to gas and electricity.

Overall, security of supply is a matter of various instruments that contribute to maximising our protection against supply risks.

Generation adequacy

With respect to the electricity sector, in particular, the question of generation adequacy has been at the forefront of debates within the sector and more widely with the public. That is the case in many European member states. This is a question for which it is important not to jump to conclusions. Nor should decision be based on fears. Rather, it is important to rationally analyse factors that contribute to generation adequacy. On the one hand, the analyses of generation adequacy that have been undertaken in Europe show that we appear to be in a situation of over-capacity rather than under-capacity. On the other hand, we have come to the end of the life-cycle in a number of major power generation plants. New capacity has also been built on the basis of investment decisions that were taken before the economic and financial crisis emerged. Substantial proportions of renewables have come onto the system, as well as new CCGTs and coal fired plants. In Germany, for example, the 8GW of nuclear plants that have disappeared have been more than compensated for by the new capacity that has come into the system.

With regard to renewables, the speed of their development was not predicted by observers or the public authorities, in particular in countries where rapid development took place: Germany, Spain, Greece, or Bulgaria. That too raises a number of important questions with respect to generation adequacy. These low marginal cost production types have an impact on wholesale prices. The wholesale price in France, for example, decreased by 12% between 2012 and 2013, and decreased further at the beginning of 2014. Part of that is due to the introduction of renewables in France, and in other markets with which France has been coupled. It is also related to low coal prices, and even to low temperatures earlier this year. Wholesale electricity prices are therefore low, exacerbating the issue of whether electricity markets alone can underpin investment in new capacity. Other elements – regulatory uncertainty and uncertainty about CO₂ prices – have also resulted in the effect that, while we are in a situation of over-capacity today, we may move from a boom cycle to a bust cycle if no further investments are made.

This raises legitimate questions that have put considerable pressure on policy makers to intervene. Today, policy makers have a more difficult task with respect to security of supply, and do not have enough instruments to deal with that task. In the non-liberalised past, it was easier for policymakers to deal with security of supply: they simply outsourced that responsibility to vertically integrated monopolists that could easily invest in the overcapacity in the market. That made for a quite predictable system. Today, there is no single entity to which the responsibility for security of supply can be outsourced. It is also necessary to deal with intermittency in production, and the fact that national electricity systems are much more integrated with neighbouring systems.

The EU perspective

What is the European Commission proposing as possible answers to deal with this situation? First, we want to come to an in-depth and comprehensive analysis of the extent and nature of concerns with respect to generation adequacy. Second, how can we provide input to national authorities on making the right decisions as to the most effective and cost efficient way forward?

In terms of identifying the problem, a fundamental question to be addressed is what exactly is missing in terms of generation facilities: peaking plants (that operate for a few hours only during periods of extreme demand) or a general level of production including some base load? Is the problem a local one, a nation-wide one, or a regional one? The European Commission tries to promote a certain depth and objectivity in the analysis of the problem being addressed. That analysis should ideally be carried out, or at least coordinated, on a regional level.

Second, we want to understand the causes of the problem. If there is a lack of flexibility in the power production park but there is also a regulatory cap on wholesale prices, this could create a disincentive for generators to invest in peaking plants. The best solution in such a case could be the removal of the barrier to the functioning of the wholesale market. In conjunction with industry, the European Commission developed the famous target model for the electricity market whereby prices reflect whether electricity is scarce or abundant during each moment of the day. That work is far from being accomplished, and intraday market coupling is still lagging behind. Before jumping to conclusions and creating a new market, it is preferable to try and remove any existing barriers to market functioning.

Third, in our view, interconnectors are of crucial importance in dealing with security of supply, in particular against a background of a higher proportion of intermittent renewables coming into the system. France is a good case in point to illustrate this. France has an export capacity of 12 GW today, and import capacity of 8 GW. The interconnection between France and Germany was congested 50% of the time in 2013. The congestion in interconnectors between France and the UK, between France and Switzerland, and between France and Italy is among the highest in Europe today. In itself, this is an indication of the need for more interconnection, both for security of supply and for the proper functioning of the market.

Fourth, capacity remuneration mechanisms are of great interest but we know from experience that they involve many different risks and questions. Are we sufficiently sure that markets will behave rationally? Why do we believe that capacity remuneration mechanisms will deliver the necessary price signals? Do we have a certain price in mind that we think will be needed to incentivise the building of CCGTs even if they only run for 200 to 500 hours per year? The design of these capacity mechanisms is a very complex issue. There is also the concern that these mechanisms may become a permanent construction. That is not to say that we should not start somewhere. However, before we start such a system, we should be aware of potential pitfalls. The system should also be flexible enough to be able to be adapted should it not deliver the desired effects.

Capacity remuneration mechanisms and the future of the EU electricity market

Carlos Batlle, Comillas University and MIT



It is paradoxical that these mechanisms have not been widely considered in Europe until these recent years, at precisely the time when we have an over-capacity in a good number of markets.

Market design

In terms of market design, I believe that we should try to avoid government interference in the market. If government interference does prove to be necessary it should at least be done explicitly. But in any case, when it comes to policies to support investments in infrastructure, there is no better way to do this than by minimising regulatory risk and maximising stability.

We should increase the role of distributed generation and demand response in the balancing and ancillary services markets (TSOs). Although it is not an easy task, we also need to make a greater effort to achieve not only the integration of day-ahead markets across Europe but also the balancing ones.

With respect to tariff design, subsidies for renewables should be better designed to avoid sending the wrong signal, for example by creating negative pricing. Hidden subsidies such as net metering with volumetric tariffs should also be avoided.

CRMs and the EU electricity market

The regional integration of power systems is aimed at a number of different objectives. First, it aims at increasing the responsiveness of the system to short-term contingencies. Second, it aims at optimising economic dispatch. This relates to short-term fluctuations (for example, due to intermittency of renewables) and medium-term fluctuations (seasonal fluctuations). Third, it aims to achieve integrated expansion of both generation and transmission at the regional level. In principle, it is in the spirit of the European Directives to ultimately achieve these three levels of integration. But in these last years, while both the European Commission and ACER have been putting the main focus on going further on the integration of short-term markets, the majority of Member States have launched into the development of CRMs. While theoretically, if properly designed, CRMs should not necessarily harm the future development of the Internal Energy Market, unfortunately, these national initiatives seem to aim at energy autarky rather than seeking a wider regional coordination. This situation can significantly affect the potential benefits of an integrated long-term expansion of the European power system, limiting the scope of the Internal Energy Market to a short-term market for “left-overs”.

In reality, CRMs are here to stay and it is a waste of time to come back on that question. The elephant is already on the living room floor and it is no longer possible to take the elephant out of the room! Our time would be better spent in focusing on preventing flawed design and barriers, and guaranteeing minimum design requirements. If properly designed, CRMs could contribute to the integration and efficiency of the internal energy market (for example turning them into a helpful tool to develop demand response, precisely contrary to what the current designs under discussions are leading to). The current trend appears to heading in the wrong

direction with new non-market oriented patches, a continuation of the current structure of market agents, and long-term cross-border market segregation.

In terms of the shrinking market, the future short-term volatility of prices should by no means be an issue for system adequacy. In terms of the harmonisation of CRMs, implementation of an EU-wide capacity mechanism is not only extremely unlikely for the moment, that also unnecessary from both a theoretical and a practical point of view. Regulations in the member states should be allowed to require different levels of reliability. Again, if properly and carefully designed, there is nothing intrinsically harmful of CRMs, as soon as they do not discriminate foreign resources. To take advantage of the benefits of market integration, it is crucial to avoid the creation of any regulatory barriers that could hamper cross-border trades.

Conclusion

Although there will always be different points of view about the suitability of their choices, both the European Commission and ACER have done and are doing a good job enhancing the integration of short-term markets. But in my opinion both institutions should take as quick as possible a much more active role to avoid that certain design features of the CRMs currently under development could severely condition the future efficiency of the Internal Energy Market. The focus should no longer be put on discussing the suitability of implementing CRMs, but on the careful analysis of the design details of these mechanisms, since especially in these case, the devil is in the details.

A capacity market in France: status of discussions and future steps

Thomas Veyrenc, RTE



In France, the capacity mechanism law was voted in December 2010. It then took three years to design the system which is currently proposed, including one year to carry out stakeholder consultation on the detailed rules. The market rules have been presented to the regulator and Minister in April 2014, for approval. A supporting report presenting the rationale for the capacity mechanism from a technical and economic point of view comes with the proposition of rules. Public consultations were held in autumn 2013. The first delivery year is scheduled to happen in 2017.

Rationale for capacity mechanisms

I was initially cautious about capacity approaches when the issue was raised 5 years ago. However, it is likely that France experiences a textbook case of market failure with significant concerns about its ability to manage peak load events according to public objectives for security of supply. Peak load has grown by 30% in 10 years, and the French system is particularly sensitive to cold waves, which generally occur every 10 years. That means that peakers (generation as well as demand-response) make their money in a few hours every 10 years. That is an extremely risky situation for market participants, and no one would want to invest in that.

The present concern is confirmed by adequacy studies forecasting the evolution of the power system in France in the medium run. Those studies are based on a stochastic

approach, modelling both France and neighbouring countries. They show that overcapacity is disappearing with the worst-case scenario showing a clear lack of capacity as from 2016.

Like other capital-intensive industries, the electricity sector is likely to experience boom and bust cycles, which also affect the security of supply: situations featuring a small overcapacity may end up with simultaneous economic retirements of units resulting in situations of risks for security of supply. The capacity mechanism can help to smooth this phenomenon.

Changes in the generation mix may, lastly, provide an additional rationale for capacity markets. Intermittency is a growing challenge in Europe, which leads to new patterns (cheap energy when capacity is available, but risks for the system when capacity is unavailable). Pricing capacity as a product as such seems likely to be a necessary tool to help this transition to happen whilst respecting public authorities' requirements over security of supply.

