

Tales from EDF

By [Evens Salies^a](#)

The challenge facing policy-making on the reduction of greenhouse gas emissions is not just environmental. It is also necessary to [stimulate innovation, a factor in economic growth](#). Measures to improve energy efficiency [1] demand high levels of investment to transform the electricity network into a [smart grid](#). To this end, EU Member States have until 2020 to replace the meters of at least 80% of their customers in the residential and commercial sectors with “smarter” meters. In France, these two sectors account for 99% of the sites connected to the low-voltage grid (< 36 kVA), or about 43% of electricity consumption and nearly 25% of greenhouse gas emissions (without taking into account emissions from the production of the electrical power that supplies these sites).

These new meters have features which, as has been shown by research, lead to lower energy consumption. The [remote reading](#) at 10 minute intervals of data on consumption, which is transmitted in real time to a remote display (a computer screen, etc.), immediately shows the savings in electricity, which, with two surveys per year, was previously impossible. High-frequency remote reading also makes it possible to expand the range of vendor contracts to include rates that are better suited to customers' actual consumption profiles. The “pilot” flying the transmission network can better optimize the balance between demand and a supply system that has fragmented due to the growing number of small independent producers. For distributors [2], remote reading solves the problem of gaining access to meters [3].

These features are supposed to create the conditions for the emergence of a market for demand-side management (DSM) that is complementary to the supply market. This market would give non-traditional [suppliers](#) an opportunity to differentiate

themselves further by offering services that are tailored to the needs of the DSM customer [4]. This could lead to significant gains in innovation if other companies that specialize in information and communication technology also develop software applications that are adapted to the use of the smart meters. However, in France, the policy on the roll-out of smart meters does not seem to be facilitating greater competition. Innovation could stop at the meter due to a [decision](#) by the French Regulatory Commission (CRE) which states that:

“The features of advanced metering systems must strictly meet the missions of the electricity [distributors] ... Thus the additional features requested by some stakeholders [essentially suppliers] which are subject to competition (basically remote displays) are not accepted.”

A reading of this paragraph would seem to indicate that the suppliers are not willing to bear the cost of developing these features. However, according to Article 4 of this decision, which specifies the list of features for distributors, none of them seems to have been left exclusively to the competitive sector. In practice, households with a computer can check their consumption data without going through their provider or a third party.

It is worth considering the costs and benefits of such an approach, which *a priori* would seem to amount to the monopolization of the DSM market by the distributors.

This approach will make it possible to quickly reach the goal of 80%, since the CRE has opted for a public DSM service: the distributors, who have public service obligations, will roll out the smart meters. The “Linky” meter alone, from the dominant electricity distributor, the ERDF, will be installed on 35 million low-voltage sites, covering 95% of the national distribution network [5]. There is thus little risk of under-investment in the demand-response capacity that electricity

suppliers will soon have. In fact, as the suppliers do not have to bear the costs of the manufacture and deployment of the meters, they can quickly invest in the development of these capabilities. In addition, the equalization of subcontracting costs for the manufacturing of the meters and their installation throughout the French distribution network will make for considerable economies of scale. Finally, the low rate of penetration of meters in countries that have opted for a decentralized approach (the cost of the meter and services are then borne partly by the households concerned) argues in favour of the French model. This model is more practical since it removes most of the barriers to adoption.

Despite this, the degree of concentration in the business of the distribution and supply of electricity to households raises questions: ERDF is affiliated with EDF and has a virtual monopoly on the supply of electricity to households. In terms of innovations in DSM services, it would seem that EDF has little reason to go beyond its subsidiary's Linky project – first, because of the costs already incurred by the Group (at least five billion euros), and second, because the quality of the default basic information mechanism in Linky will be sufficient to lead to a cost for migrating to DSM services offered by competitors. [\[6\]](#) Alternative suppliers will of course be able to introduce innovative tariffs. But so will EDF. One way to overcome this problem would be to set up a Linky platform so that other companies' applications could interact with its operating system. With the agreement of the household and possibly a charge for access to the data, the business would of course be regulated, but entry would be free. This would stimulate innovation in DSM services, but would not increase competition since these companies would not be electricity suppliers. Would the consumer have a lot to lose? This would obviously depend on the amount of the reduction in their bills. Given that the price of electricity is likely to rise by 30% by 2017 (including inflation), we are worried that consumers' efforts to optimize their consumption

will not be rewarded. The net gain in the medium term could be negative.

Finally, we can ask ourselves whether with Linky the EDF group is not trying to reinforce its position as the dominant company in the supply of electricity, a position that has grown weaker since the introduction of competition. With DSM service installed by default on 95% of the country's low-voltage sites, Linky will become an element in the network infrastructure that all DSM service providers will have to use. From the point of view of the rules on competition, one must then ask whether ERDF and its partners have properly communicated information about the Linky operating system, without any favouritism being shown to the EDF Group and its subsidiaries (Edelia, NetSeenergy). The story tellers would like to tell us a beautiful tale about encouraging innovation in energy and the digital economy in order to deal with the ecological transition. Knowing that the current CEO of the company in charge of the architecture of the Linky information system, Atos, was Minister of the Economy and Finance just prior to the launch of the Linky project in 2007, there seems to be room for doubt ...

[1] "Energy efficiency improvement" and "energy savings" are used interchangeably in this post. For precise definitions, see Article 2 of Directive [2012/27/EU](#) of the European Parliament and of the Council.

