North Carolina Clean Energy Plan Workshop #4

North Carolina

Department of Environmental Quality

May 22, 2019

North Carolina

Clean Energy Plan Development

Welcome to Workshop 4

Objectives

- Further our understanding of clean energy technology and policy opportunities for North Carolina and potential tensions that may arise
- Share and discuss other related efforts going on in the state that can inform the development of North Carolina's Clean Energy Plan
- Present initial outline and schedule of Clean Energy Plan and solicit reactions and feedback from workshop participants

Agenda

- Welcome, Opening Remarks, and Introductions
- Overview of Clean Energy Plan Outline and Opportunity for Initial Feedback

BREAK

- Clean Energy Plan Modeling and Other Collaborative Efforts (Part 1)
- Session 1: Concurrent Group Presentations and Discussion
  Grid Modernization to Support Clean Energy
  Equitable Access and Just Transition

LUNCH

- Session 2: Concurrent Group Presentations and Discussion
  Utility System Planning and Investment
  DER Interconnection and Compensation
- Session 3: Concurrent Group Presentations and Discussion
  Utility Business Model
  Grid Resiliency Enhancements
  Customer Access to Renewables

BREAK

- Group Breakouts to Discuss Feedback and Refine Recommendations
- Next Steps

Proposed Ground Rules

1. Be Present
2. Democracy of Time

Check-In

Having worked with different stakeholders, what is something that you learned since we last met about your working group's topic?

North Carolina

Clean Energy Plan Development

Clean Energy Plan Outline

Clean Energy Plan Development Process

A. Engagement with stakeholders

B. Technical analysis
   - NC energy landscape
   - NC energy resources
   - Use of predictive energy modeling

C. Action areas
   - Recommendations on policies, regulatory changes, administrative actions, incentives, etc.

Public Engagement Methods:

Method 1. Six Facilitated Workshops, Raleigh

Method 2. Regional Listening Sessions (9 locations)

Method 3. Combined with Other Statewide Events

Method 4. Online Input

Dates and locations posted at https://deq.nc.gov/cleanenergy

Facilitated Workshops 1 & 2

Vision Building and Current Landscape

What is NC's vision of a clean energy future, how different is it from the current direction, and how well do current policies, regulatory and business practices help achieve that vision?

- Stakeholders discuss **NC's current energy direction** and changing landscape; vision for a clean energy future; current policies, regulatory and business practices; and the **ability of current policies/laws/practices to achieve the vision.**
- Stakeholders share views and prioritize ideas.

Milestones:

- Stakeholders learn and share perspectives on their vision of a clean energy future how well the current system works through facilitated discussion.
- Stakeholders share their positions on issues; elements of agreement and disagreement are identified

Facilitated Workshops 3 & 4

Changing Landscape

What policy and technology trends are influencing how we foster clean energy use?

- Identify policy and technology trends that are driving clean energy deployment, the opportunities presented by these trends, and barriers that exist to seizing those opportunities
- Stakeholders share views and prioritize ideas

Milestones:

- Stakeholders learn and share perspectives on the changing technology and policy landscape for clean energy
- Stakeholders share their positions on issues raised thus far; elements of agreement and disagreement are identified

Facilitated Workshops 5 & 6

Recommendations for the Clean Energy Plan

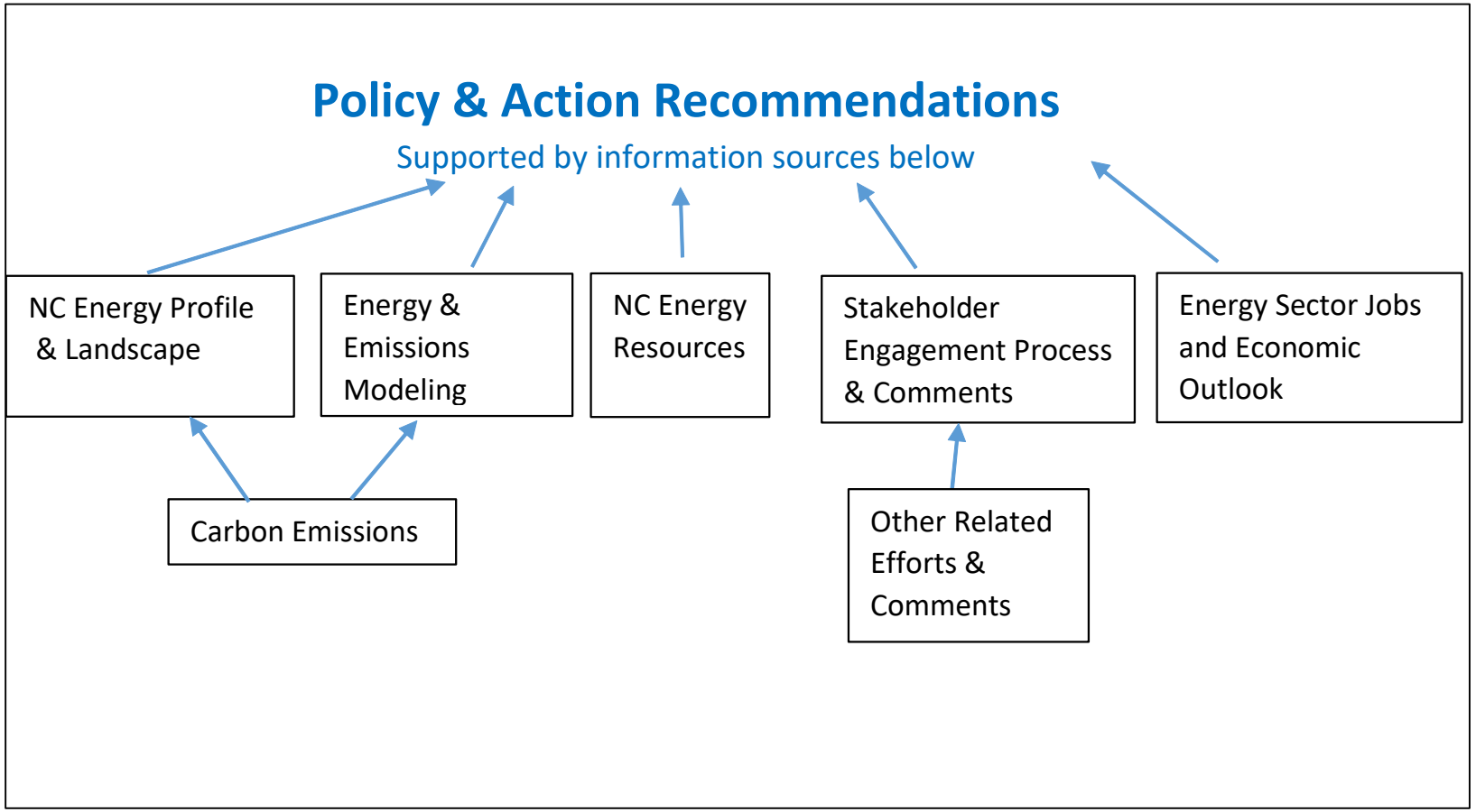
What policy or regulatory actions should be taken to achieve the clean energy vision?

- Stakeholders identify areas of policy or regulation that need to be developed or updated to overcome rules or practices that prevent NC from achieving the clean energy vision.
- Stakeholders share views and prioritize ideas.

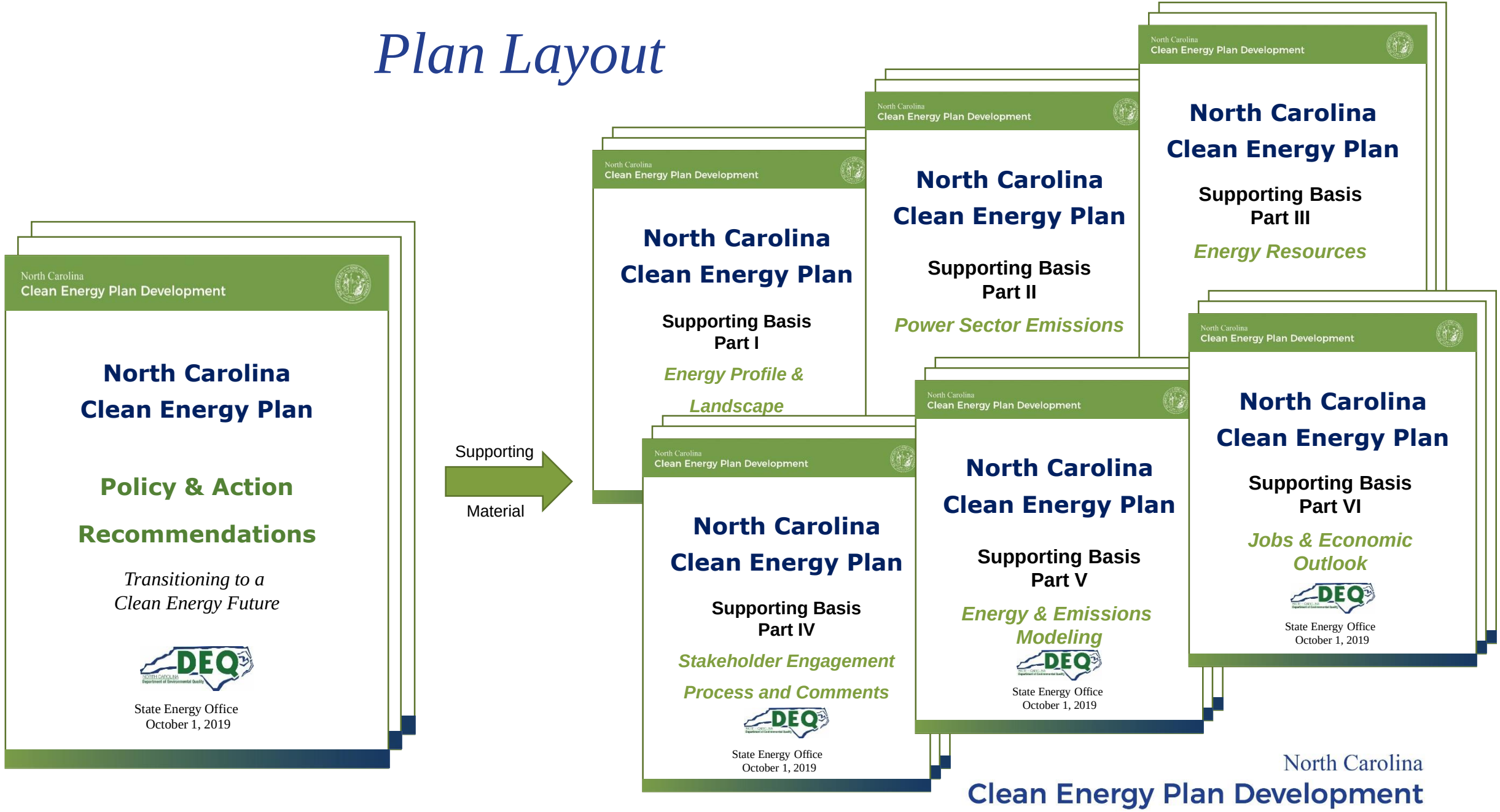
Milestones:

- Stakeholders better understand the suite of possible options for achieving NC's clean energy vision.
- stakeholders share their positions on key elements of NC's Clean Energy Plan; elements of agreement and disagreement are identified

Clean Energy Plan Structure



Plan Layout


North Carolina
Clean Energy Plan Development
North Carolina
Clean Energy Plan
Policy & Action
Recommendations
Transitioning to a
Clean Energy Future
State Energy Office
October 1, 2019
Supporting
Material
North Carolina
Clean Energy Plan
Supporting Basis
Part I
Energy Profile &
Landscape
North Carolina
Clean Energy Plan
Supporting Basis
Part II
Power Sector Emissions
North Carolina
Clean Energy Plan
Supporting Basis
Part III
Energy Resources
North Carolina
Clean Energy Plan
Supporting Basis
Part IV
Stakeholder Engagement
Process and Comments
State Energy Office
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Supporting Basis
Part V
Energy & Emissions
Modeling
State Energy Office
October 1, 2019
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Part VI
Jobs & Economic
Outlook
State Energy Office
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Policies & Action Recommendations Draft Outline

I. **Acknowledgements**

II. **Introduction** (EO80 directive, process, timing, stakeholders, roles, …)

III. **Electric Sector Transformation in Process** <---- Workshops #1 – 4

IV. **Clean Energy Plan Stakeholder Process**

V. **Vision and Goals for North Carolina's Electricity System** <---- Workshops #1 - 2

VI. **Guiding Principles** <---- Workshops #1 - 2

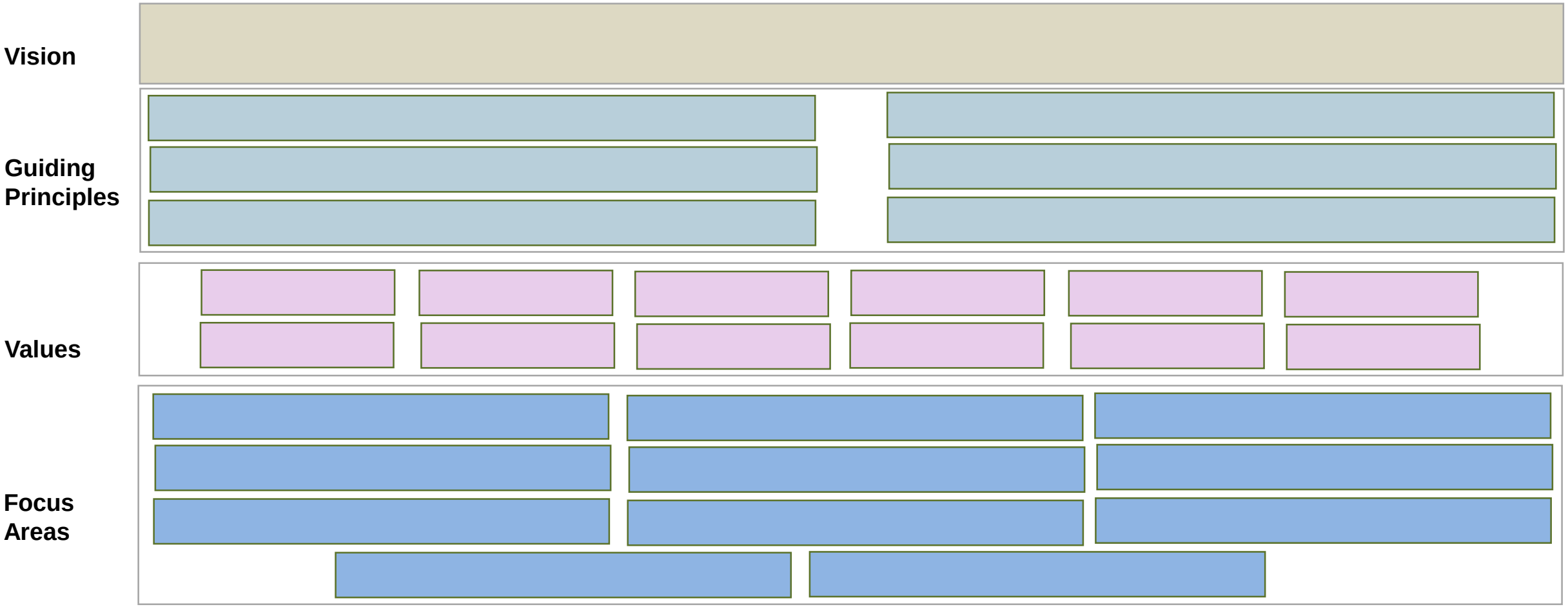
VII. **Electricity System Values to Uphold and Promote** <---- Workshops #1 - 2

