Report to NC Energy Policy Council

Duke Energy Carolinas

Progress Energy Carolinas

March 18, 2010

Executive Summary

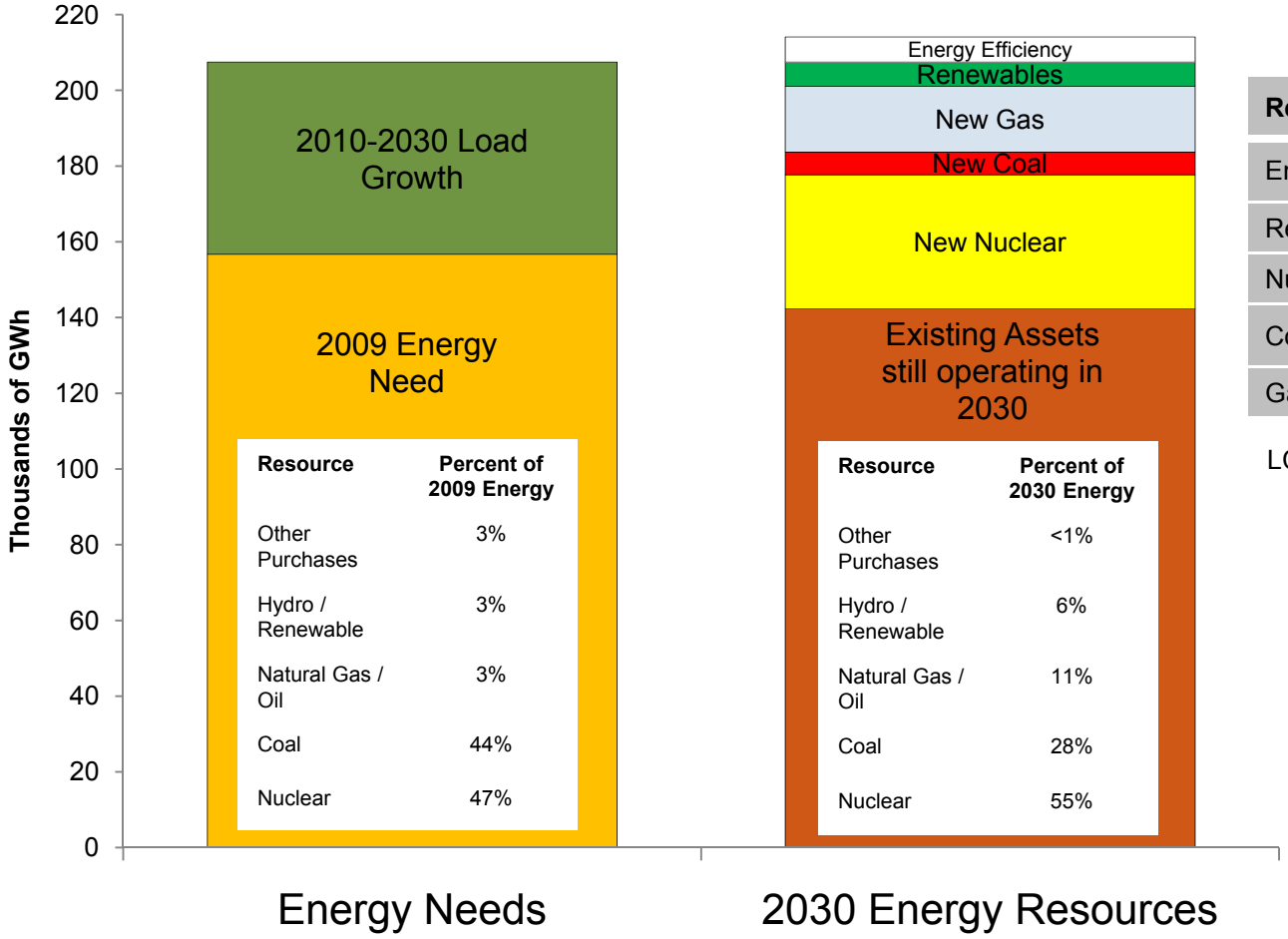
A responsible and comprehensive energy policy in North Carolina should prepare the State to address new energy realities; ensure citizens have secure, reliable and affordable electricity; and provide optimal positive impact on the North Carolina environment and economy. A frank assessment of all proposed options should be a part of any energy policy discussion.

Duke Energy Carolinas and Progress Energy Carolinas file annual reports summarizing their plans for cost-effectively meeting projected customer demand for twenty years out. Consistent with the statutory obligation to pursue a least-cost strategy for customers, these plans are developed to ensure electricity remains available, reliable and affordable and is produced in an environmentally sound manner. Implementation of these plans is expected to result in reductions in greenhouse gas emissions.

