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End of previous Forum article

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The EU Internal Market and the Transformation of Energy Systems to Sustainability

The vision of a completed internal market occupies a preeminent position within the EU integration project: accordingly, "ensur[ing] the functioning of the energy market" is listed as the first goal in the energy section of the Lisbon Treaty (Article 194, TFEU). A fundamental energy policy challenge, in turn, consists of initiating and fostering the transformation to sustainability. From the EU Commission's perspective, both internal market agenda and the sustainability transformation mutually benefit from each other. Thus, the so-called 'Winter Package', an array of energy policy and governance proposals published by the EU Commission in November 2016 (that is currently nearing implementation) has been subtitled 'Clean energy for all Europeans'. Following this package, the internal market also advances the EU's other energy policy aims such as security of energy supply, the promotion of energy efficiency and renewables as well as the promotion of network integration.

However, the label of an 'Energy Union' glosses over the factual diversity of energy policy priorities endorsed by the

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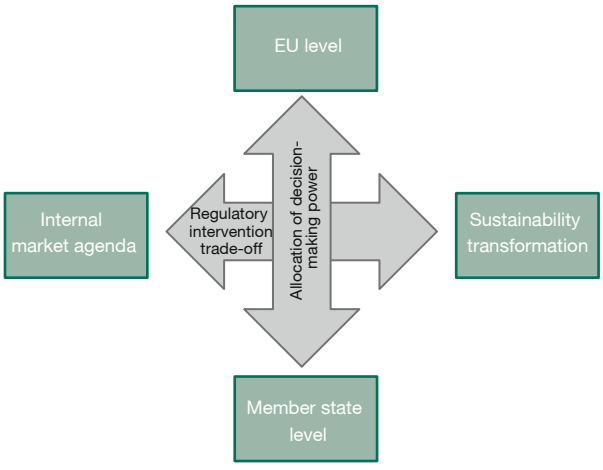
individual member states[1] – as well as over the manifold disputes in both public and scientific arenas around the transition to a sustainable energy system. For instance, some economists have frequently criticised national renewable energy policies as fragmented, calling for more centralised and/or more coordinated energy policies so as to reap economies of scope and scale within the EU.[2] Others even cast doubt on the general economic rationale for renewables policies, arguing that such support just drives up the cost of climate mitigation, thereby doing more harm than good.[3] To be sure, all of these criticisms are highly contested. Indeed, another strand of literature highlights decentralised bottom-up approaches as an essential prerequisite to sustainability: from this perspective, the energy transition requires not only technological but also regulatory and institutional innovations.[4] Consequently, this literature calls for ambitious (sub-)national energy policies and emphasises the merits of decentralised problem-solving.

Overall, therefore, the synergies on paper are called into question by interest conflicts and possible inherent trade-offs. Figure 1 sorts these issues along two conflict dimensions. First, the vertical dimension represents the *allocation of decision-making power* between governance levels. Within this conflict dimension, politico-economic frictions arise due to the partly diverging self-interest of political actors involved. For instance, the EU Commission acts as a discrete energy policy actor and also pursues its own self-interest, not only noble ideas.[5] Second, the horizontal dimension represents the *regulatory intervention trade-off* that possibly arises between the objectives of the internal market agenda and those of the sustainability transformation.

Figure 1
Two conflict dimensions: Regulatory intervention trade-off and allocation of decision-making power



Source: Authors' own illustration.

Building on this framework, we aim to disentangle the discussion in three steps. The first step is identifying valid economic rationales for restricting the internal market agenda in the name of the sustainability transformation. The second step consists of asking on which governance level – if any – such policy interventions should be implemented. Third, we relate these arguments to specific policy implications.

