MULTISTATE DECISION MAKING FOR RENEWABLE ENERGY AND TRANSMISSION: AN OVERVIEW

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INTRODUCTION

Today's electricity sector needs to do more than just keep the lights on. It needs to meet renewable energy goals, reduce carbon emissions, minimize the impact that new facilities have on sensitive habitat, and encourage customers to use energy more efficiently. Even utilities' traditional charge of maintaining reliability is becoming more complex because the ever-growing physical ties between utility service areas make wholesale power markets more electrically interdependent.

The articles that constitute this special issue of the *University of Colorado Law Review* provide a rich intellectual foundation for revisiting how utility law can accommodate issues that transcend the purview of a single state. The articles were introduced as part of the legal symposium "Multistate Decision Making for Renewable Energy and Transmission," organized by the National Renewable Energy Laboratory ("NREL") and the U.S. Department of Energy ("DOE") in collaboration with state utility commissioners from Colorado, New Mexico, Utah, and Wyoming.

The authors presented their conclusions to a gathering of 170 conference attendees on August 11, 2009, in Denver, Colorado. The conference began with an overview of the four states' utility codes, focusing on how the laws govern joint decision making on matters such as transmission approval and the allocation of shared costs. The discussion then turned to what the term "public interest" means in the context of today's electricity sector. Finally, participants considered the constitutional factors that proscribe the actions states can take in collaboration with one another.

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The conference produced several articles, which are presented here. This Essay will introduce the others by sketching the real-world context that makes the legal issues crucial, drawing on recent technical studies by NREL and others. Increasingly, the problems now demanding attention do not stop at the state line. Engineers and system planners face challenges arising from changing public needs that span several states; yet the legal institutions that would put new ideas to work to meet these challenges have been slow to follow a parallel path of change. The articles in this volume look more closely at why these new interdisciplinary challenges are problematic from a legal standpoint and how to approach these problems.

In many places, utility law still adheres to a traditional paradigm in which the preeminent objective is for local utilities to have just enough generation and transmission in their rate base to serve local demand growth, with a reserve margin that is not too small and not too large. In the old paradigm, Goldilocks would be a model utility regulator.

In particular, the old paradigm is poorly equipped to handle regionalism. Challenges such as reducing carbon emissions and increasing energy security—and maintaining system reliability while doing so—cross state lines, as do the most cost-effective solutions. Many legislators and regulators recognize this fact, but in only a few cases has recognition translated into new law. If legal decision making remains horizontally fragmented among many state jurisdictions and vertically stratified between the states and the federal government, the best- and least-cost strategies for reducing carbon emissions in the electricity sector while maintaining reliability and promoting economic well-being may remain out of reach.

The purpose of the Denver conference was to begin examining what the laws say specifically about regulators' authority to look beyond state borders when defining the public interest. Because the details of a comparative legal analysis can easily become intractable as more states are included, the scope was limited to four diverse neighboring states that already have a history of cross-border power flows: Colorado, New Mexico, Utah, and Wyoming.

Table 1: Four States' Electricity Demand
and Annual Renewable Resource Potential ("GWh")[1]

	Total electricity sales (2008)	Estimated renewable resources for interstate commerce				
		Wind		**Solar**		**Geothermal**
		Premium quality	Total	Premium quality	Total	Total
CO	**51,299**	1,031	42,714	326	4,943	0
NM	22,267	6,176	36,576	**14,414**	32,338	0
UT	27,785	95	4,174	0	15,268	**1,594**
WY	15,536	**47,434**	49,104	0	0	0

Table 1 provides numerical sketches of the four states' electricity demand and renewable resource potential. The contrasts most pertinent to this discussion may be summarized succinctly: Colorado has the largest native load among the four states; New Mexico has the highest solar potential; Utah is exceptional in that wind, solar, and geothermal resources exist in commercial quality within a single zone and thus can be connected via a single transmission corridor; and Wyoming has world-class wind resources.

An important theme emerging from the conference is that the concept of "public interest" in the electric utility sector has outgrown its numerous state-centric cradles. State interests still exist, but they are no longer separable from broader issues that reach across state lines. Consequently, the new challenge is how to reconcile state and extra-state exigencies into an operational understanding of the public interest; the question is whether existing institutions can do so.

Federal preemption is a simple answer, even though it triggers long-standing sensitivities over states' rights.[2]

1. For total electricity sales, see ENERGY INFO. ADMIN., U.S. DEP'T OF ENERGY, ELECTRIC POWER MONTHLY 106 tbl.5.4.B (2009) ("Retail Sales of Electricity to Ultimate Customers by End-Use Sector, by State, Year-to-Date through December 2008 and 2007"). For renewable resources for interstate commerce, see W. GOVERNORS' ASS'N, WESTERN RENEWABLE ENERGY ZONES—PHASE 1 REPORT 24 (2009), *available at* http://www.westgov.org/wga/publicat/WREZ09.pdf [hereinafter WGA PHASE 1 REPORT]. For this table, "renewable resources for interstate commerce" means renewable resources that passed the screening described in the WGA PHASE 1 REPORT, "premium quality" for wind means wind power class 5 or greater, "premium quality" for solar means 7.25 or more kilowatt-hours per square meter per day of direct normal insolation, and "geothermal" includes resources defined in the WGA PHASE 1 REPORT as "discovered."

2. *See* Clinton A. Vince & John S. Moot, *Federal Preemption Versus State Utility Regulation in a Post-Mississippi Era*, 10 ENERGY L.J. 1, 40–52 (1989)

Various legislative proposals before Congress at the time of the conference were putting federal preemption of state decision-making authority on the table, either outright or through a time delay (by first giving the state a certain length of time in which to act on its own).[3] States have raised concern about this course, setting the stage for conflict.[4]

A goal of the conference, however, was to begin a discussion among state utility regulators and stakeholders about whether a more collaborative alternative might be possible. The electricity sector has elements that are constitutionally within federal jurisdiction (such as interstate commerce and issues affecting national policy) and some that traditionally have been reserved to the states (retail rate determination and facility siting, for example). The conference examined fundamental issues that pertain to how legal authority could be allocated between states and the federal government based on their constitutional roles and the type of institution that could provide a venue for collaborative decision making. The questions presumed that states would take the initiative and collaborate on the creation of an appropriate regional institution.

This Essay will look at the crucial technical issues that suggest the most cost-effective solutions—both to renewable energy development in particular and to reducing carbon emissions generally—may lie beyond a state's jurisdictional reach. The discussion will show that, in essence, both the policy path and the technical path have converged at a common roadblock: to go further may require institutions and legal arrangements that do not yet exist. The Essay draws on the Texas experience as an illustrative example of both the challenges of, and possible solutions to, this roadblock.[5] The other articles of this volume will then take up the discussion by examining key legal issues in greater detail.

(discussing several electric utility regulation areas in which federal preemption has been an issue).

3. *See, e.g.*, American Clean Energy Leadership Act, S. 1462, 111th Cong. (2009); American Clean Energy and Security Act, H.R. 2454, 111th Cong. (2009).

4. *See* NAT'L ASS'N OF REGULATORY UTILITY COMM'RS, RESOLUTION REGARDING POSSIBLE FEDERAL LEGISLATION AMENDING THE FEDERAL POWER ACT ADDRESSING EXPANSION OF TRANSMISSION FACILITIES (2009).

5. Texas pioneered a new legal approach to transmission development that will improve access to the state's best areas for wind power. *See infra* notes 58–79 and accompanying text.