[2] The distributors manage low and medium-voltage lines. [ERDF](#) has the largest network. The networks and meters are licensed equipment, which are the property of the local public authorities.

[3] This would nevertheless involve, for example for ERDF, the elimination of 5000 jobs (compared with 5900 retirements, see Senate Report no. 667, 2012, Vol. II, p. 294).

[4] In accordance with the NOME law of 2010, suppliers and other operators must be able to make ad hoc reductions in the consumption of electricity for certain customers (temporarily cut the supply to an electric boiler, etc.), which is called demand-response load-shedding.

[5] In areas where the ERDF is not a supplier, other experiments exist, such as that of the distributor SRD in Vienna, which has installed its smart meter, i-0uate, on 130,000 sites.

[6] See the document by the DGEC, 2013, the Working group on smart electricity meters (GTCEC) – [Coordination document](#), February [in French].

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Long-term competitiveness based on an environmental tax

By [Jacques Le Cacheux](#)

“Shock” or “Pact”? The debate over the loss of France’s competitiveness has recently focused on how fast a switchover from employer payroll taxes to another type of financing is being implemented, implying that the principle of doing this has already been established. As France faces a combination of a deteriorating situation in employment and the trade balance,

plus growing evidence that its companies are becoming less competitive compared to those of most of our partners [1] and that business margins are alarmingly low for the future, the need to reduce labour costs seems to be clear. But how and how fast are subject to debate. Should there be a rise in the CSG tax, VAT, or other charges, at the risk of reducing the purchasing power of households in an economic context that is already worse than bleak?

The economic situation has to be managed at the euro zone level

The value of switching a portion of charges on employers – a figure of 30 billion is often bandied about – over to another levy is often disputed by invoking the risks that such a strategy would pose to what is already sluggish growth: undermining consumption would further curtail business opportunities, hurting activity and thus employment and margins.

But France is in this depressed situation only because the European Union is committed to a forced march of fiscal adjustment that everyone – or almost everyone – now recognizes is counterproductive and doomed to failure: as the heartbreaking situation in Spain illustrates, the quest to reduce the budget deficit when the economy is in recession is futile, and “virtuous” efforts – repeatedly slashing public spending and increasing taxes – merely weaken the economy further and increase unemployment, since the fiscal multipliers are very high, as Keynes demonstrated over 70 years ago!

Fiscal support for economic activity is the only way out. But the experience of the early years of the first Socialist government is alive in all our memories: the failure was as great as were the illusions, and the “turn to austerity” made the government unpopular. An approach that failed in the context of the early 1980s, with a less open economy, an

autonomous monetary policy and the possibility of adjusting the currency's exchange rate, is all the less appropriate in the context of deeper integration and the single currency. Trying to maintain the purchasing power of French households while the rest of the euro zone is in recession and French companies are less competitive could only widen the deficit without boosting growth or employment.

We must therefore continue the fight in Europe: to slow down the pace of deficit reduction; to implement a more accommodative monetary policy in the euro zone, which would have the double advantage of reducing the cost of debt, public and private, thereby making them more sustainable, and of exerting downward pressure on the exchange rate of the euro, boosting external competitiveness at a time when the US and Japanese central banks are seeking to reduce the value of their own currencies, which would automatically push the euro up; and to jointly engage in a coordinated European policy to support growth, by funding research and investing in trans-European transport and electricity and in education and training.

The national productive capacity must be supported and stimulated

The lack of competitiveness of French industry is not reducible to a problem of labour costs. And it is well known that a downward spiral of wage moderation and social dumping, which we can already see is wreaking havoc in Europe, can only lead the euro zone into a deflationary spiral, comparable to what these same countries vainly attempted in the 1930s in their "every man for himself" effort to escape the Great Depression.

Reducing social spending cannot therefore be an answer, while rising unemployment and the precarious situation of an increasing number of households, workers and retirees are pushing up the needs on all sides. Lowering wages, as some

countries have done (Greece and Ireland in particular), either directly or through an increase in working hours without an increase in pay, is not a solution, as wage deflation will further depress demand and thereby feed yet another round of social dumping in Europe.

Improving cost competitiveness by reducing the charges on wages may be part of the solution. But this option does not necessarily send the right signals to businesses and will not necessarily lead to a decrease in their selling prices or an increase in hiring: windfall gains are inevitable, and the greatest affluence is likely to go to shareholders as much as to customers and employees. Reductions in social security contributions could be targeted for certain levels of pay, but they cannot be sectoral or conditional or else they would violate European rules on competition.

It is also necessary to encourage and assist French companies in modernizing their supply capacity. The new Public Investment Bank [*Banque publique d'investissement* – BPI] can help by funding promising projects. But we can also make use of the taxation of corporate profits, including through incentives for investment and research that allow tax credits and depreciation rules: this is a way of more directly using incentives for businesses and conditioning public support on conduct that is likely to improve their competitiveness.

Environmental taxation: a lever for long-term competitiveness

Which charges should now bear the cost of these measures to boost business? Discussions on the respective advantages and disadvantages of VAT and the CSG tax abound. Suffice it to recall here that the VAT has been created to anticipate the reduction in tariff protection, which it replaces very effectively without discriminating on the domestic market between domestic products and imports but while exempting exports: an increase in VAT therefore differs little from a devaluation, with very similar pros and cons, especially with

regard to its non-cooperative character within the euro zone. But also recall (see our post of July 2012) that consumption is now relatively less taxed in France than a few years ago, and less than in many of our European partners.

