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South Carolina Energy Efficiency Roadmap

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EXECUTIVE SUMMARY

Introduction

Energy efficiency (EE) is widely considered a least-cost option for meeting energy demand while reducing energy costs and carbon emissions. While EE has experienced slow and steady growth in South Carolina, much more can be done to maximize the full potential of this least cost resource. The Electric Power Research Institute (EPRI) estimates that South Carolina has 16,902 GWh of cost-effective electric energy efficiency economic potential by 2035.[1] To explore this opportunity, leading EE and energy experts—including academic experts, consumer advocates, environmental nonprofits, commercial entities, state agencies, and utilities—participated in a series of meetings to determine where and how to deploy EE at a significantly greater rate. This report makes recommendations for increased and effective EE deployment in South Carolina.

Despite bipartisan support for the economic and environmental benefits of EE and an increasing focus by advocates, utilities, and big energy users, challenges exist to achieve the full potential of EE in South Carolina. With a greater understanding of these challenges, there are multiple opportunities for increased EE in the state. This Energy Efficiency Roadmap report collects the expertise and ideas from over 70 EE stakeholders in the region and maps out the shared objectives and strategies that can help the state implement new solutions, overcome challenges, and achieve its EE potential.

Objectives of Roadmap

To capitalize on the EE opportunities in the state, the Nicholas Institute (NI), in partnership with the Energy Office of the South Carolina Office of Regulatory Staff (Energy Office), initiated a process to develop a comprehensive state EE Roadmap. This initiative, launched in September 2019, convened stakeholders from across the state to think collectively about how to increase investment in energy efficiency in South Carolina. Using the 24 EE recommendations from the state's 2016 State Energy Plan as a foundation, the objective of the Roadmap is to build on the collective priorities and strengths of the state's energy stakeholders to identify and achieve a shared set of EE policy goals and inform the state's EE strategy.[2]

The EE Roadmap strives to include diverse voices from across the state and identify a variety of paths forward to help all stakeholders seize the EE opportunities in the state. Some of the discussions generated substantial debate and disagreement among various parties that could be impacted by a new paradigm for EE. These discussions, particularly as they relate to statewide mandates, building codes, cost-effectiveness, and utility industrial programs, did not always garner consensus from all participants and are worthy of additional discussion from a broader

1. Electric Power Research Institute, "State Level Electric Energy Efficiency Potential Estimates, Technical Update," May 2017, Table 4-1, page 4-4. https://www.energy.gov/sites/prod/files/2017/05/f34/epri_state_level_electric_energy_efficiency_potential_estimates_0.pdf.

2 The South Carolina State Energy Plan was developed as a result of extensive stakeholder engagement in 2016. A summary of EE recommendations can be found in Appendix A. Additional information on the plan and the collaborative process can be found on SC Energy Office's website: http://energy.sc.gov/energyplan.

group of EE stakeholders. Participation in this effort by any stakeholder should not necessarily be represented as an agreement with the final recommendations.

The EE Roadmap Framework

In September 2019, the NI, in partnership with the Energy Office, formed the EE Advisory Committee, a group of leaders in the state with diverse organizational perspectives. This steering committee met regularly from October 2019 through July 2020 to provide critical guidance and input to NI as progress on the EE Roadmap evolved. A final list of recommendations on specific EE-related focus areas has been provided to the Energy Office and the EE Advisory Committee and is outlined in this final report.

Through a series of workshops and working group meetings, over 70 EE stakeholders from state, regional, and national organizations participated in the roadmap process. These included representatives from academia, building associations, community organizations, environmental nonprofits, financial institutions, industrial associations, regulators, state agencies, utilities, and others. Each participant voluntarily selected a role; some participated in working groups, others provided subject matter expertise or research into solutions, and others observed or participated in an advisory role. Whenever possible, a diverse set of voices was sought to ensure that a balanced and thoughtful approach was taken for all recommendations. The final recommendations outlined in this report represent impactful and largely agreed upon ideas, although not all recommendations reflect consensus from all parties.

Shared South Carolina EE Roadmap Objectives

Increase energy efficiency in South Carolina by:

- Expanding 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.

During the first EE stakeholder workshop in November 2019, the group established a set of shared objectives that would serve as the foundation for the evaluation of all recommendations.

Following the establishment of these three shared objectives and a review of the 24 EE recommendations from the 2016 State Energy Plan, the workshop participants discussed approaches, methods, tools, and other ideas that could help to achieve each of the shared objectives. Over 200 different solutions were discussed in five initial working groups (growing to six working groups in March 2020):

(1) Efficient Buildings (EB)

(2) Energy Equity and Energy Burden (EE/EB)

(3) Financing Mechanisms (FM)

(4) Nonprofits and Public Entities (NP/PE)

(5) Utility Programs (UP)

(6) Education and Workforce Development[3] (EWD)

Over the course of eight months, the advisory committee and working groups researched over 100 of the most promising solutions to address perceived barriers and opportunities that would meet the three shared objectives outlined above. In May 2020, these solutions were narrowed down to a set of 20 recommendations and further refined into focus areas.

