

Confrontations-Europe – Energy and Climate Group

23 November 2016 Seminars

THE ROLE OF ENERGY EFFICIENCY IN REDUCING GREENHOUSE GAS EMISSIONS BY THE 2030 HORIZON

This briefing summarizes the contributions of the five panelists:

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- **Mr. Pierre Dechamps**, Policy Officer for the Directorate-General for Research and Innovation, European Commission
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This text is a summary of their introductory presentations, their answers to participants' questions, and participants' contributions.

INTRODUCTION:

In the context of the 12 December 2015 Paris Agreement, the European Union announced its intentions to reduce its total greenhouse gas emissions by 40% of what they were in 1990 by 2030. In accordance with this plan, which had been drawn up by the European Council on 23 and 24 October 2014, the European Commission worked along two lines:

- 15 July 2015, it presented a proposal to reform the ETS, aiming to reduce greenhouse gas emissions in these sectors by 43% of what they were in 2005 by 2030. This proposition is currently under review by the European Parliament.
- 20 July 2016, the Commission filed two proposals related to the reduction of greenhouse gas emissions in the sectors outside of the ETS:
 - One on distributing responsibility relative to member states' GDP in order to achieve a 30% emissions reduction from 2005 to 2030,
 - The other on considering land-use change when calculating member states' emissions.

On 30 November 2016, the European Commission published its energy package titled, "Clean Energy for All Europeans" (or "Winter Package"), comprised of revisions to **eight pieces of legislation** concerning renewable energy, energy efficiency and building energy performance, the electricity market and the security of the electricity supply, the rules for a system of governance for the Energy Union, a new pathway for ecodesign, as well as a strategy for connected and automated mobility. In regards to **energy efficiency**, the EU executive branch is counting on a **binding EU-wide goal of 30% by 2030** instead of the 27% initially set.

First, the conference on 23 November 2016 allowed for time to study the two proposals from July 2016. It was a matter of understanding (and questioning, in applicable cases) the importance of the commitment asked of member states, the mechanisms offering them flexibility in carrying out the measures, and the possible consequences for national policies relating to the sectors outside of the ETS: construction,

transportation, agriculture, commerce, and small business. Second, the conference examined the leading policies in France on construction and transportation.

THE IMPACT OF ENERGY EFFICIENCY ON GREENHOUSE GAS EMISSIONS OUTSIDE OF THE ETS

EUROPEAN APPROACH:

The “energy efficiency” measure originally only contained modest constraints as defined by the 2006 Directive. Then in 2009, by the wishes of the Council, it was decided to set a goal of 20% by 2020. Consequently, a new directive, adopted in 2012, has toughened the member states’ obligations. For 2030, the initial efficiency goal was set at 27%, but the Commission is now advocating raising that goal by 3 percentage points. This would be a **binding** goal for the whole of the European Union; but **indicative** for each member state, which implies developing a method of governance.

a) An Unsatisfactory Implementation:

It would appear that energy efficiency is difficult to assess since results depend on the set criteria. For example, should primary energy or final energy consumption be measured? Multiple municipal regulations contribute to efficiency: building codes, labeling requirements, standards imposing the progressive use of eco-friendly products, limits on car and van emissions, investment aid issued from the Juncker Plan, support for research in the “Horizon 2020” program, etc. But each of these regulations has constraints; because the emissions measured in real conditions increasingly differ from those reported by builders, actual progress is limited. Finally, public policy on investment aid lacks coordination between different levels (supranational – with **€17 billion for 2014-2020**, national, regional, and local), which harms their effectiveness.

It should be noted however that efficiency is measured based on the energy that would have been consumed in a “business as usual” setting. Therefore, efficiency shouldn’t be conflated with energy intensity, which measures the amount of energy used to generate €1 of GDP. However, consumption tends to decline spontaneously, notably as a side effect of other policies. Because of this, the **goal to reduce greenhouse gas emissions by 40% by 2030** automatically results in a **25% gain in energy efficiency**, according to the European Commission’s service impact assessment. A goal of 27% for the latter thus seems unambitious...

b) Maintain Multiple Objectives?