The recourse to a genuine environmental tax would, with regard to the other options for financing these concessions, have the great advantage of promoting sectors that are less polluting and less dependent on fossil fuels – while at the same time diminishing our problems with trade balances, which are partly due to our energy imports – and putting in place the right price and cost incentives for both businesses and consumers. In particular, taking a serious approach to the energy transition demands the introduction of an ambitious carbon tax that is better designed than the one that was censored by the *Conseil constitutionnel* in 2009. Its creation and its step-by-step implementation need to be accompanied by reforming both the direct levies on household income and the main means-tested benefits so that compensation is kept under good control (cf. article in the [work “Réforme fiscale”, April 2012](#)).

A “competitiveness shock” therefore, but also a “sustainable competitiveness pact”, which encourages French companies to take the right paths by making good choices for the future.

[1] See in particular the [post of 20 July 2012](#).

Must we choose between saving the planet and exiting the crisis?

By [Xavier Timbeau](#)

It is up to our generation and those that follow to find a way for 10 billion people to live decently and sustainably on a planet with finite resources and capacities. As a decent standard of living requires a mode of consumption closer to that of our Western societies than the deprivation that afflicts a large part of the world's inhabitants, the task is immense – but failure is unacceptable. All this requires us to curb climate change, to anticipate falling agricultural yields, to prepare for the impact of rising sea levels, to adapt, and to halt the destruction of biomass and biodiversity while taking into account the depletion of natural resources, whether renewable or not. The list of constraints is long, and unfortunately it does not stop with these few examples (the interested reader can profit from reading the [OFCE's previous work](#) on this subject).

Yet the crisis facing the developed countries ([the Great Recession](#)) is often put in opposition to the environmental emergency, suggesting that any ethical concern for integrating human society into the limits imposed by the environment is a luxury that we can no longer afford. As we are obliged either to hope for a return to growth or to prepare the liquidation of our economies, *décroissance*, or de-growth, out of a concern for nature would be an idle fantasy, an option that only the most idealistic – and thus someone freed from the constraints of reality – could take “seriously”. How could societies that are experiencing record rates of unemployment, which need to get back to work in order to absorb the excesses of yesteryear (!), societies threatened moreover by emerging powers that

will hasten the decline of anyone who fails to comply with the rules of the new world – how could they allow themselves to become absorbed in saving the planet?

The idea that these two priorities (ending the crisis, saving the planet) have themselves to be prioritized (one realistic, the other idealistic) is a very poor way of addressing the challenge of our times. It can only lead to bad policies, to increasing the future cost of the environmental realism so necessary today and prolonging the economic crisis we are going through again and again. Three arguments are often advanced that lead to neglecting environmental issues in favour of economic issues. These arguments are especially questionable.

The first argument is that the solution to the environmental issue has to be postponed – but it can't be. Indeed, and as an example, the capacity of the global ecosystem to absorb carbon dioxide has long been exceeded. Continuing to emit carbon because oil is cheaper than other energy sources [\[1\]](#) on the pretext that there is no other choice is a dead end. Every time a gas plant is built (shale or not), it has to be worked (to be profitable) at least 50 years. But after 10 years we will take fright at the level of carbon emissions and realize that climate change is threatening not just our comfort, but the very survival of the human species, and it will be obvious that we must reduce CO₂ emissions. So in addition to new investments to change the way we consume energy, it will then be necessary to add the scrapping of the still-unprofitable gas plant. Putting off doing what is needed does not save money – on the contrary, it increases the cost, simply because the environmental constraints cannot be put off. This is currently the diagnosis, for example, even of the [International Energy Agency](#), hardly a den of hard-core ecologists. To stop the planet's climate from heating up by more than 2°C (relative to the pre-industrial era), it is necessary to immediately take the path of reducing CO₂

emissions by around 2t of CO₂ per year per capita (down to 5 to 10 times less than current emissions in the developed countries). Not doing this today means investing in poor solutions that will have to be mothballed before they have become profitable, and resigning ourselves to limiting the increase in the planet's temperature to 3°C or even more. It therefore means paying more for a worse level of climate stabilization that will then cost even more to adapt. Making the reduction of public debt the priority on behalf of future generations is completely hypocritical if it is done at the expense of future generations. In other words, investing in the decarbonisation of the economy, if it is done well, would have a future social profitability well above interest rates on the public debt. Not doing this means impoverishing future generations. Not doing this because cash constraints prohibit it amounts to a denial that we will not be able to justify to future generations.