VIII. **Successes and Challenges of the Current System** <---- Workshops #3 - 4

IX. **Portfolio of Recommendations** <---- Workshops #5 - 6

X. **Detailed Recommendations** <---- Workshops #1 - 6

NC Clean Energy Plan
Recommendations Development Block Diagram



North Carolina
Clean Energy Plan Development

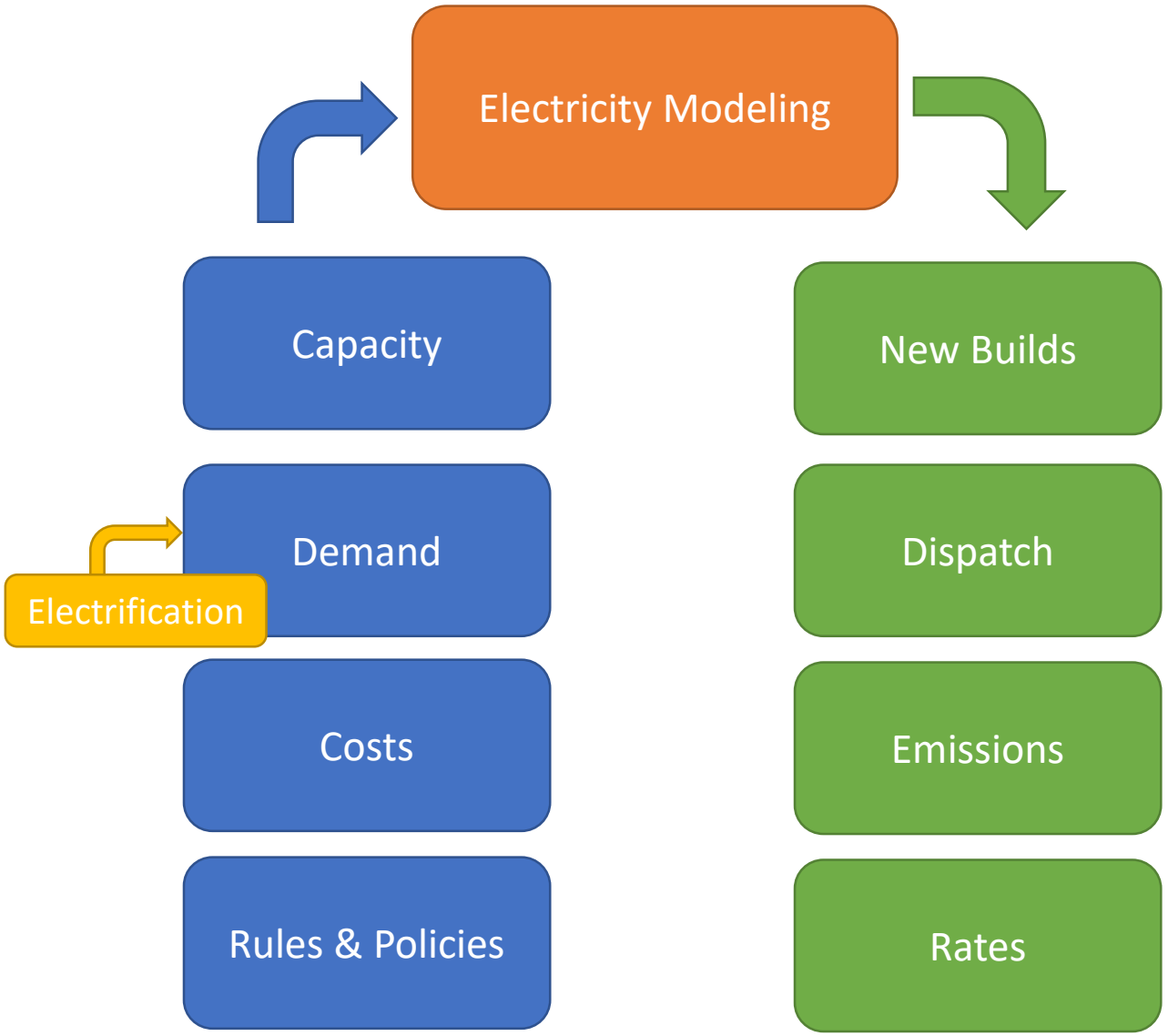
Portfolio of Recommendations
Focus Area 1 Example

Focus Areas		Recommendations (examples)		Legislative	Utilities Commission	Utilities	Governor	Agency	Local Government	Higher Education	Private Sector
1	**Increase Customer Access to Clean Energy Resources**	1-1	End the ban on third-party sales of electricity	●							
		1-2	Expand the cap on solar rebates under HB589	●							
		1-3	Develop innovative solar rebate programs to increase access to diverse groups of customers, especially low-income residents	●							
		1-4	Restore the 35% renewable energy state tax credit	●							
		1-5	Require or incentivize utilities to offer on-bill financing	●							
		1-6	Enact a statewide commercial PACE program	●	●						
		1-7	Require utilities to invest in a specific amount of solar energy paired with storage	●	●						
		1-8	Require virtual net metering by utilities offering community solar programs		●						
		1-9	Achieve greater participation from smaller customers by revising Duke Energy's Green Source Advantage Program		●						
		1-10	Require utilities to provide an easy option to purchase renewable energy through electric billing		●	●					
		1-11	Empower customers to voice their opinions, desires and need for their best power generation option				●	●	●		●
		1-12	Provide resources for the Utilities Commission to increase their understanding of customers' needs and capability of alternate resources		●					●	

Portfolio of Recommendations Focus Areas 2 through 11

Remaining Focus Areas	
2	Facilitate Interconnection of Greater DERs and Develop Compensation Methods for the Value Added to the Grid
3	Modernize Electric Grid to Support Clean Energy Resources
4	Modernize Utility Business Model
5	Require Comprehensive Utility System Planning Process and Investment Strategy Reviews
6	Address Equitable Access, Affordability and Just Transition to Clean Energy
7	Strengthen Resilience and Flexibility of the Grid
8	Develop Pathways to Further Decarbonize the Electric Power Sector
9	Increase Clean Energy Economic Development Opportunities
10	Increase Use of Energy Efficiency and Demand Side Management Programs
11	Expand Adoption of Electrification Technologies (transportation and efficient utilization)

Energy Modeling



RESOURCES FOR THE FUTURE

NC SUSTAINABLE ENERGY ASSOCIATION

NRDC

NC STATE UNIVERSITY

* Storage

GEORGETOWN CLIMATE CENTER

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

*EV Focus

Modeling Organizations

CEP Recommendations Input

Clean Energy Plan Stakeholder Process

Workshops, Listening Sessions, etc.

+

Cities Initiative

EDF ENVIRONMENTAL DEFENSE FUND
Finding the ways that work

Energy Efficiency Roadmap

Duke NICHOLAS INSTITUTE FOR ENVIRONMENTAL POLICY SOLUTIONS

SOUTHEAST ENERGY INNOVATION COLLABORATIVE

E4 CAROLINAS

Current Schedule

June 26 - Workshop #5 - Stakeholders develop preliminary list of recommendations

July 24 - Workshop #6 **-** Stakeholders prioritize recommendation ideas

August 12 – **September 4** Public Comment Period

End September – Final Plan presented to Climate Council for approval

October 1 – Final Plan submitted to the Governor

Feedback on Clean Energy Plan Outline and Recommendations

Did anything in DEQ's presentation on the Clean Energy Plan's outline and process surprise you?

Feedback on Clean Energy Plan Outline and Recommendations

What focus areas are missing from DEQs outline?

Feedback on Clean Energy Plan Outline and Recommendations

What other questions do you have on the development process and structure of the Clean Energy Plan?

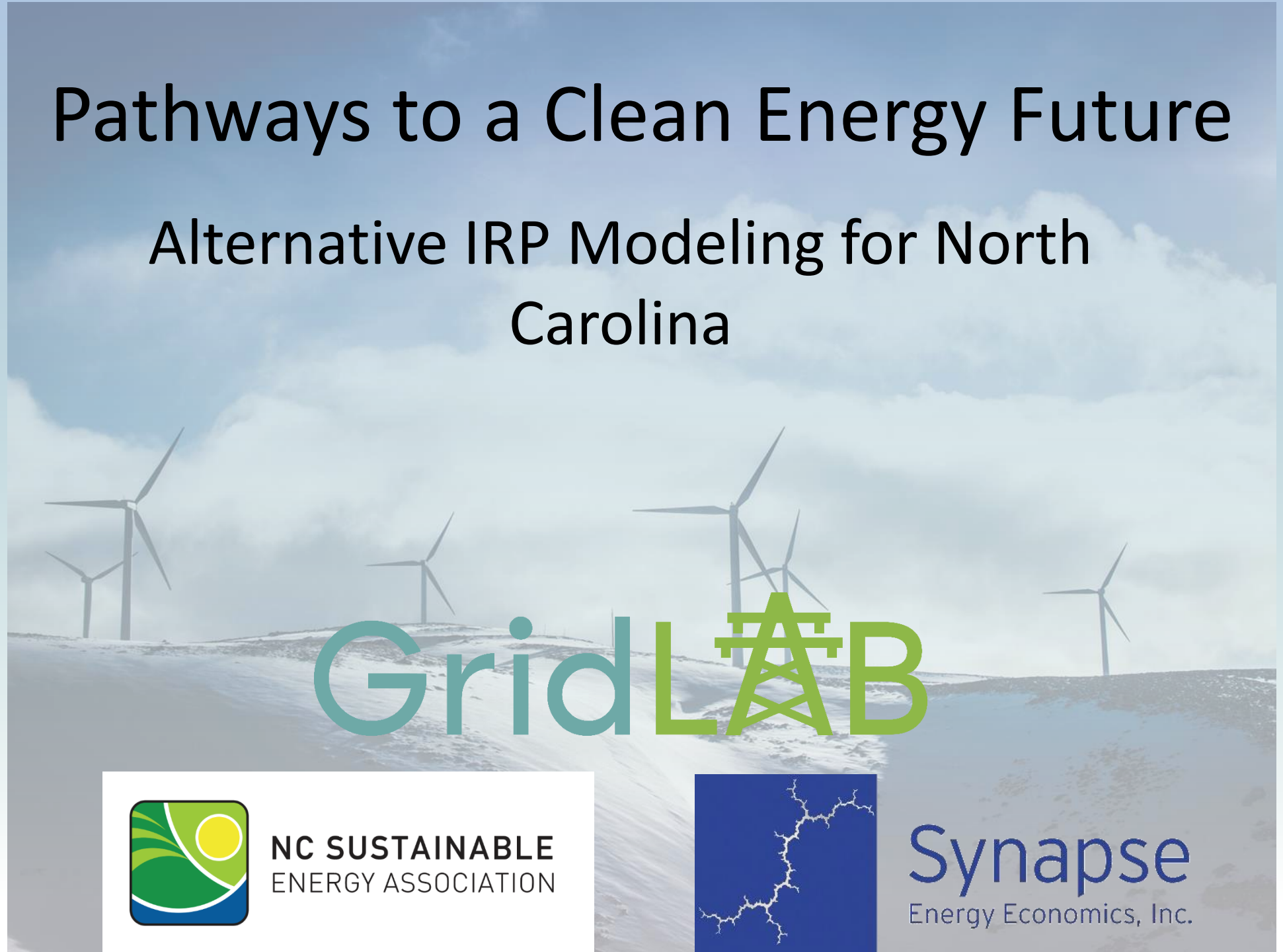
North Carolina
Clean Energy Plan Development

Clean Energy Plan Modeling and Other Collaborative Efforts (Part 1)

Daniel Brookshire, North Carolina Sustainable Energy Association

Pathways to a Clean Energy Future

Alternative IRP Modeling for North Carolina



GridLAB

NC SUSTAINABLE ENERGY ASSOCIATION

Synapse Energy Economics, Inc.

GridLab is a new organization founded on the premise that policymakers and advocates need more **comprehensive and credible technical information** on the design, operation, and attributes of a flexible and dynamic grid.

Synapse Energy Economics is a research and consulting firm specializing in energy, economic, and environmental topics. Since its inception in 1996, Synapse has grown to become a leader in providing rigorous analysis of the electric power and natural gas sectors for public interest and governmental clients

NC Sustainable Energy Association (NCSEA) is the leading 501(c)(3) non-profit organization that drives public policy and market development for clean energy. Our work enables clean energy jobs, economic opportunities and affordable energy options for North Carolinians.

NC SUSTAINABLE ENERGY ASSOCIATION

Synapse Energy Economics, Inc.

GridLAB

Electric Sector Modeling

- Synapse Energy Economics used the EnCompass model to perform scenario-based analysis of the proposed Duke IRPs

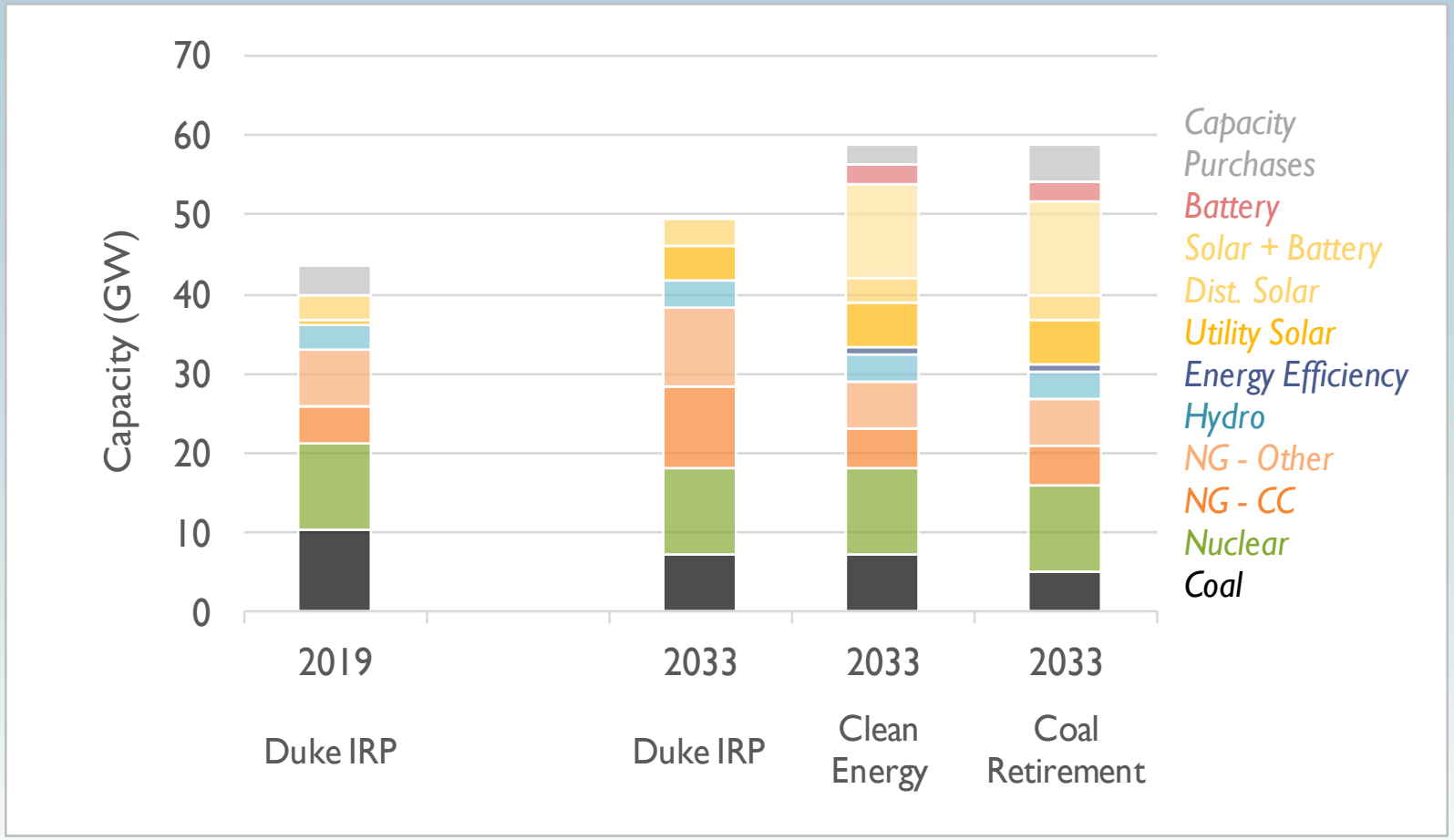
- Duke's IRP is over-reliant on natural gas and builds renewables only to meet legislative targets

- Modeled Scenarios:
  - Duke IRP Baseline
  - Clean Energy Scenario
  - Accelerated Coal Retirement Scenario

- When must-run requirements for coal units are removed, emissions and costs decrease immediately