Confrontations-Europe had advocated for a single guiding objective for greenhouse gas emissions. We can’t help but regret that the European Union maintained **multiple goals in its November 2016 Winter Package** (energy efficiency, the role of renewable energy, and greenhouse gas emissions), at the risk them interfering with one another, translating into additional costs. A simple example illustrates these interferences: a reduction in consumption, coupled with a reduction in CO₂ emissions, will lead to the further decline in what was supposed to be the key variable, the price of carbon.

The actual purpose of the reduction of primary energy consumption is to increase the security of energy supply, improving the European Union’s energy independence and reducing its vulnerability to price shocks.

c) The Position of Member States:

France will succeed in achieving its goals for 2020. In 2015, the country reduced its CO₂ emissions by 23% and predicts that that number will be between 24% and 25% by 2020. In 2015, 16% of all energy consumed came from renewable resources, leaving France reasonably confident that it will achieve its goal of 23% by 2020. Finally, in terms of energy efficiency, based on current trends, France will reach 13% by 2020.

This trajectory will be sustained and France affirms that its 2030 commitments will be fulfilled (**i.e., a 43% reduction of CO₂ emissions in the ETS sectors and a 30% reduction in the sectors outside of the**

ETS) given a sufficiently high carbon price signal. France is on the frontlines defending a market-set carbon price and has proposed several measures to rectify the ETS:

- Introduce a price corridor (**a maximum and minimum price**) in order to direct investors towards low-carbon technology. One such system exists in California.
- **Review the method of allocating allowances free of charge:** free allocation should be limited to the sectors the most vulnerable to carbon leakage (the biggest polluters). This position seems to be shared by other member states.
- Include importers in the ETS market so that imported products are on the same footing. This measure ("**carbon inclusion mechanism**") could replace free allocation, but has met with limited success within the Council...
- **Integrate the compensation** for indirect costs in order to avoid market distortions between member states. Debates on these practices are taking place within the Council.

Beyond this list, France has proposed implementing **dynamic allocation**. This would take into account variations in production and make sure that the system avoids rewarding polluters¹ (the cement and petrochemicals sectors). This proposal seems to be the minority opinion as the ITRE parliamentary committee, in reading the ETS reforms, has proposed that 52% of allowances be auctioned and 48% be allocated free of charge (as opposed to the European Commission's proposal that 57% be auctioned and 43% be allocated free of charge).

The European Commission is visibly disappointed by the member states' multitude of positions that are driving a **block within the Council**. Member states are barring the way forward. Certain states enjoy low carbon prices while others suffer. The Commission warns against the risk national solutions present (e.g. a carbon tax) that would lead to breaking the ties between states that currently sustain the ETS market.

The Commission has also pointed out that reforms to the ETS have just been adopted, with the creation of a stability reserve, and that they need to be put in place before initiating a new strategy. However, the scope of these reforms seems to be modest; the announcement of the stability reserve itself should have pushed the price of CO₂ up, which has yet to happen. It's therefore feared that even before its activation, this reserve is doomed to fail. It's based on this reasoning that France supports the idea of a price corridor.

Other proposals on the table:

- **Modify the stability reserve settings** to remove a greater number of allowances from the market.
- **Raise the level of the reduction factor** allowances put in circulation each year (Denmark has proposed canceling stability reserve allowances after depositing for five years).
- Revitalize the **project mechanism** by which a member state financing an emissions reduction project in another state can acquire an exchange of carbon credit. France supports this mechanism.

d) The Question of Effort Sharing (Greenhouse Gas Emissions in Sectors Outside of the ETS):

In its "Summer Package" (July 2016), the European Commission set an overall goal of a 30% reduction in greenhouse gas emissions outside of the ETS (**agriculture, construction, and transportation**) and gave each member state responsibility proportional to its GDP per capita; richer states are invited to take on more responsibility. This "justice criterion" contrasts with an "economic rationality criterion;" reductions should be made where they are least expensive. The "project mechanism" enables reconciling these two criteria: the richest countries finance reductions in countries where reductions are the least expensive and in exchange receive the carbon credits necessary to achieve their goals.