Can the internal market agenda deliver sustainable energy provision? Identifying potential trade-offs

The EU Commission, in its communication on the Energy Union,[6] holds that the aims of completing the common market and of transforming the energy system towards sustainability are complementary. Within this logic, climate protection depends on the internal market: "The unavoidable challenge of moving towards a low-carbon economy will be made harder by the economic, social and environmental costs of having fragmented national energy markets".[7] Certainly, there is something to this argument which can be seen from the ambivalent experi-

1 K. Szukecki, S. Fischer, A.T. Gullberg, O. Sartor: Shaping the Energy Union: between national positions and governance innovation in EU energy and climate policy, in: Climate Policy, Vol. 16, No. 5, 2016, pp. 548-567.

2 See, e.g. Acatech/Leopoldina/Akademienunion (eds.): Die Energiewende europäisch integrieren. Neue Gestaltungsmöglichkeiten für die gemeinsame Energie- und Klimapolitik, Berlin 2015; Monopolies Commission: Energie 2017: Gezielt vorgehen, Stückwerk vermeiden, Sondergutachten 77, Bonn 2017; 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.

3 For example, see J. Weimann: Rettet die Energiewende? Warum eigentlich?, in: Wirtschaftsdienst, Vol. 93, No. 11, 2013, pp. 793-795, available at https://archiv.wirtschaftsdienst.eu/jahr/2013/11/rettet-die-energiewende-warum-eigentlich/.

4 C. Burger, J. Weinmann: The Decentralized Energy Revolution. Business Strategies for a New Paradigm, Basingstroke 2013, Palgrave Macmillan; K. Tews: Europeanization of Energy and Climate Policy: The Struggle Between Competing Ideas of Coordinating Energy Transitions, in: Journal of Environment & Development, Vol. 24, No. 3, 2015, pp. 267-291.

5 S. Strunz, E. Gawel, P. Lehmann: Between energy transition and the internal market agenda: The impact of the EU Commission as a discrete energy policy actor, in: E. Gawel, S. Strunz, P. Lehmann, A. Purkus (eds.): The European Dimension of Germany's energy transition – opportunities and conflicts, Cham 2019, Springer, pp. 413-430.

6 European Commission: A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy, Communication from the Commission to the European Parliament, The Council, The European Economic and Social Committee and The Committee of the Regions, COM(2015) 80.

7 Ibid., p. 3.

ence of the Emissions Trading System (ETS). As the main instrument of the EU's climate mitigation efforts, the ETS should trigger the continent-wide transition to sustainable energy provision; the slow and possibly insufficient efforts to revamp the ETS (after a prolonged period of oversupply of emission permits) may be blamed on nationally fragmented climate policies. Making the ETS more effective would require the reduction of overlapping regulations, a binding emissions cap and the gradual expansion of the scheme to hitherto non-ETS sectors.[8] Such reforms to foster market-based emission regulation would perfectly align with the overall internal market agenda. However, as we argue, there may be sound economic reasons to not exclusively rely on the ETS and otherwise unfettered energy markets for transforming the energy system towards sustainability. There are three aspects – non-climate externalities, sustainability as a long-term issue and security of supply – that we address in turn.

Environmental externalities beyond climate change

An implicit core assumption backs the view that "internal market and sustainability transformation are complementary" – namely that climate change represents the only negative externality from conventional energy provision. While the climate externality may well be the most important, it is not the only one. For instance, the ecological, health and safety risks associated with nuclear power constitute another major externality. Yet if the EU Commission's vision of "an integrated continent-wide energy system where energy flows freely across borders, based on competition and the best possible use of resources"[9] were realised, the nuclear phase-out decisions in Germany and Belgium[10] would be virtually overturned. Moreover, when carbon capture and storage (CCS) is taken into account, fossil energies could be continuously used without sacrificing emission reduction targets. However, this would imply that other externalities related to the extraction and transportation of these fossil fuels (such as open-pit coal mining, oil spills, methane leaks) would prevail. Considering that sustainability is inherently a long-term issue (see below), one might also question the compatibility of the CCS technology with sustainable energy provision – the lack of acceptability for this technology in many EU countries seems to point in this direction.