To conclude this point, I would argue that capacity mechanisms are already a reality in Europe, and some have even existed for many years. European Commission recommendations published in November 2013 provide a check-lists of “dons” over which it is possible to start elaborating, but this list could be followed by “dos”. In any case, the cross border component is yet to be designed.

The French capacity market

The main design principles of the French capacity market include complete market coverage, an equal treatment for new and existing plants, technology neutrality, lack of interference in the functioning of the IEM, a market based system without any public funding, and a forward looking approach. I would like to say that I disagree with the concept of “generation” adequacy; in France we only ever refer to adequacy, as promoting demand-response has been integrated as a cornerstone to address peak-load issues.

In order to leave room for demand response, the way you define the peaking period of the requirements to participate to the capacity market is of utmost importance. In France, the proposition of rules submitted by RTE on April 2014 has made the choice of technical parameters (peaking period durations, etc.) that should help demand-response to actively participate. The decentralized nature of the CRM, added to the ability let to demand-response capacity owners to obtain certificates up to the last moment should create a reactive system in which increases in capacity prices would lead to additional demand-response entering the market, which would help stabilizing the price.

In other words, the French capacity mechanism is embedded in a policy that aims to promote the demand response. As of 2014, we will see the achievement of a 3-year programme to open all French markets to explicit demand response participation. France will be the first European countries to have gone this far. Opening markets to explicit DR participation is implemented under a specific regulatory regime forged following a first opinion of the Competition Authority in 2012, and then supported by a second opinion of the Competition authority in December 2103.

A European capacity mechanism

With respect to European integration, a roadmap for explicit cross-border participation has been proposed by RTE in April 2014. Explicit cross-border participation is the

ultimate goal but transitory solutions could be considered in the meantime to achieve faster implementation. It may be that the regional approach is the pragmatic way forward. To this end, there are 3 pillars that should be taken into account when designing a solution. First, preserving of the internal energy market, which has delivered huge benefits so far. Second, taking into account the existence of different national choices about security of supply: harmonization of security of supply levels would make things easier but this is not a realistic prerequisite. Third, providing real added value for security of supply. Cross border participation makes sense in economic terms only if the contribution of a foreign capacity is equivalent to the contribution of a French capacity.

The roadmap is based on a number of key principles including the need for compatibility with different levels of security of supply, without reserving interconnection capacity. It will also be limited by physical import capacities, allocated on the basis of a market-based process. The target model is conditional on the existence of a cross-border certification and control process. It is also conditional on the existence of a cooperation framework for security of supply. The transition phase could be conditional on the participation of foreign capacities in the French balancing market. This is a second-best that more reasonable assumption in the medium term. It is also compatible with a regional approach. If approved by the Minister, this roadmap will be discussed with stakeholders as from September 2014, for 10 months.

This is very much work in progress, and we will not have one solution that will solve all the problems that have emerged on the market. For example, the French capacity mechanism is not an alternative to the reform the support scheme for renewables, the commissioning of new physical cross-border infrastructures, or the harmonization of markets design for the intraday and balancing timeframes. Capacity mechanisms are simply one element in a global framework to address the issues we face today.

Open discussion

Issues for debate:

- ▶ How can electricity market design cope with the growing share of renewables?
- ▶ How can we avoid a negative influence on neighbouring markets?
- ▶ Whether and why the market needs coordinated capacity mechanisms?
- ▶ Whether EU European policy supports investments in infrastructure?

Einari Kisel

I will now open the floor to your questions.

Leonhard Birnbaum

I very much agree with the idea of the white elephant. While I understand the caution of the European Commission, I also believe it is a major error. I would argue that it would be much better to have market-based regimes in place that include demand response rather than having patches and fixes that are not compatible with each other. There are encouraging signs that German industry is proposing a system that is compatible with our major neighbour, France. That would be a good example of cooperation on the regulatory side. In addition to the white elephant argument, there is also the argument that power stations will disappear. Negative spark spreads over

four years will not be acceptable to anyone in the industry, and we will see a more rapid reduction in capacity. I would therefore encourage the European Commission to move more rapidly forward on this.

We have been discussing capacity mechanisms but, given the situation in Ukraine, it is also necessary to discuss the issue of the physical availability of commodities. Is the concern of the physical availability of the complexity or the price effect of potential scarcity signals? What we really talking about: gas, coal or oil? If we are talking only about gas, that hurts Russia and it hurts the EU; if we are talking about coal that will primarily hurt Russia and the EU; if we are talking about oil – buy far Russia's largest commodity – I cannot imagine how the world would cope without Russian oil.

Inge Bernaerts

Regarding capacity mechanisms, you seem to suggest that the position of the Commission is to stop capacity mechanisms until we come up with the perfect grand scheme. That is not at all our approach, and we are in fact particularly focused on design. I am not sure that we face an elephant in the room but rather a dog, and I am not convinced as to how dramatic the impact of capacity mechanisms is on the internal energy market. We already have capacity mechanisms in Europe today, and the framework of an internal energy market will not disappear because of the introduction of capacity mechanisms. Nevertheless, I fully agree on the design principles such as no restrictions on interconnectors on the pretext that national consumers have been paying for security of supply in their countries. That is very clear both under the state aid rules and the public service obligations.

In terms of taking demand response into account, we look at adequacy from both the supply and demand side. The French system has beneficial effects in that direction. However a number of questions still remain. For example, is availability checked only on days of scarcity?

Interconnection is a crucial issue. It is not sufficient to only discount for technical availability on interconnectors. That will not give the same value to an interconnector as is given to national production. It is also necessary to incentivise interconnectors, or at least production abroad, in the same way as is done with national production. We proposed to earmark for that capacity the value it would have obtained if it had participated in the capacity mechanism, and to use that money to develop additional interconnectors that are desperately needed. We do not want to stop all initiatives until we develop the perfect design. We want to work on those design features as of today.

Regarding Ukraine, to date there has not been any interruption to the supply of gas or any other commodity to the European Union. Nevertheless, our risk assessment has been modified. We know that Ukraine is an important supply route, and it is wise for Europe to prepare for any eventuality. In this context, the situation for gas differs from that of coal or oil. Due to the need for a physical transit through Ukraine, the risks associated with gas are quite different. We are therefore preparing for the various disruption scenarios that could emerge. In this context, it is important not to jump to conclusions and engage in short-term reactions. At the same time it is important to be prepared.

Carlos Batlle

I believe this is a white elephant not a dog. We are making decisions that will condition investments for the next 50 years. If we make a mistake today, the results of that will continue to have an impact for the next 50 years. This is therefore a major issue.

I was pleased to see someone from the Commission being so explicit with respect to the design details of the capacity mechanism. Given the impact of the regulations in practice, it is important to be very strict about the details because those details can make a real difference.

Inge Bernaerts

There are many different types of dogs in different rooms across the EU, and some look nicer than others! Due to the many different mechanisms in place across Europe, it is difficult for the European Commission to generalise. We are engaged in discussions with national authorities that are in the process of reforming their own mechanisms.

Thomas Veyrenc

The discussion on the precise design will emerge as we go forward. Our discussions today are already very different from what they were one year ago. It is also important to engage with market participants and stakeholders in a public consultation that is as in-depth as possible.

Regarding cross-border participation, I see the system we have proposed as a first but important step. We now have the framework in place to allow us to progress with practical solutions. I also believe that we need to be fair among the different CRMs. Those countries that are putting these questions on the table should not be treated more severely in those countries that are sweeping them under the carpet.

Cross-border coordination is theoretically possible but is unlikely to occur at pan-European level right now: the regional level makes more sense. Exchanging certificates could be a good way to show that coordination between CRM is possible - it is more difficult to see how we could have cooperation between a decentralised market and a call for tender, for example. We face many technical and practical difficulties that do not exist in the United States, for example. That means we have to develop new ideas compared to what exists in the United States.

Michael Grubb

There are two distinct aspects of cross-border issues. First, whether and how capacity can participate in capacity mechanisms? The UK is lagging behind in this area, and is still trying to determine how interconnectors could be included in the UK capacity mechanism. Second, how do countries calculate how much capacity they want to procure through their capacity mechanisms? There has been quite a lot of wishful thinking from the floor. The UK, for example, will not agree that capacity abroad is counted in the same way as capacity at home. Until we develop a methodology that can be replicated across different states, national regulators will always err on the side of caution and assume no reliance on interconnectors. That is a major problem.

Inge Bernaerts

This is similar to the problem on CO₂ pricing. It is a politically difficult issue but it has to be addressed. All of this has to be explained to citizens. Politicians can take the easy political solution and pretend that it is cheaper to produce all electricity within one's national borders. Alternatively, they could explain to citizens that everyone has to gain by trading in energy and linking one's market to one's neighbours through interconnectors. By having complementary energy mixes in neighbouring countries, both countries gain by linking their markets through interconnectors. It should not be too difficult to explain this to the public but it requires a certain level of political courage.

Thomas Veyrenc

I would distinguish between the technical and political issues. On the technical side, in France, in terms of the reliance on cross-border capacities, the discount was determined by modelling the contribution of the neighbouring country to imports during peak load. The result was a reliance of about 7GW, compared to the physical limit of 9GW. In most cases, there will be in-flows from neighbouring countries during peak loads. But there could be some situations where there is not enough capacity at the border to resolve the situation in France.

Carlos Batlle

The current model proposed by ACER provides that a country like France could have a capacity mechanism. It could face a situation where some generation resources could go into another country. Therefore, it is not just that you cannot rely on what is coming from across the border; something could be skipping from your own country under this target model. I do not think this situation will actually arise in practice. However we would need to modify the regulations to allow for physical contracts. It is therefore a complicated issue from both the technical and political perspective.

