

Green Power Transmission and Consumer Savings

Reinvesting in our electric grid will produce a number of major benefits for the country. By connecting world-class wind resources that are currently stranded in remote parts of the U.S., we can put these clean, domestic energy resources to use powering our homes, businesses, and factories, reducing carbon dioxide emissions as well as energy prices and creating hundreds of thousands of new domestic jobs. A number of recent studies have concluded that the consumer energy savings from building transmission are significantly larger than the costs of the initial infrastructure investment, meaning that on net consumers would see their electric bills decrease if we create a policy environment that will allow a major reinvestment in our grid. This fact sheet summarizes the results of these studies and explains what policy reforms are needed to realize these benefits.

A Variety of Benefits for Consumers

Investing in the grid yields a number of benefits for consumers, as indicated in Figure 1 below. Most importantly, a robust transmission grid provides consumers with access to lower-cost electricity. On a severely constrained transmission grid, as we currently have in many parts of the U.S., consumers are forced to rely on local power plants even though plants in other regions can produce power more efficiently and at lower cost. The effect of higher electricity prices goes beyond financial hardship for residential consumers. Businesses must pass higher electricity costs on to their customers, and electricity-intensive industries have a strong incentive to relocate to regions with lower electricity costs, taking jobs with them.

Transmission is also an important mechanism to protect consumers against volatility in the price of fuels used for electricity generation. Consumers in transmission-constrained regions often have no choice but to continue using expensive fuels to meet some of their power needs, even if the price of those fuels increases drastically. The prices of natural gas and Appalachian coal have fluctuated by a factor of three in recent years, and these cost increases have directly led to comparable increases in electricity prices for regions of the country that depend on these fuels for electricity generation. A more robust transmission grid could have significantly alleviated the negative impact of these fuel price fluctuations on consumers by making it possible to buy power from other regions.

In addition, just as an interstate highway allows traffic to flow far more efficiently than an overloaded 2-lane local road, upgrading our electric grid with new high-capacity transmission lines will significantly reduce electrical losses, the cost of which is passed on to consumers.

Transmission Study Results

A number of recent regional and national studies have found that the costs of transmission investments are significantly outweighed by the consumer savings that those investments produce. One regional study by Charles River Associates (CRA), International, the results of which appear below, found that an investment in a high-voltage transmission overlay to access wind resources in Kansas, Oklahoma, and Texas would provide benefits of around \$2 billion per year, more than four times the \$400-500 million annual cost of the transmission investment. \$100 million of these savings come from the significantly higher efficiency of high-voltage transmission, which would reduce electricity losses by 1,600 gigawatt-hours (GWh) each year. The new transmission would bring 14,000 MW of new wind plants online, reducing CO2 emissions by 30 million tons per year. The overall wind and transmission project would also create 5,000 new permanent jobs, \$60 million in annual property tax revenue, and \$500 million in economic activity each year.

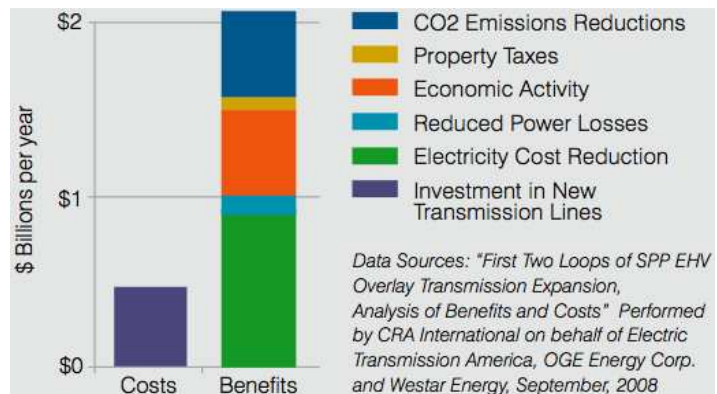


Figure 1: Costs and Benefits of Transmission (CRA study)

An analysis by American Electric Power built on the results of the CRA International study to evaluate the costs and benefits of building transmission for the entire nation. Using conservative assumptions, this analysis found that building transmission would result in savings of \$5.95 per month for the average household, compared to a transmission cost of between \$1.95 and \$3.24 per month, resulting in net savings of \$2.71 to \$4.00 per month.

Another national analysis, the Joint Coordinated System Plan (JCSP) conducted by many of the grid operators in the Eastern U.S., similarly found that the consumer benefits of building transmission would outweigh the cost of the investment. The study found that making the investment in transmission needed to achieve a 20% wind penetration in the Eastern U.S. would reduce electricity prices by \$41 billion total, with the regional breakdown of these benefits indicated in Table 1. It is worth noting that this study did not account for the significant economic development benefits that would accrue to all regions as a result of increased wind power development, nor did it account for the broad-based benefits of improving electric grid reliability.