Hence, negative environmental externalities beyond climate change constitute a sound economic rationale for not limiting the sustainability transformation of the energy system to decarbonisation. And this points to an important friction at the core of the EU legal framework: The internal market agenda notwithstanding, Article 194(2) TFEU guarantees and preserves the member states' rights to choose their energy mix in accordance with their national risk preferences. In other words, a trade-off holds: Either the free flow of energy across borders reduces member states' control over their national energy mix, or – as it is now – interventions at the national level (which may result from heterogeneous and perfectly legitimate evaluations of non-climate externalities) slow down the completion of the common market.

The sustainability transformation as a long-term challenge

Sustainability requires taking the lasting effects of current actions into account, while acknowledging uncertainty over future preferences and technology. In other words, it is a long-term issue.[11] This is particularly true for the energy sector, which exhibits strong path dependencies and lock-in effects:[12] Current policy decisions shape infrastructure and technology development for decades and can be reversed only in the long run. Thus, the socio-technical co-development of policies and technologies to the benefit of fossil fuel exploitation has been referred to as a 'carbon lock-in'.[13] When investments in clean technologies and infrastructure in the electricity sector are inefficiently low, this inefficiency is perpetuated over decades. From the perspective of the internal market agenda, one might point to the possibility of reforming the ETS so that it appropriately incentivises long-term decarbonisation. However, regulatory uncertainty over the long-term stringency of EU climate policy puts the dynamic performance of this approach severely into doubt:[14] Only if climate change was the sole externality to be internalised *and* if EU climate policy was perfectly credible, would the resulting investment decisions be efficient.

8 C. Böhringer: Two decades of European Climate Policy: A critical appraisal, in: Review of Environmental Economics and Policy, Vol. 8, No. 1, 2014, pp. 1-17; D. Buchan, M. Keay: Europe's Long Energy Journey: Towards an Energy Union?, Oxford 2016, Oxford University Press.

9 European Commission, op. cit., p. 2.

10 While Germany is the focus of many pro/contra nuclear energy discussions, one should not forget other countries that have committed themselves to not using nuclear energy a long time ago, such as Italy or Austria, or non-member states that will phase out nuclear energy, such as Switzerland.

11 B. Klauer, R. Manstetten, T. Petersen, J. Schiller: The art of long-term thinking: a bridge between sustainability science and politics, in: Ecological Economics, Vol. 93, 2013, pp. 79-84.

12 G.C. Unruh: Understanding Carbon Lock-in, in: Energy Policy, Vol. 28, 2000, pp. 817-830.

13 Ibid.

14 S. Brunner, C. Flachsland, R. Marschinski: Credible commitment in carbon policy, in: Climate Policy, Vol. 12, 2012, pp. 255-271.

Moreover, it can be questioned whether the internal market provides the necessary investments in research and development (R&D) for clean technologies: Empirically, to date, the deregulation of electricity markets has entailed a decline in public R&D on renewable energy.[15] More competition within an extended market reach implies lower profit margins and hence lower incentive for technology investments that would pay off in the long term only and that exhibit public-good characteristics.[16] Overall, one might, thus, conclude that a dynamic and long-term perspective on the sustainability transformation of the energy system fosters the case for market intervention beyond the ETS.

Security of supply

Security of energy supply involves several dimensions: In the long term, it requires the adequacy of supply (building, in turn, on the availability of primary energy sources and sufficient production capacities); in the short term, it includes network stability and resilience to supply interruptions. Specific security of supply challenges may vary, both across industry sectors and across member states. As a result of this multi-dimensionality, different indicators of security of supply may lead to diverging assessments.[17] For the sake of brevity, we focus on general trade-offs that may arise between the internal market agenda and security of supply in the electricity and the heating sector.

