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South Carolina Energy Efficiency Implementation Roadmap

Stakeholder Workshop #1

November 18, 2019

Nicholas Institute for Environmental Policy Solutions

Our Mission Statement:

To help decision makers create timely, effective, and economically practical solutions to the world's critical environmental challenges.

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Welcome

Anthony James
Catherine Reed

South Carolina Energy Office

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Today's Objectives

- Foster a community of energy efficiency stakeholders in South Carolina
- Create a shared understanding of energy efficiency landscape
- Establish consensus on a set of shared objectives
- Collectively work to implement these objectives

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Today's Agenda

- Current energy efficiency landscape in South Carolina
- SC energy efficiency recommendations from 2016 Energy Plan
- South Carolina's shared objectives
- Working group breakouts
- Concluding remarks

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Ground Rules

- All ideas are great ideas
- Stay open and willing to learn / engage with differing opinions
- Help the group stay on track
- Keep time in mind
- Place items in parking lot to discuss later

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Scope of Energy Efficiency

For the purposes of this initiative, the scope of EE will include:

- Reductions in the energy used by equipment and/or processes while maintaining or improving the user's level of comfort and end-use functionality, ideally at a lower customer total cost.
- Reductions in energy consumption achieved by substituting less energy intensive technology or by reorganizing the process to reduce overall energy consumption.
- Demand response

This scope of EE does not include:

- Short term conservation as a result of a user reaction to a price increase unless the conservation effort is sustained over time.
- Although it can reflect a more efficient use of energy, electrification is not part of this EE Roadmap Process. With that being said, it is an important opportunity that warrants future discussion.

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South Carolina's Energy Efficiency Landscape

Where are we now?

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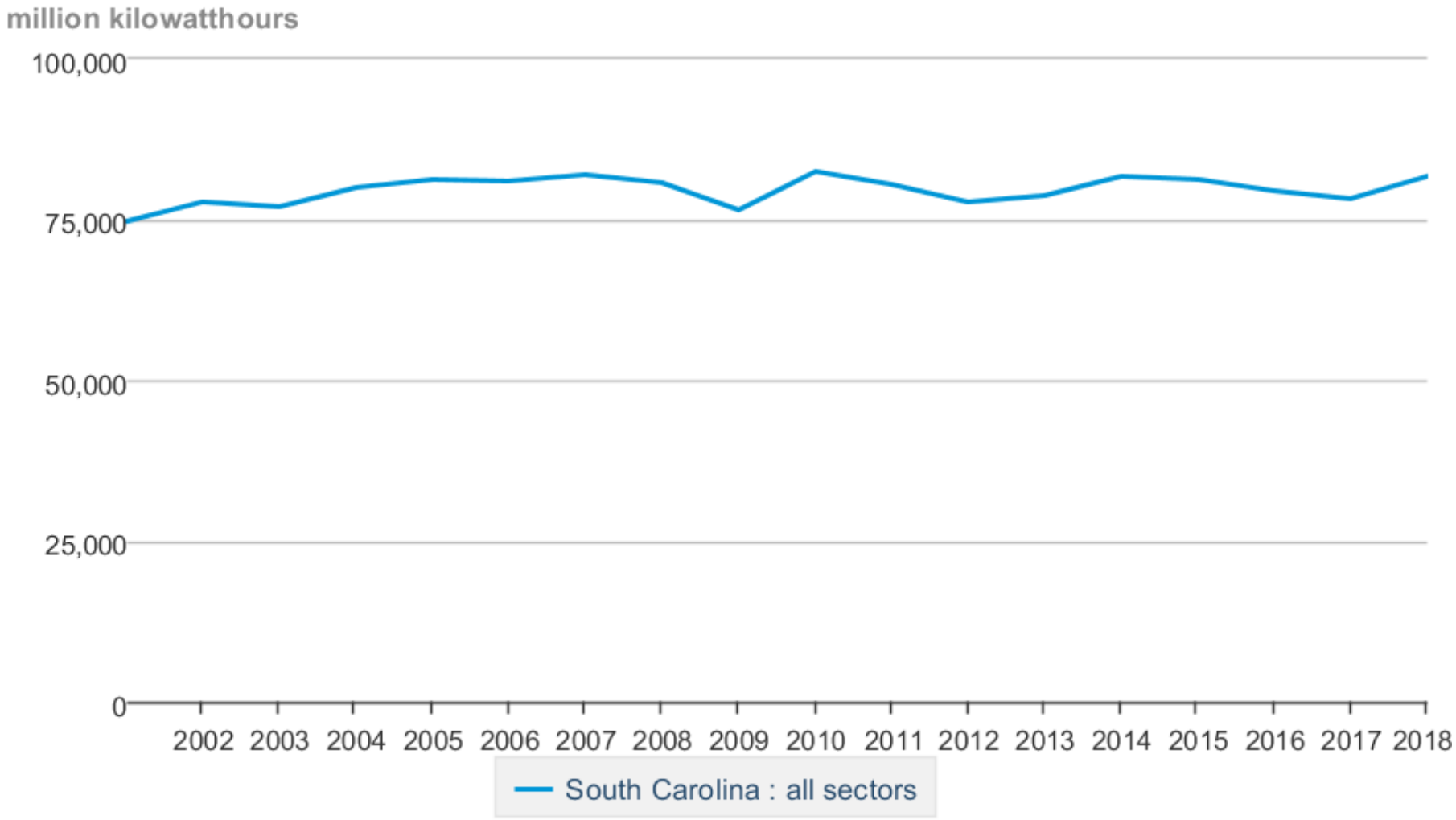
Retail sales of electricity, annual



eia Source: U.S. Energy Information Administration

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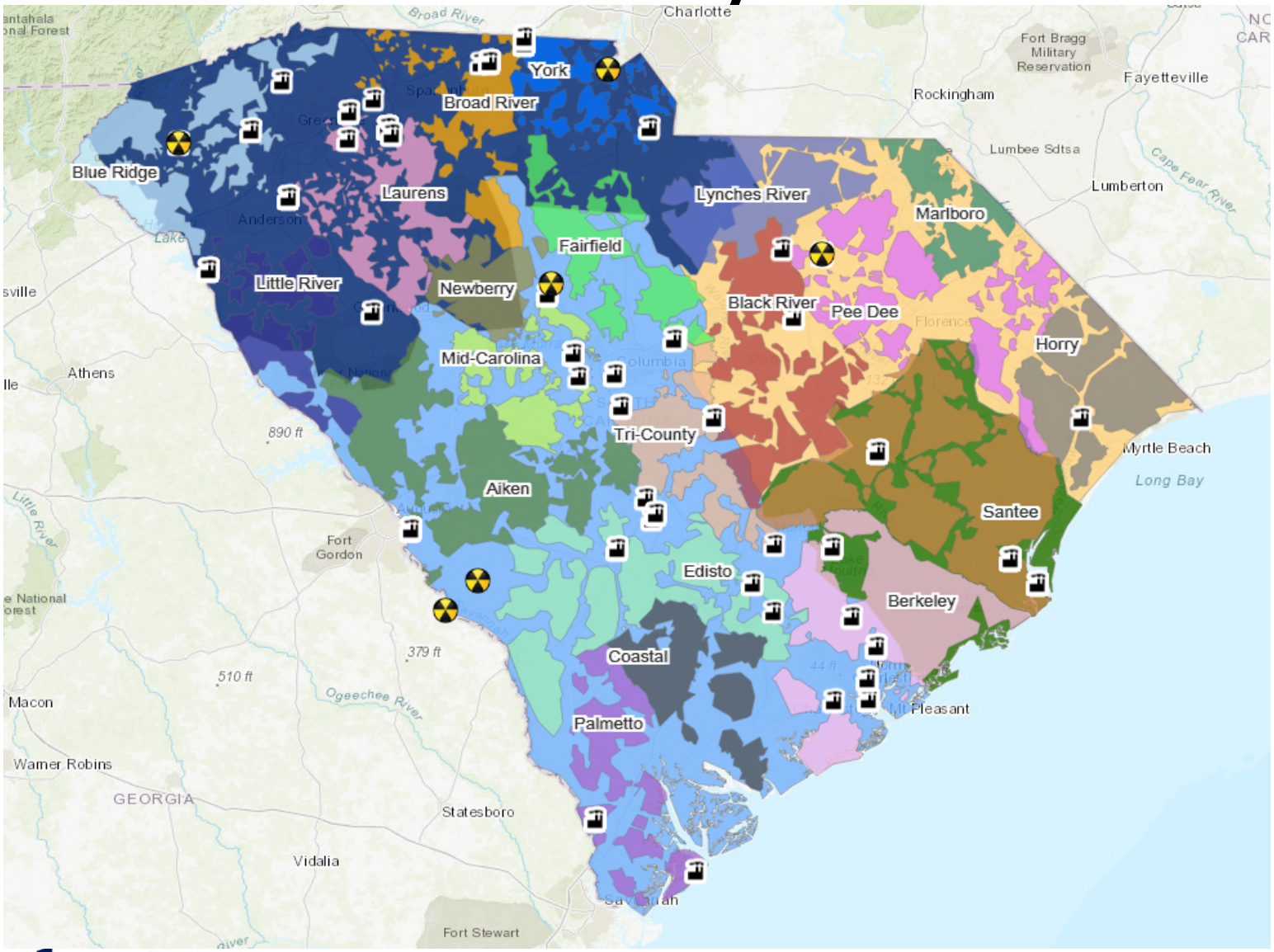
SC Electric Utility Territories



