



# Report

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1. Citizens, consumers, producers and policy makers in Europe expect a lot from the European Energy and Climate policy, which aims at achieving three goals
  - Security of supply: can we have adequate supplies of energy to meet our needs, at any time?
  - Protection of the environment, particularly with regards to the fight against climate change: can we produce and consume this energy without putting the planet at risk of irreversible damage?
  - Competitiveness, which raises the question of cost and price.

The conviction of the authors of this paper is that despite strong national differences, these goals are easier to achieve if efforts are made coherently across a large geographic territory: for Europe, the EU level matters. Indeed, size itself allows for more diverse and complementary options. Therefore, size makes it easier to proceed on the basis of solidarity, which is an essential factor of security; it also makes it easier to optimize investment, and to choose cheaper solutions.

2. Apart from the long forgotten Euratom, and the long gone ECSC, attempts towards the construction of a European energy framework have essentially followed two paths:
  - a) creation of the internal market for gas and electricity, subject to the mechanisms of competition law, which seems, at first glance, to be a good idea as a properly-functioning market leads to the most effective decisions,
  - b) protection of the environment, that is to say working to limit the emission of greenhouse gases. Very quickly however, the latter goal was subject to ramification and an independent sub-goal was created: increasing the proportion of renewable energy under the discipline of targets which are legally binding on member states (the well-known “3x20 by 2020” set of targets). This refinement was probably driven by two factors, official or unspoken: the opposition of NGOs to the development of nuclear power, and the fear of a rapid exhaustion of global fossil fuel resources. We now know that the second reason is null and void, at least for fifty years to come, since technological progress and rising prices have allowed the exploitation of new resources. Indeed, in the November 2013 issue of the World Energy Outlook, the IEA estimates that recoverable oil, natural gas, and coal resources amount to 178 years, 233 years, and 30 centuries of current production respectively (and still to an impressive 54 years, 61 years and 142 years for proven reserves), provided, that is, that considerable investments are made, but it is clear from these figures that the core of the matter is not resources, but emissions.
3. These overdetermined and often contradictory goals have led to a deeply unsatisfactory situation, and one in which other rules have been added by the European authorities and which prevent the gas and electricity markets from functioning properly. Technically, MWh of electricity, cubic meters of gas and CO<sub>2</sub> emission allowances are traded on exchanges, but the price signals these exchanges provide are far from being those expected to guide investment decisions because of the way policy distorts the markets. On the contrary, the resulting price signals fail to foster efficient, competitive resource allocation, as the following examples show.

4. Natural gas is expensive in Europe compared to North America because European domestic production is falling sharply and Europe is competing for imports with Asia which accepts paying high oil-indexed premiums. Even exports of US liquefied gas may not change the situation by much as the cost of liquefying and transporting gas to Europe would almost offset the price advantage that the US derives from plentiful shale gas resources priced through gas-to-gas competition. Because natural gas is much cleaner than coal from a climate perspective, gas can compete with low-priced coal if the price of carbon emissions can effectively change the merit order between coal and gas. As it is not the case, due to flaws in the carbon market, the present situation undermines demand, and clean natural gas-powered plants keep shutting down, only to be replaced with polluting but cheaper coal-powered plants.
  
5. The situation on the power market is even more awkward. In an effort to meet market penetration targets for expensive, and more often than not, intermittent, renewable energy sources (the 20% overall target, specified at a different level for each country), specific measures have been enacted such as guaranteed buy-back prices (feed-in tariffs) and network access priority. The market is in theory a functioning one, but since the prices paid to and volumes purchased from the producer of favoured power sources are guaranteed, price signals fail to drive efficient resource allocation. At the same time, renewable non-hydro power production is taking a more and more significant market share in the European Union: according to the IEA, these sources accounted for 7.8% of actually produced volumes, while at the same time constituting a much larger 16.7% of production capacities in 2013; the difference speaking eloquently about the cost of intermittency. The gap between market prices and prices guaranteed to the producer of renewable energies has to be paid for, either by the whole consumer base in a country – through the CSPE system in France, for instance – or the whole consumer base with the exception of large industrial consumers – as is the case with the EEG system in Germany. The grotesque result is that bulk prices are very volatile and, on average, pulled down by the expansion of supply, while retail prices are pushed up by a more and more expensive CSPE- or EEG- like system. Governments consequently either try to regulate retail prices on the individual consumer market, increasing the number of economic players evading market rules or are tempted to threaten direct action, such as the price freeze being promoted by the main (Labour) Opposition party in the UK. Simply put, the internal power market looks like a market, but enjoys none of the characteristics which should help it move towards a cost-effective equilibrium. One could argue that such a situation, whereby everybody lives with the illusion that the market is functioning, could in fact be worse than a centrally planned market. At least the latter situation shows where accountability should lie.
  