Thomas Veyrenc

The problem occurs when 2 countries face the same issue at the same time. For example, if France faces a peak situation and Germany does not, the flows will be directed from Germany to France because prices will be higher in France. If, on the other hand, France and Germany both have the same problem at the same time, it will be necessary to have a method that will allow the TSOs to distribute shortage according to the different levels of security of supply. This is precisely why condition 5 in our Roadmap is aimed at resolving this issue. This is what is at stake: when you think about capacity mechanisms it is always necessary to consider the worst case scenario, as that is when the mechanism is supposed to provide some form of insurance.

Einari Kisel

I would like to conclude this session by stating that we all know that capacity mechanisms are on their way in all markets. We do not yet know if they are dogs or elephants, but we do know that many details have to be worked out, and the devil is clearly in the details. If we opt for capacity mechanisms, it is necessary to make every effort to ensure that we get them right.

Friday

25 April

- ▶ **Session IV:**

FUTURE OF STATE AID FRAMEWORK

- ▶ **Keynote speech:**

THE ENERGIEWENDE IN THE EU-2030 CONTEXT

- ▶ **Session V:**

ENERGY PRICES AND COMPETITIVENESS

Session IV: Future of state aid framework

- ▶ Carsten Rolle, Federation of German Industries
- ▶ Dominique Finon, CNRS
- ▶ Denis Cochet, Alstom

Moderator: Slav Slavov, WEC

Slav Slavov

We will now commence Day 2 of our meeting with a very sensitive issue: the future of the state aid framework. Since the WWII subsidies have regularly been allocated to the European coal industry, with a view to achieving certain political objectives. Later, subsidies came to be considered in a negative light, particularly in their form of hidden cross-sectoral subsidies. In the 1980s and 1990s, subsidies were considered by some politicians as dirty – they were called “black subsidies”. Today, when we talk about subsidies to renewables, they are called with more attractive names such as: “incentives”, “green subsidies”, “state aide”, and so on. Such subsidies are being practised without exception in all the European countries. A part of subsidies provided by state as “state aid” the major share of subsidies to renewables is today paid by end consumers, both, households and industry.

Since recently, many questions have been raised about whether such subsidies should continue to be allocated, a policy measure against the basic principles of a competitive market. What kind of aid could be provided without leading to a distortion to the market? Many questions have also been raised as to the speed of the energy transition and the cost of that transition. The more rapidly we want the transition to occur, the more we should pay for it.

Transforming the energy system while ensuring competitiveness

Carsten Rolle, Federation of German Industries



The main principles of the German *Energiewende* were decided in 2010. They constitute a long-term plan to 2050 with respect to CO₂ emissions, renewables, energy efficiency and so on. The government has set a range of targets to shift the entire energy system to a more sustainable one. The accidents that occurred in Fukushima had an impact by leading to a faster phasing out of nuclear, but the principles had already been decided before that

disaster occurred. The new government that was elected in November 2013 has retained the principal targets, which have now been translated into law. All political parties are very much committed to this transition, and there is a high level of consensus concerning the long-term strategy that must be undertaken as well as the future share of renewables in the energy mix.

Cost of the *Energiewende*

One of the issues that should be addressed is security of supply. With respect to residual load, there is a high level of volatility due to the intermittence of renewables (wind and solar). As a result, it is necessary to find solutions to provide the necessary guaranteed capacities and also to develop storage capacities, interconnectors and cooperation with neighbouring countries.

The core of the electricity *wende* is taking place in the renewables sector. This will require extra investments of approximately €200 billion in terms of the German electricity sector to 2030. We are now in the position to get 3 power parks: a conventional power park with guaranteed capacities, and 2 other parks for renewables. In 2020, we will have almost 3 times the maximum load capacity. On the one hand this implies big chances for many companies; on the other, it involves costs for many consumers and goes along with major changes of the whole system..

Implementing the entire strategy will require an investment of approximately €370 billion in the electricity sector in total, primarily in generation capacities but also in the grid. This is therefore a huge, long-term project that goes far beyond 2030. That huge investment has to be financed somehow.

In terms of competitiveness, German electricity prices for households and SMEs are among the highest in the world. Only Italy and Denmark have similar prices, and there is a huge gap notably with the US and China. This is a particular issue for energy intensive industries. Wholesale prices for electricity are not high but the levies and taxes on electricity for the manufacturing industry and private households are very high, and have increased significantly in recent years. Renewable levies in Germany have also increased dramatically, and are currently almost double the wholesale price. The politically induced costs therefore play a greater role than the market itself. That cost is not matched in other European and non-European countries.

Energy intensive industry: a silent leakage

The consequence of all this is a silent process of investment leakage in energy intensive industries such as the metal industry, the chemicals industry, the paper industry or the glass and ceramic industries. These industries have to deal not only with higher prices but a high level of uncertainty due to the unsecure framework conditions of the future. 23% of Germany's GDP is generated by the manufacturing sector – double the figure for the UK or France, for example – and this is therefore a significant development.

Gas prices have developed differently in the US as compared to Europe, due to the impact of shale gas since 2008. The scissor has therefore opened on gas, which represents an important fuel for the manufacturing industry. When it comes to competitiveness issues for industry, gas and electricity matter much more than oil. Shale gas has led to low prices of industrial gas and electricity. The scissor has opened and electricity prices in the US are now almost half of those in Germany. Different branches are affected in different ways. If we look at PVC production, for example, raw material costs and energy costs have a strong impact on product prices

and production costs. The production costs of PVC are relatively high in Germany as compared to North America and the rest of Western Europe, and would be even higher if industry would not profit from some cost reductions for the renewable support schemes that are currently under discussion.

When it comes to gas prices, the IEA's *World Energy Outlook* shows that gas prices are much higher in Europe, Japan and China compared to the US. They will remain higher to at least 2035, with European gas prices probably double those of the US. As a result, the European share of the global export market for energy intensive goods will shrink. We are the losers in the global game in this respect. At the same time, the share of China, the Middle East or India will grow.

All of these market developments show how sensitive we are to politically induced costs. They also highlight the need to find a European framework to keep industrial value chains within Europe, as these are one of our strengths today.

Challenges of an integrated European energy market

On 9 April 2014, the European Commission announced environmental and energy state aid guidelines that set the framework for all subsidies and relief schemes for the future. In parallel, the Commission started a review of the German renewables legislation and relief schemes in December 2013. In Germany, this is considered as an attempt to increase the Commission's competency in the energy sector (where it has little power) via competition policy (where it has significant power). Competition law is the Commission's most powerful instrument: it is directly binding and is not subject to a parliamentary process.

The Commission decided that, for competitiveness reasons, relief schemes would be possible but they are significantly restricted to 68 branches out of 170. In those branches, companies are able to pay a lower renewables levy than they would otherwise pay. That exemption amounts to approximately 15% of the costs that would otherwise be paid. For some companies, this means higher production and energy costs; for others it could mean lower costs.

I do not believe that the European Commission's option of attempting to influence energy policy through competition policy is the right approach. These branches feature very different products, production procedures, and markets. In addition, the European Commission referred to assumed energy prices, which do not actually exist in practice. The European approach in some respect is therefore far from the practical world of the manufacturing industry, and is creating difficulties.

We are now in the process of implementing this in a national Renewable Energy Act, which is under discussion in Germany until the summer. We are in favour of a stronger European energy market and of greater energy competences for Europe. However, we would prefer to have those competencies located in the Energy DG. We would also prefer the creation of a real energy market rather than the launch of very complex mechanisms via competition policy. That is my final conclusion.

From the floor

When you compare the cost of electricity, you have provided a figure for Europe as a whole as compared to the US or Japan.

Carsten Rolle

I also provided figures by country and by region. The prices in Italy, Denmark and Germany are among the highest in Europe.

Could EU state aid regulations hinder EU policies for decarbonisation and security of supply?

Dominique Finon, CNRS



A first remark to begin: there is a real lack of knowledge concerning long term coordination of electricity markets while the characters of this coordination is leading to market failure in terms of investment. The penetration of renewables has further complicated these issues.

Due to the challenges posed by decarbonisation and energy security which needed capital intensive equipment (even peaking units have large capital costs per MWh), member states have moved to regain control of their energy policies. This has led to the development of long-term support for investment in capital intensive technologies in particular low carbon technologies among which renewables (RES) and fossil fuel technologies for adequacy and flexibility. For example, the increased use of feed-in tariffs, the British contracts for difference, and the launch of capacity mechanisms. At the same time, the European Commission has also reacted, through the Guidance to member states on state intervention in electricity markets (November 2013) or the EU Guidelines on State Aid for Environmental Protection. This has redefined the type of support that can be given to renewables or low carbon technologies, or else new fossil fuel capacities for long term reliability. Control of state aid has become the key instrument available to the European Commission in this area. However, is this the right answer if decarbonisation and energy security remain two of the three pillars of EU climate – energy objectives?

The Commission's state aid approach

Under the Guidelines, state aid needs to be notified and assessed by the Commission, which could determine that it is not genuine state aid or that it is not justified. Aid can obtain clearance if it complies with the following principles. It must be aimed at the common interest. It must be the appropriate instrument, and have an incentive effect. Finally, the aid must be proportionate to the objective, and it should be limited in duration and in amount.

The review of the Guidelines is aimed at harmonising and simplifying the rules that apply to energy equipment. System reliability and generation adequacy are to be achieved via a capacity mechanism. Support is provided to low carbon energy sources, and I will here be discussing both renewables and CCS. In order to preserve the competitiveness of energy intensive industries, exemptions would be available on the charges levied in support of renewables. This is only a partial reduction and is only available to certain sectors. The review excludes nuclear technology, which is a purely political decision, but long term contracts with guaranteed prices for nuclear investment in EU countries which still promote this technology are exposed to strict control by the Commission, and I will discuss also this issue.

Reform of renewables support

When it comes to support for renewables, the guidelines will impose that state aid must be paid in from feed-in premiums. It must be granted via a technology-neutral bidding process so as not to distort competition. Exceptions are available for small equipment of less than 0.5 MW. Beneficiaries will be subject in the near future to standard balancing responsibilities, unless there is no liquid intraday market available. The issue of negative prices also has to be addressed.