Table 1. South Carolina's Energy Efficiency Recommendations by Focus Area

Focus Area	Recommendation
Accessible Financing	Evaluate the expansion of on-bill financing programs (FM 1, p. 64)
	Assess the feasibility, costs, and benefits of establishing a South Carolina Green Bank (FM 2, p. 66)
Building Codes and Labeling	Adopt updated version of commercial energy code (EB 4, p. 59)
	Commence a commercial building labeling pilot/study (EB 1, p. 55)
	Develop a residential labeling/sticker disclosure pilot (EE/EB 1, p. 60)
Enhanced Data Tracking	Share energy usage history for commercial properties (EB 2, p. 56)
	Adopt a Technical Reference Manual to standardize savings metrics for all utility EE measures (UP 4, p. 80)
Legislative Action	Re-establish the state's energy conservation goals for state agencies, public colleges and universities, and public-school districts (Section 48-52-620) (NP/PE 1, p. 68)
	Update Section 48-52-640 to include LEDs as lighting replacement requirement (NP/PE 2, p. 69)
	Consider annual EE target for all electric and gas utilities (UP 2, p. 76)
Public Entities	Allow public entities flexibility in funding EE upgrades (NP/PE 3, p. 70)
	Install individual meters for new construction / major renovation of public buildings (NP/PE 4, p. 71)
	Develop energy conservation guidelines for public entities to consider when leasing new space (NP/PE 5, p. 73)

3. As the working groups began to discuss possible solutions, education and workforce development became a theme that resonated across all five. This was separated into its own working group in March 2020.

Focus Area	Recommendation
Studies	Conduct a commercial and industrial customer opt-out study (UP 1, p. 74)
	Evaluate and update utility cost-effectiveness testing methodologies (UP 3, p. 79)
Weatherization Programs	Institute a "one stop shop" for all low-income residential weatherization programs (EE/EB 2, p. 62)
	Evaluate the alternatives to optimize weatherization funding from federal and utility sources (EE/EB 3, p. 63)
Workforce Development, Training, and Education	Coordinate a statewide strategy for EE workforce development education and training (EWD 1, 52)
	Develop statewide metrics for tracking and communicating EE goals and outcomes (EWD 2, p. 54)
	Increase awareness of EE training options for real estate appraisers (EB 3, p. 57)

These recommendations will enable South Carolina to meet its shared EE stakeholder objectives to expand energy efficiency engagement and create accessible funding mechanisms while pursuing an equitable and just transition to an energy efficient economy.

INTRODUCTION

Energy efficiency (EE) is widely considered a least-cost option for meeting energy demand while reducing energy costs and carbon emissions. While EE has experienced slow and steady growth in South Carolina, much more can be done to maximize the full potential of this least cost resource. As such, leading EE and energy experts—including academic experts, consumer advocates, environmental nonprofits, commercial entities, state agencies, and utilities—participated in a series of meetings to determine where and how to deploy EE at a significantly greater rate.

According to the U.S. Energy Information Administration (EIA), total retail electricity sales to South Carolina consumers in 2019 was 80,123 GWh.[4] Although the state has realized increasing annual incremental EE savings, EE savings from all utility programs as a percentage of retail sales is only 0.65 percent in 2019.[5] Each incremental investment in energy efficiency accrues multiple benefits to consumers, including: lower energy bills; increased grid reliability; and the deferral or elimination of expensive new generation, transmission, and distribution infrastructure investments—costs that would otherwise be borne by ratepayers.

Even with an increasing focus by advocates, utilities, and big energy users, EE remains underutilized in South Carolina. In a November 2019 workshop, the stakeholders identified challenges to achieving increased adoption of EE in the state, which can be broadly grouped into four distinct areas: end-user, building sector, policy, and utility challenges. Examples of the stakeholder-identified challenges can be found below. A complete list of challenges—both real and perceived—can be found in Appendix B. Addressing the challenges is a goal of this report.

End-user challenges: Investment in EE is not being made due to end-user capital constraints, lack of awareness, or other challenges.

Building sector challenges: The state has a significant amount of older housing stock, including many manufactured homes and multi-family homes.

Policy challenges: Existing legislative requirements are in need of updates.

Utility challenges: General lack of awareness of utility programs available to end-users.

South Carolina possesses multiple opportunities to increase energy efficiency in the state. EE potential studies from the Investor-Owned Utilities (IOUs) estimate that the cumulative, cost-effective energy efficiency economic potential in the state ranges from 883 GWh by 2029 (Dominion Energy SC)[6] to 566 GWh (Duke Energy Progress) and 1,773 GWh (Duke Energy Carolinas) by 2044.[7] Cumulatively, this is much lower than the 16,902 GWh by 2035 estimate

4. The EE Roadmap utilizes data from the U.S. Energy Information Association (EIA) for consistency. In some cases, this data might differ slightly from the utility-reported data found on the SC Energy Office website.
5. U.S. Energy Information Administration, Form EIA-861, "Annual Electric Power Industry Report" for 2019. https://www.eia.gov/electricity/data/eia861/.
6. ICF, Dominion Energy South Carolina 2020–2029 Achievable DSM Potential and PY10–PY14 Program Plan Final Report, June 2019. https://dms.psc.sc.gov/Attachments/Matter/d72d39e8-113c-41b4-8731-990dfd3411b2.
7. Nexant, Inc., "Duke Energy South Carolina DSM Market Potential Study," June 2020. This study includes EE potential estimates for DEC and DEP electric customers only, adjusted to remove opt out customers.

provided in a national EPRI study.[8] All of the studies, however, indicate a large opportunity for EE. Nonetheless, as investment in EE increases and energy reductions from short-payback EE projects such as lighting retrofits are achieved, continued cost-effective investment in EE projects will require new and creative solutions.

BACKGROUND

In 1992, the South Carolina General Assembly passed the South Carolina Energy Efficiency Act, which created the State Energy Office. This act called for the creation of a state energy plan and outlined a number of energy conservation initiatives aimed at the public sector.[9] Since that time—for nearly 30 years—South Carolina has included EE in state energy, utility resource, and public building conservation plans. EE will continue to have a large role to play in these planning efforts, not only in the reduction in energy used and the accompanying GHG reductions, but also in other non-climate benefits, including retaining industrial competitiveness, cutting consumer electric bills, avoiding the construction of new generation, transmission, and distribution infrastructure, and creating a new market for jobs and technologies.

Scope of Energy Efficiency

EE can be defined in many ways. For the purposes of this report, and the entire EE Roadmap process, 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 to reduce usage during periods of peak electricity demand.