I. STATES' RENEWABLE ENERGY TRACK RECORD

Some scholars argue that, by several important benchmarks, states have done a better job of solving renewable energy policy puzzles than has the federal government.[6] Congressional efforts to establish a federal renewable portfolio standard ("RPS") have failed repeatedly since the late 1990s.[7] During this same period, however, twenty-nine states and the District of Columbia passed their own RPS goals.[8] As a group, the early-adopter RPS states are ahead of the game with respect to increasing generation from renewable energy and reducing generation from coal and fuel oil.[9]

Success has not been consistent, however. While most early-adopter RPS states are ahead of the national indicators for clean energy, some are not.[10] Wind power has emerged as the preeminent renewable energy growth technology due to its relatively low cost, but not all states are equally endowed with commercially viable wind potential.[11] For states that do not have their own abundant, accessible, low-cost renewable resources, a successful RPS may depend on regional transmission policies to complement their renewable energy goals.[12]

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6. *See, e.g.*, BARRY RABE, STATEHOUSE AND GREENHOUSE: THE EMERGING POLITICS OF AMERICAN CLIMATE CHANGE POLICY 17 (2004) ("A growing body of scholarship concludes that these decentralized units are increasingly proving more capable than their central-level counterparts.").

7. Early federal RPS proposals were included in legislation addressing competition in the electricity sector. *See* Comprehensive Electricity Competition Act, S. 1047, 106th Cong. (1999); Comprehensive Electricity Competition Act, S. 2287, 105th Cong. (1998). *See also* Clean Power Act, H.R. 4861, 106th Cong. (2000).

8. North Dakota, South Dakota, Utah, Vermont, Virginia, and West Virginia had non-binding targets. For a comprehensive list and descriptions of each state's program, see North Carolina Solar Center, DSIRE: Database of State Incentives for Renewables & Efficiency, Rules, Regulations & Policies for Renewable Energy, http://www.dsireusa.org/summarytables/rrpre.cfm (last visited Mar. 9, 2010).

9. For present purposes, "early adopter" states are those that had an RPS in place by 2003. This group includes Iowa (1983), Minnesota (1997), Connecticut (1998), Maine (1999), New Jersey (2001), Wisconsin (2001), Massachusetts (2002), Texas (2002), Arizona (2002), Nevada (2002), New Mexico (2002), and California (2003). *See* DAVID HURLBUT, STATE CLEAN ENERGY PRACTICES: RENEWABLE PORTFOLIO STANDARDS 16 (2008), *available at* http://www.nrel.gov/docs/fy08osti/43512.pdf.

10. *Id.* at 16–18.

11. For a detailed comparison of wind power potential in western states, see WGA PHASE 1 REPORT, *supra* note 1, at 23. For a geographic representation of wind potential across the United States, see U.S. Department of Energy, Wind Power America: Wind Resource Potential Estimates, http://www.windpoweringamerica.gov/wind_maps.asp (last visited Feb. 14, 2010).

12. HURLBUT, *supra* note 9, at 3.

States that have moved far enough down the road to encounter potholes have already begun to address the obstacles that have arisen. Transmission has emerged as a particularly significant challenge to renewable energy development, and a number of states have launched initiatives to identify renewable energy zones to guide the construction of new infrastructure.[13] The Western Governors' Association has begun the most ambitious effort to date, identifying concentrated areas containing more than 199 gigawatts of top-quality renewable energy resources suitable for regional exchange across the entire Western Interconnection.[14] The federal government supported the effort through the DOE and its national laboratories, but the initiative and direction came from the western governors.[15]

An important take-away from the literature on state experiences with renewable energy policy is that different circumstances can lead to different problems and solutions. Some states have competitive wholesale markets, while others do not.[16] The quality of wind, solar, geothermal, and biomass potential also varies widely among states.[17] Diversity of circumstance suggests the need for institutional flexibility.

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13. Texas was the first, pioneering the Competitive Renewable Energy Zones ("CREZ") concept. *See* Commission Staff's Petition for Designation of Competitive Renewable Energy Zones (Order), Tex. Pub. Util. Comm'n Docket No. 33672 (2008). *See also* RENEWABLE ENERGY TRANSMISSION INITIATIVE, PHASE 2A FINAL REPORT (2009), *available at* http://www.energy.ca.gov/2009publications/RETI-1000-2009-001/RETI-1000-2009-001-F-REV2.PDF; COLORADO SENATE BILL 07-091 RENEWABLE RESOURCE GENERATION DEVELOPMENT AREAS TASK FORCE, CONNECTING COLORADO'S RENEWABLE RESOURCES TO THE MARKETS (2007), *available at* http://www.colorado.gov/energy/images/uploads/pdfs/23158d65cf0c2de7be220e35d1f7b72a.pdf [hereinafter CONNECTING COLORADO]; UTAH RENEWABLE ENERGY ZONE TASK FORCE, PHASE 1 REPORT (2009), *available at* http://geology.utah.gov/sep/renewable_energy/urez/phase1/pdf/mp-09-1.pdf.

14. WGA PHASE 1 REPORT, *supra* note 1, at 23. Much of this discussion will focus on the Western Interconnection, which is the grid comprising Colorado, most of New Mexico, Utah, most of Wyoming, and the rest of the western continental United States. *See* N. AM. ELEC. RELIABILITY CORP. ("NERC"), GLOSSARY OF TERMS USED IN RELIABILITY STANDARDS (2008), *available at* http://www.nerc.com/files/Glossary_2009April20.pdf [hereinafter NERC GLOSSARY].

15. WGA PHASE 1 REPORT, *supra* note 1, at 3.

16. Energy Info. Admin., U.S. Dep't of Energy, Electricity Restructuring by State, http://www.eia.doe.gov/cneaf/electricity/page/restructuring/restructure_elect.html (last visited Feb. 14, 2010) (showing each state's status with respect to electricity market restructuring).

17. NREL has developed maps showing the geographic distribution of native wind and solar potential in the United States. *See* NREL, Renewable Resources Maps & Data Homepage, http://www.nrel.gov/renewable_resources/ (last visited Feb. 14, 2010).

At the same time, states are also finding that their ability to solve renewable energy supply and transmission issues depends on what their neighbors are doing. The correct policy scope is often neither local nor leviathan, but rather something in between.

If it were left up to nature, the policy sphere for renewable energy development would be bounded by where the best wind, sunshine, and underground heat occur, and by the physics of the infrastructure that can turn those resources into electricity and deliver it to customers. In this sense, commercially developable renewable resources within their geographically relevant market may be regarded as common-pool resources.[18] The initial policy question is whether the rules that govern how the pool is used should come from an outside super-authority (in the present context, the federal government), or from those who themselves use the resource pool, with states acting as their agents.

Experience with collective management of other common-pool resources suggests that users can establish their own operational rules, and, in some cases, can do so better than an outside super-authority that is not itself a user of the resource.[19] Success depends on whether the governing institution created by the users can decrease uncertainty, establish operational rules that are fair and functional, monitor use of the common-pool resource, arbitrate disputes among members, have the authority to punish rule violations, and, by clearly defined membership rules, include producers and consumers living in the vicinity of the common-pool resource.[20] These are powers of governance operating in a public interest that exceeds state boundaries, however, and federalism limits the ability of a group of states to be agents for the users of a common pool of renewable resources.[21]

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18. *See* ELINOR OSTROM, GOVERNING THE COMMONS: THE EVOLUTION OF INSTITUTIONS FOR COLLECTIVE ACTION 30 (1990) (defining a "common-pool resource" as "a natural or man-made resource system that is sufficiently large as to make it costly . . . to exclude potential beneficiaries from obtaining benefits from its use").

