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Energy Policy: European, National, Regional?

When it comes to energy policy, EU countries go their own way with little regard for other member states. What strategies exist in the EU Commission to coordinate and integrate energy markets? Are these strategies consistent with national plans currently in action? Is it too late to establish a unified energy policy? What can be achieved in a unified energy policy given the considerable differences in resource endowment and political preferences in energy strategies? Can the effectiveness of EU energy policy objectives be enhanced through policy coordination at the regional scale? This Forum seeks to provide answers to these questions.

Sebastian Strunz, Erik Gawel and Paul Lehmann

On the Alleged Need to Strictly Europeanise the German *Energiewende*

Germany has embarked on an ambitious project to transform its energy system by 2050 – the so-called *Energiewende*. Some critics contend that the *Energiewende* imposes unnecessary and avoidable welfare losses due to a lack of integration within the EU. However, these critiques largely miss the point because the asserted lack of integration cannot be pinned on the *Energiewende*, and the welfare consequences of EU-wide integration are less clear than the critiques imply.

Germany aims to completely redesign its energy system within the next few decades. In particular, nuclear power shall be phased out by 2022 and the share of renewable energy sources (RES) in overall electricity supply shall be increased to at least 80 per cent by 2050. While many international observers regard this ambitious set of energy transition targets with a mix of applauding respect and slight scepticism,[1] some domestic critics judge the transformation project very harshly. Specifically, they criticise the *Energiewende* for being a national and unilateral approach that fails to reap the potential benefits of an EU-wide approach.[2] It has even been suggested that Germany, by rolling out *Energiewende* policies, acts as a kind of wrong-way driver heading in the opposite direction to a presumed mainstream of European energy policy.[3] Therefore, the critics contend that Germany should only proceed with its energy transition policies (if at all[4]) if they are aligned within a common EU framework.

The critics bring forward two main economic arguments: first, the spatial allocation of electricity infrastructure (generation facilities and transmission lines) could be more efficiently organised at the EU level.[5] Second, the technology portfolio that emerges from Germany's feed-in tariff for RES is said to be inefficient compared to an EU-wide scheme of tradable green electricity quotas.[6] In the following, the validity of these arguments is questioned. We argue that – while technically correct – they only hold under very narrow assumptions, which all but nullifies their warranted assertion.

Therefore, the perspective should be broadened so as to provide a more comprehensive picture. In particular, the following aspects are indispensable for an overall assess-

1 See, for example, D. Buchan: The Energiewende: Germany's Gamble, The Oxford Institute for Energy Studies, SP 26, 2012.

2 For example, acatech: Die Energiewende finanzierbar gestalten: Effiziente Ordnungspolitik für das Energiesystem der Zukunft, acatech Position, Heidelberg 2012; J. Weimann: Atomausstieg und Energiewende: Wie sinnvoll ist der deutsche Alleingang?, in: Energiewirtschaftliche Tagesfragen, Vol. 62, No. 12, 2012, pp. 34-38.

3 H.-W. Sinn: Zu viele unrealistische Hoffnungen und zu wenig Pragmatismus, in: Energiewirtschaftliche Tagesfragen, Vol. 62, No. 1/2, 2012, pp. 54-56.

4 J. Weimann: Rettet die Energiewende? Warum eigentlich?, in: Wirtschaftsdienst, Vol. 93, No. 11, 2013, pp. 793-795.

5 M. Frondel, C. Schmidt, N. aus dem Moore: Marktwirtschaftliche Energiewende: Ein Wettbewerbsrahmen für die Stromversorgung mit alternativen Technologien, in: Zeitschrift für Energiewirtschaft, Vol. 37, No. 1, 2013, pp. 27-41; A. Mundt: Die Energiewende braucht Marktvertrauen, in: Zeitschrift für das gesamte Recht der Energiewirtschaft, Vol. 2, No. 6, 2013, pp. 241-242.

6 M. Hübner, C. Schmidt, B. Weigert: Energiepolitik: Erfolgreiche Energiewende nur im europäischen Kontext, in: Perspektiven der Wirtschaftspolitik, Vol. 13, No. 4, pp. 286-307; J. Haucap, J. Kühling: Zeit für eine grundlegende Reform der EEG-Förderung – das Quotenmodell, in: Energiewirtschaftliche Tagesfragen, Vol. 63, No. 3, pp. 41-49.

ment of Germany's energy transition policies within the EU context.

- Can Germany's *Energiewende* be meaningfully described as unilateral? First and foremost, it is an empirical question whether Germany's energy policy stands out compared to its neighbours. In fact, the analysis shows that the claim of unilateralism cannot be substantiated because the main pillars of the *Energiewende*, the nuclear phase-out and RES support policies (objectives as well as instruments), are not unique within the EU; the same also goes for Germany's RES shares and mid-term renewables goals up to 2020 that are completely in line with the EU average (Table 2). Furthermore, since energy policies are, on the whole, rather diverse in the EU, any perceived lack of integration cannot be blamed on one particular member state.

- How strong is the economic case for EU-wide integration of energy transition policies? This normative question is not reducible to the issue of geographical production costs of RES: instead, a range of arguments concerning general issues (e.g. decentralised versus uniform provision of public goods) and specific aspects of the energy transition are to be considered here. For instance, a complete evaluation needs to take possible preference heterogeneity concerning externalities from electricity production (e.g. nuclear risks, landscape impacts of renewable energy plants) into account.

- Specific questions on the appropriateness of particular policy instruments must not be conflated with the analysis of the adequate governance level for energy transition policies. For instance, the issue of whether a feed-in tariff or a quota system is preferable for supporting RES needs to be separated from the question of whether RES policies should be implemented on the EU level or on the level of member states.

- Assuming that closer cooperation on some aspects of *Energiewende* policies is to be welcomed, which pathways are most conducive towards integration, given specific legal and politico-economic side constraints? Against the background of past developments in EU energy policy, it is clear that bottom-up processes are far more likely to facilitate cooperation than centralisation and forced top-down harmonisation of policies.

Thus, the abovementioned critiques of the energy transition are, at the end of the day, hardly convincing and should not guide policy advice: an EU-wide scheme of tradable green electricity quotas is not a readily available policy option, nor should it constitute the goal of German energy transition polices. The rest of this paper demonstrates that neither implication is valid by setting out the above points in more detail.

Nuclear power and RES policies in the EU

To what extent can the main pillars of the electricity-related *Energiewende*, the nuclear phase-out and the specific RES support policies be considered as outliers in the EU?

First, as regards nuclear power, a rather diverse picture emerges: Table 1 displays the number of nuclear reactors that are currently in operation, under construction or being planned within the EU28 member states and Switzerland. Several observations seem noteworthy. To start with, there is a huge spread between the countries that do rely on nuclear power: on the one hand, the nuclear share of overall electricity production in France reaches almost three-quarters; on the other hand, the nuclear share in the Netherlands stands at slightly below three per cent. In addition, a number of EU member states do not use any nuclear energy, among them Italy, Austria, Portugal and Ireland. An exception is Poland, which currently does not have nuclear plants but envisages building two plants in

Sebastian Strunz, Helmholtz Centre for Environmental Research (UFZ), Leipzig, Germany.

Erik Gawel, Helmholtz Centre for Environmental Research (UFZ), Leipzig, Germany; and Leipzig University, Germany.

Paul Lehmann, Helmholtz Centre for Environmental Research (UFZ), Leipzig, Germany.

Teresa Ribera, Institute for Sustainable Development and International Relations (IDDRI), Paris, France.

Andreas Rüdinger, Institute for Sustainable Development and International Relations (IDDRI), Paris, France.

Ralf Boscheck, International Institute for Management Development, Lausanne, Switzerland; and University of St. Gallen, Switzerland.

Christian Egenhofer, Centre for European Policy Studies, Brussels, Belgium.

Jacques de Jong, Clingendael International Energy Programme, The Hague, Netherlands.

Table 1
Nuclear power in Europe (EU28 plus Switzerland)

Country	No. of reactors in operation	Nuclear share at overall electricity supply, in %	Future development
Countries that rely on nuclear power or intend to phase in			
Netherlands	1	2.9	-
Slovenia	1	33.4	-
Bulgaria	2	33.2	-
Romania	2	21.2	-
Finland	4	33.3	1 reactor in construction
Hungary	4	51.5	-
Slovakia	4	54.7	2 reactors in construction
Czech Republic	6	35.9	-
Spain	7	19.7	-
Sweden	10	42.6	-
UK	16	18.8	1 reactor in planning
France	58	73.6	1 reactor in construction
Poland	-	-	2 reactors in planning
Countries that have no nuclear power or intend to phase out			
Austria	-	-	-
Croatia	-	-	-
Cyprus	-	-	-
Denmark	-	-	-
Estonia	-	-	-
Greece	-	-	-
Ireland	-	-	-
Italy	-	-	-
Latvia	-	-	-
Lithuania	-	-	-
Luxembourg	-	-	-
Malta	-	-	-
Portugal	-	-	-
Switzerland	5	36.4	Nuclear phase-out by 2034
Belgium	7	52.1	Nuclear phase-out by 2025
Germany	9	15.4	Nuclear phase-out by 2022

Sources: Adapted from European Nuclear Society: Nuclear Power Plants in Europe, March 2014; and Eurostat: Electricity and Supply Statistics, December 2013.

Table 2
Share of RES at final energy consumption and EU targets for 2020
in %

	RES share 2012	RES target 2020		RES share 2012	RES target 2020
EU27	14.1	20.0	Italy	13.5	17.0
Austria	32.1	34.0	Latvia	35.8	40.0
Belgium	6.8	13.0	Lithuania	21.7	23.0
Bulgaria	16.3	16.0	Luxembourg	3.1	11.0
Cyprus	6.8	13.0	Malta	1.4	10.0
Czech Republic	11.2	13.0	Netherlands	4.5	14.0
Denmark	26.0	30.0	Poland	11.0	15.0
Estonia	25.9	25.0	Portugal	24.6	31.0
Finland	34.3	38.0	Romania	22.9	24.0
France	13.4	23.0	Slovakia	10.4	14.0
Germany	12.4	18.0	Slovenia	20.2	25.0
Greece	11.6	18.0	Spain	14.3	20.0
Hungary	9.6	13.0	Sweden	51.0	49.0
Ireland	7.2	16.0	UK	4.2	15.0

Sources: Statista: Anteil erneuerbarer Energien am Bruttoendenergieverbrauch un den EU-Ländern 2012 und 2020 (Zielwert), 2014.

the future. Furthermore, two European countries, Switzerland and Belgium, also have recently decided to phase out nuclear power. Summing up, portraying Germany's nuclear phase-out as an outlier somewhat distorts the actual status quo of nuclear power in Europe. As there is no discernable trend or mainstream to which all nuclear policies could be said to converge, singling out Germany's phase-out as unilateral seems unjustified.

Second, regarding the targets for RES expansion by 2020, Germany might even be considered as below average, as Table 2 shows. In fact, both Germany's share of RES at final energy consumption in 2012 and the corresponding target for 2020 are slightly below the average at the EU level. Thus, any claim about exceptionality of Germany's RES policies must refer to the 2050 horizon, where Germany's RES targets are indeed ambitious and other member states lack comparative long-term frameworks. In a sense, the ambition of Germany's energy transition lies not so much in the mid-term targets for RES, but rather in the fact that a thoroughly industrialised country, which often praises itself for being "world champion" in exporting goods, aims to completely transform its energy system in the long run. However, other European countries will be forced to set appropriate energy policy goals for 2050 in line with the overall EU decarbonisation scheme for the energy sector. Comparing German 2050 goals with present-day EU-wide energy policies does not make much sense.

Furthermore, Germany's support scheme for RES is no misfit within the EU. The Renewable Energy Sources Act

Table 3
Number of member states that have implemented specific RES instruments

	2000	2005	2010	2013
Feed-in tariff	7	16	23	17
Feed-in premium	-	4	7	10
Quota	1	6	6	6
Tender	2	2	6	2

Sources: Adapted from L. Kitzing, C. Mitchell, P. Mothorst: Renewable Energy Policies in Europe: Converging or Diverging?, in: Energy Policy, Vol. 51, 2012, pp. 192-201: footnote 12, p. 196; and RES LEGAL: www.res-legal.eu.