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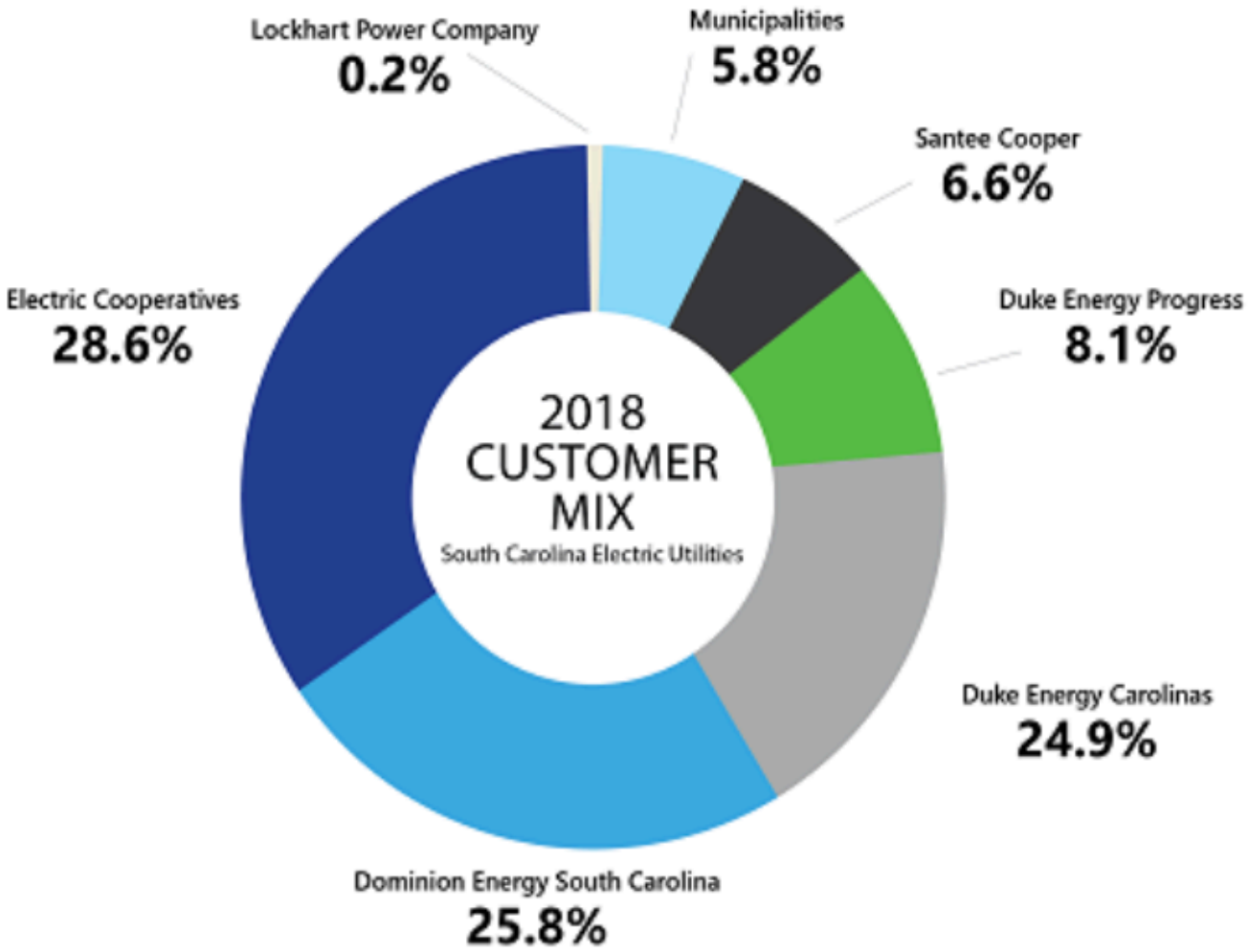
2018 Customer Mix



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A snapshot of the SC electricity sector

2018 Electricity Landscape	Investor Owned	State Owned Utility	Municipal (Public)	Electric Cooperative	Total
Number of entities	4	1	21	20	46
2018 Number of retail customers	1,653,037	183,815	162,689	802,321	2,801,862
Percentage of customers	59%	7%	6%	29%	

Source: Energy Information Administration, Form EIA-861

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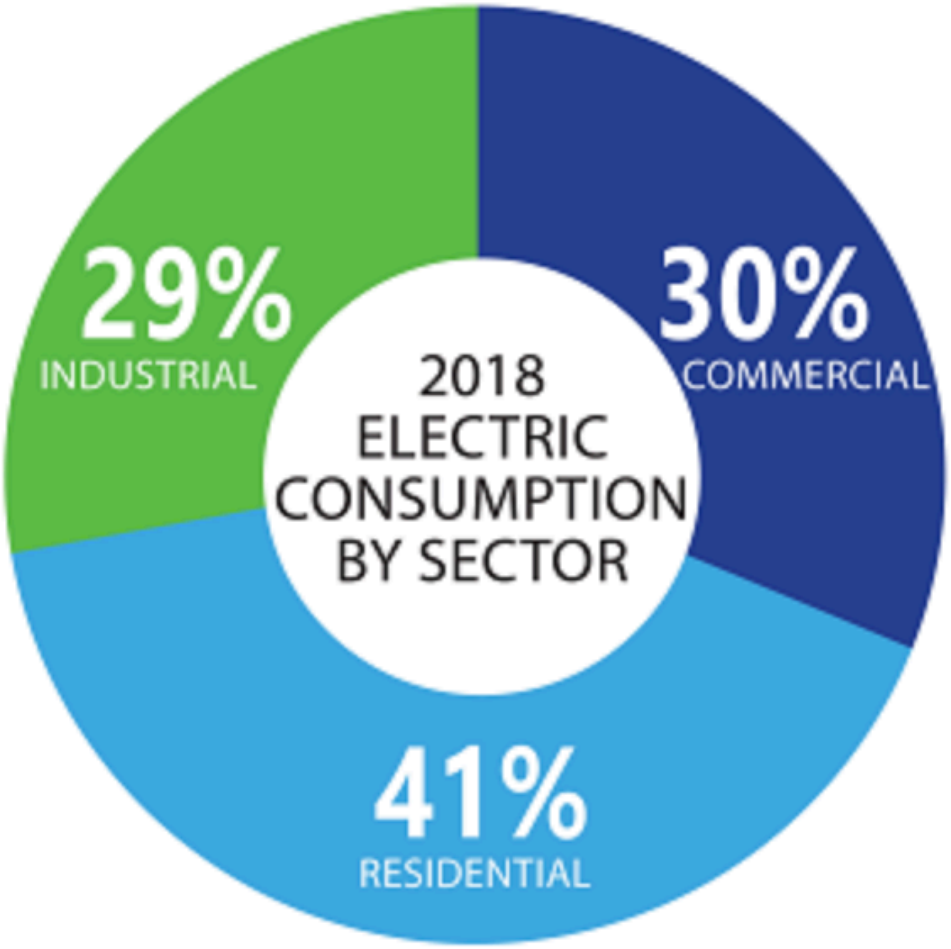
Electric Consumption By Sector