19. Ostrom describes several examples from different parts of the world in which users attempted to self-regulate common-pool resources. *See, e.g.*, *id.* at 61–88 (discussing self-regulation in Switzerland, Japan, the Philippines, and Spain, among others).

20. *Id.* at 178.

21. Robin Kundis Craig discusses this problem from a constitutional perspective in her contribution to this Issue. *See infra* Part IV.B.

The issue that states will need to address, directly or indirectly, is whether federal preemption is the only realistic way to achieve a common regional solution to the problem of shared goals for the electricity sector. For states themselves to take the lead—essentially, preempting federal preemption—is a very narrow road that has been rarely traveled in the constitutional sphere.

This Part has introduced the proposition that states have been—and can be—sources of policy innovation with respect to complex energy issues. The next Part introduces some of the technical reasons for states to pool their intellectual capital in developing laws and policies that will achieve their energy and environmental goals.

II. TECHNICAL RATIONALE FOR WIDER COLLABORATION

NREL conducted a special analysis to provide empirical background specific to the articles in this issue of the *University of Colorado Law Review*. Before presenting the results of this original analysis, this Part summarizes the major issues under study in numerous technical venues, with particular focus on those most constrained by law or policy.

There are measurable reasons for believing the costs and benefits of multistate collaboration constitute a plus-sum game for the states involved. For example, the North American Electric Reliability Corporation ("NERC") published a study in May 2009 on how to integrate intermittent renewable resources into the grid.[22] As the entity responsible for the nation's electric reliability standards, NERC brings considerable gravitas to the often esoteric issues of grid operations.[23] Among other things, NERC concluded that a collection of small, operationally fragmented operation areas is an inefficient way to manage large amounts of wind and solar generation.[24] Combining operations across a larger footprint makes intermittent resources easier and less costly to manage.[25]

Among NERC's specific recommendations relevant to multistate collaboration are: permitting greater access to larger

22. N. AM. ELEC. RELIABILITY CORP., ACCOMMODATING HIGH LEVELS OF VARIABLE GENERATION (2009), *available at* http://www.aeso.ca/downloads/IVGTF_Report_041609%281%29.pdf.

23. *Id.* at 2.

24. *See id.* at 42–43.

25. *Id.* at ii.

pools of available generation and demand; locating variable resources across a large geographic region; deploying different types of variable resources, such as solar and wind, to take advantage of complementary patterns of production; creating more comprehensive planning approaches, from the distribution system through to the bulk power system; and constructing significant transmission additions and reinforcements.[26]

"Balancing authorities" perform the real-time operational functions that would turn many of the above changes into actual efficiency gains.[27] A balancing authority's area is defined by the collection of generation, transmission, and loads within its metered boundaries.[28] The balancing authority maintains the moment-by-moment balance between demand, actual generation, and the net flow of power to and from adjacent balancing authority areas.[29] Its daily operations are based on resource plans that it receives ahead of time showing forecasted load and scheduled generation throughout the operating day.[30]

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26. *Id.* at ii–iv.

27. While some efficiencies relate to the characteristics of an individual unit or the consumption habits of specific customers, others relate to how all generation and all load are managed as an integrated system. For example, running a highly efficient generator to meet all demand at one location may cause the connecting transmission line to overload. In such a case, the balancing authority would reduce the generator's output to a safe and reliable level, and dispatch generation from another unit via another network line in order to meet demand. The efficiency gains of concern in this Essay pertain to network operations.

28. NERC GLOSSARY, *supra* note 14, at 2.

29. While corn, metal, and other commodities may be produced and easily warehoused for consumption at a later time, large-scale storage of electricity is technically and economically problematic. For a detailed discussion of electricity storage and renewable energy resources, see PAUL DENHOLM ET AL., NAT'L RENEWABLE ENERGY LAB., TECHNICAL REPORT NO. NREL/TP-6A2-47187, THE ROLE OF ENERGY STORAGE WITH RENEWABLE ELECTRICITY GENERATION (2010), *available at* http://www.nrel.gov/docs/fy10osti/47187.pdf. Consequently, a balancing authority's objective is to keep all electric generators that are under its control operating at a megawatt level that is equal to the megawatt level of usage by all customers for whom it has metered information on consumption. For examples of detailed protocols describing how these activities are conducted, see PJM INTERCONNECTION L.L.C., PJM OPEN ACCESS TRANSMISSION TARIFF 318 (2010), *available at* http://www.pjm.com/~/media/documents/agreements/tariff.ashx (discussing open-access tariffs of FERC-authorized regional transmission organizations); CAL. INDEP. SYS. OPERATOR CORP., CONFORMED FOURTH REPLACEMENT CAISO TARIFF AS OF JANUARY 5, 2010, *available at* http://www.caiso.com/2715/27159d2351d90.pdf.

30. The balancing authority also supports interconnection frequency in real time. *See* NERC GLOSSARY, *supra* note 14, at 2.

The Western Interconnection is divided into thirty-seven balancing authority areas.[31]

Two recent NREL studies echo the findings of NERC. The Eastern Wind Integration and Transmission Study looked at scenarios in which up to 30 percent of the electricity generated in the Eastern Interconnection came from wind power.[32] The study found that such generation levels were feasible with transmission upgrades.[33] It also concluded:

> The pooling of larger amounts of load and discrete generating resources via regional markets also realizes diversity benefits. The per-unit variability of load declines as the amount of load increases; larger markets also have more discrete generating units of diverse fuel types and capabilities for meeting load and managing variability.[34]

NREL's Western Wind and Solar Integration Study ("WWSIS") addresses a number of NERC's findings in the specific context of the Western Interconnection.[35] One of the issues explored by the WWSIS is how geospatial diversity affects moment-to-moment variations in output due to natural changes in wind speed and sunshine.[36] Unscheduled variations in output require the use of reserves in order to keep total generation matched with total moment-to-moment load.[37] Reducing the magnitude of unscheduled variations reduces the amount of reserves required to keep the system in balance.

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31. W. ELEC. COORDINATING COUNCIL, WESTERN INTERCONNECTION BALANCING AUTHORITIES (2009), *available at* http://www.wecc.biz/library/WECC Documents/Publications/BalancingAuthorities.pdf.

32. NREL, EASTERN WIND INTEGRATION AND TRANSMISSION STUDY: EXECUTIVE SUMMARY AND PROJECT OVERVIEW 10 (2010), *available at* http://www.uwig.org/ewits_executive_summary.pdf [hereinafter EWITS].

33. *Id.* at 13.

34. *Id.* at 29.

35. NREL has an overall description of WWSIS and links to supporting documents online. *See* NREL, Wind Systems Integration—Western Wind and Solar Integration Study, http://www.nrel.gov/wind/systemsintegration/wwsis.html (last visited Mar. 26, 2010).

36. The study examined ten-minute changes in wind output. DEBRA LEW ET AL., NREL CONFERENCE PAPER NO. NREL/CP-550-46517, HOW DO WIND AND SOLAR POWER AFFECT GRID OPERATIONS: THE WESTERN WIND AND SOLAR INTEGRATION STUDY 2 (2009), *available at* http://www.nrel.gov/docs/fy09osti/46517.pdf [hereinafter WWSIS]. The original analysis conducted by NREL for this issue of the *University of Colorado Law Review* draws on WWSIS data to examine this issue specifically with respect to wind power in Colorado and Wyoming.