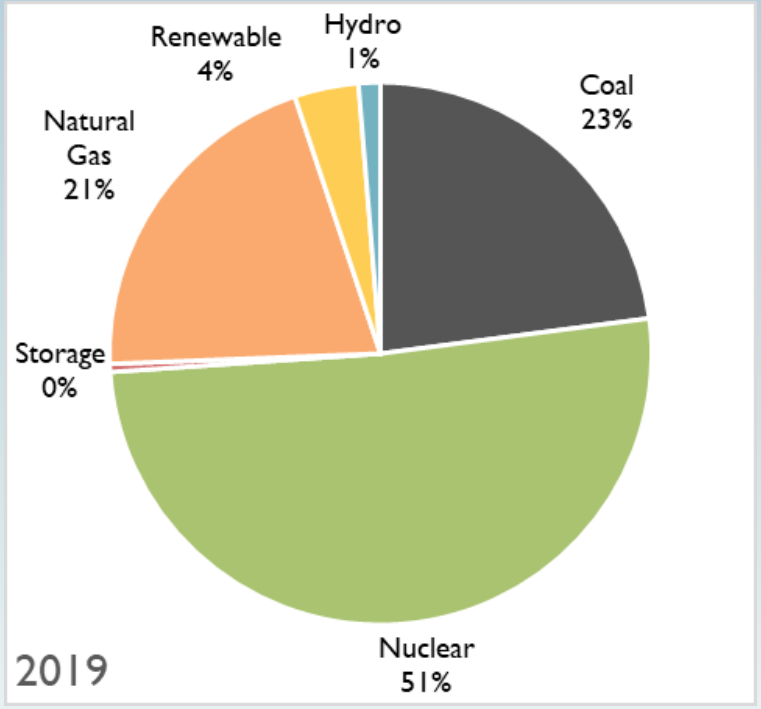
- Compared to the IRP Baseline, the 2033 Clean Energy Scenario sees:
  - 49% renewable capacity (versus 23%)
  - ~30 million tons of CO2 emissions (versus 50 mt)
  - $1.8B in production cost savings
  - 4-9% average annual savings on ratepayer spending

Nameplate Capacity by Scenario

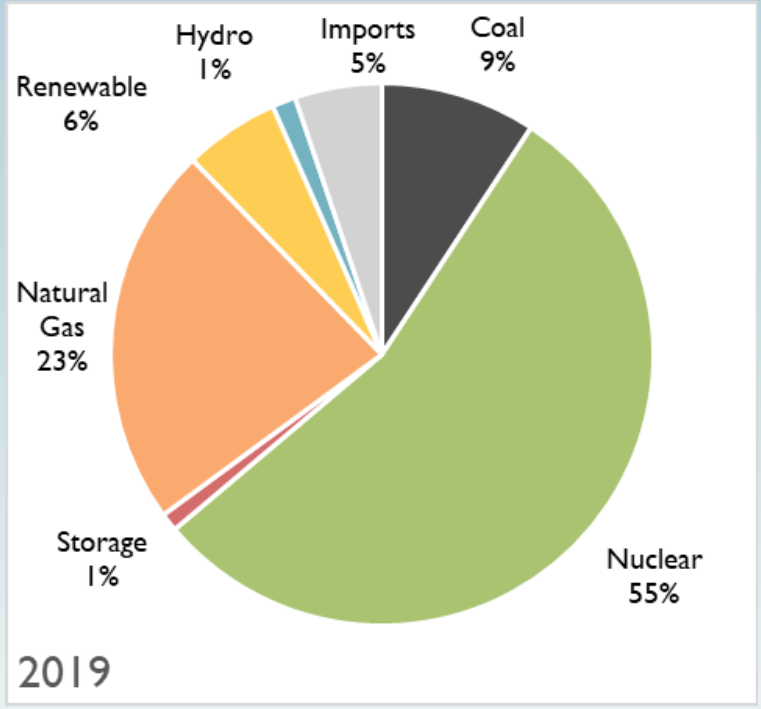


Modeled Generation (2019)

Duke IRP Baseline

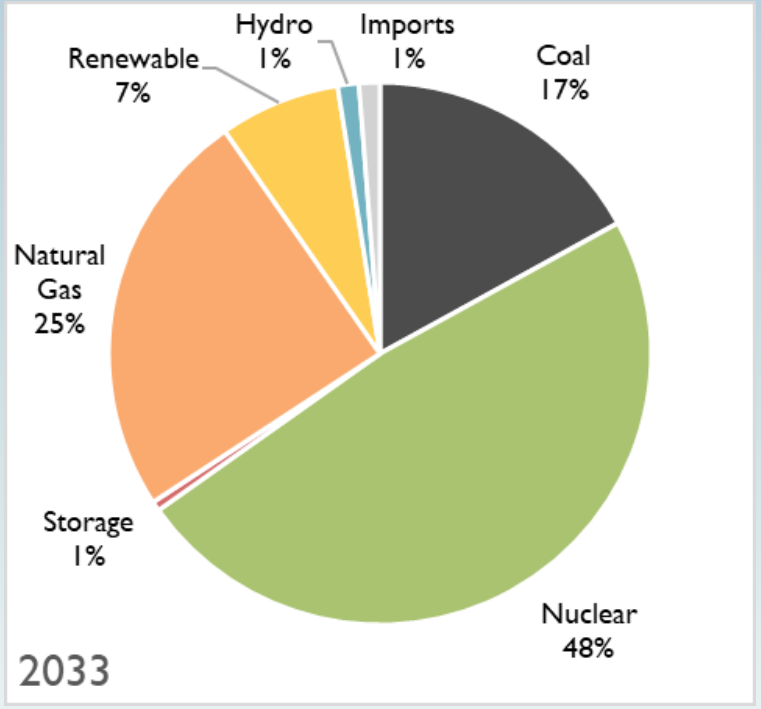


Clean Energy Scenario

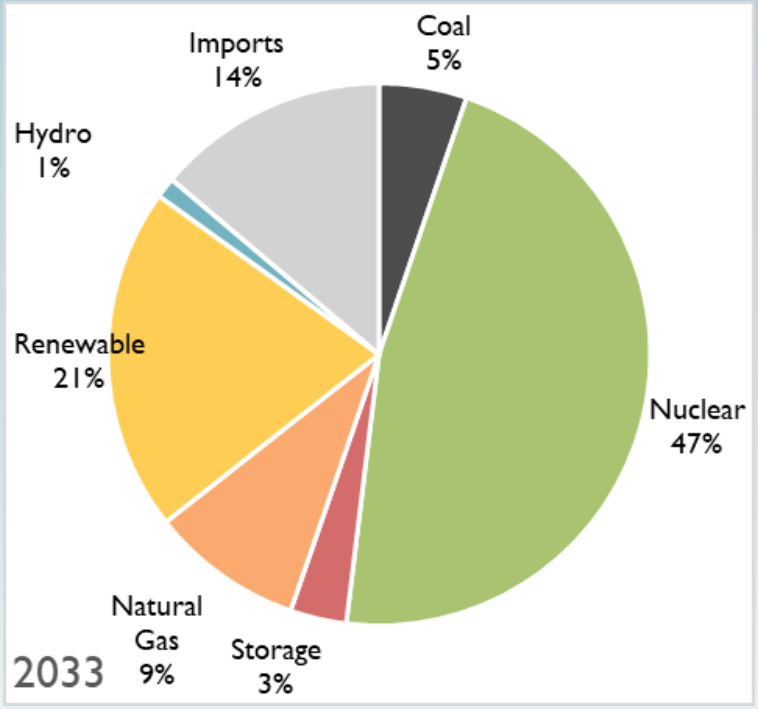


Modeled Generation (2033)

Duke IRP Baseline



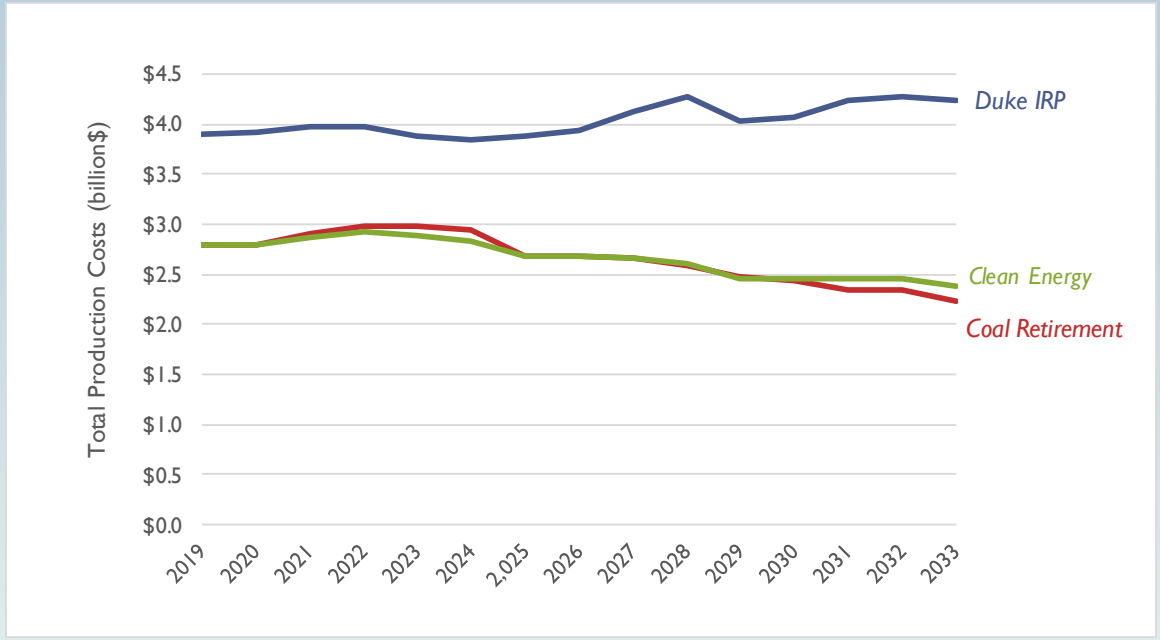
Clean Energy Scenario



Capacity and Generation Results

- The Duke IRP scenario adds 9 GW of new gas, 5 GW of new renewables over the analysis period
- Under the IRP scenario, Duke's 2033 generating capacity is virtually unchanged from 2019, with 56% coming from fossil fuels
- When must-run coal designations are removed as a modeling constraint, coal generation decreases immediately
- The Accelerated Coal Retirement Scenario expedites the retirement of Roxboro Unit 3 & 4 (in Dec 2030) and Marshall 1 & 2 (in Dec 2032)
- Retired coal generation is replaced by additional imports

Total Production Costs by Scenario



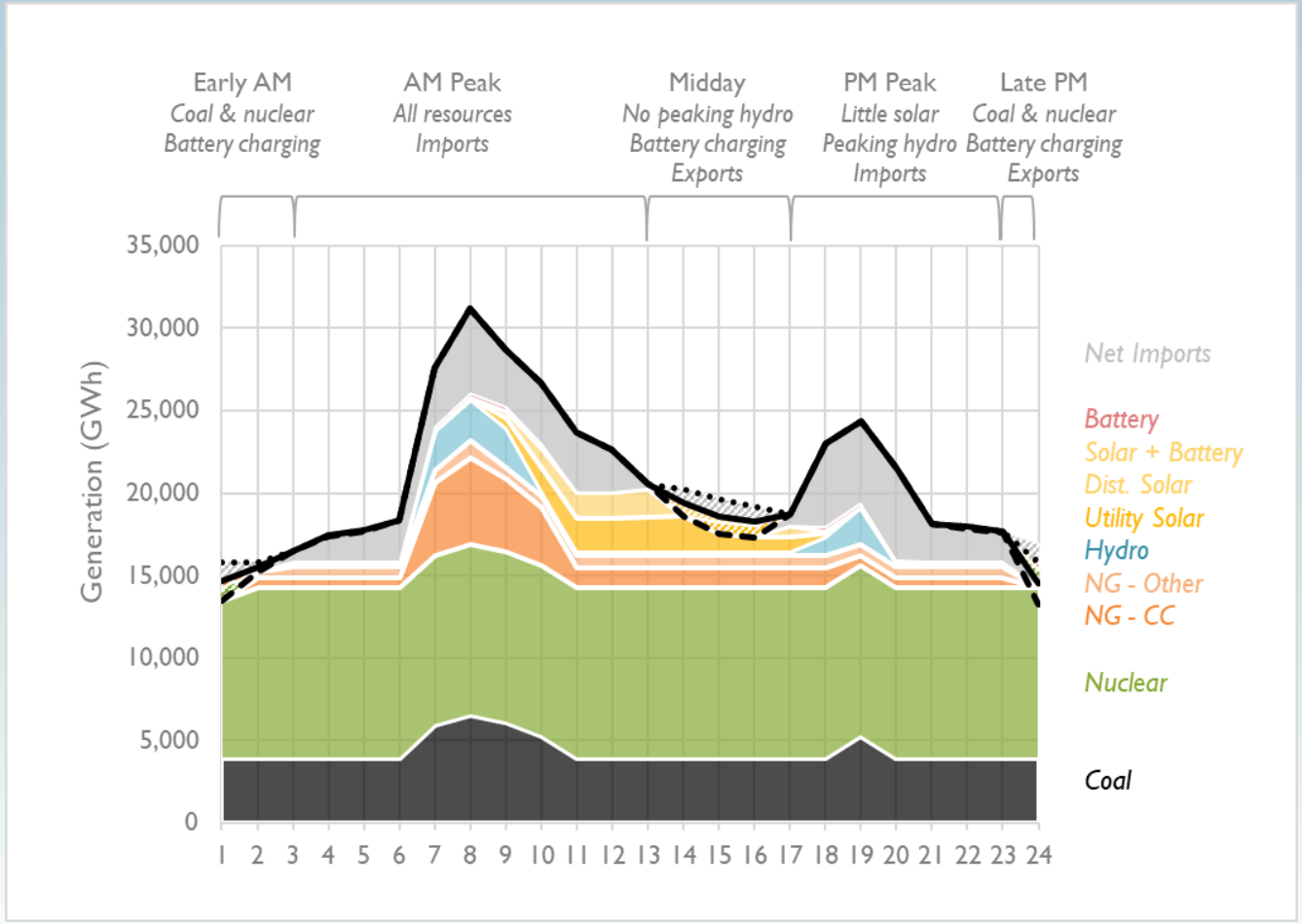
- The Clean Energy scenario is markedly cheaper than the current Duke IRP
- Removing must-run designations leads to immediate cost savings
- Production costs drop by 28% immediately when coal does not generate

Daily Load Requirements

- The Clean Energy scenario (CES) utilizes a lower 15% reserve margin in accordance with NERC standards
- EnCompass projects no loss-of-load-hours and zero hours of unserved energy under the CES, even as demand increases
- The Duke IRP scenario dispatches coal, natural gas, hydro, and some solar to meet daily peaks
- CES relies on a greater mix of resources to meet daily peaks, with battery capacity charged during the morning and midday trough

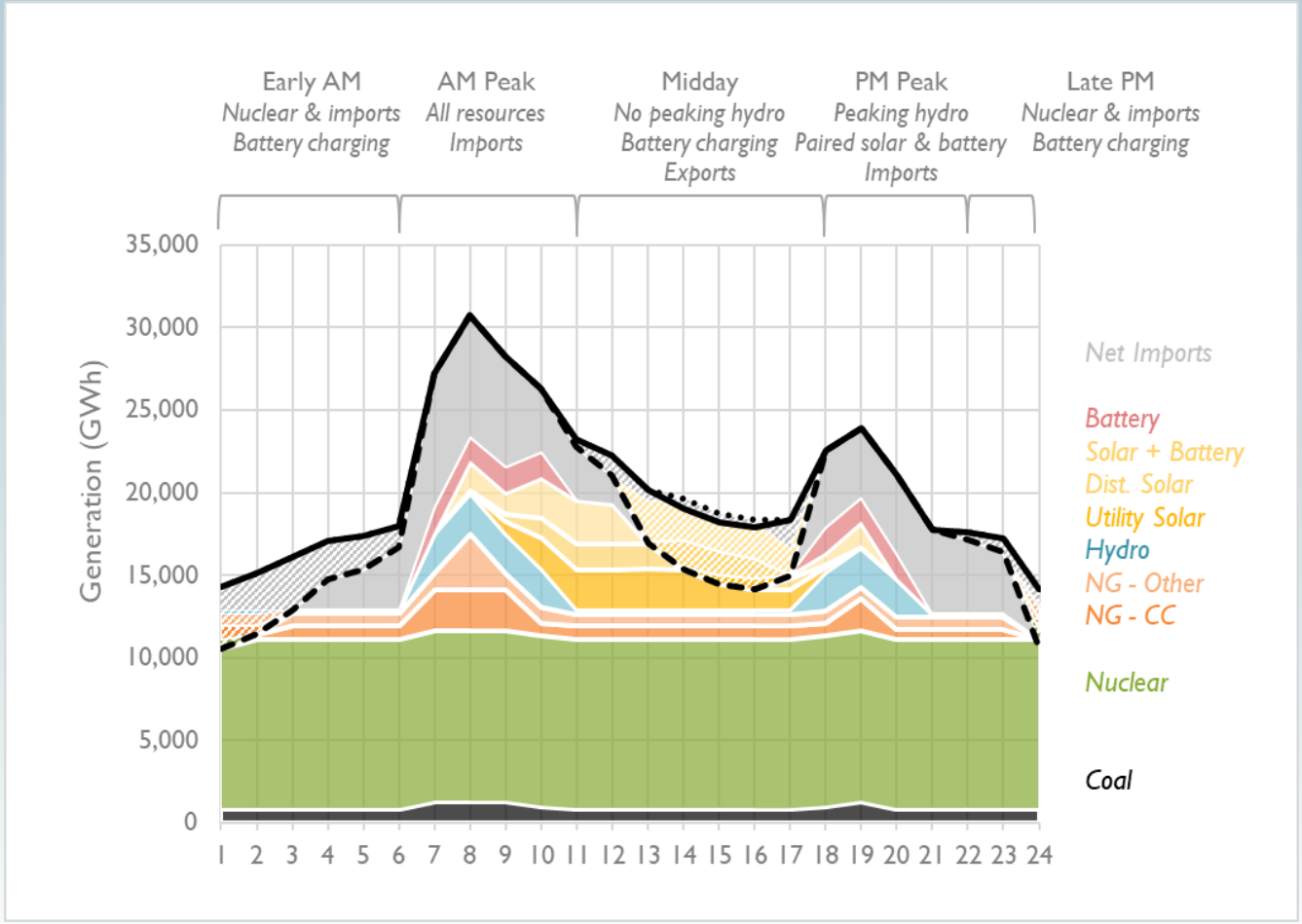
Winter Peak Example (Duke IRP)

