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THE REGULATORY ANTICOMMONS OF GREEN
INFRASTRUCTURES

Giuseppe Bellantuono

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THE REGULATORY ANTICOMMONS OF GREEN INFRASTRUCTURES

ABSTRACT

Development of green infrastructures (renewable energy plants and transmission networks) is urgently needed if significant reductions of greenhouse emissions are to be accomplished in the next few decades. But the huge financial investments required by these infrastructures will not be undertaken without a well-designed regulatory framework. This paper argues that barriers to the implementation of such a framework can best be understood by drawing analogies to the Law and Economics literature on anticommons. This analytic framework is employed to assess and criticize EU and US proposals to regulate planning and siting of green infrastructures.

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Keywords

Energy Law – Environmental Law – Comparative Law -
Anticommons – Planning – EU Law – US Law

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THE REGULATORY ANTICOMMONS OF GREEN INFRASTRUCTURES*

Giuseppe Bellantuono

1. Introduction: regulating green infrastructures

In October 2010 the Chairman of the German agency DENA made a scaremonger declaration: Germany's aging power grid could collapse in the near future if the current trend of increasing the injection of solar power is not cut back quickly and drastically. Generous subsidies for renewable energy sources (RES) were described as the main cause for this unpleasant scenario.¹ However, it is clear that subsidies are not the only problem. The unavailability of transmission infrastructure is at least as relevant as the distortionary effects of RES-supporting measures. The difference is that subsidies can be easily modified in the short term, while an infrastructure deficit can only be remedied with a sustained commitment in the medium-long term.

The German example is interesting in itself because it comes from a country that in the last decades has been at the forefront of green investments. If one of the most successful attempts to increase

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¹ The declaration by Stephan Kohler, Chairman of the Deutsche Energie-Agentur GmbH (DENA), can be read at www.germanenergyblog.org, post of 19 October 2010. A few weeks later, this declaration was supported by the data published in the DENA Grid Study II (November 2010), showing that the need for new power lines by 2015 had been satisfied only to a limited extent and that the new base scenario for 2020 asked for 3,600 km of new extra high voltage lines, at a cost of €9.7 billion.

the environmental sustainability of energy systems is now faced with severe grid stability problems, this is an alarm bell for any other national or international climate change policy.

Cries for a complete overhaul of electricity transmission and distribution grids have been heard for a while. In the nineties the main argument was that existing networks were the legacy of the era of vertically integrated monopolies. Liberalization policies asked for the development of new power lines, both to knock down barriers preventing the entry of new energy players and to increase interconnections among formerly divided energy systems. Later on, when climate change policies came high on the political agenda, infrastructure development was invoked to allow the fullest exploitation of low-carbon technologies. In both cases, many new regulatory measures have been proposed and implemented. Sadly enough, their effectiveness in tackling the infrastructure deficit has still to be proved. Problems with grid stability are not a peculiar feature of the German system. In the EU, the cross-border interconnections which should support the ambitious goal of decarbonising the energy systems in a few decades are still in a project phase. At national level, most Member States are striving to overcome past failures which hampered RES integration within existing grids and market structures.

The picture is no less gloomy on the other side of the Atlantic Ocean. In the USA, a comprehensive federal policy on climate change has not been enacted so far. Hence, federal measures aimed at developing the electricity transmission networks have a narrow scope and are mainly of a financial nature. The federal energy regulator (FERC) is trying to exploit its powers to build a regulatory framework that eases the transition towards a greener energy system. Moreover, a large number of independent initiatives is going on at

regional and state levels. Whether this flurry of activities will have a significant impact on the overall rate of GHG emissions is difficult to foresee.²

This paper tries to shed light on the reasons which obstruct attempts to foster the development of green infrastructures. I include in this definition both RES plants (e.g. onshore and offshore wind farms, small and large solar plants) and transmission grids.³ The lack of an adequate regulatory framework for green infrastructures is especially worrisome in light of their peculiar characteristics. The most important ones are: a) a long time horizon (up to 40 years for power plants and more than 75 years for power lines); b) the lumpiness of the investments, usually undertaken in a relatively short period of time; c) the presence of externalities generated by cumulative mechanisms like increasing returns to scale, induced technological change, learning by doing or agglomeration economics. Taken together, these characteristics make it very costly to remedy mistakes in the initial choice of the infrastructure. If the stream of GHG emissions they generate is too high compared to available alternatives, this negative effect will be felt in the future for a long time. The presence of externalities will make it unlikely or too costly a shift to low-carbon infrastructures. Likewise, alternative solutions available in the future, like retrofit (reducing or eliminating

² See, e.g., the preliminary assessments by R. Wiser and G. Barbose, *Renewables Portfolio Standards in the United States: A Status Report with Data Through 2007*, Lawrence Berkeley National Laboratory, April 2008, 15 (under existing policies non-hydro RES will provide just 6% of total US electricity generation by 2025); S. Carley, *State Renewable Energy Electricity Policies: An Empirical Evaluation of Effectiveness*, 37 *Energy Pol.* 3071 (2009) (states adopting Renewable Portfolio Standard policies did increase total RES investment and deployment, but not the percentage of RES electricity generation).

³ A different definition of green infrastructure is provided by the European Commission in its biodiversity strategy and in the policies aimed at maintaining and restoring ecosystem services: see http://ec.europa.eu/environment/nature/ecosystems/index_en.htm.

emissions from existing infrastructures with technological innovations) or closedown, may entail large costs.⁴

At the most general level, many factors might affect the ability of a decision-maker to overcome inertia in the development of green infrastructures or to choose the infrastructure with the optimal level of GHG emissions. The decision-maker may simply ignore the probability of the catastrophic consequences of climate change, may consider only local damage and not global damage, may discount the future too heavily, or may be influenced by energy prices below the optimal level.⁵ Of course, the next question is what kind of institutional design is needed to improve on the decision-making capabilities of regulators. I suggest that this issue can be analyzed with the tools provided by the Law and Economics literature on ownership anticommons.⁶ More specifically, I suggest that planning

4 On the characteristics of investments in low-carbon infrastructures see Z. Shalizi and F. Lecocq, *Climate Change and the Economics of Targeted Mitigation in Sectors with Long-Lived Capital Stock*, World Bank Policy Research Working Paper 5063, September 2009. On the costs of retrofitting and closedown see J. Strand and S. Miller, *Climate Cost Uncertainty, Retrofit Cost Uncertainty, and Infrastructure Closedown: A Framework for Analysis*, World Bank Policy Research Working Paper 5208, February 2010.

5 See the analysis by J. Strand, *Inertia in Infrastructure Development: Some Analytical Aspects, and Reasons for Inefficient Infrastructure Choices*, World Bank Policy Research Working Paper 5295, May 2010. Of course, for many other categories of infrastructure investments, causes like strategic misrepresentation and psychological biases contribute to underestimation of costs and overestimation of benefits: see B. Flyvbjerg, *Survival of the Unfittest: Why the Worst Infrastructure Gets Built – and What We Can Do About It*, 25(3) *Oxford Rev. Econ. Pol.* 344 (2009). The same problems plague investment in green infrastructures, but I suggest that the difficult assessment of costs and benefits in climate change policies adds another layer of complexity for the choice of governance structures.

6 References to anticommons in the energy sector have already been made by the pioneer of this literature. See M. Heller, *Gridlock Economy: How Too Much Ownership Wrecks Markets, Stops Innovation, and Costs Lives*, Basic Books, 2008, xiv, 19-20 (difficulties with transmitting wind energy from states with high wind potential to coastal cities with the strongest demand for clean energy). See also H.

of green infrastructures can be managed more effectively if the underlying problem is described as one of coordination among veto players, much like a traditional ownership anticommons where each owner has the right to exclude others from using a privately held resource.

The main advantage of the anticommons approach lies in its emphasis on the strategic posture of the multiple owners. Each of them tries to maximize her own utility function, but the final outcome of their uncoordinated decisions is underexploitation or underinvestment in the resource. Compared to the more traditional tragedy of the commons, anticommons display one similarity and one difference. In both cases, a collective action problem must be solved. The difference is in the direction of the inefficient behaviour: overexploitation for commons, underexploitation for anticommons.⁷

The opposite tragedies of the commons and the anticommons offer a valuable analytic perspective for issues relating to the optimal use of a resource by a large number of stakeholders. I maintain that planning of green infrastructures fits in with this category. At a more immediate level, it is clear that new power lines and RES plants require a big shift of large quantities of natural resources (land, water, air, landscape) from traditional to alternatives uses. Therefore, each green infrastructure will encroach upon other stakeholders'

Wiseman, *Expanding Regional Renewable Governance*, forthcoming 35 *Harv. Envtl. L. Rev.* (2011), available at www.ssrn.com, 30-32 (identifying an anticommons in “renewable parcels” where wind and sunlight can be exploited). For anticommons in the siting of gas infrastructures see A.J. Durbin, *Striking a Delicate Balance: Developing a New Rationale for Preemption While Protecting the Public’s Role in Siting Liquefied Natural Gas Terminals*, 56 *Emory L.J.* 507 (2006).

⁷ It has been suggested that overexploitation is also possible in an anticommons, hence the real difference from the commons is the type of strategic interaction. See L.A. Fennell, *Common Interest Tragedies*, 98 *Nw. U. L. Rev.* 907, 934-937 (2004).

rights. In many cases, each of them will be entitled to veto the project. But in a second and less straightforward meaning, the anticommons perspective can be extended to the design of the coordination mechanisms among the many types of regulators usually involved in the development of green infrastructures. Whereas the anticommons perspective is usually associated with property concepts, it also offers an additional analytic tool to regulation studies.⁸

The paper is organized as follows. Section 2 describes the regulatory measures for the development of green infrastructures proposed or implemented in three MSs. Section 3 deals with the EU initiatives for cross-border planning and authorization. Section 4 describes the regulatory measures and the debate on green infrastructures in the US. Section 5 explains why the concept of regulatory anticommons is the key to understanding the infrastructure deficit. At the same time, this section deals with some theoretical issues raised by the analogy between ownership and regulatory anticommons. Section 6 offers some suggestions on the regulatory mechanisms which, according to the anticommons literature, have better chances of success in addressing coordination failures. Section 7 summarizes the arguments.