37. N. AM. ELEC. RELIABILITY CORP., *supra* note 22, at 6. *See also* EWITS, *supra* note 32, at 27.

Because maintaining these reserves costs money, reducing the amount needed would reduce operating costs and, ultimately, the costs that must be borne by customers.[38]

The WWSIS is conducting a comprehensive analysis of wind variation using mesoscale-modeled wind production potential for wind turbines at a hub height of one hundred meters, which is the height of many new wind installations.[39] Site-specific estimates of production potential are the result of a computerized model that combines wind turbine technical specifications and topographic data with detailed meteorological data for 2004, 2005, and 2006.[40] The results are estimates of wind speed at a height of one hundred meters at ten-minute intervals throughout the year.[41] Data for more than 32,000 sites across the Western Interconnection were selected for detailed analysis.[42]

Early results indicate that normal wind power variability is similar to normal load variability if the context is the Western Interconnection as a whole. Wind variability becomes more problematic if the scope of operation is limited to a state or a single utility service territory.[43] This means that the challenges and the costs of managing wind variability decline when managing the variability over a larger area.

The original analysis conducted by NREL for this issue of the *University of Colorado Law Review* found similar results. The analysis used six sample sites from the WWSIS data set. Three are in Colorado and are among the best sites in the wind development areas identified in a statewide renewable resource assessment ordered by the Colorado State Assembly in 2007.[44]

38. Texas added nearly ten gigawatts of wind power between 2001 and 2010, and has had to address these additional cost issues sooner than most other parts of the country due to the rapid pace of wind power expansion. ERCOT, TEXAS RENEWABLE ENERGY CREDIT TRADING PROGRAM ANNUAL PROGRAM SUMMARY FOR 2001 (2002), *available at* https://www.texasrenewables.com/ (follow "Public Reports" hyperlink; then follow "2001_Report.xls" hyperlink); ERCOT, Existing/New REC Capacity Report, https://www.texasrenewables.com/ (follow "Public Reports" hyperlink; then follow "Existing/New Capacity (R5)" hyperlink) (last visited Mar. 7, 2010).

39. 3TIER, DEVELOPMENT OF REGIONAL WIND RESOURCE AND WIND PLANT OUTPUT DATASETS (2008).

40. *Id.*

41. *Id.*

42. NREL, Wind Integration Datasets—Obtaining the Western Wind Dataset, http://www.nrel.gov/wind/integrationdatasets/western/data.html (last visited Feb. 10, 2010).

43. WWSIS, *supra* note 36, at 4.

44. CONNECTING COLORADO, *supra* note 13, at 1.

The other three sites are in Wyoming, near renewable energy zone hubs identified in a study of western states conducted for the Western Governors' Association.[45]

The NREL analysis examined production levels at ten-minute intervals for all of 2005 as follows:

1. The estimated ten-minute output of each individual site was standardized.[46]

2. Changes in standardized output were calculated over each ten-minute period for the entire year.

3. The ten-minute changes were then averaged over the year for each site.

4. The same calculation was then performed after combining the same-time output at all six sites.

5. Finally, the standardized results were converted back into equivalent megawatts, assuming a base of one gigawatt of nameplate wind capacity.[47]

Using the same analytical methodology, NREL examined hour-to-hour changes in production levels.

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45. WGA PHASE 1 REPORT, *supra* note 1, at 12.

46. "Standardize" means to convert each value in a set of observations (in this case, the output of a specific wind farm at various times) to an equivalent value that enables comparing one set of observations with another set (e.g., output of another wind farm). A value's standardized equivalent indicates how much it deviates from its group average.

47. In other words, the results were indicative of one gigawatt placed at a single site or one gigawatt distributed among several sites. For perspective, the amount of wind power installed in the four states as of this writing was 3.2 gigawatts. *See* Am. Wind Energy Ass'n, U.S. Wind Energy Projects, http://www.awea.org/projects/ (last visited Mar. 26, 2010).

Table 2: Geographic Diversity and Variation in Output[48]

	Ten-Minute Variation		One-Hour Variation	
	σ [49]	Megawatt equivalent[50]	σ	Megawatt equivalent
All output at CO sample site 1	0.24	96	0.48	193
All output at CO sample site 2	0.21	69	0.42	140
All output at CO sample site 3	0.24	81	0.48	162
Simultaneous output at three CO sites	0.18	45	0.40	102
All output at WY sample site 1	0.19	72	0.38	148
All output at WY sample site 2	0.20	73	0.48	172
All output at WY sample site 3	0.18	69	0.38	143
Simultaneous output at three WY sites	0.13	42	0.29	95
Simultaneous output at all six sample sites	**0.12**	**31**	**0.28**	**71**

Scheduling and dispatching wind plants together at these six sample sites—as would happen in a single balancing authority area that covered all of Colorado and Wyoming—considerably reduces both the ten-minute and one-hour variation in output. Table 2 shows the variations expressed as normalized quantities and as megawatts, assuming one gigawatt of installed wind capacity. Smaller values for σ indicate less variability. For one gigawatt of wind capacity distributed equally among all six sites, the typical ten-minute variation in output is significantly less than what it would be with all of the capacity located at any one of the six sites.

Reducing typical output variation by such magnitudes could save millions of dollars each year in operating costs.[51]

48. Author's analysis using mesoscale-modeled data from the NREL, Wind Integration Datasets—Western Wind and Solar Integration Study, http://www.nrel.gov/wind/integrationdatasets/western/methodology.html (last visited Feb. 10, 2010). Wyoming sample sites were Nos. 16338, 19065, and 22193; Colorado sample sites were Nos. 9099, 13663, and 30940. *Id.* Production data for all sites were based on meteorological data for 2005. *Id.*

49. Standard deviations from mean annual output.

50. σ converted to megawatt equivalent for one gigawatt of nameplate wind capacity. The results indicate the amount of backup capacity that typically would be needed to manage the variability of one gigawatt of wind power capacity geographically configured as indicated in the left column.

51. The savings would be due to less utilization of operating reserves. For a more detailed discussion, see DAVID HURLBUT, NAT'L RENEWABLE ENERGY LAB.,

Colorado cannot make these savings happen by itself, however, and neither can Wyoming. For this to be a plus-sum game, both states need to engage, with each represented by persons with authority to make binding decisions about resource procurement and new infrastructure. Effectively addressing the issues raised by NERC may even require consolidating many of the Western Interconnection's thirty-seven balancing authority areas under a single multistate entity that operates independently from the utilities that own the transmission system. This in turn would raise the question of who would oversee such an independent entity: an interstate compact, a federally regulated regional transmission organization, or some other institutional arrangement.

Consequently, technical analyses often yield results that suggest a need for political dialogue among people who are not themselves technicians. The next Part takes the technical discussion into the realm of policy. After generally describing how technical conclusions can collide unproductively with statutes, the Part examines two examples of how states have addressed their particular challenges: the evolution of Competitive Renewable Energy Zones ("CREZs") in Texas and the cost allocation principles endorsed by several states in the Northwest under the Northern Tier Transmission Group ("NTTG").

III. FROM STUDIES TO DECISIONS

NREL, other national laboratories, and the Western Electric Coordinating Council ("WECC") are studying numerous technical issues, as well as long-term assessments of how to achieve high levels of renewable energy penetration at a large scale.[52] But engineers, economists, and other researchers can study such things ad infinitum; at some point, somebody with authority has to make a decision that will pass judicial muster. Even though engineers, economists, and other technicians often do not like to admit it, laws do matter.