Sample winter peak generation by fuel type, January 3, 2028

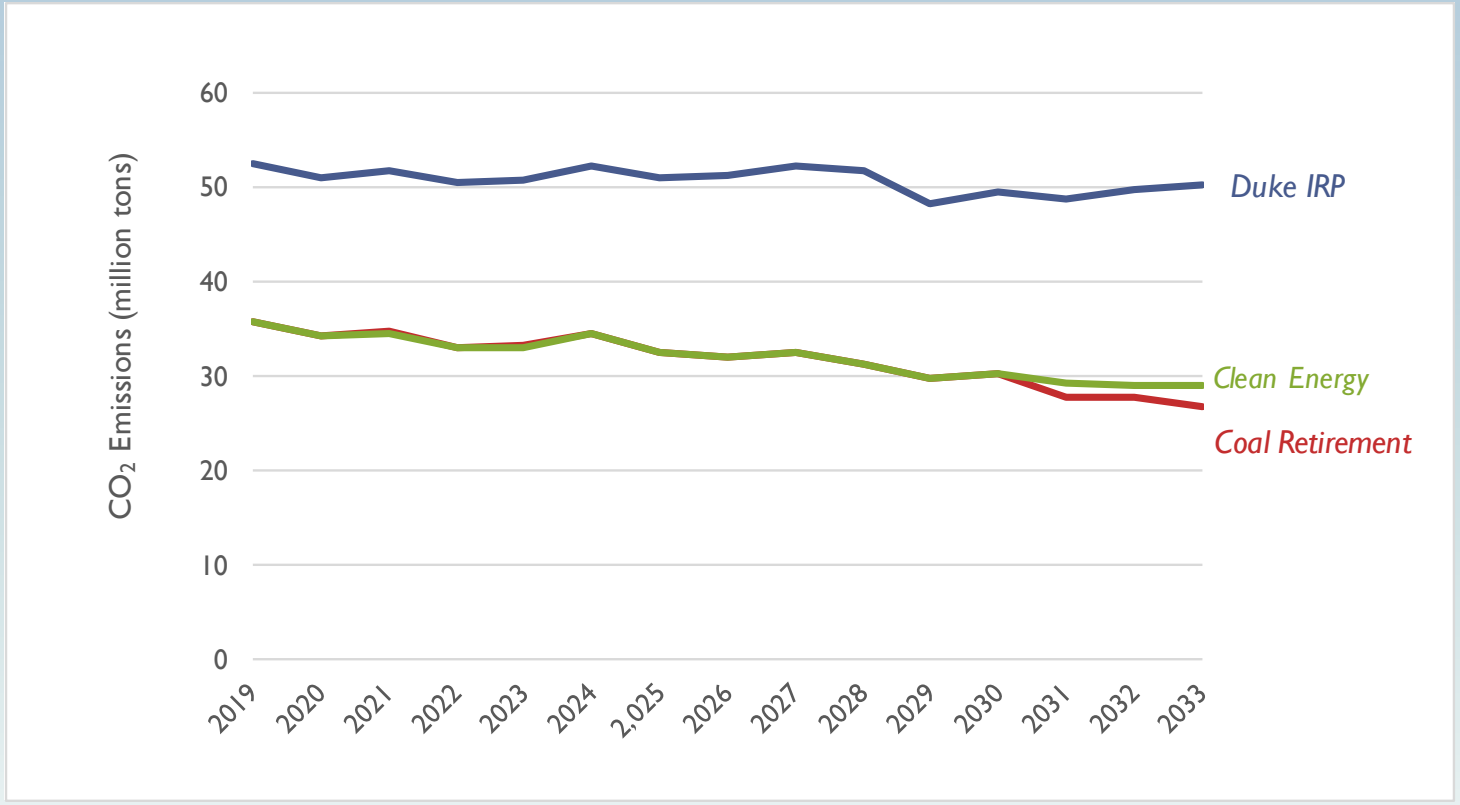


Winter Peak Example (Clean IRP)

Sample winter peak generation by fuel type, January 3, 2028



CO2 Emissions by Scenario

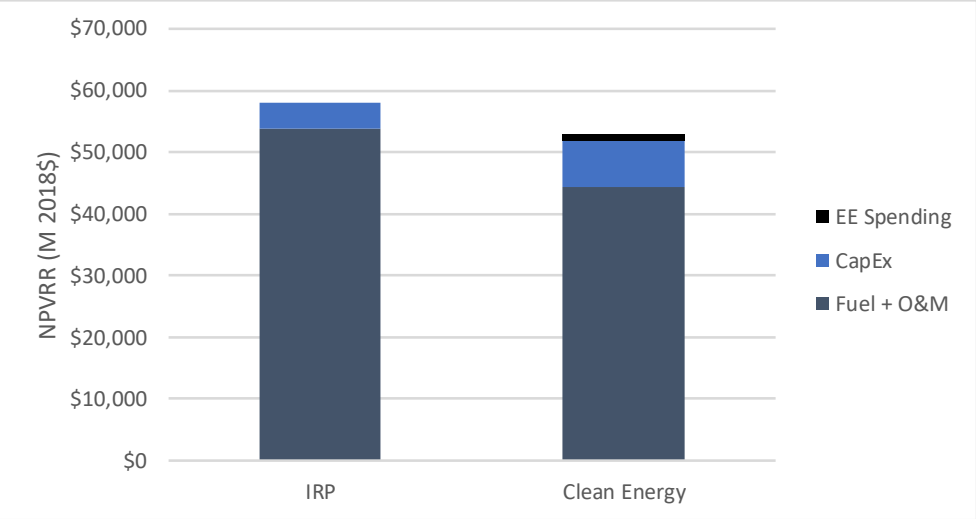


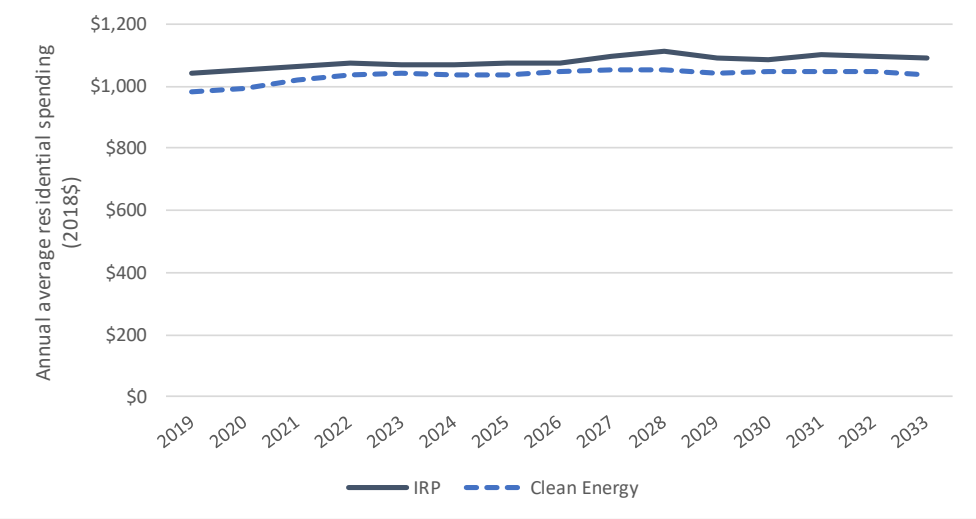
Avoided Health Impacts and Associated Monetary Benefits

Year	Hospital Admits, Respiratory	Hospital Admits, Respiratory Direct	Hospital Admits, Asthma	Hospital Admits, Lung Disease	Hospital Admits, Cardio	Emergency Room Visits, Asthma	Work Loss Days
2020	6.0	4.3	0.5	1.2	7.1	10.8	2,398
2025	5.9	4.3	0.5	1.2	7.0	10.7	2,372
2030	4.9	3.5	0.4	1.0	5.8	8.9	1,966
2033	4.8	3.4	0.4	0.9	5.6	8.6	1,911

Year	Total Health Benefits, Low	Total Health Benefits, High
2020	$196,778,415	$444,771,642
2025	$194,592,175	$439,830,666
2030	$161,291,821	$364,570,301
2033	$156,736,570	$354,274,856

Revenue Requirements and Residential Electricity Bills





- Revenue requirements are lower in the CES due to lower production costs
- Capital expenditures increase in the CES due to increased spending on renewables beyond HB 589 levels, but are offset by fuel and O&M savings
- Ratepayers see $.24/kWh - $.48/kWh annual rate savings
- This amounts to $27-$58 annual electric cost savings per household

Duke Energy IRP Summary

- Duke Energy's proposed IRP represents an energy future inconsistent with current trends shaping the industry
- In contrast to Duke's IRP, new solar and storage resources can meet all future energy and capacity needs with no incremental natural gas builds
- Removing must-run coal requirements lowers electric system productions costs and carbon emissions immediately, and the system can maintain reliability

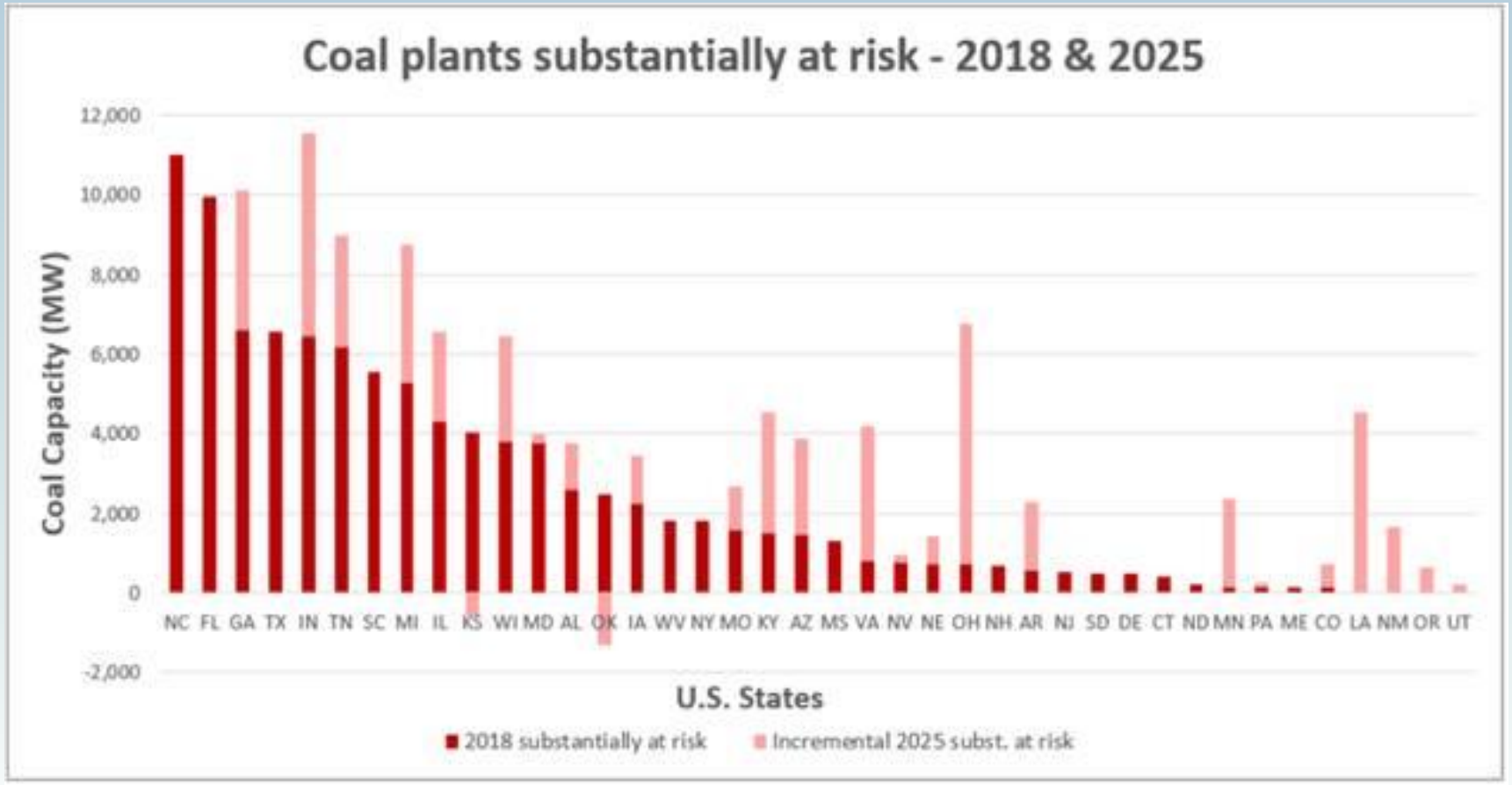
Applied Economics Clinic
Economic and Policy Analysis of Energy, Environment and Equity

1. Introduction

The Southern Environmental Law Center (SELC), on behalf of its clients, the Natural Resources Defense Fund, the Sierra Club, and the Southern Alliance for Clean Energy, engaged Applied Economics Clinic (AEC) to review the 2018 Integrated Resource Plans (IRPs) filed by Duke Energy Carolinas (DEC) and Duke Energy Progress (DEP) (collectively the Companies" or Duke) with the North Carolina Utilities Commission (NCUC) under Docket E-100 Sub 157.[1] This report focuses on the Companies' treatment of their existing coal-fired power plants in the 2018 IRPs.

We find that the Companies' analysis underlying their 2018 IRPs falls short of best practices in IRP development. Of particular importance, Duke fails to take the critical step of modeling an optimal allocation of existing and new resources. The Companies have hardwired the retirement dates for their coal units and prevented their capacity expansion model from retiring a unit or units for economic reasons prior to the end of the units' useful life.[2] Thus, the Companies' IRPs do not fully investigate the lowest-cost option for ratepayers. Furthermore, many of the Companies' coal units are identified as peaking resources in the IRPs, which, on a cost- and performance-basis, is unsustainable. Coal plants are physically ill-suited to run as peaking plants, with high start-up costs and long start-up times. Also, frequent cycling of coal units has been found to damage equipment and shorten life expectancies due to cycling-associated thermal fatigue, stress and wear on equipment, and corrosion of parts.[3] Finally, coal plants also have high fixed costs (typically between $40 and $80 per kw-year[4]) making it a costly option to keep them online but run rarely. The Companies' own modeling indicates that they do not [redacted] for these units—in fact, some are expected to [redacted] than in recent years. If the Companies conducted a more rigorous modeling process and allowed for a true cost-optimization of their resource selection, ratepayers could benefit from a lower-cost, lower-risk portfolio.