With respect to feed-in premiums, there has been no real improvement in incentives to operational efficiency. There is an incentive to cut wind generation when negative prices are higher than the premium, but this does not resolve the entire problem. The feed-in premiums also create more risks for developers with respect to the recovery of fixed costs, and so higher capital costs. Feed-in tariffs and CfDs are a preferable option in this respect provided that there are annual quotas per technologies, spatial differentiation and regular revisions of the tariffs to control quantity and developer' rent.

Technology neutral auctioning for long-term contracts with fixed premium proposed by the guidelines is relevant to the long-term competition for contracts. However, the higher transaction costs and administrative risks mean that there are no scale effects for small and medium sized projects. They create barriers for small developers and are only valid for relatively large projects.

More generally speaking, balancing responsibility is the better answer. However, the cost of balancing responsibility would introduce risks and increase price bids in the auctioning of feed-in premiums.

Low carbon technologies: the new nuclear case

With respect to the nuclear industry, Commissioner Almunia has stated that energy companies could build new nuclear reactors without any public support. In 2014, the European Commission stated that nuclear technology was not immature enough to warrant state aid. The European Commission also contests the contribution of nuclear energy to decarbonisation. It has stated that Hinkley Point C will not help the UK achieve security of supply, and concludes that subsidies for nuclear could severely distort competition.

The European Commission is ignoring the reality of new nuclear investment. It has ignored market failures in areas of learning investment. The decisions to invest in EPR in Finland and France are not normal business. In Finland, the risk has been borne by AREVA. In France, a deep pocket, non-privatised and vertically integrated company is bearing the risk. The Commission has also ignored the difficulties that arise in managing risk in large, capital intensive equipment in the electricity market.

I believe the Commission has overstepped its authority concerning state aid as to the energy policy choices by a member state (the UK). Member states benefit from the subsidiarity principle and are entitled to choose their own energy mix.

Conclusion

This competition policy framework presents a significant obstacle in the EU's efforts to develop a robust long term market for low carbon technologies. The state aid approach ignores the reality of electricity market coordination. It also ignores the constraints to investment in large capital intensive equipment and in learning technologies. The existing market price setting on an hourly basis is driven by short-

term marginal costs, and technologies with high upfront capital costs and low short-term marginal costs cannot recover their fixed cost. The case concerns RES, CCS and also nuclear. The issues have been further exacerbated by the penetration of renewables, which creates high price volatility, have lowered average prices and lead to long-term support due to a mechanism of self-reinforcement.

I believe that we need a new Directive that recognises the priority of long-term objectives on market coordination. It should also recognise the central place of planning, in parallel to the secondary role played by markets. It should recognise long-term contracts with neutral agencies, and recognise the central buyer. Such a process would lead to a change in the Guidelines on Environment and Energy. At this stage, we are only restricting the guidelines without producing any real value.

The Commission's communication has been entitled: "Delivering the internal electricity market and making the most of public intervention". In fact a next one should be entitled: "Priority public intervention of member states in overcoming the failure in long-term coordination by the electricity market". That is my rather provocative conclusion!

Specific needs and issues of an energy equipment supplier

Denis Cochet, Alstom



Alstom has 3 main activities: power generation, power transmission, and rail transport. It has one of the broadest portfolios of in-house technologies from gas to coal, oil, hydro, nuclear, onshore and offshore wind, solar, geothermal and biomass. It is present in 25% of the world's installed power plants. Alstom spends €737 million in R&D per year, and has increased its spending by over 50% in the power generation sector alone.

Energy sector overview

The electric power sector is a long-term, capital-intensive industry that operates on the basis of long cycles. As a manufacturer, we are impacted by swings in technologies and by swings in geographies. In terms of the evolution in the market in the past 50 years, the 1960s and 1970s saw a boom mainly in nuclear and coal, and mainly in North America and Europe. We then went through "the valley of death" to the 1990s, followed by a rebound in the late 1990s, mainly due to deregulation in the US. We also had a coal boom in China and the 2007-2008 "all energies" boom at the global level. The 2008 financial crisis halved our market in one year from 370 GW of new orders to 180 GW.

Going forward, we believe the market will remain in the range of 200-250 GW per year due to 3 main drivers. First, replacement needs (in the US and Europe). Secondly, the growth in demand in emerging countries. Thirdly, the boom in renewables, which were not even visible 10 years ago.

A differentiated approach is needed for state aid between R&D and deployment. There are 2 main phases in our work in terms of R&D to commercial deployment. In the first phase, we carry out research and development in our labs, followed by field

validation to validate the technology and performance. In this first phase, we need IPR protection, and adequate support and policy visibility. In the second phase, we shift to the commercial demonstration phase. To develop a commercial demo, it is necessary to have a business case, stable regulations, and policy visibility.

In CCS, for example, Alstom was at the forefront of the development of this technology. We went through the first phase but were unable to enter the second phase due to a lack of visibility, financing and regulations.

EU state aid regulation

When it comes to state aid, an equipment supplier's basic needs include a framework of long-term policy goals. Aid should also provide a differentiated approach for R&D and deployment. It is totally unacceptable to have a system that includes retroactive changes. Protection of intellectual property rights is crucial. The aid process and methodology must be simple and fast, and should create a technology-neutral level playing field. State aid should not privilege one technology over another. Finally, it is necessary to preserve markets and the competitiveness of EU industry.

The new EU rules on state aid provide a satisfactory outcome, generally speaking. Alstom in fact played an active role in driving this process, in particular with respect to CCS. The rules will gradually introduce a market-based mechanism, which we are in favour of. There is an exemption for small and early stage technologies. It includes CCS, and provides for a competitive bidding process. It preserves the competitiveness of EU industry, notably through the charge exemption for energy intensive industries. It provides support for cross-border energy infrastructures, and allows for support to electricity generation adequacy.

Nevertheless, there is room for improvement. The new system is very complex, for example with the concept of net extra costs, which reduces predictability and significantly increases the timeline for the process. The transparency requirements mean that all countries around the world will have access to the relevant data. The matching clause should be completed with information exchange clauses. Finally, the level of aid intensity has been reduced for loans and repayable advances for experimental development projects.

Issues focus

A number of specific issues should also be mentioned. They are all forms of state aid but are not usually thought of as such. First, the danger of the introduction of sectoral rules by international financial institutions (IFIs). There is a strong push today – primarily from the US – to exclude coal power plants from any financing support. Coal power plants will be present in the world for the next 30 years, and Alstom is investing heavily in clean coal technologies. The introduction of such sectoral rules will totally hamper the development of CCS in Europe and the US. It will also hamper performance retrofits on existing plants. Those policies will not reduce the coal market, nor induce emission reductions, they will just penalise Western exports. Coal equipment manufacturing capacity will continue to concentrate in Asia, including highly skilled engineering and R&D jobs, which will be lost for Europe and US.

Second, EU e-market reform is urgently needed. The penetration of renewables, the financial crisis, and the drop in coal and CO₂ prices means that electricity prices are in decline – much below the cost of gas generation. This has a critical impact on Alstom: if our customers are not paid for the kilowatt-hours they produce, they will no longer

buy any equipment from us. Urgent reform of e-markets is therefore necessary to price both energy and dependable capacity.

Third, in order to determine a realistic pathway to energy transition, it is necessary to develop an EU simulation model based on interconnection needs, demand management, public acceptance, cost and so on. This will also help determine the limits to the penetration of renewables.

In conclusion, I believe that we need an in-depth pan-European reform of electricity markets. ETS should be improved to deliver a stronger and more predictable CO₂ price. The European Commission should launch a full regional assessment of power generation adequacy and bottom-up roadmaps. Market liberalisation should allow third parties to operate interconnectors and bid in ancillary markets. Regulatory and permitting barriers to efficient transmission should be removed. Finally, effective planning by grid operators and municipalities is needed to create vision and define the technologies and investments that are needed going forward, in terms of smart grids and CCS.

Open discussion

Issues for debate:

- ▶ How to restructure EU State Aid regulations to better meet the needs of the EU energy sector?
- ▶ What specifics of the energy sector define the needs for change?
- ▶ What issues need special attention in the new state aid framework?

François Dassa, EDF

When it comes to long-term contracts for capital-intensive projects, an important issue is the notion of market failure. The Guidelines on renewables provide for the possibility of special arrangements due to market failure. With respect to Hinkley Point, we could ask whether it is meaningful for the UK to invest in nuclear plants. I believe that it is because nuclear energy is competitive on average. However, there is a need for long-term contracts to allow investors to recoup their investments, and to provide insurance against gas prices and CO₂ prices. That insurance is not provided by the market.

With respect to Germany, you did not mention the fact that there could be a double-win for German industry. On the one hand, subsidies and, on the other hand, industrial companies benefit from lower wholesale prices due to renewables, in particular. What are your views on that?

Europe has a very different system from the US. In Europe, renewable subsidies are only provided via electricity prices. In the US, this is done via fiscal policy. Is it not time for Europe to follow a similar approach and promote public support for general interest policies such as CO₂ or renewables? We could take these policies out of the electricity system and put them into the state's general budget. That would also avoid the free rider issue: the state implements policies but is not responsible for all their impacts. Some of those impacts are borne by operators and consumers. Could this be the way to achieve a level playing field for industry in Europe?

Carsten Rolle

The empirical analysis shows that the correlation between coal prices and electricity prices is much higher than the correlation between renewable energies and electricity prices. Even more relevant, we are all striving for a European energy market that has no bottlenecks and that is based on a *European* energy price. That is the vision we are working towards. When one calculates the competitiveness of an industry, the historical development of prices is not relevant. What matters is the international price comparison. As long as the politically induced burden on prices (levies and taxes) is so much higher than wholesale prices are, small changes in the wholesale prices have no real impact. The extra cost of levies and taxes on the electricity price is met by national consumers only.

