A Tale Of Two Transmission Systems

The transmission genie is out of the bottle.

By Elliot Roseman

Think long term—beyond the current transition in power markets. In 2012, you look back and reflect. "Over the past decade we made momentous choices regarding transmission regulation and operation that have dramatically changed the way we do business." What were those choices, and are we better off? Let's consider two polar scenarios based on clear objectives for future performance that define whether we would be "better off" in 2012.

Scenario 1: Objectives

1. Transmission bottlenecks are minimal, and wholesale power transactions flow effectively.
2. There is sufficient generation to satisfy demand.
3. There is a healthy market in risk management and hedging products.
4. Financial institutions are comfortable providing debt for facilities required to upgrade capacity and reliability.
5. Retail customers have sufficient choice of power suppliers.
6. Fuel supply for power generation is well diversified.
7. Technological improvements have increased power flows, enhanced productivity and reliability, and mitigated price increases.
8. Environmental performance has improved substantially.
9. Regulatory tensions have been ironed out.
10. Non-fuel electricity prices are lower.

Can you imagine this scenario (scenario 2 is the downside of the first one), in which we all have a stake? Five key actions and changes need to take place to achieve these objectives:

Action #1: Get Regional Transmission Organizations (RTOs) Up and Running. RTOs are needed—wholesale markets are not operating competitively. Investments in transmission have declined $115 million annually for 25 years, wholesale transactions have quadrupled in four years, and canceled transactions have proliferated.

With few exceptions, utilities are not pursuing upgrades until RTOs, incentives for ownership, and recovery of costs are resolved. One critical function of RTOs will be to plan new lines and get them built or encourage others to build them. Note that RTOs focus on centralized planning, while restructuring is intended to encourage market forces, so RTOs will probably be replaced by another entity in the future. But for now, RTOs are the way to go.

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We need to get past this phase in RTO development in two to three years, or we'll be in "no man's land" between RTOs and traditional regulation. The Federal Energy Regulatory Commission (FERC) should specify a number of common features and the organizational model it will accept. Public utilities (e.g., municipal, cooperative, federal) must also participate, lest RTOs resemble Swiss cheese.

Action #2: Clarify Who Regulates What. There is a deep schism between FERC and the states on regulation and siting. Some transmission is state regulated, but as transmission comes under RTOs, assets will be increasingly FERC regulated. What is unclear is how much of the retail rate is subject to FERC's jurisdiction. It does not seem efficient for *new* transmission investment to be FERC regulated while regulation of *existing* assets is split.

On siting, states have jurisdiction, yet some lawmakers, including President Bush, have proposed federal preemption. There are hopeful signs. Some state regulators are willing to set deadlines for ruling on proposed lines, after which the federal government could assume responsibility. We need a framework whereby states meet together to consider proposed lines and streamline hearings and rate-making. FERC could also participate.

Action #3: Consolidate Trans-mission Ownership. The top 20 investor-owned utilities own two thirds of private transmission, while another 100 or so own the rest.

Also, public utilities own dominant regional transmission shares, and several thousand cooperatives and municipal utilities own some. There are too many owners to be efficient, which leads to significant rate "pancaking". Figure 1 (next page) shows the dispersion of transmission ownership in the East Central Area Reliability Council (ECAR) and PJM Interconnection regions alone.

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This ownership situation should change soon. Once FERC clarifies the tariffs, performance-based incentives, and requirements for RTOs, many utilities will decide whether to stay in transmission. FERC should establish

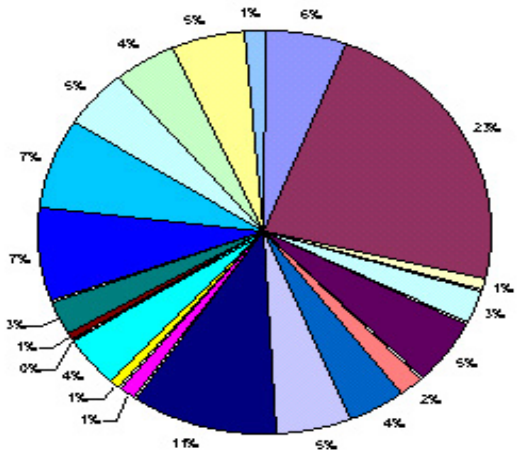

Figure 1 shows the dispersion of transmission ownership in the ECAR and PJM regions.

"exempt transmission facilities" with lighter regulation, just as it established "exempt wholesale generators" to attract entrepreneurs, as proposed by John Howe, Vice President of American Superconductor, in response to the U.S. Department of Energy's National Transmission Grid Study (October 2001). Transmission ownership will shift over the next decade to merchant owners and operators.

Larger entities will be better able to serve customers, consolidate costs, test and deploy new technologies, finance asset additions and acquisitions, manage congestion, and achieve a critical mass. What is the most efficient size? Using the five-percent market share threshold that seems to apply in generation and distribution implies a transmission asset base of $3 billion to achieve sufficient scale, which few utilities achieve today.

Action #4: Anticipate Short-Term Moderate Price Increases and Lower Prices in the Longer Term. Transmission is only about 10 percent of the delivered power cost, so even if costs rise due to investment by 30 to 50 percent over a decade, delivered costs will only rise 3 to 5 percent. FERC recently proposed that if wholesale prices do not increase more than a threshold such as three percent due to RTO formation, the cost should be acceptable. Setting up RTOs also costs money, but nationwide costs of $2 billion—most of which is a one-time cost—are just one percent of the $220 billion annual retail sales. If we focus on short-term costs, we will never realize the long-term benefits, which are worth much more than the transition costs.

Action #5: Implement New Transmission Technologies. Competition accelerates the use of new technologies, and such a renaissance will take place in transmission when competition is unleashed. A number of utilities and associations are now testing Flexible AC Transmission Systems (FACTS), superconductivity, new cabling and undergrounding techniques, and other technologies to substantially improve efficiency. FACTS can increase existing line throughput 30 percent, and new information technologies can utilize much more capacity. Superconductivity can alleviate bottlenecks by storing power (Distributed Superconducting Magnetic Energy Storage or D-SMES), and High Temperature Superconductor (HTS) cable can transmit alternating current (AC) and direct current (DC) power with few losses.

These technologies would mitigate the need for new lines and greatly reduce electric and magnetic fields (EMF) and other impacts. They could make the need for new rights-of-way essentially moot. Government should liberally finance R&D and demonstrations, and RTOs should give these technologies priority.

Conclusion. We can achieve our objectives through these five actions. We need to have patience and accept that some costs may rise in the near term to achieve longer-term benefits.

The transmission genie is out of the bottle. The transition will be messy, as stakeholders struggle to identify how their roles are changing and how to satisfy their constituents in the restructured electricity industry. In a decade, if we keep the overall objectives and key actions in mind, this transition should be behind us, and the consumer will be better for it.

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