2. Developing green infrastructures: planning and

⁸ There have been many other instances of cross-fertilization between property concepts and environmental regulation: see, e.g., C.M. Rose, *Common Property, Regulatory Property, and Environmental Protection: Comparing Community-Based Management to Tradable Environmental Allowances*, in E. Ostrom et al. (eds.), *The Drama of the Commons*, National Academy Pr., 2002, 223; D.H. Cole, *Pollution and Property: Comparing Ownership Institutions for Environmental Protection*, Cambridge UP, 2002; D.H. Cole, *New Forms of Private Property: Property Rights in Environmental Goods*, in B. Bouckaert (ed.), *Property Law and Economics*, Elgar, 2010, 225.

authorization in EU Member States.

At the most general level, the development of green infrastructures is dependent on a sequence of authorization procedures. They include the choice of the site where the infrastructure will be built, the issuance of all the permits related to construction and operation of the infrastructure, as well as its connection to the already existing grids. Many factors affect content and duration of authorization procedures, including the dimensions of the infrastructure, the characteristics of the geographic zone where it is placed and the number of stakeholders entitled to participate in the procedure or to oppose the project. In the last decade the EU has tried to avoid that delays in these procedures hamper the goal of decarbonising the energy sector. European interventions have been directed at both the national and the supranational level. More recently, many Member States (MSs) have independently adopted new measures to speed up and coordinate the authorization procedures. It is too early to assess their effectiveness, but in any case they only address infrastructure needs at national level.

For the European level, available studies show that the measures enacted so far have not produced satisfactory results. It is hoped that the new measures included in the 2009 Third Energy Package will fare better. The proposed Infrastructure Package, to be discussed in the next section, is meant to boost the development of cross-border interconnections. For the purposes of this paper, it is interesting to note that the focus of EU policies on the legal-administrative barriers to green infrastructures closely resembles the description of a regulatory anticommons: many public authorities, communities and other stakeholders must give their assent to the project and can

exercise formal or informal veto rights. In the balance of this section I describe the main EU measures aimed at harmonizing authorization procedures at MS level. The next section discusses EU initiatives for cross-border infrastructures.

The first RES directive (2001/77/EC) already asked MSs to review their procedures in order to reduce regulatory and non-regulatory barriers to the increase of RES electricity production, to streamline and expedite procedures at the appropriate administrative level, to ensure that the rules are objective, transparent and non-discriminatory, and take fully into account the particularities of different RES technologies (article 6). Transmission system operators (TSOs) and distribution system operators (DSOs) were required to guarantee connection of RES plants according to objective, transparent and non-discriminatory criteria (article 7).

Were these measures successfully implemented ? Only to a limited extent. Several reports by the European Commission show that MSs made little progress on the adoption of best practices for authorization procedures, namely one-stop authorization agencies, pre-planning mechanisms assigning locations for RES development, lighter procedures for small projects and guidance on the relationship with the European environmental legislation. Grid access was hampered by opaque procedures and by the lack of coordination between construction of RES plants and extension of grid capacity.⁹

In keeping with claims on the central role played by administrative barriers, many studies have tried to compare authorization procedures at national level for different RES technologies. It has been shown that 85% of MSs do not have

⁹ See COM (2005) 627 fin. of 7 December 2005; SEC(2008)57 of 23 January 2008; COM (2009) 192 fin. of 24 April 2009; SEC (2009) 503 fin. of 24 April 2009.

effective one-stop shop authorization procedures, the number of permits ranges between one and forty, 40% of MS do not exempt small-scale systems from authorization, lead time for grid connection ranges between less than six months and over three years, 60% of MSs do not have efficient plans for the reinforcement of connection capacity within the country and of the interconnection capacity with neighbouring countries.¹⁰

Much the same picture is displayed by other two studies. For wind power, the average number of authorities to be contacted directly or indirectly is 18 for onshore projects and 23 for offshore projects. Even the best performing countries require fewer than 10 contacts in total, much higher than the recommended one-stop approach. Lead time for authorization procedures and connection is also much higher than the recommended 24 months, ranging on average between 54.8 months for onshore and 32 months for offshore.¹¹ For large-scale photovoltaic systems, average duration of the project ranges between 50 and 231 weeks, while legal-administrative costs can represent a share of overall project costs ranging between 8% and 47%.¹²

The new RES directive (2009/28/EC), to be implemented by 5 December 2010, includes provisions which should push MSs to reduce administrative barriers. According to article 13.1(a)-(f), certification and licensing procedures shall be clearly coordinated and defined, with transparent timetables for determining planning and building applications. Administrative procedures shall be streamlined and expedited at the appropriate administrative level.

¹⁰ See Ecorys, *Assessment of Non-Cost Barriers to Renewable Energy Growth in EU Member States*, Final Report, May 2010, available (together with national reports for the 27 MSs) at the DG Energy website.

¹¹ See *Wind Barriers, Administrative and Grid Access Barriers to Wind Power*, July 2010, available at www.windbarriers.eu.

¹² *PV Legal, First Status Report*, July 2010, available at www.pvlegal.eu.

Simplified procedures shall be established for smaller projects and decentralized devices. Article 16 asks MSs to develop grid infrastructures to accommodate increases in RES electricity production. Moreover, authorization procedures for grid infrastructures shall be sped up and coordinated with administrative and planning procedures. Unlike the first RES directive, article 16.2(b) asks MSs to provide for either priority access or guaranteed access. Additionally, TSOs and DSOs shall provide any new producer a reasonable indicative timetable for any proposed grid connection [article 16.5(c)].

The implementation of these measures may improve on the present situation. The coordination between the development of grid infrastructures and planning procedures addresses one of the most vexing problems for effective RES integration. Moreover, the Commission has provided guidelines on the compatibility of wind farms development and some aspects of the EU environmental legislation.¹³ Although not binding, the guidelines can help to promote coordinated planning and reduce conflicts between divergent interests in authorization procedures.

However, even the new RES directive did not compel the MSs to follow the best practices repeatedly recommended in implementation reports. This may come as a surprise. Why more advanced harmonization measures were not included? Concerns for the subsidiarity principle are a plausible explanation. But they are only a partial one. After all, the EU energy policy has already imposed many constraints on MSs' sovereignty. Binding commitments on the 2020 objectives will surely have a deeper impact on national energy systems than further modifications of authorization procedures. I advance the hypothesis that this aspect

¹³ See European Commission, Wind Energy Developments and Natura 2000, October 2010, available on the DG Environment website.

of national regulatory systems entails a difficult balancing exercise among competing interests. Which regulatory authorities should be involved, how vertical and horizontal competences should be distributed, how the goals of environmental protection should be traded off with the development of energy markets, how broad should be the participatory rights of stakeholders, are all questions which admit a variety of answers. Moreover, there is a high probability that the answers will be strongly influenced by national administrative law. This means that the best practices for authorization procedures suggested by the Commission are but one of the possible regulatory options available to national legislators. A cursory glance to existing authorization procedures in three MSs (Denmark, UK and Italy) confirms that they all share the same goals (reducing delays and costs), but try to achieve them through different paths.

Denmark is generally praised for its successful implementation of the one stop shop approach for wind farms. However, this country also displays a large number of peculiarities which explain why it was able to develop a strong domestic industry for wind turbines and to use it as a driver for wind power development.¹⁴ Thanks to this national strategy, wind power has been widely supported with generous subsidy schemes and compensations for landowners, thus becoming more attractive than other RES technologies. In this favourable regulatory framework, streamlining of authorization procedures is an obvious consequence. Though, even in this case the effectiveness of such procedures depends on

¹⁴ On the factors which helped Denmark to become a world leader in wind technologies see, e.g., J. Buen, *Danish and Norwegian Wind Industry: The Relationship Between Policy Instruments, Innovation and Diffusion*, 34 *Energy Pol.* 3887 (2006); P. Karnøe and A. Buchhorn, *Denmark: Path Creation Dynamics and Winds of Change*, in W. M. Lafferty and A. Ruud (eds.), *Promoting Sustainable Electricity in Europe*, Elgar, 2008, 73.

the details of institutional choices. For example, the quick approval of offshore wind projects is heavily influenced by the strong selection effect of the large fines the developers have to pay if the project is not implemented within strict deadlines. The downside of this mechanism is that valuable projects become too risky and may not be proposed at all. Moreover, how the one shop stop approach is really implemented is directly related to the nature of the relationship among the stakeholders, which is in turn influenced by the national regulatory style. The Danish Energy Authority (DEA) is formally empowered with exclusive decision-making powers, but it is clear that the consultation process is directed at preventing conflicts and brokering a consensus position among all the interested stakeholders.¹⁵

Another example of centralized authorization procedure can be found in the UK Planning Act 2008. For nationally significant infrastructure projects, the Act replaces the traditional procedure of public inquiries with a development consent order to be issued by the Infrastructure Planning Commission (IPC).¹⁶ The order must

¹⁵ At least six other authorities are usually “involved” in the authorization process for offshore wind turbine projects. See Danish Energy Authority, *Wind Turbines in Denmark*, November 2009, available at www.ens.dk. For descriptions of Danish authorization procedures see also the national report on Denmark in the Ecorys study, above note 10; Asia Sustainable and Alternative Energy Program, *China: Meeting the Challenges of Offshore and Large-Scale Wind Power*, World Bank, May 2010.

¹⁶ While the Planning Act conceived of the IPC as an independent non-governmental body, the new coalition government elected in 2010 will replace the IPC with a Major Infrastructure Planning Unit that will be part of the Planning Inspectorate within the UK Department of Communities and Local Government. This Unit will carry out broadly the same functions as the IPC, but final decisions will be made by Ministers based on the recommendations of the Unit. See the statement of the coalition government of 29 June 2010, the Draft Structural Plan published by the Department of Communities and Local Government in July 2010 and the Infrastructure Plan 2010 published by the UK Treasury in October 2010.

follow the guidelines set out by the government in the National Policy Statements for each type of infrastructure. Such guidelines prevail over local plans. The order will cover any authorization required for building the proposed infrastructure, including rights to compulsorily purchase land. The IPC can also provide a defence against any civil or criminal proceedings for common law or statutory nuisance.¹⁷ To ensure that all the affected interests are taken into account, two different consultation procedures must be carried out. In the pre-application stage, the developer shall consult relevant local authorities and any persons with an interest in land. After the application, the IPC shall start a new consultation and the local authorities shall submit a local impact report.

