



3 Operations

Excel in safety, operational performance and environmental stewardship.

2015 Highlights

- Safety – decreased our Total Incident Case Rate (TICR) by about 30 percent in 2015 vs. 2014.
- Decreased reportable environmental events by 50 percent.
- Nuclear fleet had its best capacity factor in over a decade – 94.2 percent; the 17th consecutive year it’s been above 90 percent.
- Received new operating licenses for the Catawba-Wataree Hydroelectric and Yadkin-Pee Dee Hydroelectric projects from the Federal Energy Regulatory Commission.

Challenges and Opportunities

- Continue to improve employee and contractor safety.
- Continue to demonstrate our commitment to operational excellence.

Safety: Progress with vision for the future

At Duke Energy, safety is more than a corporate priority; it is a core company value. Safety is job one, every day. We value the safety of our employees, contractors and communities and are taking action to prevent incidents. Building upon the success, and failures, of past years, our mission is to create a safer place to work and live, where everyone gets to go home at the end of the workday.

In 2015, Duke Energy enhanced and implemented several initiatives to improve safety performance. For example, the rollout of an improved contractor safety program in September 2015 puts more rigor around selecting, managing and providing oversight to contractors.

In addition, business units executed “Keys to Life” control plans that reduced risk and improved worker behaviors related to high-hazard activities. And our Transmission and Delivery Operations group did a deep dive into its injury data that led to a renewed mission to eradicate electrical contact events.

The results of our new and existing safety initiatives and processes led to substantially improved performance in our 2015 safety measures. Duke Energy had zero employee fatalities. We also decreased our Employee Total Incident Case Rate (TICR) by almost 30 percent to 0.41. Tragically, there were five contractor fatalities, all of which were traffic related. We are working together with our contractor partners to address these safety concerns.

INNOVATION IN ACTION

As part of our pursuit of operational excellence, Duke Energy's Generation and Transmission group challenged employees to seek out ways to reduce environmental and safety hazards. Jerry Lee DeWeese took the challenge seriously when he sought a way to eliminate the risk of oil entering the waterway at a hydroelectric plant if there is an oil cooler leak or water intrusion.

Jerry developed a low-cost water detector that can be retrofitted to equipment to detect water and prevent oil from getting into the river. This device can send a signal to the control system to alert technicians of the trouble and allow quick action, including a controlled shutdown of the unit. His device could also be used at other manned and unmanned generation facilities. Another way innovation is helping sustainability at Duke Energy.

Jerry Lee DeWeese / Lead Engineer, Carolinas Hydro Operations

We are pleased about our improvements but not satisfied with our results. In 2016, we are launching a five-year plan that will drive continued focus on event-free operations and challenge the company to reach even greater safety success by 2020.

Striving toward a lower-carbon future

Duke Energy is committed to a cleaner, smarter energy future. We have worked to modernize our system and established voluntary carbon reduction goals in 2010.

Our tons of CO₂ emissions have decreased 28 percent since 2005. In addition, the CO₂ intensity of our generating fleet is more than 23 percent lower, producing fewer emissions per kWh. More than 40 percent of the electricity we generated in 2015 was from carbon-free sources: nuclear, hydro, wind and solar. Our current five-year business plan includes plans to retire more than 1,800 MW of coal generation, invest \$4 billion in new, efficient natural gas facilities and invest \$3 billion in renewables.

The Clean Power Plan (CPP) is a new federal regulation by the United States Environmental Protection Agency (EPA) that establishes performance standards for CO₂ emissions from existing fossil-fueled power plants – those that use coal, oil or natural gas to produce electricity. Twenty-seven states and numerous industry organizations have challenged the rule in the courts, and 18 states have filed

petitions in support of it. In February 2016, the U.S. Supreme Court issued a stay of the CPP, suspending the regulation from going into effect while legal challenges are heard by the courts. It is unclear when the legal challenges will be fully resolved.

If the rule is ultimately upheld, EPA estimates the regulation will reduce CO₂ emissions by 32 percent from 2005 levels by 2030, although specific reduction targets vary by state. Regardless of the legal outcome of the CPP, we remain committed to reduce emissions and invest in energy technologies that are good for our customers, our communities and the environment. Duke Energy will continue to work constructively with our states as they decide their path forward.