First, in the electricity sector, the long-standing debate whether adequacy of production supply can be ensured without regulatory interventions (i.e. the so-called 'missing money problem') has garnered additional concern due to the sharply rising but volatile feed-in of renewable sources.[18] So the transformation to clean energies further challenges the unfettered markets logic here. De facto, the introduction of diverse 'capacity mechanisms' on the member state level hampers the free exchange of electricity across borders. Against this background, one might argue that a continent-wide internal market with geographically optimised allocation of large-scale production and transmission facilities could guarantee security of supply at minimal production costs. Unfortunately, such large-scale system integration would also negatively affect precisely those characteristics positively associated with resilience of the electricity system – namely modularity, redundancy and diversity. It is, therefore, unclear, how security of supply would fare in a highly centralised system.[19] In fact, after the 2006 'European blackout', EU policymakers claimed that this blackout illustrated the vulnerability of the EU's electricity infrastructure, arguing for centralisation as a remedy; conversely, the national Transmission System Operators pointed to their fast and adequate fixes of the problem, concluding that the event strongly supported the existing decentralised governance approach.[20]

Second, as regards the heating sector, a trade-off between diversification of imports in order to minimise import risks (e.g. price volatility) and the free trade of primary energy sources arises. This is especially true for gas as the most important energy carrier for heating in the EU. Consider the recent discussions about Nord Stream 2, a gas pipeline currently under construction between Russia and Germany via the Baltic Sea. Interestingly, in this case, the usual roles (EU Commission heralds free exchange of energy across borders, a member state defends regulatory intervention) seem reversed: It is Germany who frames the issue as a regular transaction between market participants, thereby highlighting the no-regulatory-intervention-necessary logic, whereas the Commission argues that the pipeline would increase EU dependency on Russian gas, claiming that the project, therefore, requires an explicit treaty between Russia and the EU (as the Commission concedes that it cannot simply prohibit the pipeline, this may be seen as an effort to at least gain some influence over the issue).[21] Overall, therefore, the vision of a common energy market and the requirements of safeguarding the energy supply may clash in several respects. These trade-offs, in turn, are amplified through the sustainability transformation and the impact of renewables on the energy market.[22]

15 M.G. Smith, J. Urpelainen: Why has public R&D on alternatives to fossil fuels decreased in industrialized countries?, in: Environmental Science and Policy, Vol. 25, 2013, pp. 127-137.

16 J. Grafström, P. Söderholm, E. Gawel, P. Lehmann, S. Strunz: Knowledge Accumulation from Public Renewable Energy R&D in the European Union: Converging or Diverging Trends?, UFZ Discussion Paper No. 2017/5, available at http://www.ufz.de/export/data/global/152343_DP_2017_05_Grafstroemetal.pdf.

17 A. Löschel, U. Moslener, D. Rübbelke: Indicators of energy security in industrialized countries, in: Energy Policy, Vol. 38, No. 4, 2010, pp. 1665-1671.

18 P. Lehmann, R. Brandt, E. Gawel, S. Heim, K. Korte, A. Löschel, P. Massier, M. Reeg, D. Schober, S. Wassermann: Capacity Payments to Secure Electricity Supply? On the Future of Germany's Power Market Design, in: Energy, Sustainability and Society, Vol. 5, No. 15, 2015, pp. 1-7.

19 Again, note that specific indicators to measure security of supply might entail opposing assessments.

20 E. van der Vleuten, V. Lagendijk: Interpreting transnational infrastructure vulnerability: European blackout and the historical dynamics of transnational electricity governance, in: Energy Policy, Vol. 38, No. 4, 2010, pp. 2053-2062.

21 See, for instance, http://europa.eu/rapid/press-release_SPEECH-16-1283_en.htm; https://www.cleanenergywire.org/factsheets/gas-pipeline-nord-stream-2-links-germany-russia-splits-europe; https://www.n-tv.de/politik/EU-Kommission-verlangt-Pipeline-Abkommen-article20646618.html.

22 S. Strunz, E. Gawel: Import dependency and the energy transition – A new risk field of security of supply?, in: E. Gawel, S. Strunz, P. Lehmann, A. Purkus (eds.), op. cit., pp. 301-310.