This scope of EE for this initiative 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.
- Electrification, as defined as the conversion of a fuel source to the use of electrical power. Although it can reflect a more efficient use of energy, electrification is not part of this EE Roadmap process. With that being said, electrification is an important opportunity that warrants future discussion.
- Although important in the analysis of EE solutions, the cost/benefit implications were not evaluated within the scope of this roadmap.

8. Electric Power Research Institute, "State Level Electric Energy Efficiency Potential Estimates, Technical Update," May 2017. https://www.energy.gov/sites/prod/files/2017/05/f34/epri_state_level_electric_energy_efficiency_potential_estimates_0.pdf.
9. See Title 14, Chapter 52 of the South Carolina Code of Laws. https://www.scstatehouse.gov/code/t48c052.php.

Current Electricity Landscape in South Carolina

Retail sales to South Carolina electricity consumers in 2019 was 80,123 GWh distributed between residential (39%), commercial (28%), and industrial (33%) customers.[10] The state is home to 46 electric utilities serving over 2.7 million retail customers with 56 percent served by investor-owned utilities, 30 percent served by electric cooperatives and the remaining 14 percent served by municipal utilities and Santee Cooper, a state-owned utility (see Table 2).

Table 2. South Carolina Electricity Sector in 2019

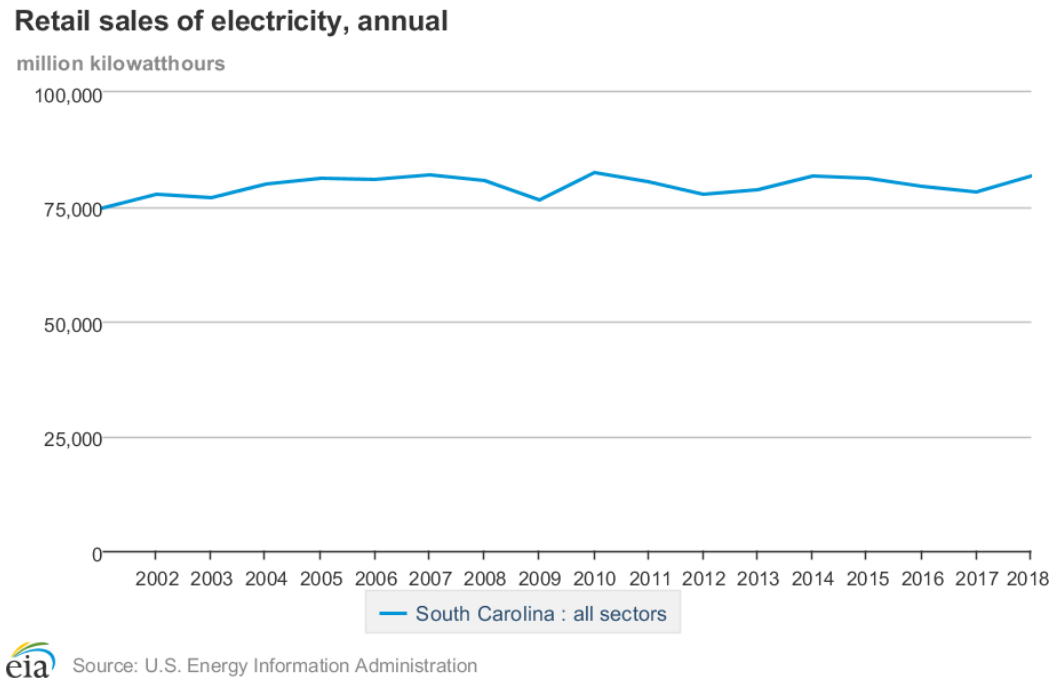
2019 Electricity Landscape	Investor Owned	State Owned Utility	Municipal (Public)	Electric Cooperative	Total
Number of entities	4	1	21	20	46
Number of retail customers	1,523,295	189,205	190,546	816,845	2,719,891
Percentage of customers	56%	7%	7%	30%	

Source: U.S. Energy Information Administration, Form 861.

The overall trend since 2010 suggests electricity demand is flattening—even declining in 2017—as shown in Figure 1. Improved building codes, appliance standards, and end-user EE investment have contributed to this trend. However, as the population in South Carolina continues to grow[11] and beneficial electrification occurs in transportation and building sectors, the demand for electricity will likely also increase. EE measures implemented in existing and new buildings will play a vital role in keeping the demand curve flat in the coming decades.

10. U.S. Energy Information Administration, Form EIA-861, "Annual Electric Power Industry Report" for 2019. https://www.eia.gov/electricity/data/eia861/.
11. South Carolina's population is expected to grow 35% by 2035 compared to the 2010 Census. Population projections through 2035 are based on data from the SC Revenue and Fiscal Affairs Office. SC Energy Office website accessed 11/4/2020. http://energy.sc.gov/node/3088.

Figure 1. Annual Retail Sales of Electricity in SC (2001–2018)



Utility incentives and rebates—primarily from SC's four investor-owned utilities—have helped to encourage modest EE investment. While investment in EE has been increasing, annual incremental EE savings from utility programs as a percentage of retail sales in 2019 was only 0.65 percent—much lower than states in the Northeast and West which approach two percent and higher.[12] That said, the reported numbers likely understate the amount of EE actually occurring in the state since they do not include EE investment from industrial and commercial customers that have opted out of utility programs and are making investments on their own.[13]

12. U.S. Energy Information Administration, Form EIA-861, "Annual Electric Power Industry Report" for 2019. https://www.eia.gov/electricity/data/eia861/.