(EEG), which prioritises RES as regards electricity feed-in into the system and guarantees a fixed remuneration for every kilowatt hour of RES electricity produced, was introduced in 2000. At the time, only six other EU member states had implemented similar RES support policies. However, as can be seen from Table 3, by 2010 this form of support via feed-in tariff had become the mainstream way of pushing RES in the EU. Interestingly, the recent revisions of the EEG are perfectly aligned with the general development of support policies: in 2012, Germany introduced a premium scheme in order to steer dispatchable RES. Questions about the economic merit of this measure notwithstanding,[7] it directly corresponds to the continuous EU-wide trend of complementing feed-in schemes with premium schemes. The most recent revision of the EEG in 2014 envisages (sceptically: ponders – depending on the reading of the rather vague formulations within the law) a long-term transformation away from feed-in tariffs and towards tender schemes. Again, this conforms to the overall direction, if the EU Commission's guidelines may serve as point of reference.[8]

On the basis of these general trends, and more detailed analyses of parallel developments in some EU countries, some have even argued that there is evidence of bottom-up convergence of RES policies.[9] In any case, what the analysis clearly demonstrates is that Germany's RES support policies are far from being an outlier or a wrong-way driver in the EU; on the contrary, in comparison to the quota scheme, Germany's introduction of a feed-in tariff (and revisions thereof) can reasonably be considered as a mainstream policy.

EU-wide integration of energy transition polices?

In order to address the question of how "Europeanised" Germany's energy transition policies should be, it is necessary to clarify analytically what "Europeanisation" means.[10] On the one hand, Europeanisation might refer to the degree of homogeneity of policies across the EU. On the other hand, Europeanisation might refer to the location of decision-making power on a continuum from completely decentralised at the level of member states to fully centralised at the EU level. Based on this differentiation, then, specific criteria for more integration on each of the dimensions could be set up. For the scope of this contribution, however, it suffices to point out that there are two aspects to Europeanisation and that these need not necessarily align: for example, a more homogeneous pattern of policies might be achieved by centralised decision-making at the EU level as well as via decentralised cooperation between member states.

In general, a tension exists between the EU's aim of a common internal market for energy and the member states' sovereignty over energy policy. This tension materialises both legally and economically. Legally, the Treaty for the European Union (TFEU) is sufficiently vague in providing both supranational EU institutions and member states with competing and overlapping competences (see also below). Economically, the welfare benefits from an internal market need to be traded off against possible welfare losses from overriding national peculiarities – the case of the *Energiewende* is a prime example in this respect, as will be argued in the following.

To what extent, then, would an EU version of the *Energiewende* be desirable? As regards the nuclear phase-out, the obvious heterogeneity of policies in the EU challenges the notion that there might be welfare gains from harmonising policies: the diversity of nuclear policies points to an underlying diversity of preferences about the risks associated with nuclear power. In particular, (hypothetically) imposing a nuclear phase-out on France would imply overriding French risk preferences. Certainly, the systemic costs of a rapid French nuclear phase-out related to its much higher dependence on nuclear power compared to

7 See E. Gawel, A. Purkus: Promoting Market and System Integration of Renewable Energies through Premium Schemes – A Case Study of the German Market Premium, in: Energy Policy, Vol. 61, 2012, pp. 599-609.

8 See E. Gawel, S. Strunz: State Aid Dispute on Germany's Support for Renewables: Is the Commission on the Right Course?, in: Journal for European Environmental and Planning Law, Vol. 11, No. 2, 2014, pp. 139-152.

9 D. Jacobs: Renewable Energy Policy Convergence in the EU: The Evolution of Feed-in Tariffs in Germany, Spain and France, London 2012, Ashgate; L. Kitzing, C. Mitchell, P. Mothorst: Renewable energy policies …, op. cit.

10 For an extended discussion of the arguments presented in this subsection see E. Gawel, S. Strunz, P. Lehmann: Wieviel Europa braucht die Energiewende?, UFZ Discussion Papers, Working Paper No. 2014-4, 2014; and S. Strunz, E. Gawel, P. Lehmann: Towards a General "Europeanization" of EU Member States' Energy Policies?, UFZ-Discussion Papers, Working Paper No. 2014-17, 2014.

Germany would be huge. Certainly, some supranational coordination may be warranted as some nuclear risks may be transboundary. However, such issues do not necessarily call for a uniform EU-wide approach but may also be addressed by bilateral agreements.

Turning to the deployment of RES: assume, for the sake of argument, that there was a clean sweep and Europe's energy supply could be rebuilt from scratch. In order to minimise production costs, RES should be allocated according to most favourable geographical conditions, placing photovoltaic installations in Southern Europe and so on. Additionally, a European-wide supergrid could be implemented, possibly including North African deserts as a large-scale production location and Norway's fjords as storage facilities.[11] Such seems to be the hidden vision behind some of the *Energiewende* critiques.

Yet, this counterfactual scenario is no appropriate yardstick for assessing current RES policies. Sure enough, there are sizeable benefits to be expected from coordinating RES support schemes.[12] However, this does not necessarily imply that a completely harmonised approach should be aimed for. First, RES-related preference heterogeneity has to be taken into account: negative external effects of RES are highly technology-specific but mostly local (compare wind and biomass), so potential benefits from economies of scale in centralising RES at geographical hotspots have to be traded off against according negative externalities in the form of acceptance problems. EU-wide optimisation of production facilities would also lead to increased need for transmission line extensions – current protests in Germany against new transmission lines attest to the related difficulties. Additionally, the idea of transforming Norway into a "green battery" for Europe should not be taken as a politically available short-term option due to ambivalent Norwegian preferences (landscape conservation versus economic benefits from storing electricity) and the prevalent political culture of incremental change.[13] For the same preference-related reason, it is not clear whether the use of Norwegian fjords as "green batteries" would really improve the overall efficiency including environmental and resource costs of land-use change. Thus, spatially allocating RES is not reducible to a one-dimensional optimisation problem following geographical patterns of energy yields and direct generation costs. Second, beyond these RES-specific aspects, there is a more general issue that deserves consideration: decentralised regulatory "experiments" may improve the overall result of policy intervention (i.e. the laboratory federalism argument). In case of uncertainty about the best regulatory solution to address a given problem, trial-and-error on lower government scales supposedly yields faster feedback processes and policy adaptation, and reduces societal learning costs compared to a uniform top-down EU approach.

In sum, a thorough and rapid "Europeanisation" of German energy transition policies is unlikely to constitute an adequate policy recommendation from a comprehensive economic point of view. Instead, while more coordinated RES support seems worthwhile for increasing production cost efficiency, a fully harmonised EU support scheme is not to be called for. In case of nuclear power, broad policy diversity in the EU means that a fully harmonised approach would override diversity of risk preferences.

RES support: distinguishing "on what level?" and "by which instrument?"

The abovementioned argument that Germany's RES support scheme leads to an inefficient technology portfolio unduly mixes two levels of analysis: a given preference for regulating RES policy on a specific governance level does not entail a distinct preference for a specific instrument. While the proponents of the argument suggest (partly implicitly, partly explicitly) that a trading scheme for green electricity certificates – analogous to the emissions trading scheme – is the most appropriate for an EU-wide approach towards RES, such a general proposition is not warranted. In the following, we outline some criteria by which to evaluate the question of how to support RES.

Assuming, for the sake of argument, that a harmonised RES support scheme is desirable, how will authorities decide upon the best instrument to reach a common EU target for RES? Naturally, each instrument exhibits specific (dis-)advantages. Focusing on feed-in tariffs and quota schemes allows us to see the according pros and cons in more detail. Since Weitzman's seminal 1974 study[14] it is common wisdom in economics that the relative slopes of marginal costs and marginal benefits are crucial when deciding between a price (feed-in tariff) and a quantity (quota) instrument.[15]

11 See C. Macilwain: Supergrid: Is a Vast Undersea Grid Bringing Wind-Generated Electricity from the North Sea to Europe a Feasible Proposition or an Overpriced Fantasy?, in: Nature, Vol. 468, 2012, pp. 624-625.

12 M. Unteutsch, D. Lindenberger: Promotion of Electricity from Renewable Energy in Europe Post 2020 – The Economic Benefits of Cooperation, in: Zeitschrift für Energiewirtschaft, Vol. 38, No. 1, 2014, pp. 47-64.

13 A.-T. Gullberg: The Political Feasibility of Norway as the "Green Battery" of Europe, in: Energy Policy, Vol. 57, 2012, pp. 615-623.

14 M.L. Weitzman: Prices vs. Quantities, in: Review of Economic Studies, Vol. 41, 1974, pp. 447-491.

15 Without uncertainty about marginal costs and benefits, both approaches are theoretically equal because the regulator can either set a quantity target or implement an equivalent price instrument.

Thus, the question becomes one of determining and evaluating costs and benefits from deploying RES. It has been argued that a stronger focus on the cross-boundary benefits of RES would speak in favour of feed-in tariffs: in particular, benefits of increased security of supply (due to lower fossil fuel imports from potentially unstable world regions) might be rather constant over the whole range of RES deployment, which would speak in favour of a price instrument.[16] In contrast, if local employment impacts are of main concern to policy makers, benefits from RES may mainly accrue in the early stages of deployment, suggesting preference for a quota scheme. The latter point, however, is somewhat self-defeating: where local benefits are a main driver of RES support, political willingness to coordinate across boundaries will usually not be given in the first place (see also below). Likewise, common arguments in favour of quantity instruments, cost efficiency and precise regulation of progressive damage functions seem to cancel each other out in the case of RES: consider wind energy, which, as the cheapest volatile RES, would mostly benefit from a quota scheme. However, the negative externalities (i.e. the aesthetic impact on the landscape and the ecological impact on bird populations) are increasing per windmill built. So in order to limit these progressive damages, regulators might want to set technology-specific quotas.[17] Then again, this technology-differentiation would reduce the benefits of a quota scheme in terms of cost savings from supporting only the cheapest technologies.

Apart from these issues, there is another, energy system-related objection to be made against the "inefficient technology portfolio" charge that is meant to prove the superiority of the quota scheme: the argument is based on a static conception of efficiency, which is somewhat at odds with the long-term project of the *Energiewende* and general characteristics of the energy system (path-dependency, lock-in effects) suggesting we should rely on a dynamic perspective. Under simple quota systems, private actors may fail to take optimal long-term investment decisions for a variety of reasons, including externalities (knowledge spill-overs), myopic decision-making or improper consideration of uncertainty. In the presence of these market failures, feed-in tariffs might be preferable in addressing the long-term market prospects of specific RES – particularly those that are in rather early development stages and, therefore, would not benefit from a pure quota scheme. For instance, the feed-in tariff-driven, large-scale deployment of photovoltaic installations in Germany during the last decade contributed to driving down module costs.[18]

Summing up, there is no theoretical reason to prefer a specific instrument to support RES. Considering the actual distribution of instruments in the EU (as outlined above), however, it might be argued that since feed-in tariffs (or feed-in premiums) are more common than quota schemes, the former could more easily be merged into a joint, supranational support scheme. In the following, we describe the conditions for more coordinated RES policies.

Fostering the EU embedment of RES policies: bottom-up instead of top-down

The historical development of RES policies in the EU has shown, above all, that member states consistently resist the Commission's attempts to implement an EU-wide quota scheme: the origins of both the directive 2001/77/EC and the substituting directive 2009/28/EC have been interpreted as failed attempts to do so.[19] Recently, the Commission seems keen to push member states into the direction of uniform tender schemes.[20] Given the history of member states' refusal to adopt top-down harmonisation and their insistence on national sovereignty over the energy mix in the Lisbon Treaty – article 194(2) TFEU affirms "a Member State's right to determine the conditions for exploiting its energy resources, its choice between different energy sources and the general structure of its energy supply" – the prospects for the success of this plan could be meagre.

Furthermore, the European Court of Justice (ECJ) has upheld member states' rights to pursue purely national RES policies: in its decision concerning Finnish Åland Vindkraft's complaint to access the Swedish RES support scheme, the ECJ stated that although national support schemes might be distorting the internal market, they can be justified as policy interventions aimed at the common interest (environmental protection, combating climate change).[21] Hence, both from a political and a legal point of view, the future of RES policies in the EU is likely to be decided bottom-up rather than top-down.