The application should be decided within nine months. Compared to the previous authorization procedure, with many public bodies involved and longer time frames, the Planning Act is a clear improvement. But besides timing issues, it seems clear that the new procedure is intended to give due consideration to the interests opposing the infrastructure and to a large set of factors. The IPC shall take into account national, regional and local benefits as well as any environmental, social and economic impacts. Consent should be refused if the adverse impacts identified outweigh the benefits of the proposed development. Conditions can be imposed when they are necessary to make the proposed development acceptable in planning

¹⁷ However, the defence is available only to the extent that the nuisance is the inevitable consequence of what has been authorised. Moreover, the defence does not extinguish the local authority's duties to inspect its area and take reasonable steps to investigate complaints of statutory nuisance and to serve an abatement notice where satisfied of its existence, likely occurrence or recurrence. The defence is not intended to extend to proceedings where the matter is prejudicial to health and not a nuisance. Finally, the IPC can impose requirements to mitigate or limit nuisances. See Department of Energy and Climate Change, Revised Draft Overarching National Policy Statement for Energy, October 2010, 65, 84f.

terms.¹⁸ Also relevant is the fact that planning decisions and transmission grid development are kept separate, the latter being under the control of the energy regulator Ofgem. All in all, the real benefits of the new procedure are tightly linked to a host of implementation details, including the scope of consultations, the human resources available to the IPC, and coordination with policies related to grid development and maritime infrastructures.¹⁹ These observations support the argument that the choice to assign most decision-making powers to a single body is just one piece of a much larger infrastructure strategy.

In Italy two different mechanisms have been adopted to streamline and accelerate authorization procedures. The first is the Conference of Parties (COP). It allows the public body with the power to start the procedure (usually a region or a province, for offshore wind farms the ministry for Infrastructures) to convene all the other concerned public bodies and ask them to express their consent or denial within tight time limits. The convener issues the authorization taking into account the prevailing positions, which means that the decision does not require unanimity. However, according to the new rules introduced in 2010, motivated dissent from public bodies responsible for the protection of the environment, public health, or historical and cultural heritage, shifts

¹⁸ DECC, Revised Draft, above note 17, 44f..

¹⁹ See E. Gibson and P. Howsam, *The Legal Framework for Offshore Wind Farms: A Critical Analysis of the Consents Process*, 38 *Energy Pol.* 4692 (2010). The parliamentary scrutiny on the draft national statements concluded that they should be coordinated with other ongoing reforms in the planning system and in the electricity markets. Recommendations were also made for more strategic spatial guidance in the development of energy infrastructures. See House of Commons, Energy and Climate Change Committee, *The Revised Draft National Policy Statements on Energy*, 26 January 2011. A discussion of methods for handling the environmental impact of offshore wind projects in the UK planning process is provided by D. Toke, *The UK Offshore Wind Power Programme: a Sea-Change in UK Energy Policy ?* 39 *Energy Pol.* 526 (2011).

the final decision to the national government, even without the agreement of the interested local governments. At least in principle, the COP is a useful device to speed up the collection of a large number of different authorizations. Developers are also granted the right to ask for damages to the administrative judge when the time limits for the COP are not complied with.²⁰ However, the effectiveness of such procedure in reducing lead time to put in operation a RES plant has been much debated. According to one European study, time spent for the administrative process is on average fifteen months (up to sixty months for wind farms), compared to the legislative time limit of six months. The number of public bodies involved can be very high, ranging between 15 and 50.²¹

As far as the national electricity networks are concerned, a single authorization procedure modelled after the consensual mechanism of the COP was introduced in 2003 and modified in 2004. However, in 2005 the Italian Constitutional Court denied the legitimacy of the provisions transferring to the national government the power to authorize the transmission infrastructure when the agreement with the regions cannot be reached. This means that in case of

²⁰ The single authorization procedure for RES plants was adopted by art. 12, legislative decree 29 December 2003, n. 387 (implementing the first RES directive). It refers to the procedure for the COP regulated by art. 14ff. law 7 August 1990, n. 241. See also the guidelines on the regional authorization of RES plants adopted with ministerial decree of 10 September 2010. Art. 4 of the legislative decree implementing the second RES directive will introduce shorter time limits for the single authorization procedure. For comments on the Italian authorization procedures see generally S. Fanetti, *L'autorizzazione unica per la costruzione e l'esercizio di impianti alimentati da fonti rinnovabili*, in B. Pozzo (ed.), *Le politiche energetiche comunitarie: un'analisi degli incentivi allo sviluppo delle fonti rinnovabili*, Giuffrè, 2009, 157; C. Mezzabarba, *Profili critici nello sviluppo della produzione di energia da fonti rinnovabili*, *ibid.*, 193; A. Macchiati and G. Rossi (eds.), *La sfida dell'energia pulita - ambiente, clima e energie rinnovabili: problemi economici e giuridici*, il Mulino, 2009.

²¹ See *Non-Cost Barriers to Renewables – AEON study: Italy*, 10 May 2010, 10f., available on the website of the DG Energy.

disagreement the controversy must be addressed to the Constitutional Court.²² It does not seem that this procedure has worked well. The Italian stakeholders claim that the grid has not been modernized in the last fifteen years. Its present status does not allow the connection of an increasing number of RES plants. Moreover, priority dispatch of wind farms is not guaranteed because of lack of capacity. Finally, lead time for getting grid connection is very long (between 6 and 30 months).²³

In 2010 the Italian government introduced a new procedure for energy infrastructures of strategic national relevance. The interventions are implemented through the cooperation between the special commissioners appointed by the national government and the local public bodies. The commissioners have the power to overcome inertia by the local bodies. When the agreement with the local governments cannot be achieved, the final decision on the interventions is taken by the national government.²⁴

While the example of Italy seems a paradigmatic case of regulatory anticommons, it also shows that insistence on the one shop stop approach cannot, in itself, provide satisfactory solutions when straightforward coordination mechanisms are not available. Both horizontal (among local bodies) and vertical (among national government and local bodies) interplay shall be explicitly managed to

²² See art. 1-sexies law 27 October 2003, n. 290; Italian Constitutional Court, decision of 14 October 2005, n. 383, *Giur. Cost.*, 2005, 3640.

²³ Non-Cost Barriers to Renewables – AEON study: Italy, above note 21, 43-45, 47-49. New provisions attempting to coordinate the authorization procedure for the RES plant and its connection to the network will be introduced by the legislative decree implementing the second RES directive.

²⁴ See art. 1 law 13 August 2010, n. 129. The previous attempt to appoint special commissioners (law 3 August 2009, n. 102) was deemed illegitimate by the Italian Constitutional Court because it did not justify the transfer of powers from the regions to the state when the investment is to be undertaken by private parties: see the decision of 17 June 2010, n. 215.

avoid that conflicts among different categories of public and private interests end up in stalemate. The Italian example also shows that national institutional constraints (in this case, the constitutional allocation of concurring legislative powers to the state and the regions in energy matters) make it very difficult to suggest uniform solutions for all MSs.

3. Planning and authorization for EU cross-border infrastructures.

While imposing a single point of equilibrium for authorization procedures in all the EU will lead to unnecessary controversies, there is space for European interventions when cross-border infrastructures are needed. In the past fifteen years, the TEN-E program has been the main policy instrument. Following the mandate of articles 154-156 EC Treaty, now confirmed by articles 170-172 TFEU, energy infrastructures of European interest have been selected for financial support. However, the TEN-E program displayed many weaknesses: co-financing could not exceed 1% of the total investment cost for each project, only a handful of listed projects have been completed, there was a lack of provisions addressing coordination and differences in authorization procedures. Only the new 2006 guidelines provided for the appointment of European Coordinators, whose role is to mediate in strategic cross-border projects to resolve practical difficulties.²⁵

Acknowledging that the TEN-E program will not deliver the

²⁵ See decision No 1364/2006/EC of the European Parliament and of the Council of 6 September 2006 laying down guidelines for trans-European energy networks; European Commission, *The Implementation of the Trans-European Energy Networks in the Period 2007-2009*, COM (2010) 203 fin. of 4 May 2010. See also P. Buijs et al., *Seams Issues in European Transmission Investments*, 23(10) *Elec. J.* 18 (2010).

results expected by liberalization and climate change policies, the EU institutions are now trying to design new tools aimed at supporting a truly pan-European energy infrastructure. The electricity regulation (EC) No. 714/2009 asks the European Network of Transmission System Operators (ENTSO-E) to publish a Community-wide network development plan every two years (article 8). The plan shall take into account both the ten-year network development plans submitted by each TSO at national level (article 22 directive 2009/72/EC) and the regional investment plans published every two years (art. 12 reg. 714/09). The Community-wide plan and the regional plans are not binding. However, enforcement powers are given to national regulators (NRAs) to ensure that the planned investments are actually executed (article 22.5-8 dir. 72/09). Moreover, the Agency for the cooperation of Energy Regulators (ACER) monitors the contents and implementation of the Community-wide plan, as well as the regional cooperation among TSOs. The ACER can issue a reasoned opinion or recommendations to ENTSO-E and EU institutions if the plan does not contribute to non-discrimination, effective competition, the efficient functioning of the market or a sufficient level of cross-border interconnection (article 6.4, 6.8-9 reg. (EC) No. 713/2009).