The second argument is that we are not rich enough to be able to save the planet. Complying with environmental requirements and implementing solutions to reduce our impact on the environment would impoverish us, with very few exceptions, at least at first [\[2\]](#). What was once cheap (e.g. producing energy with reserves accumulated underground over millions of years) would now be done with more work and more infrastructure or capital (and thus more work to produce the capital), and thus in a way that is generally less efficient. Designing products that can be recycled completely, and producing and recycling them so that the materials that compose them can be *indefinitely* reused so as not to tap into the stock of the planet's finite resources, will require more work, more energy (and thus more work) and more capital (and thus more work). Choosing to take the path of respect for the environment thus means less consumption (final consumption, or, if you prefer, fewer services from consumption or a decrease in the flow of material well-being drawn from consumption). But that does not mean a decline in production, or even less a decline in

domestic production. Greater concern for the environment will mean a fall in productivity and living standards, but it will also mean job creation (this is the simple corollary). But what happens when jobs are created by reducing productivity in a situation of massive underemployment? It may, though this is not certain, reduce inequality and unemployment. The negative overall effect on income could be compensated for part of the population by the impact on inequality. Since escaping from the rarities of resources (e.g. oil) reduces (or in an extreme case eliminates) the rents associated with those rarities, a reduction in inequality means in particular the primacy of work over property. This is how we can reconcile a reduction in inequality with the environmental transition. Less wealth is consumed, but there is less unemployment, provided that we take the opportunity offered by the environmental transition to reduce inequality, and not just by means of social tariffs but also by the creation of new production.

The third argument frequently advanced is the constraint of international competition. Since our competitors do not choose to respect the environment, their costs remain low. If we insist on burdening our companies with additional environmental costs (taxes, quotas, standards, right-to-pollute contracts), not only do we lose competitiveness and thereby destroy economic activity and employment, but furthermore, because these activities will be relocated to areas where pollution or CO2 emissions are "authorized", while the environmental degradation will not recur in our country, it will in others, and will thus ultimately increase. In short, the environmental ideal is incompatible with the harsh laws of globalization. Yet it is this argument that is deeply naive and off target, and not the environmental imperative. There are two types of possible answers, both fully compatible with globalization as it is now [little] regulated. The first involves cooperation through applying the same rules on larger and larger spaces. The European Union and its carbon market is one example. This space can be extended, as was tried by the

Kyoto Protocol or as is evidenced by the recent cooperation between the European Union and Australia. But such cooperation cannot be established on a stable basis if there is no possibility of coercion. The second possible answer is thus the environmental tax on imports, which is legitimate under the WTO agreements (protection of the environment is one of the few reasons for an exception to the principle of untaxed free trade). It should be noted, for there to be no doubt about the environmental motivation for this, that the proceeds of such import taxes should be redistributed at least in part to the countries sending the imports, or even reserved for environmental investments. This would remove any suspicion that this is a protectionist tax; it would help promote environmental issues in the developing countries; it would provide a concrete response to the notion of the North's ecological debt vis-à-vis the South; and it would be neutral when establishing an environmental tax system or a market for emissions rights in the countries concerned. It would also make it possible to retain an international division of labour (and the trade flows that go with it), which is a source of productivity and of a better allocation of capital that is still necessary to deal with all the constraints that we need to respect.

The environmental challenge and finding an exit to the crisis are issues that converge, not conflict. The first cannot be postponed without major costs or irreversible damage. The levers to act on the environment must be the same as those that will help put an end to the crisis, in particular because they reduce inequality and increase employment. There is still the issue of the public debt and the need for more manoeuvring room in the future. But submission to cash constraints ("I have to repay my debts right now or I'll collapse") amounts to the panic of a rabbit caught in the headlights of the car that is about to crush it. Yet this is exactly the kind of fiscal strategy that we are endeavouring to follow. And it is this that is inconsistent with the concern for future generations

and for the environment.

[1] Just like trying to become a little more competitive by exploiting shale gas because it is twice as cheap as average oil, while in the end, and despite the more advantageous ratio of energy to carbon emitted, it leads to more emissions.

[2] Subsequently, the environmental constraints will stimulate the technical progress that will ultimately raise our overall productivity again.

Let's negotiate a global carbon price signal – quickly!

By Stéphane Dion [\[1\]](#) and [Éloi Laurent](#)

Two decades after the Rio Conference, and just as a new climate conference is opening in Bonn on Monday 14 May 2012, we must admit to collective failure in combating human-induced climate change. We cannot escape serious climate disruption if we continue down this same path. We must change direction, and we must do it quickly.

The International Energy Agency forecasts warming of over 3.5°C by the end of the 21st century if all countries respect their commitments, and by more than 6°C if they content themselves with their present policies. At that level of warming, climate science warns us that our planet will become

much less hospitable for humans and all other forms of life.

At the Durban Conference in December 2011, the countries expressed their grave concern about the gap between their commitments and achieving the objective of a 2°C limit on increased global warming (relative to the pre-industrial era). They promised to re-double their efforts to bridge this gap. But they failed to make any commitment to achieve more stringent targets. We are thus facing an increasingly untenable gap between the urgent need for action and the inertia of international negotiations.

The developed countries are refusing to strengthen their climate policies so long as the other major emitters don't do the same. But the emerging economies, particularly China and India, with annual GDP growth rates of 8 to 10%, will not accept in the foreseeable future targets for the reduction of the volume of their greenhouse gas (GHG) emissions. On the other hand, these countries might be more open to the idea of setting a price per ton of CO₂ that was standardized at the global level, from which they would derive revenue, and which their economic competitors would also be required to levy.

We believe that the best instrument for the international coordination needed to combat climate change is a global carbon price signal. This is why we are proposing that the forthcoming negotiations focus on this crucial goal.