13. In South Carolina, large commercial and industrial customers with annual consumption exceeding 1 GWh are allowed to opt-out of utility DSM and EE programs, choosing instead to make investments at their own expense. In 2019, over 70% of nonresidential customers in Duke Energy Carolina's SC territory opted out of the Company's EE programs and 63% opted out of DSM programs. SC PSC Docket 2020-83-E, Order 2020-593, September 16, 2020. https://dms.psc.sc.gov/Attachments/Order/1d480b63-fbb9-4940-b55c-1c5d4c242c67.

Table 3. Annual Energy Efficiency Savings in SC, 2019

2019 Electricity Landscape	Investor Owned	State Owned Utility	Municipal (Public)	Electric Cooperative	Total
2019 Retail Sales (GWh)	49,871	8,318	4,210	17,724	80,123
2019 Annual EE Savings (GWh)	498	18	0	1	517
EE Savings as a % of Sales	1.00%	0.21%	0.00%	0.01%	0.65%

Source: U.S. Energy Information Administration, Form 861.

Existing SC EE Plans and Policies

South Carolina has policies already in place that have helped to provide access and increase EE adoption within the state, plus 24 recommendations for enhancing those policies from the most recent State Energy Plan. These recommendations can be built upon to realize the state's EE potential and were revisited for inclusion in the EE Roadmap.

2016 South Carolina Energy Plan

In 2004, the South Carolina General Assembly created the ORS to represent the public interest in utility regulation. In 2015, the Energy Office became part of ORS as a result of legislation restructuring SC state government. Development of a State Energy Plan is the responsibility of the Energy Office as outlined in state statute (SC Code Section 48-52-210). In 2016, the Energy Office spearheaded the energy plan process which included the participation of over 130 professionals, representing more than 60 organizations. The final document included 63 recommendations, including 24 recommendations with an energy efficiency focus. These recommendations are summarized in Table 4.

Table 4. Energy Efficiency Recommendations from the 2016 SC State Energy Plan[14]

Working Group		Recommendation
Efficient Buildings	1	Recommendation for Changing the Review and Adoption Process of the Energy Code in South Carolina
	2	Building Energy Efficiency
	3	Trade Ally Certification to Maximize Efficiency Gains
	4	Building Energy Labeling
	5	Workforce Development
Energy Equity/ Energy Burden	1	Converted EE Manufactured Housing Tax Credit to Direct Rebate
	2	Environmental Justice Assessment
	3	Multifamily Housing EE
	4	Enhanced Energy Efficiency Incentives in Rental and Public Housing Projects
	5	Enhancing Inter-Organization Collaboration through a Weatherization Assistance "One-Stop Shop"
Utility Programs	1	Opt Out for Industrial Customers
	2	Energy Efficiency Portfolio Standards
	3	Natural Gas and Propane Efficiency Programs
Financing Mechanisms	1	Create a State Tax Credit for Energy Efficiency for Residential Homeowners
	2	Encourage On-Bill Financing Programs
	3	Public Benefits Fund
	4	EE Use/Potential Study
	5	Funding for Low-Income Residential Energy Efficiency Upgrades
	6	Property-Assessed Clean Energy (PACE) Programs
Nonprofit and Public Entities	1	Convene the Green Purchasing Taskforce
	2	Incentive for State Entities
	3	Energy Audits
	4	Recommendation for Minimum Energy Requirements for Leased Facilities
	5	Energy and Water Conservation Through More Effective Measurement and Analysis of Use

14. Office of Regulatory Staff, "Energy in Action: South Carolina State Energy Plan," 2016. Additional detail can be found in Appendix A. http://www.energy.sc.gov/files/Energy%20Plan%2003.02.2018.pdf.

"20 by 2020" Requirements

SC Code Section 48-52-620, enacted in 2008, requires all state agencies, school districts, and public colleges and universities to develop energy conservation plans to reduce their energy consumption by one percent annually during fiscal years 2009–2013 and by a total of a 20 percent reduction in energy use by 2020, as compared to 2000 levels.[15] These plans, along with annual consumption data, are required to be submitted to the Energy Office. As of 2020, the public entities have exceeded the 20 percent reduction at the aggregate level. A summary can be found in Figure 2.

Figure 2. 2020 Report of the Annual Conservation Savings of SC Public Entities[16]

Public Entities by Type	Average Energy Use per Square Foot (site kBTU)			Average Energy Spending per Square Foot ($)		
	FY 2000	FY 2020	% change	FY 2000	FY 2020	% change
State Agencies	113	77.47	-31%	$2.02	$1.78	-12%
Residential Colleges and Universities	143	110.76	-23%	$1.96	$1.82	-7%
Non-Residential Colleges and Universities	80	63.19	-21%	$1.75	$1.57	-10%
School Districts	45	33.90	-25%	$1.27	$1.05	-17%
Overall	**74**	**55.24**	**-25%**	**$1.54**	**$1.31**	**-15%**

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.

EE Market Potential Studies for Investor-Owned Utilities

South Carolina's investor-owned utilities regularly file EE market potential studies within their Integrated Resource Plans (IRPs). These studies forecast what each utility sees as the cost-effective, achievable savings potential available in the residential, commercial, and industrial sectors in each utilities' service territory and are used as guidance for demand side management