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EE Savings from SC Utility Programs

ENERGY SAVED AS A % OF ANNUAL KWH SALES

UTILITY	2017
DUKE ENERGY CAROLINAS	1.07 %
DUKE ENERGY PROGRESS	0.80 %
STATE AVERAGE	0.46 %
SOUTHEAST AVERAGE	0.29 %
SCE&G	0.26 %
SANTEE COOPER	0.10 %

Source: Southern Alliance for Clean energy, 2018 Energy Efficiency in the Southeast

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South Carolina's 20 by 2020

Public Entities by Type	Average Energy Use per Square Foot (site kBTU)			Average Energy Spending per Square Foot ($)		
	FY 2000	FY 2018	% change	FY 2000[1]	FY 2018	% change
State Agencies	113	89.53	-21%	$2.01	$2.11	5%
Residential Colleges and Universities	143	112.20	-22%	$1.88	$2.11	12%
Non-Residential Colleges and Universities	80	64.42	-19%	$1.67	$1.68	0%
School Districts	45	37.14	-17%	$1.20	$1.19	-1.0%
Overall	**74**	**58.43**	**-21%**	**$1.45**	**$1.49**	**3%**

Note: These statistics are based on self-reported data submitted by public entities. The Energy Office makes no representation regarding the accuracy of these data.

1 These figures have been adjusted for inflation using the Bureau of Labor Statistics of the U.S. Department of Labor Consumer Price Index-Urban, (available at data.bls.gov). Therefore, the figures here are presented in 2018 dollars.

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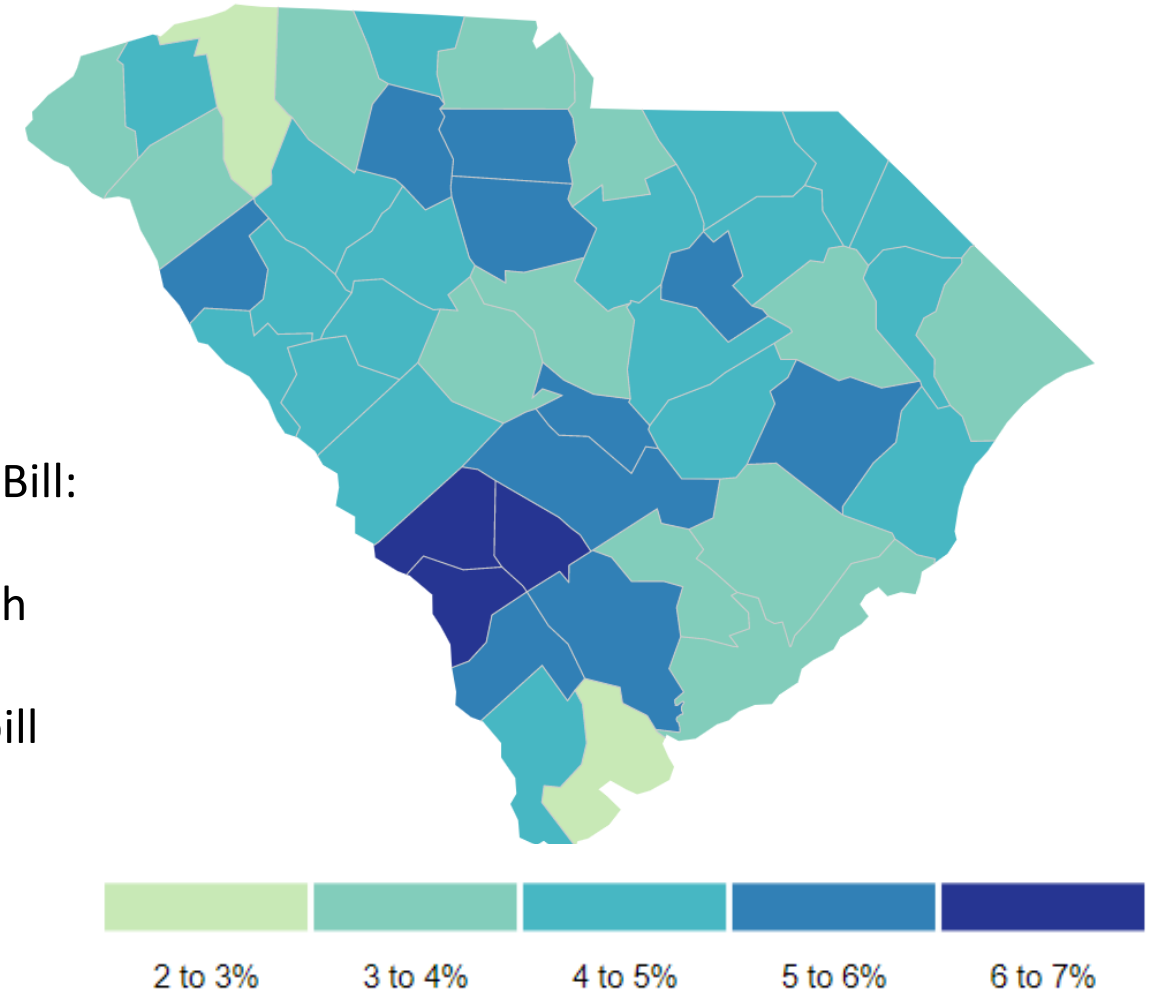
Energy Burden (% income) by County



2018 Avg. Electric Bill:

1,159 kWh / month
12.44 cents / kWh
$144.20 average bill

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https://www.eia.gov/electricity/sales_revenue_price/pdf/table5_a.pdf

Estimates of EE Potential

Where can we go from here?