Here is what we are proposing (for more detail, see, in French, <http://www.ofce.sciences-po.fr/pdf/dtravail/WP2012-15.pdf> and, in English): every country would make a commitment to introduce, in their respective jurisdictions, a carbon price aligned with a scientifically validated international standard, in order for the world to achieve or at least come as close as possible to the objective of keeping global warming below 2°C. Each country would decide whether to extract this levy through taxation or through a system of ceilings and trading in

emissions permits (a "carbon market").

Governments would be free to invest, as they see fit, revenues from the carbon emission levy and from the corresponding elimination of fossil fuel subsidies. They could, for example, invest in research and development in clean energy and public transportation, etc. They could also choose to address social inequalities with respect to access to energy.

Developed countries would be required to set aside part of their revenues to help developing countries introduce policies to mitigate emissions, to adapt facilities and to create carbon sinks (by means of reforestation, for example). The contributions of each country would be based on what their respective GHG emissions represent relative to the total emissions of all the developed countries.

Under this international agreement, countries would have the right to levy border taxes on products from countries that have not established a carbon price in accordance with the international standard. The message would be clear to all large emitters: if you do not levy a carbon tax on your products before you export them, the other countries will do so in your place, and it is they who will collect the revenues. Each country will understand that it is in its own commercial interests to comply with the international agreement, to tax its own emissions and to use the corresponding revenues as it sees fit.

In this way, the world would have available an instrument that is vital to its sustainable development. At last, carbon emitters would be required to pay the environmental price for their actions. Consumers and manufacturers would have an incentive to choose lower-carbon-content goods and services and to invest in new emission-reducing forms of technology.

We need to negotiate a global carbon price signal, and quickly. What better place to do this than at Rio, where the

problem of climate change was first recognized by the international community 20 years ago?

[1] Stéphane Dion is a Member of the House of Commons of Canada; as Canada's then Minister of the Environment, he chaired the 11th Conference of the Parties to the United Nations Framework Convention on Climate Change, held in Montréal in 2005 (COP 11).

A carbon tax at Europe's borders: Fasten your seat belts!

By [Éloi Laurent](#) and [Jacques Le Cacheux](#)

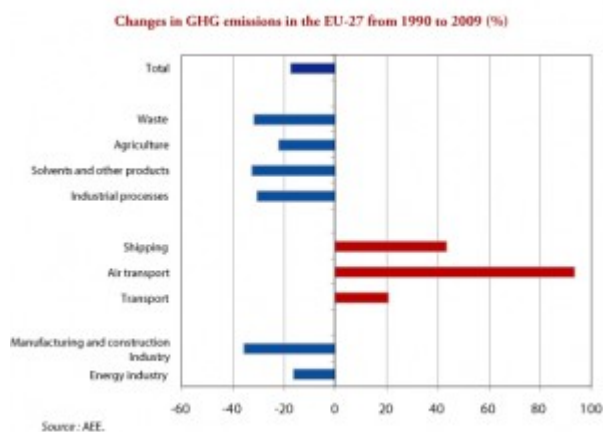
How can the current deadlock in international climate negotiations be resolved? By an optimal mix of incentives and constraints. In the case that currently opposes the European Union and the international air carriers, the EU is legitimately bringing this winning combination to bear by imposing what amounts to a carbon tax on its borders. It is brandishing a constraint, the threat of financial penalties, to encourage an industry-wide agreement that is long overdue among the airlines to reduce their greenhouse gas (GHG) emissions.

The ongoing face-off with the carriers of several major countries, which, with the more or less open support of their governments, are contesting the application of these new regulations on GHG emissions from planes flying into or out of the EU is, from this perspective, a crucial test. It is an

issue with considerable symbolic value, as it represents a first: all the airlines serving airports in the EU are subject to the new measure, regardless of their nationality. On March 9th, European officials reaffirmed their determination to maintain this regulation, so long as a satisfactory solution has not been proposed by the International Civil Aviation Organization (ICAO). However, 26 of the 36 member states of the ICAO Board, including China, the United States and Russia, have expressed their opposition to the new European requirement, advising their airlines not to comply. And the Chinese government is now threatening to block or outright cancel orders for 45 Airbus aircraft, including 10 A380 super-jumbos, if the European measure is not repealed.

Air emissions up sharply

GHG emissions attributable to air transport account for only about 3% of global and European emissions (about 12% of total emissions from transport in the EU). But despite the progress made by aircraft manufacturers in energy intensity, these emissions, which are still modest compared to road transport, have been experiencing explosive growth over the last 20 years, and are rising much faster than those in all other sectors, including shipping (see chart). They must be controlled.



In addition, in most countries, in particular in the EU, airline fuel is not subject to the usual taxation applied to

oil products, which obviously distorts competition with other modes of transport.

A robust legal framework

The [new European regulations](#), which took effect on 1 January 2012, require all airlines serving any EU airport to acquire emission permits in an amount corresponding to 15% of the CO2 emissions generated by each trip to or from that airport. The measure is non-discriminatory, since it affects all airlines flying into or out of European air space, whatever their nationality or legal residence. This requirement, which is grounded in environmental protection, is therefore fully consistent with the Charter of the World Trade Organization (WTO).

The measure is also of course in compliance with European treaties as well as with the various provisions of international law in the field of civil aviation, as is reiterated in the [judgment of 21 December 2011](#) by the Court of Justice of the European Union, in a case brought by several US carriers challenging its legality. The legal framework for this new provision is thus robust.

Towards the death of air transportation?

