Committed to carbon reduction

For many years, Duke Energy has advocated for passage of U.S. federal legislation to reduce greenhouse gas emissions. We continue to believe Congress should act to establish a market-based approach to greenhouse gas emission reductions. However, Congress took no action on this important issue in 2011, nor is it likely to do so in 2012.

Filling this policy void to some extent, in March 2012 the U.S. Environmental Protection Agency (EPA) proposed a rule to limit the carbon dioxide emission rate from certain types of new fossil-fueled power plants not yet under construction. The EPA is expected to issue a similar rule for existing power plants at some point. These rules will certainly face scrutiny from Congress and legal challenges in the federal courts.

Meanwhile, President Obama, in his January 2012 State of the Union address, again urged Congress to pass a Clean Energy Standard that calls for the generation of up to 80 percent of the nation’s electricity from an array of low-carbon sources — including solar, wind, nuclear and natural gas — by 2035. It is unlikely, however, that a deeply divided Congress will pass such a standard during a contentious presidential election year.

Despite Washington’s lack of action, in early 2012 the U.S. Energy Information Administration predicted U.S. carbon dioxide emissions will be 7 percent below their 2005 level by 2020, and will remain below the 2005 level into 2035. The reasons include:

- Reduced energy use due to a sluggish economy
- Stringent federal air quality regulations and the availability of low-cost natural gas, leading to the replacement of coal-burning power plants with lower-carbon-emitting natural gas plants
- State renewable energy mandates that will bring more wind and solar generation onto the power grid
I’m Accountable

Dhiaa Jamil
Group Executive, Chief Generation Officer and Chief Nuclear Officer

Following the 2011 earthquake and tsunami that impacted the Fukushima Daichi nuclear plant in Japan, Duke Energy and the nuclear industry took immediate action to re-verify that every station is in a high state of readiness to respond to emergency events. In this Q&A, Dhiaa Jamil shares some of those actions, and how Duke Energy and the nuclear industry will continue to incorporate lessons learned from Fukushima.

What actions has Duke Energy taken in response to the events in Fukushima? Following the events in March 2011, we created a Fukushima team to monitor the event, integrate lessons learned, and coordinate our responses to related oversight activities on the part of the Institute of Nuclear Power Operations (INPO) and the Nuclear Regulatory Commission (NRC). Internal, regulatory and industry assessments and guidance identified enhancements to further augment safety at each of our nuclear power plants. Items identified were either immediately implemented or entered into our corrective action program for resolution.

I would also like to acknowledge the personal contributions made by many of our employees in the weeks following the events in Japan. Many Duke Energy employees donated to the American Nuclear Society’s Japan Relief Fund, which was set up to help nuclear power plant employees and their families who had been affected by the earthquake and tsunami.

How is Duke Energy working within the industry in the aftermath of Fukushima? The nuclear industry has a long history of collaboration and teamwork, and Duke Energy is no exception to the rule. Duke Energy is working through INPO, the Nuclear Energy Institute (NEI) and the Electric Power Research Institute (EPRI) to put standards and practices in place to address the lessons learned from Fukushima, as well as other operating experience.

Duke Energy personnel are participating in NEI task forces that are collaborating with the NRC on requirements arising from Fukushima. In addition, INPO is addressing the operations and training aspects of the event, and EPRI is carrying out research and analyses of the accident. Our participation with these organizations was in place before Fukushima, and is part of the nuclear industry’s focus on sharing operating experience and best practices.

To read Dhiaa Jamil’s view on what lies ahead for the nuclear industry, please see the continuation of his Q&A in the Environmental Footprint section of our Sustainability Report online.

- Tougher vehicle fuel-economy standards that will reduce gasoline consumption.

Some experts question whether a drop in carbon emissions can be sustained on a long-term basis, especially if the U.S. economy experiences significant growth in the years ahead. An economic reversal would result in increased electricity use by homes, commercial businesses and industrial plants.

Against this backdrop, Duke Energy is continuing to modernize and decarbonize its fleet of power plants — regardless of what happens, or doesn’t happen, in Washington, D.C. We are also helping our customers lower their energy usage through our efficiency programs.

Thanks to these efforts, the carbon intensity of our domestic fleet is improving, based on the latest available data for U.S.-based, investor-owned generators. Our carbon intensity ranking moved from 10th highest in 2008 to 12th highest in 2010 — even though we remained the fifth largest of those generators. Our international operations, consisting mostly of carbon-free hydropower, lower the carbon intensity of our total fleet by about 10 percent.

Read about Duke Energy’s fleet modernization program in this section. And read about Duke Energy’s growing renewable power portfolio and our energy efficiency and digital grid programs in the Innovative Products and Services section.