The three issues of non-climate externalities, sustainability as a long-term challenge and security of supply suggest that there is an economic rationale for regulatory interventions beyond the ETS in order to correct energy market failures. Relating to Figure 1, this pertains to the horizontal conflict dimension. Yet optimally 'solving' the regulatory intervention trade-off is arguably open to debate and would merit extended analyses in each of the respective cases (next to first-best arguments, this may also involve second-best arguments, that is, situations where efficient policy design is not available).[23] Within the limited scope of this contribution, we now focus on the vertical conflict dimension indicating the allocation of decision-making power: Assuming that additional regulatory interventions for the sake of the sustainability transformation are warranted, on which governance level should these interventions be made?

Does sustainability require a decentralised governance of energy systems?

Some argue that the sustainable transformation of energy systems requires a fundamental reconfiguration from the bottom up. This view has been called the 'thousand flowers'[24] perspective as it assumes an essential role for small-scale actors such as communal energy cooperatives. Some advocates of this perspective refer poignantly to a 'decentralised energy revolution': Instead of centralising decision-making power on the EU level, the idea is rather to decentralise it as much as possible and to increase citizen participation in all energy policy decisions.[25] What is more, energy-related public goods should be placed under local control (i.e. municipal ownership of utilities and distribution grids). Such visions about the organisation of energy systems obviously clash with the idea of a liberalised and common market area at the EU level. In fact, local efforts to re-communalise (or to prevent privatisation of) distribution grids for gas and electricity have already been inhibited by EU procurement law: For instance, as the German Federal Court of Justice decided in 2013 (Case No. KZR 65/12 und 66/12), municipalities cannot just refer to the principle of subsidiarity and local self-government when intending to attain or regain control over communal grids. Instead, they need to comply with EU procurement law and carry out transparent tender procedures where corporate bidders can apply as well. Furthermore, as regards renewable energy support, the EU Commission's course has been criticised as 'neoliberal' for some time already.[26] Along these lines, some claim that the Commission's recent push towards tender schemes endangers bottom-up transformation initiatives by decentralised actors such as communal energy cooperatives.[27]

Within these criticisms of the internal market agenda, the two-conflict dimensions of Figure 1 are often conflated, in particular, when arguments for decentralisation of decision-making and arguments for regulatory intervention are mixed. But the two conflict dimensions need not align: For instance, one may very well argue for strong regulatory interventions in the name of sustainability while maintaining that these interventions should be implemented at the EU level. Hence, we now exclusively evaluate the case for a (de)centralisation of decision-making (having addressed the case for regulatory interventions above).

Let us very briefly recapitulate the rationales: Centralisation builds on economies of scope and scale. For in a renewable-based energy system, the large-scale allocation of production capacities – regardless of political boundaries, exclusively following geographical and meteorological characteristics – would enable the minimisation of production costs.[28] Moreover, the centralisation of energy policies would further lower the administrative costs when there are several outputs to be jointly produced; such economies of scope might also *increase* overall accountability (namely if institutional quality in some areas is low).[29]

23 See, e.g., E. Gawel, S. Strunz, P. Lehmann: A public choice view on the climate and energy policy mix in the EU – how do emissions trading scheme and support for renewables interact?, in: Energy Policy, Vol. 64, 2014, pp. 175-182.

24 T.J. Foxon: Transition pathways for a UK low carbon electricity future, in: Energy Policy, Vol. 52, 2013, pp. 10-24.

25 C. Burger, J. Weinmann, op. cit.

26 V. Lauber, E. Schenner: The struggle over support schemes for renewal electricity in the European Union: a discursive-institutionalist analysis, in: Environmental Politics, Vol. 20, No. 4, 2011, pp. 508-527.