The airlines and the governments of the countries that are major emitters of greenhouse gases and that are hostile to this measure justify their outright opposition by arguing its poor timing, given the current economic climate of low growth and rising fuel costs, and its excessive cost, *i.e.* that the resulting rise in passenger air fares would be likely to further depress an already fragile industry.

In reality, the measure is largely symbolic and the cost is almost insignificant. Judge for yourself: according to the [Air France calculator approved by the French environmental agency, the ADEME](#), emissions per passenger amount to just over one tonne of CO2 for a Paris-New York return trip, and

approximately 1.4 tonnes for Paris-Beijing. The current price of a tonne of carbon on the European carbon market on which companies must buy emissions permits, the ETS, is just under 8 euros. The additional cost per ticket thus amounts, respectively to 2 euros for Paris-New York and 1.7 euros for Paris-Beijing! (estimates using [the ICAO calculator](#) are even lower).

Towards a trade war?

Given the current state of the legislation, the threats to cancel Airbus orders or similar retaliatory trade measures are obviously out of proportion to the economic impact of the tax on the European skies. To fear that this might trigger a “trade war” is also to forget that such a war has already been declared in industry, particularly in the aviation sector (with the multiplication of [more or less disguised subsidies, including in Europe](#), and with the use of [exchange rates as a veritable weapon of industrial policy](#)). Furthermore, agreements or cancellations of orders in this sector are in any case very often influenced by the political context, sometimes for dubious reasons (as in the case of diplomatic reconciliation with relatively distasteful regimes). In this case the cause, the defence of the integrity of Europe’s climate policy, is legitimate.

The various threats and blackmail attempts being taken up by the pressure groups targeted, in this case air passengers, are intended to sway governments for obtaining short-sighted gains. They are targeting particular countries, foremost among them Germany and Poland, which are currently dragging their feet in accepting the EU Commission’s proposal to accelerate the pace of European emissions reduction by raising the goal of emissions reduction for 2020 from 20% to 30% (compared to 1990 levels). As is their right, on the climate issue Germany and Poland have been following an approach that is in accordance, respectively, with a growth strategy based on exports and an energy strategy based on coal. In both cases,

these are national decisions that should not take precedence over the European approach. From the perspective of Europe's interests, there is therefore no valid reason to yield to these pressures even if some member states become involved.

By confirming its determination, the EU can provide proof that leadership by example on the climate can go beyond simply setting a moral example and lead to actual changes in economic behaviour. The EU can ensure that everyone sees that, despite the impasse at the global level, a regional climate strategy can still be effective. If its approach is confirmed, the success of the European strategy, which consists of encouraging cooperative strategies under the threat of credible sanctions, would point towards a way to break the deadlock on climate negotiations.

The European Union will, in the coming weeks, be passing through a zone of turbulence (yet another) on the issue of its border carbon tax. It would be legally absurd and politically very costly to make a U-turn now: instead, let's fasten our seat belts and wait calmly for the stop light to change.

Post-Durban: For a Sino-European axis

By [Eloi Laurent](#)

The European Union absolutely must stay the course at the Durban conference and afterwards, not only by reaffirming its

climate goals but even more by consolidating these through the improved control of its carbon linkages (see the OFCE note in French: [The European Union in Durban: Hold the course](#)), that is to say, the overall impact of its economic growth. This requires moving – on its own if necessary – from a target for 2020 of a 20% reduction in its greenhouse gas emissions to a target of 30% of its emissions, which is more in synch with the goal that it has endorsed of limiting global warming to 2°C compared to the pre-industrial era.

The possibility of transitioning the global economy towards a low-carbon economy depends on Europe's determination. As the largest market in the world, the EU possesses great power over the environmental policies of the world's other countries: the more ambitious it is in terms of the climate, the more its influence and leadership will spur the ambitions of other countries too.

But the pursuit of the de-carbonization of the European economy requires the reform and coherent articulation of EU and national economic policy tools.

For France, this means achieving its climate targets (the division of its emissions by four by 2050, called the "factor 4" approach) by introducing a price signal to contain emissions from diffuse greenhouse gas emissions (*i.e.* from housing and transport) that are not included in the European carbon market. To be clear, it will be necessary to introduce a carbon tax that spells out how it will be integrated into the French tax system. [A recent study by the OFCE](#) shows that this may well generate a dual dividend, both social and environmental. The [Perthuis report](#) is quite clear on this point: with the support of a price signal, the French climate transition will generate jobs. This transition should not, however, neglect issues of social justice, starting with the urgent problem of fuel poverty.

The European Union must also speed up the reform of its carbon

markets, whose price signal is now almost inoperative (a tonne of CO₂ has fallen to 7 euros). These markets could be significantly affected by the outcome of the Durban conference, as was the case after the summit in Copenhagen. Various options exist, such as to establish a Europe-wide central carbon bank.

Finally, the introduction of a carbon tariff at the borders of the European Union could restore coherence to the region's climate policy by addressing the problem of carbon leakage and imported emissions and by providing a source of funding for the Green Fund, whose architecture might be the only genuine accomplishment of Durban.