Once the studies have been done, the transition from what *should* be done to what *shall* be done depends on the legal

TECHNICAL REPORT NO. NREL/TP-6A2-47179, COLORADO'S PROSPECTS FOR INTERSTATE COMMERCE IN RENEWABLE POWER 19 (2009).

52. *See* W. GOVERNORS' ASS'N, WREZ STUDY REQUEST TO WECC/TEPPC (2009), http://www.westgov.org/wga/initiatives/wrez/WREZ%20Study%20Request%20to%20TEPPC.pdf; *see also* U.S. DEPARTMENT OF ENERGY, 20% WIND ENERGY BY 2030 (2008), *available at* http://www1.eere.energy.gov/windandhydro/pdfs/41869.pdf.

parameters within which decision makers have authority to act. Any technical recommendation will end up in one of three legal baskets: (1) the action is allowable under the regulating body's statutory authority; (2) the action fails to satisfy relevant legal tests and is therefore impermissible; or (3) the action falls into a gray area about which the law is silent.

Whether or not the recommendation is a good idea from a technical standpoint may have little or no effect on its status under the controlling law. One common controversy is over who bears the costs of a good idea.[53] If the benefits of a transmission line extend beyond the regulator's jurisdiction, assigning all the costs to jurisdictional ratepayers may be politically infeasible.[54] A project with demonstrable net benefits to everyone may end up in a legal purgatory if the affected jurisdictions cannot agree on a cost-allocation methodology.[55]

Another area in which the technical and legal realms may fail to connect is risk and uncertainty. Future needs tend to be more speculative than present needs, and traditional laws intended to protect the public interest generally eschew speculation.[56] Logically, a regulator's risk-averse strategy is to delay addressing long-term needs until the consequences of not doing so are imminent. The result could be a decision to shelve a technically and economically superior long-term solution and instead adopt a sequence of incremental yet sub-optimal solutions. For example, regulators may need to decide between two

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53. Richard Piwko et al., *What Comes First?*, IEEE POWER & ENERGY MAG., Nov.–Dec. 2007, at 68.

54. In addition to inter-state conflicts, cross-jurisdictional conflicts can happen within the same state. For example, state utility commissions lack the authority to set retail customer rates for electric cooperatives and municipally owned utilities even though these utilities may be interconnected with those under the jurisdiction of the state.

55. FERC approved a cost allocation proposal for the Southwest Power Pool ("SPP") in 2009 that embodied the results of intensive negotiations among regulatory officials and staff from all SPP member states. Sw. Power Pool, Inc., 127 F.E.R.C. ¶ 61,283 (June 18, 2009). The NTTG has endorsed principles for cost allocation that they use in evaluating regional transmission proposals. NTTG, COST ALLOCATION COMMITTEE CHARTER 8–9 (2009), *available at* http://nttg.biz/site/index2.php?option=com_docman&task=doc_view&gid=956&Itemid=31.

56. FERC attempted to address this problem in its Order 679 establishing rules for incentive-based transmission rates. Promoting Transmission Reform through Pricing Reform, 116 F.E.R.C. 679, ¶ 61,057 (July 20, 2006) (codified at 18 C.F.R. pt. 35). FERC explains in the Order, "for the Nation to be able to integrate the next generation of resources, we must encourage investors to take the risks associated with constructing large new transmission projects that can integrate new generation and otherwise reduce congestion and increase reliability." *Id.* ¶ 61,081.

options: building one large transmission line that may be oversized relative to current demand, and building two smaller lines staged for construction as demand grows over time. One large line generally costs less per mile—and has less line loss—than moving the same amount of power over two smaller lines.[57] Therefore, the less-efficient incremental scenario for two smaller lines could end up costing ratepayers more, even though a larger line would be underutilized in the early years.

The example of wind power growth in Texas illustrates how old legal institutions can stymie solutions that may be attractive from a technical standpoint. From 2001 to 2002, the Texas wind power industry grew faster than policy makers had anticipated; more than nine hundred megawatts of wind power had been installed, which was nearly twice the amount required by the state's RPS for that point in time.[58] Moreover, the growth took place in one area, seriously overloading the local transmission system.[59] The Electric Reliability Council of Texas ("ERCOT"), the independent entity operating the Texas grid, issued daily curtailment orders throughout the spring—normally wind power's most productive season.[60] As a result, wind facilities that would have had a capacity factor of around

57. *See* COLORADO GOVERNOR'S ENERGY OFFICE, CONNECTING COLORADO'S RENEWABLE RESOURCES TO THE MARKETS IN A CARBON-CONSTRAINED ELECTRICITY SECTOR 37 fig. WREZ Transmission Cost Comparison (2009), *available at* http://www.colorado.gov/energy/images/uploads/pdfs/redi_full%5B1%5D.pdf (showing typical line costs).

58. David Hurlbut, Memorandum to Chairman Rebecca Klein & Commissioner Brett Perlman, PUC Proceeding to Address Transmission Constraints Affecting West Texas Wind Power Generators (Pub. Util. Comm'n of Tex. Aug. 20, 2002) (Project No. 25819). Under the original mandate in effect at the time, the state's goal for renewable power capacity in 2002 was 400 megawatts. TEX. UTIL. CODE ANN. § 39.904(a) (Vernon Supp. 2002) ("It is the intent of the legislature that by January 1, 2009, an additional 2,000 megawatts of generating capacity from renewable energy technologies will have been installed in this state. The cumulative installed renewable capacity in this state shall total 1,280 megawatts by January 1, 2003, 1,730 megawatts by January 1, 2005, 2,280 megawatts by January 1, 2007, and 2,880 megawatts by January 1, 2009.") (repealed 2005). *See also* Energy Info. Admin., U.S. Dep't of Energy, Annual Electric Generator—EIA-860 data file (2009), http://www.eia.doe.gov/cneaf/electricity/page/eia860.html (filtering for wind capacity in Texas with an in-service date of 2002 or 2001).

59. The development occurred near the town of McCamey. ELEC. RELIABILITY COUNCIL OF TEX. ("ERCOT"), REPORT ON EXISTING AND POTENTIAL ELECTRIC SYSTEM CONSTRAINTS AND NEEDS WITHIN THE ERCOT REGION 47 (2003).

60. PUB. UTIL. COMM'N OF TEX., REPORT TO THE 78TH TEXAS LEGISLATURE: SCOPE OF COMPETITION IN ELECTRIC MARKETS IN TEXAS 100 (2003).

40 percent absent curtailment had an effective annual capacity factor of 27 percent.[61]

The Texas Public Utilities Commission ("PUC") conducted a series of workshops to address the problem.[62] One of the proposed solutions was CREZs, in which new transmission to wind-rich areas would be built in advance of signed interconnection commitments with specific developers.[63] As the CREZ concept evolved in PUC staff discussions, the intent was to select well-defined areas where meteorological data showed vast amounts of top-quality wind potential—a market opportunity so good that no rational wind developer with a line of credit would pass it up.[64] Transmission to a CREZ would define the market space within which competition would occur. The potential for return on investment in a CREZ would be compelling enough to support a reasonable expectation that the line would be utilized by a sufficient number of economically rational wind developers—even if the developers were not known at the time the PUC authorized the transmission. The winners

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61. *See* Petition of Cielo Wind Power, LLC, et al. for Declaratory Order to Modify Renewable Energy Credit Capacity Conversion Factor Calculation for 2004 and 2005, Declaratory Order, Pub. Util. Comm'n of Tex. Docket No. 29324 (Aug. 30, 2004); Remand of Docket No. 29324 (Petition of Cielo Wind Power, LLC, et al. for Declaratory Order to Modify Renewable Energy Credit Capacity Conversion Factor Calculation for 2004 and 2005), Declaratory Order on Remand, Pub. Util. Comm'n of Tex. Docket No. 31259 (Sept. 12, 2005). Technical analysis estimated the natural capacity factors of Texas's prime wind areas to be around 40 percent annually. *See* ELEC. RELIABILITY COUNCIL OF TEX., COMPETITIVE RENEWABLE ENERGY ZONES IN TEXAS (2006), http://www.ercot.com/content/news/presentations/2006/ATTCH_A_CREZ_Analysis_Report.pdf.