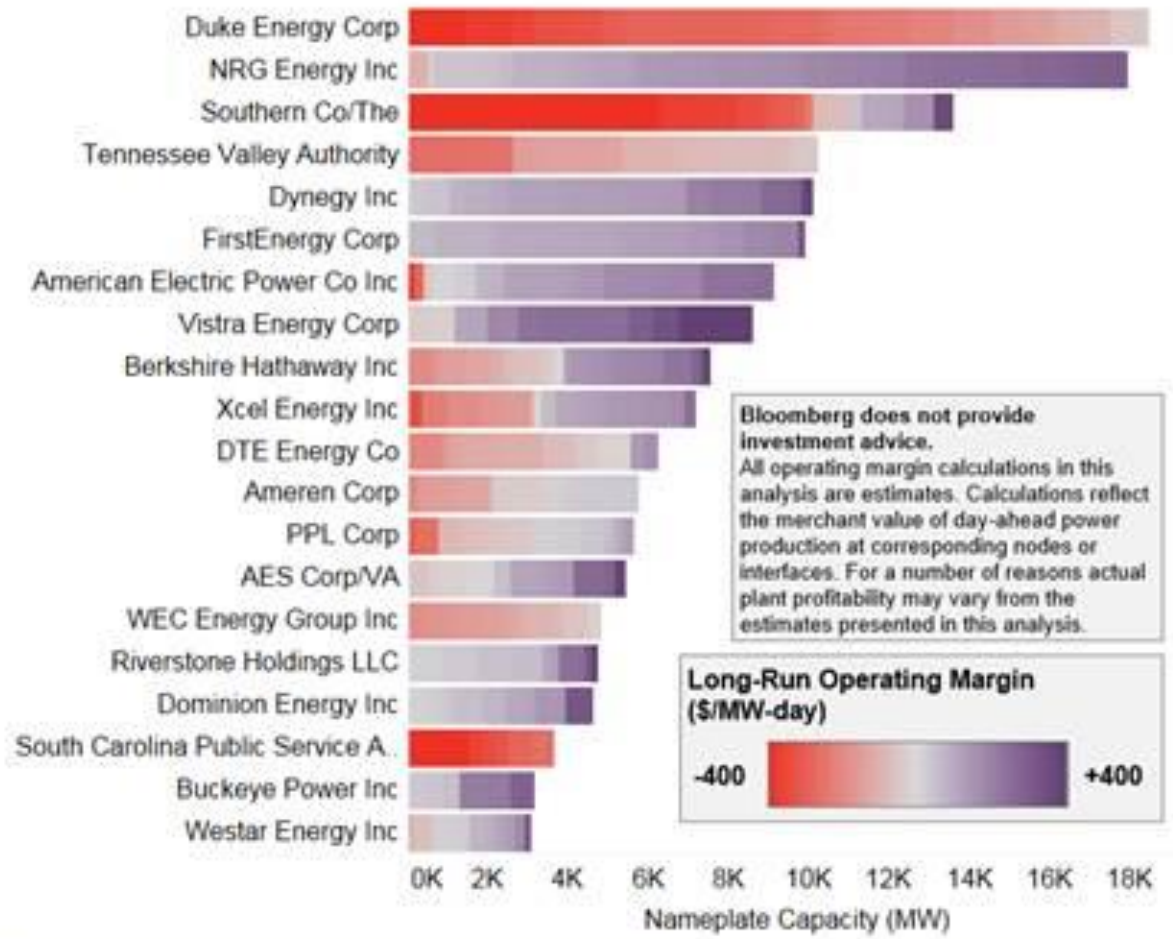
NC Coal Fleet most at risk in U.S. vs. local wind and solar



Source: Energy Innovation LLC / VCE report, March 2019

Economic footing for largest coal fleets

Online coal capacity – colored by long-run operating margin, 2012-17



Regulated Fleets

- The bulk of **Duke Energy's** coal capacity is based in the Carolinas. The costs of shipping coal over the Appalachian mountains renders coal more costly than local Transco Zone 5 gas – and more costly than importing replacement power from PJM or MISO. Duke's regulated plants remain online at the discretion of regulators, who may have good reason keep Duke's 'out-of-the-money' (i.e. red) coal capacity online: the Carolinas have the lowest reserve margins in the Southeast. As such, retiring Duke's coal capacity might jeopardize local grid reliability.
- The same *cannot* be said of **Southern Company's** coal fleet, which is concentrated in Georgia/Alabama, where coal costs more to burn than displace, and where in 2017 estimated reserve margins were 37%.

Deregulated Fleets

- **NRG's** coal fleet spans four ISOs (PJM, MISO, ERCOT, NYISO). Its Texas and Illinois capacity delivered healthy returns from 2012-17. But its plants in Pennsylvania are plagued by fire-sale natural gas prices emerging from the Marcellus and Utica shales. These plants and their neighbors were disappointed by the latest PJM capacity auction (EY2021), which saw 'Rest of RTO' capacity prices fall to $76/MWh-day.[1]
- **Dynegy Inc** and **Vistra Energy Corp** have fared relatively well in recent years, against all odds. Vistra's fleet in particular is among the cheapest-running in the nation, by our estimate, and Dynegy's exposure to Northeast ISO capacity prices will grant the soon-to-be-joint[2] fleets another pathway to profitability.

For More

The Excel File accompanying this report has details on every plant. Click here or on Terminal run 97<GO>.

[1] PJM Capacity Auction Plunders Coal Country, Pays Coast (web | Terminal)
[2] Vistra Doubles Down on Fossil Bet by Absorbing Dynegy (web | Terminal)

Limitations of Current Regulatory Structures – Incomplete Planning

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- Utility Integrated Resource Plans (IRPs) in NC are used to justify the needs for new utility owned generating assets, among other supply and demand side needs. *NC G.S. 62-110.1 and Commission Rule R8-60*
- IRP regulations require "least cost" generation portfolio to meet demand
- Traditional IRP process does not include integrated distribution planning, lacks granularity and ignores significant EE, RE, and storage opportunities
- Investments now in traditional generation resources are likely to become uneconomic and lead to stranded costs in the near future that will have to be paid by ratepayers
  - Multiple studies have recently concluded that coal generation in NC is already uneconomic compared to cleaner and cheaper resources
- Aging grid is in need of significant upgrades, estimated at $13 billion by Duke Energy for its NC territories, but not included in their IRP

More Information

- 2018 Biennial Integrated Resource Plans and Related 2018 REPS Compliance Plans and Comments filed in North Carolina Utilities Commission Docket No. E-100, Sub 157 and is available here.

- NCSEA's Initial Comments are available here.

- Reply comments filed May 20, 2019
  - Duke Energy
  - NC Attorney General

North Carolina
Clean Energy Plan Development

Clean Energy Plan Modeling and Other Collaborative Efforts (Part 1)

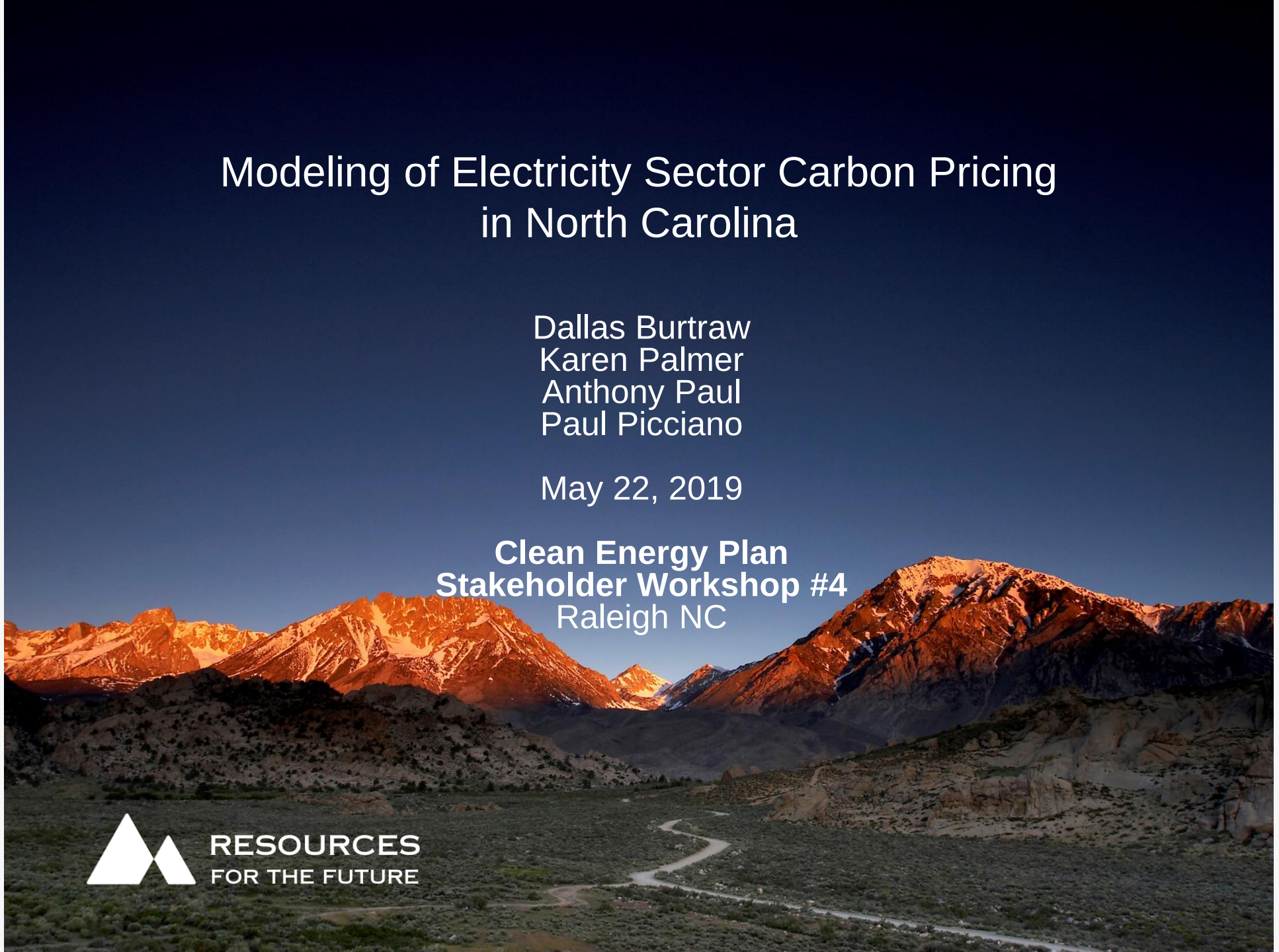
Dallas Burtraw, Resources for the Future

Modeling of Electricity Sector Carbon Pricing in North Carolina

Dallas Burtraw
Karen Palmer
Anthony Paul
Paul Picciano

May 22, 2019

Clean Energy Plan
Stakeholder Workshop #4
Raleigh NC

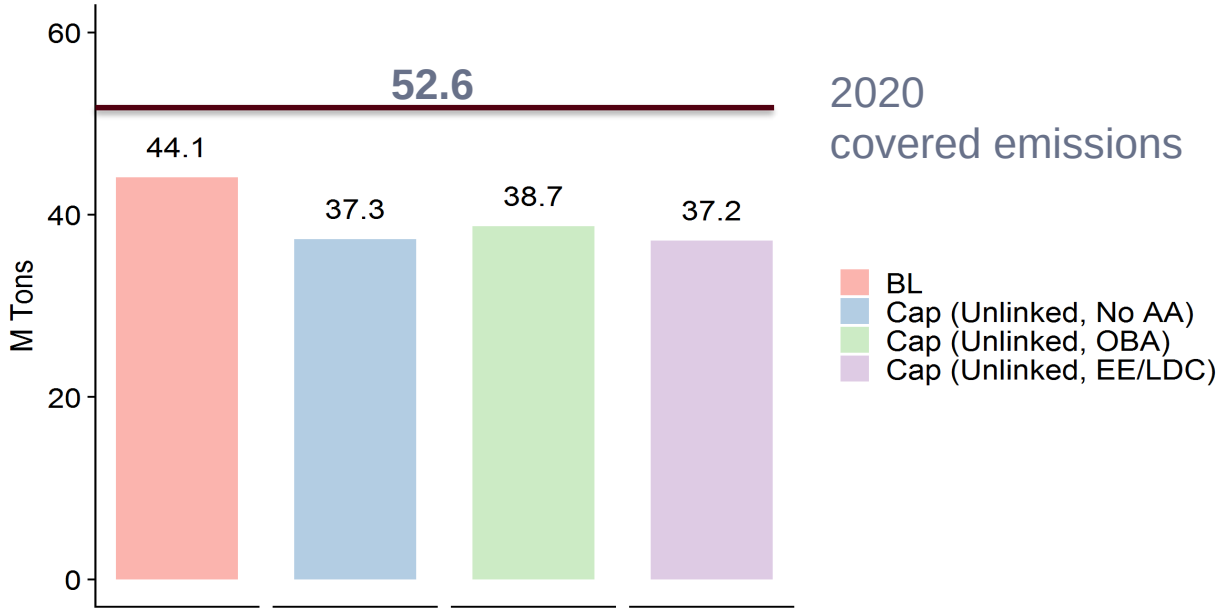


RESOURCES FOR THE FUTURE

Introduction

- We examined the opportunity to expand clean energy production in North Carolina
- We consider cap and trade in the electricity sector
  - The cap limits emissions to 30 percent below 2020 levels by 2030
  - Trading ensures emissions are achieved at least cost
- We also modeled a renewable technology standard, and its interaction with cap and trade
- Because the results for the end year 2030 depend on what is assumed to come after 2030, we focus on results for 2026

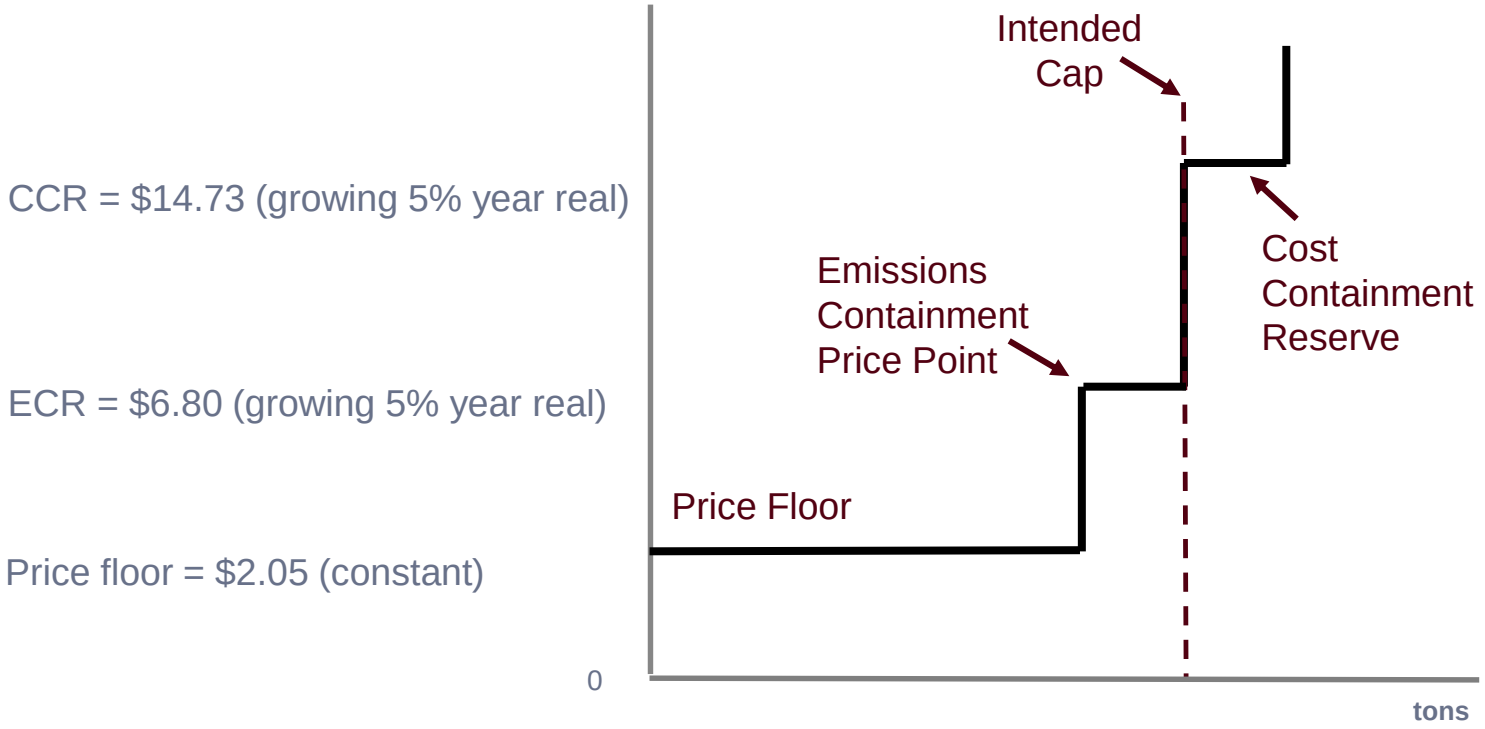
1. Emissions reductions can be achieved at very low cost



Emissions outcomes in 2026 under various cap-and-trade scenarios

- Baseline emissions fall almost to the level of the cap
- Cap and trade yields additional emissions reductions due to cost management features of the program (next slide)

Background: Cap and Trade Program Design
(2026 prices in 2015$)



- The model borrows the RGGI program design
- Low allowance prices yield additional reductions
- Note the role of consignment auctions with free allocation