Federal proposals may require broader measures including additional investments in energy efficiency and renewable energy, accelerated implementation of low-carbon generation and the purchase of emissions allowances. The following conclusions are the result of work to define potential actions necessary in a carbon constrained environment:

- Energy efficiency and renewable energy resources are an integral part of a carbon reduction strategy, however supply is limited by availability and operational constraints as well as customer acceptance and adoption of efficiency measures.
- Nuclear generation is an essential component of a carbon reduction strategy, providing by far the largest supply of cost-effective and reliable energy of any carbon-free resource.
- Carbon reduction strategies aimed at expected compliance targets will result in higher costs to customers.

Planning Needs and Resources – Retail & Wholesale
Consistent with Integrated Resource Plans (IRP)



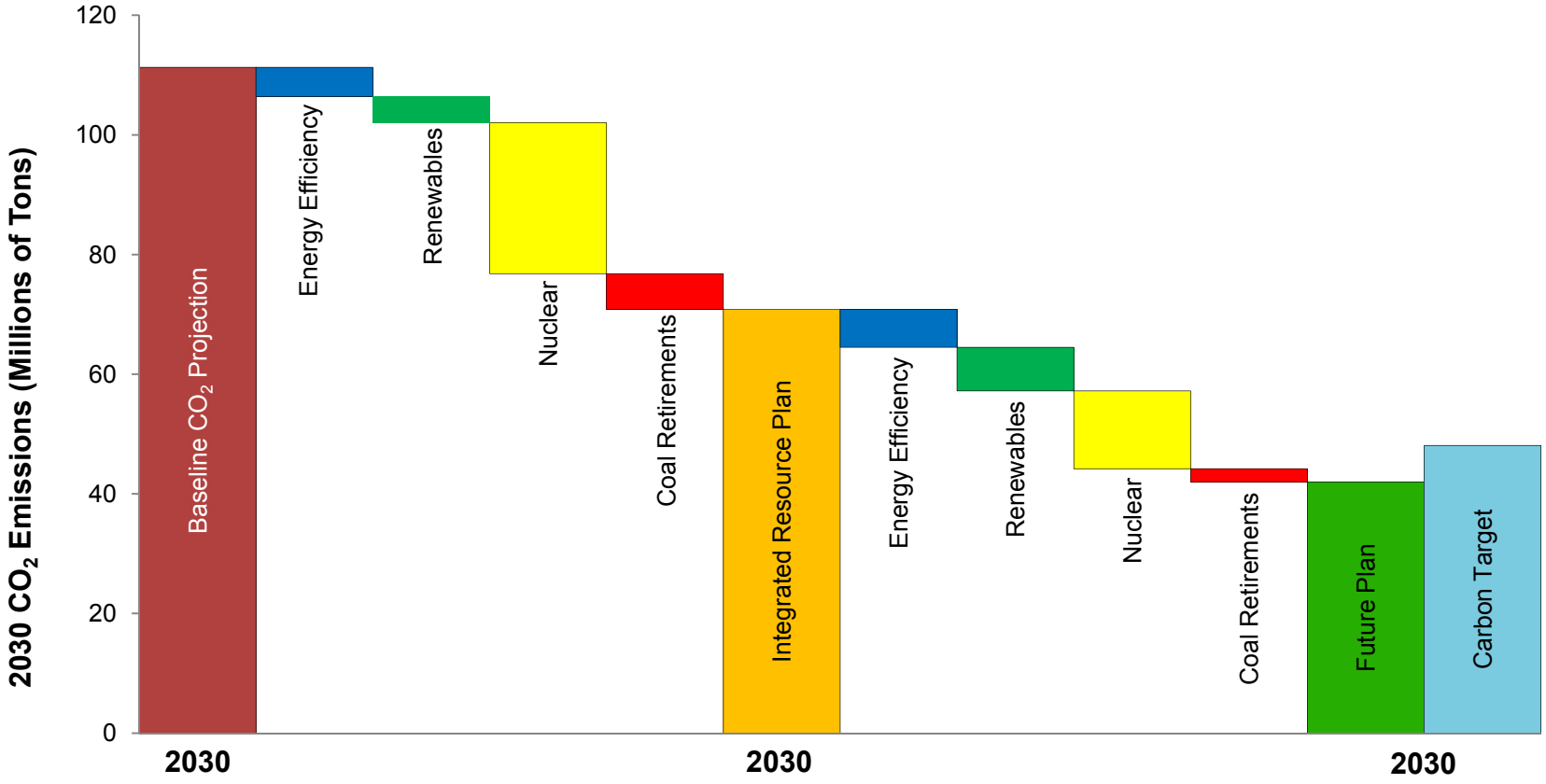
Resource Options	LCOE ($/MWh)
Energy Efficiency	$30 - $320
Renewables	$55 - $700
Nuclear	$82 - $100
Coal w/o CCS	$100
Gas CC	$115 - $168