16 P. Söderholm: Harmonization of Renewable Feed-In Laws: A Comment, in: Energy Policy, Vol. 36, 2008, pp. 946-953.

17 Ensuring grid stability by putting a portfolio of complementary RES in place is another reason why technology-specific quotas would be preferable (e.g. a combination of wind and solar is more robust to meteorological fluctuations than each of the technologies by itself).

18 H. Wirth: Recent Facts about Photovoltaics in Germany, Fraunhofer Institute for Solar Energy Systems ISE, 2014.

19 See D. Jacobs: Renewable Energy Policy Convergence, op. cit.

20 EU Commission: Communication from the Commission. Guidelines on State Aid for Environmental Protection and Energy 2014-2020, in: Official Journal of the European Union, 2014/C 200/01.

21 See. E. Gawel, S. Strunz: State Aid Dispute on Germany's Support for Renewables, op. cit.

Clearly, the politico-economic interests giving rise to this constellation should be acknowledged within policy recommendations. In other words, as member states' politicians are motivated by protecting regional and national energy infrastructures (so as to secure voter support), policy advice that ignores actual political decision processes renders itself irrelevant. A completely technology-neutral RES support scheme without reference to national peculiarities would imply structural reallocations that are not politically palatable: if, for instance, support for photovoltaic installations in Germany were to cease (in favour of more convenient locations from a meteorological point of view), considerable political protests from beneficiaries and lobby groups would have to be overcome.

Given these restrictions, what is the most realistic pathway towards more cooperative RES policies that take cross-boundary benefits into account? Interestingly, the relevant legal provision, the directive 2009/28/EC, already provides for cooperation between member states (statistical transfers, joint projects, joint support schemes). So far, these cooperation mechanisms have not been used, however. On the one hand, from a pessimistic outlook, one could argue that if even these existing options are not realised, RES policies are likely to remain an exclusively national issue for the time being. The apparent failure of member states to agree on an extension of binding RES targets for the post-2020 period[22] might be raised as support for this perspective. On the other hand, the hypothesis of bottom-up convergence implies that explicit cooperation between member states is not necessarily the crucial mechanism at work. Instead, some of the benefits of allocating RES above the member state level could be indirectly secured – by different national policies aligning (e.g. via spill-over of best-practice regulations) and providing a more level playing field for RES across the EU. Additionally, other instruments, such as the EU emissions trading scheme and increased cooperation regarding transnational transmission grids, would also contribute to integration on RES.

Conclusion

Criticising Germany's *Energiewende* as a unilateral approach that inhibits an EU-wide optimisation of energy transition policies is misleading. To begin with, the two main pillars of the energy transition project, the nuclear phase-out and the deployment of RES, are less exceptional than sometimes suggested. Nuclear policies in the EU are highly diverse and Germany's support scheme for RES is very similar to the other member states' schemes. Regarding the 2020 horizon, Germany's RES targets might even be considered as below average; as for the 2050 horizon, Germany's RES targets are surely very ambitious. On the other hand, as Germany stands alone with respect to these long-term targets, a comparison with comparative policies is not yet possible.

Moreover, in the case of nuclear power, an EU-wide approach would probably not be – due to preference heterogeneity – desirable in the first place. As the nuclear phase-out cannot and should not be imposed on neighbouring countries that use nuclear power (France and the Czech Republic), a national approach including bilateral negotiations on near-border power plants (e.g. Fessenheim in France, Temelin in the Czech Republic) seems more appropriate. Sure enough, phasing out nuclear power in Germany must be complemented by an according increase in RES deployment so as to avoid substituting domestic with imported nuclear power. Regarding support policies for RES, increased cooperation would increase the cost efficiency of RES deployment in the EU. Yet, concerning the externalities of specific RES, there might be preference heterogeneity as well and the argument for laboratory federalism should caution us against unambiguous calls for a completely harmonised EU-wide approach.

Furthermore, the suggestion that a German switch to a green electricity quota scheme would mark the beginning of policy harmonisation[23] flies in the face of the actual developments in EU energy policy during the last two decades. The quota scheme has never represented the mainstream way of supporting RES in the EU. In contrast, feed-in tariffs and feed-in premiums, such as implemented in Germany, proved to be most common.

So, considering the European embedment of the *Energiewende* from a more comprehensive perspective yields the following conclusions: a full and immediate "Europeanisation" of the *Energiewende* could not be recommended. Yet, although such proposals seem too visionary in the first place, there might still be a path towards improved cost efficiency of RES deployment, which is both sensible and feasible: bottom-up alignment of support policies for RES poses no legal obstacles and incurs the fewest political hurdles.

22 The proposition for the EU's Climate and Energy Policy towards 2030 does contain a common EU-wide target for RES. Without identifying clear responsibilities for specific member states, however, the EU target can hardly be considered as legally binding.

23 M. Hübner, C. Schmidt, B. Weigert: Energiepolitik: Erfolgreiche Energiewende ..., op. cit., p. 303.

Teresa Ribera and Andreas Rüdinger

The Energy Transition in France: A Shift Towards a New Energy Model?

Like many other industrialised economies, France has identified the energy transition as one of the major challenges ahead – one that is also full of promise. Environmental, economic and social reasons have led to a policy challenge that will demand a strong political line and a coherent and multi-sector approach.

France has undergone a structural evolution in its energy policy over the last two years. This process has led to the definition of a long-term strategy, including objectives on greenhouse gas emissions, energy efficiency and the transition of the power mix. With a new "framing law on the energy transition" to be adopted by early 2015 in view of the international climate conference to be hosted by France later that year, it is interesting to take a look behind the scenes at the French process in comparison to transition strategies in neighbouring countries, as well as in the light of the current debate on a post-2020 EU climate and energy framework.

A bit of history: the energy-nuclear nexus in France and its reverberation in the present

French energy policy is closely tied to the importance of nuclear power. The political relevancy of nuclear energy goes back to the scientific pride of France in the early days of nuclear technology: with Henri Becquerel, Pierre and Marie Curie, and Irène and Frédéric Joliot-Curie, France had already produced five Nobel Prize winners in the field of nuclear science before the Second World War. This continued with the crucial significance of French nuclear weapons for the country's return to the international diplomatic scene after the war.

Only in the early 1970s did nuclear energy become a real issue for national energy policy. Lacking any important domestic energy reserves, energy conservation programmes and a very strong commitment to nuclear power became the cornerstones of the French response to the first oil shock in 1973. That same year, Prime Minister Messmer laid the first stone of what would become the most important nuclear fleet in Europe and one of the first in the world. In only 12 years, France built 55 of its current 58 reactors, totalling a generation capacity of 63 gigawatts (GW). It is also interesting to note that starting with the oil crisis, France begun a very ambitious policy in favour of energy efficiency, including the creation of a dedicated organisation (French Agency for the Conservation of Energy, nowadays ADEME). This interesting approach, however, was sidelined after the oil glut countershock of 1986 and was only resumed later in the 2000s.

Forty years later, what could be characterised as France's first energy transition still provides the backbone of its centralised energy system. Based on its amortised nuclear fleet and public control over prices (guaranteeing equal access to the same regulated prices all over the country), France still provides some of the cheapest electricity to households in Europe, 30 per cent cheaper than the EU average and half the price Germans pay. Simultaneously, with its almost decarbonised power sector (75 per cent nuclear, 15 per cent renewables and ten per cent fossil fuels) and the decreasing weight of heavy industry, France already had one of the lowest levels of GDP carbon intensity and per capita greenhouse gas (GHG) emissions among OECD countries in 2010.[1]

Looking at the future through a rear-view mirror

For a long time, the general French position has been to maintain the current status quo while observing others in a wait-and-see approach. However, the time has come for an important question: how long can the country rely on its past to face current and future challenges?

Indeed, the country faces many challenges today that require a comprehensive strategic change.

Climate: Even with its almost carbon-free electricity sector, France still has a long way to go to reach its national objective of a 75 per cent reduction of GHG emissions by 2050, which will require significant efforts in all sectors of the economy. Between 1990 and 2012, GHG emissions were reduced by only 12 per cent. The transport and building sectors represent the highest priority (respectively 28 per cent and 18 per cent of overall GHG emissions). However, industry plays a major role as well (18 per cent), and the crucial importance of the agricultural sector, representing 21 per cent (due primarily to significant methane emissions[2]), is often forgotten.

An investment gap in the power sector: With an average age of almost 30 years, the current nuclear fleet faces an uncertain future. A complete overhaul will be necessary to implement new safety standards (expected for 2016) and

1 http://stats.oecd.org/Index.aspx?DataSetCode=AIR_GHG.

2 This fact is reinforced by the recent reevaluation of the global warming potential of methane by the IPCC, which passed from 25 (compared to CO_2) to 34 over a 100 year period, taking into account its descendants (chemical decomposition) over time. This means that the importance of methane (including descendants) for global climate change is actually twice as important as previously assumed: 32 per cent of total radiative forcing, as opposed to 16 per cent in prior reports. See IPCC: Fifth Assessment Report, 2013.

post-Fukushima requirements. Much more than costs, there is uncertainty over the technical feasibility of such a refurbishment. The national nuclear safety authority has also pointed to the risks of "generic defaults" that might appear over the next decades, bringing with it the risk of a simultaneous shutdown of large shares of the fleet (up to 20 reactors for the first generation) given their identical architecture. This high uncertainty is one of the main justifications for the diversification target (including reducing the share of nuclear power) proposed by the current government. Additionally, considering that most reactors were built in a very short time span, significant investments will be needed in 2020-2030 to renew the aging fleet, and long-term planning is needed to smooth the investment curve over time, regardless of technology choices.

Deploying the transition economy and increasing energy security: Despite the important share of nuclear power (which only represents 17 per cent of the country's final energy consumption), France depends on fossil fuels for 70 per cent of its final energy needs, with an increasing exposure to price fluctuations. Accounting for 45 per cent of final consumption, oil remains the biggest energy source, whereas gas represents 20 per cent. This has direct implications for the French trade balance, which has worsened significantly since the early 2000s, in large part because of increasing energy prices. In 2012, the cost of energy imports (€66 billion) exceeded the overall trade deficit (€62 billion). On average, France is spending over €1000 per capita per year on energy imports. Reversing this trend by substituting investments into energy efficiency and domestic energy sources instead of capital outflows for oil and gas will be one of the main challenges for the French transition and requires a rethinking of long-term financing mechanisms.

Restructuring the energy market: France has reluctantly committed itself to the European liberalisation of its energy market. To date, competition is almost non-existent in the power sector: 91 per cent of consumers (including industry) are still bound to regulated tariffs provided by Électricité de France (EdF). To lower barriers for new entrants, EdF is legally obliged to sell 25 per cent of its historic nuclear production to competitors to allow at least a semblance of competition. This concentration and lack of diversification might also have consequences for the emergence of new markets (e.g. energy services, energy performance contracting) and innovative products. Additionally, the French model is challenged by the current evolution of the European electricity market, with gross market prices currently even lower than the cost of existing nuclear plants.

Energy pricing: Despite frequent alerts by the regulator on the increasing costs of electricity generation, it is politically difficulty for the government to raise prices, even if only to cover costs (quite apart from the long-run marginal cost of new supply). This not only creates a risk for the viability of business models in the power sector but also impedes wider deployment of policy measures and energy efficiency: at similar standards of living, a French household consumes 30 per cent more electricity (excluding heat and hot water) than a German household. More broadly, the inability of French politics to communicate on price increases also makes it impossible to consider an ambitious ecological tax reform. Despite two recent attempts to create a national carbon tax and the creation of a high-level expert committee on environmental tax reform, the current draft law does not contain any concrete fiscal reform proposition.

Raising energy poverty: To date, it is estimated that almost 4 million French households are experiencing energy poverty (i.e. they are spending more than ten per cent of their budgets on energy). Policy measures have so far concentrated on price relief through social tariffs, encouraging further consumption rather than deploying structural solutions to reduce vulnerability through energy efficiency measures. In the event of rising prices, the sustainability of a solely price-focused approach remains uncertain, however.

The evolution of the French policy debate on the energy transition

Until the 2000s, the French debate on its energy policy was held exclusively among high-level officials and technical experts, without a broader approach involving stakeholders and long-term visions on the energy transition.

