# 2030 Challenge

## Can Duke Energy cut its carbon dioxide ($CO_2$) emissions in half between 2006 and 2030?

Approximately 70 percent of the electricity that Duke Energy generates in the U.S. comes from coal-burning power plants. The remaining 30 percent comes from lower or zero carbon emitting sources such as nuclear, natural gas and hydropower.

A large number of our coal plants are located in the Midwest, an area that has an abundant supply of consistently priced, low-cost coal. Decisions to build these plants were driven by the price and availability of domestic coal and were made before there were concerns about climate change.

As part of our strategic planning process, we develop core beliefs and assumptions that drive our scenario planning. Here are just some of those considerations:

### CORE QUESTIONS:

- What will be the future demand for electricity in the areas we serve?
- What will be the regulated price of electricity and natural gas in our service areas? How will that affect our customers?
- What will be the impact on our investors? Will we remain a strong business?

### NEW AND IMPROVED TECHNOLOGY

- What technologies will be commercially available to generate electricity with less or no carbon emissions? Will they be economical?
  - Renewable energy resources – solar, wind, biomass, hydro
  - Carbon capture and sequestration technology
  - Nuclear energy
  - New generating technology?
- How will technology improve the efficiency of electricity use? How will that reduce the need for new generation?
  - Smart grid and smart meter technology
  - Improved energy efficiency in all applications of electricity, including manufacturing, buildings, etc.

### ENABLING PUBLIC POLICY

- Will save-a-watt – or similar models for rate recovery for investments in energy efficiency – be approved by state regulators?
- What level of carbon emission reductions will be set by Congress and what model will they follow? How will allowances be distributed?
- How will the carbon market evolve? What will be the price on carbon? What role will offsets play?

### CUSTOMER BEHAVIOR

- Will customers change their behavior to reduce energy use?
- Will customers accept and/or optimize advanced technologies available through the smarter electric network?
- If customer incentives are needed, will cost recovery be allowed? Will they be sufficient to drive these changes?

### SUSTAINABILITY AND COLLABORATION

- What are the environmental impacts of each type of generation?
- What are the community and other social implications of each type of generation?
- Will stakeholders support the direction?
- What new ideas will come from collaboration?

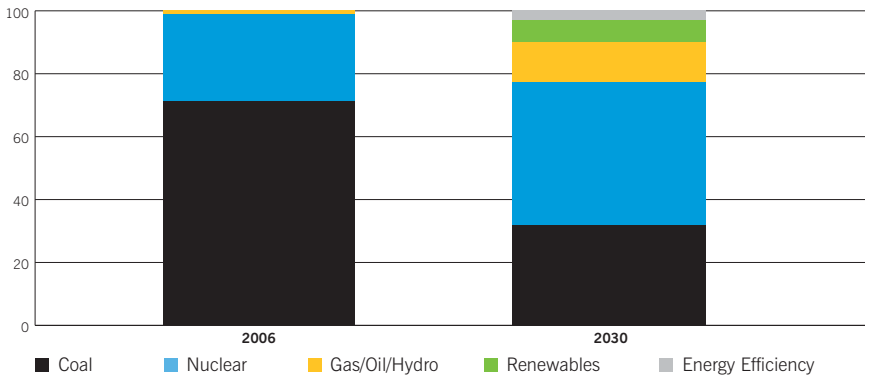
## 2030 SCENARIO

Our initial work has resulted in one possible scenario that would enable us to cut our 2006 $CO_2$ emissions in half – by approximately 50 million tons – by 2030, while meeting our customers' increasing demands for electricity. This scenario is a first step to help us better understand the carbon emissions challenge we may face. Under this scenario, we would take all of the following actions in the Midwest and Carolinas:

| ACTIONS THAT WOULD ENABLE US TO HALVE $CO_2$ EMISSIONS BY 2030 | IN THE MIDWEST | IN THE CAROLINAS |
|---|---|---|
| Retire coal-fired generation | About one-fourth of existing fleet | About one-third of existing fleet |
| Add carbon capture and sequestration technology | To most of the remaining major coal plants beginning in approximately 2020 | Unlikely before 2030 |
| Increase nuclear generation | Unlikely | To nearly double the existing fleet |
| Increase natural gas-fired generation | To nearly double the existing fleet | To nearly triple the existing fleet |
| Add renewable generation | To about 3 percent of summer peak capacity and about 10 percent of energy contribution in 2030 | |
| Implement energy efficiency to: | | |
| ■ Reduce the average annual growth rate in peak demand | By about 25 percent | By about 15 percent |
| ■ Reduce the average annual growth rate in energy consumption | By about 20 percent | By about 25 percent |

As shown in the chart below, this scenario would significantly change the fuel mix in Duke Energy's U.S. generating portfolio. We would move from a coal-intensive portfolio to one that has a large percentage of lower or zero carbon-emitting sources.

**2006 vs. 2030 Fuel Mix to Halve $CO_2$ Emissions**
(Percent of total megawatt-hours generated)
For Discussion Purposes Only




## IMPLICATIONS AND NEXT STEPS

Here are a few key implications of this scenario:

- **New generation must be built:** A considerable amount of new generation – approximately 18,500 megawatts, or 55 percent, of our current installed capacity – would have to be built between now and 2030.
- **Nuclear must make a comeback:** A significant portion of the new generation would need to be nuclear, making it imperative for us to have nuclear as a supply option.
- **High hopes for carbon capture and sequestration:** This scenario anticipates the commercial availability of carbon capture and sequestration technology.
- **Much larger role for energy efficiency, renewables and natural gas:** Energy efficiency, renewables and natural gas would have to play a much larger role in our supply portfolio than they do today.
- **Customer rates could increase significantly:** Customer rates, with inflation included, could increase 70 to 120 percent. The increase could be even larger if $CO_2$ allowances have to be purchased.

This work represents one possible scenario to significantly reduce our carbon emissions. Technology, customer expectations and public policy are constantly changing, and our planning must be equally agile. We will continue to improve our assumptions and analyses based on new developments and input from our many stakeholders. We are committed to stretching our creativity and thinking to build bridges to a low-carbon future.