The ENTSO-E published its first pilot Community-wide plan in June 2010. However, it was criticized on the ground that it amounted to no more than a list of investment projects, without any clear model of the future European grid.²⁶ The pilot Community-wide plan addresses explicitly the issue of authorization procedures. It complains that the whole procedure for new power lines can take up to 20 years. Recommended improvements include integrated

²⁶ See the joint declaration by Eurelectric and EWEA of 10 June 2010, as well as the ENTSO-E report on received comments, 21 May 2010.

procedures, to be centralized at national level, effective time-limits, and explicit support in national laws for TEN-E projects, with infrastructure corridors to be reserved for those projects.²⁷

The lack of an adequate regulatory framework for cross-border networks is widely acknowledged in most studies on the development of the European grids. Attempts to develop European interconnections within well-defined priority corridors entail a strong cooperation among NRAs and an advanced level of harmonization for planning and authorization procedures, methodologies for cost allocation, market structures and congestion management.²⁸ Similarly, the EU goal of at least 80% lower GHG emissions by 2050 entails a major expansion of interconnection capacity among the national transmission networks and the coordinated operation of a trans-European wholesale power market. These big accomplishments can be achieved only if ENTSO-E and ACER are given the mandate to collect MSs' longer term forecasts and develop a strategic interconnection plan aimed at minimising the resource costs of decarbonisation across Europe. An improved regulatory regime should also be developed to fund the new infrastructures and enable the costs to be shared equitably across European consumers who will all benefit from the reduced energy costs and increased system security. Moreover, to avoid the delays usually associated with authorization procedures, pre-approved planning areas for strategic low carbon assets could be singled out.²⁹

²⁷ See ENTSO-E, Ten Year Network Development Plan 2010-2020, 28 June 2010, 279-283. See also ENTSO-E, Position Paper on Permitting Procedures for Electricity Transmission Infrastructure, 29 June 2010.

²⁸ See Ramboll Oil & Gas and Mercados, TEN-Energy Priority Corridors for Energy Transmission, Part Two: Electricity, November 2008, available on the website of DG Energy.

²⁹ See European Climate Foundation, Roadmap 2050: A Practical Guide to a Prosperous, Low-Carbon Europe, volume 2, Policy Recommendations, April 2010, available at www.europeanclimate.org.

The Commission had already decided to move along this path with its Second Strategic Energy Review and the Green Paper on European Energy Networks, both published in 2008.³⁰ At the end of 2010, the new Infrastructure Package began to take shape.³¹ A blueprint for strategic planning was put forward. For electricity networks, four priority corridors were identified. These priorities will then be translated into projects. They will be awarded the label of “Project of European Interest” and subject to special rules for their implementation. More specifically, the tools proposed by the Commission include the delegation of planning tasks to the existing Regional Initiatives or to ad hoc regional structures, streamlined authorization procedures, improvement of cost allocation rules and optimization of EU’s leverage of private and public funds.

The streamlined procedure shall be designed as follows. A single national authority will serve as interface between project developers and public authorities. This authority would be in charge of coordinating the entire permitting process. For cross-border projects, the possibility of coordinated or joint procedures is left open. A time-limit for the procedure could be set up. After its expiry, special powers to adopt a final positive or negative decision within a set timeframe could be given to an authority designated by the concerned MSs. Requirements for compensation of the affected

For other proposals see S. Andoura et al., *Towards a European Energy Community: A Policy Proposal*, Notre Europe, 2010, 111-113 (proposing the creation of independent regional executive energy agencies, exclusively competent for the development of cross-border networks); P.A. Boot and B. van Bree, *A Zero-Carbon European Power System in 2050: Proposals for a Policy Package*, Energy Research Centre of the Netherlands, April 2010, 82f., available at www.roadmap2050.eu (ACER could be delegated the task of promoting the development of a European zero carbon infrastructure).

³⁰ COM (2008) 781 fin. of 13 November 2008 and COM (2008) 782 fin. of 13 November 2008.

³¹ COM (2010) 677 fin. of 17 November 2010 and the accompanying impact assessment SEC (2010) 1395 fin. .

populations, together with rewards and incentives where timely authorization is made easier, could be included.

These proposals will be translated in more specific rules with the Energy Security and Infrastructure Instrument, to be tabled in 2011. But there is enough material to advance two observations. Firstly, the present situation of green infrastructures in the EU displays all the characteristics usually associated with an anticommons. Secondly, the Commission's proposals attempt to reduce the costs of authorization procedures and avoid delays, but it is not clear whether there is complete awareness of the extent and nature of coordination problems.

As far as the characteristics leading to an anticommons-type situation are concerned, it is clear that each public body involved in the authorization process can block the final approval of the project. This means that there is perfect complementarity among all the public bodies. Anticommons can also arise when complementarity is less than perfect, for example because some uses of the resource are still possible without the consent of other stakeholders. But anticommons located at the extreme of perfect complementarity are harder to deal with.³² Additionally, the higher the number of stakeholders with veto powers, the larger the losses from underutilization of the resource.³³ Finally, authorization of green infrastructures resembles the situation of a sequential anticommons, where the decision of each stakeholder to exercise her veto right or not is made in successive stages. Non-simultaneous decisions have some advantages in reducing the losses from underutilization. If the

³² See the model proposed by F. Parisi et al., *Duality in Property: Commons and Anticommons*, 25 *Int. Rev. L. & Econ.* 578, 585 (2006). The same idea can be expressed through a reference to production functions, with lumpy or step goods requiring all the contributions to deliver the surplus. See Fennell, above note 7, 956-961.

³³ See N. Schulz et al., *Fragmentation in Property: Towards a General Model*, 158 *J. Inst. & Theor. Econ.* 594, 600 (2002).

first mover decides not to exclude, the second mover can reap the benefits of this positive externality and decide to pursue the common project. Knowing this, the first mover will decide not to exclude to obtain her share of profits from the common project.³⁴ However, underutilization is still possible when the first mover decides to exclude because she is unable to obtain the full revenue from her investment. Hence, devising a process which aligns the preferences of the public bodies involved is the main hurdle to overcome in sequential anticommons.

Strict complementarity and the large number of veto players explain why it has been difficult to solve the problem of delay in authorization procedures. But heterogeneity of preferences among public bodies is another crucial factor. The goal of GHG reduction must be somewhat balanced with environmental protection and land planning. This means that the bargaining process modelled in examples of ownership anticommons, where each rightholder is interested in maximizing her utility, shall be modified in settings involving public bodies. We shall come back to this point in section 5.

The Commission's proposals fall short of the centralized authorization procedure invoked, among others, by ENTSO-E. The impact assessment suggests that harmonization of permitting procedures with final decision-making powers to the EU level would not be compatible with the principles of proportionality and subsidiarity. But the streamlined national procedure will only be successful if new and more effective coordination mechanisms will be implemented. Only a handful of MSs have made some progress on this count, and only for national infrastructures.

In the last few years, some voluntary initiatives for the development of cross-border infrastructures have been

³⁴ See Schulz et al., above note 33, 603f..

undertaken.³⁵ Besides their limited geographic scope, these initiatives introduce new coordination mechanisms. For example, the Memorandum on the North Seas Grid Initiative provides for a Steering Committee, a Programme Board and three working groups, covering the areas of grid configuration and integration, market and regulatory issues, planning and authorization procedures. The main goal is to improve the coordination among projects by increasing awareness of existing barriers and proposing solutions. However, there isn't any transfer of regulatory powers to new administrative structures at regional level. The signatory states are left full discretion to accept the proposed solutions or not.

A further step ahead towards cross-border coordination could be the new role that the Commission envisages for the Regional Initiatives (RIs).³⁶ They were set up in 2006 to support the implementation of the Single Energy Market with a bottom-up approach. In the December 2010 communication, the Commission proposes to strengthen their effectiveness in two ways. Firstly, the priorities of the RIs should be clearly established. They include the implementation of the Third Package, promoting cross-border

³⁵ The more advanced experiences of voluntary cross-border cooperation for transmission planning can be found in the Nordic countries (see, e.g., Nordreg, *Grid Investments from a Nordic Perspective: Nordreg Recommendations*, 2010), in the North Seas (see the Political Declaration of the North Seas Countries Offshore Grid Initiative of 7 December 2009 and the Memorandum of Understanding of 2 December 2010), and in the Baltic countries (see the Memorandum of Understanding on the Baltic Energy Market Interconnection Plan of 17 June 2009).

³⁶ See the Commission's communication on the future role of Regional Initiatives, COM (2010) 721 fin. of 7 December 2010. See also ERGEG, *Strategy for Delivering a More Integrated European Energy Market: The Role of the ERGEG Regional Initiatives*, 21 May 2010 (supporting the view that the RIs will change the nature of their work from a voluntary process to the implementation of European requirements); Everis and Mercados, *From Regional Markets to a Single European Market, Final Report*, 28 April 2010 (advancing the recommendations on policy guidance and the Governmental Committee that the Commission has included in its December 2010 communication).

investments and pilot testing on issues not covered by framework guidelines and network codes. Secondly, new governance mechanisms should be adopted. The main changes are the direct involvement of MSs, ACER and the Commission in the Regional Steering Committee and the supervisory role of ACER in order to ensure the coherence of work programmes in each RI. In this case, too, the driving force behind the Commission's proposal is the enhancement of communication channels among MSs and stakeholders. But regulatory implementation is still a national matter. The strengthening of RIs will increase the effectiveness of their decision-making process only if they will be able to design reference models for cross-border issues which represent an acceptable compromise from the point of view of MSs' interests.

4. Developing green infrastructures in USA.

Much like the European one, the American regulatory framework for planning and siting of green infrastructures is in a state of flux. As far as RES plants are concerned, regulatory jurisdiction is entirely in the hands of state and local authorities. However, the federal government regulates the authorization procedures for RES development on the lands it owns and for offshore wind farms in the Outer Continental Shelf.³⁷ We shall see

³⁷ See Department of the Interior, Minerals Management Service, Renewable Energy and Alternate Uses of Existing Facilities on the Outer Continental Shelf: Final Rule, April 29, 2009, 30 CFR Parts 250, 285 and 290. See the description of the authorization procedure in NREL, Large-Scale Offshore Wind Power in the United States: Assessment of Opportunities and Barriers, September 2010, 138-150. See also the 'Smart from the Start' wind energy initiative for the Atlantic OCS, US DOI press release, November 23, 2010 (aiming at identifying priority Wind Energy Areas for potential development, improving coordination with local, state, and federal partners, and accelerating the leasing process). The White House's Executive Order 13547 of 19 July 2010 led to the formation of

that, according to some authors, a broader involvement of the federal level for large-scale RES plants might have beneficial effects. Siting of transmission networks falls within state jurisdiction, too, but the federal level (the Congress and the FERC) is striving to extend its reach. In what follows I describe the authorization procedures for both types of green infrastructures. It seems clear that the spectre of anticommons problems looms large in the multi-layered US regulatory framework. Those problems are often tackled with the tools of federalist doctrines. But the latter offer vague prescriptions and leave room for alternative interpretations. Hopefully, the anticommons perspective suggests how to assess the pros and cons of different governance structures.

