

*Chapter 4*

# What Would The WCI Cost?

As noted in Chapter III, the WCI analysis contends that the jurisdictions can meet the regional goal of reducing emissions 15 percent below 2005 levels by 2020 with a small overall savings, due to reduced energy expenditures exceeding the direct costs of GHG emission reductions, and that the initiative would have favorable impacts on the West's economy and employment.

This is the equivalent of WCI saying that the West will enjoy a “free lunch” under its program: the argument goes that GHG emissions will be significantly reduced with positive impacts on the jurisdictions' economies and jobs. This conclusion is best described as wishful thinking, given that numerous studies of GHG control and cap-and-trade programs have found the opposite to be true..

Carbon dioxide (CO<sub>2</sub>) is the unavoidable byproduct of fossil fuel combustion, which currently provides 85 percent of U.S. energy. Thus, it will be very costly to try to replace this preferred energy source, especially attempting to do so as rapidly as the WCI requires. While WCI provides insufficient data to allow a comprehensive analysis of the economic impact of the WCI plan, other highly regarded analyses of national cap-and-trade programs offer important insights into the likely economic effects of the WCI program.

For example, Charles River Associates (CRA) has estimated the economic impacts of Senate bill 2191, “America's Climate Security Act of 2007,” sponsored by Joseph Lieberman (I-CT) and John Warner (R-VA).<sup>29</sup> S. 2191 proposed to impose strict upper limits on the emission of six GHGs with the primary emphasis on CO<sub>2</sub>, and would establish a cap-and-trade system that requires emitters to acquire federally-created permits for each ton emitted. CRA

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<sup>29</sup> William W. Beach, David Kreutzer, Ben Lieberman and Nicolas Loris, The Economic Costs of the Lieberman-Warner Climate Change Legislation, Heritage Foundation, Center for Data Analysis Report #08-02, May 2008.

Contrary to the claims of an economic stimulus from "green investment" and "green-collar" jobs, the WCI would likely retard economic growth, GDP and job creation in the West.

estimated the cost (in terms of reduced household spending per year) of S. 2191 at \$800 to \$1,300 per household by 2015, rising to \$1,500 to \$2,500 by 2050. Electricity prices could increase 36 to 65 percent by 2015 and 80 to 125 percent by 2050. No analysis has been conducted on the impact of S. 2191 on gasoline prices, but an EPA study of a less stringent cap-and-trade bill estimates impacts of 26 cents per gallon by 2030 and 68 cents by 2050.<sup>30</sup>

Energy is the lifeblood of the American economy, and the CRA analysis makes clear that the WCI implies extraordinary perils for the American economy – especially given the current economic recession.

Arbitrary restrictions predicated on multiple, untested and undeveloped technologies will lead to severe restrictions on energy use and large increases in energy

costs. In addition to the direct impact on consumers' budgets, these higher energy costs will spread through the jurisdictions' economies and inject unnecessary inefficiencies at virtually every stage of production and consumption -- all of which will add yet more financial burdens that must be borne by taxpayers.

For example, CRA found that implementing S. 2191 will be very costly, even given the most generous assumptions:

- Cumulative GDP losses are at least \$1.7 trillion and could reach \$4.8 trillion by 2030 (in inflation-adjusted 2006 dollars).<sup>31</sup>
- Single-year GDP losses total at least \$155 billion and realistically could exceed \$500 billion (in inflation-adjusted 2006 dollars).
- Annual job losses exceed 500,000 before 2030, and could approach 1,000,000.

<sup>30</sup> U.S. Environmental Protection Agency, "EPA Analysis of the Climate Stewardship and Innovation Act of 2007," July 16, 2007, p. 2. Even these cost projections may underestimate the true costs, because they assume no unpleasant surprises.

<sup>31</sup> The CRA analysis does not extend beyond 2030, at which point S. 2191 mandates GHG reductions to 33 percent below the 2005 level. However, it should be noted that the mandated GHG reductions continue to become more severe and must be 70 per-cent below the 2005 level by 2050.

- The annual cost of emission permits to energy users will be at least \$100 billion by 2020 and could exceed \$300 billion by 2030 (in inflation-adjusted 2006 dollars).<sup>32</sup>
- The average household will pay \$467 more each year for its natural gas and electricity (in inflation-adjusted 2006 dollars). That means that the average household would spend an additional \$8,870 to purchase energy over the period 2012 through 2030.
- The cost of the allowances will be significant and will lead to large increases in the cost of energy. Because the allowances have an economic effect much like the effect of an energy tax, the increase in energy costs creates correspondingly large transfers of income from private energy consumers to special interests.