27 K. Tews: Europeanization of Energy and Climate Policy: The Struggle Between Competing Ideas of Coordinating Energy Transitions, in: Journal of Environment & Development, Vol. 24, No. 3, 2015, pp. 267-291; E. Michalena, J. Hills: Stepping up but back: How EU policy reform fails to meet the needs of renewable energy actors, in: Renewable and Sustainable Energy Reviews, Vol. 64, 2016, pp. 716-726.

28 S. Bigerna, C.A. Bollino, S. Micheli: Renewable energy scenarios for cost reductions in the European Union, in: Renewable Energy, Vol. 96, 2016, pp. 80-90; 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; K. Neuhoff, J. Barquin, J.W. Bialek, R. Boyd, C.J. Dent, F. Echavarren, T. Grau, C. Von Hirschhausen, B.F. Hobbs, F. Kunz, H. Weigt, C. Nabe, G. Papaefthymiou, C. Weber: Renewable electric energy integration: quantifying the value of design of markets for international transmission capacity, in: Energy Economics, Vol. 40, 2013, pp. 760-772; C. Grams, R. Beerli, S. Pfenninger, I. Staffell, H. Wernlie: Balancing Europe's wind-power output through spatial deployment informed by weather regimes, in: Nature Climate Change, Vol. 8, 2017, pp. 557-562.

29 F. Boffa, A. Piolatto, A.M. Ponzetto: Political Centralization and Government Accountability, in: Quarterly Journal of Economics, Vol. 131, No. 1, 2016, pp. 381-422.

In contrast, the theory of fiscal federalism brings forward two main arguments calling for the decentralisation of decision-making. First, decentralisation facilitates 'laboratory federalism'.[30] That is, a federally organised political system may perform trial-and-error processes more efficiently than a uniform political system. In the context at hand, for instance, a wide variety of policy proposals for openly debated issues such as how to promote e-mobility without rebound-effects or how to adapt electricity market regulation to high shares of renewables can be implemented and compared on national and regional scales. In contrast, implementation on the EU level would make policy experimentation a lengthy and possibly more costly process (in that negative results affect a larger scale). Second, decentralisation enables better preference matching when preferences are heterogeneous. Consider the (implicit) valuation of the external costs of highly debated technologies such as nuclear power or CCS in national energy policies.[31] Under a continent-wide electricity market with harmonised rules on the EU level, preference heterogeneity with respect to the risks of these technologies would not be taken into account. Leaving technology decisions to the member states – while naturally not guaranteeing perfect preference matching either – at least provides for a diversity of approaches roughly in line with the national populations' preferences.

From the above, it follows that both proponents and opponents of (de)centralisation have valid economic arguments. So, next to the trade-off on the horizontal conflict dimension, there also prevails a trade-off regarding the allocation of decision-making power on the vertical dimension. Again, there is no overall optimal 'solution' to this trade-off as different weights might be attributed to the respective arguments. Nevertheless, we may draw two general conclusions here:

- Neither the arguments for decentralisation nor the need for regulatory interventions in the name of sustainability imply that the economic rationale for market integration is 'wrong' – market integration should, however, not be seen as a panacea but should be evaluated with respect to counter-arguments.
- The two conflict dimensions of Figure 1 need to be distinguished. In particular, when assessing the (de)centralisation trade-off, only the 'laboratory federalism' and the 'preference heterogeneity' arguments should count (as opposed to those criticisms of EU energy policy that conflate the suggested degree of intervention with the proposed governance level).

In the following, we turn to more specific settings in order to illustrate how the above arguments may play out in practice.

Policy implications

Should the EU set a renewable energies target?