Starting with the authorization procedures for RES plants, a wide array of solutions can be observed in the US states. In many cases, each local public body (town or county) is free to set the requirements for authorizing RES plants and to decide where they can be built. This option reflects a traditional distribution of land planning powers within the US, with the lower level of government delegated to exercise them without major constraints from the upper state level.³⁸ However, local regulation is becoming increasingly unsatisfactory. More often than not, towns and counties set up conflicting requirements. Additionally, large-scale plants span the

the National Ocean Council, whose role is to strengthen ocean governance and coordination across the federal government. Regarding federal lands, the Energy Policy Act of 2005 mandated the designation of corridors for electricity transmission and distribution facilities in the 11 contiguous Western States. In the designated corridors, interagency operating procedures provide the industry with a streamlined application process: see Bureau of Land Management, *Approved Resource Management Plan Amendments/Record of Decision for Designation of Energy Corridors on Bureau of Land Management-Administered Lands in the 11 Western States*, January 2009.

³⁸ See generally S. Bronin, *The Quiet Revolution Revived: Sustainable Design, Land Use Regulation, and the States*, 93 *Minn. L. Rev.* 231 (2008).

territory of many towns and can even cross state boundaries. This means that many different public bodies are involved in the authorization process and can independently decide to impose their own requirements or stop the project outright. Of course, many different communities and land owners are directly or indirectly affected and can oppose the project.³⁹

Several remedies have been tried to speed up and coordinate authorization procedures. The milder one takes the form of voluntary state guidelines or model ordinances that local governments may follow. An intermediate option is to split siting authority, moving to state level the task to decide about larger plants. Finally, some states chose to adopt streamlined procedures following the one stop shop approach. However, only in some cases (e.g. California and Minnesota) local regulations are totally preempted. In other cases the state body simply acts as single reference forum for the applicants, but it must ensure that all local regulations have been complied with.⁴⁰

While there seems to be a general trend towards centralization of planning and siting procedures at state or regional level, how they should be designed is still open to debate. Different degrees of involvement of lower government levels, as well as of other stakeholders, are possible. Likewise, centralization in itself does not

³⁹ As observed by Wiseman, *Expanding Regional Renewable Governance*, above note 6, 31, the lack of a clear hierarchical authority among the many public bodies involved is a defining characteristic of an anticommons. On this aspect see M. Heller, *The Tragedy of the Anticommons: Property in The Transition From Marx to Markets*, 111 *Harv. L. Rev.* 621, 670-673 (1998).

⁴⁰ See the survey of state regulations by R.H. Rosenberg, *Making Renewable Energy a Reality – Finding Ways to Site Wind Power Facilities*, 32 *Wm. & Mary Envtl. L. & Pol. Rev.* 635 (2008); AWEA, *Siting Handbook*, February 2008; P.E. Salkin, *Renewable Energy and Land Use Regulation (Part 2)*, ALI-ABA Business Law Course Materials J. 27 (2010); Wiseman, *Expanding Regional Renewable Governance*, above note 6, 26-30, 51-53; U. Outka, *The Renewable Energy Footprint*, forthcoming *Stan. Envtl. L.J.* (2011), 24-36, available at www.ssrn.com.

answer the more difficult question, that is how concerns for competing objectives (GHG emissions reduction, environmental preservation, health protection, alternative land uses) should be balanced.

Two other proposals are worth mentioning. The first suggests a federal wind siting policy that provides regulatory uniformity, but without totally preempting local regulations. In the spirit of cooperative federalism, a national siting policy would reduce application and compliance costs which stymie wind energy development. At the same time, local regulations would take into account the geographical and cultural characteristics of the areas where the plants will be built. More specifically, this proposal argues that the federal wind siting policy should: a) prohibit bans on wind energy facilities; b) require decisions by local governments within a reasonable time; c) require that such decisions are supported by substantial evidence.⁴¹

These contents are not much different by those forwarded in the November 2010 communication of the European Commission. In both cases, the aim is to coordinate the higher and the lower levels of government. The Commission's proposal is more explicit in asking for the adoption of the one-shop stop approach. It also suggests that guidelines on compensations and financial rewards could be provided. The most relevant difference is how remedies for non-compliance with these guidelines are designed. The Salkin-Ostrow proposal suggests that the courts should adopt a heightened standard of judicial review, ensuring that scientific evidence and overall project benefits have been carefully considered. The

⁴¹ P.E. Salkin and A.P. Ostrow, *Cooperative Federalism and Wind: A New Framework for Achieving Sustainability*, 37 *Hofstra L. Rev.* 1049, 1080-1096 (2009). The proposal follows the approach already adopted for the siting of cellular communication towers by the US Telecommunications Act of 1996.

Commission's proposal suggests that, in case of delay, a designated authority could be given the power to issue the final decision. No indications are provided on standards of judicial review, which are left to MSs. However, if a EU legislative act is issued, the European Court of Justice could give its interpretation on the scope and breadth of judicial review by MSs' courts.

The second proposal argues in favour of new Regional Energy Boards with the power to issue permits for green infrastructures. The idea is to avoid the fragmentation of exclusion rights by concentrating in a single body all the regulatory powers existing at federal, state and local level. These boards would be the only forum where exclusion rights can be exercised by interested stakeholders. In case of conflict, compromise standards could be agreed upon. When compromise is not possible, preemption of local, state and federal laws may be necessary. The main advantage would be to establish a clear hierarchy among the exclusion rights of interested parties, so as to avoid the paralyzing effect of the anticommons.⁴²

The Regional Energy Boards have some points of contact with the European Commission's proposal to delegate planning tasks to the RIs. However, in the EU constitutional framework there is a low probability that these regional are turned into independent regulators. At best, they could work as coordination mechanism. Enforcement powers are jealously guarded at national level. This means that the Commission's proposal represents only a partial solution to the problem of fragmented exclusion rights.

I now turn to transmission siting and planning in US. The states have exclusive jurisdiction.⁴³ However, the FERC can regulate

⁴² Wiseman, Expanding Regional Renewable Governance, above note 6, 53-60.

⁴³ In most states local public bodies were preempted by centralized procedures. But even where this solution was embraced there is much procedural variation from one state to another. See A.C. Brown

interstate electricity transmission. Traditionally, federal powers were addressed to network access and tariffs. More recently, the FERC stepped in the transmission planning arena.

In 2007 FERC Order No. 890 required transmission providers to adopt a planning process complying with nine principles.⁴⁴ While useful in some respects, this Order did not address the problems of regional planning. Transmission providers were only asked to coordinate with interconnected systems to share system plans and to identify system enhancements that could relieve congestion or integrate new resources. However, the federal regulator made it clear that there was no duty to undertake investments identified in transmission plans.

When climate change came high on the presidential agenda, the federal regulator started to propose more aggressive solutions. The notice of proposed rulemaking issued by FERC on 17 June 2010 aims at strengthening coordination for both intraregional and interregional facilities and at adopting a more detailed cost allocation methodology. Transmission providers are required to participate to regional planning processes that meet the same principles already established by Order No. 890. Both local and regional planning processes should account for public policy requirements established by state or federal laws and regulations. Transmission planning

and J. Rossi, *Siting Transmission Lines in a Changed Milieu: Evolving Notions of the “Public Interest” in Balancing State and Regional Considerations*, 81 *Colo. L. Rev.* 705 (2010); S. Porter and K. Fink, *State Transmission Infrastructure Authorities: The Story So Far*, 22(2) *Elec. J.* 30 (2009). Statistical analyses show that siting difficulty varies widely among states and that public opposition has a stronger impact than regulation and environmental considerations: see S.P. Vajjhala and P.S. Fischbeck, *Quantifying Siting Difficulty: A Case Study of Transmission Line Siting*, 35 *Energy Pol.* 650 (2007).

⁴⁴ The nine principles are: 1) coordination, 2) openness, 3) transparency, 4) information exchange, 5) comparability, 6) dispute resolution, 7) regional participation, 8) economic planning studies, 9) cost allocation for new projects.

agreements must be entered into among neighbouring regions. Finally, default principles for allocating the costs of intraregional and interregional facilities in a manner which is roughly commensurate with the distribution of benefits are established.

At the end of 2010 these proposals were still in the consultation phase. They have engendered much opposition from several quarters. Although the federal regulator claims that the proposal leaves much flexibility in the design of the planning process and does not infringe upon state authority, it is clear that the new requirements force all transmission providers to participate to regional and interregional processes. The end result could be close to what some legislative proposals on transmission planning pending in the Congress are trying to accomplish.⁴⁵ However, there is a heated debate on the best way to coordinate state and federal powers. For example, state regulators claim that the FERC does not have jurisdiction on transmission planning. Moreover, its June 2010 proposal would have other detrimental effects: regional planning

⁴⁵ In the American Clean Energy and Security Act 2009 (the Waxman-Markey bill), H.R. 2454, passed by the House of Representatives on 26 June 2009, sec. 151 asks the FERC to issue national planning principles. Adherence to the principles is voluntary. Plans inconsistent with national principles can be returned for further consideration. New and extended backstop authority (replacing state authority in case of inaction) is granted to the FERC only in the Western Interconnection. Different solutions on siting and backstop authority are proposed in other five bills pending in the US Senate and House of Representatives (S. 539, S. 774, S. 807, S. 1462 and H.R. 2211). For critical discussions see Brown and Rossi, *Siting Transmission Lines*, above note 43, 741-748 (observing that many legal barriers to new transmission infrastructure are not addressed by pending federal proposals); J. Rossi, *The Trojan Horse of Electric Power Transmission Siting Authority*, 39 *Env. L.* 1015, 1039ff. (2009) (criticizing expansion of federal authority on transmission siting); Noor, *Herding Cats: What to Do When States Get in the Way of National Energy Policy*, 11(1) *N.C. J. L. & Tech.* 145, 163-166 (2009) (describing federal proposals on transmission siting); T. Benedetti, *Running Roughshod? Extending Federal Siting Authority Over Interstate Electric Transmission Lines*, 47 *Harv. J. Legis.* 253 (2009) (arguing in favour of preserving state input and authority in the grid planning and siting processes).

authorities could pursue policies not embedded in state or federal regulation, or reduce the possibility for states to implement their own policies on generation and integrated resource plans. Any attempt to shift to the regional level the power to authorize transmission lines is firmly rejected.⁴⁶

Interestingly, an alternative framework for regional transmission planning is slowly emerging. At the end of 2009 the US Department of Energy awarded \$60 billion from the American Recovery and Reinvestment Act to support collaborative long-term analysis and planning for the Eastern, Western and Texas electricity interconnections. The awards will fund both transmission planners, for the development of project options, and state agencies, for the development of coordinated interconnection priorities and planning processes.⁴⁷ It seems that this bottom-up approach is able to avoid the controversies arising from the FERC's attempt to impose a mandatory regional planning process.⁴⁸ Moreover, these regional collaborations resemble many other experiences of translocal organizations of government officials, which in the last decades have

46 See NARUC's comments of 29 September 2010 in FERC Docket RM10-23-000. Other reactions to the FERC's proposal are discussed by D. Bloom et al., *Current Conflicts in U.S. Electricity Transmission Planning, Cost Allocation and Renewable Energy Policy: More Heat than Light?*, 23(10) *Elec. J.* 8 (2010).