This analysis finds that, without appropriate Congressional direction and oversight, the WCI could end up extracting hundreds of billions of dollars from millions of energy consumers and transfer this wealth to special interest groups and unique classes of citizens, circumventing the normal Congressional tax and appropriations processes. Unbound by the periodic review of these processes, such a de facto tax-and-spend program could threaten to become permanent and independent of the goals of any federal legislation.

In addition to directly harming consumers, the higher energy prices that are likely to result from a WCI-like plan could seriously affect the production side of the West's economy. Contrary to claims that WCI would spur an economic stimulus from "green investment" and "green-collar" job creation, the plan is much more likely to retard economic growth, GDP and job creation.

Business investment could be undermined by the negative effects of higher energy prices. Investment contributes to the economy when it increases future productivity and income, and the greater and more effective the investment, the greater the increase in future income. Since income could decline as a result of the WCI, it is possible that more income and jobs would be destroyed than would be created.

WCI's prediction of millions of new "green-collar" jobs would likely meet a similar fate. Firms could be burdened with significantly higher energy costs that must be reflected in their product prices. The higher prices could make their products less attractive to consumers and thus less competitive. As a result, job creation and growth could be reduced from what normally would occur.

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<sup>32</sup> To put these numbers in perspective, taxpayers spent \$43 billion on the Department of Homeland Security in 2007, \$155 billion on U.S. highways in 2005, and \$549 billion on the Department of Defense in 2007.

More generally, according to Paul Bledsoe, Strategy Director at the National Commission on Energy Policy, "People in Washington have begun to focus on the cost of climate change. But it's important to recognize that legislation to mitigate climate change is going to have significant economic costs, as well."<sup>33</sup> As Alan Greenspan noted in his memoir, "Cap-and-trade systems or carbon taxes are likely to be popular only until real people lose real jobs as their consequence."<sup>34</sup>

In short, this analysis concludes that the WCI plan could deepen, and lengthen, the current economic recession plaguing the West and the U.S.

## **4.A. Measuring Specific Economic Impacts**

The WCI plan leaves many implementation details to individual states and provinces, which precludes analysis of specific state-by-state impacts of the plan. However, CRA provides the best yardstick available with which to project potential impacts of a WCI-like plan. The CRA's estimates of impacts of Lieberman-Warner to Western states follow.

### **4.A.1. Impact on Jobs**

The primary cause of job losses would be lower industrial output due to higher energy prices, the high cost of complying with required emissions reductions, and greater competition from overseas manufacturers with lower energy costs.

For example, as shown in Figure IV-1, in 2020:

- Arizona would lose 29,000 jobs.
- California would lose 163,000 jobs.
- New Mexico would lose 10,000 jobs.
- Oregon would lose 18,000 jobs.
- Washington would lose 30,000 jobs.

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<sup>33</sup> Steven Mufson, op. cit.

