

# the *TRANSMISSION* line

## TRANSMISSION 101

**T**he electrification of America has been called the greatest engineering feat of the 20th century. Ironically, this outstanding achievement is becoming the nation's handicap in this new century. This is because our power grid is increasingly outdated and less reliable.

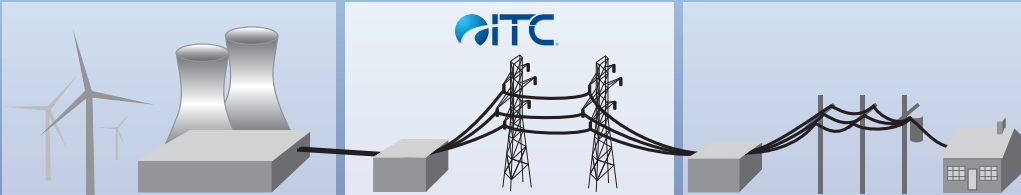
Today, 70% of transmission lines are 25 years or older, 70% of our large power transformers are 25 years or older, and 60% of circuit breakers are more than 30 years old.<sup>1</sup> Energy experts are concerned that the aging grid simply isn't equipped to meet modern energy demands.

There's a growing conversation in this country about what investments are needed in our nation's power transmission infrastructure. A modern grid is essential to achieving our common national goals of consumer savings, energy security, economic development, access to cheaper energy sources and environmental protection.

Today's power grid includes electricity generation (power plants, wind farms, solar fields), electric power transmission (high-voltage wires spanning the country), and electricity distribution (small wires you see on your street). >>

### COMPONENTS OF THE GRID

There are three stages in the delivery of power to customers:



**Generation.** This is the process of creating electricity from other forms of energy at a power plant or facility. It is fueled by coal, nuclear, wind, natural gas, biomass, solar and hydro power.

**Transmission.** The network of high voltage lines and towers acts as the energy superhighway, interconnecting generating facilities to the local distribution system near populated areas.

**Distribution.** The most visible component of the power delivery is the system of distribution lines along streets and the wires that bring electricity into our homes and businesses.

## How transmission benefits consumers

Transmission is a vital part of the electricity delivery cycle. It links consumers to competitive wholesale energy markets that stretch across state boundaries and regions. This gives consumers a more robust energy mix that can incorporate all types of power generation. When consumers have more choices, costs come down.

Just as the interstate highway system facilitates commerce by providing access and economic benefits to markets across the country, an interstate transmission system will expand regional access to electricity supply. That's because a transmission project's location alone is not indicative of where the benefits are realized. It's similar to how the exit and entry ramps of that interstate highway provide access and economic benefits to people hundreds of miles away.

New transmission infrastructure will reverse the effects of decades of underinvestment that have left our electricity grid unable to meet today's demand.

### Transmission development serves reliability, economic and policy goals:

- Improves system reliability
- Expands access to power generation markets
- Lowers the overall cost of delivered energy
- Interconnects new generating resources

## Regulation of transmission

Our grid is governed by a combination of state, regional and federal agencies created to deal with mostly local-level incremental changes.

**Federal.** The Federal Energy Regulatory Commission and the departments of Energy, Agriculture and Interior regulate everything from utility, transmission and generation rates to rights of way and land use management.

**Regional.** Regional Transmission Organizations (RTOs) and Independent System Operators (ISOs) advocate competition among generators, provide equal, non-discriminatory access to transmission, conduct regional planning, manage interconnections and oversee energy markets.

**State.** At the state and local levels, public service and public utility commissions regulate retail rates and siting. Environmental agencies and legislators regulate land use, siting and environmental standards.

This fragmented regulatory structure is ill-suited to manage these transformational changes to the national electric system expected in the coming decades:

- Developing remote renewable energy resources rapidly and at large scale
- Improving national energy security, electrifying transportation
- Reducing carbon emissions

## Amid neglect, growing demand

America's electricity grid was built more than half a century ago for a country that looked very different from the one we know today. It was designed around the population of those times which consisted exclusively of cities and rural communities.

Since the 1970s, per capita consumption of energy has doubled. Over this same period, the population of the U.S. has grown from approximately 200 million people to more than 300 million people. The places people live have changed as well. Americans have moved away from cities into sprawling suburban population centers, which now rely on transmission that was originally built to support farming communities. Yet our electricity grid has stayed largely the same.

***This high energy demand trend shows no signs of letting up. By 2035, demand is expected to increase by 31 percent. Energy experts are concerned that growth in electricity demand and consumption is exacerbating the problem of an already overburdened grid.<sup>2</sup>***

This neglect comes at a cost to consumers. Strong evidence suggests that this underinvestment and lack of proper maintenance led to the 2003 blackout that struck the Northeast and Midwest. Even without a large blackout, the current state of the grid is already taking its toll on the economy. According to the Department of Energy, major power outages and power quality disturbances cost the economy between \$25 and \$180 billion annually.<sup>3</sup> >>

## There are three components of regulation that are critical to grid modernization:

1

### Cost Allocation

America is connected through our energy grid. The national transmission system is a highly integrated network spanning thousands of miles. When any component is changed, for example a new power plant comes online or a section suffers damage in a storm, the impacts are felt across the grid. That means adding new wind energy in the Great Plains or solar energy in the Southwest benefits everyone everywhere in between. Other energy sources like natural gas and nuclear power are part of this diverse mix. Regulators must assign cost responsibility in a manner that takes into consideration the fluid and interconnected nature of interstate transmission.

