A smart grid is an electricity delivery system enhanced with digital technologies that detect problems on the electric system and notifies ComEd so you experience fewer and shorter power outages.

In the same way that today’s “smart phone” technology merged the power of computers with cellular phones, smart grid technology merges the power of computers with the electric grid.

Today’s ComEd smart grid system includes:

- Smart Switches that automatically reroute power around problem areas so you experience fewer and shorter power outages
- Intelligent Substations that detect potential problems and automatically notify ComEd to help prevent power outages
- Smart Meters that provide you with more energy-usage data to give you greater control over your energy use and costs
EIMA STATUS - INCEPTION TO DATE

• On October 27, 2011, the Illinois General Assembly enacted the Energy Infrastructure Modernization Act (EIMA), setting in motion a $2.6 billion investment by ComEd to strengthen and modernize the state’s electric grid.

• As of April 2015, 59% of the work has been completed including 1,900 Smart Switches installed, five Smart Substations completed, and more than one million Smart Meters installed across ComEd’s system.

• Benefits from EIMA include:
  o Over one million avoided customer outages since 2012, 643,000 from Smart Switches.
  o Over 12,000,000 automatic meter reads resulting in a significant reduction in estimated bills.
  o More than 1,900 avoided truck rolls during storms due to smart meters.
  o Access to online energy-management tools, high-usage alerts and weekly reports summarizing daily electricity usage to help manage electric bills.
SMART GRID’S CRITICAL ROLE IN SMART CITIES

- **Smart meters** on every home and building give residents and the utility invaluable information about energy use, leading to greater efficiency, improved reliability and cost savings.

- **Alternative energy** reduces the need for fossil-fuel generation.

- **The communications network that connects smart meters** can often be used for other city purposes.

- **Visualization and analytics** provide full situational awareness of what is going on with the electric power and gas systems.

- **Clearly defined interconnection standards** make it easy for residents to plug solar and wind into the grid.

- **Automation equipment** can execute protection schemes in microseconds, minimizing outages.

- **Automated outage management** detects disturbances and isolates areas before they create a cascading blackout.

- **Electrical Vehicles (EVs)** reduce fossil fuel consumption and increase energy independence. They can fortify the grid and increase the integration of renewable energy.
SMART CITIES FOR UTILITIES

- Smart City projects for a utility could consist of implementing a portfolio of applications that meet the goals of improving livability, workability, and sustainability within their service territory.

- Applications of interest will leverage existing communications and physical infrastructure and provide a wide potential of services.

Sample opportunities now and in the future could include:

- **Energy Resilience**: Microgrid, Super Conductor
- **Enhanced AMI**: Smart Water and Gas Metering
- **Electric Vehicle Charging**
- **Connected Response & Monitoring**: Smart Streetlights, Smart Sensors, Smart Metering, High School, Management System
A smart and resilient grid is the foundation of a Smart City
ENERGY RESILIENCE - MICROGRIDS

- The United States Department of Energy (DOE) defines Microgrids as localized power grids that can disconnect from the traditional utility grid to operate autonomously and help mitigate grid disturbances to strengthen grid resiliency.

- Microgrids include local distributed generation (DG), which allows them to continue operating while the main grid is down and enables them to function as a resource for faster system response and recovery.

- Microgrids support a flexible and efficient electric grid by enabling large-scale integration of renewable energy sources such as solar and wind as well as distributed energy resources - namely combined heat and power, energy storage, and demand response.
VALUE PROPOSITION FOR MICROGRIDS

Microgrids provide numerous and wide reaching benefits

Resiliency, Security & Safety:
- Improved physical and cyber security
- Increased resiliency through localized system control and operations

Reliability & Power Quality:
- Reduced interruptions
- Shorter outages
- Enhanced power quality

Economic:
- Greater system efficiency
- Deferred or avoided capacity investments
- Create new jobs

Environmental:
- Reduced CO2 and other harmful emissions
- Increases sustainable generation resources
- Reduced system losses
ComEd is piloting this technology with about 750 streetlights in 2 suburban municipalities.

**Technology**

Smart Streetlights leverage and strengthen ComEd's wireless smart meter network.

**LED Streetlights Features**
- Last up to twice as long as traditional streetlight technologies.
- More resilient and less susceptible to external damage.
- Offer a cleaner, whiter light that promotes a safer environment.

**Benefits**

- LEDs use up to 60% less energy than incumbent streetlight technologies.
- Significant savings for communities.
- Reduction in harmful emissions.

LEDs also last twice as long as incumbent streetlight technologies, so maintenance costs are reduced.