47 See the press release of December 18, 2009 by the US Department of Energy (DOE), as well as the Memorandum of Understanding between DOE and FERC. For an overview of state and regional initiatives so far see A. Schumaker et al., *Moving Beyond Paralysis: How States and Regions Are Creating Innovative Transmission Policies for Renewable Energy Projects*, 22(7) *Elec. J.* 27 (2009).

48 Lurking in the background of this debate are contrasting visions for the twenty-first century grid. In 2009 ten East Coast governors and five West governors publicly opposed the idea of the transmission superhighway (on which see AWEA and Solar Energy Industries Association, *Green Power Superhighways: Building a Path to America's Clean Energy Future*, February 2009, available at www.awea.org), proposing instead to study alternatives to transmission and to support local development of RES.

furthered national policies without direct involvement by the federal government.⁴⁹

Of course, there is no guarantee that a voluntary process involving a large number of stakeholders will succeed in delivering the expected grid expansion within a reasonable time. However, without further legislative interventions the federal authority on transmission planning and siting is severely constrained. If enacted, the FERC's proposal would start a period of protracted litigation with a very uncertain final outcome. Voluntary participation in transmission planning may be the only credible alternative for the US transmission system.

The Regional Energy Boards discussed above are one among many different governance structures which the states could employ. From the point of view of US constitutional law, agreements among states that delegate regulatory tasks to regional bodies would be interstate compacts, to be authorized by Congress (Article I, par. 10, cl. 3 US Const.). While this additional layer of approval could increase the complexity of multistate agreements, an interstate compact would ensure a more durable collaboration and bind the states to enforceable obligations. Moreover, once authorized by Congress, the interstate compacts become federal law. Therefore, they can be insulated from FERC's initiatives or future climate change federal legislation. At the same time, they prevail over conflicting state laws.⁵⁰

⁴⁹ By adding another regulatory layer, translocal organizations go beyond the traditional division of competences between the federal and the state level. See J. Resnik et al., *Ratifying Kyoto at the Local Level: Sovereignism, Federalism, and Translocal Organizations of Government Actors (TOGAs)*, 50 *Arizona L. Rev.* 709 (2008).

⁵⁰ See R.K. Craig, *Constitutional Contours for the Design and Implementation of Multistate Renewable Energy Programs and Projects*, 81 *U. Colo. L. Rev.* 771 (2010); Noor, above note 45, 169-174 (suggesting that the Congress should strengthen incentives to participate to interstate compacts). There is currently one interstate compact, The Northwest

5. From ownership to regulatory anticommons.

The discussion in the three previous sections suggests two observations. Firstly, the development of green infrastructures fits the main characteristics of anticommons-type situations. Exclusion rights held by many different stakeholders must be coordinated to move existing resources from their present use to a new one. Those resources are strictly complementary because they must be used together to allow the construction of a RES plant or a new power line. As mentioned above, with strict complementarity strategic interactions could lead to inefficient underutilization of resources.

Secondly, attempts in the EU and US to adopt new authorization procedures are meant to shift exclusion rights. If the one shop stop approach and regional planning are implemented on a large scale, they will increase the probability that the goals of climate change policy will prevail over other interests like environmental conservation and autonomy of local governments in deciding about land use. This is not to say that those interests will be completely discarded. However, the new procedures will strengthen the position of those advocating green infrastructures, while at the same time weakening the position of those opposing them.

These symmetric effects stem from the reorganization of entitlements and are another distinguishing feature of anticommons.⁵¹ While the new procedures try to remedy the actual

Power and Conservation Council, which could take up transmission planning tasks, but it is more probable that new interstate compacts will be needed to reflect the optimal geographic scope of transmission planning. See National Council on Electricity Policy, *Coordinating Interstate Electricity Transmission Siting: An Introduction to the Debate*, July 2008, 17f..

51 On the “virtual inevitability” of fragmentation see Fennell, *Common Interest Tragedies*, above note 7, 966-971.

fragmentation of exclusion rights, which delays or blocks green infrastructures, they also introduce a new fragmentation, this time making it more difficult to oppose green infrastructures. To be sure, centralizing planning and siting powers in a single body can be perceived as a clear improvement on widely dispersed exclusion rights. Both advocates and opponents of green infrastructures can present evidence supporting their arguments in the same forum. Neither group is forced to bargain with many different stakeholders, each entitled to strategically hold out its consent to extract a larger share of the surplus. But the final decision of the authorizing body will inevitably override the interests of one group. Provided that such decision favours the optimal use of the resources, their tragic underutilization is avoided. Though, controversies surrounding alternative visions of future energy systems (e.g, transmission superhighways versus distributed generation) show that there will be widely divergent opinions on the meaning of optimal use. Hence, depending on individual and group preferences, the new authorization procedures can be perceived as another form of anticommons.

In the remaining part of this section I address two issues. Firstly, to what extent the analogy between ownership anticommons and regulatory anticommons is justified? I discuss recent scholarship taking issue with such analogy, but conclude that it does not undermine the core arguments supporting it. Secondly, I claim that the dynamics of bargaining are well understood in ownership anticommons, but require a more extended analysis in regulatory anticommons.

Take up the credibility of the analogy first. Since the beginnings in late nineties, the anticommons literature has placed situations involving multiple owners and multiple regulators on the same

plane.⁵² However, such extension has been contested by some authors, both from the point of view of the meaning and content of ownership and of its policy implications.

Firstly, it has been argued that anticommons arise in a far more limited number of cases than Heller suggests.⁵³ On this account, there is an anticommons when at least two owners have independent but overlapping authority over the same resource. That is, they must be granted exactly the same right over the resource. In contrast, the anticommons perspective should not be extended to situations in which an owner cannot pursue its ends because of the opposition of owners of complementary goods or regulators. In the latter two cases, there isn't overlapping authority over the same resource because neither the owners of complementary goods nor the regulators have the right to set the agenda for the resource. Likewise, regulatory anticommons can be observed only when two or more regulators have been granted exactly the same mandates, but not when they have complementary mandates.⁵⁴

It should be noted that this interpretation does not deny that the

⁵² See Heller, *Gridlock Economy*, above note 6, 26 (extending the anticommons concept to fragmented decision making). For other examples of regulatory anticommons see R. Dibadj, *Regulatory Givings and the Anticommons*, 64(4) *Ohio St. L.J.* 1041 (2003); F. Parisi et al., *Two Dimensions of Regulatory Competition*, 26 *Int. Rev. L. & Econ.* 56 (2006); L.R. Kosnik, *From Cournot to the Commons: An Analysis of Regulatory Property Rights*, working paper, 2010, available at www.ssrn.com.

⁵³ See L. Katz, *Red Tape and Gridlock*, 23 *Can. J. L. & Juris.* 99 (2010). See also E.R. Claeys, *Gridlock, Exclusion, and Exclusivity*, forthcoming 53 *Arizona L. Rev.* (2011), 24-26 (arguing that ownership gridlock is different from regulatory gridlock because in the latter the regulators further non-property interests public goals), available at www.ssrn.com.

⁵⁴ In the same vein, Kosnik, *From Cournot to the Commons*, above note 52, 13-14, proposes a model in which the regulators have overlapping authority over the same set of goals. However, she does not rule out the possibility of extending the model to include regulators with multiple preferences. Overlapping jurisdictions are also assumed by Parisi et al., above note 52.

presence of non-owners or multiple regulators can lead to an increase of transaction costs and to holdout problems. However, their causes cannot be traced back to the structure of ownership (too many veto rights), but simply to a suboptimal distribution of decision-making authority. Hence, anticommons are singled out as a narrow instance of the broader category of problems usually associated with high transaction costs and holdout.

But why give such a narrow definition of anticommons ? The first reason has to do with the meaning of ownership, whose content cannot be identified with exclusion rights, as Heller seems to suggest. But another and deeper reason has to do with the horizontal relationship among owners or regulators. Insofar as they have complementary rights or mandates, there might be coordination problems, but there is not an anticommons problem. On this view, the optimal number of owners and regulators should be judged according to the competing values to be pursued, and not by assuming a deficiency in the structure of authority.

This perspective has the advantage of avoiding an anti-regulation slant, which in turn could lead to the simplistic advice of reducing the number of regulators. As we have seen, proposals for green infrastructure planning sometimes fall prey to just this kind of bias. But criticisms against overbroad extensions of the idea of regulatory anticommons should not be meant to imply that the latter is a useless analytic tool. On Katz's account, the agenda-setting authority of owners cannot be equated with regulatory interventions. While the former entails the right to decide about resource use, the latter is only an external constraint. The distinction relies on an explicit dichotomy between private law and public law powers. Whatever its usefulness in settings which involve both private owners and regulators, it does not provide a careful description of those settings

which only involve a plurality of regulators. Even though their mandates are completely different or only partially overlapping, none of them is able to accomplish its goals without coordinating with all the other regulators.⁵⁵ According to Katz, only perfect overlapping leads to anticommons. But the coordination costs must also be incurred when overlapping is less than perfect. Hence, the same strategic interaction can be observed in situations with different degrees of complementarity. Even though an appeal to the concept of anticommons does not supply ready-made solutions for the optimal distribution of authority, it helps locate the case of infrastructure planning in the wider class of coordination problems and find out the type of barriers to be overcome.