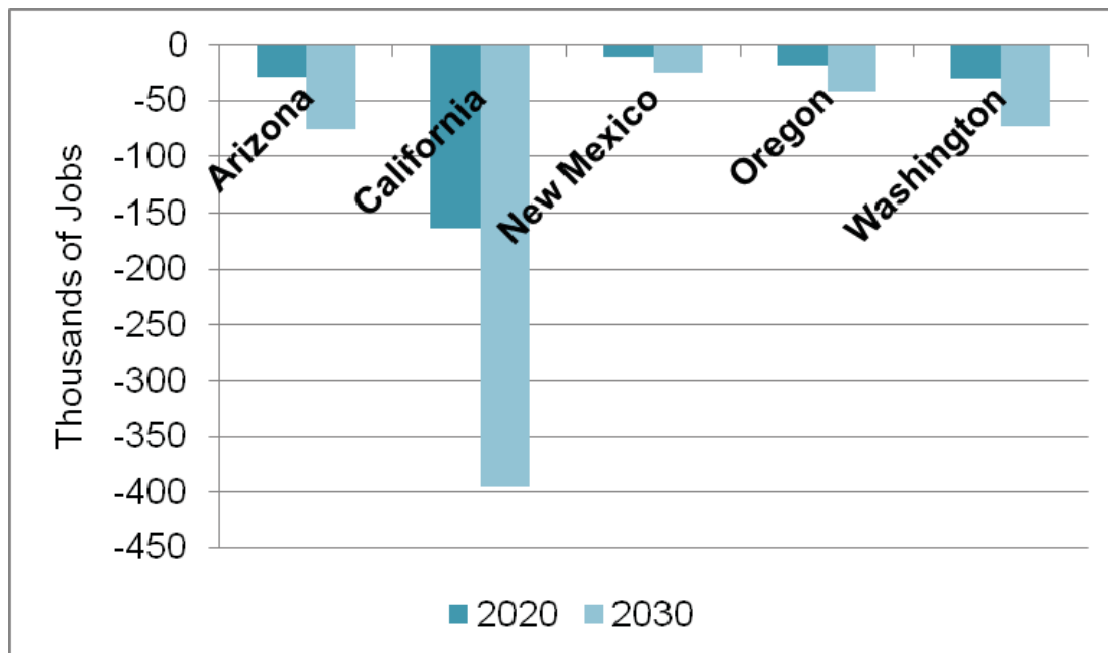
<sup>34</sup> Alan Greenspan, *The Age of Turbulence*, Penguin, 2007.

- All of the other Western states<sup>35</sup> combined would lose 258,000 jobs.

In 2030:

- Arizona would lose 75,000 jobs.
- California would lose 394,000 jobs.
- New Mexico would lose 24,000 jobs.
- Oregon would lose 42,000 jobs.
- Washington would lose 72,000 jobs.
- All of the other Western states<sup>36</sup> combined would lose 647,000 jobs.

**Figure 4-1** Job Losses in Western States from the Lieberman-Warner Bill



Source: SAIC and Management Information Services, Inc., 2008.

<sup>35</sup> Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, North Dakota, Oklahoma, South Dakota, Texas, Utah, and Washington.

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#### 4.A.2. Losses in Disposable Household Income

Higher energy prices would have ripple impacts on prices throughout the West's economy and would impose a financial cost on households. For example, as shown in Figure II-2, annual losses in disposable household income in 2020 would total<sup>37</sup> :

- \$1,745 in Arizona.
- \$2,640 in California.
- 1,540 in New Mexico.
- \$1,935 in Oregon.
- \$2,300 in Washington.
- An average of about \$2,000 in each of the other Western states.

Annual losses in disposable household income in 2030 would total:<sup>38</sup>

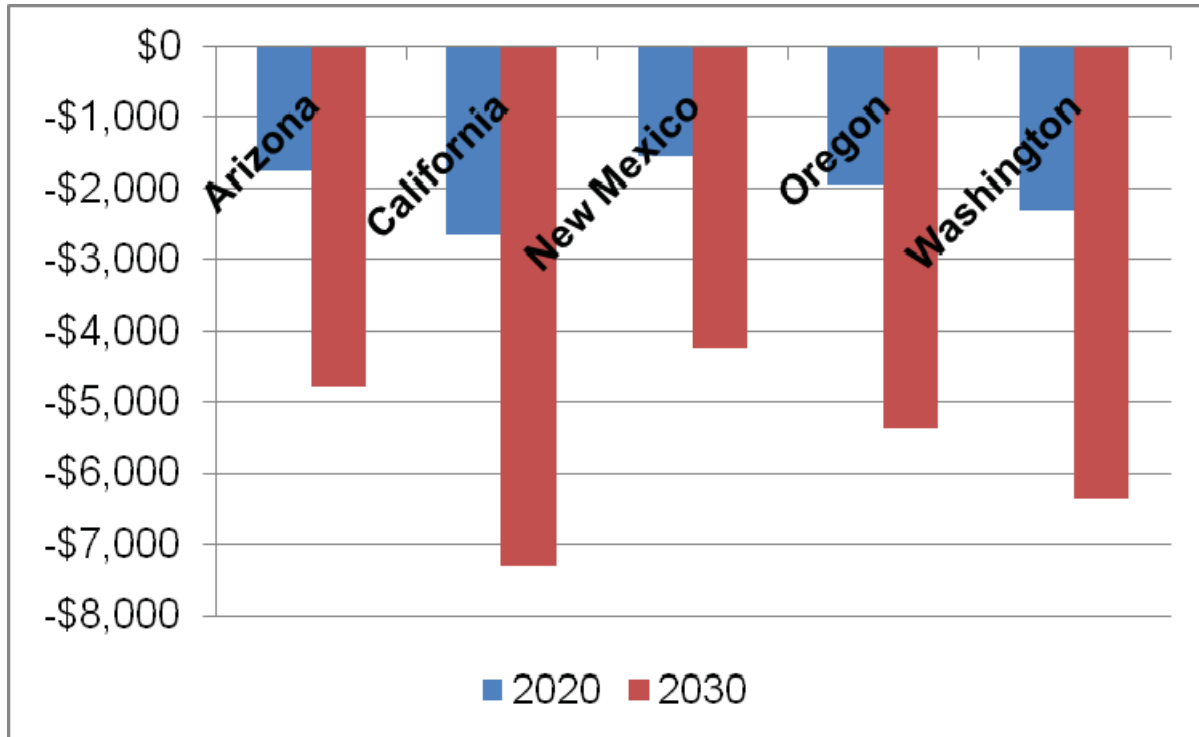
- \$4,775 in Arizona.
- \$7,290 in California.
- \$4,220 in New Mexico.
- \$5,350 in Oregon.
- \$6,350 in Washington.
- An average of about \$5,900 in each of the other Western states.