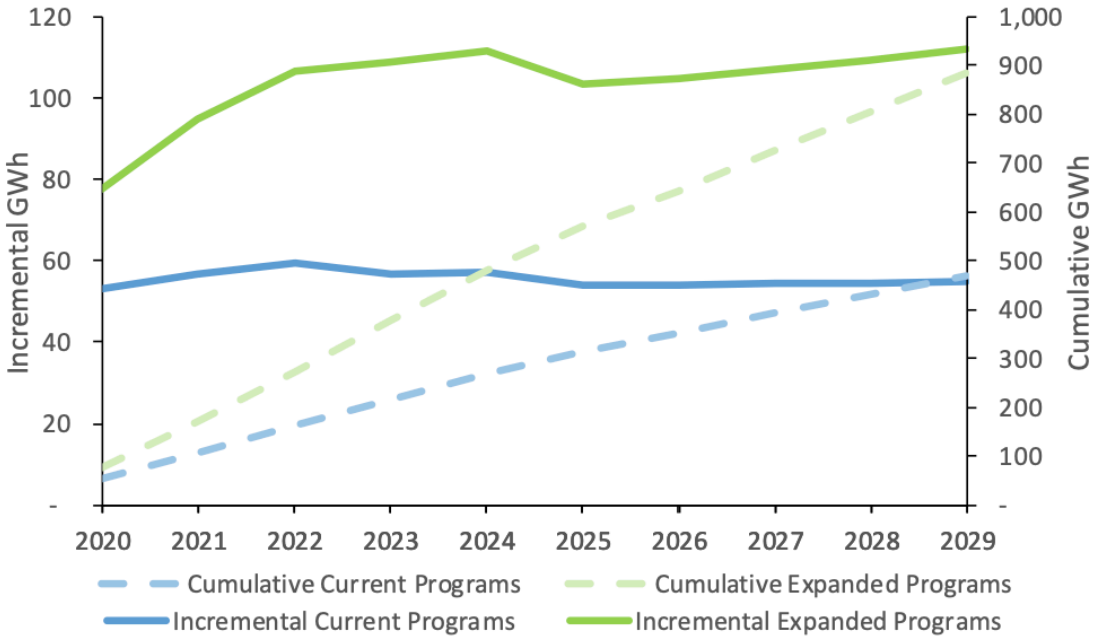
15. South Carolina Code of Laws, Title 48 – Environmental Protection and Conservation, Article 6 – State Government Energy Conservation. https://www.scstatehouse.gov/code/t48c052.php.
16. Campana, R. 2020. Annual Report on the Implementation of State Government Energy Conservation. http://energy.sc.gov/files/view/State%20Energy%20Use%20Report%202020.pdf.

(DSM)/EE program planning and to forecast the effect of EE on generation requirements in their IRPs.

Dominion Energy South Carolina

Dominion Energy SC (DESC) released their latest market potential study in June 2019. In the expanded programs scenario, annual savings achieved by DESC programs grow to 1.6 times the savings achieved by DESC programs in the 2017–2018 program year. Cumulative savings grow from 77 GWh in 2020 to nearly 883 GWh by 2029 in the expanded programs scenario (Fig. 3).[17] Cumulative savings include those achieved in one program year plus savings from measures installed in previous program years that are still functioning. These savings are approximately 5.2 percent of all energy sales from participating customers. This calculation excludes the forecasted sales from opt-out customers.[18]

Figure 3. Dominion Energy SC Incremental and Cumulative Portfolio Energy Savings



Source: Dominion Energy SC, 2020–2029 Achievable DSM Potential & PY10–PY14 Program Plan.

Duke Energy Carolinas and Duke Energy Progress

In June 2020, Duke Energy Carolinas (DEC) and Duke Energy Progress (DEP) released their South Carolina EE and DSM Market Potential Study. The study estimates the technical,

17. ICF, Dominion Energy South Carolina 2020–2029 Achievable DSM Potential and PY10–PY14 Program Plan Final Report, June 2019. https://dms.psc.sc.gov/Attachments/Matter/d72d39e8-113c-41b4-8731-990dfd3411b2.
18. At the close of Program Year 9, 438 large commercial and industrial accounts had opted-out of DESC's DSM programs. Retail electric sales associated with these accounts represent approximately 23% of DESC's retail electric load.

economic, and achievable potential scenarios for each utility. Cumulative savings grow to nearly 2,574 GWh (DEC) and 843 GWh (DEP) by 2044 in the enhanced scenario. The cumulative energy and demand savings over 25 years are summarized in Table 5 (DEC) and Table 6 (DEP).[19]

Table 5. Duke Energy Carolinas EE Potential through 2044

Duke Energy Carolinas	Energy (GWh)	Demand (MW)	
		Summer	Winter
Technical	4,388	1,504	312
Economic	1,773	376	170
Achievable – Base	2,461	882	224
Achievable – Enhanced	2,574	901	235

Table 6. Duke Energy Progress EE Technical and Economic Potential through 2044

Duke Energy Progress	Energy (GWh)	Demand (MW)	
		Summer	Winter
Technical	1,482	640	86
Economic	566	202	37
Achievable – Base	811	368	56
Achievable – Enhanced	843	375	59

SC ENERGY EFFICIENCY ROADMAP FRAMEWORK

To capitalize on the energy efficiency opportunities in the state, the NI, in partnership with the Energy Office, initiated a process to develop a comprehensive state EE Roadmap. This initiative, launched in October 2019, convened stakeholders from across the state to think collectively about EE opportunities. Recognizing that considerable EE work had already been done within the state's 2016 State Energy Plan, the objective of the Roadmap was to update and refine the energy plan's 24 recommendations building upon the collective priorities and strengths of the state's energy stakeholders to identify and achieve a shared set of EE policy objectives and revise the state's energy efficiency goals.

19. Nexant, "Duke Energy South Carolina DSM Market Potential Study," June 2020. This study includes EE potential estimates for DEC and DEP SC electric customers only, adjusted to remove opt out customers. Technical potential refers to the indicates the theoretical upper limit on savings from EE. Economic potential takes program costs, cost-effectiveness, and avoided energy costs into consideration. Achievable potential reflects estimated customer participation rates in a base (current) and enhanced scenario. https://dms.psc.sc.gov/Attachments/Matter/54107782-79c5-4f15-a6c3-a380cd5df05f.