Another objection to the idea of regulatory anticommons relates to its policy implications for the interplay between private property and regulation.⁵⁶ Whereas Heller suggests that too much private property is the ultimate cause of anticommons, Epstein counters that too much or inefficient regulation is to blame. These contrasting views are relevant for the discussion on green infrastructures. They lead to very different policy recommendations. In the anticommons perspective, the main problem should be identified in the veto rights of owners or regulators who can block the approval and completion of green infrastructures. In the perspective suggested by Epstein, the main problem is the permitting system which gives to a large number of competing interests the possibility to interfere with the project without showing actual harm or paying the price for the under-used resource. Of course, debates on the type of interests to

⁵⁵ For a typology of patterns of regulatory interaction characterized by jurisdictional overlap and dependence see R.B. Ahdieh, *Dialectical Regulation*, 38 Conn. L. Rev. 863 (2006).

⁵⁶ R.A. Epstein, *Heller's Gridlock Economy in Perspective: Why There Is Too Little, Not Too Much, Private Property*, forthcoming 53 Arizona L. Rev. (2011), available at www.ssrn.com.

be considered and the weight to be assigned to each of them are not easily solved. But the regulatory anticommons perspective has still an advantage over the competing perspective: it clearly shows that the central issue is the coordination of different stakeholders. This insight is lost in the story told by Epstein, who leads one to believe that reducing the number of interests to be considered is the best way to avoid the anticommons.

While the analogy between ownership and regulatory anticommons seems well grounded, there are some adjustments to be made. The dynamics of bargaining in the context of a regulatory anticommons should be better understood. This means that two aspects shall be explored: the preferences of the regulators and the type of transaction costs they face in their coordination efforts.

As far as the preferences of regulators are concerned, the anticommons literature usually follows public choice theory and assumes that each regulator is interested in maximizing its rent.⁵⁷ This means that strategic bargaining among regulators can be modelled much in the same way as in ownership anticommons. In the latter, each owner tries to extract the larger share of surplus; in the former, each regulator tries to obtain the larger rent.

However, alternative assumptions about the preferences of regulators may be equally plausible. For example, the decisions of regulators are directly dependent on the amount and quality of information they possess, how they frame the issues at stake, the kind of horizontal and vertical relationship with other regulators. This means that in a regulatory anticommons the level of

⁵⁷ See, e.g., Parisi et al., above note 52, 60 (identifying regulators' payoff with rent extraction or the degree to which each regulator achieves his regulatory mission); R.S. Sobel and P.T. Leeson, Government's Response to Hurricane Katrina: A Public Choice Analysis, 127 Public Choice 55 (2006) (self-interested bureaucrats created a centralized decision-making structure for disaster relief which ended up in a tragedy of the anticommons).

cooperation could be higher or lower than expected, depending on the impact of the above mentioned factors. More complex motivations should be assumed than simple rent-maximization.⁵⁸

Experimental studies on individual behaviour in anticommons provide a starting point for the assessment of regulators' preferences. It has been shown that strategic behaviour (asking higher prices to transfer a part of a unitary resource) is more probable when there is perfect complementarity and when the payoffs to the third party purchaser are framed as losses to the owners. Moreover, people seem to be less cooperative in anticommons scenarios than in commons ones. Several psychological factors might explain this outcome. For example, the anticommons scenario may elicit a preference for individual rationality and lessen concerns for collective interests. Relatedly, an anticommons owner may perceive she is exercising her own right to veto or to exclude and may not realize that such behaviour harms other owners. Finally, commons and anticommons situations may also differ from the point of view of the perceived severity of the consequences stemming from noncooperative behaviour.⁵⁹

Without additional research, these results can hardly be

⁵⁸ See R.L. Scharff, *A Common Tragedy: Condemnation and the Anticommons*, 47 *Nat. Resources J.* 165, 175f. (Winter 2007), who argues that the mixed motives of regulators, together with the public availability of information about developers' rents, make it more difficult to solve the problem of regulatory fragmentation than the problem of ownership fragmentation.

⁵⁹ See B. Depoorter and S. Vanneste, *Putting Humpty Dumpty Back Together: Experimental Evidence of Anticommons Tragedies*, 3 *J. L. Econ. & Pol.* 1 (2006); S. Vanneste et al., *From "Tragedy" to "Disaster": Welfare Effects of Commons and Anticommons Dilemmas*, 26 *Int. Rev. L. & Econ.* 104 (2006); A. Van Hiel et al., *Why Did They Claim Too Much? The Role of Causal Attribution in Explaining Level of Cooperation in Commons and Anticommons Dilemmas*, 38(1) *J. Appl. Soc. Psychology* 173 (2008). In real-life land deals, too, it is often difficult to distinguish strategic holdouts from other psychological motivations: see G. Parchomovsky and P. Siegelman, *Selling Mayberry: Communities and Individuals in Law and Economics*, 92 *Cal. L. Rev.* 75 (2004).

generalized. But a few observations are in order. It can be safely assumed that framing effects are also at work in regulatory decision-making. For example, each regulator develops its own understanding of the priorities within its jurisdiction. This means that it can come to different conclusions on the severity of consequences which might ensue if it refuses to cooperate. With divergent priorities and divergent frames, each regulator may simply try to accomplish its mandate without worrying about the larger picture.

Whereas this observation seems to point to a heightened risk of noncooperative equilibria in regulatory anticommons, it is important to note that the experiments mentioned above exclude any type of communication, bargaining or informal sanctions for noncooperative behaviour. All three mechanisms are usually available in regulatory settings. This means that in regulatory anticommons there could be a higher probability that the severity of the consequences is rightly understood. Moreover, communication and informal sanctions tend to favour cooperative behaviour.⁶⁰

Regulators' preferences are also relevant from the point of view of the design of streamlined authorization procedures. If the approval of concurrent regulators is needed, rent-seeking behaviour will lead to a lower than optimal level of green infrastructures development. A higher surplus could be obtained with alternative approval by independent regulators. But when the shirking behaviour of bureaucrats is the problem, concurrent regulation helps distribute the costs of approval (the first regulator approving the project generates a positive externality for the others) and may

⁶⁰ See, e.g., A. Falk et al., *Appropriating the Commons: A Theoretical Explanation*, in E. Ostrom et al. (eds.), *The Drama of the Commons*, above note 8, 157; D. Balliet, *Communication and Cooperation in Social Dilemmas: A Meta-Analytic Review*, 54 (1) *J. Conflict Res.* 39 (2010).

improve the decision-making process.⁶¹

What about the transaction costs impacting on bargaining in regulatory anticommons? Their nature is directly dependent on the type of strategic interaction. In game theory terms, anticommons can be described as coordination games.⁶² When the players share the same preferences, they will generally converge to one of the efficient Nash equilibria. This is the simplest case, in which the only barrier to coordination is lack of communication. For green infrastructures, a pure coordination game can be observed when two countries agree on the construction of an electricity interconnector which benefits both.

But things are rarely that simple. In other coordination games the parties have conflicting preferences. In the milder form of conflict (exemplified by the battle of the sexes), they are still interested in choosing the same strategy, but each player would prefer a different strategy. For example, investment in RES plants could be deemed desirable by all the involved regulators. However, they might disagree on the choice of the technology, the size of the plants or their location. In the stronger form of conflicting preferences (exemplified by the Hawk-Dove game or Chicken game), the players prefer different strategies. For example, some regulators might fiercely oppose green infrastructures because they fear their negative environmental impact, or because there are alternative infrastructures to consider.

Whatever the form of coordination games, it is clear that expectations on other players' behaviour are the main factor leading

⁶¹ See the analysis by Parisi et al., above note 52, 63-65.

⁶² See Fennell, Common Interest Tragedies, above note 7, 946-949; R. B. Ahdieh, The Visible Hand: Coordination Functions of the Regulatory State, 95 Minn. L. Rev. 578 (2010). On legal applications of coordination games see also R.H. McAdams, Beyond the Prisoners' Dilemma: Coordination, Game Theory, and Law, 82 S. Cal. L. Rev. 209 (2009).

to convergence to the efficient or the inefficient equilibrium. Hence, proposals to streamline authorization procedures should be understood more as attempts to redirect expectations than as coercive mechanisms aimed at modifying the incentives faced by each regulator. New expectations should be fostered to overcome two types of barriers: firstly, barriers hampering the decision to coordinate with other regulators; secondly, barriers hampering the decision to change the existing equilibrium.⁶³ In the case of green infrastructures, the decision to coordinate with other regulators may be delayed or discouraged because of the uncertainty about the costs and benefits of RES plants or new power lines. Alternatively, the existing fragmentation of regulatory powers can lock in the status quo and prevent wide-scale planning. Whether any type of barrier will actually lead to the coordination failures associated with an anticommons depends on how the institutional context aligns the expectations of regulators and designs the relationship among them. In turn, interventions on that relationship are constrained by the legal principles which each national or supranational legal system employs to define the jurisdictional lines among levels of government. As we have seen, in the EU centralized infrastructure planning at supranational level was already discarded in the impact assessment of the November 2010 communication. In the US, mandatory regional planning is met with strong opposition by the states. This means that there is a limited set of institutional mechanisms available in each legal system to manage the regulatory anticommons. Because of these constraints, answers to anticommons may well differ both from the point of view of the type of coordination they try to implement and from the point of view of their effectiveness.

⁶³ For this distinction between front-end and back-end challenges to coordination see Ahdieh, *The Visible Hand*, above note 62, 629-631.