Leonhard Birnbaum

You have all basically argued that state aid does not work. However, the EU has reverted to state aid as it is the strongest instrument in its possession: the EU can not push through an energy policy and it is therefore pushing through state aid. Given that the EU has failed with state aid, how can the EU succeed with the European energy market? Second, how can we ever imagine there might be market integration if we do not accept the risks that it involves? Should we not simply stop talking about the market integration of renewables?

From the floor

If the EU wants to play a role in greenhouse gas policies, it has to offer technologies that can be used in the rest of the world. Have these issues been discussed at the EU level? If so, where? Second, when I looked at this issue some years ago, the price of CCS was approximately \$100 per tonne of CO₂. That was to come down to approximately \$60 by 2020. If we remain at such a high level, it could prove difficult to develop this technology. If we compare the capital costs of CO₂ reduction via renewables or via CCS, what is the future of this technology?

Didier Bosseboeuf, ADEME

We are coordinating a project on cross-country comparisons on the energy efficiency performance of 30 European countries. The price of electricity in Germany is twice as high as it is in France. However, German households consume 30% less electricity than French households for appliances. With respect to heating, French households consume twice as much as the Dutch benchmark per square metre. Price does not explain all differences in price efficiency, but it does explain some of those differences. We can observe that efficient countries also practise higher prices.

Denis Cochet

We had a long debate yesterday on policies, instruments and mechanisms. I believe that state aid is not working as it should. If we are using the state aid mechanism to implement a policy that we cannot otherwise agree on, we clearly cannot succeed. Regarding CCS, you referred to the cost of CO₂ avoided by this technology versus renewables. We worked on small prototypes and so on but we stopped all our developments in the area of CCS before reaching the commercial demonstration stage. You cannot compare that to the wind or solar industries that have received billions of euros of support. I believe that CCS will be needed in the future, and we should give it every opportunity to demonstrate what it can do at the commercial

scale. There is no reason why CCS could not achieve a competitive price. We were at the forefront of this technology in Europe but, due to the lack of support, this technology has now almost been brought to a standstill in Europe. Only China is still working on this technology.

Carsten Rolle

It can be frustrating to consider the speed of European common market development. However, I do not envisage a return to national systems. What are the realistic steps we could take in the meantime? If we do not see functioning European energy markets soon, we could imagine, for example, different speeds for these markets. Energy markets are interlinked to a different extent. Markets that have more in common already could start moving more rapidly today with common bilateral and multilateral agreements. We could begin with regional markets where we deepen the cooperation and the institutional frameworks.

Dominique Finon

For European policy, the market does not work. For national policies, the market does not work. Electricity is not compatible with the market. It is a very specific product that is quite different from the automobile sector, for example. Price setting by short-term marginal costs on an hourly market is not compatible with long-term investment. State aid policy can therefore appear to be an artefact developed by bureaucrats when what we really need is long-term contracts with fixed costs and risk sharing. This could be done by a neutral public agency. If renewables do increase risks, we need to make renewable investors assume their responsibilities. If 30% of the energy mix is generated by wind power, it is not possible to manage the resulting electricity system. With a good price signal relative to costs, that will not occur. Ultimately, we need to recognise that the first principle is planning. If the level of renewables is too high, they should be stopped.

Slav Slavov

I will conclude with a number of remarks that have emerged from our discussions on state aid. Through the new Guidelines, state aid on renewables will be maintained to 2020. This is in support of the political targets that have been established for renewables to 2020. No one can say what will happen after that date, and this is not explicitly explained in the Guidelines. In addition, there are strong doubts that the Guidelines preserve competitiveness or that they provide the conditions that would allow capital-intensive industries to remain in Europe. The Guidelines do not provide support other low carbon technologies, in particular, CCS or nuclear energy. There is no transparency in the Guidelines as to the effectiveness of the transition from feed-in tariffs to feed-in premiums. A new Directive is therefore needed to define low carbon technologies.

From the perspective of manufacturing companies, the current economic crisis will considerably slow down large investment projects in energy. Policies are therefore crucial in order to provide the visibility and stability that is needed for large-scale investment in CCS, for example.

Keynote speech: the *Energiewende* in the EU-2030 context

Leonhard Birnbaum, WEC Vice-Chair Europe



The energy Trilemma

We have been discussing the evolution of the market as we go forward and there is a general consensus that we face a trilemma: if we over-emphasise only one target out of the 3, we will not succeed. Given that the trilemma is a reality, how can we achieve balance around the 3 targets? We no longer talk about climate policies alone but also talk about security of supply and competitiveness. There is also consensus that the system should not be over-determined by having too many targets. In the WEC poll presented yesterday, 14 of the 28 member states were in favour of one target only. Balance therefore requires taking care not to do *too* much.

The WEC Issues Monitor 2013 showed the results of a European poll on the key issues and uncertainties perceived by committees, company, institutions, and governments. The critical macroeconomic uncertainties that emerged in 2013 remain the global recession, energy prices and the climate framework. However, in the past, the climate framework came out on top of these concerns, and that is no longer the case. The trilemma is therefore also the subjective perception of the relevant players, including governments. Security of supply was already an issue in the past in terms of systems stability. Physical uncertainty around commodity supply has now emerged in the context of the Ukraine crisis.

The competitiveness issue was also mentioned yesterday. The energy transition (*Energiewende*) is not only underway in Germany but all over Europe. The business as usual case is also very expensive. If we change to a renewable world the incremental costs are lower. Gas prices went down in North America but went up in Europe. We therefore have a real shift in development, and the shift on the gas side is reflected in a shift on the power side. The marginal price of electricity is set by the CCGTs, and the US line is developing in a positive manner. We are looking at a world in which we will see long-term low gas and power prices in the US, unless it undergoes a demand explosion. In that sense, the world is a very challenging one for Europe and we are seeing a real global shift.

One of the key messages of this conference is that energy policy is economic policy as well as environmental policy. The equation of energy policy serving environmental targets is no longer at the heart of the problem. Rather, energy policy is at the heart of

economic development. In that sense, there is a philosophical difference between Europe and the US. In the US, the perception is that energy is a precious input that should be as cheap as possible to drive economic activity. In Europe, energy is also considered as a precious input, but that is the rationale for making it expensive. The IHS CERA investigation has convincingly shown that the macroeconomic impact of cheap energy is very high. If energy does become more expensive, that should be the result of economic activity and not of taxation.

In the context of the trilemma, economic policy and global competitiveness are highly linked.

European energy prices

The relative price differences in energy are driven by both wholesale prices and by levies. Nearly half of the household electricity bill in Germany is made up of taxes and levies. The German levy for renewables is the same as the entire household price in the US. It is actually quite remarkable that consumers in Europe are prepared to accept such prices. This shows that the energy transition is the result of a desire by society to change the energy system. That is something that we, as utilities, have to accept. Policy makers also have to be aware that that is what they are doing without causing undesired side effects such as the destruction of integrated industries. This morning's panel showed that, with the best instrument it has, the EU has failed.

I would like to remind everyone that the problem is not the EU but the member states. The EU has created a framework for an internal market that has triggered the liberalisation that resulted in cost efficiencies that we would not otherwise have seen. German utilities have kept household prices nominally constant over 12 years (pre-tax, pre-levies). There are some market failures and there are some challenges but we should acknowledge that the markets have worked. The EU has done much to foster a system that is very beneficial from the macroeconomic side. However, this has been undermined by national policies, in particular on renewables.

Market integration

We do not have market integration of renewables. However, when the system becomes too difficult, retroactive changes are imposed. The market integration of renewables is perceived as being an unacceptable risk. Today, 70% of capacity has been excluded from integration into the market. There is no technical reason not to integrate everybody down to 30 KW. This is a question of political will only. It is also the will of society. However, the energy transition has created so many interested parties that it will become more and more difficult to develop meaningful and consistent frameworks. In the US, I am always asked how such a system can possibly persist in Europe. I reply that we have so many interested parties that it is very difficult to change the system. That is why we should try to do make changes as soon as possible. The EU has tried to do this through the back door, and has failed. In this context, the German government is both the biggest problem and the biggest opportunity for Europe.

In terms of market integration, interconnectors play a vital role. However, the real bottlenecks in Germany are not the interconnectors but the *intraconnectors*. If we do not see the relevant lines being built, Germany is in danger of being divided into individual price zones. That would be very undesirable for Germany, as it would lead to a higher price zone in the south, where most industry is located. It would also lead to lower liquidity on wholesale markets, which would translate into higher prices. The problems therefore do not only lie at the borders between countries. In addition, due to

the lack of interconnection, we are seeing more and more system interventions by TSOs.

Regarding gas infrastructure, a number of European projects are of strategic importance. However, these projects of common interest do not have a business case and will simply not be built by private investors.

Regarding the internal energy market, we are seeing an increase in the price differences in the CEW region. The number of hours of convergent prices is therefore falling. That can be an advantage on the wholesale side but, ultimately, it is the total end price that matters.

Capacity mechanisms

Due to the increase in intermittent renewables, the profitability of gas generation has declined since 2011. The clean spark spread refers to the power price minus the gas price minus the CO₂ price. In other words, it shows the margin that can be made per kilowatt-hour produced. A negative clean spark spread means that it is not possible to burn gas and highly efficient CCGT plants will have to be mothballed. That capacity will not be kept alive without a capacity mechanism.

We have the infrastructure, we have market integration, and we have inter- and intra-connectors. However, market design needs to be addressed to ensure stability. Renewables integration is the driver of the problems we find in the market, and we need to find solutions to that, notably by balancing responsibilities for renewables. The system cannot continue as it is today. In the past, renewables were a niche technology that had no ultimate responsibility. However, once they shift from being a niche to being the actual system, they have to have responsibility and that means it is necessary to have market integration. The aim here is not to “kill” renewables but adapt the system to reality.