62. Notice of Workshop Concerning Transmission Constraints Affecting West Texas Wind Power Generators, PUC Proceeding to Address Transmission Constraints Affecting West Texas Wind Power Generators, Pub. Util. Comm'n of Tex. Project No. 25819 (June 21, 2002).

63. David Hurlbut, Request for Comment, PUC Proceeding to Address Transmission Constraints Affecting West Texas Wind Power Generators, Pub. Util. Comm'n of Tex. Project No. 25891 (Nov. 27, 2002).

64. The zones were intended to be "competitive" in that the new transmission capacity would be less than a zone's resource potential. Preliminary study zones identified by ERCOT represented the best 4,000 megawatts within each wind resource area identified by mesoscale modeling analysis. ELEC. RELIABILITY COUNCIL OF TEX., *supra* note 61, at 10. The transmission plan ultimately approved by the PUC contemplated 11,553 megawatts of transfer capability from the five CREZs that were ultimately approved, equivalent to about one-third of the potential wind power ERCOT had estimated for these areas. Commission Staff's Petition for Designation of Competitive Renewable Energy Zones, Order, Pub. Util. Comm'n of Tex. Docket No. 33672 at 11 (Aug. 15, 2008). The five CREZs comprised eight of ERCOT's preliminary study zones, plus some expansions. *Id.* at 8.

would be those developers who could bring projects online the quickest and at the least cost. [65]

While there was little question that CREZs could be identified through technical analysis, the legal questions were formidable.[66] State law required proof that a new line would be "necessary for the service, accommodation, convenience, or safety of the public" before it could receive a certificate from the Texas PUC.[67] A signed interconnection agreement—which included posting a surety bond from the generation developer equal to the estimated cost of the transmission upgrade, in case the developer pulled out before the utility finished building the line—was the conventional means to demonstrate that the line would be fully used.[68] But having large amounts of money tied up in a surety bond for the four to five years it would take to build the line placed a significant financial risk on wind developers and their financial partners.[69] This resulted in a legal conundrum: how to prove in a contested proceeding, in the face of arguments from interveners opposed to wind development, that a new line to a CREZ would indeed be used and useful in the absence of any binding commitment from a developer.[70]

65. The expectation that wind developers would compete for finite transmission access distinguishes the CREZ model from a simple resource assessment. As contemplated in PUC Staff's request for comment, selection of a zone would be based on "a determination by the commission that economically sustainable wind power development is more likely in the [competitive wind power area] than in other areas." Hurlbut, *supra* note 63, at 2.

66. Comments of Texas Industrial Energy Consumers, PUC Proceeding to Address Transmission Constraints Affecting West Texas Wind Power Generators, Pub. Util. Comm'n of Tex. Project No. 25819 (Jan. 31, 2003).

67. TEX. UTIL. CODE ANN. § 37.056 (Vernon 2007).

68. 16 TEX. ADMIN. CODE, § 25.195(c)(1) (2006).

69. Comments of LCRA Transmission Services Corporation, Proceeding to Address Transmission Constraints Affecting West Texas Wind Power Generators, Pub. Util. Comm'n of Tex Project No. 25819, 2–3 (Jan. 31, 2003) (Project No. 25819). ERCOT approved a plan in 2003 calling for staged transmission expansion of up to 2,000 megawatts, adding new 345-kilovolt lines, contingent on the amount of interconnection agreements that wind developers executed in the McCamey area. ELEC. RELIABILITY COUNCIL OF TEX., MINUTES OF THE ERCOT BOARD OF DIRECTORS MEETING 3 (2003); ELEC. RELIABILITY COUNCIL OF TEX., MCCAMEY AREA TRANSMISSION PLAN 1 (2003), http://www.ercot.com/calendar/2003/05/20030520-BOARD (follow "Item 4—McCamey Area Transmission Plan" hyperlink). As of 2007, however, none of the lines that had been contingent upon wind generator commitments in the McCamey area had been built. ELEC. RELIABILITY COUNCIL OF TEX., REPORT ON EXISTING AND POTENTIAL ELECTRIC SYSTEM CONSTRAINTS AND NEEDS 50–53 (2007).

70. Comments of Oncor Electric Delivery Company, PUC Proceeding to Address Transmission Constraints Affecting West Texas Wind Power Generators, Pub. Util. Comm'n of Tex. Project No. 25810, at 3–4 (Jan. 31, 2003).

Without such a commitment, the transmission owner would have no guarantee of cost recovery and could not begin the project.

The CREZ concept stayed on the shelf for three years.[71] Then, in 2005, new installations and interconnection requests indicated that Texas would surpass its ultimate RPS goal four years ahead of schedule.[72] The Texas Legislature more than doubled the state's renewable energy goal and at the same time passed revisions to the Texas Utility Code that cleared the way legally for the creation of CREZs.[73] The new statute directed the Texas PUC to "designate competitive renewable energy zones" and to "develop a plan to construct transmission."[74] The strength of the legislation, however, arose from amendments to other parts of the utility code that represented a clear departure from the old paradigm.

First, the bill provided special flexibility with respect to determining need. The bill states that "[i]n considering an application for a certificate of public convenience and necessity for a transmission project intended to serve a [CREZ], the commission is not required to consider . . . the adequacy of existing service [or] the need for additional service."[75]

Second, the bill assured transmission owners that they would not end up bearing the cost of a CREZ line if it were underutilized due to project cancellations or a lack of interest by wind developers, noting:

> If the commission issues a certificate of convenience and necessity . . . to facilitate meeting the goal for generating capacity from renewable energy technologies . . . the commission shall find that the facilities are used and useful to the utility in providing service . . . and are prudent and includable in the rate base, regardless of the extent of the utility's actual use of the facilities.[76]

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71. The PUC considered such a proposal in early 2005, but declined to adopt it. *See* Transmission Planning, Licensing and Cost-Recovery Rulemaking, Order Adopting New § 25.199 and Amendment to § 25.231, Pub. Util. Comm'n of Tex. Project No. 28884, at 7 (Feb. 10, 2005).

72. Pub. Util. Comm'n of Tex., Texas to Hit Renewable Energy Goal Early, PUC News Release (Mar. 15, 2005).

73. An Act Relating to this State's Goal for Renewable Energy, Tex. S.B. No. 20 § 3, Sess. 79(1) (2005) (amending TEX. UTIL. CODE ANN. § 39.904 (Vernon 2009)).

74. *Id*. (amending § 39.904(g)(1)–(2)).

75. *Id.* (amending §§ 37.056(c)(1)–(2), 39.904(h)).

76. *Id.* (amending § 36.053(d)).