There are, ultimately, three fundamental reasons why the EU needs to confirm and reinforce its climate goals at Durban and especially "post-Durban":

1. The first concerns the human security of Europeans: the EU needs to reduce its emissions of greenhouse gases because, as is shown by a recent report by the IPCC, these are at the origin of the proliferation of extreme weather events on our planet, and this will be even more the case in the future. The European Union has experienced nearly 350 of these events during the Noughties alone, almost four times more than in the 1980s. The heat wave of summer 2003, alone, cost the lives of 70,000 Europeans.
2. The second reason relates to the economic prosperity of Europeans. The EU needs to strengthen its comparative environmental advantage and free itself as soon as possible from the fossil fuel trap. Europe's dependence on carbon has only increased over the past two decades. The rate of energy dependence of the EU member countries rose by an average of about 10 percentage points over the last fifteen years, to 53% in 2007, including 82%

for oil and 60% for natural gas, which between them account for 60% of all energy consumed in the EU. Conversely, the short-term economic cost (not including the longer-term benefits) of switching from a 20% target for the reduction of emissions to a 30% reduction by 2020 is minimal, on the order of about 0.6% of the EU's GDP per year (estimated by the European Commission).

3. The third reason, and perhaps the most fundamental, concerns the need today for the political cohesion of the European Union. What is necessary now is nothing less than rebuilding the European Union, which has been devastated economically and politically by the global crisis. The prospect of the coordinated economic depression currently being proposed to European citizens by their governments will signal the breakup of the euro zone but also in turn, it can be feared, a halt to the construction of Europe and even its unraveling. The ecological transition may indeed "save the climate", but it can also save Europe by giving it a future once again.

The best hope for what is already being called "post-Durban" may well lie in the establishment of a Sino-European axis on the climate: China is becoming aware that its impact on climate change is matched only by the impact of climate change on it (the world's largest emitter, it will in turn be the first victim of its emissions). As a result of the desertion by the US, Europe can confirm its role as global leader on the climate.

Europe's leaders sometimes seem annoyed to be alone among the developed countries to assume this responsibility, and they are tired of suffering the criticisms reserved for the one who wields the baton, even though the EU is the only region in the world to have met its Kyoto commitment, the only one to have set itself interim targets on the reduction of greenhouse gas (GHG) emissions, and the only one capable of meeting these

goals. This European annoyance is misplaced: given the disasters that science is warning us of, the fight against climate change could be Europe's greatest contribution to the future of humanity. Holding the course on the climate is a compelling duty. It also just happens to be in Europe's interest.

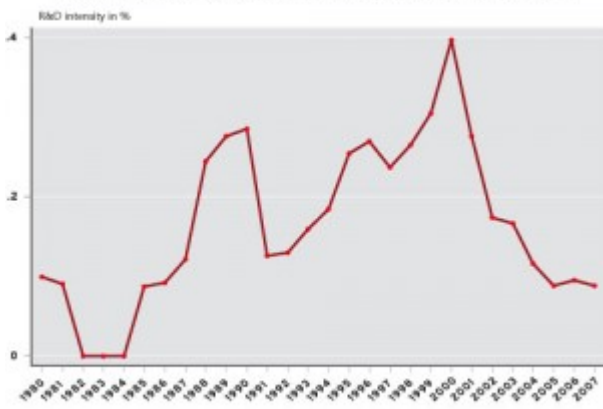
R&D all at sea: Have electricity producers lost the plot?

By [Evens Salies](#)

Is there an inherent conflict between the technological efforts needed to meet the requirements of environmental policies and the liberalization of electricity markets? In effect, the way R&D spending by European electricity producers has changed over the last three decades can give rise to doubts about the ability of the European Union to meet its goal of reducing greenhouse gas emissions by 80% to 93% by 2050 ([European Commission, COM/2010/0639](#)).

This is shown by the graph below, where we have isolated the expenditure of the 15 main producers. The figure shows a surprising reversal of the trend concomitant with the wave of liberalization in the sector sought by the EU. As concurrence doesn't necessarily mean causation, we took a look at whether the liberalization could be the source of this turnaround.

R&D intensity among Europe's main electricity producers, 1980-2007



Note: Changes in aggregate R&D expenditure relative to assets. This is merely an estimate of expenditure, as the portion of it that is capitalized is not available in a detailed breakdown in company financial statements.

The R&D spending of Europe's electricity producers has shrunk by 70% between 2000 and 2007, from 1.9 billion euros to 570 million euros (figures adjusted for inflation). The giants EDF and E.ON, which represent the two biggest R&D budgets in the sector, are largely responsible for this decline. R&D spending by the French electricity firm fell 33% from 2000 to 2007, from 568 million euros to 375 million. As readers are probably aware that R&D costs mainly go on personnel, it will come as no surprise that, in the case of EDF, the number of employees engaged in R&D (researchers plus technical support and administration) has fallen by about one-quarter since 2007, but we were not able to break this reduction down by type of activity.

How can producers meet the technical challenge posed by alternative energy while spending so little on R&D? Some people might believe that the situation is not as dramatic as implied by the graph above. Indeed, the R&D expenditures of the large electrical groups constitute only the bare minimum (around 10%) of the total, which is mainly spent by equipment manufacturers and public research laboratories. Looking at the figures for total private spending, it can be seen that there has been a relative increase since 2000 in the shares intended not only to increase energy efficiency, but also to produce

electricity from renewable energy sources. This is the result of numerous support measures for innovation (measures to purchase "green" electricity, financing for public / private partnership projects, etc.), without omitting the research tax credit also enjoyed by EDF.