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<sup>37</sup> 2007 dollars.

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**Figure 4-2** Losses in Disposable Household Income in Western States from the Lieberman-Warner Bill



Source: SAIC and Management Information Services, Inc., 2008.

### 4.A.3. Impact on Energy Prices

Most energy prices would rise under Lieberman-Warner, particularly coal, oil, and natural gas. In 2020, in the Western jurisdictions:

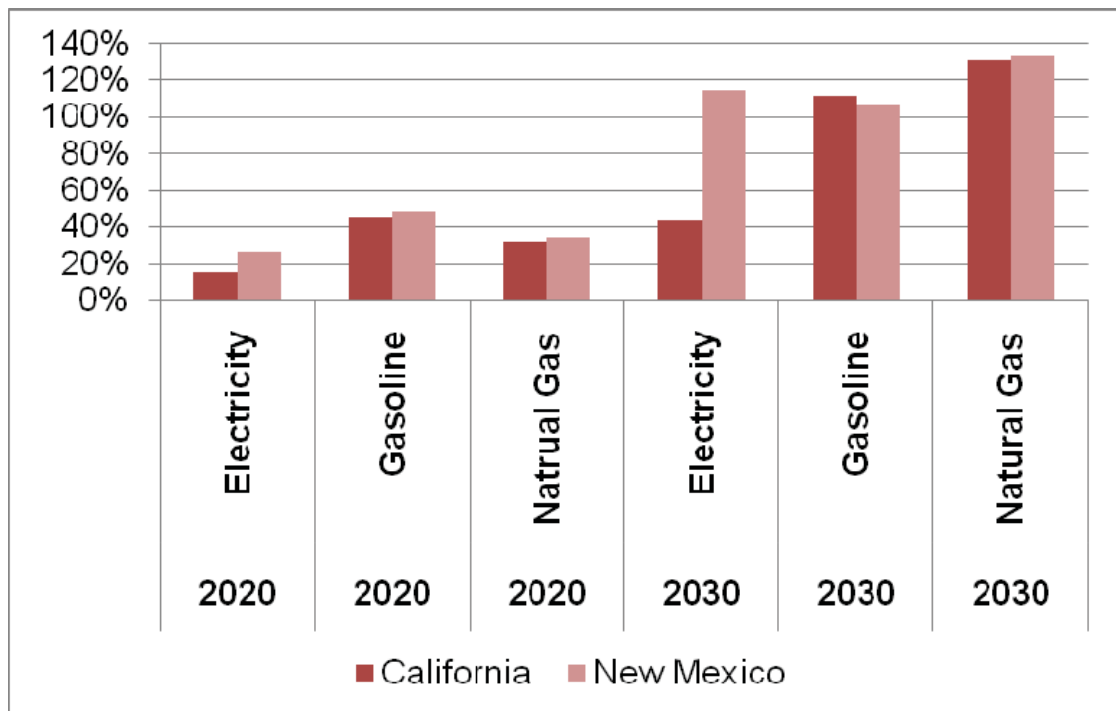
- The price of gasoline would increase between 44 percent and 50 percent.
- Electricity prices would increase by 15 percent to 27 percent.
- Natural gas prices would increase by 32 percent to 34 percent.