In short, the new statutory trail for CREZs directed the PUC to develop a long-term transmission plan for renewable energy resources after obtaining technical advice from the independent grid operator.[77] As a consequence, the issue of need and cost recovery were closed to further litigation once the PUC had designated a CREZ.[78]

The Texas experience highlights the problem of legal and institutional issues acting as a roadblock to solutions that may seem reasonable from a technical perspective. It also shows that addressing the legal issues properly and in the correct forum can produce outcomes that are both real and innovative. For Colorado, New Mexico, Utah, and Wyoming, the problem is more complicated because it involves four state utility codes as well as federal laws under which the Federal Energy Regulatory Commission ("FERC") has jurisdiction.[79] To address this problem, utilities and stakeholders in the West are experimenting with innovative approaches to a number of regulatory issues.

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77. Although the bill directed "consultation with each appropriate independent organization, electric reliability council, or regional transmission organization," Tex. S.B. No. 20, *supra* note 73, § 3 (codified at TEX. UTIL. CODE ANN. § 39.904(g)), the ERCOT conducted most of the technical study for the CREZ effort, as the ERCOT system covers 85 percent of Texas load and 75 percent of the state's geographic area. *See* ELEC. RELIABILITY COUNCIL OF TEX., ANALYSIS OF TRANSMISSION ALTERNATIVES FOR COMPETITIVE RENEWABLE ENERGY ZONES IN TEXAS (2006), *available at* http://www.ercot.com/content/news/presentations/2006/ATTCH_A_CREZ_Analysis_Report.pdf; s*ee also* ELEC. RELIABILITY COUNCIL OF TEX., ERCOT QUICK FACTS 1 (2009), *available at* http://www.ercot.com/content/news/presentations/2009/ERCOT Quick Facts May 2009.pdf.

78. The effect of the bill was to shift the traditional question of need to the CREZ proceeding with respect to transmission that the PUC would include in its CREZ development plan. Normally, the question of need is established in a proceeding for a certificate of convenience and necessity. TEX. UTIL. CODE ANN. § 37.056(a) (Vernon 2007). The exception added by the bill directs the PUC to use a standard of "most beneficial and cost-effective to the customers" when determining which transmission projects to include in its CREZ development plan. *Id.* § 39.904(g)(2). Consequently, the bill legislatively establishes the need for CREZ lines, and directs the PUC to exercise its discretion in adopting a plan to meet the need in a manner that is most beneficial and cost-effective to the customers.

79. FERC issued a declaratory order in 2009 disclaiming jurisdiction over CREZ lines located solely in Texas that connect to the ERCOT system, on the basis that "no energy transmitted over the proposed CREZ Lines will be commingled with energy transmitted in interstate commerce." Order Granting Petition for Declaratory Order, 129 F.E.R.C. ¶¶ 61,106, 61,126 (Nov. 5, 2009). Consequently, both the need for renewable resources and the approval of the needed transmission are matters of Texas state authority with respect to ERCOT. With respect to Colorado, New Mexico, Utah, and Wyoming, each state has authority to determine its own need for renewable energy, but the transmission is largely subject to FERC jurisdiction. Federal Power Act, 16 C.F.R. § 824 (2009).

Cost allocation is one public interest issue that arises frequently with respect to transmission projects involving more than one jurisdiction. In some parts of the country, regional transmission organizations ("RTOs") provide a framework for addressing transmission issues that cross state lines. The Western Interconnection has no multistate RTO, however.[80] Nevertheless, regulators from a number of northwestern states participate in the NTTG, which has endorsed cost-allocation principles for long-distance transmission projects that affect a plurality of the group's member states.[81] Of the four states that were the focus of the Denver conference, Utah and Wyoming are NTTG members; Colorado and New Mexico are not.

The NTTG's cost allocation guidelines include the following principles:

- Equitable allocation is a function of who causes costs and of who receives benefits.

- Project developers should identify consensus on cost allocation as soon as practicable, so that state authorities can evaluate the project's compliance with state requirements as well as its cost effectiveness vis-à-vis other resource options.

- The allocation of cost should result in full cost recovery for the transmission owner, but no more.

- Whether project costs are allocated to a single transmission customer, multiple customers, or to the region should depend on the distribution of benefits. NTTG en-

80. The California Independent System Operator and the Alberta Electric System Operator are independent entities operating the transmission systems in California and Alberta.

81. The author is grateful to Malcolm McLellan and LouAnn Westerfield for providing authoritative insights into the NTTG process, both during their presentation at the August 11, 2009, law conference in Denver, and in two draft papers shared with the author during the preparation of this Essay. Malcolm McLellan & LouAnn Westerfield, The Public Interest Jurisdictionally and Extra-Jurisdictionally: Toward Effective and Empowered Collaborative Institutions for Multistate Decisions on Transmission Planning and Cost Allocation (Aug. 11, 2009), *available at* http://www.vnf.com/news-articles-41.html [hereinafter McLellan & Westerfield, The Public Interest]; Malcolm McLellan & LouAnn Westerfield, Effective and Empowered Collaborative Institutions for Multi-State Decisions on Transmission Planning and Cost Allocation (Mar. 26, 2010), *available at* http://www.vnf.com/news-articles-42.html [hereinafter McLellan & Westerfield, Effective and Empowered].

courages projects that serve multiple retail and wholesale purposes for a wide array of beneficiaries.

- Network customers should be held harmless with respect to the cost of lines intended to enable wholesale power transactions that do not directly benefit native load. In such cases, the wholesale transmission customers using the line should bear the cost of the project.[82]

These general principles fall short of an explicit allocation formula. Rather, the burden is on the transmission developer to include with its proposal some approach to cost allocation that enjoys as much consensus as possible.[83] Thus, rather than establishing a bright-line rule for transmission developments, the NTTG principles provide guidelines for how the developer might build consensus and for how the NTTG steering committee might decide to endorse the project and its cost allocation methodology.

State utility commissioners can provide informal, general guidance at several junctures in the NTTG process before a project is brought to a state commission in a formal docket. While the process lacks the legal authority that would convey a rebuttable presumption (i.e., the presumption that the methodology is reasonable absent it being challenged by an intervenor), this informal input increases the likelihood that the evidentiary record will be complete by the time the project comes to commissioners for actual approval. As McLellan and Westerfield note,

> [T]he NTTG model provides reliable information for the use of regulators in considering the local aspects of transmission projects in a region-wide context. For purposes of state cost recovery, inclusion of a project within NTTG's Sub-regional Transmission Plan does not create any rebuttable presumptions, but, in the absence of identical state laws allowing them to be created, it nevertheless advances and streamlines the process with high quality planning and economic information.[84]

82. McLellan & Westerfield, The Public Interest, *supra* note 81, at 12–14.
83. *Id.* at 13.
84. McLellan & Westerfield, Effective and Empowered, *supra* note 81, at 12.

As of this writing, the first group of sixteen transmission projects has passed NTTG's cost allocation review and are pending approval by the NTTG Steering Committee.[85]

These examples show that states need not passively await federal action on regional transmission issues. Indeed, a reasonable plan that is studied, endorsed, and proposed by the affected states could carry great weight in federal proceedings. Thus, the papers invited for the Denver conference—and appearing in this issue of the *University of Colorado Law Review*—examine some of the broader legal issues that are likely to affect states' ability to formulate their own plans.

IV. INVITED PAPERS

Conference attendees listened to discussions of invited papers from noted legal scholars and practitioners addressing crucial pieces of the legal puzzle. The topics included the following:

- *Starting points*. What do utility laws in the four states currently say about need, siting requirements, and other issues affecting transmission approval? To what extent can a state's regulators collaborate with their counterparts in neighboring states?