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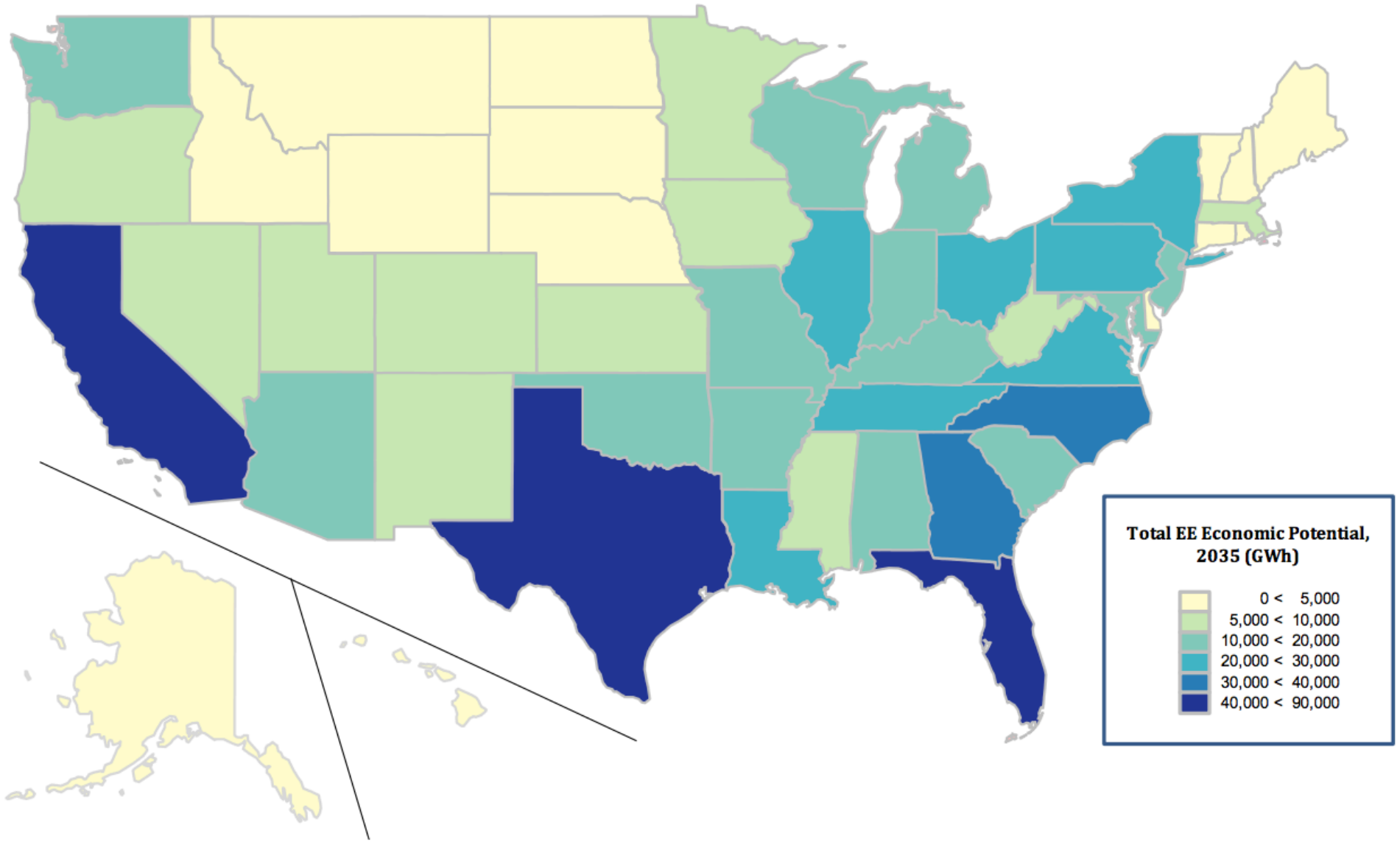

Figure 4-1
Total Energy Efficiency Economic Potential (EP) by State in 2035, in GWh

NREL Residential EE Potential

ResStock | Back to all states | Analysis approach | Print

SOUTH CAROLINA

Residential Energy Efficiency Potential

Cost-effective package savings potential in South Carolina single-family homes

- **956.6 million** dollars per year utility bill savings
- **10.7 trillion** Btu per year gas, propane, and fuel oil savings
- **6.4 billion** kWh per year electricity savings
- **1.1 million** cars of pollution reduction

Energy used by South Carolina single-family homes that can be saved through cost-effective improvements

South Carolina existing jobs in energy efficiency (2016)[1]

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Duke Energy Estimates: 2017-2041

Duke Energy Carolinas (2016)

	Energy (Gwh)	Demand (MW)	Levelized Cost ($/kWh)
Technical Potential	5,859	1,370	$0.417
Economic Potential	3,552	956	$0.036
Achievable Potential (Base)	1,195	285	$0.064
Achievable Potential (Enhanced)	1,637	413	$0.058

Duke Energy Progress (2016)

	Energy (Gwh)	Demand (MW)	Levelized Cost ($/kWh)
Technical Potential	1,667	**340**	$0.462
Economic Potential	983	228	$0.058
Achievable Potential (Base)	308	62	$0.074
Achievable Potential (Enhanced)	410	93	$0.060

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DUKE ENERGY®

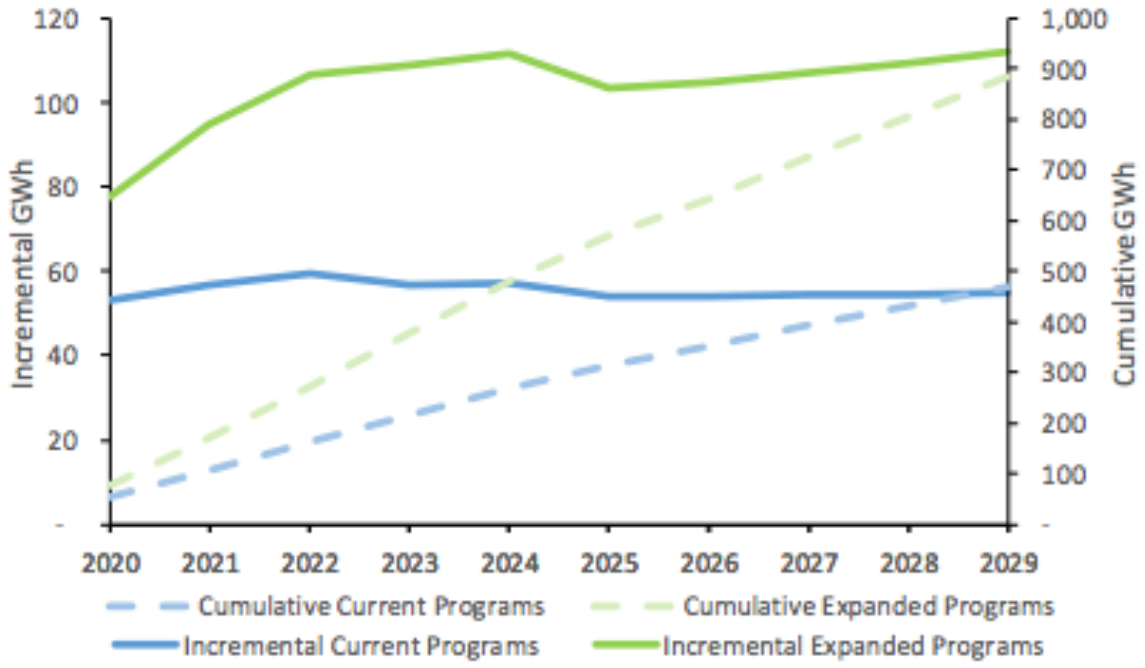
Dominion Achievable Potential Estimates: 2020-2029

Table 12. Forecasted MWh Savings as a Percentage of Previous Year Sales

Portfolio Savings	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
Incremental (Annual)										
Current Program Scenario	0.3%	0.4%	0.4%	0.4%	0.4%	0.3%	0.3%	0.3%	0.3%	0.3%
Expanded Program Scenario	0.5%	0.6%	0.7%	0.7%	0.7%	0.6%	0.6%	0.6%	0.6%	0.7%
Cumulative										
Current Program Scenario	0.3%	0.7%	1.0%	1.3%	1.6%	1.9%	2.1%	2.3%	2.6%	2.8%
Expanded Program Scenario	0.5%	1.1%	1.7%	2.3%	3.0%	3.5%	3.9%	4.3%	4.8%	5.2%

Dominion Energy®

Figure 11. Incremental and Cumulative Portfolio Energy Savings



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Review of EE Recommendations