In line with the internal market perspective on climate change, critics have called for dropping the EU renewables target.[32] Yet, as laid out above, the EU ETS does not address other environmental externalities from conventional energies. Moreover, whether the ETS in its current form suffices to incentivise the long-term decarbonisation of the energy system may be in doubt. Consequently, setting a target for renewable energy deployment at the EU level (irrespective of the question at which level and by which means renewables should be subsidised) might help to mitigate some of these issues: in particular, numerical analyses suggest that renewables subsidies decrease negative externalities from fossil fuel combustion and from radiation hazards – whereas the externalities related to the extraction and transportation of fossil fuels should be primarily addressed by other policy instruments.[33]

EU state aid law as a lever to attract decision-making power

The EU Commission increasingly employs state aid law to steer national energy policies in a direction it deems compatible with the internal market. In doing so, the Commission slowly and implicitly seizes some of the member states' decision-making competencies on energy policy.[34] The member states formally retain the last word (i.e. sovereignty over the national energy mix, as stipulated by

30 W.E. Oates: Fiscal Federalism, New York 1972, Harcourt Brace Javanovich; W.E. Oates: An Essay on Fiscal Federalism, in: Journal of Economic Literature, Vol. 37, 1999, pp. 1120-1149; A. Ania, A. Wagener: Laboratory Federalism: The Open Method Of Coordination (OMC) as an evolutionary learning process, in: Journal of Public Economic Theory, Vol. 16, No. 5, 2014, pp. 767-795.

31 S. Strunz, E. Gawel, P. Lehmann: Towards a general "Europeanization" of EU Member States' energy policies?, in: Economics of Energy & Environmental Policy, Vol. 4, No. 2, 2015, pp. 143-159; C. Bausch, B. Görlach, M. Mehling: Ambitious climate policy through centralization? Evidence from the European Union, in: Policy Analysis, Vol. 17, No. 1, 2017, pp. 32-50.

32 R.N. Stavins: The Problem with EU Renewables. The Environmental Forum, May/June 2014, p. 14, available at http://www.hks.harvard.edu/fs/rstavins/Forum/Column_60.pdf.

33 P. Lehmann, J. Sijm, E. Gawel, S. Strunz, U. Chewpreecha, J.-M. Mercure, H. Pollitt: Addressing multiple externalities from electricity generation: a case for EU renewable energy policy beyond 2020?, in: Environmental Economics and Policy Studies, Vol. 21, No. 2, 2018, pp. 255-283.

34 T. Müller: Zur Kompetenzverteilung von EU und Mitgliedsstaaten im Energiebereich, Speech at the '12. Österreichisches Windenergie-Symposium', Vienna, 9 March 2016.

Article 194 TFEU), but the Commission's influence grows. Given the above arguments, this use of state aid law to achieve policy harmonisation 'through the back door' can be questioned: Insofar as the Commission prescribes specific policies (tender schemes as a default option for renewables support), the laboratory function of decentralised policy experimentation is shut down in a field with lots of uncertainties and unresolved issues.[35] Acknowledging the Commission's mandate to foster the internal market, one may still wonder whether the increasing leverage of EU state aid law risks crippling laboratory federalism at the national level.

Balancing bottom-up initiatives with benefits from coordination and integration

As regards the 'thousand flower' perspective's plea for a 'decentralised energy revolution', we suggest critical reevaluation: Equating the sustainable transformation of energy systems with decentral revolution means ignoring the benefits from coordination. Clearly, the large-scale transformation to volatile renewables also incurs spillover effects across regional and national boundaries. The benefits of internalising such spillover effects should be taken into account. For instance, regional initiatives need to ensure policy consistency within higher governance levels to address potential system externalities from initiatives such as '100% renewable regions'. Consider the case of renewables targets at the German state level whose sum does not match the overall target at the national level.[36] Similarly, the concerns for 'actor diversity' in the energy system in a recent revision of Germany's RES Act entailed strong advantages for energy cooperatives when applying for the renewable energy tenders. Yet this 'comfort zone' for energy cooperatives seems to have considerably distorted the auction results, while the actual target of promoting local citizen cooperatives may have been subverted.[37] Also, preferential treatment for some electricity suppliers, *ceteris paribus* drives up electricity prices at the expense of all electricity consumers – so one might ask in what way distributive arguments lend themselves to promote 'actor diversity' at all. Finally, consider again the legal struggles over re-communalisation of electricity grids: from an efficiency perspective, no bidder should be granted preferential access. Any proposal for grids to come under public ownership, therefore, requires public consent for potential cost increases in exchange for stakeholder control over security of supply as a public good. Overall, the regulatory framework should guarantee free market entry by preventing monopolistic or oligopolistic entry barriers. Certainly, local efforts to promote sustainable energy are to be welcomed but the potential benefits from (supra-) national coordination and market competition are not to be forgotten either.