In 2030, in the Western jurisdictions:

- The price of gasoline would increase between 107 percent and 102 percent.
- Electricity prices would increase by 44 percent to 115 percent.
- Natural gas prices would increase by 132-134 percent.

The estimated energy price increases in California and New Mexico in 2020 and 2030 resulting from Lieberman-Warner are shown in Figure II-3.

**Figure 4-3** Increased Energy Costs in CA and NM from the Lieberman-Warner Bill



Source: SAIC and Management Information Services, Inc., 2008.

Lieberman-Warner would reduce GHG emissions from all sectors of the economy (transportation, residential, commercial, and industry); however, as the largest emitter of GHGs, the primary impact would fall on the electric sector. Lieberman-Warner would result in the electric industry shutting down most carbon-based generation and/or using

expensive, as yet unproven technology, to capture and store CO<sub>2</sub>. To meet the stringent goals of Lieberman-Warner, the electric industry would also have to substitute high cost technologies, such as biomass and wind, for conventional generation.

#### 4.A.4. Impact on Economic Growth

High energy prices, fewer jobs, and loss of industrial output are estimated to reduce Western jurisdictions' gross state product (GSP) significantly. As shown in Table II-3:

Annual losses in state GSP in 2020 would total<sup>39</sup> :

- \$3.2 billion in Arizona.
- \$24 billion in California.
- \$1 billion in New Mexico.
- \$2.1 billion in Oregon.
- \$4.3 billion in Washington.
- All of the other Western states combined would lose \$30 billion

Annual losses in state GSP in 2030 would total<sup>40</sup> :

- \$10.5 billion in Arizona.
- \$81 billion in California.
- \$3.5 billion in New Mexico.
- \$7.1 billion in Oregon.
- \$13.6 billion in Washington.
- All of the other Western states combined would lose \$103 billion.

The increases in energy costs under Lieberman-Warner will impact expenditures and budgets throughout the Western states. For example, the jurisdictions' schools, universities, and hospitals will likely experience significant increases in

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<sup>39</sup> 2007 dollars.

<sup>40</sup> 2007 dollars.

expenditures by 2020 and even larger increases by 2030. For government entities, costs for services, including public transportation and vehicle fleets, such as school buses, will also rise under Lieberman-Warner

**Table 4-1** Impact of the Lieberman-Warner Bill on the Western Jurisdictions\*

	2020			2030		
	GSP (billions)	Household Income	Jobs (thousands)	GSP (billions)	Household Income	Jobs (thousands)
<b>Arizona</b>	-\$3.2	-\$1,745	-29	-\$105	-\$4,775	-75
<b>California</b>	-\$24	-\$2,640	-163	-\$81	-\$7,290	-394
<b>New Mexico</b>	-\$1	-\$1,540	-10	-\$3.5	-\$4,220	-24
<b>Oregon</b>	-\$2.1	-\$1,935	-18	-\$7.1	-\$5,350	-42
<b>Washington</b>	-\$4.3	-\$2,300	-30	-\$13.6	-\$6,350	-72

\*Dollar estimates are in 2007 dollars.

Source: SAIC and Management Information Services, Inc., 2008.

#### **4.B. The Hidden Costs of A Massive Renewable Build-Out: Transmission Infrastructure**

Proponents of adding massive amounts of renewable power generation often underestimate the costs and technological, legal and political challenges associated with building the high-voltage transmission infrastructure needed to make remotely located, intermittent renewables work.

Transmission costs can almost double the cost of delivered power in some areas. Recent studies show that the U.S. will require more than 15,700 miles of new electricity transmission lines over the next decade. The Western Electricity Coordinating Council (WECC) may require nearly 7,000 miles alone for reliability purposes. This estimate does not take into account the more aggressive build-out of grids that is proposed by the renewable energy industry and the WCI.

Adding transmission lines and upgrading the grid will be an extremely costly endeavor that will take a minimum of seven years and may easily extend into 20+ years. While the activity will create economic activity and jobs, the money to pay for these activities to accommodate the wind technology will cause ratepayer bills to increase substantially.