Protecting our water resources: New operating license will sustain region for generations to come

The Federal Energy Regulatory Commission issued a new operating license to Duke Energy effective November 1, 2015, for the Catawba-Watawee Hydroelectric Project, which includes 13 hydropower stations and 11 reservoirs in North Carolina and South Carolina. The project provides drinking water for nearly 2 million people, supports energy generation and offers numerous recreational opportunities to residents and visitors. The new license ensures the



photo courtesy of Hannah Hayes

Tim Hayes / Environmental Development Director, Commercial Renewables

ENSURING WIND POWER CAN COEXIST WITH EAGLES, BATS

Duke Energy is committed to minimizing bird and bat fatalities caused by turbine blade collisions at its clean-energy wind power projects.

To protect eagles at Duke Energy's Top of the World Windpower Project in Wyoming, wildlife specialists in a specially built tower scan the sky and shut down turbines when eagles approach. The company also is testing new technology that automatically shuts down turbines when high-resolution cameras detect eagles.

To protect bats at several of its wind power projects, Duke Energy significantly reduces turbine blade speed during low-wind conditions in late summer and early fall, which coincides with bats' migration and breeding season.

"We're on the leading edge of addressing this issue," says Tim Hayes, Duke Energy Renewables' environmental director.

Catawba-Wataeree River will continue to support and sustain communities for at least the next 40 years.

With the new license in hand, Duke Energy will invest about \$100 million to implement an agreement designed over a three-year period with input from about 160 community stakeholders. The agreement's new benefits range from operational changes to protect aquatic habitats to land conservation to new and enhanced recreation amenities.

The new license includes several water management provisions designed to ensure long-term availability of the water resource. A new drought management protocol will be implemented by a regional advisory group composed of major water users, governmental agencies and Duke Energy. Another organization of regional water utilities and Duke Energy will study and implement long-range strategies to ensure the region's water supply continues to be sustainable.

Duke Energy also received a new operating license in April 2015 for its Yadkin-Pee Dee Hydroelectric Project, which includes two hydropower stations and associated reservoirs in North Carolina. This license and the supporting regional stakeholder agreement provide many regional benefits and promote smart water management practices.

Coal Plant Retirements

Closing ash basins in ways that protect the environment, communities

More than two years following the Dan River coal ash release, Duke Energy's ash management work advances on multiple fronts.

Ash basin closure is underway at multiple sites across our service territory. In the Carolinas, the company began excavating ash at six plant sites in 2015 and has relocated more than 1 million tons to lined storage solutions. Excavation rates will jump dramatically in 2016 now that rail infrastructure is in place at multiple sites to safely and efficiently move ash.

The North Carolina Coal Ash Management Act, passed in 2014, outlines the detailed process the company is following to thoroughly study groundwater near ash basins, develop closure plans based on the unique features of the sites and close the basins by aggressive deadlines. The company hosted several community events for plant neighbors so they could learn more in advance of excavation work. The North Carolina law also provides several public input opportunities throughout the process. In December of 2014, EPA finalized the Coal Combustion Residuals (CCR) rule, which governs the management and disposal of coal ash. Duke Energy's activities comply with all relevant state and federal regulations.

Across the rest of our service area, the company is in the process of safely closing some ash basins, while conducting engineering studies to prepare customized closure plans for others.

At locations where ash is either required to be excavated or where science determines that's the best approach, the company looks first at relocating ash to landfills on plant property before evaluating off-site locations. Duke Energy announced in 2015 that it will pursue permitting for four new on-site, lined landfills in the Carolinas to receive excavated material.

All closure plans will meet requirements of the CCR rule and will protect groundwater. As Duke Energy continues this important work, it will close ash basins in ways that put safety first, protect the environment, minimize impact to communities and manage costs.

Retired Coal Units¹

	Location	Units	Total capacity (megawatts)	Actual retirement date
Cliffside Steam Station	N.C.	1, 2, 3, 4	198	2011
Buck Steam Station	N.C.	3, 4	113	2011
Edwardsport Generating Station	Ind.	6, 7, 8	160	2011
W.H. Weatherspoon Plant	N.C.	1, 2, 3	177	2011
Gallagher Generating Station	Ind.	1, 3 ²	280	2012
Cape Fear Plant	N.C.	5, 6	316	2012
Beckjord Station	Ohio	1	94	2012
Dan River Steam Station	N.C.	1, 2, 3	276	2012
H.F. Lee Plant	N.C.	1, 2, 3	382	2012
Robinson Plant	S.C.	1	177	2012
Buck Steam Station	N.C.	5, 6	256	2013
Riverbend Steam Station	N.C.	4, 5, 6, 7	454	2013
Sutton Plant	N.C.	1, 2, 3	575	2013
Beckjord Station	Ohio	2, 3	222	2013
Beckjord Station	Ohio	4, 5, 6	543	2014
W.S. Lee Steam Station	S.C.	1, 2	200	2014
W.S. Lee Steam Station	S.C.	3	170	2015 Converted to natural gas
Miami Fort Station	Ohio	6	163	2015
Total			4,756	

