Need for Reliable Energy for a Smarter Energy Future

- Duke Energy: 7.6 million retail electric customers in 6 states; 1.6 million retail natural gas customers in 5 states
- Reliable and low cost electricity, while reducing our environmental footprint
  - Vital for Indiana’s economy and the daily comfort and safety of Indiana’s residents
- Duke Energy serves 813,000 customers in 69 counties of Indiana’s 92 counties
Thomas Edison established the first electric power grid in New York City in 1882. Edison built electric generating plants and substations to send electricity across wires to homes and business.

We've been using essentially the same model since, and much of the transmission and distribution systems across the US are decades old.

Many of the power plants, particularly coal and nuclear generating units, are 50 years old.
The Electricity Grid

- National focus on improving the electric grid stability—both in terms of reliability but also to prevent cyber attacks.

- Heavy lift: In Indiana alone, Duke Energy Indiana owns and operates 5,800 miles of transmission lines and 22,000 miles of distribution lines.
The Enemy:
Mother Nature

Damage from Hurricane Michael
Power Outages:
- Severe weather, such as ice storms, high winds and tornadoes, cause extensive damage to overhead power lines
- Overgrown or diseased trees near power lines can damage equipment
- Animal damage
- Extreme hot temperatures and cold weather can stress transmission and distribution equipment
The Enemy: Mother Nature

Restoring Power
- Prioritize critical facilities such as water treatment facilities, hospitals, police and fire departments
- Environmental factors (ice, wind, etc.)
- Accessibility to equipment
- Safety
Duke Energy focuses on restoring power in a sequence that ensures power restoration to public health and safety facilities and to the greatest number of customers as safely and quickly as possible. A typical sequence of activities, many of which occur simultaneously, is as follows:

1. **Public safety situations** – locate downed power lines and make sure electricity is no longer flowing through the wires.
2. **Transmission, substation equipment and main distribution lines** – these serve large numbers of customers and large geographic areas, and must be restored first to keep electricity flowing from power plants to neighborhoods.
3. **Essential facilities** – emergency service and critical infrastructure such as hospitals, law enforcement, fire departments and water treatment facilities.
4. **Distribution lines** – we work to get the largest number of customers back on as quickly as possible.

**Restoration diagram**

1. Generation sources (power plants)
2. Transmission lines (supply large number of customers and large geographic areas)
3. Substation (where voltage is lowered)
4. Main distribution lines (deliver electricity to large subdivisions and commercial areas)
5. Power pole (showing underground service to hospital)
6. Local distribution or tap line (the type of line that runs along neighborhood streets)
7. Transformer (reduces service voltage to individual households and businesses – may also be padmounted on the ground)
8. Service lines (to individual homes)
Indiana and many other states have passed laws that encourage utilities to invest in aging infrastructure and modernize their facilities.

The Indiana General Assembly recognized the need for electric grid infrastructure improvements, and enacted the Transmission, Distribution and Storage System Improvements Charge (TDSIC) in 2013.
- The General Assembly encouraged the Indiana Utility Regulatory Commission (IURC) to approve 7 year plans for modernizing transmission and distribution systems of electric and natural gas utilities, by providing for timely cost recovery associated with such investments.
- The IURC reviews TDSIC plans, and if approved, the utility is allowed to recover costs from customers.
- There were a number of consumer protections included in the legislation, such as requiring a rate case every 7 years and only allowing 80% of the costs to be tracked, with the remainder recovered in a subsequent rate case.
Under TDSIC, Duke Energy and other Indiana utilities have invested in a variety of projects and programs to replace aging systems, modernize the grid, and make the grid more resilient to damage from storms.

Duke Energy Indiana has approval for a 7 year plan to replace transmission and distribution infrastructure (2016-2022).

Estimated cost approved for rate recovery: $1.4 billion.
Duke Energy Indiana’s Reliability Plan

The plan is:

- Designed to improve reliability
- Focused on transmission system reliability risks with equipment replacements, enhanced monitoring and remote control capabilities
- Focused on distribution system reliability risks with equipment replacements, vegetation management, improved Estimated Time of Restoration (ETR) process, enhanced monitoring and remote control capabilities
- Economic development to bring employment and growth to the State of Indiana, as well as improved customer experience
- System reliability and reduced power outage time duration
Smarter Energy Future
Smarter Energy Future

- **Renewable Energy in Indiana**
  - Wind: 2500 MW
  - Solar: 300 MW
  - Hydro: 60 MW

- **Duke Energy Indiana**
  - Wind: 100 MW purchased power contract
  - Solar: 17 MW Crane facility; purchased power contracts with 5 solar farms (25 MW total)
  - Hydro: 45 MW Markland Hydro
Battery Storage
- 6 Indiana sites in service or under construction
- Duke Energy Indiana
  - Camp Atterbury—2 MW solar and 5 MW battery storage which provides backup power to base
  - Nabb—backup power for town of Nabb if a power outage
- Investments in research with the Battery Innovation Center at Crane Naval Base