France welcomes the Commission's proposition with some observation on:

¹ Carbon Market Watch Report

- **Flexibility:** The Commission's proposed point of departure is the average of greenhouse gas emissions in 2016 through 2018. France points out that with this calculation, the countries that have yet to achieve their 2020 goals are the ones that won't be sanctioned. This is not a good indication. France advocates using either the average of 2016-2018 as a departure point or the 2020 goals.
- **Land Use:** France is in a good position since it will receive a credit of 58.2 million tons of CO₂. But the accounting regulations are extremely complex, because the land sector is highly compartmentalized. The use of this credit is subject to a non-debit rule.
- **The Compensation System:** France doesn't understand why it isn't eligible.

WHAT ARE THE EXPECTATIONS OF AND INITIATIVES IN THE PRIVATE SECTOR?

IN THE CASE OF FRANCE

a) The Need for Intelligent and Stable Regulation:

Private actors in most economic activities have gained awareness on climate issues. They have adapted, even invented, new business models. Their economic strength however is threatened by the interactions between different policies, particularly between those on energy efficiency and the price of carbon that has just been mentioned. Moreover, no economic model seems capable of meeting too ambitious a goal, such as the 40% improvement in energy efficiency recently envisioned in the European Parliament.

On the subject of policy measures, the Energy Savings Certificate (ESC) plan proved itself in France; it allowed our country to stay on trajectory for a **1.5% gain in energy efficiency** per year. In France, the 4th stage of ESC begins soon. This mechanism contains a weak point: it puts measures that don't present the same efficiency in carbon and energy gains on equal footing.

In the same spirit, the **conversion coefficient applied in France** to switch from primary energy to final energy penalizes electricity. Thus the thermal regulation in effect (RT 2012) imposes a **50 kWh/m²** primary energy consumption cap on new construction. This requirement is equivalent, with the current coefficient, to less than **20 kWh/m²** of electrical energy, which excludes electric heating in new buildings, since 2012. It would therefore be advisable to change the regulation to use a standard of CO₂ emitted per m² per year.

b) The Energy Efficiency of Buildings and Transportation:

The table below indicates the division of final energy consumption and greenhouse gas emissions between residential buildings, commercial buildings, and transportation. For all of these sectors the challenge is to optimize investment aid in terms of energy efficiency achieved.

	Final Energy Consumption	Greenhouse Gas Emissions
Residential Buildings	33 %	20 %
Commercial Buildings	15 %	6 %
Transportation	33 %	39 %

Source: ADEME, Chiffres Clés Air Energie Climat, 2016 Edition.

- **Transportation :**

In France, the development of **electric cars** appears to be one of the most promising ways to reduce energy consumption as well as greenhouse gas emissions. **EDF** has shown itself to be a dynamic actor in this sector, acting both as a supplier of electricity and an installer of charging stations. The launch of this sector assumes that public authorities will continue help to:

- Reach the maturity of essential technologies, notably the improvement of batteries;
- Accelerate, through regulation, the installation of charging terminals in the private sphere, in residential and commercial areas;
- Encourage recharging utilities' flexibility with intelligent systems that can facilitate supply and demand management.

Renault, global automobile manufacturer, is going further than just improving the fuel efficiency of its vehicles: environmental externalities are now fully integrated into the group's strategy. The company now takes into account the whole life cycle of its vehicles, on one hand by trying to reduce the raw material required to build, distribute, and use one, and on the other by playing a role at the end of a vehicle's life. Renault is already applying the principles of a **circular economy** by designing cars from recycled materials, which goes well beyond today's deteriorating cycle. Partnership agreements were signed with Total Renewables and Suez Environnement. This direction results in the conviction that changes in the market are in the works and that the current business model must be adapted and innovated. Already today, 33% of raw materials used by the group are recycled.

The stakes are enormous considering that the demand for mobility in emerging countries will double the total number of cars in use by 2050 and that car use already contributes to 17% of the planet's greenhouse gas emissions in 2016. To prevent surpassing the 2°C average temperature rise by 2100, the cars in use in 2050 (about 2 billion vehicles) would have to halve their 2016 emissions. This goal calls for combining diverse technologies, for example, urban electric cars, hydrogen trucks, and planes using biofuel. The popularization of hydrogen fuel predicted by some doesn't seem particularly relevant to daily use (less than 20km per day); however, hydrogen fuel could find its place in long-distance travel. The rise of electric cars assumes the corollary decarbonization of electricity.

