

*“Managing the Fleet Transition to Greater Use of Natural Gas”*  
EPRI Summer Seminar – August 1, 2011 – Marina Del Rey, Los Angeles

**SLIDE #1: Title Slide**

This afternoon we’ve heard about the opportunities and risks associated with increasing natural gas use in the U.S. power sector. Now let’s focus on a utility example of how this is playing out – the strategy behind Progress Energy’s decision to transition our fleet to more gas, less coal and the practical implications for the future.

The rhetoric around natural gas in recent months has ranged from extremely bullish to sharply alarmist – from talk of “a golden age for gas” to fears of price volatility and environmental risks. Of course, our industry’s roller-coaster history with gas makes us cautious about over-commitment.

Even in the face of some uncertainties, utility companies must make decisions and engage in long-term planning. We must mitigate risks and move forward to prepare for the future needs of our customers and the unfolding requirements of governmental policies.

That makes it an exciting time to be in this business ... if you have a taste for ambiguity, change and challenge.

At Progress Energy, we see natural gas as an increasingly important part of our generation portfolio, particularly for the next couple of decades.

We also recognize gas is no panacea and is not the long-term answer to a low-carbon future. It’s dangerous to indulge in “**irrational exuberance**” for any energy source. We take a pragmatic, balanced view, knowing we’re bound by the laws of physics, economics and politics.

There’s no cookie-cutter approach to modernizing an aging fleet. The path forward for a utility must be based on its unique situation as well as its view of the future.

A word about Progress Energy: We are in the integrated, regulated utility business and are headquartered in Raleigh, N.C. Our two electric utilities in the Carolinas and Florida serve more than three million homes and businesses. Our mission is to provide reliable, affordable service in an environmentally responsible way.

Our generation mix is becoming more diverse and less carbon-intensive, but we still rely on coal for a substantial share of our generation, and that will continue for years to come. Last year coal accounted for more than 40 percent of our total generation.

**SLIDE #2: Retrofit or Replace? How & When?**

The example I’ll focus on is the strategic decision we made at Progress Energy Carolinas – one of our two utilities.

In late 2009 we announced a major coal-to-gas fleet transition – early retirement for 11 coal-fired units with a total generating capacity of about 1500 MW. That’s about 30 percent of our coal fleet in North Carolina, which serves our South Carolina area as well.

These 11 coal units range in size from about 50 MW to more than 400 MW. And they range in age from 39 to 62 years – an average of 51 years old. So think Harry Truman and Dwight Eisenhower in the White House – up through 1972 when Richard Nixon was in office.

In 2009, we said we would retire these 11 coal units no later than the end of 2017. This year we have moved up the final closure timetable to 2014 and will retire the first of these units by the end of this year.

To replace this coal-fired generation, we decided to build two combined-cycle plants fueled by natural gas – 1550 MW in all. At that time we were already moving forward with a combined-cycle plant, a 600-MW plant that went into service two months ago today. Now we have broken ground on the other two plants, which begin service in 2013.

So, look at our fuel mix at Progress Energy Carolinas.

### **SLIDE #3: PEC Fuel Mix**

This slide shows our fuel mix from 2005 to 2015, excluding the renewable energy we purchase.

In 2005, coal and nuclear each accounted for almost half of our company’s output in the Carolinas; natural gas less than four percent. In 2015, nuclear will still account for about half; coal and gas about one-fourth each.

We also go from zero percent of our coal energy coming from units with scrubbers to 72 percent in 2010 and 100% in 2015. We’ve invested a billion dollars in environmental retrofits at our large coal units in the Carolinas, and another billion at our plants in Florida.

So, what are the drivers behind our fleet transition?

### **SLIDE #4: Why? Strategic Considerations**

In making this decision, we considered many factors. Think of them as industry-wide macro trends and the factors more specific to Progress Energy.

Three macro trends:

- **Growing environmental constraints on coal** – This was becoming apparent when we made our decision two years ago, and it has become more obvious today with the new EPA regulations. A couple of years ago, we also thought federal carbon legislation was imminent. That hasn’t happened, but we still think we’re headed toward a lower-carbon future.

- **Favorable U.S. natural gas supply and price** – By the end of 2009, we were getting more comfortable about the long-term prospects for domestic natural gas. Daniel Yergin pointed out in a recent essay that “the shale gas revolution is both a major innovation and a formidable new addition to our energy supply.”

He acknowledges it will take some time to sort out all the issues, but “we should not lose sight of the larger picture: the potential for a century’s worth of inexpensive, environmentally attractive energy.”

- **Improvements in combined-cycle technology** – Turbine vendors have continued making technical improvements that added to the attractiveness of the combined-cycle option.

Against this backdrop, there were **company-specific issues** that shaped our fleet decision in late 2009:

- **History of public policy collaboration** – This story began a decade ago as we partnered with North Carolina policymakers, environmentalists and others on a reasonable path to lower fossil-fuel emissions. This collaboration resulted in the 2002 Clean Smokestacks Act – an innovative North Carolina law that has led to dramatic reductions in NOx and SO2 emissions and put our state ahead of the curve in meeting federal environmental rules.

We built on that progress with the development and implementation of the first renewable portfolio standard in the Southeast. This spirit of collaboration helped set the stage for our fleet-transition decision and for the widely positive reception to our plan.