Planned Coal Unit Retirements

	Location	Units	Total capacity (megawatts)	Planned retirement date
Wabash River Generating Station	Ind.	2, 3, 4, 5, 6	668	Retire 2-5 by 2016; suspend 6 by 2016
Crystal River Energy Center	Fla.	1, 2	873	2018
Asheville Plant	N.C.	1, 2	324	2020
Total			1,865	

TOTAL ACTUAL/PLANNED RETIREMENTS 6,621

¹ In addition to coal unit retirements, a number of older oil/natural gas generation units have been or will be retired.

² Per a 2009 settlement agreement with the EPA.



CATAWBA-WATEREE OPERATING LICENSE AND REGIONAL STAKEHOLDER AGREEMENT HIGHLIGHTS

- New flow releases and increased aeration will improve water quality and enhance aquatic habitats to protect species
- Donation of 2,455 acres of land
- \$13.1 million has also been spent to purchase and conserve 5,371 acres of land
- \$3 million for additional land conservation, recreation and water quality protection
- More than \$4 million in funding for local partners to develop recreational amenities
- New scheduled recreational flow releases
- Improved management of high-water events
- 89 new or expanded public recreation areas

Protecting nature while ensuring reliable electricity

Trees and other large vegetation can cause power outages if they fall on or even touch power lines. Duke Energy must keep tall vegetation away from power lines while protecting wildlife habitat and rare plant areas under and around those lines.

Duke Energy’s vegetation management program includes the use of environmentally sound

herbicide application techniques that encourage low-growing vegetation for wildlife habitat and discourage tall vegetation that could interfere with the power lines above.

The herbicides promote non-woody plants such as grasses and other native species which provide natural habitat for a wide variety of wildlife, including wild turkeys, bob white quail and pollinators such as bees.

Safety Performance Metrics

Safety at Duke Energy

	2012	2013	2014	2015
Employee and contractor work-related fatalities *	2	3	4	5 ⁵
Employee Total Incident Case Rate (TICR) ^{1,2}	0.69	0.62	0.58	0.41
Employee Lost Workday Case Rate (LWCR) ^{1,3}	0.20	0.20	0.17	0.18
Contractor Total Incident Case Rate (TICR) ²	1.60 ⁴	1.27	1.05	1.18 ⁶
Contractor Lost Workday Case Rate (LWCR) ³	0.38 ⁴	0.28	0.28	0.21 ⁶

1 Includes both employees and workforce augmentation contractors.

2 Number of recordable incidents per 100 workers (based on OSHA criteria). Top decile in 2014 for employee TICR was .58 (based on latest data available from EEI).

3 Number of lost workdays per 100 workers.

4 Data represent turnkey contractors for pre-merger Duke Energy (before the Duke Energy/Progress Energy merger).

5 Tragically, there were five turnkey contractor fatalities in 2015, all traffic related.

6 We have a systematic process in place for collecting productive work hours for a large portion of the contractor fleet. Data represent approximately 80 percent of turnkey contractors.

* Beginning in 2016, Duke Energy will track worker life-altering injury (LAI), replacing serious injury or fatality (SIF) as a company measure. LAI is a sub-set of the previous SIF category. The change focuses attention on the most serious of all work-related injuries and includes only specific types of injuries within the control of the company or worker.

Reliability Is A Commitment

Duke Energy uses herbicides approved by EPA and appropriate state agencies, which are similar to those products used by homeowners in their own yards.

Other vegetation management highlights:

- In the Midwest, Duke Energy works to avoid pruning and removing specific tree species, such as the shag bark hickory, at times when nesting bats might be present.
- In North Carolina, Duke Energy carefully coordinates its vegetation management activities with the state's Natural Heritage Program to protect rare and threatened plant species, such as the Schweinitz's sunflower.
- Duke Energy engages in research to ensure it uses ecologically friendly vegetation management practices on all land traversed by its power lines – both private property and public parcels, such as national parks and forests.