2016 South Carolina State Energy Plan

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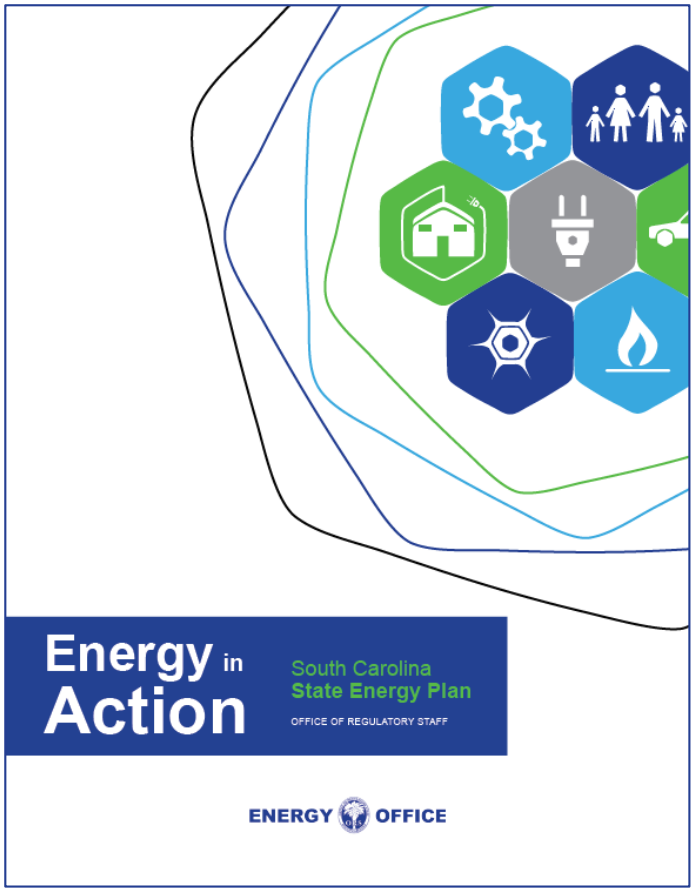
Review of EE Recommendations from the 2016 SC State Energy Plan

SC Energy Efficiency Roadmap

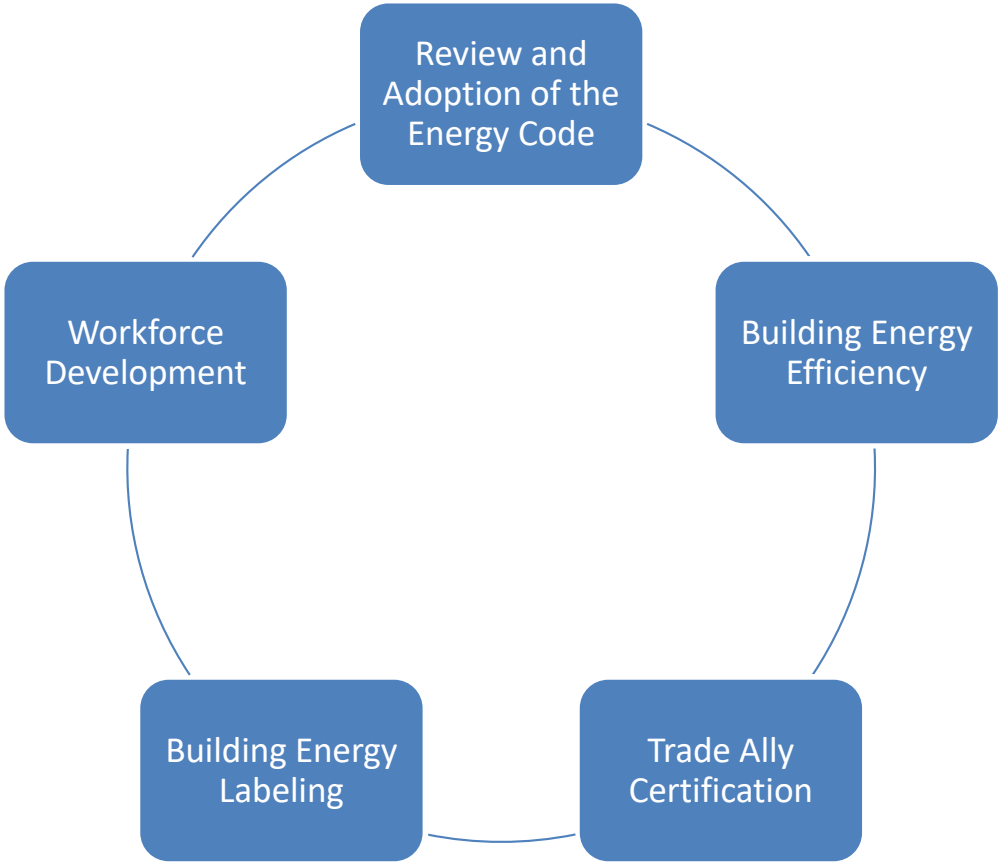
November 18, 2019

Some notes…



- Recommendations are from the six subcommittees in the energy planning process:
  1. Demand-side management/demand response/energy efficiency (DSM-DR-EE)
  2. Environmental justice, economic development, and environment planning
  3. Electric and natural gas planning
  4. Renewables
  5. State government energy use
  6. Transportation planning

- Of over 60 recommendations, 24 pertained to EE
- Similar recommendations may have been consolidated
- Not all recommendations reached consensus
- The "status" is the Energy Office's assessment, but we want to hear yours!
- Not an exhaustive or prescriptive list



EFFICIENT BUILDINGS

Recommendation for Changing the Review and Adoption Process of the Energy Code in South Carolina

Challenges	Statutory requirement of 2006 IECC for all new and renovated buildings. Code removed from normal adoption process.
Approach	Move the amendment and adoption of the International Energy Conservation Code (IECC) back to the Building Codes Council (BCC).
Status	Requires Legislative/Regulatory Action

Building Energy Efficiency

Challenge	Need to maximize efficiencies in South Carolina city buildings.
Approach	Mimic Envision Charlotte to focus on waste, water, air, and energy.
Status	Active

Trade Ally Certification to Maximize Efficiency Gains

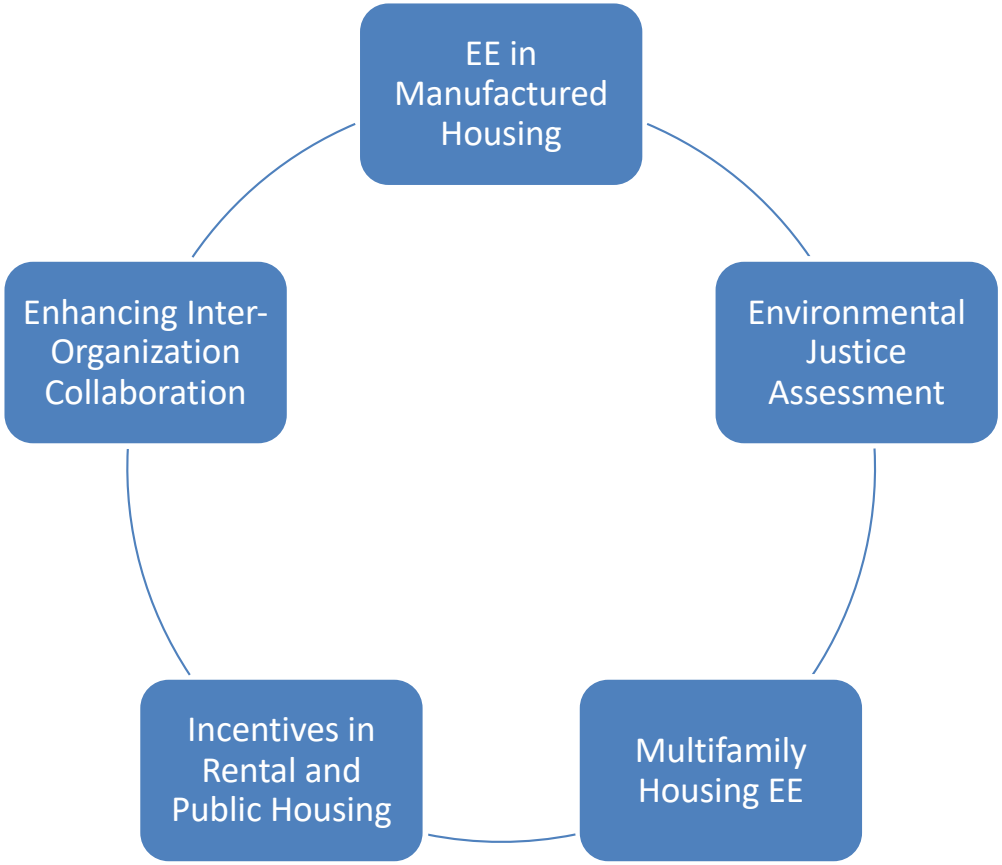
Challenge	Need to maximize energy efficiency savings achieved from installed efficiency measures.
Approach	Develop a South Carolina trade-ally certification process.
Status	Active