Project Team and Participants

In September 2019, the NI and the Energy Office formed the EE Advisory Committee, a group of EE leaders in the state with diverse organizational perspectives. The advisory committee met once monthly from October 2019 through June 2020 to provide critical guidance and input to the Institute and SC Energy Office as progress on the EE Roadmap evolved. Over 70 EE stakeholders from state, regional, and national organizations participated in the roadmap process. These included representatives from academia, consumer groups, environmental nonprofits, financial institutions, industrial associations, regulators, state agencies, utilities, and others. Each participant voluntarily selected a role; some participated in working groups, others provided subject matter expertise or research into solutions, and others observed or participated in an advisory role. Whenever possible, a diverse set of voices was sought to ensure that a balanced and thoughtful approach was taken for all recommendations. A final list of recommendations on specific EE-related areas has been provided to the SC Energy Office and is outlined in this final report.

The EE Roadmap Timeline

The first stakeholder meeting was held on November 18, 2019 in Columbia, South Carolina. The meeting included all 12 of the Advisory Committee members, as well as five Energy Office staff and 40 other EE stakeholders representing a wide variety of organizations from across the state (see Appendix C for a complete list of participating organizations). The day-long meeting sought to:

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

Throughout the day, the participants worked together to understand the current EE landscape in South Carolina and review the challenges and opportunities of increased EE in SC (see Appendix for a complete list of challenges and opportunities). Through a series of facilitated break-out groups, the participants agreed to a set of three shared objectives that would guide the collaborative work of the EE Roadmap in the following months.

Shared South Carolina EE Roadmap objectives

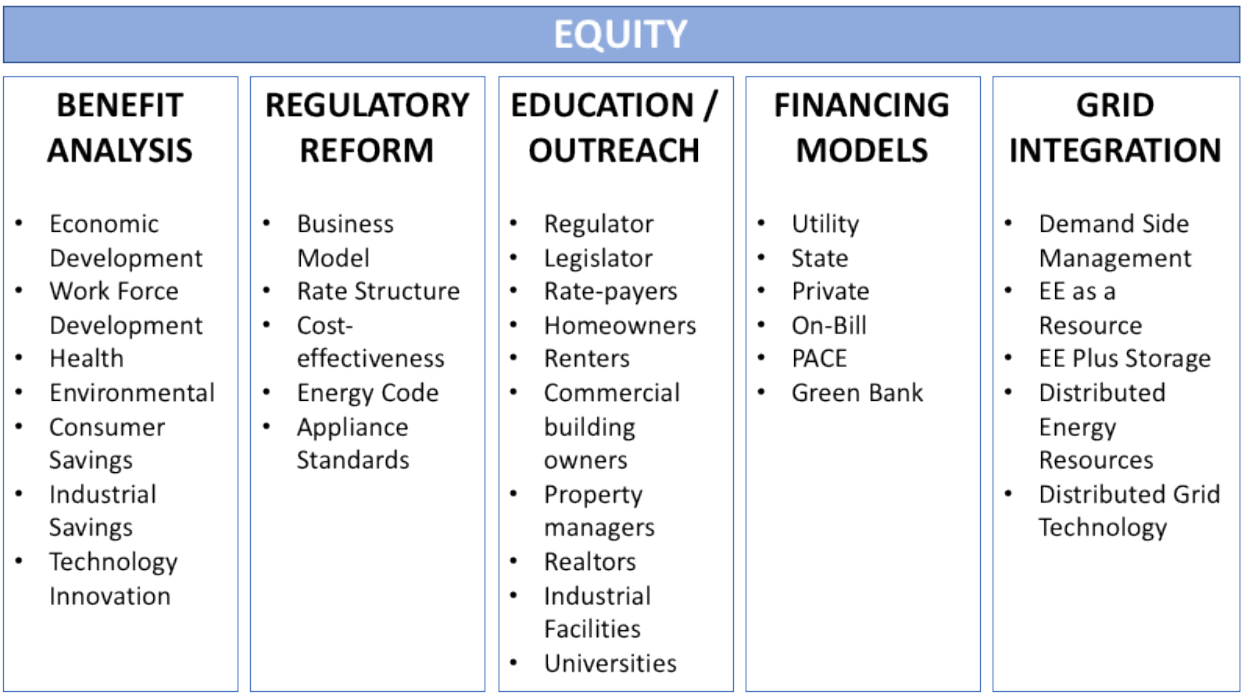
Increase energy efficiency in South Carolina by:

- Expanding 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.

The Five Pillars of the EE Roadmap

A primary driver for the EE Roadmap was to coordinate a comprehensive investigation into EE opportunities for the state. This includes multiple energy sources, all types of utilities and all sectors, with a particular focus on areas that are underserved by the state's existing EE programs and services. To ensure a comprehensive review of potential solutions, the Roadmap followed a "five-pillar" approach to developing recommendations in order to ensure that the recommendations coming out of the process were holistic and addressed a variety of design considerations. The five pillars outlined below—benefit analysis, regulatory reform, education/outreach, financing models, and grid integration—form the framework of the EE Roadmap, with equity as an overarching consideration for all pillars.[20] Through a series of stakeholder workshops and working groups, the Nicholas Institute used the five-pillar framework to identify a set of recommendations in support of the shared set of policy goals and objectives.

Figure 4. The SC EE Roadmap "Five-Pillar" Framework



Following the establishment of the three shared objectives, the workshop participants broke into five topical working groups (established by the Advisory Committee) and used the five-pillar framework to focus on approaches, methods, tools, and other ideas that could help to achieve each of the shared objectives. Over 200 different solutions were discussed, which were synthesized and condensed by the five working groups for further consideration.

Between December 2019 and May 2020, EE stakeholders were invited to join one or more working groups to participate in a more in-depth look into existing barriers and potential solutions, research the feasibility of solutions, and participate in informative focus group calls with subject matter experts. As the working groups began to discuss possible solutions, education and workforce development became themes that resonated across all five. Thus, "education and workforce development" was separated into its own working group in March 2020. All of this research was used to create a set of feasible recommendations in six focus areas for consideration in the EE Roadmap.