Positioning our coal fleet for more stringent environmental regulations

New regulations recently finalized or under development by the U.S. Environmental Protection Agency (EPA) present what we call “stoke of pen” risks. These rules will require us and others in our industry to install new environmental control equipment and potentially retire some older coal-fired generating units.

At this point, the magnitude, timing and compliance costs associated with the new rules are uncertain and will depend on the final requirements of each rule. However, we currently estimate that the cost of new environmental control equipment to comply with these rules could total approximately $4.5 to $5 billion over the next 10 years. (See “New and Pending Environmental Regulations” table in this section.)

Over the last 10 years, Duke Energy has invested about $5 billion to reduce air emissions from many of our coal-fired power plants. As a result, we have reduced sulfur dioxide emissions by almost 76 percent and nitrogen oxides emissions by 52 percent since 2006. Those investments and the new state-of-the-art power plants we are building have positioned us well for complying with environmental rules to come.

For some of Duke Energy’s coal-fired power plants, the costly upgrades needed to comply with new...
environmental regulations make retirement the economic option. Our current planning assumption is to potentially retire 2,773 megawatts (MW) of older coal-fired generation from the Duke Energy system by 2015. That’s in addition to retirements of 1,027 MW that have already occurred in 2011 and early 2012.

We will rely on our Integrated Resource Planning process to determine the best options for replacing retired generation capacity.

Reducing our reliance on mountaintop coal

Mountaintop-removal coal mining — surface mining that’s accomplished by removing the tops of mountains where the seams of coal are too thin to mine any other way — remains controversial. In the Carolinas, we buy the majority of our plants’ coal from Central Appalachia, where an estimated 25 percent of the coal comes from mountaintop mines. Our plants in the Carolinas were designed to burn Central Appalachian coal, so switching to fuel from a different coal basin is difficult and requires extensive tolerance-level testing.

During 2011, Duke Energy tested non-Central Appalachian coal in various quantities and blends at several of our plants in the Carolinas. Test results are still being reviewed, but current plans are to burn blends of non-Central Appalachian coals starting in 2012.

In addition, we continue our practice of purchasing Central Appalachian coal that does not come from mountaintop mines, when we can do so without paying a premium. Duke Energy expects to reduce its dependency on Central Appalachian coal going forward, as economics and plant reliability warrant. State utility regulations require us to keep overall costs as low as possible for our customers.

New generation nearing the finish line

To provide cleaner, more efficient electricity to our millions of customers, Duke Energy is proactively modernizing our generating facilities. Retrosfits
and replacement of several of our aging, high-emitting units are nearing completion.

Cleaner-coal construction update
After four-plus years of construction and more than $2 billion spent at the Cliffside Steam Station in southwest North Carolina, the new clean-coal unit 6 is expected to begin commercial operation in September. It will be one of the cleanest coal-burning units in the U.S., generating 825 megawatts (MW)—enough to power 660,000 homes at any one time.

Four older Cliffside units were retired last year, and unit 5 has been retrofitted with a sulfur dioxide emissions "scrubber." The modernized two-unit facility will generate more than twice the electricity than the five units did previously, while emitting 80 percent less sulfur dioxide, 50 percent less nitrogen oxides and 50 percent less mercury.

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The 618-MW integrated gasification combined-cycle (IGCC) Edwardsport project in Indiana is also nearing completion, with extensive start-up and testing procedures well under way. Like Cliffside, Edwardsport is key to modernizing the company’s power fleet. The new facility, which will convert coal into a synthetic gas and strip out most pollutants, will make Edwardsport one of the cleanest coal-fired power plants in the world. It will produce 10 times as much power as the plant it replaces, while emitting less sulfur dioxide, nitrogen oxides and mercury.

We pursued this technology partly because it allows us to continue using Indiana coal, a plentiful local resource, to produce energy.

The Edwardsport project has had its challenges. A plant using this technology has never been built on this scale before, and the project’s scope and complexity drove costs up to an estimated $2.98 billion, plus financing costs. While that’s more than we originally anticipated, we have proposed significant steps to mitigate the impact on customers’ rates, including capping cost recovery at $2.72 billion, plus applicable financing costs.

Indiana Utility Regulatory Commission hearings on the project occurred in 2011 and early 2012. The commission’s decision on how much of the project’s costs can be charged to customers is not expected before the end of the third quarter of this year. Meanwhile, the plant is due to begin commercial operation by the fall of 2012.

