

## Power Production Decentralizes in Mexico

By Lucas Laursen

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Over the last twenty years, Mexico's electricity sector has shifted from being almost 100 percent state-owned and centralized to about one quarter (<http://www.eia.gov/countries/cab.cfm?fips=mx>) privately generated. This summer, the Mexican government signed into law energy and electricity grid reforms that will accelerate the decentralization of its electricity production (See "[Mexico Opens Its Grid to Competition.](http://spectrum.ieee.org/energywise/energy/policy/mexico-opens-its-grid-to-competition)") (<http://spectrum.ieee.org/energywise/energy/policy/mexico-opens-its-grid-to-competition>). By the end of this year, a new agency should have a regulatory map available for power producers large and small, said [Edgar López](http://mx.linkedin.com/pub/edgar-lópez-satow/30/bb/8a1) (<http://mx.linkedin.com/pub/edgar-lópez-satow/30/bb/8a1>), renewable energies director at Mexico's Energy Regulatory Commission (CRE) at a conference in Mexico City last month.



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Mexico has long enjoyed cheap sources of energy but suffered from poor distribution. It loses around 17 percent of the electricity it produces in transit, compared to the 7 percent average of other members of the Organization for Economic Cooperation and Development, a rich country's club.

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**"In the long run, [microgrids] could constitute the principal design element of future electricity distribution systems."**

—*Rolando Nieva, Electric Research Institute, Cuernavaca, Mexico*

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said that Mexico is already pioneering the sort of smart substation automation that will be necessary to handle more variable power production. A leading example is the substation at Ixtepec, Oaxaca, which handles electricity produced by windmills in the Isthmus of Tehuantepec, one of the world's windiest onshore sites. Components of that substation use fiber optic cables to communicate internally.

All those changes pave the way for local generation to connect to the rest of Mexico, and it opens an opportunity for the 2 percent or so of Mexicans without electricity, who are often in the weakest position to invest in

As a result, most of the distributed production of electricity has been sited at remote industrial plants whose managers were unwilling to pay Mexico's exorbitant retail electricity rates. The reform to the grid passed earlier this year will put the CRE in the role of a market overseer, rather than a benevolent, if inefficient, buyer and seller of electricity. López said that private investment in the grid should help drive down costs, and create opportunities for more distributed power production.

Another change that will accompany the decentralization of power production is that renewables should make up a larger fraction of production. To accommodate renewables, the grid will have to grow smarter, said [Carlos Corona](https://www.linkedin.com/pub/carlos-corona-martinez/38/213/16) (<https://www.linkedin.com/pub/carlos-corona-martinez/38/213/16>), an energy account manager at Siemens. He

connections to the national grid. Their plight has led to a drive for household and building-level generation. Iluméxico (<http://www.ilumexico.mx/>) has established a comprehensive system for household and village-level solar generation, including local maintenance, management, and microfinancing.

In fact, financial flexibility may be a key element to bringing off-grid generators into the fold of the national grid, Rolando Nieva, director of the division of electrical systems at the Electric Research Institute in Cuernavaca, Mexico (<http://vmwl1.iie.org.mx/sitioIIE/site/indice.php>) said at last month's conference. Hardware companies are offering equipment for rent or lease now, to lower the barrier to entry for smaller, more remote markets.

Such communities may build microgrids with local power generation and management, Nieva predicted, but eventually they will plug into the bigger grid to take advantage of the increasingly competitive wholesale market. Unlike today's electricity consumers in Mexico, however, they'll have a choice, "They can work independently or be connected," Nieva said. "In the long run, [microgrids] could constitute the principal design element of future electricity distribution systems."

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## **The advanced substation at Ixtepec, Oaxaca, handles wind power from one of the world's windiest onshore sites**

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