6. As everybody knows, it never rains, it pours. Almost simultaneously, two major external shocks have come to alter the market even more. First came the 2008 financial crisis, whose impact on the European economy persists even six years later. Among other collateral damage, market prices for CO<sub>2</sub> emission allowances collapsed: companies produce less, therefore, reduce their emissions, therefore, don't need to buy these allowances anymore. The price of a metric ton of CO<sub>2</sub> was around 25 euros before the crisis. Some expected it to

rise to as much as 50 euros. It's now 7 euros. As we discuss later, this collapse reflects not just supply and demand but a failure to design and govern markets for emissions in an optimal way. As a consequence, investments made to limit emissions, related to nuclear power, renewable energy, energy efficiency, coal-to-gas replacement programmes, and CO<sub>2</sub> capture and sequestration, are less and less profitable. They are in danger of disappearing.

7. Then came the second external shock: the phenomenal expansion of non-conventional gas production in the United States. This caused natural gas prices to collapse in North America, and a massive replacement of coal by gas. Between 2005 and 2012, US coal-based power generation fell 24%, from 2150 TWh to 1640 TWh, gas-based power generation rose 63%, from 780 TWh to 1275 TWh, while total output remained stable. And where would this American coal fetch up? Europe, of course! Why? Because the very carbon prices meant to make gas more competitive than coal are very low and because renewable sources are given an absolute preference: they compete on the basis of their (very low) variable costs while their capital cost is not factored in. The preference of renewable sources in the market has substantially reduced the uptime of conventional plants, while the reward for their flexibility is insufficient in current market circumstances. This explains why many gas-fired power plants - even very modern and efficient ones - are shutting down in Europe, despite the fact that they are indispensable: they are flexible, and can act as a back-up for intermittent energy sources, providing power when there's no sunlight or no wind. In Germany alone, energy companies have asked the regulator for permission to shut down 28 gas-fired powered plants. Coupled with Germany's hasty nuclear power plant shutdowns, this has left the power sector there extremely dependent on coal - while Germans are paying a big price for renewables supposedly to reduce the country's greenhouse gas emissions.
8. To summarize the picture of the present situation:
  - i) The market was supposed to develop competition and cause prices to drop. In fact, individual consumers are paying more than ever before for natural gas and for power, in spite of ample supplies.
  - ii) Renewable energy sources were only meant to be supported temporarily, until they became profitable, thanks to learning curve, innovative gains and scale effects. All too often, the opposite happened: generous subsidies allowed energy sources with little potential to become cost competitive in the short to medium term (such as offshore wind power generation) to take root, and innovation to stall.
  - iii) The security of the power generation system is compromised by the anarchic development of intermittent power sources, and the shutting down of gas-fired power plants. On windless, sunless days, disruptions are to be expected.
  - iv) As far as climate change is concerned, Europe wanted to be the poster child, and even the pontificator: the opposite of the American unruly kid. Now the unruly kid has significantly reduced his emissions, and the poster child keeps increasing his, especially in Germany.

- v) Economic recovery in Europe is compromised by the mindless pursuit of such policies and their resulting costs. Unfortunately, the situation has become largely irreversible: if Germany was to stop all support to renewable energy, the future cost of past decisions would still be in the region of 200 billion euros.
  - vi) Last but not least, public support for energy policies has been undermined, as people compare the early promise of competition, lower cost and broader choice, with the reality of state enforced choices, higher costs and higher subsidies.
9. The need to tackle this situation has not been fully accepted by political authorities yet, but some experts are starting to address it. If we discard the quixotic option to wait until things get better by themselves, the question is: what can we do? A first option – we must make it clear immediately that such is not our thinking, for it is not completely practical – is to say that the ills have become so severe that only a complete overhaul of the European system could bring progress. Let's just make a clean sweep, revoke all directives, suppress all existing market designs and build a new coherent energy system from scratch.
  10. The problem with this option is that it will take a very long time, and has to be driven by individual member states each of whom has his own idea of what should be a "coherent energy system". Moreover, these ideas are deeply contradictory. The Poles will refuse anything that may go against their coal production, the Germans are obsessed with developing renewable energy, the French are ridden with their own unsolvable contradictions, the British are building their own system anyway, and smaller member states are conflicted what strategy to follow without getting crushed by these wavering examples. As things stand, the clean sweep option would inevitably cause the whole structure to implode, and lead to the development of 28 conflicting national policies: a dramatically sub-optimal outcome.
  11. That's why it is necessary to look into another method: tackling the current system so as to urgently achieve pragmatic improvements while getting rid of its most appalling deficiencies. Here are a few examples – the list is not exhaustive:
    - i) Since markets exist (the power market, gas market, CO<sub>2</sub> emissions market), let's make them work as they should, so that the choices of economic players, suppliers and consumers, are influenced by costs, contrary to all that we have observed so far. This means, for example, making buy-back prices for renewable energy non-specific - same price for photovoltaics, offshore or inland wind power – and subject to a taper over time so as to promote energy sources that are closer to achieving profitability (like onshore wind power generation) or those which are likely to enjoy more technological progress (like photovoltaics). Above all, the need for cost reflectivity means that renewable energy sources should have to pay the price of their intermittence (including the cost of capacity markets, and the extra cost of load following for gas- or coal-fired backup facilities, as well as payment for energy storage when wholesale prices fall below a certain level).
    - ii) As concerns the ETS market, a market intervention mechanism should be implemented in order to maintain confidence in the allowance price as a relevant signal for long term