Table 1: Costs and Benefits of Transmission Buildout by Region, according to JCSP study (Year 2024 \$)

	Average electricity price, before buildout (\$/MWh)	Average electricity price, after buildout (\$/MWh)	Annual Reduction in Electricity Prices		Annual Transmission Cost		Annual Net Consumer Benefits	
			Total (Billions)	\$ Per Monthly Bill	Total (Billions)	\$ Per Monthly Bill	Total (Billions)	\$ Per Monthly Bill
New York	\$106	\$58	\$10.765	\$62.04	\$0.737	\$4.25	\$10.028	\$57.79
PJM (Mid-Atlantic/Great Lakes)	\$75	\$62	\$12.172	\$16.56	\$3.122	\$4.25	\$9.050	\$12.31
New England	\$100	\$64	\$6.605	\$47.32	\$0.593	\$4.25	\$6.012	\$43.07
SPP (Lower Plains)	\$77	\$54	\$5.848	\$29.89	\$0.831	\$4.25	\$5.017	\$25.64
SERC (Southeast)	\$73	\$65	\$5.357	\$11.01	\$2.066	\$4.25	\$3.290	\$6.76
TVA (Tenn. Valley)	\$60	\$56	\$1.424	\$5.38	\$1.124	\$4.25	\$0.300	\$1.13
MAPP (Upper Plains)	\$44	\$42	\$0.189	\$2.37	\$0.339	\$4.25	-\$0.150	-\$1.88
Midwest ISO (Upper Plains)	\$49	\$51	-\$1.298	-\$2.16	\$2.554	\$4.25	-\$3.852	-\$6.41
Average/Total	\$66	\$55	\$41.063	\$14.30	\$11.366	\$4.25	\$29.696	\$10.05

The grid operator in Texas (ERCOT) has also studied the costs and benefits of building transmission. The analysis found that a \$4.9 billion investment in transmission would save \$1.7 billion per year in fuel costs (production savings), repaying the \$4.9 billion cost of the investment in 2.9 years. An earlier analysis by ERCOT concluded that the consumer savings of transmission would be even larger, as indicated in Figure 2 below.

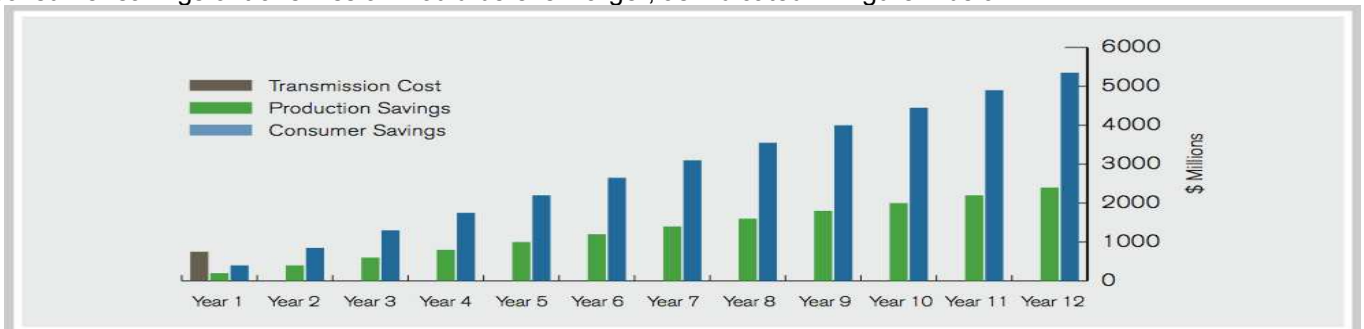


Figure 2: Production savings (fuel savings) and consumer savings of building transmission for wind in Texas



What Policies Are Needed to Realize These Benefits?

While these studies have concluded that there are major benefits to building transmission, policy obstacles have largely prevented these benefits from being realized. Specifically, the policies that govern how the transmission system is **planned, paid for, and permitted** have failed to keep pace with the evolving structure of the electric industry, making it very difficult for private transmission investment to occur and resulting in the current inadequacy of the nation's grid. The policy reforms that are needed are briefly summarized below:

- **Planning** – A pro-active planning process is needed to identify the regions of the country with the best renewable resources and design the transmission lines that most cost-effectively connect these regions with electricity demand centers.
- **Paying** – The cost of transmission needs to be broadly allocated to consumers across a wide region if we are to build transmission on the scale needed. Spreading the cost reduces the cost of the transmission for any one consumer to a trivial amount, and recognizes the fact that the benefits of building transmission will be larger than the cost for almost all consumers.
- **Permitting** – The slow and cumbersome process of obtaining the many siting permits required before a transmission project can be built is a major impediment to the construction of new transmission, often taking a decade or more and causing great expense. Greater federal authority for granting siting permits and an overall streamlining of the permitting process can remove a major barrier to transmission construction.

As an example of the difference that policy makes, transmission companies in Texas are moving forward with building the \$4.9 billion transmission investment discussed above. This progress was possible because the state passed a law establishing a pro-active transmission planning process, and also stipulated that the cost of building these transmission plans would be broadly allocated to all electric consumers in the state. Texas expects to see almost 12,000 MW of new wind plants installed to take advantage of this new transmission, which will bring tens of billions of dollars worth of additional economic development to the state while saving consumers billions of dollars per year on their electric bills by reducing the use of coal and natural gas. Guided by Texas's success, Colorado and California have passed similar laws, and several of the transmission bills that have been proposed in the U.S. Congress have been modeled on this approach. Given the immense benefits of building transmission, it's easy to see why so many people are eager to make the policy reforms that will allow new transmission development to go forward.

For more information, please see AWEA's white paper on green power transmission:

<http://www.awea.org/GreenPowerSuperhighways.pdf>