- *The public interest*. Although state regulations must consider the public interest, do their governing laws allow state decision makers to construe "the public interest" based on costs and benefits that extend beyond their own state's borders?

- *Constitutional issues*. The U.S. Constitution's Interstate Compact Clause provides an institutional means for states to collaborate with one another. If states pursue some other institutional arrangement, will it survive a constitutional challenge in court? Moreover, where is the balance between constitutional sufficiency and the ability of states to collaborate on substantive decisions?

85. NTTG, ANNOUNCEMENT: NTTG COST ALLOCATION COMMITTEE DRAFT 2008–2009 COST ALLOCATION RECOMMENDATION 1 (2009), *available at* http://nttg.biz/site/index.php?option=com_content&task=view&id=42&Itemid=84 (follow "Cost Allocation 2008–2009 Biennial Draft Recommendation Public Comment Period Notice 10-30-09" hyperlink).

The following Sections briefly summarize the articles in this volume that proceeded from the invited papers.

A. *Ashley C. Brown and Jim Rossi: An Extra-Jurisdictional View of the Public Interest*

States—either by statute or constitutional provision—generally charge their utility regulators to act in the public interest. Courts often defer to the regulators' technical estimation of what the public interest entails, so long as the action itself is within the regulators' authority. Therefore, how regulators define the public interest is vitally important to identifying how neighboring states might collaborate on renewable energy and transmission issues.

In their article, *Siting Transmission Lines in a Changed Milieu: Evolving Notions of the "Public Interest" in Balancing State and Regional Considerations*,[86] Former Ohio Commissioner Ashley C. Brown and Professor Jim Rossi track how notions of the public interest have evolved over the past decades with respect to planning, approving, and siting transmission. At the federal level, the public interest calculus has expanded to include factors beyond reliability. Increased attention to climate change is a relatively new driver behind a more expansive federal conception of the public interest. Further, even before this increased focus on climate change, the development of competitive wholesale power markets across the country prompted regulators to revisit what the public interest means.

To illustrate, the old paradigm of public interest determined "need" for new facilities by looking mostly at local load forecasts and reliability-based reserve margins. However, a well-tempered market also requires a transmission infrastructure that facilitates easy entry for qualified suppliers. Similarly, "need" may also involve mitigating sources of market power and anticompetitive behavior that threaten to compromise market efficiency. Thus, a new line may be in the public interest if it prevents a single supplier from controlling wholesale power prices within a transmission-constrained load pocket, regardless of the system-wide reserve margin.

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[86] Ashley C. Brown & Jim Rossi, *Siting Transmission Lines in a Changed Milieu: Evolving Notions of the "Public Interest" in Balancing State and Regional Considerations*, 81 U. COLO. L. REV. 705 (2010).

The authors recommend either eliminating the traditional definition of need altogether, or expanding the concept to account for non-traditional benefits such as greater market competition and regional environmental concerns. They also advance a seemingly radical proposition that, they contend, would promote the shift to a new paradigm: take transmission out of a utility's rate base and pay for it in a way commensurate with a broader multistate distribution of project benefits. If the financial risk of a new transmission line is spread among a larger pool of societal beneficiaries—rather than being borne solely by the utility's ratepayers who constitute only a small portion of the affected society—then decision makers can embrace a more expansive notion of the public interest with greater comfort.

B. Robin Craig: Constitutional Issues

Whether any agreement or institution among states is constitutionally permissible depends on a number of factors. Professor Robin Craig describes these factors in her article, *Constitutional Contours for the Design and Implementation of Multistate Renewable Energy Programs and Projects,*[87] and examines the institutional options for collaboration among states in light of the various constitutional law issues that multistate cooperation could raise. The options can be informal, such as multistate transmission projects among WECC states, or something as formal as a full interstate compact ratified by Congress.

Growing national priorities to address climate change, combined with recession-driven pressure to keep electricity rates low, are bound to increase the demands placed on any interstate arrangement, whatever form it may take. These mounting pressures will severely test the legal resilience of any agreement. The author elaborates on the most crucial challenges to the agreement that could arise:

- Does the agreement amount to an interstate compact, and if so, does it pass muster for constitutional validity?

[87] Robin Kundis Craig, *Constitutional Contours for the Design and Implementation of Multistate Renewable Energy Programs and Projects*, 81 U. COLO. L. REV. 771 (2010).

- Does the arrangement constitute economic protectionism, or does it otherwise materially restrain or distort interstate commerce?

- Does the arrangement contemplate joint state decisions in matters that are likely to be preempted by federal authority?

- If states give decision-making power to a multistate agreement, will the states effectively lose the sovereign immunity that they enjoy individually?

- In light of the fact that some of the best wind and solar resources in the West are located on tribal lands, would the agreement accommodate commercial relations with Indian tribes in a manner that does not violate the Constitution?

Economic protectionism is usually the driving concern when courts rule against states over matters pertaining to interstate commerce. The author points out, however, that courts have been more amenable to a state regulation if it affects interstate commerce but does not constitute economic protectionism. The Supreme Court has, in fact, upheld state regulations intended to manage common-pool resources more effectively. What remains untested is whether *several* states can jointly adopt common regulations to manage common resources, even if the common regulations do not constitute economic protectionism.

The author concludes that a group of neighboring states may not be able to avoid the application of the Interstate Compact Clause. The good news, however, is that if a compact were in place, the states could more easily avoid other constitutional issues and minimize the degree of federal preemption. The production, transmission, and sale of renewable energy across state lines are in large part beyond the authority of states. The remaining question is whether oversight should be in the hands of the federal government or of a compact created by the affected states.

CONCLUSION

The western governors and the Obama administration have articulated policy goals that aim to change how electricity is generated and used, thereby effecting—at the least cost to society—the greatest reduction in carbon emissions, the greatest creation of jobs, and the most improvement in energy security.[88] The articles in this issue examine fundamental legal and institutional factors that profoundly affect whether utility-scale renewable energy development in the West can jointly optimize all public interest objectives at the lowest overall cost.

Developing renewable energy and transmission across a multistate market can be a plus-sum game for all involved; that, at least, is indicated by an increasing number of technical studies. Even if one unequivocally accepts the technical conclusion, the path to achieving those benefits is rife with legal and strategic problems that may defy technical solutions. The customary institutional dichotomy under the Constitution is for authority to rest either with the states or with the federal government. The nature of common-pool renewable resources and their utilization for generating electricity, however, suggests a need for something in between. Otherwise, each state in the West will continue to pursue individually rational, yet collectively sub-optimal, choices insofar as the Constitution allows, while hoping that future federal action will not undo any gains the state has made on its own.

States may attempt their own collaborative agreements under umbrellas such as the Northern Tier Transmission Group, but they face a tradeoff. An interstate arrangement that is safe constitutionally may end up being an informal agreement that confers relatively little real authority; the further an arrangement moves in the direction of substantive decision making, the more likely the decisions will change the course of interstate commerce and thereby run afoul of federalism. The only constitutionally safe detour around this tradeoff may be an interstate compact.

The articles that follow in this volume do not provide answers to the foregoing dilemmas, nor do they recommend which path western states should follow. They do, however, provide a foundation for considering how to approach the public interest from a new and more expansive perspective.

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88. W. GOVERNORS' ASS'N, POLICY RESOLUTION 09-1: ENERGY POLICY, RENEWABLE ENERGY AND TRANSMISSION FOR THE WEST (2009); Remarks on the Economy and Clean Energy, DAILY COMP. PRES. DOC., 2010 DCPD NO. 00012 (Jan. 8, 2010).