2

### Planning

Today transmission planning is still done state by state, even power plant by power plant. This antiquated process only leads to inefficiency and higher costs for consumers, and more importantly, today's grid is not designed to efficiently connect renewable energy resources to the towns and cities that need that power. The existing governance structure and planning processes are not effective, resulting in little to no true regional transmission being planned or built. We need a truly inclusive planning process that brings all stakeholders to the table and is governed by an independent entity so that we can develop a vision for a regional transmission infrastructure.

3

### Siting

Consumers benefit when all stakeholders – energy providers, federal agencies, and state and local officials – are involved in a collaborative building process. The regulatory process should be designed to ensure that the state can weigh in on local issues that they are best equipped to navigate; including zoning, land use and other local concerns. At the same time, federal regulators should be empowered to step in and assume responsibility to route a project if a state fails to fulfill its role. A national energy policy can help ensure that strategically planned regional transmission helps us reach our national energy goals.

## New MIT study reiterates need for modern regulations for a modern grid

A 2011 study by the Massachusetts Institute of Technology (MIT) looks at the current state of the power grid and identifies a path toward addressing the challenges the U.S. transmission system will face over the next two decades.

The study, *The Future of the Electric Grid*, identifies two major challenges to the next evolution of the grid:

- The lack of a national electricity policy
- The patchwork of “regulatory regimes” that currently govern this vital infrastructure

Ensuring the reliability and maximum efficiency of the system can be achieved through a range of common sense regulatory reforms, including full utilization of the interregional and intraregional directives related to planning and cost allocation found in the Federal Energy Regulatory Commission's (FERC) Order 1000.

The full MIT report can be viewed at: <http://web.mit.edu/mitei/research/studies/the-electric-grid-2011.shtml>

## Promising solutions toward a 21st century transmission system

The Federal Energy Regulatory Commission (FERC) has enunciated policies that will serve to promote regional transmission projects by providing for appropriate broad-based, regional cost allocation. FERC's proposed rules will accelerate reliable access to power of all types around the region, promote job creation and better facilitate electricity markets through much-needed transmission development. FERC's rules:

**Support voluntary regional agreements** All around the country, regions are working with stakeholders, which include state utility commissions, end users, state and local utilities and co-ops, and transmission providers, to craft consensus agreements that support needed transmission in their regions.

**Align costs with benefits** FERC's rules ensure that only those who benefit from new electric transmission facilities will pay for those facilities and that the amount paid should be "roughly commensurate with the benefits received" – a much more reasonable and workable standard given the long-term and broad benefits of transmission.

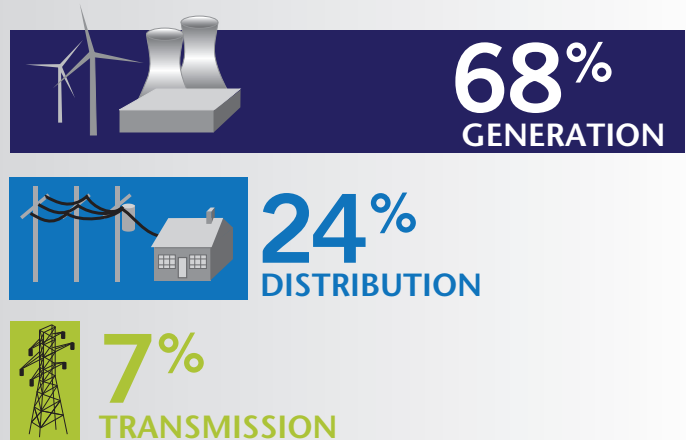
**Help regions build the infrastructure to meet consumer demand** The rules solidify investment in transmission projects aimed at driving growth, increasing reliability and competition, and providing energy security, national security and environmental benefits for our nation.

**Link paying for transmission to the planning process** The rules enhance regional planning processes, and encourage regions to consider public policy objectives, such as state clean energy standards, in their planning activities. It will also facilitate planning efforts between various regions. These measures build upon the reforms that local regions are already doing and will increase competition and lower electricity prices.

**If we ultimately want to achieve a 21st century transmission system, designed to meet the needs of today's energy intensive economy, we will need a reliable, robust and adaptable power grid to address the interconnection of new generating sources as well as efficient energy transport, wholesale market competition and future adaptability. >>**

### » INSIDE YOUR ELECTRIC BILL

*When it comes to electricity, two-thirds of the average consumer bill goes to power generation. The next step in the power delivery process – transmission – is the smallest part of the bill at less than 10 percent on average. The rest of the costs are eaten up by local distribution. This important perspective on the transmission component of the electric bill has largely been absent from the conversation about costs, benefits and who should pay for updates to the grid.*



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27175 Energy Way  
Novi, MI 48377

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