A first sign of change arose in 2007, when the government under President Nicolas Sarkozy held the Grenelle Summit, an environmental conference with stakeholders to define new policy measures to improve sustainability and environmental conditions. This conference led in particular to a strengthening of energy efficiency policies (especially in the building sector, with the objective of reducing the energy consumption of the building stock by 38 per cent). Another potential milestone was the creation of a national carbon tax, which was, however, abandoned later in 2009. Interestingly, the topic of nuclear energy was excluded from the beginning, impeding a comprehensive debate on long-term orientations. The Grenelle process also represented the start of a greater French commitment towards defining the EU energy and climate package, adopted under the French presidency in 2008. Relying on this first initiative, presidential candidate François Hollande committed himself to the organisation of a nationwide policy debate on the energy transition. This debate was the first of its kind in France, aiming to establish a comprehensive and pluralist analysis of long-term challenges for the energy transition in France, as well as the identification of objectives and policy measures needed to initiate this transition.

The national debate on the energy transition in France: objectives and architecture

The national debate on the energy transition was effectively launched in November 2012 and lasted until July 2013. Unlike other countries where the energy policy debate emerged as a bottom-up process, the French debate was highly institutionalised from the beginning, involving the creation of a high-level steering committee (including the minister of environment and experts in the fields of energy and climate), a secretary general, an expert committee, a citizen committee, and a plenary assembly gathering 120 actors from seven stakeholder groups (national and European MPs, local representatives, unions, an employers' association, environmental NGOs, a consumers' association, and representatives of the state).

The objective of this stakeholder debate was not to define the policy orientations per se, but to prepare the subsequent legislative process through a common understanding of the challenges and – if possible – the identification of consensual objectives and measures. Additionally, through the process of a continuous national debate over eight months and the organisation of multiple local debates, it also pursued the aim of raising awareness on energy and climate policy challenges among the wider French public. This was a significant challenge in a country where energy policy had remained the responsibility of the central state and administration, and where energy had so far not been considered as a real issue for electoral matters.

The debate on long-term orientations was framed through existing laws (in particular the 2005 law on energy, which included the 75 per cent reduction of GHG emissions between 1990 and 2050, as well as national objectives for 2020 under the 2008 EU climate and energy package). The presidential engagement of François Hollande to reduce the share of nuclear power in the electricity mix from 75 per cent to 50 per cent by 2025 represented a further landmark for discussions and, not surprisingly, one of the main points of conflict within the debate.

The debate itself was structured around four main pillars and corresponding working groups, reflecting the four main issues to be addressed:

1. How can the energy efficiency and sufficiency of the French system be increased? What does this imply for the evolution of lifestyles, production and consumption models, and transports?

2. What are the possible trajectories to achieve the objectives by 2030 and 2050?

3. Which choices should be made to develop renewable energies and new energy technologies? And what does this mean in terms of industrial strategy and local governance?

4. What are the costs, benefits and financing models for the energy transition?

This structure is interesting insofar as it clearly translates the political will to place energy demand at the core of the transition, rather than focusing on supply issues only. These four initial questions were later supplemented by additional topics and working groups, mainly on governance, competitiveness and employment transitions/training.

The outcomes of the debate

Without creating a general consensus on a single policy vision, the national debate generated a number of achievements. First, the extensive work on energy scenarios, including the assessment of all existing scenarios along a predefined matrix, allowed a much more transparent debate on policy visions and helped identify common aspects that could guide a long-term strategy.

Second, the deliberative nature of the debate, without a pre-imposed government proposition that stakeholders had to "accept", helped establish a functioning permanent body of stakeholders to follow the parliamentary process and implement the strategy.

Third, the issue of energy savings clearly came out as the one single driver that will be crucial for the French transition, regardless of energy technology choices. In this regard, the fact that the government adopted the debate's recommendation of establishing a long-term target to reduce final energy demand by 50 per cent between 2012 and 2050 clearly shows that the debate succeeded at least partly in changing the French policy approach, which had long focused solely on the supply side.

Finally, the national debate led to the general understanding that the energy transition cannot be reduced to energy policy alone. In particular the discussion on local governance and energy savings showed that a much broader perspective on the triggers of social innovation is needed to drive the transition, including a reflection on economic and consumption models, as well as cultural values.

Establishing a broader approach of public participation

Another achievement of the debate was related to the inclusion of the wider public. Whereas prior policy debates

had been limited to a small circle of policy makers and experts, several initiatives were undertaken to improve public participation. First of all, the use of a citizen committee, which gathered 20 citizens without any prior expertise in the field of energy who regularly expressed their views in front of the stakeholder assembly, helped to add a more general vision of the energy transition to a debate that is otherwise inclined to "slip" into a very technocratic dimension. Secondly, the organisation of over 850 regional and local debates during the same timeframe provided complementary views on local issues and greatly improved the awareness-raising process. Finally, the French government employed the Danish Board of Technology to organise a "Citizen Day", utilising their World Wide Views method: on the same day, assemblies of 100 citizens were gathered in ten French regions to participate in a deliberative debate and survey to provide their opinions on the issues and solutions for the transition. Despite relatively minimal media coverage, this initiative was a success, insofar as the vision of the participants (as reflected in the qualitative survey) was a highly responsible and positive one, with a strong desire for an ambitious transition.

Although no clear causal link can be established between these participative initiatives and the outcomes of the debate and law, they nevertheless provide an interesting experience and example for other countries and regions seeking to enhance public understanding of and participation in debate on the issues at hand.

The ambitious blueprint for the energy transition

Based on the current draft law, the French energy transition is highly ambitious, at least on paper. The main objectives include:

- an overall reduction of GHG emissions by 75 per cent between 1990 and 2050 and by 40 per cent by 2030, with the introduction of a national low-carbon strategy and carbon budgets (following the UK example);
- halving the final energy consumption between 2012 and 2050 and reducing the consumption of fossil fuels by 30 per cent by 2030;
- reducing the share of nuclear energy from 75 to 50 per cent of electricity generation by 2025;
- developing the share of renewable energies to 23 per cent of gross domestic consumption by 2020 and 32 per cent by 2030;
- supporting the deployment of electric vehicles through subsidies and the construction of 7 million charging stations;
- developing the principle of a circular economy and increasing the share of waste recycling;
- supporting the establishment of 200 "positive-energy territories" and "zero-waste cities".

Behind these very challenging objectives, some policy objectives still leave a lot of room for interpretation regarding specific implementation mechanisms. This is particularly the case for three issues: the evolution of the power sector, energy efficiency and financing the transition.

The evolution in the power sector

The political will to reduce the share of nuclear power to 50 per cent clearly opens a new chapter for French energy policy in the electricity sector. However, several questions have to be raised regarding the credibility of this vision.

First of all, the objective itself does not open the perspective of a new market for industrial actors: investments will only be triggered if the credibility of this measure is confirmed. To date, the law envisages two mechanisms to secure this objective: a legally mandatory five-year plan for the evolution of the electricity sector and a veto right for the government representative on the board of EdF (84 per cent of which is owned by the French state) whenever the business strategy would not align with national planning (regarding the reduction of nuclear power). The implementation of these measures remains to be seen.

In parallel, the pace of nuclear reduction will depend on the establishment of viable alternatives. Considering renewable energy sources (RES), this means that the current situation has to be improved considerably. Under current conditions, France will not achieve its 2020 objective under the energy and climate package (23 per cent overall RES share, 27 per cent in the power sector), and achieving its goal of 40 per cent renewable electricity by 2025 or 2030 remains a great challenge. France has some of the best physical potential for RES (per capita) in Europe (for wind, solar, biomass and marine energy). But a clear political signal should be given, including the simplification of overly time-consuming and costly administrative procedures (a wind power project takes up to eight years to complete in France, compared to two or three years in Germany) and the establishment of preferential financing models, which are the one single factor that might be able to reduce generation costs by up to 30 per cent for capital-intensive technologies such as photovoltaic and wind power.

Additionally, the transformation of the power sector might be considerably facilitated if the government succeeds in implementing a strategy for electricity savings. Because of over-

capacities and low prices, French households have been inclined to consume *more* rather than *less* electricity. As mentioned previously, the average French household consumes almost 30 per cent more electricity (excluding electric heating and hot water) than its German counterpart, illustrating the big potential that could be tapped.

Energy efficiency

The French government has emphasised its will to place energy efficiency at the core of the national strategy. Considering the sector's large potential, this targets primarily the building sector, responsible for 40 per cent of final energy consumption. France has several specific targets in this regard, including a (rather unrealistic) objective to reduce the primary consumption of buildings by 38 per cent by 2020 and to accelerate the thermal retrofitting rate to 500,000 dwellings per year. Furthermore, a new thermal regulation was implemented in 2012 which places France at the forefront of EU member states regarding energy performance standards for new buildings. Additional measures include a stronger focus on energy poverty through a specific objective and reinforced subsidies (up to 50 per cent of investment costs for modest households).

So far, the policy measures implemented to improve the efficiency of the existing building stock remain however far behind the expectations. Financial support is granted through tax credits, but unlike other countries, incentives are not linked to the achievement of specific performance standards, thus generating a fair amount of windfall profits. Several propositions are being implemented to create new financing mechanisms in order to facilitate preferential loans for retrofitting projects, but they often lack the critical size and scope to generate structural effects (see the following section).

The programme on energy poverty has witnessed an increase in volume, though this is mostly due to the easing of eligibility criteria (one of every two households is eligible). However, discussions are ongoing to develop a more comprehensive approach to combine technical and financial assistance for very modest households. Furthermore, the current framing law also proposes a reorganisation of the social tariffs in the form of an "energy cheque" for modest households, covering not only energy costs but also investment costs for energy-saving measures.

On the positive side, French regions have started several initiatives to create third-party financing institutions that work rather well and could provide a blueprint for a general financing model. However, these are currently hampered by the high uncertainty over the legal framework and competition coming from the private banking sector. Clarifying the legal framework for third-party financing will thus be crucial to enable a wider deployment.

Financing the transition

Considering the ambitious objectives, recent studies have estimated that between 20 or 30 billion euros of additional investments are needed to implement the French transition. In order to create a positive macroeconomic impact, this would have to be additional finance in order to avoid crowding-out effects. This means that new innovative financing and refinancing models are required in order to leverage low-cost long-term capital on international capital markets.

Several propositions are currently under discussion in the French context, but all fall short of satisfying the overall needs. Indeed, most initiatives target one specific sector (refinancing of retrofits in public buildings, guarantee schemes to facilitate loans for private households, etc.) but do not address the issue of the overall refinancing model. If implemented, the juxtaposition of these mechanisms might in the end generate more complexity and fail to create the needed economy of scale effects, thus reinforcing the challenge. Simultaneously, the French debate proposed a clear recommendation to create a French version of the German *Kreditanstalt für Wiederaufbau*, which provides up to €40 billion per year for investments in the energy transition and sustainability projects. To date it is unclear how this debate will end, but the financing issue will clearly be one of the great challenges in the short term that will have to be overcome to trigger the French transition.

Interestingly, new innovative proposals with a high level of relevancy for Europe have emerged very recently in France. These include first the option of modifying the European treaties on public budgets and debt in order to facilitate public investments in "productive" and economically viable investments, such as building retrofitting. Another, more radical proposal presents the idea of supporting monetary creation at the European Central Bank in order to provide up to one per cent of GDP of low- or zero-interest loans for each member state, specifically earmarked for the energy transition, to support the green growth agenda in Europe.

Addressing the issue of mobility

Dealing with the transport sector remains a big challenge for all decarbonisation strategies, and France – where the transport sector is both the largest emitter (28 per cent of overall GHG emissions) and the biggest consumer of energy (30 per cent of final consumption) – is no exception. To address this issue, the current law proposal concentrates on the supply side, with three main measures: an industrial plan to develop an affordable low-consumption vehicle

(2L/100km) by 2020, an equivalent industrial plan to support innovation on electric vehicles and charging stations, and the deployment of up to 7 million charging stations throughout the territory by 2030. Existing subsidies for the purchase of electric or low-emission vehicles remain and might be increased (up to €10,000).