As stated in the recent Texas Public Policy Foundation report:

*“Cost estimates for wind-energy generation typically include only turbine construction and maintenance. Left out are the many of wind energy’s costs – transmission, grid connection and management, and backup generation – that ultimately will be borne by Texas’ electric ratepayers. Direct subsidies, tax breaks, and increased production and ancillary costs associated with wind energy could cost Texas more than \$4 billion per year and at least \$60 billion through 2025.”<sup>41</sup>*

Cost estimates of supplying wind power to the grid range wildly based on a number of factors, but a recent comprehensive survey determined that most costs fell below \$20/MWh or \$420/kW.<sup>42</sup> More recent financial information shows that cost estimates for building transmission lines vary based on topography and length:

- A joint venture will create a 290-mile span of 765v transmission from West Virginia into Maryland costing an estimated \$1.8 billion (\$6.2 million per mile).
- A partnership is to build 240 miles of extra-high-voltage transmission lines in Indiana for an estimated total cost of \$1 billion (\$4.2 million per mile).
- A joint venture will build 170 miles of extra-high-voltage lines from the Kansas-Oklahoma border into Oklahoma for an estimated cost of \$500 million (\$2.9 million per mile).
- A joint venture will construct a 230-mile, 765v transmission line in Kansas at an estimated cost of \$600 million (\$2.6 million per mile).<sup>43</sup>

For the wind technology to reach a significant level of penetration in the electric power mix, as much as \$230 billion in transmission line investment may be required to move all the planned green energy into and around the grid.<sup>44</sup> These costs will eventually be borne by

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<sup>41</sup> Drew Thornley, *Texas Wind Energy: Past, Present, and Future*, October 2008.

<sup>42</sup> Andrew Mills, Ryan Wisner, and Kevin Porter, “A Critical Review of Wind Transmission Cost Estimates From Major Transmission Planning Efforts”, 27<sup>th</sup> USAEE/IAEE Conference, Sept. 2007.

<sup>43</sup> Susan Arterian Chang, “Renewables Call For Transmission Build,” *Energy Risk*, January 2009.

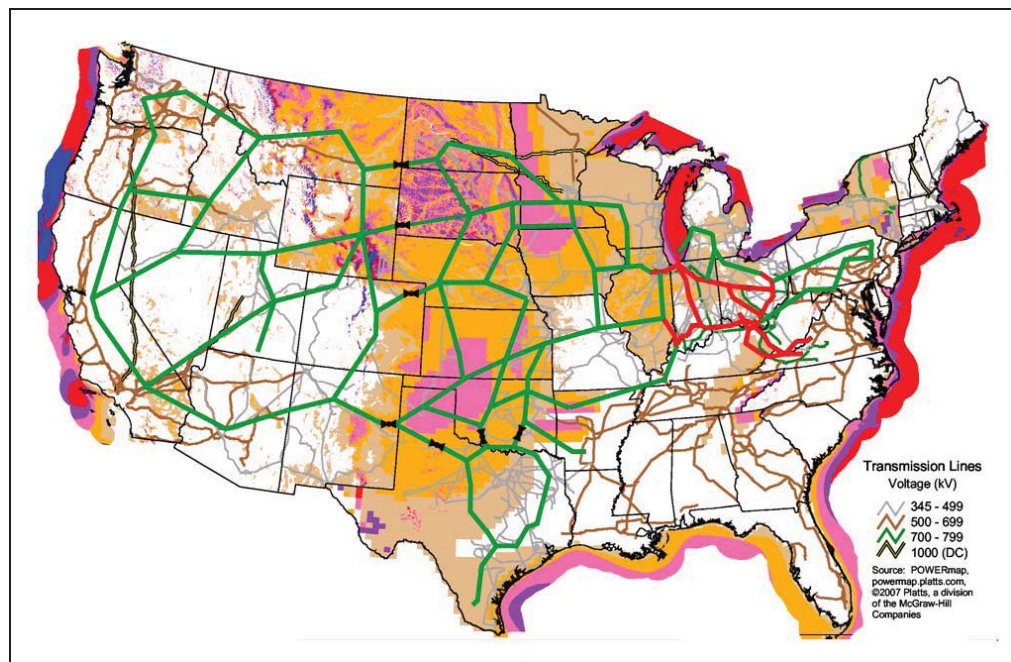
<sup>44</sup> Ibid.

the ratepayers and will be in addition to the high costs of the wind energy technology itself.