Building Energy Labeling

Challenge	Lack of information in real estate markets on building energy use.
Approach	Identify and propose model energy-labeling approaches.
Status	Active

Workforce Development

Challenges	Difficulty finding local qualified contractors. Vulnerable communities need new job opportunities.
Approach	Explore ways to integrate workforce development into low-income EE programs.
Status	Active



ENERGY EQUITY/ENERGY BURDEN

Converted EE Manufactured Housing Tax Credit to Direct Rebate

Challenge	Low participation in current tax credit program.
Approach	Convert EE manufactured housing tax credit to direct rebate.
Status	Requires Legislative/Regulatory Action

Environmental Justice Assessment

Challenges	Energy and transportation decisions may inadvertently affect environmental justice communities. Limited coordination among multiple agencies.
Approach	Establish a statewide environmental justice advisory panel that will serve as a “think tank” and resource center for environmental justice issues.
Status	Active

Multifamily Housing EE

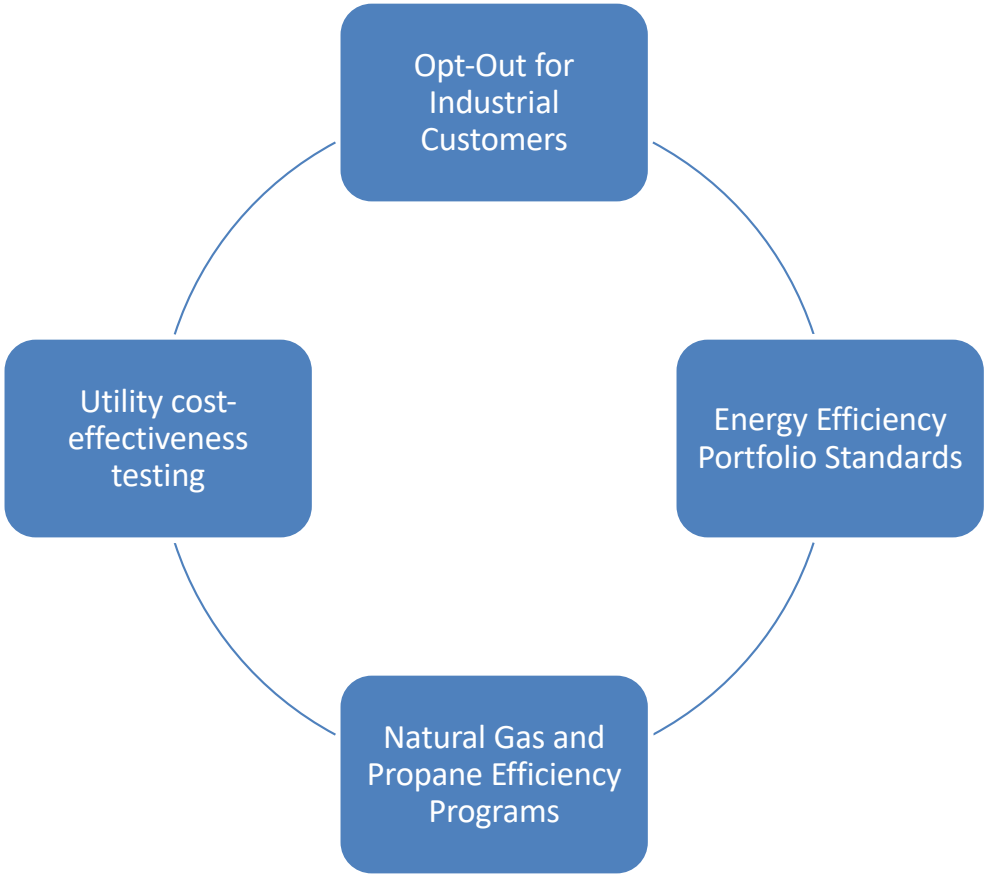
Challenge	Multifamily communities are underserved by existing energy efficiency programs.
Approaches	Adopt state tax credits for EE upgrades for rentals and multifamily properties. Discuss legislation to require minimum EE standards for rental properties. Utilities should continue to investigate multifamily programs. Examine opportunities to provide incentives and resources.
Status	Requires Legislative/Regulatory Action

Enhanced Energy Efficiency Incentives in Rental and Public Housing Projects

Challenge	EE initiatives in rental and public housing are restricted by existing funding.
Approach	Examine opportunities to provide incentives and resources to local government and NGOs for rental and public housing EE projects.
Status	Requires Legislative/Regulatory Action

Enhancing Inter-Organization Collaboration through a Weatherization Assistance "One-Stop Shop"

Challenge	Weatherization Assistance Programs (WAP) may face barriers to implementation of key projects due to unforeseen circumstances.
Approach	Form an inter-organization “one-stop shop” for building retrofits for affordable housing to consider holistic projects and improve timing and efficiency of implementation schedules.
Status	Active



UTILITY PROGRAMS

Opt Out for Industrial Customers

Challenges	Limited awareness of industrial EE programs. No system in place to verify opted-out industrial customers' EE measures.
Approach	Convene a study committee to examine industrial customers' EE needs.
Status	Active

Energy Efficiency Portfolio Standards

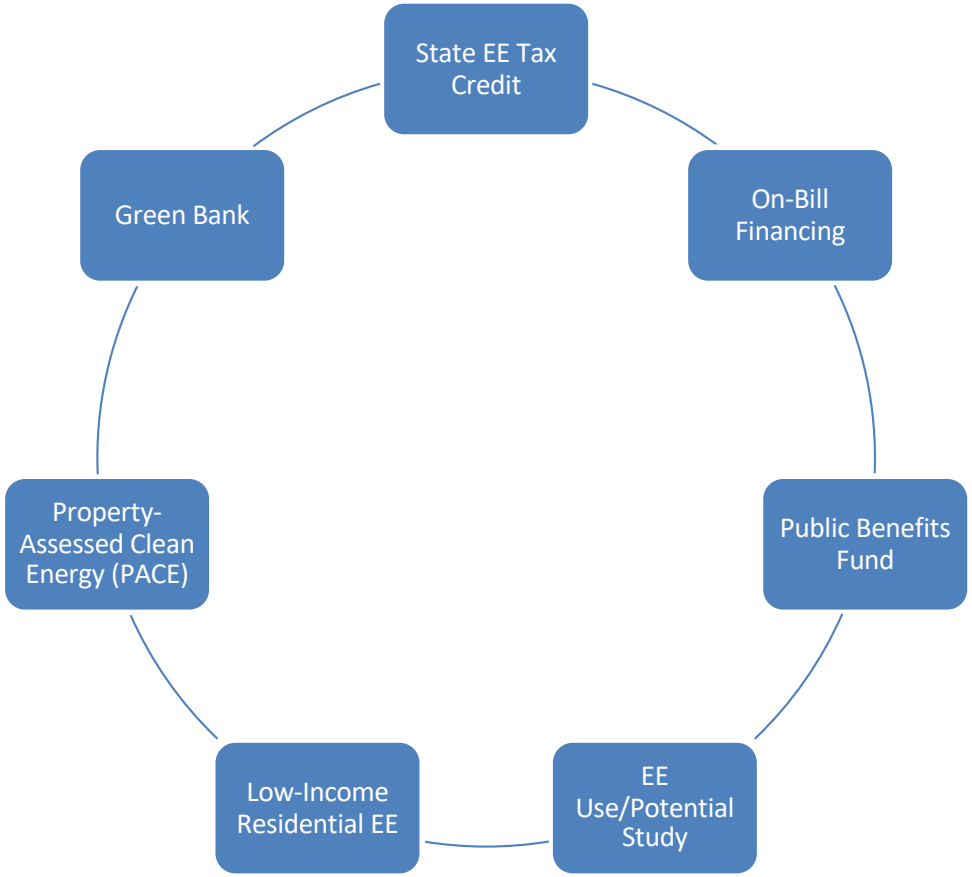
Challenge	No energy savings targets in SC.
Approach	Propose legislation to set a preliminary target of 1.5% energy savings for all utilities.
Status	Requires Legislative/Regulatory Action