However, other relevant measures identified during the energy transition debate have not been pursued. This concerns in particular the reduction of urban sprawl through new planning rules, as well as stronger support for public transport, a modal shift and "soft" mobility options (bicycle, car-sharing). Thus the current strategy is essentially based on the rapid deployment of backstop technologies, rather than a more structural approach to understand and reduce mobility needs and lift the barriers hampering the wider development of public transport and less energy-intensive modes.

The French transition from outside: implications for Europe

Uncertainty over implementation could still raise unknown barriers and difficulties, since many points remain unclear, and the credibility of the French strategy depends on the political will and the actual implementation of measures in the near future. The French push presents a new opportunity to strengthen the EU framework and confirm EU leadership ahead of upcoming United Nations Climate Change Conference to be held in Paris in 2015. It should be perceived as a great opportunity to build a strong European alliance oriented to welfare and an economic recovery while playing a key role in writing the next chapter in the building of a united European future.

The emergence of an ambitious transition strategy in France is a good sign for Europe and might help foster a political alliance for an ambitious 2030 climate and energy framework. A right combination of contents under the European energy union once imagined by Jacques Delors and now re-introduced by Donald Tusk in a version focused more on "energy security" may play the role of a positive driver for an economic recovery and a solid pathway towards an efficient and decarbonised Europe.

However, to make the European vision for a low-carbon transition tangible for the citizens, it will be crucial to go beyond the techno-economic approach of system transformation and introduce a more social angle. In this sense, the fight against energy poverty should be recognised as a main objective of European policy, including appropriate indicators and targets, following the recommendations of the European Economic and Social Committee. Furthermore, given the importance of public acceptance to succeed with such a challenging transformation, the EU could support participative approaches on different governance levels to foster local ownership of the transition.

If implemented at the pace foreseen in the current draft law, the French transition might accelerate the transition of the European power sector and require a rethinking of the current electricity market design. Consequently, structural issues of electricity market design should already be addressed in the 2030 framework through dedicated measures and provisions within the new governance framework for renewables. France's ambition is laudable, but it will require the support of a consistent European framework, both at the EU level and among neighbouring countries.

Ralf Boscheck

State Aid, National Energy Policy and EU Governance

On 31 March 2014, in a report summarising the work of 772 scientists, the Intergovernmental Panel on Climate Change (IPCC) used its strongest language yet to call on world leaders to cut carbon emissions and avert dramatic disruptions of natural ecosystems and human life.[1] Of course, the United Nations 2015 summit in Paris will debate joint mitigation actions. But in mid-2014, there was no shared sense of urgency and it seemed that any nation's unilateral initiative could have been thwarted by global accords safeguarding the interests of others.

Already in 2013, the UK Energy Research Centre had published a survey showing that the share of British citizens denying climate change had almost quadrupled since 2005.[2] Whatever the reasons, similar findings ex-

1 IPCC: Climate Change 2014: Impacts, Adaptation, and Vulnerability – Summary for Policymakers, Working Group II Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change, 31 March 2014.

2 In 2013, 28 per cent of British citizens denied climate change; W. Poortinga, N.F. Pidgeon, S. Capstick: Public Attitudes to Nuclear Power and Climate Change in Britain Two Years after the Fukushima Accident, Working Paper, UK Energy Research Centre, 19 September 2013.

isted elsewhere.[3] Besides, key producers of greenhouse gases were revising their environmental obligations: in 2014, crisis-ridden Spain reduced its climate protection budget by €3.8 billion; the UK cut such spending by €3.1 billion. China, with 29 per cent of global, energy-related CO_2 emissions the world's largest air polluter, preferred to show per capita emissions and in international talks insisted on "fair, common but differentiated responsibilities in line with capabilities".[4] The US Environmental Protection Agency's most recent proposal to reduce CO_2 emissions merely mimicked European practices but with far less ambitious targets.[5] But even this modest plan proved sufficient to trigger competitiveness concerns and to cause some US consumer groups, labour unions, and Republican and Democratic states to threaten legal action. Having faced similar responses before, President Obama had already clarified that "(i)f the message is somehow we're going to ignore jobs and growth simply to address climate change, … I won't go for that."[6]

Ostensibly similar, the EU situation was complicated by differences in national priorities, prior resource commitments and an emergent dissent about the location of relevant rule-making authority. In 2012, the EU Commission had begun to link Europe's allegedly fading competitiveness to the cost of environmental protection.[7] In June 2014, European member states still remained split over how to proceed. A "Green Growth Group" of 13 member states pressed for ambitious climate and energy policies to boost business confidence, policy influence, competitiveness and employment; conversely, the smaller, Central and Eastern European Visegrad Group called on the EU not to pursue strong initiatives for fear of losing all of the above. But, as of July 2014, all member state governments must submit to the new EU Guidelines on State Aid for Environmental Protection and Energy.[8] The rules attempt to reconcile the goals of market integration, competition and regulatory efficiency with climate change objectives and the need to secure energy supply. They also aim to provide a reference for ongoing investigations into French and German energy policies. However, the Guidelines' conceptual base and practical impact are far from clear. Ducking the dispute over the location of energy policy authority in Europe, they constitute a political compromise rather than an efficient set of rules.

EU state aid policy – conceptual foundation, challenges and modernisation

In the absence of "market failures", perfectly competitive spot markets deliver allocative, productive, and dynamic efficiency without any need for centralised, managerial, bureaucratic or political intervention. However, given imperfect competition, uncertainty, externalities or public goods, market prices may not convey optimal signals and it is preferable to complement the decentralised coordination of the *invisible hand* with a range of more centrally located *visible hands*. So spot markets are backed and eventually superseded by long-term contracts, internal monitoring mechanisms, fiscal and regulatory arrangements, and national and international political controls.

EU state aid policies operate at the crossroads of member state economic policy and regulation, and transnational single market governance. They are to ensure that a nation's state aid – that is the selective advancement of a particular beneficiary through the provision of state resources or some other economic advantage – is compatible with the Single European Market.[9] This is typically assumed to be the case provided aid is relatively insignificant (*de minimis* aid), or the support helps to achieve desired outcomes that would not otherwise be attainable, and benefits outweigh any potential adverse impact on competition and trade. The regulatory challenge is twofold: (1) assess the appropriateness and the redistributive and competitive impact of a scheme that is to mitigate market failures; (2) stipulate rules to guide the design or improvement of a given policy in ways that are administratively efficient and limit the costs of wrong decisions. In addition, a political concern needs to be addressed: where is one to draw the line between the EU's right to contest the welfare implications of a given intervention and the sovereign will of a nation that requires that very intervention to deliver on its policy pledge? Consider the evolution of EU state aid policy for environmental law and energy.

In 1974, the EU Commission published its first set of guidelines for assessing or designing aid to companies

3 See R. McKnie: Climate Change, in: The Observer, 21 September 2013. The article quotes climate economist Lord Stern who blames "some politicians and lobbyists – explicitly opposed to lifestyle changes – to confuse and mislead the public about the scientific evidence that human activities are driving climate change and are creating huge risks."

4 Statement by Xie Zhenhua, the head of Beijing's delegation in Doha trade negotiations, quoted by Spiegel Online: Failed CO_2 Targets: Going through the Motions in Doha, 12 November 2012.

5 See http://www2.epa.gov/carbon-pollution-standards/clean-power-plan-proposed-rule.

6 http://www.whitehouse.gov/the-press-office/2012/11/14/remarks-president-news-conference.

7 See Spiegel Online: War on Subsidies: Brussels Questions German Energy Revolution, 29 May 2013.

8 European Commission: Legislation: State Aid for Environmental Protection and Energy.

9 Article 107(1) of the Treaty on Functioning of the European Union (i.e. ex Article 87(1) of the EC Treaty) defines state aid as based on four cumulative conditions: the transfer of state resources; provision of economic advantage; selectivity of beneficiary undertakings; and effect on competition and trade.

facing new mandatory environmental standards. Since then, the catalogue of permissible supports has significantly expanded and aid intensity, i.e. the level of allowable funds, has steadily increased.[10] By 2008, EU state aid reforms set out to streamline regulatory processes. For one, the 2008 block exemption regulation, based on the Commission's decision-making practice, waived notification requirements for categories of presumably innocuous state aid. Next, an aid threshold was introduced, beyond which a detailed case assessment imposed a balancing test and called for proof of market failures and evidence that the aid was being delivered in an appropriate, necessary and incentive-based manner.[11] There were two exceptions to this: first, a detailed review was always required where renewable generation was justified with reference to avoided external costs to third parties. Second, and conversely, exemptions from environmental taxes were not subject to any such scrutiny even when surpassing the ceiling. Finally, the 2008 Guidelines in effect tightened the tax relief for installation under the Emissions Trading System (ETS). In doing so, the reform relieved taxpayers, cut windfall profits for energy suppliers, and improved the position of low carbon energies, including nuclear – itself, however, based on a non-renewable, polluting and potentially risky fuel, and a major recipient of state resources.

The EU's 2008 state aid regime provided the model for subsequent reforms, most importantly the Commission's 2012 State Aid Modernisation Initiative (SAM),[12] and related efforts to increase the productivity and transparency of regulatory processes. Nonetheless, the approach has been criticised for the apparent arbitrariness with which different types of aid arrangements and beneficiaries were exempted from scrutiny, the complexity of the balancing test and the lack of legal certainty that it entailed. It has also been charged with signalling the EU's interest in pursuing single market objectives and broader competitiveness concerns even at the expense of making polluters pay.[13] The 2014 EU Guidelines on State Aid for Environmental Protection and Energy seem to have retained some of these objectionable features.

The 2014 EU Guidelines on State Aid for Environmental Protection and Energy

As of 1 July 2014, a new state aid guideline, replacing the 2008 rule, sets out criteria for assessing new and pending notifiable state aid measures; it is accompanied by a new General Block Exemption Regulation that specifies conditions for exempting environmental and energy aid measures.[14] Over the next 12 months, member states are required to bring existing aid schemes in line with the new Guidelines; as of 1 January 2016, support to new renewable energy installations should face up to market tests.

The Commission motivates its reform with reference to the "increasing share of renewables in the electricity market and the need to make support systems sustainable for society. … In particular, to support the competitiveness of European industry, the guidelines allow Member States to relieve some EU energy intensive sectors particularly exposed to international competition from some of the burden of financing renewables." In addition,

> (g)rowth of renewables and the outperformance of renewable targets have been heavily supported with fixed tariffs. … However, in the process renewables installations have generated electricity irrespective of the actual demand and have out-competed other electricity generation which has to rely solely on the market price to operate economically.

Hence, "feed-in tariffs are progressively replaced by competitive bidding processes" and "from 2016, generators need to sell their electricity in the market and be subject to balancing responsibilities". As of 2017,

> Member States shall set up tenders to grant support to all new installations. … The system gives Member

10 As a general rule the aid amount ("aid intensity") is based on extra investment costs in favour of a higher level of desired performance ("eligible costs") as compared to investment costs necessary for an installation fulfilling only mandatory standards that are imposed directly by the EU legislation. The admissible level increased from 15 per cent to 30 per cent (1994), to 40 per cent (2001), and then to 80 per cent (2008) of additional costs.

11 Commission Regulation No 800/2008 of 6 August 2008 declaring certain categories of aid compatible with the common market in application of Articles 87 and 88 of the Treaty (General Block Exemption Regulation).

12 See European Commission: State Aid Modernisation, available at: ec.europa.eu/competition/state_aid/modernisation/index_en.html.

13 See for example, V. Máca: New Guidelines of the EU Commission on Environmental State Aid: Who Will Gain and Who Will Lose?, in: Common Law Review, Issue 2010/11 Environmental Law, 2012.

14 The 2014 Guidelines identify various environmental and energy measures that, under certain conditions, may be compatible with Article 107(3)(c) TFEU: aid for exceeding EU standards or increasing the level of environmental protection in the absence of EU standards; aid for early adaptation to future EU standards; investment and operating aid for energy from renewable sources (i.e. renewable non-fossil energy sources); aid for environmental studies; energy efficiency measures, including cogeneration and district heating and district cooling; aid for resource efficiency and waste management; aid for the remediation of contaminated sites; aid for relocation of undertakings; aid in the form of tradable permits; aid for CO_2 capture, transport and storage ("CCS"); operating aid in the form of reductions in or exemptions from environmental taxes; operating aid in the form of reductions in funding support for electricity from renewable sources; aid for energy infrastructure; aid for generation adequacy measures.