Natural gas update
As part of the company’s fleet modernization, Duke Energy is adding two 620-MW natural gas-fired combined-cycle generating units in North Carolina—one at Buck Steam Station and one at Dan River Steam Station. Both projects will use state-of-the-art environmental control technology to minimize plant emissions.

The Buck combustion turbine combined-cycle (CTCC) plant in Rowan County, N.C., began commercial operation in 2012.

## COAL PLANT RETIREMENTS

### UNITS ALREADY RETIRED

<table>
<thead>
<tr>
<th>Location</th>
<th>Units</th>
<th>Total capacity (megawatts)</th>
<th>Actual retirement date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cliffside Steam Station</td>
<td>1, 2, 3 and 4</td>
<td>198</td>
<td>2011</td>
</tr>
<tr>
<td>Buck Steam Station</td>
<td>3 and 4</td>
<td>113</td>
<td>2011</td>
</tr>
<tr>
<td>Edwardsport Generating Station</td>
<td>6, 7 and 8</td>
<td>160</td>
<td>2011</td>
</tr>
<tr>
<td>Gallagher Generating Station</td>
<td>1 and 3 i</td>
<td>280</td>
<td>February 2012</td>
</tr>
<tr>
<td>Dan River Steam Station</td>
<td>1, 2 and 3</td>
<td>276</td>
<td>April 2012</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>1,027</strong></td>
<td></td>
</tr>
</tbody>
</table>

1 Per 2009 settlement agreement with the EPA.

### POTENTIAL RETIREMENTS

<table>
<thead>
<tr>
<th>Location</th>
<th>Units</th>
<th>Total capacity (megawatts)</th>
<th>Potential retirement date</th>
</tr>
</thead>
<tbody>
<tr>
<td>W.S. Lee Steam Station</td>
<td>1, 2 and 3</td>
<td>370</td>
<td>Potential to convert to natural gas or retire by 2015</td>
</tr>
<tr>
<td>Buck Steam Station</td>
<td>5 and 6</td>
<td>256</td>
<td>2015</td>
</tr>
<tr>
<td>Miami Fort Generating Station</td>
<td>6</td>
<td>163</td>
<td>2015</td>
</tr>
<tr>
<td>Riverbend Steam Station</td>
<td>N.C. 4, 5, 6 and 7</td>
<td>454</td>
<td>2015</td>
</tr>
<tr>
<td>W.C. Beckjord Station</td>
<td>Ohio 1, 2, 3, 4, 5 and 6</td>
<td>862</td>
<td>2015</td>
</tr>
<tr>
<td>Wabash River Generating Station</td>
<td>Ind. 2, 3, 4, 5 and 6</td>
<td>668</td>
<td>2015</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>2,773</strong></td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL ACTUAL/POTENTIAL RETIREMENTS**

3,800
OUTLOOK ON NEW NUCLEAR

Following the tragic events of 2011 after the earthquake and devastating tsunami off the coast of Japan, the U.S. nuclear industry, including Duke Energy, undertook immediate actions to re-verify the safety capabilities of every nuclear power plant. Today, we continue to act on longer-term recommendations to further protect the public, plant workers and the environment.

To meet our customers’ future energy needs, Duke Energy is pursuing the option to add new nuclear generation to our fleet in the future. In addition to serving as a cost-effective baseload energy source, nuclear energy is also our country’s largest source of carbon-free electricity, producing no greenhouse gases.

We have applied for a combined construction and operating license (COL) from the Nuclear Regulatory Commission for the proposed Lee Nuclear Station in Cherokee County, S.C. The COL is for two Westinghouse AP1000® reactors — one of the world’s safest and most economical nuclear power technologies. Project development activities are under way, and we anticipate receiving the COL in the 2013 time frame.

Duke Energy is also considering the purchase of a minority interest in Santee Cooper’s 45 percent ownership of two new nuclear reactors at V.C. Summer Nuclear Generating Station in Jenkinsville, S.C. In July 2011, Duke Energy signed a letter of intent with Santee Cooper to explore a potential 5 to 10 percent interest in the new units.

Hydropower update

Hydroelectricity continues to play an important role in Duke Energy’s diverse energy mix by providing clean, renewable power to our customers.

In November 2011, three new units at the Bridgewater Hydro Station on Lake James in Morganton, N.C., became operable and available for service. The new 31.5-MW powerhouse increases the station’s capacity by 8.5 MW. Oct. 17, 2011, marked the official last day of operation of two 1919-vintage turbines. The new powerhouse was constructed downstream to make room for federally required seismic stability work on Lake James’ Linville Dam.

Also in 2011, we replaced two turbines at our Jocassee pumped-storage facility in South Carolina, increasing the station’s capacity by 50 MW.