Security of supply and Nord Stream 2

The concerns over the new gas pipeline Nord Stream 2 confirm both the EU Commission and critics of the internal market agenda. On the one hand, the Commission is right in being skeptical about a project that obviously tends to increase import dependency from what is already the EU's biggest external gas supplier.[38] One might doubt whether the pipeline project can be squared with the objective of diversifying import structures.[39] On the other hand, the Commission's criticism also undermines its own case for a liberalised internal market: As with the other issues of non-climate environmental externalities and long-term uncertainties, safeguarding security of supply may, in some instances, require regulatory interventions.

Conclusions

The EU Commission follows a clear economic rationale for market integration in terms of energy policy. This line of argument is valid only for well-defined aspects, such as mitigation of greenhouse gas emissions. However, the sustainability transformation of energy systems encompasses more than climate policy, which implies that regulatory interventions beyond the EU ETS may be justified. Not every departure from the internal market agenda expresses economic ignorance or a mere national reticence to surrender decision-making power – the economic rationale for regulatory interventions in energy markets both at the EU and at the (sub-)national levels should be assessed and compared to the internal market rationale. In any case, distinguishing the two conflict dimensions illustrated in Figure 1 (allocation of decision-making power, regulatory intervention vs. internal market) helps to clarify the discussion. As regards the allocation of decision-making power, attempts to coordinate transition efforts on all governance levels are cer-

35 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.

36 D. Ohlhorst: Germany's energy transition between national targets and decentralized responsibilities, in: Journal of Integrated Environmental Sciences, Vol. 12, No. 4, 2016, pp. 303-322.

37 E. Gawel, M. Amberg: Ausschreibungen im EEG – Eine Auswertung der bisherigen Erfahrungen, in: Energiewirtschaftliche Tagesfragen, Vol. 68, No. 7/8, 2018, pp. 24-30.

38 See https://ec.europa.eu/eurostat/cache/infographs/energy/bloc-2c.html.

39 S. Strunz, E. Gawel: Import dependency and the energy transition – A new risk field of security of supply?, in: E. Gawel, S. Strunz, P. Lehmann, A. Purkus (eds.), op. cit., pp. 301-310.

tainly to be welcomed. Yet, the path towards a sustainable EU energy system needs to pass a fragmented policy landscape: even if integrated solutions are economically advisable, they may not be available in the short or medium term due to politico-economic reasons.[40] Thus, regional and national approaches represent legitimate starting points for the transition to sustainable energy. Otherwise, the sustainability transition might occur too late – as history shows, energy transitions are decade-long processes that need to overcome multiple path-dependencies.[41] The Commission, due to the constraints described, also partly consents to bottom-up initiatives, for instance, when in spring 2019 it approved the communal reacquisition of a district heating network in Hamburg. At the same time, this is no plea for equating the sustainability transformation with a decentralised energy revolution because this picture strongly risks overlooking the benefits of cooperation and consistency.

40 S. Strunz, E. Gawel, P. Lehmann: The political economy of renewable energy policies in Germany and the EU, in: Utilities Policy, Vol. 42, 2016, pp. 33-41.

41 B. Sovacool: The History and Politics of Energy Transitions. Comparing Contested Views and Finding Common Ground, in: D. Arent, C. Arndt, M. Miller, F. Tarp, O. Zinaman (eds.): The Political Economy of Clean Energy Transitions, Oxford 2017, Oxford University Press, pp. 16-35.