States flexibility to take account of national circumstances, and even allows them to depart from competitive processes when the outcome might not be optimal".[15]

A detailed assessment of the 2014 Guidelines is beyond the scope of this article. The following merely discusses salient issues related to the criteria to establish compatibility with the Guidelines, the concept of competitive bidding, the need to ensure generation adequacy, and the rationale for exemptions from surcharges. The final section focuses on broader implications with regards to aligning national energy policies.

First, similar to the 2008 process, the 2014 Guidelines demand the compatibility of notifiable environmental and energy aid and aid schemes to be established by a "balancing test", which requires that the contribution towards an objective common interest outweighs any negative effects on trade and competition and that the principle of "polluter pays" established by Article 191 TFEU is being observed. In the context of energy, the common objective is defined as a competitive, sustainable and secure energy system in a well-functioning EU energy market. To justify permission, the aid must: be necessary to mitigate market failures, i.e. improve energy markets in ways that markets could not; be appropriate, i.e. less anticompetitive than any alternative; and be incentive-based and efficient in the sense of "only providing the necessary minimum support". As in 2008, the EU structures a rule of reason in favour of public supports and thereby shapes centralised and decentralised rule-making and case assessment. Yet the definition of a common objective is plainly over-specified, fraught with trade-offs and latent incompatibilities, and, in its insistence on a market ideal, apparently agnostic of second-best approaches.[16] Moreover, the ancillary conditions seem purposely vague and, as will be argued next, provide uncalled for discretion in establishing compatibility.

Second, the EU Commission favours a technology-neutral bidding process as the principal means for distributing support. But the neutrality of the market design may be questioned when evaluating total delivered generation costs including implicit subsidies provided to non-renewable fuels,[17] the imposition of balancing responsibility on all generators in a system designed to accommodate centralised, large-scale continuous production, or the differential treatment of some biofuels (e.g. food-crop based versus biomass) and the conspicuous absence of nuclear power from the 2014 Guidelines. Having said this, the Guidelines, on the other hand, allow for exemptions from competitive bidding for small scale, early stage developments and in case of evidence that bidding would not be efficient. But there is no advice on when scale ought to be considered too small to pass a "survivor test", when a technology should be deemed mature, and how one would know whether competitive bidding would result in higher than necessary supports or low project realisation rates. Given such imprecision, analysts have already commented that it should not be difficult to establish the compatibility of almost any support that violates market controls.[18] Also, the Guidelines do not limit any *a priori* reasoning to establish that a truly technology-neutral bidding process based on all-inclusive, life-time costing would inevitably select renewables over any more polluting and less abundant fuel. While such reasoning would assure a green preference, the EU's market design seems nevertheless built on conventional logic. But then again, the Guidelines offer ample escapes to accommodate the interests of nearly all opposing parties.

Third, the growth of intermittent power from renewable sources has highlighted the need to ensure sufficient generation capacity in an efficient way. For that reason, the Guidelines advise member states to make use of all existing alternatives including demand-side management, electricity storage and trade via additional interconnection capacity. Also, capacity remuneration mechanisms (CRMs) should only incentivise available capacity from any technology or geographic source rather than the actual sales of electricity. Here, and different from the above, the Commission does not seem to rely on market-testing and considers that all CRMs constitute state aid and hence require notification and clearance. However, market-based CRMs do already exist and, to avoid

15 European Commission: Energy and Environmental State aid Guidelines – Frequently asked questions, MEMO/14/276, 9 April 2014.

16 In their theorem of second best, R.G. Lipsey and K. Lancaster advised that governments "faced with non-correctable market failures … may do better to intervene in a way that is contrary to usual policy". An improvement in market perfection in one area does not necessarily improve global efficiency. R.G. Lipsey, K. Lancaster: The General Theory of Second Best, in: The Review of Economic Studies, Vol. 24, No. 1, 1957, pp. 11-32.

17 According to the IEA, the 2011 global total in fossil fuel subsidies amounted to US $523 billion, i.e. an incentive equivalent to US $110 per ton of carbon emitted. In comparison, global subsidies for renewables were US $88 billion in the same year. See Clean Technica: Fossil Fuel Subsidies Are Public Enemy Number One, Says IEA, 8 February 2013. In the same year, EU27 countries spent more than three times the amount of subsidies on nuclear (€35 billion) and fossil fuels including associated indirect health and social costs (€26 billion and €40 billion) than on renewables (€30 billion). See E. Buckle: Fossil Fuel Subsidies and Government Support in 24 OECD Countries – Summary for Decision-Makers, 31 May 2012.

18 J. Schlandt: Ökostromförderung: EU-Kommission begräbt neoliberale Leitlinie, Phasenprüfer, 21 March 2014.

overregulation, should be considered integral to any new market design.

Fourth, to preserve the competitiveness of energy-intensive producers, the Guidelines typically follow a sector-based approach when granting reductions or exemptions from renewable surcharges. Yet, given the diversity of producers within and across industries, member states are permitted to grant reductions to undertakings with electricity bills accounting for more than 20 per cent of gross value added and that are active in markets where trade with third countries accounts for more than four per cent of the EU market size. To limit supports to what is "strictly necessary", the Guidelines require cuts to be only partial but nevertheless suggest that "85% of all levies could benefit from a reduction". One may or may not question the cogency of these rules and the numerical limits they impose, but one cannot fail to notice that competitiveness concerns trump any interest in seeing polluters pay.

Clearly, some of the shortcomings of the 2008 Guideline carry over into this preliminary assessment of the 2014 EU state aid regime for environmental protection and energy. Yet, given the reform's overall objective and political context, these deficiencies are more significant today. As before, one is struck by the randomness with which different types of aid and beneficiaries appear to have been exempted from scrutiny and the ambiguous formulation of the balancing test. However, defining the goal as "a competitive, sustainable and secure energy system in a well-functioning EU energy market" settles the 2014 reform with an even broader array of policy trade-offs than before. The Guidelines "deal" with these incompatibilities by promulgating a rather ill-defined "technology-neutral bidding process" and arbitrary rules of thumb that exculpate pollution and waste, and may affect trade but certainly relate to national decisions on income re-distribution and policy directions that a supranational competition policy authority is not legitimised to take.

Where markets fail, discretionary – here political – authority has to set directions. The existence of EU-wide binding frameworks should help to avert competitive distortions and subsidy races between EU member states. Where such harmonisation is incomplete, as for example evidenced by the absence of nuclear power in the 2014 Guidelines, special interest may benefit from falling outside the reform and retaining flexibility in pursuing separate arrangements. Where such harmonisation may challenge a member state's national priorities, prior policy and resource commitments, dissent about the location of relevant rule-making authority is unavoidable. Ducking the dispute over the scope of EU competition rules and the location of energy policy authority in Europe, the Guidelines constitute a political compromise rather than an efficient set of rules.

National energy policy and EU governance: the case of *Energiewende* 2.0

Over the last 50 years, certainly since the entry of the Green party into the Bundestag in 1983, German governments have attempted in various ways to move the country towards becoming one of the world's most energy efficient, environmental friendly and competitive economies.[19] All along, policy debates as well as regulatory and legislative reforms have promoted renewable energy and pictured nuclear power as a potentially risky, transition technology.[20] There was therefore little surprise when, in the wake of the Fukushima Daiichi nuclear accident in March 2011, the CDU/FDP coalition government with strong public support reversed its previous decision to postpone the phase-out of nuclear power and ordered the immediate closure of the eight oldest plants and an accelerated exit by 2020. The required legislation to promote and finance renewable energy, grid expansion and energy efficiency measures – commonly labelled *Energiewende* – and its impact within and across German borders has since dogmatised policy debates and stifled the search for improvement. It has also raised competition and energy policy concerns within the EU Commission.

Based on the Renewable Energy Sources Act (EEG – *Erneuerbare Energien Gesetz*),[21] renewable energies receive differentiated subsidies based on generation technology, plant size and location. As could be expected, the guarantee of high returns fuelled investments which in turn boosted the renewable surcharge per kilowatt hour that consumers have to pay. To avoid competitive distortions, energy-intensive producers consuming more than ten gigawatt hours were initially excused from paying the surcharge. Lowering the energy-intensity threshold to one gigawatt hour in mid-2012 doubled the number of company sites benefitting from an exemption within one year to 2,245. By mid-2013, an average German household paid €180 per year to subsidise renewable energy.[22] At the same time, a survey of the Federation of

19 For a review, see IEA: German Energy Policy, 2013.
20 For a review, see J. Piepenbrink (ed.): Ende des Atomzeitalters, in: Aus Politik und Zeitgeschichte, Vol. 61, No. 46-47, 2011.
21 See Bundesverband WindEnergie: http://www.eeg-aktuell.de/ for the original law and its subsequent modifications.
22 For these projections, see J. Haucap: Wettbewerb und Planwirtschaft in Zeiten der Energiewende, Munich, 1 February 2012; see also J. Haucap, J. Kühling: Zeit für eine grundlegende Reform der EEG-Förderung – das Quotenmodell, in: et Energiewirtschaftliche Tagesfragen, Vol. 63, No. 3, 2013, pp. 41-49.

German Consumer Organisations (*Bundesverband der Verbraucherzentralen*, vzbv) established that 82 per cent of Germans supported the nuclear phase-out and the increase of renewable energy sources.[23] The public policy discourse nevertheless remained split.

Advocates of the *Energiewende* typically point to the growth in the share of renewable generation, events of wholesale market price reductions, the outperformance of emissions targets and the potential for the so-called decentralised decarbonisation in the hands of prosumers.[24] For them, the *Energiewende* presents an export model that offers the German economy a valuable first-mover advantage that more than justifies its initial costs. Opponents, conversely, point out that subsidies are applied to reversely discriminate, i.e. support technologies based on their lack of grid competitiveness. Also, in order to cover the balancing needs in an intermittent supply context, Germany has to not only expand grid and storage capacities but also increase its use of hard coal and brown coal plants, and thereby CO_2 emissions. So for its opponents, the *Energiewende* is not only ecologically ineffective, but squanders vital resources and threatens the country's competitiveness. In between these extremes are those that more pragmatically attempt to establish principles to improve market designs and devise cost-effective responses to challenges to sustainability and supply security. It is in the latter fashion that the new CDU/SPD coalition government tries to present its revised *Energiewende* 2.0. The reform attempts to uphold the government's sustainability agenda while meeting domestic affordability requirements and the EU's competition policy concerns.

According to the amended EEG,[25] the German Federal Government will continue to subsidise renewables but with an expected price impact of merely seven cents per kilowatt hour in 2017. For that reason, a review of exemptions for energy-intensive companies eliminated benefits for more than 400 recipients; already self-generating industries will continue to be spared but newcomers will have to pay 50 per cent of the renewable surcharge. Also, the build-up of onshore wind is to be limited to 2,500 megawatts per year; any additional capacity will reduce the level of guaranteed feed-in tariffs. As of 2017, market-based tendering will replace these subsidies for all new installations.

And yet, while key elements of the revised EEG seem to be anticipating the EU's 2014 State Aid Guidelines, a potential source of conflict between the Commission and Germany, but also other member states, remains. Shortly after announcing the new EEG, the German government turned to the EU's General Court to challenge the Commission's decision of 12 December 2013 to open state aid investigations into the German Renewable Surcharge Reduction for energy-intensive companies and the green electricity privilege.[26] In doing so, the German government met the time limit to oppose the Commission's decision. It arguably also set out to protect its *Energiewende* project in view of the unclear development of the EU's climate change agenda and the Commission's attempt to broaden its authority.

For one, at the time of issuing its 2014 Guidelines on State Aid for Environmental Protection and Energy, the EU appeared unable to agree on a climate change package to follow its 20-20-20 targets for 2020. For sure, the European Parliament, on 9 January 2014, had voted in favour of three binding 2030 goals for greenhouse gas emissions (40 per cent), renewables (30 per cent) and energy efficiency (40 per cent).[27] But disagreements between the Commission's climate and energy departments on the one hand and controversies between and within the so-called Green Growth Group and the Visegrad Group of member states on the other made it appear likely that only a 30 or 40 per cent emissions target but possibly no renewable or efficiency objective would be achieved. A target for renewables, however, had been used by the European Court of Justice (ECJ) in ruling that feed-in tariffs do not amount to state aid but are a legitimate policy tool to reach mandatory objectives.[28] In the absence of such a target, the ECJ may rule feed-in tariffs illegal and call for repayment.

