



# Watt's Up?

The ComEd Residential Real-Time Pricing Program Monthly Newsletter



## Factors Affecting Electricity Pricing (Part 1: The Grid)

The Grid can be understood as the entire massive infrastructure involved in electricity generation, transmission and distribution. In the U.S., this includes more than 9,200 electric generating units creating more than one million megawatts of electricity transported along more than 300,000 miles of transmission lines.<sup>1</sup>

But the very term "Grid" is something of a misnomer. In the U.S., the Grid is actually a network of three separate regional grids that are referred to as "interconnections."

### A little history

To grasp how the Grid grew to be the massive network it has become, we need to go back to its origins with Thomas Alva Edison. A savvy businessman, the inventor of the incandescent light bulb realized the commercial potential that could result from electricity distribution. On September 4, 1882, using a business plan targeted to provide light and power to one community at a time, Edison established the first commercial power station at Pearl Street in lower Manhattan, New York. This first station distributed electricity to 59 customers within its 1-mile radius.<sup>2</sup>

By the end of that decade, demand for electricity had quickly grown from residential nighttime lighting to a 24-hour need for industrial production and transportation. Small central power stations quickly sprouted up across the American urban landscape. It soon became apparent, however, that further growth would be limited by the range of transmission of the direct-current (DC) power Edison had developed.

Enter Nikola Tesla, an Edison employee, who arrived in America in 1884. Tesla developed alternating-current (AC) power that could transmit electricity over greater distances, thus reducing the need for so many power stations. This innovation ran contrary to Edison's business plan and was quashed by Edison.

Word of Tesla's innovation, however, reached businessman/inventor George Westinghouse, who grasped the greater possibilities of AC power. Partnering with Tesla in 1888, Westinghouse developed a transformer that could increase the voltage of AC power. This would allow for larger centralized power stations and longer distance transmission.

What followed came to be known as the "War of Currents." Edison and Westinghouse each pushed their own versions of electricity currents as the ideal standard while demonstrating the limitations of the other. Ultimately, a compromise was reached.

To this day, the Grid facilitates power generated and transmitted to your utility as well as power that has been transformed and distributed by your utility for your personal use.

As mentioned above, the Grid today has evolved from isolated generating areas in which electricity was generated and utilities served dedicated customers. By the mid-1930s, it was clear that connections between systems could bring additional reliability. They provided access to back-up generation in times of equipment failure, unexpected demand, or routine maintenance, as well as improved economics through reserve sharing and access to diverse energy resources. By the mid-1960s, the electric system had been transformed from isolated generators to an interregional grid.<sup>3</sup>

### Where to from here?

It has been said that Edison, Tesla, and Westinghouse would likely still recognize the basic Grid infrastructure they created more than a century later.

One thing is certain – the future involves you. Despite strong efficiency improvements, average household consumption is expected to increase significantly over the next several decades. This will place stress on our existing infrastructure and highlights the need for additional investment in America's electricity future. Addressing these energy challenges in an environmentally sustainable way will require creativity and innovation.

### The future is now with real-time pricing

As a ComEd RRTP participant, you are actually part of the new wave of creativity and innovation. The goal is to provide end users like you with information on better choices in how you use energy, and to allow you to participate in dynamic pricing that relates more directly to the cost of generation, transmission and distribution.

As technology ramps up throughout the Grid, improvements will result in greater efficiency, safety and security, and ultimately improved cost. Finally, the Grid will be ready for the 21st century and beyond.

We thank you for being a part of this new wave, and for helping to make a brighter future for us all.

Sincerely,

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### Sources:

1. <http://www.oe.energy.gov/1165.htm>
2. <http://inventors.about.com/library/inventors/bleidison.htm>
3. [http://www.oe.energy.gov/information\\_center/faq.htm#sys3](http://www.oe.energy.gov/information_center/faq.htm#sys3)
4. <http://sites.energetics.com/gridworks/grid.html>
5. Ibid.
6. [http://www.eia.doe.gov/oiaf/aeo/pdf/0383\(2008\).pdf](http://www.eia.doe.gov/oiaf/aeo/pdf/0383(2008).pdf)

**Next month: Factors Affecting Electricity Pricing (Part 2: Market Conditions)**



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## Did you know...

- According to the U.S. Dept. of Energy (D.O.E.), since 1990 electricity demand has increased about 25%, while construction of transmission facilities decreased about 30%.<sup>4</sup>
- Also from the D.O.E., there are less than 10,000 power plants operating in the U.S.<sup>5</sup>
- The EIA projects 281 gigawatts of new generating capacity will be needed by 2025—equivalent to 937 new 300-megawatt power plants.<sup>6</sup>