2. Low allowance prices accelerate emissions reductions

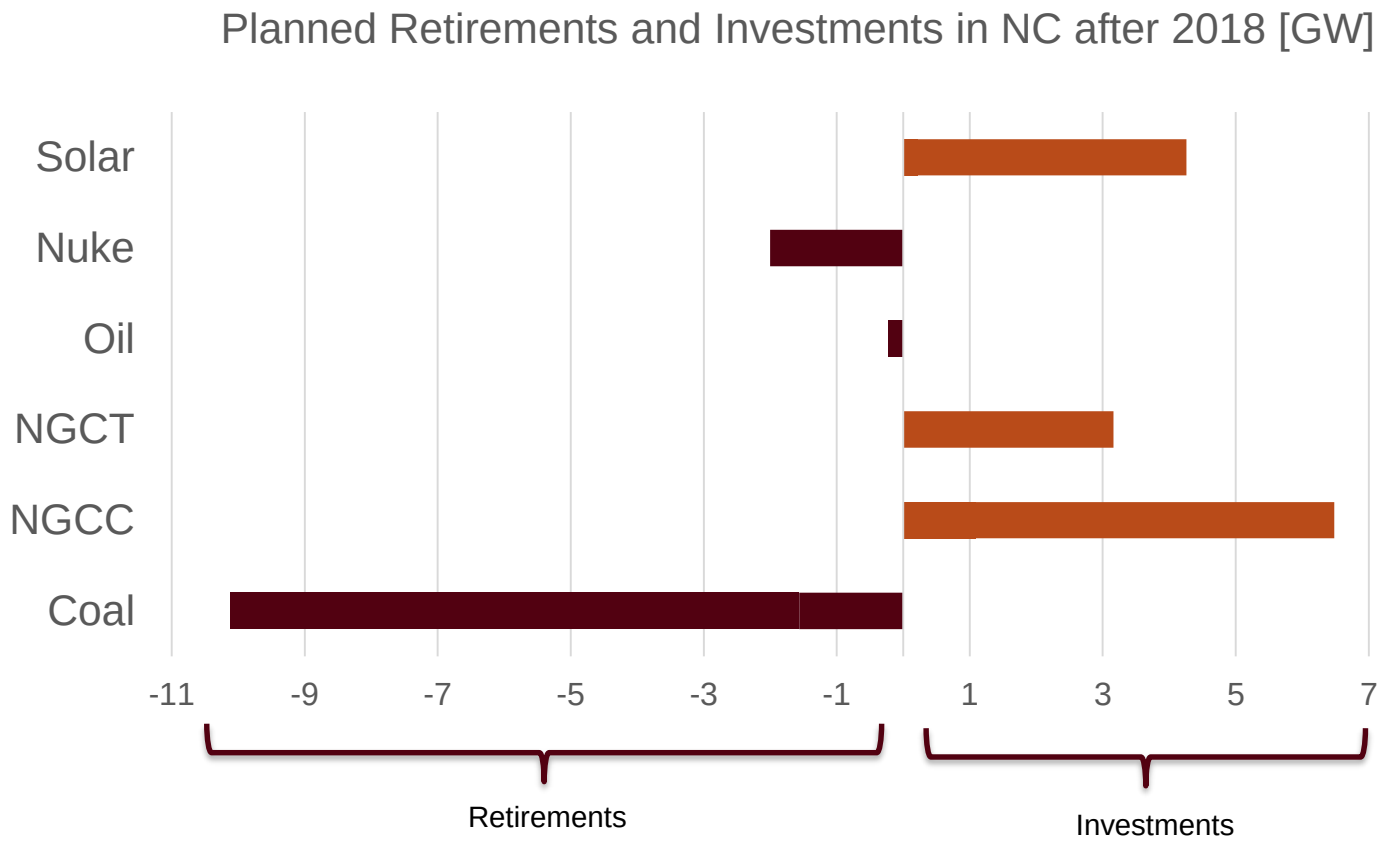
- Low prices result in an additional 4% annual emissions reductions in 2030
- Low prices result in 10.4% further cumulative reductions over the decade
- Cumulative reductions from 2020 levels by 2030 are 150 million tons
- Annual allowance value is $76-79 million in 2026 (2015$)

3. North Carolina's baseline is getting cleaner

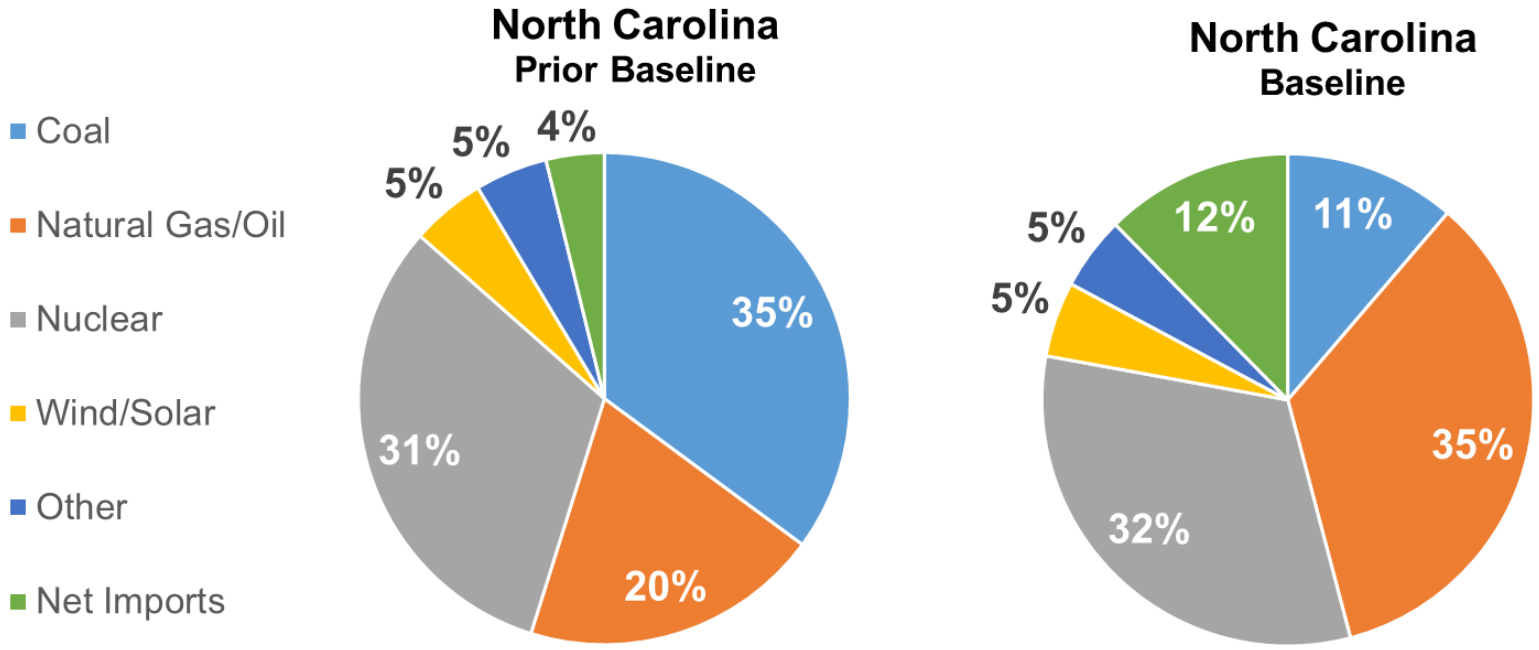
Model assumptions:

- Energy efficiency spending is assumed to reduce demand proportionately across all time blocks
  - 1.1% reduction from AEO 2016 levels by 2025
  - 1.6% reduction by 2030
- Demand side management is assumed to represent dispatchable capacity and reduces the (15%) capacity reserve requirement by:
  - 2% reduction in 2017
  - 3% reduction in 2025 and thereafter
- Retirements and Investments…..

Baseline Capacity Assumptions



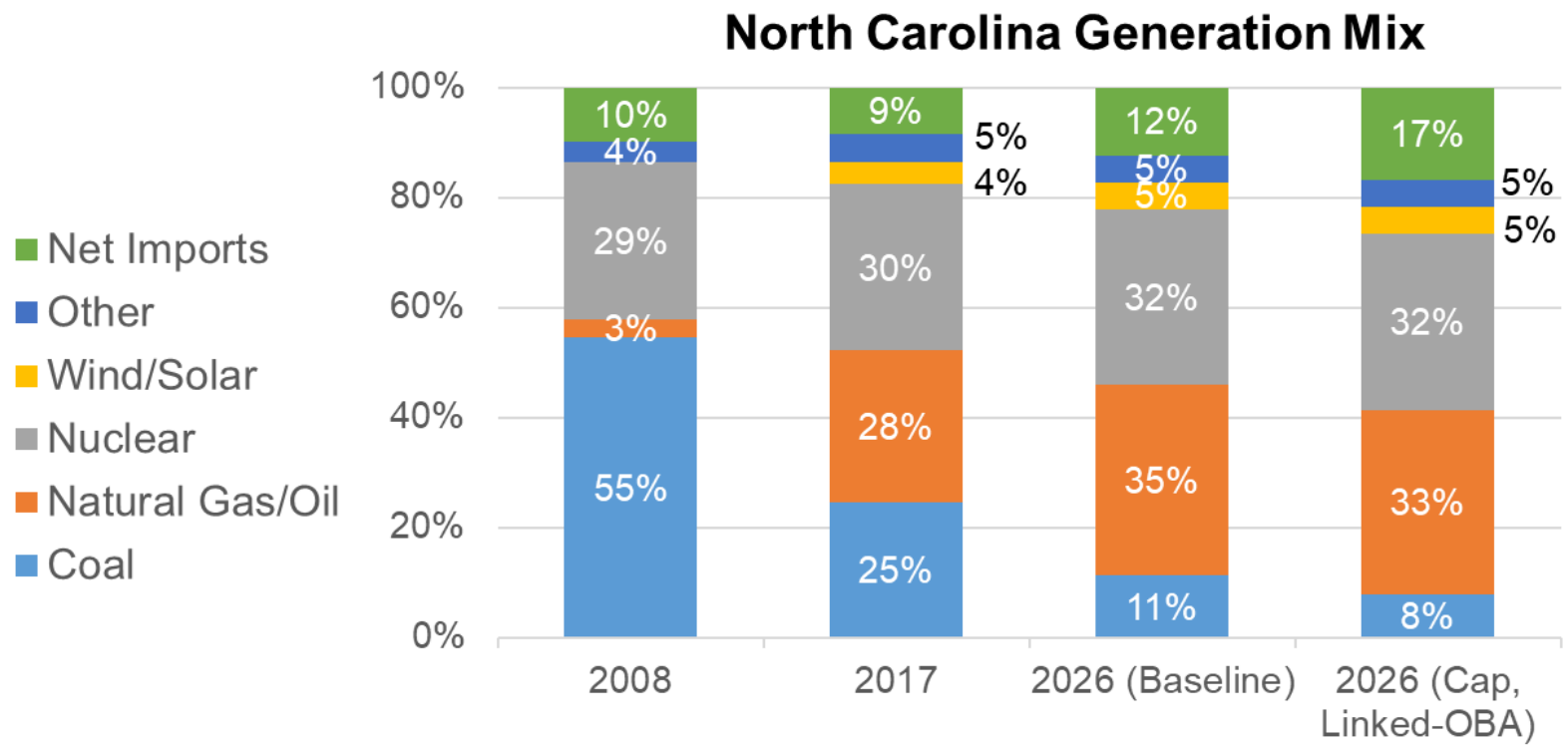
Baseline generation mix in 2026



We updated information from EIA baseline assumptions drawing on EPA modeling and utility integrated resource plans

- Anticipated consumption falls by almost 1%

4. The cap accelerates emissions reductions



- The emissions cap leads to a reduction in coal and natural gas generation

5. Allocation has a modest effect on generation

Cap and trade “allocation” (use of allowance proceeds):

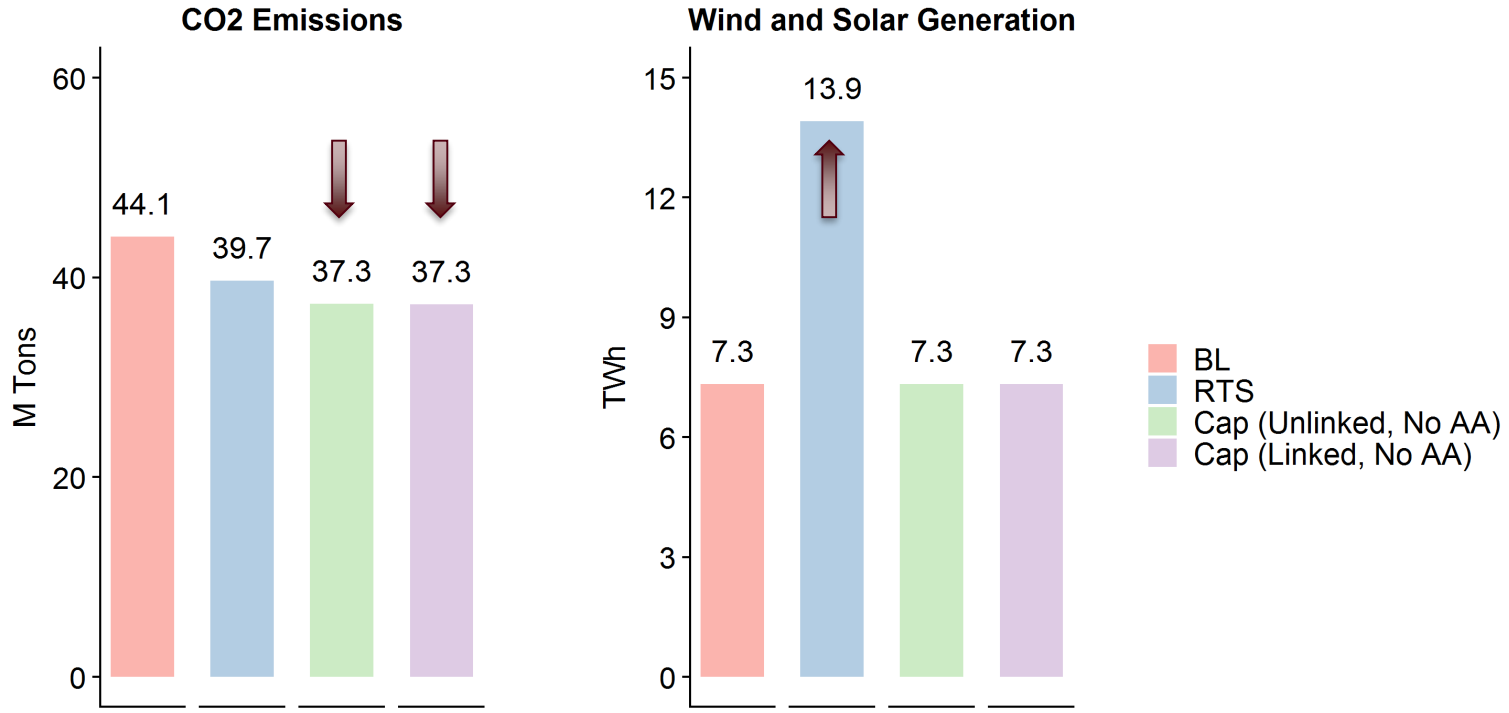
- (NoAA): No allocation within the electricity sector; auction proceeds go to the general fund
- (EE): Investments in energy efficiency
- (LDC): Value returned to local distribution companies for rate relief
- (OBA): Output based allocation to producers based on electricity generation (“output”) from all sources except coal, hydro & existing renewables

➢ Variations in allocation have predictable effects
  - Energy efficiency spending lowers consumption
  - Output-based allocation reduces power imports