6. Avoiding the tragedy of regulatory anticommons in green infrastructures.

The main message of the anticommons literature is that fragmentation of regulatory powers is inevitable and can be very costly. At the same time, studies on ownership anticommons clearly show that tragic outcomes can be avoided. Most often cited solutions include assembly tools (e.g. in oil fields and condominiums), forced aggregation through eminent domain, social norms in close-knit groups, using nonprofit organizations to solve environmental or intellectual property anticommons.⁶⁴

The theory of remedies to regulatory anticommons is much less developed. It would be unwise to propose all-encompassing solutions to be applied across the board in every country and to every green infrastructure. As the description of European and American initiatives has shown, the design of planning and authorization procedures is usually influenced by the characteristics of existing institutions, as well as by the structure and maturity of the RES industries. Effective solutions shall be tailored to local conditions. Though, the literature on anticommons suggests at least two general principles which should guide any attempt to develop green infrastructures. There are probably many different ways to implement them, but they at least suggest the direction which policymakers should head for. Both principles have to do with scale issues.⁶⁵ The first principle refers to the management of

⁶⁴ See Heller, *Gridlock Economy*, above note 6, 193-202. See also A. Bell and G. Parchomovsky, *Reconfiguring Property in Three Dimensions*, 75 *U. Chicago L. Rev.* 1015 (2008) (arguing that problems with too many owners can be managed with changes in the content of ownership rights and their territorial extension).

⁶⁵ For a definition of scale challenges see D.W. Cash et al., *Scale and Cross-Scale Dynamics: Governance and Information in a Multilevel*

geographical and jurisdictional scales. The second principle refers to temporal scales.

Let us consider geographical and jurisdictional scales first. There is a wide dispersion of regulatory powers and many different levels of government are involved. This means that the key factor is how vertical and horizontal relationships are managed. Moreover, green infrastructures require lumpy investments with a long lifecycle. This means that the optimal decision-making process must be in place at the beginning of the investment period and cannot be built incrementally. As we have seen, the most obvious solution usually called for by policymakers is the concentration of authorization procedures in the hands of a single body. However, institutional fragmentation is almost inevitable. Even new regulatory bodies, purposefully created with the goal of streamlining procedures, are rarely granted an exclusive competence: they usually perform a coordination function. Moreover, centralization is often prone to distortions worse than those it should cure.

If the number of regulators cannot be reduced, the anticommons literature suggests that other dimensions of the regulatory framework can be manipulated. More specifically, the content of regulatory powers can be changed according to the scale of resource use. Additionally, the relationship among regulators can be designed to take into account both simultaneous uses and sequential uses. We will deal with each of these dimensions in turn.

Proposals related to the scale of resource exploitation start from the observation that most of the times there are parallel uses of the resources which require different entitlements. For example, private ownership of land is the best solution for small events, but larger events require bigger governance structures.⁶⁶ Much the same

World, 11(2) *Ecol. & Soc.* 8 (2006).

⁶⁶ See R. Ellickson, *Property in Land*, 102 *Yale L.J.* 1315 (1993);

observation can be made for green infrastructures. Lower levels of government are able to deal with RES plants of small size or with distributed generation, while large plants and cross-border interconnections require system-wide planning.

An anticommons tragedy is usually the consequence of a mismatch between optimal scale and distribution of entitlements.⁶⁷ The same can be said for the fragmentation of regulatory powers. Therefore, those powers should be distributed in such a way as to better align with the different uses of resources. In other words, the new distribution of powers should help address the front-end coordination problem faced by those regulators who must choose a cooperative or a defection strategy. Here the idea of alternative regulators can be useful to manage the different scales of intervention. It means that the decision-making process for green infrastructures should provide for at least two different avenues to start and complete an authorization procedure. The first-level procedure should start at local or country level, depending on the size of the infrastructure. But a second-level procedure, at country or supranational level, should also be available whenever the first-level procedure is delayed or blocked.

This institutional design has several advantages. Building

L.A. Fennell, Commons, Anticommons, Semicommons, forthcoming in K. Ayotte and H.E. Smith (eds.), *Research Handbook on the Economics of Property Rights*, Elgar, 2011, available at www.ssrn.com; L.A. Fennell, *Scaling Property with Professor Ellickson*, 18 *Wm. & M. Bill of Rights J.* 173 (2009).

⁶⁷ See Fennell, Commons, Anticommons, Semicommons, above note 66, 30-37. It is important to note that multiscale problems with positive and negative feedbacks across scales cannot be addressed with a simple-minded application of the matching principle, i.e. that the scale of governance should be matched to the scale of the externalities: see J.B. Ruhl and J. Salzman, *Climate Change, Dead Zones, and Massive Problems in the Administrative State: A Guide for Whittling Away*, 98 *Cal. L. Rev.* 59, 100-102 (2010).

redundancy in the regulatory system helps to overcome inertia.⁶⁸ Further, the fact that the first-level procedure can be replaced by the second-level procedure ensures that there will be constant monitoring and exchange of information among levels. Finally, this institutional design is able to weaken resistance to shifts of competences from the lower levels of governments. The latter maintain their regulatory powers, provided that they are timely exercised.⁶⁹

Of course, no institutional design is able to completely avoid noncooperative behaviour and free riding. Moreover, success is crucially dependent on details about the role to be played by each level and the structure of coordination mechanisms.⁷⁰ What is important to stress here is that the two-layered institutional design suggested above is partially different from current proposals in EU and US. Both maintain that just one regulatory layer is needed and

⁶⁸ Ahdieh, above note 55, 885-890. W.W. Buzbee, *Recognizing the Regulatory Commons: A Theory of Regulatory Gaps*, 89 *Iowa L. Rev.* 1 (2003) argues that overlapping regulatory jurisdiction may lead to the opposite effect of underregulation because of blame and problem attribution, diluted credit claims, information costs and status quo preservation incentives. However, his analysis mainly focuses on issues where the primacy of one regulator has not yet been established or jurisdictional boundaries are blurred.

⁶⁹ This is the main advantage of polycentric systems: see E. Ostrom, *Polycentric Systems for Coping with Collective Action and Global Environmental Change*, 20 *Global Environmental Change* 550 (2010).

⁷⁰ See, e.g., G.R. Marshall, *Nesting, Subsidiarity, and Community-Based Environmental Governance Beyond the Local Level*, 2(1) *Int. J. Commons* 75 (2008) (discussing lessons for increasing effectiveness of environmental governance in multi-level systems); J. Gupta, *Global Change: Analyzing Scale and Scaling in Environmental Governance*, in O.R. Young et al. (eds.), *Institutions and Environmental Change*, MIT Pr., 2008, 225 (discussing reasons for scaling up and down and the ensuing costs and benefits); C.J.A.M. Termeer et al., *Disentangling Scale Approaches in Governance Research: Comparing Monocentric, Multilevel, and Adaptive Governance*, 15(4) *Ecol. & Soc.* (2010) (analyzing different responses to multiscale problems); Ruhl and Salzman, *Climate Change*, above note 67, 102-108 (discussing theories of dynamic federalism, new governance and transnational networks).

do not provide clear solutions for the relationship between the different levels. On the European side, the authorization procedure is concentrated at the MS level, but it is not clear how the relationship with local governments will be managed or whether mechanisms remedying inertia or delay will be effective. A broader role for planning cross-border infrastructure will be attributed to the RIs, but how their activities will be coordinated with authorization procedures is unclear. In the US the proposed mandatory regional planning does not leave room for voluntary collaborations among states and does not provide any guidelines for the relationships between state and local levels of governments.

Regarding the temporal scale, the main aspect to consider is the availability of coordination mechanisms for both simultaneous and sequential uses. As far as simultaneous uses are concerned, what is needed is a decision-making process which is able to give a balanced assessment of all the factors favouring or opposing the development of a green infrastructure. If they are authorized too easily, there is a high probability that one regulatory anticommons is replaced by another, this time increasing the costs of bundling the resources for alternative uses. From this point of view, two requirements of the decision-making process should be underlined. The first is the transparency and openness of the procedure to all the interested stakeholders. Of course, the availability of a single forum greatly simplifies communication and reduces its costs. The second requirement is judicial review of the final decision with substantive criteria, which should increase confidence on the fairness of the outcome.

Regarding sequential uses, the main problem is to avoid that the chosen destination of the resources cannot be changed if it becomes

inefficient over time.⁷¹ Two interventions on the authorization procedures could be useful. The first is a tight coordination between land planning and building of green infrastructures (both RES plants and power lines). This is the best way to avoid overlooking information which suggests the concrete risk of rapid obsolescence of the proposed infrastructures. The European proposal suggests that the priority corridors could increase coordination in the planning phase for some cross-border infrastructures. But the issue of coordination with national authorization procedures is left unaddressed.

The second intervention is the explicit provision for restoration duties should the infrastructure cease its operations. Several national provisions already ask for insurance or bonding obligations as a condition to grant building licences to green infrastructure developers.⁷²

7. Conclusions.

Large-scale investments in green infrastructures are needed to achieve the goals set by climate change policy in the next few decades. Both the lumpiness of such investments and the dramatic consequences of delays in reducing GHG emissions point to the need to quickly implement planning and authorization procedures

⁷¹ This is the familiar lock-in problem of coordination games: see Ahdieh, above note 62, 630f..

⁷² In the UK, where the IPC decides to grant consent for a proposed offshore wind farm, it should include a condition requiring the applicant to submit a decommissioning programme to the Secretary of State before any offshore construction works begin. See Department of Energy and Climate Change, Revised Draft National Policy Statement for Renewable Energy Infrastructure, October 2010, 32. See also sec 105 UK Energy Act 2004. In the US financial assurance requirements for offshore wind farms are provided in the 2009 MMS regulations (above note 37), sec. 585.515-517.

which allow a significant increase of RES energy shares. However, both EU and US are still far from having adopted a regulatory framework which is suitable to the needs of sustainable energy systems. The main problem can be identified in the fragmentation of regulatory powers, leading to the coordination problems already pointed out in the Law and Economics literature on ownership anticommons. The paper has shown that analogies between the two types of anticommons can be helpful both to identify barriers to cooperation and to highlight possible remedies. The anticommons literature can also be employed to criticize the reform proposals recently submitted by EU and US institutions. Two improvements have been suggested. Firstly, acknowledge the advantages of alternative authorization procedures to overcome inertia and delay. Secondly, provide comprehensive planning and restoration measures to avoid lock in to inefficient equilibria.

Of course, the analogy between ownership and regulatory anticommons cannot be taken too far. The main differences can be identified in the description of the preferences of individual owners and regulators and in the nature of transaction costs to be overcome. This means that in regulatory anticommons modelling the payoffs and the strategies of the coordination game becomes more complex.