Duke Energy Brazil’s Palmeiras small hydro plant (SHP) began commercial operation in February 2012. Electricity generated at Palmeiras is already contracted for sale through 2017. Retiro SHP, located in the same region, will begin operation in November 2012. Together, the plants will provide 32 MW of installed capacity.

Read about Duke Energy’s use of renewable energy in the Innovative Products and Services section of this report.

Water: A critical resource

Water is a critical resource for Duke Energy. In addition to providing hydropower and cooling water for our nuclear and fossil plants, water resources support public water systems, industries, wildlife and recreation.

Increasing water demands and periodic drought conditions remain challenges for our company, particularly in the Carolinas. Duke Energy is working to protect our water supply by investing in more efficient technologies, and by continuing to work with public- and private-sector partners to improve water management.

Technology solutions

As part of the modernization of our generation fleet, we’re putting technologies in place to make sure we’re using water resources efficiently.

Hydropower

The new powerhouse at our relocated Bridgewater Hydro Station improves aquatic habitat by increasing dissolved oxygen and allowing continuous flow releases downstream. In addition, the new generating units are larger and more efficient than those they replaced, and can therefore produce more electricity using less water.

Recent turbine replacements at our Jocassee Pumped-Storage Hydro Station also improve water efficiency. This South Carolina facility is designed so the turbines can reverse and pump back previously used water from Lake Keowee into Lake Jocassee, allowing Duke Energy to reuse the same water multiple times to generate electricity for customers during periods of highest demand.

Wind and solar

We have added more than 1,000 MW of wind and solar generation capacity over the past four years and will complete five additional wind farms in 2012. Except for a limited amount of water used for washing photovoltaic panels, wind and solar farms do not require water for power production.

Proposed nuclear

For the proposed Lee Nuclear Station in South Carolina, Duke Energy analyzed the plant’s potential water needs. We looked at available water sources, needs of upstream and downstream water users, and station and regulatory requirements. Based on this detailed analysis, we determined that additional water storage — a drought contingency storage pond — would be needed. The proposed pond would provide cooling water during a prolonged drought, while minimizing the impact on other regional water users.
Partnerships

We continue to collaborate with government agencies, community groups and the private sector to improve the management of our shared water resources.

- To properly respond to periodic drought conditions in the Keowee-Toxaway River Basin in South Carolina, Duke Energy joined forces with Seneca Light & Water and Greenville Water to implement the Keowee-Toxaway Interim Low Inflow Protocol. This interim drought procedure establishes a shared responsibility among the main water users to protect the limited water storage available in lakes Jocassee and Keowee.

- The Catawba-Wateree Drought Management Advisory Group consists of large water users/withdrawers in the Carolinas, including Duke Energy and resource agencies, which implement the drought management procedures set forth in the Catawba-Wateree River Basin Low Inflow Protocol, when needed.

- The Catawba-Wateree Water Management Group (CWWMG) is exploring ways to improve water consumption trends through a survey of demand-management best practices across the U.S. The CWWMG is using the survey results to identify measures that member utilities can implement to manage water demand in the Catawba-Wateree River Basin.

I’m Accountable

I’m accountable for reducing Duke Energy’s landfill waste by identifying and recovering reusable materials. Part of my job includes a fair amount of dumpster diving!

Reducing landfill waste is part of Duke Energy’s Sustainability Plan. In 2008, we set a challenging four-year goal to increase our percentage of solid waste that’s recycled from 52 to 62 percent. We exceeded our goal — by establishing aggressive departmental targets and initiatives for recycling, and by significantly improving our wood waste reuse and recycling efforts.

The results are substantial. In 2011, Duke Energy recycled about 7,000 tons more material than we did in 2008. More than 4,700 tons of wood would have ended up in local landfills (the weight equivalent of 2,500 Chevy Volts) — that’s about 3,000 tons more wood than the company recycled in 2008.

One way we achieved our wood recycling targets was by pioneering new programs with innovative vendors. In the Midwest, for example, one vendor processes thousands of tons of discarded wood — utility poles, reels, pallets and packing materials — and repurposes much of it as treated wood or mulch. Most of the remainder is shipped to a wood shredding facility, where it is processed and sold as biomass fuel. We are one of the leading wood recyclers in our industry — currently recycling about 400 tons of wood per month, on average. Now, we are ramping up our wood recycling program in the Carolinas. We expect to yield at least 1,000 additional tons of repurposed wood in 2012.

Every Duke Energy employee has an opportunity to recycle and reduce waste. Together with departmental and vendor initiatives, we are making substantial progress. Through our collective efforts, thousands of tons of repurposed or recycled materials stay out of our local landfills every year.