Renewable Technology Standard

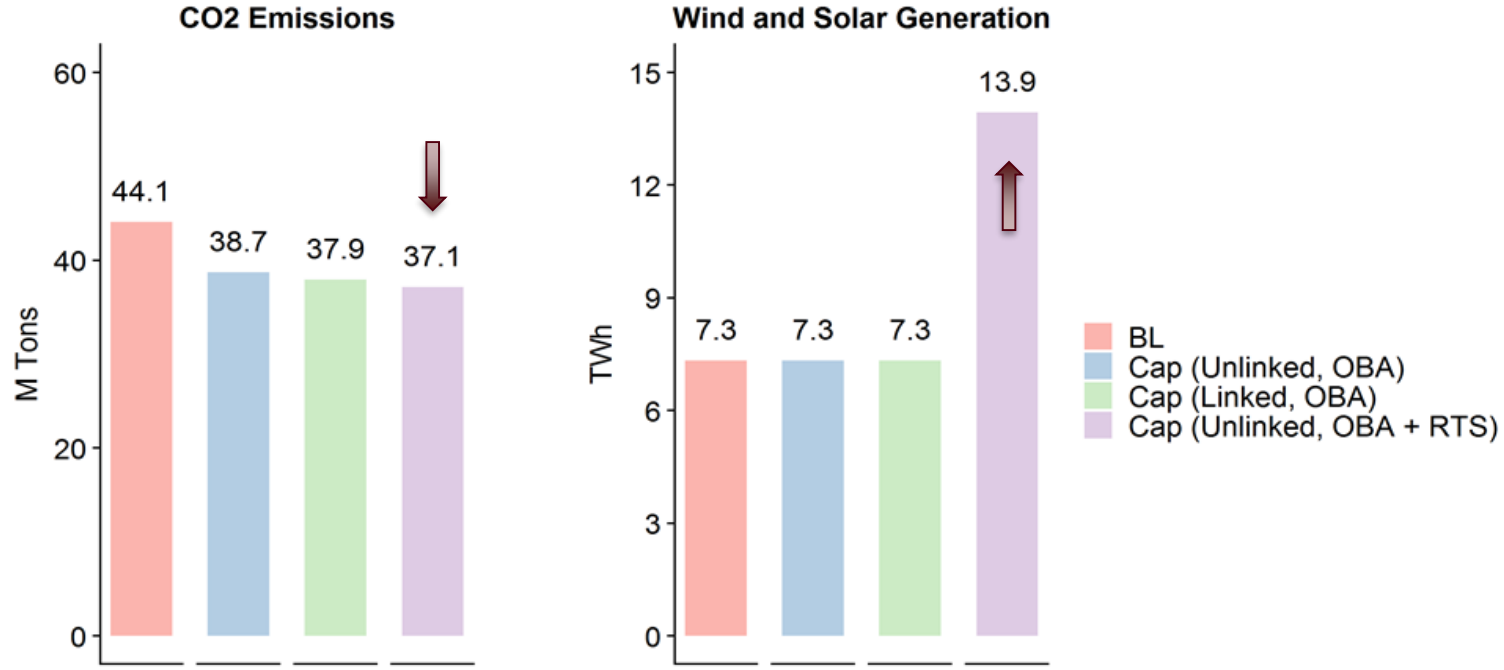
- We model a requirement for in-state wind and solar generation to grow by 1% of consumption per year
- We model this separately and in combination with cap and trade

6. The renewable standard achieves slightly fewer reductions but doubles renewable capacity compared to cap and trade



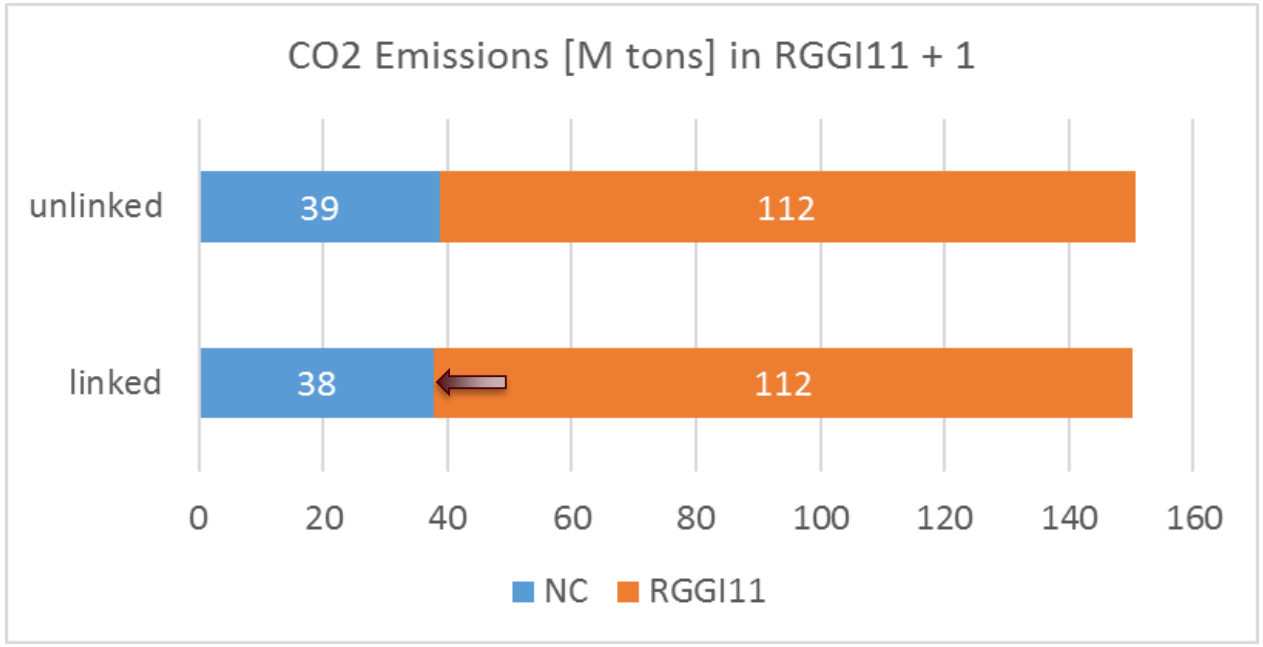
- The renewable standard has greater upfront costs
- It provides important new infrastructure that puts the state in a better position for future emissions reductions

7. A combination of cap and trade and a renewable standard is an option used by many states



- Output based allocation brings more generation into the state and reduces leakage
- Emissions are lowest when the cap is combined with a technology standard

8. Linking cap and trade has little effect on emissions or prices, and strengthens the program in other ways



- Allowance prices are similar in NC and RGGI
- The ‘trading ready design’ makes linking seamless
- Linking reduces emissions in NC and reduces emissions in the combined regions

Reflections on Linking

- Linking would lower the cost in NC whether the state is a buyer or seller of allowances
- Given uncertain market trends and fuel prices, linking is expected to reduce the variability of allowance prices on average
- Linking benefits electricity markets by enabling coordination of investments
- Linking enables greater ambition and policy influence at the national level

Summary

- We attempt to reflect NC resource plans and climate policy goals
- The baseline is trending toward cleaner energy, and policy can accelerate that trend
- Emissions cap and trade achieves reductions at a low price
- Renewable technology standards have greater upfront costs, but position the state to achieve additional reductions in the future
- Cap and trade and renewable standards can be pursued together
- Linking can strengthen the cap-and-trade program
- This analysis is independent and was not solicited by advocacy or industry groups or state government

Acknowledgements

- This independent analysis is part of the RGGI Project Series which is supported by the Barr Foundation, Energy Foundation, Merck Family Fund, Environmental Trust, The Betterment Fund, Devonshire Foundation, Daniel Hildreth, and New York Community Trust. The research was supported by the RGGI Project Series and by RFF's Energy and Climate Program.

State-Level Data

- EIA's National Energy Modeling System (NEMS), which is used for the *Annual Energy Outlook* (AEO), is our key source and used by EPA (IPM)

- Downscaled *regional* forecasts from the NEMS Electricity Market Model
  - Demand, Electricity Prices
  - Generation by ten fuel types
  - Emissions
    - ❖ Note that in many cases, states and EMM regions do not match and care must be taken

- We embed additional investment assumptions in the model *baseline* for North Carolina

Background: Allocation in RGGI

- Use of allowance value in *RGGI 9* in the third compliance period (2015-2017)

Energy Efficiency	Bill Assistance (allocation to LDCs)	Output-Based Allocation	Grand-fathering	R&D / General Fund / Education / Other
51.5%	12.8%	17.5% (directed to RE)	0%	18.1%

North Carolina
Clean Energy Plan Development

Clean Energy Plan Modeling and Other Collaborative Efforts (Part 1)

Zach Ambrose, Cities Initiative

Cities Initiative

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Finding the ways that work

Participants

Twelve cities and towns joined the State of North Carolina as participants in the Cities Initiative.

- Asheville, Carrboro, Chapel Hill, Charlotte, Durham, Greensboro, Highlands, Hillsborough, Raleigh, Winston-Salem, Cary and Wilmington

Participants were from across the state and represented large and small communities.

Roundtables' Objectives

- July - Identify sectors of interest, Secretary Regan welcome, NC GHG Inventory
- September - Develop a priority-order list of high-priority issues
- October - Identify and prioritize solutions for priority issues
- November – Consensus Action Items

Consensus Action Items

- Get additional locally-controlled revenue for transportation
- Adjust State Transportation Improvement Program (STIP) allocations
- Incorporate GHG scoring for state funded projects
- Develop a voluntary carbon credit tracking system
- Aggregate data access at a safe level to allow for program prioritization
- Create a utility billing platform that helps cities and customers understand energy use
- Allow for new renewable energy procurement options
- Increase speed and transparency of the interconnection process
- Address barriers to Commercial Property Assessed Clean Energy (C-PACE) in North Carolina
- Develop a local government supported green energy bank
- Improve energy impact of building codes
- Change makeup of the NC Building Code Council

Phase 2

- Launches June of 2019
- Develop strategies to implement the consensus action items
- Open to all NC counties, towns and cities
- https://deq.nc.gov/energy-climate/climate-change/mitigation/cities-and-towns/cities-initiative

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Finding the ways that work

North Carolina
Clean Energy Plan Development

Clean Energy Plan Modeling and Other Collaborative Efforts (Part 1)

Brianna Esteves, CERES

Ceres

Sustainability is the bottom line.

NC Clean Energy Plan Stakeholder Workshop Presentation

Corporate Support for Clean Energy

Brianna Esteves

May 22, 2019

Ceres

Ceres is a national sustainability organization working with the most influential investors and companies to build leadership and drive solutions throughout the economy.

Ceres Investor Network

160+ institutional investors representing $26 trillion in assets under management

Ceres Company Network

50+ major U.S. businesses, including 37 Fortune 500 companies

Ceres BICEP Network

52 leading companies with over $1 trillion in combined annual revenue

Ceres BICEP Network

Corporate America Wants Clean Energy

Across the globe…

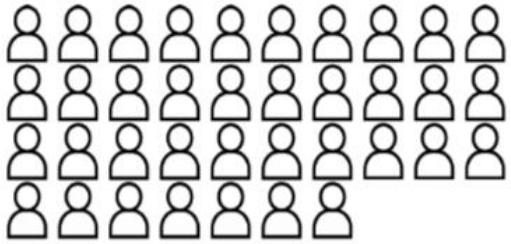
- RE 100: 175 companies have committee to 100% renewable energy
- REBA: 200+ companies looking to catalyze 60 GW of new renewable energy by 2025
- SCIENCE BASED TARGETS (DRIVING AMBITIOUS CORPORATE CLIMATE ACTION): 554 companies have committed to science-based greenhouse gas targets
- EP 100: 40+ companies committed to use energy more productively
- EV 100: 39 companies committed to accelerating the transition to EVs

Corporate America Wants Clean Energy

Here in North Carolina...

17/30

17 of North Carolina's **30 largest private employers** have set targets to procure more renewable energy or reduce their energy consumption.



37 companies in North Carolina haved set a goal of being powered by **100% renewable energy.**[2]

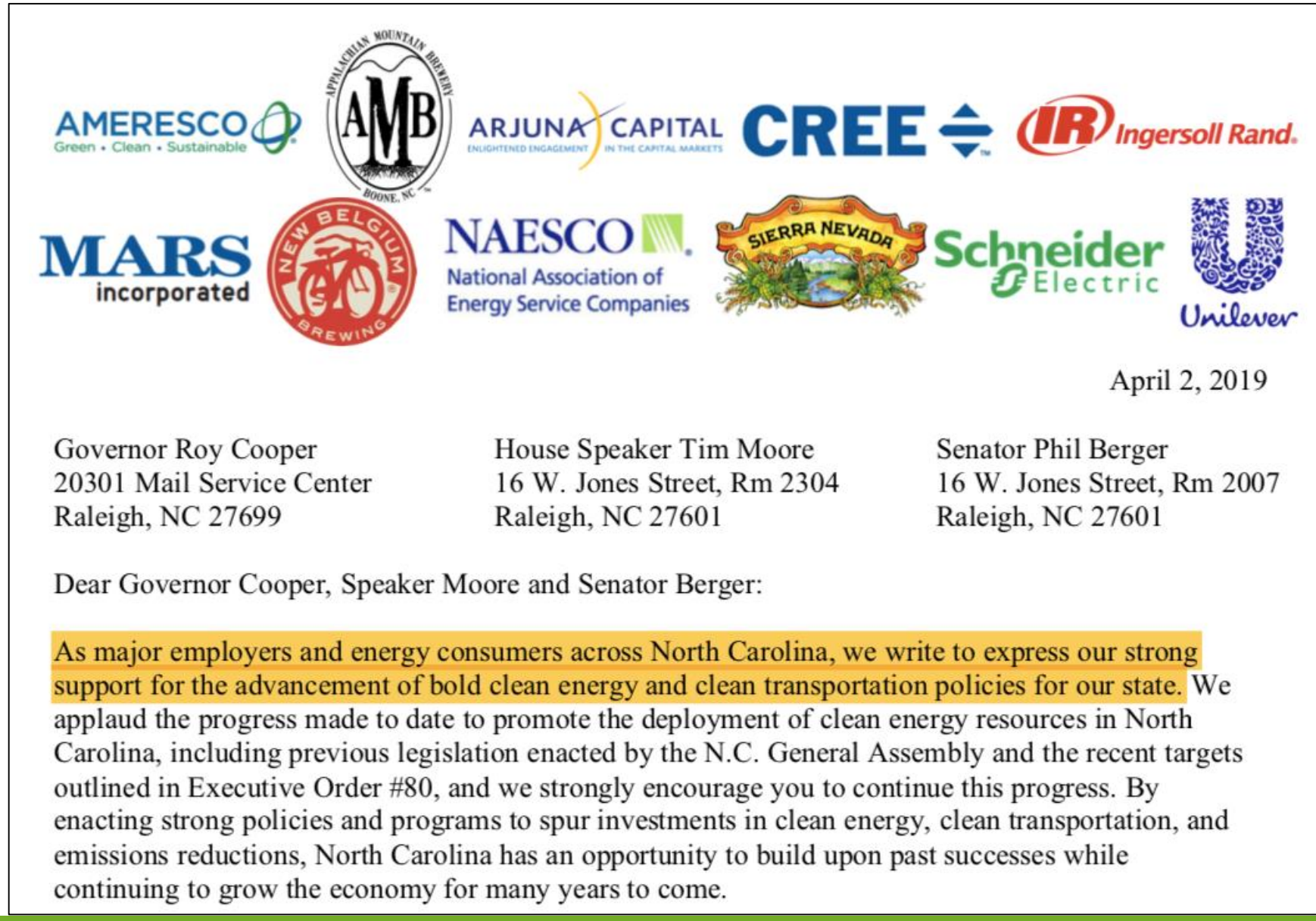
Corporate wind/solar installations in NC include:

- Amazon
- American Express
- Apple
- Blue Cross Blue Shield NC
- Cisco
- Etsy
- Facebook
- Google
- IKEA
- Kohl's
- New Belgium Brewing
- Novo Nordisk
- SAS
- Sierra Nevada Brewing
- Starbucks
- QVC, Inc.

Business Case for Clean Energy

- Ability to reduce energy costs
- Diversification of energy supply
- Locking in long-term energy price stability to hedge against energy market volatility
- Meeting expectations of:
  - Shareholders (providing lasting value and ROI)
  - Customers (demonstrating corporate responsibility)
  - Employees (attracting talent)
- Demonstrating corporate leadership, innovation, and competitive early-mover advantage
- Reduce regulatory & price uncertainty

April 2019 Letter: Support for More Action



April 2, 2019

Governor Roy Cooper
20301 Mail Service Center
Raleigh, NC 27699

House Speaker Tim Moore
16 W. Jones Street, Rm 2304
Raleigh, NC 27601

Senator Phil Berger
16 W. Jones Street, Rm 2007
Raleigh, NC 27601

Dear Governor Cooper, Speaker Moore and Senator Berger:

As major employers and energy consumers across North Carolina, we write to express our strong support for the advancement of bold clean energy and clean transportation policies for our state. We applaud the progress made to date to promote the deployment of clean energy resources in North Carolina, including previous legislation enacted by the N.C. General Assembly and the recent targets outlined in Executive Order #80, and we strongly encourage you to continue this progress. By enacting strong policies and programs to spur investments in clean energy, clean transportation, and emissions reductions, North Carolina has an opportunity to build upon past successes while continuing to grow the economy for many years to come.