investment. Indeed Europe had taken a promising start that is now in risk of failing for lack of the fully fledged governance that such a new market calls for. This governance should meet the proper combination of impeccable technical expertise, discretionary management decision-making capacity and political accountability, in the same manner modern central banks have achieved in the monetary and banking fields. A working group should review EU and other experiences so far and make proposals.

- iii) Since the major influence on any energy policy comes from climate change, CO<sub>2</sub> emissions should be the sole binding quantifiable target. Other targets, if any, should remain non-binding ones, as proposed by the German-French ministerial meeting held in Paris on 19 February 2014. The 3x20 target, which combines a target in terms of renewable energy penetration and a target in terms of energy efficiency, makes the market overdetermined, is thus ineffective, and should be removed. It is encouraging that the European Commission's draft consultation on future energy and climate policy does indeed propose moving to a single, CO<sub>2</sub> emissions, target.
  - iv) Beyond the usual empty talk, European solidarity to be a reality commands precise and firm political commitments. All member states must publicly adhere to the hands-off-my-pal rule: any disruption of supply to any member state shall automatically trigger substitute supply from the rest of the European Union. This calls for developing flexible supply (e.g. LNG), and for continued progress in interconnecting Eastern members with the rest of Europe.
  - v) But solidarity also requires responsibility and discipline: each member state must publicly and regularly announce the measures prepared to cope with the default of one of his suppliers or other disruptions to supply, and must refrain from policy interventions which transfer the burdens to other member states.
  - vi) Since it's an illusion to believe that member states could be stripped of their prerogatives related to energy policy (in particular, those related to nuclear policy), it is essential that national decisions should be coherent. The Energy Trilemma Report 2012 stresses that the lack of European coordination is a primary concern of the energy business community. To alleviate this issue, "peer reviews" among member states, aimed at checking the coherence of indicative programs, should be organized by the Commission, based on the model of the International Energy Agency, and the results made public.
  - vii) A fraction of the savings achieved by an implementation of the above measures should be allotted to the financing of additional research effort, in particular concerning energy storage and CO<sub>2</sub> capture and sequestration.
12. An arduous task remains: explaining. It is arduous for two reasons: the first, objective, reason is that energy is indeed a complicated topic, and has therefore been confiscated by "experts" for too long. The second, political, reason is probably partly a consequence of the first reason: public trust in these experts or politicians is very low. Overcoming this crisis of confidence is not easy, but it is essential: the German example shows that it's not possible to develop an energy policy which runs counter to public opinion. The starting point may lie in



the debunking of several so-called obvious truths, which are in fact myths. For example: 1) locally-produced energy is always safer than imported energy, 2) European energy policies suppose a common “energy mix”, 3) solidarity means we have to pay for the foolishness of others. Then try to explain that an energy source which is safe, plentiful, clean, non radioactive, free of any equipment in my backyard, and cheap, simply does not exist, even if the operations of the big energy companies are subject to external control.

13. We are well aware that we are not the first, and certainly not the last either, to describe the impasse at which European energy policy has arrived, nor to suggest urgent measures to help remedy the situation. But we believe that building a European policy involves a long learning process. Since all European institutions are about to undergo profound changes, and given the mounting difficulties of delivering on the goals of European energy policy which are so important to the health and prosperity of our society, we believe that the time to address these issues is now. And because the process will be slow, we believe that it should start as soon as possible. The European Council scheduled on March 21-22 is an opportunity to devise a true energy policy of Europe.

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