In regards to the electric car, its continued development also involves a reflection on the key equipment for batteries. The cost of the batteries can indeed be depreciated as daily use, especially where drivers are stationary for as long as they are mobile, rapidly reduces their lifespan. In this light, it would be better to rent batteries to electric car owners rather than sell them the battery.

In France, scenarios that focus on energy efficiency as the central tool in decarbonizing the country's economy count on **reducing the total mobility per capita**. According to projections made in 2013, 2/3 of the cars in use in 2050 will be electric. These scenarios rest on the assumption that the price of energy will stay fixed, despite the recent drop in oil prices. They predicted that purchasing an electric car, an €8,000 additional investment over a combustion engine vehicle, would save €1,000 annually in energy costs, meaning 8 years to see a return on investment, excluding tax incentives.

To better lead the transformation of the transportation sector, new municipal regulations should be laid out. At this stage, nothing is decided. The European Commission will probably publish guidelines in fall 2017.

While waiting for a European-level agreement, Renault made commitments concerning public health and CO₂, by setting a goal for a 3% annual carbon reduction per car sold worldwide, for the entire life-cycle of the car. In this strategy, manufacturing audits will take place to evaluate the carbon footprint of electric cars.

- **Construction:**

In France, the 2015 Loi relative à la transition énergétique was adopted after debate covering a large swath of scenarios, with possible electricity consumption ranging from 300 to 800 TWh per year, according to the authors. The choice was finally made based on energy efficiency and the diversity of energy sources. This choice entails the thermal renovation of all existing buildings by 2050, at the pace of **500,000 buildings per year, leading to a 60% reduction in energy consumption**. Renovations per building are expected to cost between €15,000 and €20,000 for an expected gain of €1,000 per year, meaning it will take 15-20 years to see a return on investment, excluding the rebound effect. This outcome would seem insufficiently beneficial for consumers subject to financial constraints: this trajectory for energy efficiency will therefore only be possible with significant support for renovation investment.

Rapid progress in this sector is visible however, for example with the development of air/air and air/water heat pumps that have contributed to a substantial reduction in greenhouse gas emissions. Their price dropped; investment incentives for them, via the Crédit d'Impôt pour la Transition Énergétique (CITE), constitute a good allocation of public resources. Conversely, replacing a window costs close to €1,500 and only saves one ton of CO₂, an unwise investment... Note that electric cars have led to the development of very powerful heat pumps (5kW for a few hundred Euros). Developments in the construction industry could be inspired by low-cost designs from the automobile industry; thus leading to the cross pollination of ideas, reducing costs.

Estimates likewise show that, given good economic conditions, about 2 million people could be connected to **district heating**. Outside of traditional financing, new tools will need to be designed, such as **Energy Savings Performance Contracts**. With these contracts, the user guarantees a precise level of consumption and keeps any savings made during the contracted period.

However, in the context of low primary energy prices, current innovations aren't enough. Support from public powers remains indispensable for encouraging energy efficiency improvements and should take the form of direct aid and **environmentally sensitive fiscal policy** to establish a clear, long-term carbon price signal.

CONCLUSION:

It won't be possible to limit the temperature rise to less than 2°C if we don't reduce greenhouse gas emissions to 1.7 tons of CO₂ per capita or less by 2050. Energy efficiency makes it possible to achieve half the necessary reduction. To get there, each country and actor should:

- Retain a structured strategy (e.g., the share of renewable energy in energy production)
- Set operational goals (e.g., the number of annual renovations)
- Adopt sectoral policies and measures (e.g., standards and taxes)

On the other hand, experts aren't unanimous on a single CO₂ price. Should we focus on the equalization of marginal reduction costs with a single carbon price? Shouldn't we rather specify emission standards (for example, by tons of CO₂ per ton of steel, per kWh, etc.) with carbon prices by sector? President Barack Obama retained this direction for the United States; if his successor keeps it, it could serve as a model for other countries.

In Europe, the tension around burden sharing between member states wastes too much time. There is reason to fear that China will become the global leader in climate-friendly products since the European Union doesn't fully benefit from its investments in research due to inadequate policies (35% of the community budget, "Horizon 2020").