Conclusion

The energy industry will remain one of the most exciting industries in the world in the coming decades. Decision makers know that that some balancing will be necessary, and that is an opportunity to find constructive solutions that balance the different requirements of society.

WEC has made a number of specific recommendations in this context. First, reduce the number of binding targets to a greenhouse gas target. Second, without a global agreement, it will be difficult to recover the competitiveness of European industry. Third, further measures on energy efficiency and renewables are up to the member states but must be in line with internal market rules.

Finally, the conditions for success as we go forward include a long-term, predictable, stable and favourable climate for investment, access to financing and capital at a fair costs, and further research, development and deployment.

Open discussion

From the floor

Since the EU began the state aid process, it has publicly stated that certain industries that are considered as critical for the world will be subsidised in Europe. That leaves it open to attack from other countries such as the US. Is that concern justified?

Leonhard Birnbaum

I am not an expert on the legal issues raised under the WTO with respect to that statement. There could be some concern but this is less a case of a direct legal attack than of a *quid pro quo*. If a policy is obviously favourable to one country or region, there will always be some sort of pay-back later on. For example, in the European context, Germany will pay a price for the way it has exempted certain industries. It will have to pay that back at some point. The same will apply between the US and Europe, between the US and Asia, and between Europe and Asia. There is always a price to be paid for everything one does.

From the floor

How fit for the job are the current European policies and regulations in the gas sector? Are we not going towards a situation of too much volatility? What is your view on the debate for greater integration of the European site on the consumer-producer dimension? There is a growing appeal for non-market mechanisms and solutions in this respect.

Leonhard Birnbaum

I do not believe in huge volatility in the gas market. Today, we have no volatility at all and the system is sufficient as it stands. The volatility in the system is not physical but is politically induced. We have sufficient storage and import capacity. If we want additional strategic assets (such as an LNG terminal for Germany), that will not be built on the basis of a business case; it will only be built via the regulations. If a country wants to do that in order to have security of supply, the EU will not prevent that but there is no business case for it. That is perhaps not sufficiently reflected in the thinking of the regulators.

Should we have a European energy union? I do not think that is wise. If our interests are so divergent, it will be difficult to create a unified energy union. Instead, we should devote our efforts to those areas where we can resolve existing issues.

From the floor

I often wonder whether energy also means electricity. We also need to explore the issues that are faced by the oil industry in Europe, in particular, the refining industry. We tend to assume that the refining industry will always be there without any assistance. That is an error because this sector is also important for issues such as greenhouse gases, transport, and so on.

Leonhard Birnbaum

That is an excellent point. In discussing the energy transition, we tend to focus on power. However, there are also the issues of heat and transport, and we can only reach a consistent picture if we consider the interactions between all those sectors. Oil is always the last focus perhaps because it is the area where we have the best functioning market. Oil is the most market based of all the commodities.

From the floor

I am the General Secretary of the Energy Efficiency Network Knowledge, which will have its kick-off meeting in London next month. I am not sure that we share in your first concluding remark on the need to reduce the number of binding targets. Are you not in favour of a coordinated European policy on energy efficiency?

Leonhard Birnbaum

The proposals in my conclusion are the result of the work led by Jean Eudes Moncomble. We have stated that what we really need is a CO₂ target. If we have a second target it should not be for renewables but for energy efficiency. If we do have additional targets they should be non-binding and at the European level. From a WEC standpoint, we looked at the development of efficiency in the past few decades and found that the rate of efficiency improvements was decreasing. We are making less and less progress on energy efficiency, and we are far from the efficiency targets we would need to reach the worldwide 2° target. WEC has therefore stated that we need breakthrough R&D on efficiency to get us beyond where we are today.

Session V: Energy prices and competitiveness

- ▶ Bosse Anderson, Svensk Energi
- ▶ Marco Margheri, Edison
- ▶ Jean-Louis Schilansky, UFIP

Moderator: Jean Eudes Moncomble, CFE

Jean Eudes Moncomble

Our meeting opened with a discussion of the trilemma, one of the pillars of which is the search for greater equity. The WEC Task Force has defined equity in terms of lower energy prices, which address the issue of fuel poverty and contribute to competitiveness, economic growth and employment. Competitiveness is therefore a key issue at the very top of the agenda.

A challenging future

Bosse Andersson, Svensk Energi



Today, electricity and energy markets are characterised by change. 20 years ago when we deregulated electricity markets in Sweden, we thought that politicians would no longer have a role to play in these markets. However, we have seen a continuation of the political initiatives in this area making for a difficult investment environment.

A changing world

A few years ago, climate change was at the top of the agenda. Today, economic crises, unemployment and the recession have changed that focus. Europe is still aiming for a 40% reduction in greenhouse gases by 2030. However, this is proving to be a significant challenge. Sweden participated in a study, *North European Power Perspectives*, which is concerned with the climate change goals for 2050. We reduced emissions by 20% over 30 years. We are now saying that we can achieve a further 20% reduction in the next 10 years. At the same time, we are aiming for a competitive Europe. That will be quite a challenge.

The general perception is that we will always have electricity, and few people would consider there is risk of not having the electricity we need. We have made an error by

discussing how many kilowatt-hours we need per year instead of engaging in the more difficult discussion of how to have a balanced system every second of the day. We use three times more electricity on a cold February morning than in the middle of the summer. We discuss, phasing out nuclear plants as if we could replace them with the same number of kilowatt-hours of wind power. However, there is a major difference between the two, and that is something on which we have not sufficiently communicated.

Balancing the energy Trilemma

We have to emphasise the necessity to have a broad scope for the future if we are to balance the energy trilemma. We tend to think that what is going on in Europe is the same as what is going on in the rest of the world. In terms of the electricity generation mix in the world between 2006 and 2010, renewables have increased from 2.3% to 3.7%. Nevertheless, there is a general perception that fossil fuels are being phased out throughout the world.

Each economy wants to retain its competitiveness, and it is difficult to accept changes that harm one's own economy and help others.

Game changers

We have been discussing peak oil for over one hundred years even though we have never had as much known fossil fuel in the world as we have today. It is difficult to justify not using these reserves.

Sweden's electricity production is 97% fossil fuel free today. Therefore, what is the potential for reduction of CO₂ emissions by Swedish industry? We could do something through the existing technologies, but 50% of the possible reductions relate to new measures that are currently in the R&D stage only. It will be very costly to actually get those technologies onto the market.

Wholesale electricity prices are relatively low in most European countries today. It is the taxes and levies that are added to those wholesale prices that make electricity so expensive in Europe. In determining what we will do in the future, we should ask ourselves whether we really want to focus on a competitive electricity market? The worst solution is the one that we have in place today: we want a competitive market but we also want to introduce new capacity on the basis of strong support schemes. That makes it impossible to invest in base load for the future. The easy answer is to make electricity an investable sector and, in that context, the market solution is the best solution. However, it must be an investment without subsidies. We cannot build the future of electricity on subsidies. However, there is no business case today for making that investment in base load for the future.

I would argue that we need to make electricity investable and not interfere with the market to too great a degree. That could be the solution to having affordable electricity prices in the future.

Keeping retail customer bills in check

Marco Margheri, Edison



I will be speaking in three different capacities: as a member of WEC Italy, as a member of eurelectric (the union of the European electricity industry, which has recently established a Retail Customers Committee, which I have the pleasure to chair), and from a personal perspective.

A WEC perspective

My first comments will be made from my perspective as a member of WEC Italy, which is contributing with all European WECs to a timely and sensible discussion in Europe, that we hope will deliver a more sensible result than the 2008 round of decisions. When I was in Brussels in my previous post, the first event I saw was the launch of the Green Paper in March 2006. That Green Paper repeated quite the same points as the Green Paper of 1995, arguing for a holistic approach, organic policies, and organic outputs for the benefit of consumers and to address the 3 dimensions of energy policy as a whole. The perception today is that we are clearly not at that stage.

We are on the verge of a new set of discussions and a new round of policies. It is therefore important to be vocal and crystal clear in our messages. In that context, I congratulate WEC France and WEC Europe for their efforts in this area.

A Eurelectric perspective

My next comments are made in my capacity as Chair of Eurelectric's Retail Customers Committee. At Eurelectric, we understood that the downstream part of the electricity market was suffering from growing complexity. The issues lie upstream but the symptoms are clearly to be found downstream, especially when we are face-to-face with customers. All of our companies and industries are aware how much our reputation is important, and this is what is at stake vis-à-vis consumers. All sorts of public policies and levies are being channelled through our invoices. Our daily customer facing operations, whose scale and stability are critical in retail markets, are incredibly challenged. In one country, the state decided to channel property taxes through electricity bills. Months later, this resulted in a €1.5 billion increase in the outstanding receivable levels of the relevant utilities. We are clearly face here with issues that play out downstream with a critical impact on our relationship with our customers.

This is the framework in which, Eurelectric decided to devote a specific set of initiatives and a specific part of its organisation to the retail dimension. That was particularly instrumental at the beginning of this year when the Council and the Commission began to analyse the situation. We have found that the Commission risks again to be contradictory in this area. The policy debate seems to be going in the correct direction, and is much more sensible and attentive to retail markets, than it was some years ago. However, when the Commission presented their own assessment of energy prices and costs, the output of the analysis did not match the standards we expected from the European Commission. This study, clearly stated that there was no possibility for the European Commission itself to assess its the impact of its own policies! The purported reason is that the entire portfolio of elements that are

channelled through electricity bills is absolutely opaque. For example, in one country a tax for nursery care is channelled via a levy on the electricity bill. In Italy, a debate is underway these days to channel the public television contribution through the electricity bill. Of course, nobody discusses to pay a fee for this and remuneration is provided for electricity companies to enable them to bill these components, whereas costs incurred in managing this are clearly growing. Many different components are scattered throughout the bills, across all European member states.