Second, and related, facing dissenting groups of member states, the EU Commission in April 2014 had suggested that national governments draw up comprehensive national energy plans, covering all key target areas, and submit these to Brussels for approval. To be sure, throughout its history, the EU has often involved itself in

23 See German Energy Blog: Articles tagged with "VZBV", available at: http://www.germanenergyblog.de/?tag=vzbv.

24 For a discussion see R. Schleicher-Tappeser: How Renewables Will Change Electricity Markets in the Next Five Years, in: Energy Policy, Vol. 48, 2012, pp. 64-75.

25 Bundesministerium für Wirtschaft und Energie: Key Elements of a Revised Renewable Energy Sources Act, Berlin, 21 January 2014.

26 European Commission decision of 6 March 2013, SA.34045, Exemption from network charges for large electricity consumers (section 19 StromNEV). On 28 February 2014, the German government reiterated its conviction that the EEG systems, including its reductions for energy-intensive companies, does not constitute state aid, and is in compliance with EU law. See M. Land, U. Mutschler: Germany Challenges Commission's Opening of In-Depth Investigation of EEG-Surcharge Reduction Before General Court, German Energy Blog, 6 March 2014.

27 See European Parliament: 2030 Climate Goals: MEPs Sceptical about Commission Proposals, Press Release, 22 January 2014.

28 For a discussion see C. Morris: What the EU's 2030 targets mean for the Energiewende, The Energiewende Blog, 29 January 2014.

the area of energy policy but the idea of a European energy policy was only recognised as a concept in an informal European council meeting in October 2005[29] and has subsequently been dealt with in EU Green Papers and consultation processes. Also, even though the Treaty of Lisbon of 2007 covered issues related to energy supply and policy, energy policy competencies, for all practical purposes, had always remained at the level of member states and any joint activity in this area had always been based on voluntary cooperation. It is therefore unsurprising that even strongly pro-EU, Green Growth member states, like the Netherlands, rebutted Brussels' request for authority, calling it "unconvincing".

For Germany, however, Brussels' proposal is as unattractive as the EU's inability to agree on significant and binding renewable targets that may trigger a review of the ECJ decision. The legal action by the German government can therefore only be a first step to work for procedural and substantive consensus on the scope of EU competition rules and their impact on national energy policy commitments. This calls for more than a mere quick fix based on a "pragmatic course of action that would get rid of the system's most appalling deficiencies".[30] A substantive debate is needed to refocus attention on fundamental concerns related to the benefits of market coordination, the precedence of a nation's sovereign will and the ability to protect a domestic policy consensus against free-riders inside and outside the EU. In particular, three issues would need to be addressed:

- how to benefit from market allocation when emissions trading in the absence of a central market coordinator is suffering from political distortions, and technology neutrality in grid competitiveness is barred by the path dependence of system design and implicit fossil fuel subsidies;
- how to recognise the limits of market allocation in furthering broader, politically legitimised welfare goals; and
- how to ensure that polluting strategies which create an unjustified cost advantage and mock the principle of polluter pays trigger WTO compliant trade policy responses rather than appeasing state aid policies.

29 European Council Meeting, Hampton Court, UK, 27 October 2005.

30 As suggested by Claude Mandil, former executive director of the IEA, prior to the summit of the European Heads of State and government on 20-21 March 2014; see K. Beckman: Experts Issue Plea for New European Energy Policy to Overcome "Crisis of Confidence", 17 March 2014.

Christian Egenhofer and Jacques de Jong

A Call for More Regional Approaches to EU Energy Policy

During the last decade, there was unprecedented progress towards an EU common energy policy, or as the EU likes to call it, an energy policy for Europe. While many factors contributed to this, important triggers have been the formulation of a comprehensive climate change policy in the run-up to the 2009 Copenhagen climate negotiations and the successive gas crises starting in 2006. The latter made security of energy supply a priority again. Milestones were the 2007-09 Climate and Energy Package and the entry into force of the Lisbon Treaty, which established for the first time a European Union competence for energy. This was accompanied by the so-called "third (energy) package" of legislative proposals for an internal gas market, which, it was hoped, would complete the internal energy market. The momentum was maintained in 2009 with the Gas Regulation and the European Energy Programme for Recovery. The Gas Regulation enabled the European Commission to develop a sectoral security of supply framework and the European Energy Programme for Recovery plan saw the EU for the first time spend substantial sums on energy infrastructure and low-carbon technologies.

Energy and climate change policy became embedded in the broader context of sustainability. "Sustainable growth – for a resource efficient, greener and more competitive economy" became one of the three priorities of the Europe 2020 Strategy, which is seen by many as the mission statement of the second Barroso Commission.[1] This made many, including the European Commission, believe that an EU energy policy was within reach. The belief has been especially founded on the hope that two mechanisms, the directives on the internal market for electricity

1 See C. Egenhofer: A Closer Look at the EU Climate Change Leadership, in: Intereconomics, Vol. 45, No. 3, 2010, pp. 167-170.

and gas, and the EU Emissions Trading System (ETS), would lead to a convergence of member states' energy policies. The internal market for electricity and gas would create a pan-European market for electricity and gas, which would attract investment in the production, transportation and distribution of electricity and gas for the modernisation of the sectors and to increase security of supply. The ETS would ensure that across the EU this investment is low-carbon to meet the EU's short-, medium- and long-term climate change objectives. This would also gradually lead to a convergence of member states' energy sectors, facilitating *one* energy policy for Europe.

The reality today is radically different. Instead of convergence, member states' energy policies pull in different directions. Member states implemented their own policies to comply with the 2007-09 Climate and Energy Package. Their rhetoric on energy policy coordination is often not matched by deeds. Germany's unilateral decision to switch off nuclear power plants without even informing its neighbours stands out as one significant example, but others exist. More generally, different ambitions regarding renewables have made electricity trade more difficult and, in some cases, undermined the stability of the grid in neighbouring member states. Member states continue to take national or regional approaches to new network development, often detached from generation, e.g. renewables investment. In some cases, the growth of renewables has triggered the mothballing or closure of new gas generation plants, in turn leading member states to consider and implement national capacity remuneration mechanisms to ensure generation adequacy. There are greatly varying policies to address industrial competitiveness; exemptions to pay for renewable levies or grid reinforcement and compensation for carbon costs differ starkly among member states. Member states differ even in market monitoring and their industrial strategies. They have developed national low-carbon roadmaps without consideration of cross-border implications.[2] This stands in stark contrast to the political commitment to completing the single EU energy market by 2014.

As long as national policy-making remains dominant, cross-border benefits of the internal market are being missed.[3] The European Commission estimates that €40 billion per year could be saved as a result of more integrated European power markets, enabled through cross-border infrastructure.[4] According to the European Climate Foundation, system efficiencies achieved through interconnected markets could save up to €426 billion by 2030; the biggest contribution would stem from efficient system operation and the balancing of higher levels of variability in renewable resources.[5]

The internal energy market: what can still be expected?

After more than 20 years of efforts, the EU has not managed to complete the internal market for electricity and gas. Despite measurable progress, such as the market couplings based on an electricity target model and the process to establish EU-wide network codes, the new low-carbon agenda presents member states and the EU with a new situation. Member states will continue, if not accelerate, their efforts towards low-carbon economies. At the same time, it is hard to see how member states would overcome their reluctance towards an internal energy market or give up national fuel mix policies, guaranteed by the Treaty. This is not to say that internal market and competition policy will not remain crucial in shaping energy policy. However, on their own they will hardly suffice to reverse the situation of rapidly diverging energy sectors, which undermine the efficiency and even the security of national energy sectors.

State aid guidelines

The European Commission has already done what it could in this respect with the adoption of the new "Guidelines on State aid for environmental protection and energy 2014-2020" published on 28 June 2014.[6] The Guidelines constitute, to date, the most important and most effective tool for the European Commission to address the challenges described above. They go beyond being merely an instrument to address state aid. They should be seen as the European Commission's principal tool to shape energy policies up to 2020 and beyond.[7] But more will be needed.

2 Clingendael International Energy Programme, Loyola de Palacio Programme of the European University Institute, Fondazione Eni Enrico Mattei and Wilton Park: A Smart EU Energy Policy: Conclusions and Recommendations, March 2010.

3 For example, G. Zachmann: Electricity without Borders: A Plan to Make the Internal Market Work, Bruegel Blueprint Series No. 20, Brussels 2013, Bruegel.

4 Booz & Co.: Benefits of an Integrated European Energy Market, Final Report (revised), prepared for the Directorate-General Energy, European Commission, Brussels, 20 July 2013.

5 European Climate Foundation: Power Perspectives 2030: On the Road to a Decarbonised Power Sector, Contributing Study to Roadmap 2050: A Practical Guide to a Prosperous, Low-Carbon Europe, The Hague 2013.

6 Official Journal of the European Union, 28 June 2014, C 200/1.

7 F. Genoese, C. Egenhofer: Submission to DG Competition: Consultation on the "Draft Guidelines on Environmental and Energy Aid", CEPS, 14 February 2014.

Electricity market design

State aid guidelines alone are not enough, because the power sector faces fundamental change: the need to adapt the design of the electricity market in line with the low-carbon priority. To date, the underlying cost structure of the low-carbon power sector has witnessed a radical shift from variable to fixed costs. This is in stark contrast to the current power "market design", in which remuneration is based on variable costs. This jeopardises all three objectives of EU energy policy: competitiveness, security of supply and sustainability.

Competitiveness is threatened because of the lack of a credible framework where investors are able to manage their investment risks. The situation is aggravated by a situation in which energy-intensive industries depend on direct and indirect government support, i.e. free allocation under the ETS, compensation for electro-intensive industries and exemptions from renewable levies. The current market design also inhibits potentially significant additional revenues for energy-intensive industries for demand response, e.g. load-shedding in times of peak load. *Security of supply* is jeopardised by a lack of investment due to the skewed incentives. *Sustainability* is endangered as the lack of investment incentives undermines incentives in low-carbon technologies, which are required to achieve EU and global climate change ambitions.

The EU faces the challenge of developing a new paradigm between the "state and the market", designing the electricity (and gas) market in such a way that the underlying cost structure (i.e. mainly fixed costs) relates to electricity prices and the remuneration of generators. This will require some continuation of effective state interventions that incentivise investors together with improving market forces in the day-to-day balancing of the system.[8] Meeting this challenge will raise very significant distributional impacts, for example, within the power sector between generators, but also between transmission system operators (TSOs) and distribution system operators (DSOs), between different sectors (industry or household), between member states and even between regions, at an international level between consumer and producer countries, and between generations. This will take time and possibly the full tenure of the new legislature.

8 Clingendael International Energy Programme and Dutch Environmental Assessment Agency (PBL): Reflections on Coordinating Mechanisms for Accommodating Increasing Amounts of Wind and Solar in the Power Market, September 2014, The Hague.

Regional approaches are proliferating

Member states have been resorting more and more to bilateral or multilateral coordination approaches (see Box 1). Most of these consist of ad hoc multi-stakeholder discussion groups, focusing on information sharing and mutual understanding. But others are more formalised and thus develop methods of coordination and, possibly, joint instruments. They go far beyond being an implementation helpdesk or a talking shop for cross-border issues. Among the latter are the Visegrad 4 countries (V4) initiative (Poland, the Czech Republic, Slovakia and Hungary), the Pentalateral Energy Forum (which involves France, Germany, the Benelux countries, Switzerland and Austria) and the related North Seas Countries Offshore Grid Initiative (NSCOGI, for ten nations bordering or close to the North Sea),[9] as well as the Mediterranean Energy Forum.

What these initiatives have in common is that they explore and assess potential opportunities for coordinated energy policy cooperation while taking into account country-specific circumstances and preferences. It is far from certain that the particulars of national situations are always considered when policy objectives are translated into regulation and implemented at the EU level. It is not surprising, therefore, that the Pentalateral Forum focuses on energy transition, low-carbon and environmental considerations, while V4's preoccupation is the regional security of gas supply. Both, however, highlight the common issues that will have to be addressed, including from the energy policy, market, institutional and political perspectives.