LCOE is levelized cost of energy

- Energy needs are projected to grow approximately 1.3% per year through 2030
- Energy efficiency programs reduce energy requirements in 2030 by approximately 7,000 GWh
- Based on least-cost integrated resource planning models, incremental energy requirements are primarily met with a diverse mix of energy resources
- The energy reflected by “existing assets still operating in 2030” reflects planned coal retirements

2030 Emissions Reductions Waterfall

Scenario to Carbon Target (Illustrative)



- Baseline CO_2 Projection – Reflects carbon footprint in 2030 without the benefit of energy efficiency programs, expanded renewables, new nuclear capacity or coal retirements. Load growth is primarily served by additional gas capacity and increased capacity factors for existing coal plants.
- Integrated Resource Plan – Reflects carbon footprint in 2030 considering IRP components are implemented
- Carbon Target – Reflects carbon footprint equal to 42% below 2005 levels

Resource Options
Dispatchable Resources

Resources	Expected Capacity Factor	Levelized Cost of Energy (2009 $/MWh)	Economic Impact	Comments
Biomass Co-Firing	25-85%	$5 - $40	• Limited new jobs created	• Cost-effective renewable resource • Fuel costs are volatile
New Biomass	80-90%	$65 - $135	• Jobs created during construction • 0.2 operational jobs per MW	• Widely accepted as most plentiful renewable resource available in the state • Need clarity around definition of biomass
Landfill Gas	70-90%	$65 - $85	• Construction jobs for short duration • 0.5 operational jobs per MW	• Cost-effective renewable resource • Limited number of landfills and supply
Coal w/o CCS	60-85%	$100	• Significant jobs during construction • 0.2 operational jobs per MW	• Reliable baseload capacity
Nuclear	90-100%	$82 - $100	• Significant construction jobs over extended duration • 0.4 - 0.5 high paying operational jobs per MW	• Only carbon-free source of reliable baseload generation • IRPs demonstrate economic advantages to customers over life of plant
Gas Combined Cycle	40-60%	$115 - $168	• Jobs created during construction • .04 - .06 operational jobs per MW	• Essential for system reliability to “backstand” intermittent renewable sources such as wind and solar
Coal w/ CCS	60-85%	N/A in NC	N/A in NC	N/A in NC

Included in the range of levelized costs are the potential effects of tax credits (in or out) as well as other variables such as siting

Resource Options
Non-Dispatchable Resources

Resources	Expected Capacity Factor	Levelized Cost of Energy (2009 $/MWh)	Economic Impact	Comments
Energy Efficiency	Up to 75%	$30 - $320	• Approximately 19 jobs, more short duration (e.g., installation) than permanent (e.g., manufacturing materials), per $1 million of investment.	• Companies have NCUC-approved targets • Current regulatory pact requires all utility administered EE programs be cost-effective • Commercial / industrial opt-outs will affect EE impact and costs to achieve targets
Solar PV (distributed)	20-30%	$280 - $700	• Jobs created during construction • Approximately 1 operational job per MW	• Solar is an expensive renewable option • Technology is not dispatchable, resulting in the need for backup generation
Solar PV (utility scale)	20-30%	$180 - $400	• Construction jobs for short duration • 0.1 – 1.9 operational jobs per MW	• Short construction period; projects can be online within 1 year • Approximately 4-7 acres (flat) needed per MW, so substantial land required
On-Shore Wind	30-40%	$55 - $127	• Significant jobs during construction • 0.1 operational jobs per MW	• Land based wind is a very cost-effective renewable resource. However, North Carolina's land based resources are limited. • Ridge Law prohibits projects in Western NC
Off-Shore Wind	30-40%	$95 - $326	• Significant jobs during construction • 0.1 operational jobs per MW	• North Carolina possesses tremendous wind resources for off-shore development • Business case is challenging for projects off the Southeast coast • Off-shore wind is a nascent industry in the U.S. and is very costly to develop

Included in the range of levelized costs are the potential effects of tax credits (in or out) as well as other variables such as siting