- **Combined-cycle experience in Florida** – We have a substantial track record with combined-cycle gas units at our Florida utility.

The major oil-to-gas repowering project we completed at our Bartow Plant in 2009 was particularly successful and instructive. We replaced a 50-year-old steam plant burning heavy oil with a 4-on-1 combined-cycle burning natural gas. We more than doubled the output and significantly reduced emissions. And the design provides great flexibility in dispatch and efficiency in operation.

- **Being opportunistic while mindful of the long view** – We were opportunistic in 2009 in that we acted decisively to secure equipment and labor freed up at lower cost by the economic downturn. And we were able to bid these combined-cycle projects as a package.

But we had been considering our options for some time. Part of our calculus was whether to make the large retrofit investments on units of this size and vintage, or to retire them and invest in new plants.

In the end, we decided to lower environmental risk by increasing fuel risk, knowing that the fuel risk would be greatly mitigated by the emergence of shale gas and by our flexibility to burn more coal and less gas if gas prices shoot up.

The long view is important. Several years ago our company began taking more frequent, robust looks at the strategic landscape. EPRI and its PRISM model were helpful in informing our view of the future. In 2007 EPRI's Bryan Hannegan met with our leadership team to talk about technology options in a carbon-constrained world. And in 2009 EPRI's then-CEO Steven Specker discussed these issues with our Board of Directors.

We saw – and see – natural gas as one part of a Balanced Solution framework for thinking about our future resource portfolio.

#### **SLIDE #5: Balanced Solution**

As part of this Balanced Solution, we have a three-pronged strategy – energy efficiency ... alternative and renewable energy ... and a state-of-the-art power system. Fleet modernization fits within this context, along with a substantial smart grid program. And we're keeping our options open to build advanced nuclear plants – a necessary part of a clean energy future.

The objective is to have a diverse, flexible portfolio that enables us to provide reliable, affordable power with a smaller environmental footprint.

Our coal-to-gas fleet decision has multiple implications – for the workforce and for operations and customers; also for technology research, development and deployment.

#### **SLIDE #6: How? Implications of Fleet Transition**

The combined-cycle plants require fewer employees than the retiring coal plants. So, as part of our workforce strategy, we developed a Redeployment Program and were upfront and transparent with the affected employees.

To this point, about half of the employees have been redeployed within the company, including to the new plants. Some employees plan to retire and others have found work outside the company. We continue working with the remaining employees.

We also took into consideration the impact that job displacements and plant changes would have on local communities and tax bases. We have worked closely with local leaders on the transition. Building new plants on the same sites was particularly important in the case of our Lee and Sutton plant communities. Repowering with gas will have the co-benefit of expanded natural gas supply in Eastern North Carolina.

Our fleet transition has significant operational implications as well. Having more gas in the fleet creates new dynamics of generation dispatch – changes to dispatch order and unit cycling.

Minimum-load requirements can be challenging. The combined-cycle units have much higher minimum loads than the smaller coal units that we could cycle on and off. And the remaining large coal plants now have higher minimum-load constraints because of their environmental equipment.

And low natural gas prices have increased combined-cycle capacity factors at the expense of coal units. We are cycling some larger coal units we had not typically cycled.

The advantage of having about 3300 MWs of coal and about 2600 MWs of gas is that we can play to the fuel markets as the prices change. A fuel-diverse fleet can help us minimize the customer bill by burning more of the lower-cost fuel.

We have devoted significant attention to optimizing our gas operations – for example, using duct firing, intake chillers and steam augmentation.

EPRI has been extremely helpful. For example, we participate in a tailored collaboration project for life-cycle management of our combustion turbine parts. This has the potential for significant savings by extending the life of our fleet.

We also use EPRI programs to optimize the maintenance and performance of our combined-cycle units. Our reliability numbers for these units have been very good.

So, more gas in the mix means greater complexity. To realize the payoff, you need a sophisticated understanding and management of the fleet as a whole.

### **SLIDE #7: Shaping the Future**

I'll close with five brief points about shaping the future of generation fleets:

- **Stay focused on customer value** – Always keep the customer top of mind – how fleet decisions affect reliability and cost.
- **Collaborate with policymakers, regulators and others** – Electric utilities do not operate in a vacuum. Build a broad base of support for your resource strategy. Look for innovative public policy solutions that can minimize the price impact on customers. And work closely with community leaders as you retire old plants and build new ones.
- **Be opportunistic about the short term; thoughtful and balanced about the long term** – Engage in frequent strategic discussions so you understand the potential scenarios and are ready to seize opportunities as they arise. The moving parts in the utility landscape will remain fluid. Evaluate the risks, trade-offs and mitigation strategies.
- **Optimize diversity, flexibility and efficiency** – Adapt and operate your resource mix to fulfill the core mission of reliability and affordability. Recognize that generation fleets of the future will have many more variables and much more complexity to manage.

- **Draw on EPRI support** – As I said, EPRI is a valuable partner and can provide significant help in the analysis of future scenarios and in fleet optimization.

The theme of this seminar is “*Shaping the Future through Innovation.*” Innovation comes in many forms.

My central point is that there is tremendous innovation potential in how a company leverages the interplay of technologies, markets and public policies to deliver value to customers and investors.

The breakthroughs come in how you integrate all the parts and pieces of this multi-dimensional puzzle.

Thank you, and I look forward to the discussion.

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