The American Wind Energy Association (AWEA) notes that achieving its 20 percent Wind Vision plan will require 19,000 miles of new transmission lines. The Figure below shows a conceptual plan developed by American Electric Power to fit the output of the WindDDS model.

As AWEA notes, this plan is based on the highest voltage in use in the US (765 kV), but would cost more if standard 345 and 500 kV lines were used, because they deliver so much less power for the same cost.

**Figure 4-4** Transmission Needed to Attain 20 Percent Wind Generation



Source: POWERmap, powermap.platts.com

The cost associated with such a massive build-out is difficult to estimate, given that the cost of building new transmission can vary between \$500,000 per mile to more than \$16.5 million per mile (as was the case in a recent transmission project in Southern California).

Assuming a cost-per-mile on the lower end of the spectrum, and an amount recently cited by the U.S. Department of Energy — \$4.5 million — the cost of building 19,000 miles of new transmission to support a national 20 percent wind generation scenario would be at least \$85 billion. This does not include many other costs of building transmission geared toward wheeling power from intermittent resources like wind and solar.

A recent analysis of the costs of transmission expansion needed in Texas, conducted by Electric Reliability Council of Texas (ERCOT), shows costs ranging from \$3 to \$9 billion.<sup>45</sup>

Other estimates place the cost of at \$60 billion for a 12,500-mile network and as much as \$400 billion to construct an 80,000-mile network.

Another serious issue with moving substantial wind power onto the grid is the time involved. While wind turbines can be currently constructed with about an 18-month time horizon, siting new transmission lines can average between seven to ten years. There is very little optimism that these times can be reduced because new transmission lines engender many of the same negative aspects of wind turbines:

- The environmental costs related to producing the equipment and transporting it.
- The environmental onsite construction damage, natural wildlife and marine habitat and migratory impacts.
- Perceived damage to vistas.
- Perceived health impacts of noise and low-frequency vibrations.
- The impacts to the value of surrounding properties.

Thus, the regulatory processes of siting, designing and constructing a transmission system will take many years to run its course. A worst-case example may be the recent AEP West Virginia-Virginia transmission project that was first proposed in 1990 and completed in 2006 — a 16-year process.

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<sup>45</sup> “CREZ Transmission Optimization Study,” ERCOT, April 2008, [http://www.ercot.com/news/press\\_releases/2008/nr04-02-08](http://www.ercot.com/news/press_releases/2008/nr04-02-08)

As noted in Energy Risk Magazine:<sup>46</sup>

*“In fact, today's competitive, boundary-blurring US electricity marketplace continues to be regulated by a maze of state authorities, Independent Systems Operators (ISOs), Regional Transmission Organizations (RTOs), and the Federal Energy Regulatory Authority (FERC). Consequently, critical regulatory decisions involving the planning and construction of regional transmission lines are often log jammed for years. Tomasky recalls the "nightmare" story of AEP's Wyoming-Jacksons Ferry 765 kilovolt (kV) transmission project - first proposed in 1990 and completed in 2006 - that was delayed by a seemingly endless permitting process, which included the US Army Corp of Engineers, US Forest Service and West Virginia and Virginia's regulatory authorities.”*

*Currently, the AEP-Allegheny Power joint Potomac-Appalachian Transmission Highline (PATH) project in West Virginia and Maryland illustrates the hurdles utilities face in getting new transmission lines up and running. This joint venture will create a 290-mile span of 765kV transmission from West Virginia into Maryland costing an estimated \$1.8 billion. The project received approval for construction from the PJM Interconnection, the RTO under which it operates, in June 2007. PJM also approved a preliminary cost allocation methodology, spreading the cost of the project over all the electric utilities that serve retail customers in the 13 state areas that fall under its jurisdiction. AEP and Allegheny must now work through the routing studies and environmental assessments for the project. Once those studies have been completed, regulatory approval for siting the lines must be sought from the West Virginia and Maryland utility commissions.”*

Even beyond siting the wind farms, states and the federal government would have to expedite permitting and obtaining the land and permission to build transmission lines, as well as provide the resources to review interconnection applications quickly. Although the public supports renewable energy in the abstract, many groups object vociferously to wind farms in particular places and to transmission lines nearly everywhere.

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<sup>46</sup> “Renewables call for transmission build,” Energy Risk Magazine, January 2009.