The Pentalateral Forum focusing on northwestern Europe is among the most advanced and possibly most studied initiatives. It is also a good example for the potential of regional approaches for coordinated energy policy. Meulman et al. have identified four categories of tools.[10]

- The first and most basic tool is information sharing, for example, about the fuel mix in power generation or infrastructure improvements. Over time this can be enlarged to any other data that are deemed relevant.

- A more profound level of coordination is related to energy storage facilities and tendering processes, for

9 The ten countries involved are Belgium, Denmark, France, Germany, Ireland, Luxembourg, the Netherlands, Norway, Sweden and the UK. See https://www.entsoe.eu/about-entso-e/system-development/the-north-seas-countries-offshore-grid-initiative-nscogi/.

10 L. Meulman, P. Boot, C. van der Linde, J. de Jong, L. Werring: Harvesting Transition? Energy Policy Cooperation or Competition around the North Sea, Clingendael International Energy Programme, The Hague, January 2012.

Box 1
Existing initiatives and concepts for regional approaches to EU energy policy

- The "corridor" approach for the development of energy from renewable sources (RES) in the Mediterranean region, whereby countries are linked by infrastructure pathways for specific corridors.[1]
- The "infrastructure" approach by E3G, focusing on reducing carbon emissions.[2]
- An institution-based approach by Notre Europe, whereby a new European Energy Community would operate under the present EU institutional structure but according to rules that would only be compulsory for those member states that join.[3]
- The Visegrad 4 approach aiming for regional energy policy cooperation and market integration and emerging from the Russia-Ukraine-EU gas crises of 2006 and 2009.[4]
- The NSCOGI aims to maximise the potential of the renewable energy sources of the North Sea region through the coordinated and cost-effective development of offshore and onshore grids.
- A climate-centred approach by the Nordic countries,[5] fuelled by the ambition of developing a carbon-free energy system that could serve as a model for cross-border cooperation.[6]
- The Pentalateral Energy Forum platform for northwestern Europe, which includes strategies ranging from informal information-sharing devices to a much more focused harmonisation of various policy instruments.[7]

Adapted from De Jong and Egenhofer (2014).[8]

1 J.-M. Glachant, N. Ahner: In Search of an EU Energy Policy for Mediterranean Renewables Exchange: EU-Wide System vs. 'Corridor by Corridor' Approach, Policy Brief No. 2013/06, Florence School of Regulation, European University Institute, October 2013.
2 J. Gaventa: Infrastructure Networks and the 2030 EU Climate and Energy Framework, E3G Working Paper, Third Generation Environmentalism, London, September 2013.
3 S. Andoura, L. Hancher, M. Van der Woude: Towards a European Energy Community: A Policy Proposal, Notre Europe, Paris, 11 March 2010.
4 P. Kaderják, A. Selei, A. Hum: Energy Market Integration in Central Eastern Europe (CEE): Drivers, Early Lessons and the Way Forward, paper based on proceedings of a workshop, Regional Centre for Energy Policy and Research (REKK), Corvinus University, Budapest, 4 April 2013.
5 Namely, Iceland, Norway, Sweden, Finland and Denmark.
6 Nordic Action Group on Climate and Energy: Nordic Energy Ways in Europe: Clean, Competitive and Connected, Nordic Energy Vision and Action Report, November 2013.
7 J. De Jong, K. Groot: A Regional EU Energy Policy? CIEP Paper No. 2013/06, Clingendael International Energy Programme (based on workshops at the end of 2012), The Hague 2013.
8 J. De Jong, C. Egenhofer: Exploring a Regional Approach to EU Energy Policies, in: European Energy Journal, Vol. 4, No. 2, 2014. See also: CEPS Special Report No. 84, April 2014.

example for offshore wind or for renewables support systems. A similar approach is used by the NSCOGI. Coordination can also be at the industry level, such as TSO cross-border cooperation. Member states would still make all decisions individually, and no joint institutions would be developed.

- It is only at the next level of cooperation, which has been called coordination plus, where joint institutions are developed. Under this form, processes would be instituted that would encourage neighbouring countries to search for common approaches in common bodies. Over time, this could offer the basis for covering broader issues, such as the interactions between the power and gas grids and systems, the short- and longer-term system reliability, fuel supply security, back-up capacities, storage, and demand-side management, seeking cross-border solutions while exploring the most cost-efficient possibilities. This would require joint policy frameworks, but implementation would still be undertaken at the member state level with national instruments.
- The final step of coordination would be joint instruments, such as a common incentive mechanism for renewable energy sources.

This typology shows that national or local choices, for example about fuel mixes or the level of security of supply, are always respected until the participating member states decide to search for common solutions.

Challenges facing regional approaches

Regional approaches are not a panacea for EU energy challenges. They are, however, worth being explored and tested as to their relative merit in addressing them. They have the potential to be part of the answer to the EU's energy governance challenge, as identified for both the 2030 Framework communication and the Energy Union discussion.[11] In order for this to happen, there is a need for more clarity on concepts and terminology, integration of bottom-up and top-down elements and, most importantly, that governance and the emerging EU institutional and legal issues be addressed.

More clarity of concepts

To date, regional approaches mean different things to different people. The various regional approaches have developed their own nomenclatures, such as "forum", "council", "initiative" or "platform", and use different degrees of coordination methods. For example, energy regulators have arranged "regional initiatives", and the European Commission has set up a number of regional Projects of Common Interests,[12] in which the respective governments, national regulatory authorities, project promoters, the European network of TSOs and the EU Agency for the Cooperation of Energy Regulators (ACER) are working with the Commission on projects considered to be of common interest under the EU's energy infrastructure regulation. This is very different from the NSCOGI or the Pentalateral Forum. A typology with agreed terminology could create more clarity. This would be the task of the European Commission, for example by drawing up a framework for regional approaches.

Combining bottom-up and top-down elements

Regional approaches can and have been formed through both top-down and bottom-up initiatives. The Regional Initiatives by the Council of European Energy Regulators arose essentially from the top down as a result of the need to deal with cross-border issues coming from the internal market directives implementation. The Pentalateral Forum, by contrast, resulted from a decision by TSOs, national regulatory authorities and governments to establish specific market rules and coordination bodies to facilitate market integration in the region. Its successful set-up later became the "target model" for the wider EU. Steering established bottom-up initiatives can therefore facilitate market functioning and even EU integration. This element could also be included in the European Commission's framework described above.

Governance

Even if regional cooperation approaches are in parallel, i.e. outside the normal institutional processes of the EU, they nonetheless immediately pose questions as to the role and involvement of EU institutions, notably the European Commission. Regional coordination approaches cannot contradict the competences of the European Commission under the Treaty of Lisbon unless the latter is changed. More complicated is the case where the EU is no longer able to address the challenges through the passage and implementation of law, and where new tools and instruments will be required. This has been implicitly acknowledged in a recent EU communication on the post-2030 framework,[13] in which the Commission explicitly broached the topic of governance and the indicators closely associated with it. While no definitive answer on the governance challenge can be given, the suggestion is that the EU reflects also the merit and scope of regional cooperation approaches in this forthcoming governance debate.

Subsidiarity

Any concept or model of regional approaches will need to be compatible with EU law, including the subsidiarity principle. Under the EU Treaty, subsidiarity describes the obligation to assign the competence to the level at which a task can best be done, that is, at the local, regional, member state, EU or even international level. The reasons the Treaty gives for assigning competences are economies of scale and positive and negative spillovers (cross-border effects). On energy, the Treaty – as is the case with most other policies – spells out a shared competence between the EU and member states with two exceptions.[14] The Treaty acknowledges member state sovereignty for the deployment of a state's natural resources and for determining the national energy mix. At the same time, the EU has set a number of specific and concrete rules on coal, gas, renewable energies, uranium and electricity, based on EU competencies such as the internal market, competition policy or the en-

11 http://www.consilium.europa.eu/uedocs/cms_Data/docs/pressdata/en/ec/143478.pdf.

12 European Commission: The Future Role of Regional Initiatives, COM(2010) 721 final, Brussels 2010.

13 European Commission: A policy framework for climate and energy in the period from 2020 to 2030 (COM(2014)15), 22 January 2014, http://eur-lex.europa.eu/legal-content/en/TXT/?uri=celex:52014DC0015.

14 Art. 194 TFEU.

vironment. Occasionally this raises tensions, for example when member states see their sovereignty on natural or energy resources at risk. Applying regional cooperation approaches carries the risk that the balance might be tilted towards member states' sovereignty to the detriment of the integrity of the market. While this risk is real, it should be weighted against the also real and observable risk to the market that the current situation poses. The logic of "regional energy cooperation approaches" would be to attempt to close the gap between the reality of the market and the EU energy policy "constitution".[15]

Summary and recommendations

For more than 20 years, the EU has worked towards the completion of the internal market for electricity and gas. Although progress has been slow at times, it has been gradual and noticeable. The new priority of low-carbon development, notably the rapid build-up of renewable energy sources, and more generally, the different – and often incompatible – national concepts of energy transition have put the completion of the internal energy market into question. Using the EU's internal market and competition competencies to maintain the integrity of the internal energy market as much as possible is welcome but most likely will not suffice to address current challenges. The other promising avenue is to adapt the market design for electricity markets. But this will take time and might well take the full five years (or more) of the current legislature. In the meantime, real solutions will be needed.

Member states have started to develop such solutions in the form of regional coordination or cooperation approaches. The European Commission should have a careful look at their potential not only to address immediate cross-border issues but also as a means to complete the internal energy market. Regional approaches therefore are more than an implementation helpdesk. They may offer real and lasting solutions for a more integrated, united and effective Europe,[16] especially when developing EU-wide solutions covering all national and regional circumstances ends in a drawn-out process through which the EU could find itself with diluted compromises unfit for the purpose or, even worse, no result at all. This has been implicitly acknowledged by the European Commission in its communication on the 2030 climate and energy framework for the period 2020 to 2030 by prominently highlighting the question of governance.[17]

If regional energy cooperation approaches are seen as a way forward, the European Commission should consider developing a framework for regional cooperation, detailing what is permissible according to EU treaties. A mechanism to maintain the paradigm of the internal energy market would appear to be a *conditio sine qua non* for any model of regional approaches.

Regional approaches are no panacea, however. They pose serious questions as to governance and subsidiarity. This article does not offer ready-made solutions to these challenges but recommends a serious reflection on how these can be addressed. It recommends that in a first step the European Commission should bring more clarity to the debate on the meaning of concepts and terminology. The Commission should also examine how to better combine elements of bottom-up approaches developed by member states and top-down approaches developed by itself.

Based on these considerations, the following recommendations can be made:[18]

- Allow, facilitate and promote further practical, bottom-up approaches to regional energy cooperation.
- Invite the existing regional forums to come forward with a short-term agenda for meeting the challenges of system capacity and adequacy of generation and their related supply security concerns.
- The European Commission should give guidance, for example, in the form of a communication.
- In parallel, the European Commission, in cooperation with member states, should assist states' efforts to advance practical solutions for implementing the low-carbon agenda within the 2020 and 2030 frameworks and in accordance with the rules of the internal energy market. ACER's role should be explicitly addressed in this context.
- Regional energy cooperation approaches should be further studied, both in the legal context and in their pragmatic applications, as a basis for further consideration and discussion.

15 N. Ahner, J.-M. Glachant, A. De Hauteclocque: Legal Feasibility of Schengen-like Agreements in European Energy Policy: The Cases of Nuclear Cooperation and Gas Security of Supply, EUI Working Papers RSCAS 2010/43, Robert Schuman Centre for Advanced Studies, European University Institute, Florence, 16 March 2010.

16 C. Egenhofer, J. de Jong: Thinking the Unthinkable: Promoting Regional Approaches to EU Energy Policies for a More United and Effective EU, in: N. Tocci (ed.): Imagining Europe: Towards a More United and Effective EU, IAI Research Paper No. 15, Rome 2014, Institute for International Affairs.

17 http://europa.eu/rapid/press-release_IP-14-54_en.htm.

18 Similar recommendations have been published before in J. de Jong, C. Egenhofer: Exploring a Regional Approach …, op. cit.; and C. Egenhofer, J. de Jong: Thinking the Unthinkable …, op. cit.