“Reliable, 24/7 electric service and sensitive environmental protection go hand-in-hand,” says Ron Adams, Duke Energy vegetation management director.

Legal cases resolved

Duke Energy resolved two legal cases in 2015 related to environmental issues. Specifically, the company reached settlement agreements with:

- The U.S. government to close a federal criminal investigation of its subsidiaries – Duke Energy Carolinas, Duke Energy Progress and Duke Energy Business Services – related to the 2014 Dan River coal ash spill and ash basin operations at the company's other North Carolina coal-fired power plants.
- The U.S. government and three environmental groups to end litigation against the company for alleged federal Clean Air Act violations involving maintenance and repair projects at some of the company's coal-fired power plants in North Carolina. Duke Energy denied the allegations and maintained it complied fully with federal law. The company settled the case to avoid the cost of prolonged litigation.

Reliable power is one of Duke Energy's core commitments to our customers – the more than 24 million people we serve. We set reliability targets each year for the number and duration of power outages and power generation fleet performance.

Power Delivery

We experienced a large number of mid-size storms in 2015 which caused us to miss our internal target. However, the longer-term trend in number of outages continues to improve.

Outage Statistics

	2012	2013	2014	2015	2015 Target
Average number of outages ^{1,2} (occurrences)	1.19	1.14	1.13	1.16	1.14
Average time without power ^{1,2} (minutes)	126	121	123	131	124

1 Outages with a duration greater than 5 minutes; statistics are reported per customer.

2 Lower numbers indicate better performance.

Generation

Our diverse generation fleet, which includes fossil, nuclear, hydro, wind and solar resources, reliably met challenging demands, including record-breaking peak load in February 2015, and peak summer loads in June.

Nuclear fleet **capacity factor**, which is a measure of generation reliability, improved from 93.2 percent in 2014 to 94.2 percent in 2015, and exceeded 90 percent for the 17th consecutive year. The regulated fossil/hydro fleet improved **commercial availability** performance from 85.9 percent in 2014 to 87.4 percent in 2015.

The commercial renewables fleet's **commercial availability** declined from 96 percent in 2014 to 93.3 percent in 2015 because of unscheduled maintenance activities.

Generation Reliability

	2012	2013	2014	2015	2015 Target
Nuclear capacity factor ³	90.4%	92.8%	93.2%	94.2%	93.3%
Regulated fossil commercial availability ⁴	86.5% ⁵	85.7%	85.9%	87.4%	88.5%
Renewables commercial availability ⁴	96.9%	94.2%	96.0%	93.3%	96.0%

3 Crystal River Unit 3 is not included in these statistics, because 2009 was the last year it operated.

4 Based on units operated by Duke Energy and ownership share.

5 Former Progress Energy fossil plants, all regulated, are excluded because different measures were used to track their reliability performance before 2013. A common reliability measure for the entire regulated fossil fleet was used starting in 2013.



Tanya Hamilton / Harris Nuclear Plant Manager



Oconee Nuclear Station

Duke Energy's nuclear stations are running better than ever. This South Carolina plant set records in 2015.

CLEAN NUCLEAR POWER – RECORD RESULTS

With 11 operating units, Duke Energy has nuclear plants that originally started producing power in the 1970s.

Over the years, including 2015, many of these same plants in North Carolina and South Carolina have continuously improved their operations and are now more efficient than ever – even producing more electricity than their original design capacity.

In 2015, our nuclear fleet reported a capacity factor of 94.2 percent. This means the generating units collectively generated electricity 94.2 percent of the time. That's the best mark in more than a decade and considerably better than the 2015 national average of 91.9 percent. In contrast, in the 1970s capacity factors were typically below 70 percent.

It also extends the company's streak for 90-plus percent capacity factors to 17 consecutive years.

Brunswick, Harris, McGuire and Robinson stations achieved record generation runs during 2015 – producing more power in the same time frame than ever before.

Unit 1 of the Catawba Nuclear Station had its longest continuous operating run ever in 2015. Not bad for a plant that began producing power in 1985.

Also in 2015, the three-unit Oconee Nuclear Station achieved its highest capacity factor in history – 98 percent. And, Oconee had its shortest refueling outage ever. This means the Oconee units were on line delivering greenhouse gas emissions-free power to customers for most of the year.

And, although the annual radiological dose to workers has always been well below established federal limits because of our extensive, ongoing focus on safety, the Duke Energy nuclear employees had their lowest fleet annual dose ever in 2015 – creating an even safer environment for employees.