The situation is complex and that complexity has to be sorted out now, taking advantage of the upcoming round of policy discussions. In reality, the mess also results from the fact that it is easier to sweep the dust under the carpet. The energy industry is confronted with a clear free-riding by policy makers, using the electricity bill as an additional channel outside of the state budget. This occurs basically in every country albeit on the basis of different means and with a view to different purposes.

In Italy, we discovered that we were paying as much in taxes as we are in public policy support. There are 2 major areas that provide an incredible picture when brought together. Our market is now worth less than 50% of the average invoice, and 50-55% in a number of countries. That does not exist in any other industry, even in those industries that represent a much higher share in the customer's wallet than ours. Our share of the wallet in the Italian market is less than the average share of coffee consumed by an individual. That is no excuse for not finding the right set of policies to make energy markets efficient and equitable, but should frame this the correct way.

We are not confronted with a public reaction against "us". We are confronted with public reaction against a portfolio of elements that are billed through us. We should be more vocal over time in highlighting that. When we look at what is channelled through our bills, we have to be clear. All policies have a cost.

On these grounds, eurelectric has started an own assessment of final prices, aiming at shedding some light on the different components of the energy bill and what drives them up. The [study](#) bases its findings on an inventory of policy supports costs, that has been collected, analyzed and separated from taxes for the first time in a comprehensive pan-European manner. Please go and check it out on www.eurelectric.org.

A personal perspective

I will conclude with a few personal comments on what I perceive to be the critical dimensions as we go forward. They are all critical to the debate in the coming weeks. For the energy industry, what is happening in 2014 is absolutely crucial for the coming years. Italy is also preparing for its presidency of the European Union, which will be limited from a legislative point of view but critical to the policy debate. Here is what we should try to achieve, in my view:

- ▶ **Clarity.** The energy industry has to make it clear that a sensible economic and industrial policy has to deal with energy, and respect the need of the energy industry for long terms visibility. We can no longer bear a situation that puts such a diverse set of objectives on our shoulders. That is not compatible with an efficient functioning of the industry, nor of the market, especially at the retail level.

- ▶ **Transparency.** In the 2030 communication, the European Commission does not say that the current situation is faulty. However, it does recognise that the current situation does not allow for a sufficient level of effectiveness and coordinated drive. If the next round of policies takes the form of a single overarching policy and objective, coupled with some flexibility in national policies for the other objectives, it is a good outcome, in line with WEC recommendations; the challenge, as the Commission implicitly hints at in their White Paper, will be to coordinate approaches in terms of transparency and monitoring mechanisms. WEC has one component of this discussion on its agenda: the governance model or how the Commission plans to describe what come up from the member states in a coordinated manner. Having a new governance model based on transparency would represent a *de minimis improvement* in current policies.
- ▶ **Pragmatism.** The February Extraordinary European Council on competitiveness was cancelled. However, competitiveness, equity, and affordability are on the agenda, and that is a good sign. I will leave other colleagues to speak about industrial competitiveness. For the downstream part of the market, we are not speaking here about the need to qualify electricity or gas a social policy itself. On the contrary our agenda should be based on, first, getting competition working. A number of member states practise regulated prices, which are distortive regardless of the form they take. We need a functioning competition, with consumers as the first solution to the issue of an efficient supply. Second, and well related to this, we need a clear and effective definition of vulnerability. Today, in Italy, vulnerable customers make up 100% of the retail market, including SMEs. I do not believe that providing inefficient schemes to serve 22.5 million consumers that hinder the market is what is best, especially when we need to offer more 3 million families that the government estimates are in need with effective, and innovative protection.

Energy prices and manufacturing competitiveness

Jean-Louis Schilansky, UFIP



I believe that competitiveness is a wonderful subject that is often forgotten. It is being rediscovered by governments today, especially the French government! I will be speaking from an oil and gas perspective. During yesterday's discussions, someone stated that France believes that the world is flat. Even more surprisingly, France has passed a law to ensure that we cannot even try and see if the world is round. That is quite an extraordinary situation.

The shale gas revolution

Oil and gas are seen as the “bad guys” in this debate, and yet they represent 60% of the energy mix. Since 2010, the differential in gas prices has increased greatly between the US, Europe and Japan. Gas prices in the US are approximately one-third of the prices in Europe and Asia. That is the result of shale gas revolution in the US, a competitive advantage that the US government clearly wants to retain. The US market

is therefore a stand alone-one with very few export licences granted. Licences will only be granted on a case-by-case basis that considers what is best for the US. It will take some time before this market is arbitrated, giving US industry an enormous competitive advantage. Gas is used for power generation. It is also the fuel for energy intensive industries, and it is the feedstock for industries such as the petrochemical industry. The US therefore enjoys a threefold competitive advantage.

In addition to low prices, there is an absence of volatility in the US. Up to 2010, the price of gas was linked to oil and fluctuated greatly. Gas prices have been remarkably stable in the US since 2010, another enormous advantage for US industry.

With respect to oil, the differential between Brent (the European marker) and the WTI (the US marker). The WTI price has been de-connected from the worldwide Brent price, and the price of oil in the locked-in portion of the US today is approximately \$10 lower per barrel than the rest of the world. This is again a competitive advantage for US refiners and all the products they manufacture.

These competitive advantages for US industry are, to some extent, being generated at the expense of US and Canadian oil companies. They are producing and selling oil and gas at below market prices.

Manufacturing competitiveness

When it comes to measuring manufacturing competitiveness, the manufacturing cost index from the Boston Consulting Growth compares the US to Italy, Germany, France, Japan, and China. The energy price advantage in the US, when compared to China, almost entirely offsets its disadvantage in terms of labour costs. The difference in manufacturing costs between the US and China is not very high, mainly due to the positive effect of energy costs in the US. In contrast, manufacturing costs are very high in France, Germany or Italy as compared to China. The level of labour flexibility is also much higher in the US than in France or Germany, for example.

Due to the combination of low energy prices, low labour costs, and labour flexibility, capital investment is massively flowing to the US. The petrochemical industry alone will invest over €40 billion in the US, delocalising to that country. Germany's strong industrial base and export business may allow it to resist that. However, other countries may find themselves in a very difficult situation.

The refining industry

The European refining industry is suffering from its competitive disadvantage with the US. Refineries across Europe are suffering and being closed, and we are massively importing diesel from the US. Refineries in the US are running at a 90% utilisation rate, and at 65% in France and Europe. We can expect further closures in Europe in the future. This has not yet reached the petrochemicals industry but it could occur in the future.

An IHS CERA chart shows the impact of shale gas development on job creation in the US. The US is now producing 2 million barrels of shale oil per day, equivalent to more than France's consumption. By 2035, the shale gas industry will represent 16 million direct, indirect and related jobs, and this industry is an enormous economic driver. In addition, its contribution to job creation will grow by 300% in 2010 to 2035.

Open discussion

Issues for debate:

- ▶ How to reduce energy prices in Europe?
- ▶ How to finance renewables in the EU and at the national level?
- ▶ Which industries are most endangered in the EU?

From the floor

First, has the impact of dollar-euro exchange rates been taken into account in the comparisons that were made? Second, it is very difficult to take the taxes out of the electricity bill.

Jean-Louis Schilansky

As these are dollar-denominated commodities, the higher the euro the better the oil and gas industries perform. In terms of global competitiveness, a strong euro drives the demand for dollar-denominated goods. European exporters are therefore in favour of a lower euro, whereas the energy industry prefers the opposite.

Marco Margheri

When it comes to tackling state budgets, the situation is clearly complex. All countries have specific governance provisions to induce stricter and stricter financial discipline. Nevertheless, or maybe rather because of this, during the past 5 years, the tax-components have been amongst highest contributors to the increase in the final energy bill. Policy makers should abide with 2 basic principles.

- ▶ First, when they raise taxes on a product it should be clear that the final price has been increased by a public policy decision and not by the decision of individual players in a liberalised market.
- ▶ Second, there is a blurred line between adding taxes to finance public policies from the fiscal budget, and use energy as a vehicle to channel levies that finance specific public policies that are supposed to have to do with energy. In many countries, the situation has gone beyond what expected, and a reassessment of what is correctly paid out from the energy bill and what lies more into the basket of general policies would be needed. In my own country, for example, not all public policies that are billed on consumers would stand up to the equity check that fiscal policies would impose (e.g. In terms of progressive taxation):
Policy makers and regulators should ensure that the final bill is transparent as to who is paying for what. If we look at electricity bills across Europe, only very few of those bills can be understood even by an expert.

From the floor

Investors consider 2 factors when deciding on significant, long-term manufacturing investments: the absolute cost of energy, and the level of certainty (or uncertainty). Europe has both a higher level of cost and a much higher level of uncertainty. The US has lower energy prices and guarantees the low level prices for 20 years. With that, investors cannot resist moving their investments to the United States.

Jean-Louis Schilansky

I agree!

From the floor

Sweden had a project to phase out the use of oil in the domestic energy sector, allocating some taxes to improving and subsidising heating systems. Would you provide further information on that?

Bosse Andersson

In the early 1970s we had a major discussion in Sweden on the use of hydroelectricity. We decided that we should not use the last rivers but build nuclear power plants instead. After the change in government in 1976, the discussions switched to nuclear power. We built 12 plants in 13 years. A referendum was then held where the decision was made to phase those plants out before 2010. We still have 10 in production. As we had built so much nuclear capacity, without phasing out any existing plants, we had a situation of over-capacity. Electricity was very cheap and was used by the heating sector to replace oil. We are now switching to heat pumps and district heating.

In terms of Swedish taxes, in 1996, electricity prices were relatively high due to a lack of rain. This was followed by 5 years of high rain levels, leading to very low electricity prices. Swedish politicians decided to protect consumers from the “evil” of low prices, and increased taxes as a way of ensuring that customers would lower their consumption of energy and electricity.

Sweden may in a good position today but this is not the result of intelligent planning. The situation could change in the future as our nuclear plants begin ageing. It is not clear who will invest in the creation of new base load in Sweden, and we find ourselves in a very challenging situation. The Finns are investing in the construction of a new nuclear power plant that was supposed to be completed in 2009. That has now been pushed back to 2016.