(1) Education and Workforce Development

(2) Efficient Buildings

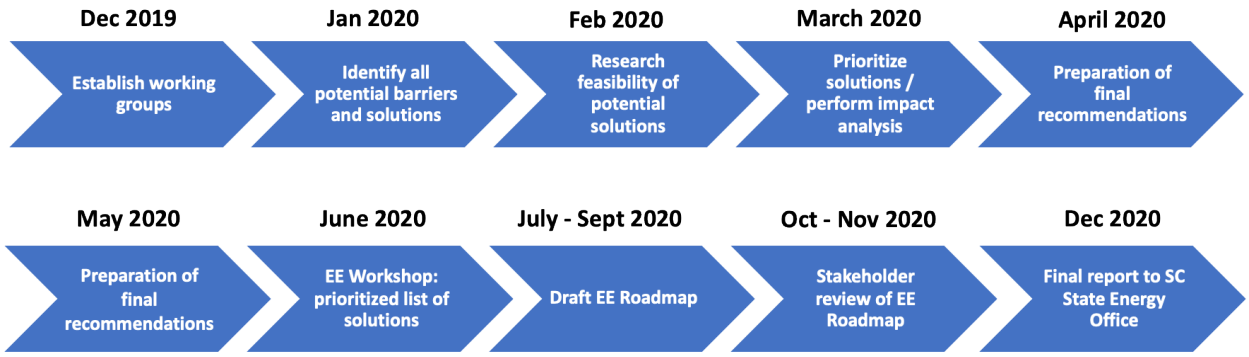
(3) Energy Equity and Energy Burden

(4) Financing Mechanisms

(5) Nonprofits and Public Entities

(6) Utility Programs

Figure 5. South Carolina EE Roadmap Timeline



In April 2020, the team leads from each of the six working groups were asked to prioritize their feasible recommendations using a standardized set of solution evaluation criteria. The objective was to develop a standardized process for prioritizing solutions that offer the greatest potential with respect to energy efficiency. The solution evaluation criteria asked each working group to consider the implementation requirements, timing, costs and benefits, market transformation potential, and existence of current programs for each of their recommendations. The results would be used to inform the prioritization of each working group's final recommendations. For a full set of solution evaluation criteria, please see Appendix D.

Based on the results from these solution evaluations, in May 2020 each working group selected their top 3–5 recommendations, which were presented at a second EE workshop held in June 2020. In this workshop, the EE stakeholders worked together to further refine and prioritize a set of recommendations which constitute this EE Roadmap.

Effects of COVID-19 on Energy Efficiency in South Carolina

In March 2020, as the state began to navigate the effects of a worldwide COVID-19 pandemic, the EE Advisory Committee discussed the impacts to EE investment, jobs and funding sources that might result from the health and safety precautions being put in place. Although initial indications were that utility programs were slowing down and that the EE industry was experiencing job losses, the industry appears to have adapted. Many utility programs, specifically energy audits, have shifted to virtual and jobs have rebounded.[21] Utility shutoff moratoria have helped to prevent disconnections, while the resulting arrearages paired with additional time spent at home have created an accelerated need for energy saving investments for vulnerable and newly vulnerable populations. The EE Roadmap recommendations outlined below present workforce development and job creation opportunities so needed during this economic downturn, as well as energy saving opportunities that can reduce energy burdens across the state.

PRIORITIZATION OF EE RECOMMENDATIONS

On June 4, 2020, a group of 70 participants—including EE Advisory Committee members, working group team members, and subject matter experts—attended the second EE Workshop. Originally intended to be an all-day in-person workshop, the format of the second EE workshop was changed to a half-day virtual meeting due to the unanticipated restrictions of the COVID-19 pandemic. While this created some difficulty in fully engaging the participants, they rose to the challenge and actively participated in prioritizing the recommendations and offering feedback.

During this second workshop, participants were asked to:

- Review the final recommendations produced by each working group
- Provide feedback to clarify and refine the recommendations
- Assess the recommendations based on their relative feasibility and impact
- Generate insights and data that will inform the final set of recommendations for the SC EE Roadmap report

Full write-ups of the EE recommendations and the feasibility/impact matrices are included in Appendix E and F. The recommendations of each working group as submitted in June 2020 by the working group are presented below. Some edits were applied to the recommendations for readability of this report. Please note that the final recommendations outlined in this report represent impactful and largely agreed upon ideas, although not all recommendations reflect consensus from all parties.

21. According to the SC Department of Commerce, unemployment in South Carolina exceeded 12% in April 2020, but has dropped to 6.6% in August 2020. It has not yet returned to pre-pandemic levels of 4% and below. AccelerateSC website, accessed 9/28/2020. https://accelerate.sc.gov.

List of Energy Efficiency Recommendations for South Carolina

Education and Workforce Development (EWD) Working Group

EWD Recommendation 1: Metric Development / Integrated Marketing

Develop education and workforce metrics and integrate marketing efforts. Educating consumers and the public as a whole on EE is a positive, but metrics and tracking processes must be developed to create change. All actions need to be judged on outcomes, even those as simple as increased website views. Messaging about EE should remain consistent, focusing on a few key points. EE marketing should be tailored to different audiences to increase the impact.

EWD Recommendation 2: Statewide Strategy for Coordinating EE Workforce Development Training and Education

Coordinate education/training efforts between K–12 educators, higher education institutions, and employers. Through partnerships, academic institutions and employers should work together to identify currently available EE education and training materials and develop a centralized resource list with assigned responsibility for collecting and updating this information. These partnerships can further help to identify high-growth energy efficiency career pathways and find funding opportunities to provide financial support for workforce training for job seekers, especially for underserved populations and small businesses.