Natural Gas and Propane Efficiency Programs

Challenge	Lack of clarity regarding the potential for demand-side efficiency programs to reduce natural gas and propane consumption.
Approach	Require efficiency potential studies for natural gas and propane at reasonable intervals, and pursue all cost-effective efficiency options.
Status	Complete

Utility cost-effectiveness testing

Status New!



FINANCING MECHANISMS

Create a state tax credit for energy efficiency for residential homeowners

Challenge	Minimal state incentives exist for homeowners or landlords for EE upgrades.
Approach	Adopt state tax credits for EE upgrades for existing residences.
Status	Requires Legislative/Regulatory Action

Encourage On-Bill Financing Programs

Challenge	Consumer interest rates on the loans are capped at 4% above the one-year Treasury rate.
Approach	Study whether the existing interest rate limit is too low to make on-bill financing programs economically viable, and whether low-interest sources of financing may be available to utilities.
Status	Requires Legislative/Regulatory Action

Public Benefits Fund

Challenge	SC lacks a revenue stream to advance EE policy goals.
Approach	Convene a stakeholder working group to explore best practices and the possibility of rolling out a PBF.
Status	Requires Legislative/Regulatory Action

EE Use/Potential Study

Challenge	Utilities' DSM plans are based on outdated and inadequate EE potential studies.
Approach	Discuss best practices for EE potential studies and require new potential studies at least once every 3 years.
Status	Complete

Funding for Low-Income Residential Energy Efficiency Upgrades

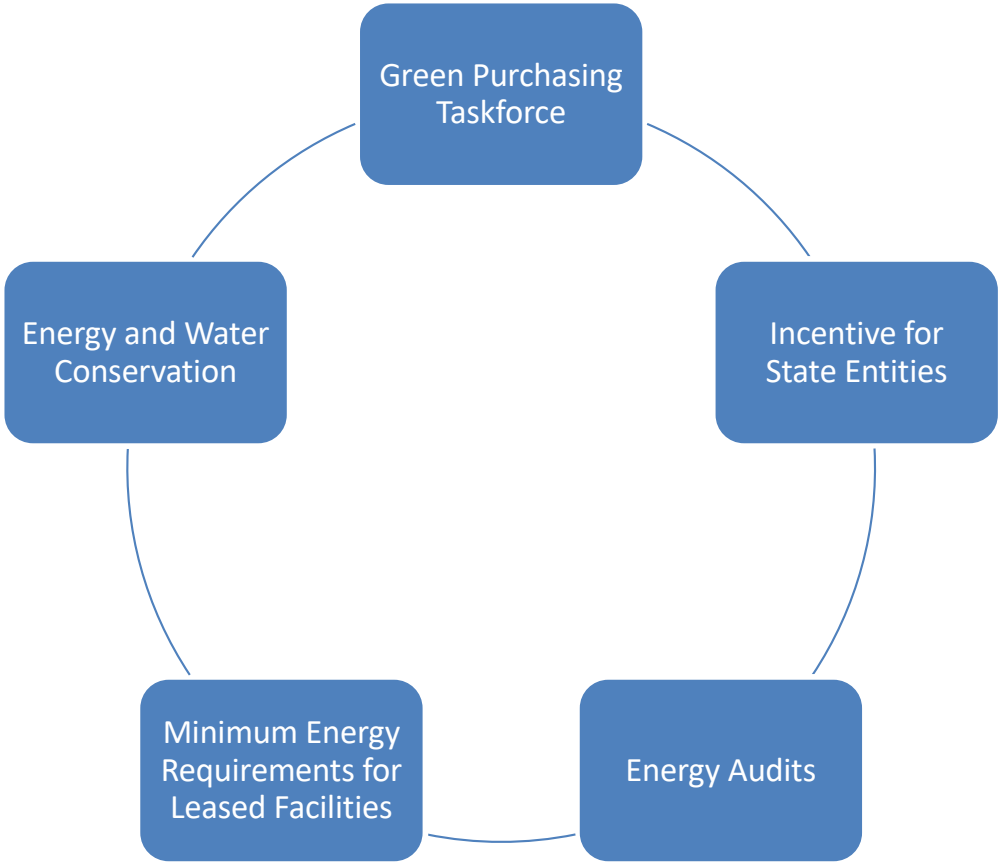
Challenge	Lack of consistent, financing capital for residential energy efficiency programs in low- to moderate-income communities.
Approaches	Create a statewide fund to complement the State Housing Trust Fund in providing grants for residential programs. Create incentives for utilities and co-ops to expand existing and create new OBF programs.
Status	Requires Legislative/Regulatory Action

Property-Assessed Clean Energy (PACE) Programs

Challenge	Utility customers are often challenged or unable to access EE financing.
Approach	Propose commercial and residential PACE legislation, and provide implementation guidance to local governments.
Status	Requires Legislative/Regulatory Action

Green Bank

Status New!



NON-PROFIT AND PUBLIC ENTITIES

Convene the Green Purchasing Taskforce

Challenge	State entities are unable to purchase energy-efficient items if they are not on state contract.
Approach	Convene the green purchasing taskforce, and add vendors of energy-efficient items to the state contract.
Status	Pending

Incentive for State Entities

Challenge	State schools, government and public buildings, or state entities are not eligible for tax incentives or any kind of rebates for EE projects/installations.
Approach	Research state incentives or grants for EE projects, special loan periods from the SC Treasurer's Office, and allow performance-based partnerships with private entities.
Status	Requires Legislative/Regulatory Action

Energy Audits

Challenge	State agencies are unable to pursue guaranteed energy savings contracts due to uncertainty, lack of personnel, and lack of knowledge of required qualifications of firms.
Approach	State Fiscal Accountability Authority (SFAA) should approve a policy to allow the Office of State Engineer (OSE) to prequalify firms.
Status	Requires Legislative/Regulatory Action

Recommendation for Minimum Energy Requirements for Leased Facilities

Challenge	Many state entities operate in leased space, which may or may not take into account energy-related operating costs.
Approach	Real Property Services should consider a requirement that the costs of energy per square foot of leased space do not exceed the average for state agency buildings by more than 5%.
Status	Pending

Energy and Water Conservation Through More Effective Measurement and Analysis of Use

Challenge	State agencies may not be able to identify energy and water conservation opportunities or measure the effects of conservation measures because several buildings may share meters.
Approach	Amend the Energy Independence and Sustainable Construction Act to require that separate meters are installed when a building undergoes major facility construction/renovation.
Status	Requires Legislative/Regulatory Action

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BREAK

Please return by 10:45

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South Carolina's Shared Objectives

A collaborative exercise

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SC EE Stakeholder Survey Results

- 25 stakeholders responded
- 72% of organizations are SC-focused, the rest split between National (5) and Southeast (3), and Local (1).
  - Energy Efficiency (24)
  - Renewable Energy (22)
  - State (20) and Federal (16) energy policy
  - Energy Policy Advocacy (12)
  - Energy Codes (16)
  - Education and Outreach (18)

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SC Survey Results (cont.)