From the floor

It is quite difficult to deregulate tariffs to end customers for a number of reasons. It is a political choice to put support for renewables or for other social measures in the tariffs. Smart metering appears to be quite expensive and it is therefore difficult to pass on the price signal to the end customer. Power tariffs are also highly politically sensitive. If deregulation of tariffs is not possible to end customers, is it possible to deregulate the upstream part of the power system?

Marco Margheri

That is the most critical issue in political terms. However, we should not disregard the possible quick wins in this area. The tariff system is not only a question of regulated prices and tariffs; it is also a question of how the system delivers clear signals to the market. The former part is paramount, but the latter is easier to achieve. The member states have to reach a situation in which the tariff system is sufficiently clear, at least with respect to the major components that are passed on to consumers. Second, deregulating (better, avoiding over-regulating) post-sale rules is also achievable. I am particularly sensitive to this issue as Italy is currently reviewing the entire range of

post-sale regulations (eg invoicing, commercial quality, etc). This is an area that our industry should leverage upon, in order to boost and ever improve relationship to consumers.

These 2 components combined could start a momentum in which the regulation of prices is made more visible to the public and the role of marketing innovation could increase.

Regarding smart metering, it is vital to define the objectives and what the true benefit to the market would be. In the case of consumers, smart meter can deliver important results, but they require integrated approaches. I will quote a famous US example: Baltimore used smart metering and smart communications together with dynamic pricing to change consumer behaviors on warm days' peak hours; that was a testing ground for the approach of US company OPower. This kind of approach is studied and experimented also in France, in the region of Lyon, by the distributor and suppliers. In essence, consumers may be willing to foot the bill for something that allows them to react in real time and change the economic consequences they face. In other cases, the massive roll out of smart meters can be seen as a different issue that is more linked to smart network management, and I will not comment on this.

Jean Eudes Moncomble

Who will pay for energy transition in Europe: the taxpayer or the consumer? Is Europe rich enough to be virtuous?

Jean-Louis Schilansky

You will pay! Only time will tell whether we can afford it or not.

Marco Margheri

I am not in favour of a one size fits all solution. Transition has many different aspects. On the one hand, part of the transition involves making energy more flexible. On the other hand, components of the energy supply chain will have to become articulate, service-rich, and therefore costly. The more the market works efficiently, the easier it will be to pay for that, also in terms of optimizing volumes and customer choices.

In a second component, transition will deal with externalities, and those externalities cannot be hidden. Still, one way or another, they have to be on the public policy bill, and each state will make a different decision as to how that will be done.

Bosse Andersson

We saw how energy intensive industry was shifting to the US, and that will lead to problems for other sectors of the economy. Today, Swedish customers pay roughly one-third of a euro cent for the country's renewables support scheme. If we cannot persuade people and industry to believe in a competitive future we will be in a very difficult situation, for which everyone will have to pay the price. If we consider this only from the electricity sector perspective, we will miss seeing the whole picture. For example, climate change is seen as something to be resolved by our sector only. However, if we do everything before the rest of the world does, that would make it very costly for all of us. I am afraid that I do not have a very bright vision of the future.

Jean Eudes Moncomble

I would like to thank our three speakers for their excellent contribution to our panel.

We have now come to the end of our Forum. The presentations of all speakers will be available on our website. The French Committee will publish an abstract of our work, which will be sent to all participants.

Thank you once again for attending this Forum. It has been a great pleasure to welcome you to Paris. We plan to organise a 4th European Energy Forum in late 2014 or early 2015. The Forum will be entitled: "On the Way to COP21". I therefore hope to see you soon in Paris.

Le Conseil Mondial de l'Énergie

Fondé en 1923, le Conseil Mondial de l'Énergie (World Energy Council, WEC) est la principale organisation multi-énergétique mondiale. Organisation à but non-lucratif et non gouvernementale, agréée par l'Organisation des Nations Unies, le Conseil Mondial de l'Énergie est doté d'un statut de bienfaisance au Royaume-Uni et est partenaire stratégique d'autres organisations clés dans le domaine de l'énergie. Il est constitué de comités nationaux, représentant près de 100 pays dans le monde et composé de dirigeants du secteur énergétique. Il est régi démocratiquement par une Assemblée Exécutive, composée de représentants de tous les comités membres. Son siège est à Londres, il comprend parmi son personnel des coordinateurs régionaux qui exercent leurs activités en Asie, en Europe centrale et orientale, en Afrique et en Amérique latine/Caraïbes. Il est financé essentiellement par les cotisations des comités nationaux.

Le Conseil Mondial de l'Énergie couvre une gamme complète de questions liées à l'énergie. Il s'intéresse à toutes les énergies (le charbon, le pétrole, le gaz naturel, l'énergie nucléaire, l'hydraulique et les nouvelles énergies renouvelables). Il réalise des projections à moyen terme et long terme et travaille sur un grand nombre de thèmes liés à l'énergie (efficacité énergétique, environnement et énergie, financement des systèmes énergétiques, prix de l'énergie et subventions, pauvreté et énergie, éthique, normes, nouvelles technologies,...). Le Conseil Mondial de l'Énergie réalise des analyses, des recherches, des études de cas et des orientations stratégiques publiées sous forme de rapport et utilisées par les principaux décideurs. Des cycles de travail de trois ans aboutissent au Congrès Mondial de l'Énergie, événement majeur de l'industrie énergétique attirant plus de 5 000 délégués, incluant un programme technique, des réunions, des séances de travail en réseau et une importante exposition sur l'énergie.

Plus d'informations sur www.worldenergy.org et [@WECouncil](https://twitter.com/WECouncil) (Twitter)

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Le Conseil Français de l'Énergie

Fondé en 1923, le Conseil Français de l'Énergie (CFE) est le comité national français du Conseil Mondial de l'Énergie. Ce dernier rassemble plus de 3 000 organisations et représente une centaine de pays dont les deux tiers de pays en développement. Il représente ses membres dans toutes les activités internationales du Conseil Mondial de l'Énergie.

Le Conseil Français de l'Énergie est une association qui a pour objectif de promouvoir la fourniture et l'utilisation durables de l'énergie pour le plus grand bien de tous. Le Conseil Français de l'Énergie regroupe des acteurs français (entreprises, administrations, organisations professionnelles ou universités) impliqués dans des réflexions qui privilégient les dimensions d'accessibilité, de disponibilité et d'acceptabilité de l'énergie dans une perspective mondiale ; toutes les ressources et les technologies de l'énergie sont représentées.

Le Conseil Français de l'Énergie soutient les recherches en économie de l'énergie et participe aux débats énergétiques, notamment par l'intermédiaire de publications et de conférences.

Le Conseil Français de l'Énergie assure la diffusion des résultats des recherches qu'il a financées. De plus, le français étant l'une des deux langues officielles du Conseil Mondial de l'Énergie, le Conseil Français de l'Énergie contribue à la promotion de la francophonie en traduisant en français et en diffusant les travaux les plus importants du Conseil Mondial de l'Énergie.

Plus d'informations sur www.wec-france.org et [@CFE_WEC_France](https://twitter.com/CFE_WEC_France) (twitter)

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Publications

- ▶ « 22^{ème} Congrès Mondial de l'Énergie – Incertitudes et résiliences » Conseil Français de l'Énergie, 2013
- ▶ « Scénarios Mondiaux de l'Énergie à l'horizon 2050 – Mises en musique du futur de l'énergie », Conseil Mondial de l'Énergie, traduit de l'anglais par le Conseil Français de l'Énergie, 2013
- ▶ « Les politiques d'efficacité énergétique dans le monde – ce qui marche et ce qui ne marche pas », Conseil Mondial de l'Énergie, traduit de l'anglais par le Conseil Français de l'Énergie, 2013
- ▶ « Trilemme Énergétique Mondial – Investir dans l'énergie durable », Conseil Mondial de l'Énergie, traduit de l'anglais par le Conseil Français de l'Énergie, 2013
- ▶ « Trilemme Énergétique Mondial – Le programme du changement », Conseil Mondial de l'Énergie, traduit de l'anglais par le Conseil Français de l'Énergie, 2013
- ▶ « Les enjeux énergétiques mondiaux vus par les acteurs français », Conseil Français de l'Énergie, 2013
- ▶ « 60^{ème} Congrès AFSE Économie des Énergies : prix et incertitudes », Conseil Français de l'Énergie, 2011
- ▶ « Politiques pour demain », Conseil Mondial de l'Énergie, traduit de l'anglais par le Conseil Français de l'Énergie, 2011
- ▶ « Le gaz de schiste : résumé et commentaires », Conseil Français de l'Énergie, 2010
- ▶ « Montréal 2010 : parole aux jeunes », Conseil Français de l'Énergie, 2010
- ▶ « Objectif : développement durable », Conseil Mondial de l'Énergie, traduit de l'anglais par le Conseil Français de l'Énergie, 2010
- ▶ « Énergie et innovation urbaine », Conseil Mondial de l'Énergie, traduit de l'anglais par le Conseil Français de l'Énergie, 2010
- ▶ « Efficacité énergétique : la recette pour réussir », Conseil Mondial de l'Énergie, traduit de l'anglais par le Conseil Français de l'Énergie, 2010
- ▶ « Conséquences de la crise sur le secteur de l'énergie », Conseil Français de l'Énergie, 2009
- ▶ « Cahiers de l'Énergie n°1 », Conseil Français de l'Énergie, 2009
- ▶ « Choisir notre futur : scénarios de politiques énergétiques en 2050 », Conseil Mondial de l'Énergie, traduit de l'anglais par le Conseil Français de l'Énergie, 2007
- ▶ « Une seule planète pour tous », Conseil Mondial de l'Énergie, traduit de l'anglais par le Conseil Français de l'Énergie, 2003.

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