It is nevertheless best to hold off before celebrating the above-mentioned shift in environmental innovation from the producers to the manufacturers, as the competition might well wind up by undermining the ability of the former to acquire these innovations. The question of why R&D spending has been falling thus remains relevant. Were levels abnormally high in the past, when producers enjoyed the status of public monopolies? It is in any case possible to find objective reasons for the decline, beginning with the liberalization of the markets in the European Union which, as several studies have shown, was the event triggering this radical change in the innovation policy of the electricity producers [1].

The thesis put forward in these studies is that the expected increase in competition following the opening up of these markets makes the value of the producers' future income more uncertain. The argument in support of this thesis is that some research projects directed towards public policy objectives (those reducing emissions) do not any yield short-term cost savings that would benefit the producers. The producers have thus refocused on their core business and abandoned research programs that are not procuring them any tangible benefits, particularly in terms of patents. In Europe, however, these sacrificed environmental innovation projects are now being developed by the manufacturers (for example, Vestas in the field of wind power). Research in nuclear power is being taken over by research providers such as Areva and Siemens. The producers are tending to replace these by programs with shorter research time frames that focus on energy demand management or improvements in energy efficiency. Note that the nature of innovation as a public good makes producers

cautious, as they are supposed to bear the costs of the research projects but will not be the only ones to reap their benefits. This encourages some players to engage in “free riding”, and therefore leads to underinvestment in R&D at the aggregate level in the sector.

Interestingly, we find that this switchover gives rise to an acceleration of R&D spending in the period just prior to liberalization. First observed in the United States, this phenomenon can be seen clearly in Europe when looking at R&D levels. When the Directive containing the common rules for the internal electricity market was passed in 1996, the decline in spending that ensued was actually preceded by an increase that was even greater than that observed on average between 1980 and 1995.

However, the establishment of market rules does not explain everything. The restructuring / fragmentation taking place as the sector has opened up is not without consequences for innovation. In a way that is similar to what has been observed in other sectors like ICT, the major electricity groups began to take on debt – which necessarily came at the expense of spending on research and other investments – as they engaged in new acquisitions. Companies reorganized their research by outsourcing. The example in France is that of EDF Energies Nouvelles, since August 2011 a wholly-owned subsidiary of EDF. The industrial organization that exists today in the electrical power sector is an oligopoly with a competitive fringe. Although the activities of the main traditional producers are subject to separate accounting, they still form vertically integrated groups, from production to marketing.

This restructuring and fragmentation evokes a hypothesis that is well-known to economists concerning the advantage of large companies in terms of innovation: the *Schumpeterian hypothesis* [2]. Formally, the question is whether the intensity of R&D – that is to say, the ratio of R&D expenditure to a size variable (the balance sheet, for example) – is positively

correlated with size. We were able to demonstrate this link in a sample of 15 major European electricity producers for the period 1980-2007 [3]. However, this result is largely contingent on the period under study, during which most producers were protected from new market entrants and competitive pressure on the territory where they were doing business as public enterprises, then called “natural monopolies”.

This position gave them at least three advantages that have now disappeared. First is a kind of “right of first refusal” on the use of innovations provided by equipment manufacturers, while they were also less fearful of being imitated on their own innovations. The potential for replication was limited to a very specific area of activity for each country, usually the country, which made it possible to spread the costs of innovation over all domestic consumers. Moreover, as they were certain not to lose their customers, the traditional producers could take risks in launching basic research projects. Finally, the regulation of tariffs ensured a predictable level of revenue.

This suggests that the Schumpeterian impact of rent appropriation dominated the negative effect on the incentive to innovate due to the lack of actual or potential competition. Once the sector was opened to competition, some of the advantages listed above disappeared. The vast majority of customers remained loyal due to the significant cost of switching, but an increasing share of the electricity produced was sold on weakly regulated wholesale markets at volatile prices. The Schumpeterian hypothesis could therefore disappear, and competition would lead to stifling the innovation fostered by spending on R&D.

An oligopoly of producers with a competitive fringe

Europe’s electric power sector is characterized by a small number of large producers (oligopoly) that hold a large share

of the market, while a large number of small firms (the competitive fringe) each have a small part of the residual market. Contrary to the received wisdom about competition, the fringe can have an impact on wholesale prices. In practice, since electricity cannot be stored, a producer asked by a carrier that is responsible for balancing production and consumption can offer the output of a power plant with low marginal costs at a price above the cost. An example is a producer at a marginal plant which, in times when demand is running up against production capacity (the peak), is requested to ensure the overall balance as a last resort.

[1] The study by Kammen, D.M. and R. M. Margolis ("Underinvestment: the energy technology and R&D policy challenge", *Science, Energy-Viewpoint*, no. 285, 1999, pp. 690-692) had anticipated this situation for the United States. A study by P. Sanyal ("The effect of deregulation on environmental research by electric utilities", *Journal of Regulatory Economics*, Vol. 31, no. 3, 2007, pp. 335-353) was the first to use econometrics to show how the liberalization of the electricity market was related to the fall in R&D spending.

[2] Please see http://en.wikipedia.org/wiki/Creative_destruction .

[3] "A test of the Schumpeterian hypothesis in a panel of European electric utilities", *Document de Travail de l'OFCE*, no. 2009-19, <http://www.ofce.sciences-po.fr/pdf/dtravail/WP2009-19.pdf>.