- Work spans all sectors:
  - Residential (14)
  - Low-to-moderate income (16)
  - New Construction (14)
  - Commercial (9)
  - Industrial (10)
  - Municipal (8)
  - Schools (14)
  - Military (6)
  - Financial (5)
  - Agriculture (7)
  - Electric/gas generation, supply or transmission (8)

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How would you describe the current successes of EE in SC?

- The state through these collaboration meetings does a decent job pulling together a consensus of common goals from the various stakeholders
- The current "free market" approach to residential energy codes have been a success to home buyers (through marketing benefits to consumers)
- EE had been gaining momentum and I think that can be attributed to support and encouragement from agencies such as the Energy Office

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Successes (cont.)

- New construction is going the right direction namely through improved energy codes and equipment efficiency standards
- Ability to conduct performance contracts with low cost loans.
- We have some state laws that support energy efficiency and support from leaders on occasion
- The windows and appliances that we use in our homes are energy efficient.

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Successes (cont.)

- Adaption of energy saving lighting strategies employing control strategies to reduce energy expenditures in some school districts have had success in behavior modification
- Success developing and passing a state energy plan with energy efficiency policies and programs
- SC made progress on EE through things like the building codes and Energy Freedom Act

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How would you describe the current challenges of EE in SC?

- The large volume of manufactured housing, poor adoption of EE measures in rental housing
- Greater funding/financing opportunities and products should exist to initiate energy efficiency projects in a more comprehensive manner.
- State has faced challenges actually implementing the Energy Plan initiatives

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Challenges (cont.)

- Consistent funding, incentives and education. Many organizations don't know where to start and what their priorities to pursue for their facilities should be.
- There is a misunderstanding that energy efficiency means adding solar panels.
- There is little understanding of the availability of resources.
- SC has some of the worst old housing stock plus a high percentage of manufactured housing that is difficult to retrofit.

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Challenges (cont.)

- Those who live in the least efficient homes are often the ones who have the least ability to invest in EE measures
- Lack of funding
- Low cost of energy
- Difficult to change culture
- Few incentives for landlords to renovate homes for renters

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Challenges (cont.)

- Lake of energy star raters
- Woefully inadequate resources, including no state funding, dedicated to energy efficiency programs
- Many school districts in SC do not have adequate funding for capital expenditures.
- Lack of coordination among the groups/coalition for a consistent message and advancement of the issue

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What SC Policy opportunities exist?

- The Energy Plan has not been fully utilized
- The PSC has some leverage to encourage EE from IOUs
- Expanding low-interest loans/grants for energy conservation measures
- Rebates for lighting, appliances
- More marketing to the end consumer of the benefits of higher efficient homes and/or products and how they can make a personal financial decision to meet their needs

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Opportunities (cont.)

- Staying up to date in the legislative adoption of more current versions of the energy codes
- While legislation that encourages solar and other supply side technologies is great, there should be legislation that pushes innovative efficiencies from a demand side as well to lower the overall energy consumption in our state.

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Opportunities (cont.)

- Make resources MUCH easier to navigate
- Electric Cooperatives' Pay As You Save (PAYS) and similar programs
- Enhanced public education
- Update commercial and residential building energy codes
- Leverage Dominion's acquisition of SCE&G to increase utility spending on EE programs (similar to VA)

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Opportunities (cont.)

- Technological advancements should enable more efficient off-peak use of energy
- There are small successes (like Help My House) that can/should be scaled
- Low-income energy efficiency is the most direct path to incrementally improving environmental justice in South Carolina, and it is also the most needed investment overall
- The willingness of different groups to work cooperatively is a good starting point to improve the lives of South Carolinians

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What are the perceived barriers?

- Cost - this is a poor state and the payback over time is a tough concept to sell to many
- Lack of knowledge: benefits of insulation, more efficient lighting, available grants
- Lack of motivation (EE gets pushed to back burner)
- The need for unanimous agreement on solutions

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Barriers (cont.)

- The end of the '20% reduction by 2020' goals is a barrier because there is no program set to replace them
- Low(ish) energy prices do not provide much incentive, but there is a huge amount of housing inventory that needs improvement.
- There is a distrust of the utilities and an unwillingness to allow people inside their homes to provide help (fear, embarrassment, etc.).

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Barriers (cont.)

- Builders have no incentive to maximize energy efficiency beyond code requirements since the don't pay the utility bills
- The overall breakdown of trust among regulators, utilities and interest groups that has occurred in the post-VC Summer era has been a barrier to EE innovation in the state
- Affordability is the biggest barrier

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Prioritizing our Shared Objectives

Bulls-Eye exercise

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Table Priority Discussion

- 30 minutes
- Focus on what SC's priorities and shared objectives should be
- Extract as many priorities from the survey that resonate with your table (write each one down on a sticky note)
- Is this set comprehensive? Are there others that were not captured?

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Bulls-Eye Poster

- 20 minutes
- To truly hit the bulls-eye with our roadmap, we need to refine our priorities to those that are most critical to the collective group
- By design, a bulls-eye diagram puts a limit on how much you can identify as critical
- As a combined group, carefully consider what is critical (center), important (middle) or peripheral (outer).
- Only 2-3 stickies can end up in the center – you must talk and make trade-offs!

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Group Discussion

- What are your groups' top 2-3 priorities?
- During lunch, the advisory committee will consolidate and refine the priorities
- We will reconvene after lunch to coalesce around the 2-3 objectives that the group feels are most critical.

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LUNCH

Please be back by 12:55

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SC EE Shared Objectives

Increase energy efficiency in South Carolina by:

- Expanding the coordination, engagement and education of thought leaders, policy makers, and all levels of consumers on energy efficiency issues.
- Creating accessible and adequate funding mechanisms for cost-effective efficiency investments.
- Employing equitable and transparent processes to reduce energy burdens for vulnerable communities by pursuing an equitable and just transition to an energy efficient economy.

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Working Group Breakouts

- Efficient Buildings
- Energy Equity / Energy Burden
- Utility Programs
- Financing Mechanisms
- Non-profit and Public Entities

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Working Group "Pillars"

EQUITY

BENEFIT ANALYSIS

- Economic Development
- Work Force Development
- Health
- Environmental
- Consumer Savings
- Industrial Savings
- Technology Innovation

REGULATORY REFORM

- Business Model
- Rate Structure
- Cost-effectiveness
- Energy Code
- Appliance Standards

EDUCATION / OUTREACH

- Regulator
- Legislator
- Rate-payers
- Homeowners
- Renters
- Commercial building owners
- Property managers
- Realtors
- Industrial Facilities
- Universities

FINANCING MODELS

- Utility
- State
- Private
- On-Bill
- PACE
- Green Bank

GRID INTEGRATION

- Demand Side Management
- EE as a Resource
- EE Plus Storage
- Distributed Energy Resources
- Distributed Grid Technology

Survey Results – Top Priorities

1. Funding for low-income EE upgrades (4.13)
2. On-bill financing programs (4.05)
3. Building energy efficiency (4.00)
4. State tax credit for residential EE (3.87)
5. Workforce development (3.65)
6. Energy and Water Conservation Through More Effective Measurement and Analysis of Use (3.57)
7. Weatherization assistance "One-Stop Shop" (3.55)
8. Energy Audits (3.52)
9. Incentive for State Entities (3.48)
10. PACE Programs (3.40)

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Concluding Remarks

Thank you for your participation!

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