April 2019 Letter: Support for More Action

"We respectfully provide the following recommendations:"

1. Use Energy More Efficiently and Eliminate Waste
2. Increase Customer Access to Renewable Energy
3. Accelerate the Deployment of Electric Vehicles
4. Promote the Development of Energy Storage

Use Energy More Efficiently and Eliminate Waste

- North Carolina is behind on EE.
  - Ranked 26th in U.S. on overall energy efficiency
  - Ranked 28th in building energy efficiency
  - Ranked 34th on utility energy efficiency programs

- **Suggestions to save more energy:**
  - Increasing state lead-by-example efforts (i.e. energy savings targets for state buildings)
  - Increasing EE in the built environment (i.e. building energy codes)
  - Creating financing mechanisms to mitigate the up-front costs of EE measures
  - Creating directives and incentives for utility EE

Use Energy More Efficiently and Eliminate Waste

May 30, 2018

The Honorable Phil Berger
President Pro Tempore of the N.C. Senate
16 W. Jones Street, Room 2007
Raleigh, NC 27601

The Honorable Tim Moore
Speaker of the N.C. House of Representatives
16 W. Jones Street, Room 2304
Raleigh, NC 27601

Dear President Pro Tempore Berger and Speaker Moore:

Re: Business support to reduce energy and water consumption in state-owned buildings by 40% by 2025

Increase Customer Access to Renewable Energy

- RILA/ITI report ranked NC **30th** on corporate clean energy procurement
- Regulated, integrated monopoly structure restricts customer choice. Corporates want access to cost-competitive renewable energy options.
- **Suggestions to increase customer RE access:**
  - Offer more utility green tariff programs that work for more customers
  - Provide more choice in the energy marketplace (ex. third-party PPAs, wholesale market options)
  - Ease interconnection process to enable more customer-sited renewables

Increase Customer Access to Renewable Energy

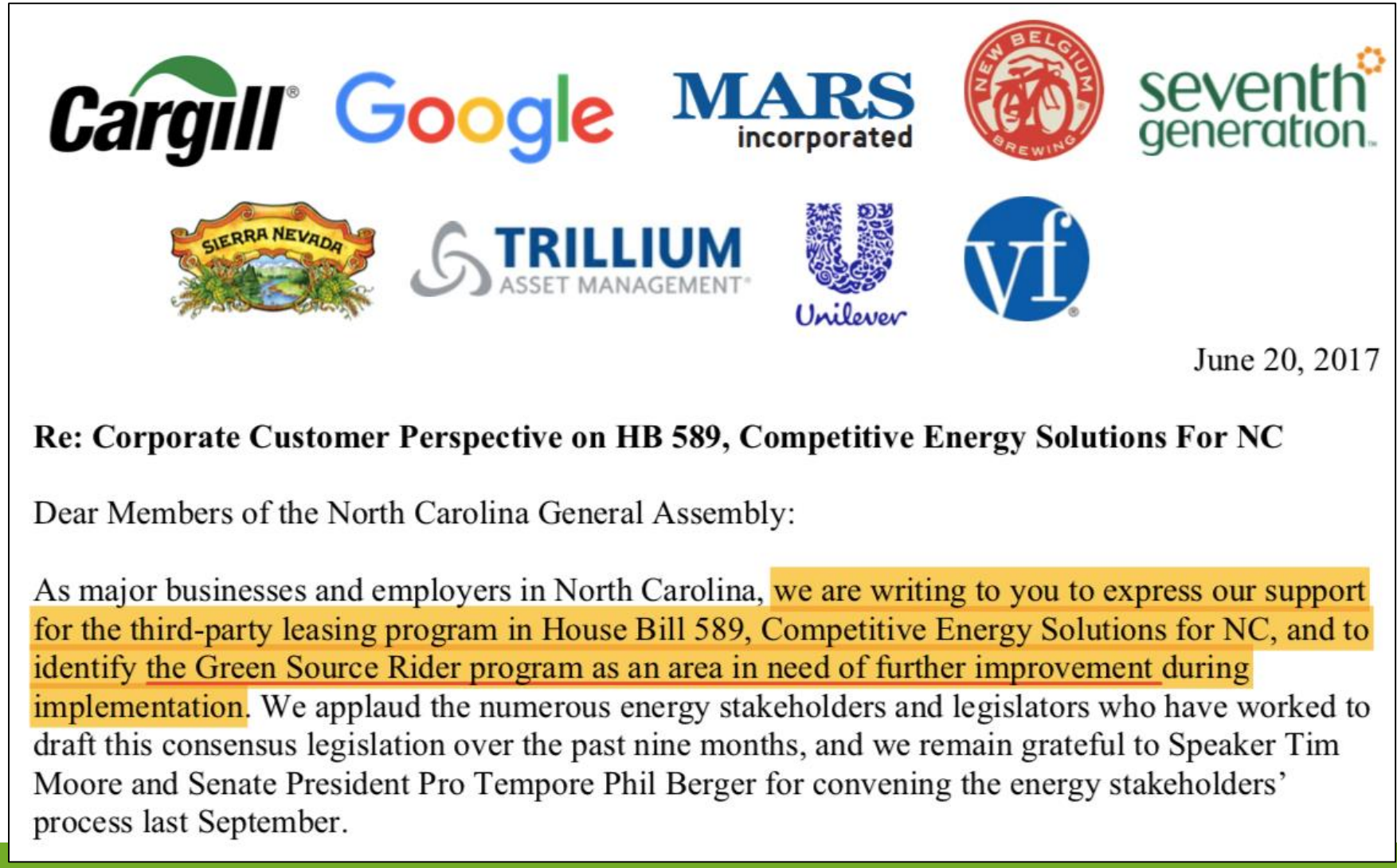
Speaker of the North Carolina House of Representatives Tim Moore
North Carolina House of Representatives

March 4, 2015

Dear Mr. Speaker:

Our companies, like many of the leading companies in the United States, have set goals to increase our use of renewable energy. We recognize that environmental sustainability has become an essential ingredient to doing business responsibly and successfully. Collectively, we represent hundreds of facilities and tens of thousands of employees in North Carolina. With a quality workforce and a strong local economy, North Carolina has been an attractive place for us to do business. We are writing because we believe that it is important to have choice when selecting energy suppliers and products to meet our business and public goals. Changing North Carolina law to allow us – and others – to purchase renewable energy from third-party providers would create an even more positive business environment and would help us continue to create jobs and contribute to an even more robust local economy.

Increase Customer Access to Renewable Energy



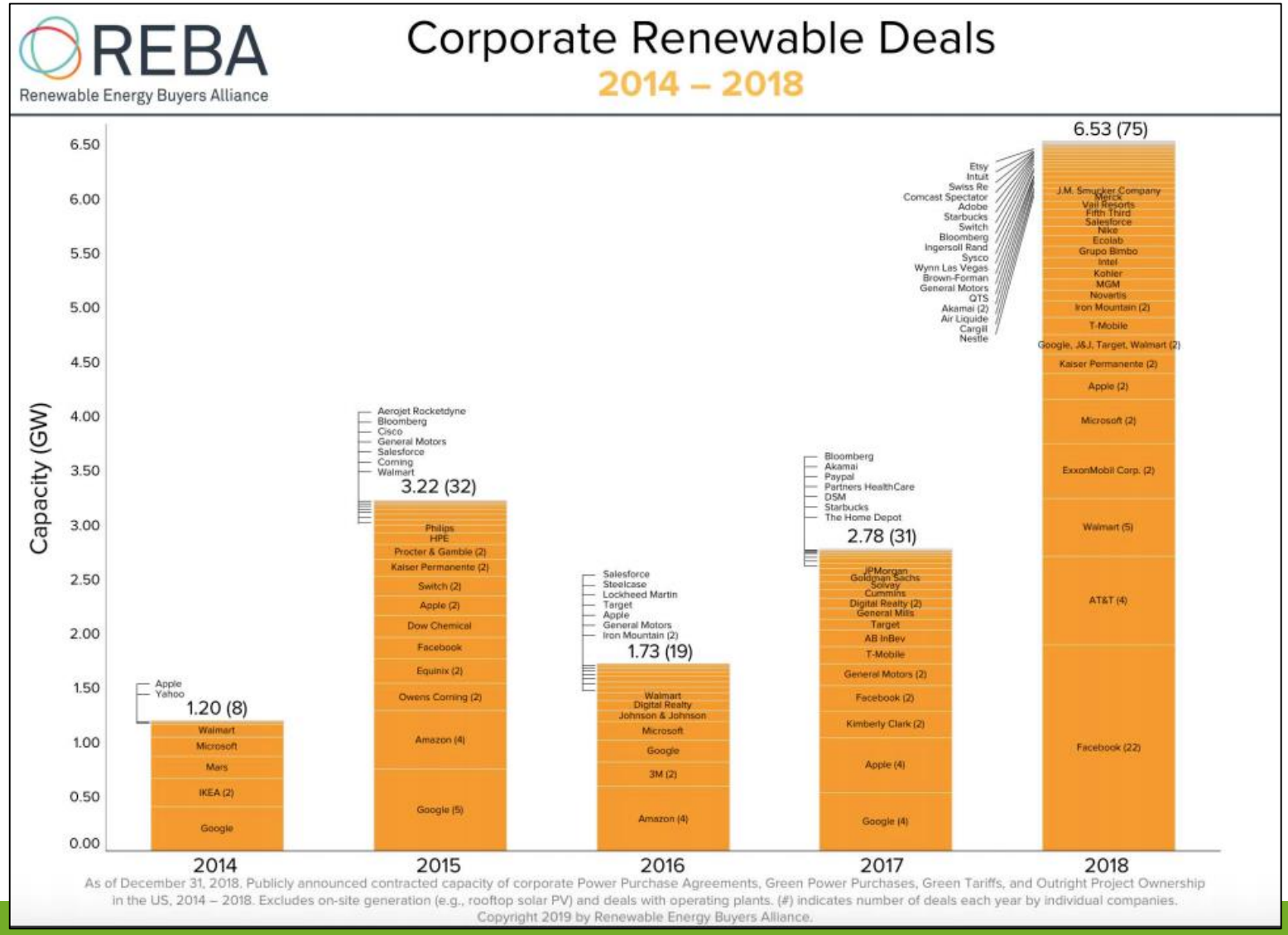
June 20, 2017

Re: Corporate Customer Perspective on HB 589, Competitive Energy Solutions For NC

Dear Members of the North Carolina General Assembly:

As major businesses and employers in North Carolina, we are writing to you to express our support for the third-party leasing program in House Bill 589, Competitive Energy Solutions for NC, and to identify the Green Source Rider program as an area in need of further improvement during implementation. We applaud the numerous energy stakeholders and legislators who have worked to draft this consensus legislation over the past nine months, and we remain grateful to Speaker Tim Moore and Senate President Pro Tempore Phil Berger for convening the energy stakeholders' process last September.

Increase Customer Access to Renewable Energy

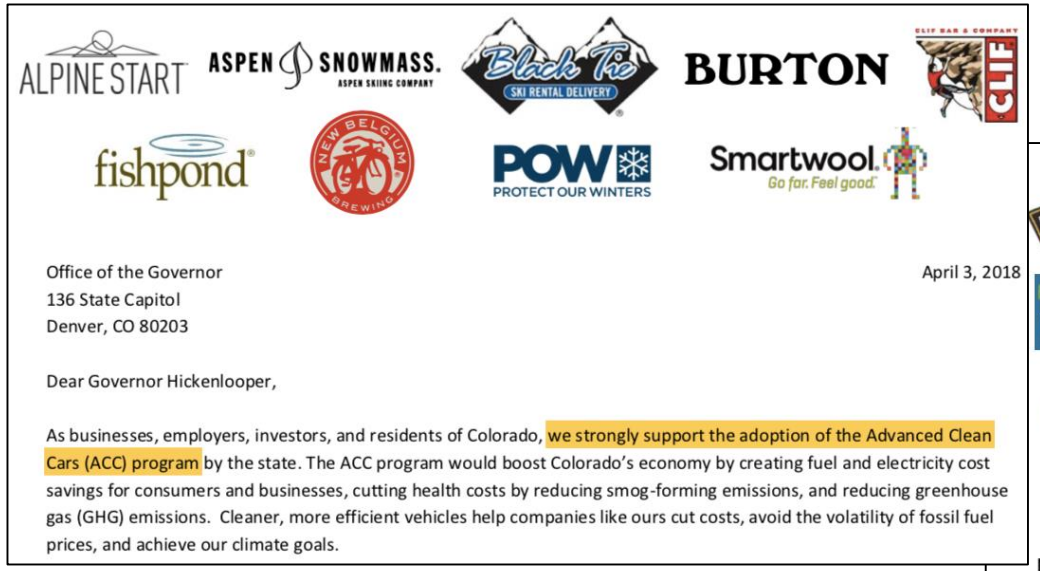


Accelerate the Deployment of EVs

- Electric vehicles are rapidly declining in price and can help their owners save money, reduce local air pollution, and provide benefits to the electricity grid.

- **Suggestions to accelerate EV deployment:**
  - Create an environment for infrastructure investments:
    - Legalize re-sale of electricity at EV charging stations
    - Enable utility investments in EV charging while prioritizing competitive procurement and smart planning
  - Foster partnerships and create incentives for corporate EV fleet transition and workplace/retail charging
  - Join the Advanced Clean Cars program (adopt LEV & ZEV standards)
  - Promote widespread participation in VW Settlement funding, prioritize zero-emission vehicles wherever feasible.

Accelerate the Deployment of EVs



Office of the Governor
136 State Capitol
Denver, CO 80203

April 3, 2018

Dear Governor Hickenlooper,

As businesses, employers, investors, and residents of Colorado, we strongly support the adoption of the Advanced Clean Cars (ACC) program by the state. The ACC program would boost Colorado's economy by creating fuel and electricity cost savings for consumers and businesses, cutting health costs by reducing smog-forming emissions, and reducing greenhouse gas (GHG) emissions. Cleaner, more efficient vehicles help companies like ours cut costs, avoid the volatility of fossil fuel prices, and achieve our climate goals.

February 20, 2019

New Jersey Legislature
125 West State Street
Trenton, NJ 08625

RE: Business and Investor Support for Groundbreaking Electric Vehicle Legislation

Dear Members of the New Jersey Legislature,

As businesses and investors with significant operations or investments in New Jersey, we encourage you to support well-designed policies to accelerate our transition to a clean, modern transportation system. Specifically, we support passage of bold electric vehicle (EV) legislation currently under consideration by the legislature (S2252/A4819).

Promote the Deployment of Energy Storage

- Energy storage helps to integrate renewable resources while creating a more resilient, reliable, and resilient grid
- Solar + storage projects beginning to outcompete new natural gas facilities

- **Suggestions to promote energy storage:**
  - Create incentives for energy storage investments (ex. tax abatement)
  - Facilitate cooperation between utilities and customers looking to integrate energy storage technologies (ex. partnership on projects, easing interconnection, etc.)
  - Make energy storage an integral part of utility planning

Ceres

Sustainability is the bottom line.

Thank you

Brianna Esteves
Sr. Associate, State Policy
Ceres
esteves@ceres.org

To learn more, visit: www.ceres.org/BICEP

Instructions for Group Presentations

- 2 people from each group give 10-min presentation on topic area
- If you are not presenting, choose which presentation you would like to attend
- After presentation, there will be 15 mins for feedback:
  - 5 mins for clarifying questions
  - 5 mins for coaching questions
  - 5 mins for team to respond/discuss 1-2 particularly important coaching questions

Worksheet for Group Presentations

- Ideas in the presentation I did not understand
- Ideas that were missing from the presentation, but should be included
- Ideas that emerged from this presentation that may be in tension with my/another group's topic area
- Ideas that I am excited about and would like to explore more

LUNCH UNTIL 1:20

North Carolina

Clean Energy Plan Development

Session 1: Concurrent Group Presentations and Discussion

Grid Modernization to Support Clean Energy

Equitable Access and Just Transition

North Carolina

Clean Energy Plan Development

Session 2: Concurrent Group Presentations and Discussion

Utility System Planning and Investment

DER Interconnection and Compensation

North Carolina

Clean Energy Plan Development

Session 3: Concurrent Group Presentations and Discussion

Utility Business Model

Grid Resiliency Enhancements

Customer Access to Renewables

North Carolina

Clean Energy Plan Development

Group Reflection and Clean Energy Plan REcommendations

Rocky Mountain Institute

Group Reflection

- What important feedback did we receive?
- What tensions emerged between the recommendations our group focused on and those of other groups?
- Given the feedback we heard, and the work we did as a group, what are the 2 most important actionable recommendations for our topic we want to share with DEQ?

Check-Out

From what you've heard throughout the last four workshops, what is a change to NC's clean energy initiatives, programs, or policies that you want to explore in the next phase of workshops?

North Carolina

Clean Energy Plan Development

Next Steps

NC DEQ