Efficient Buildings (EB) Working Group

EB Recommendation 1: Commercial Building Labeling Pilot Study

Consider a pilot study to evaluate the potential of a standardized commercial building labeling program for commercial buildings greater than 50,000 square feet. The program would inform a potential purchaser/renter—early in the process—of an existing commercial building's cost to operate which includes historical (at least 12 months) energy use. The building's energy usage could be compiled using tools such as Energy Star Portfolio Manager and identified on a scale as compared to similar buildings and displayed on a standardized label. The pilot study may target an interested municipality in coordination with its electric/natural gas provider(s). It could also consider providing training to building buyers, renters, realtors, lenders, etc., focused on the benefits of energy efficiency associated with commercial buildings.

EB Recommendation 2: Sharing Energy Usage History

Encourage a building owner/property manager to provide up to 12 months (most recent) of energy usage (electric, gas) per buyer/renter request or provided in realty listing information. The sharing of 12 months of building energy use upon listing of a property for sale or rent would add transparency to the decision-making process for the consumer with regard to energy-efficiency and the burden of paying energy costs associated with that building. While it is believed that this information will guide the consumer to the most cost-effective purchase decision, in most cases this will also be the most energy-efficient decision as well and therefore will have a positive environmental impact as it makes energy-efficient buildings more appealing to potential buyers/renters.

EB Recommendation 3: Energy Efficient Appraisals

Increase awareness of green appraisal training opportunities and encourage SC appraisers to take this training. The appraisal board currently has continuing education available that teaches appraisers how to identify and quantify energy efficient features in appraisals. Having a coordinated understanding of the value of energy efficiency and opening the path of measuring and conveying that value through the appraisal and lending processes gives transparency to the process and greater accessibility to energy efficient buildings for all consumers. When consumers have appraisals that reflect the full value of buildings, they have all the information needed to select the most energy-efficient option available.

EB Recommendation 4: Adopt Updated Edition of the Commercial Energy Code

Update the 2009 version of the International Energy Conservation Code (IECC) in effect in South Carolina to the 2018 version of the IECC for commercial buildings. Updating the energy code for commercial buildings, which are among the highest users of energy in the state and among the most expensive to operate, reduces the energy burden for building owners and operators, and has a positive impact on the health and economic vitality of all South Carolinians.

Energy Equity / Energy Burden (EE/EB) Working Group

EE/EB Recommendation 1: Residential Labeling, Sticker Disclosures

Develop an energy labeling program/sticker disclosure pilot program for renters and purchasers of residential properties. The labels should be simple, categorical, and focus on monetary savings to help residents easily assess the energy use in their home. Being presented with energy efficiency information can lead to additional questions and opportunities for education on how home features and behaviors can affect the energy efficiency of residential dwellings. Since many of labels and disclosures already exist (e.g., the US DOE Home Energy Score), "champions" are needed to promote these disclosures, especially to home builders and owners of rental properties, as well as qualified energy assessors that can continue to provide valid energy efficiency assessments. Changes in legislation may be considered after a successful pilot is completed.

EE/EB Recommendation 2: One Stop Shop

Develop a one stop shop, a single application for low-income residents to apply for services such as Low-Income Home Energy Assistance Program (LIHEAP), Weatherization Assistance Program (WAP), and home rehabilitation programs. Having knowledge of these programs and making it easier to access these services can help low-income individuals identify and receive incentives for upgrading their home and reduce their energy consumption. Additionally, home assessments and assistance can be coordinated to minimize home visits and time away from work. Information on energy efficient practices and incentives can also be incorporated into this service to further reduce energy burdens.

EE/EB Recommendation 3: Weatherization Program Funding

Develop an alternative solution to overcome the issue that utility weatherization funding cannot be used for low-income home weatherization when DOE Weatherization Assistance Program (WAP) funding is used. Utility program funding counts as program income for Community Action

Agencies (CAAs)[22] and is subtracted from DOE funding if used. Because of this administrative barrier, the utility funding is not being used by the CAAs for weatherization assistance. To overcome this barrier, this group will look at alternatives for the utility funding. For example, the SC Association of Community Action Partnerships (SCACAP) could partner with the utility companies to administer the weatherization funds because SCACAP does not receive DOE funding and would not be subject to the same administrative constraint.

Finance Mechanisms (FM) Working Group

FM Recommendation 1: Evaluate the Expansion of On-Bill Financing Programs

Conduct a study to improve the effectiveness and accessibility of on-bill financing (OBF)—including on-bill repayment and on-bill tariffs—across multiple sectors in South Carolina. OBF seeks to reduce energy burdens for LMI households and provide an option for households with limited access to other energy efficiency financing options. SC Code of Laws §58-37-50 allows electric utilities to offer OBF of energy-efficient home improvements to their customers. Currently, OBF is offered for many residential customers by the electric cooperatives through the Help My House program. This recommendation would assess the feasibility of offering OBF through investor-owned and municipal utilities.

FM Recommendation 2: Assess the Feasibility, Costs, and Benefits of Establishing a South Carolina Green Bank

Conduct a study to assess the feasibility of a South Carolina-based "Green Bank." A Green Bank may have the potential to fund highly impactful projects to reduce GHG emissions while spurring economic growth. Some existing green banks have an explicit objective to serve disadvantaged communities and ensure a just transition. The Green Bank would issue loans, provide credit enhancements, and invest in clean energy and EE projects to benefit SC government agencies, businesses, congregations, communities, nonprofits, and consumers.

Nonprofit and Public Entities (NP/PE) Working Group

NP/PE Recommendation 1: Establish Goal to Promote EE in Public Buildings

Develop a successor goal to the 2008 "20 by 2020" energy use reduction goal. The new goal would require state agencies, public colleges and universities, and public-school districts to (1) develop a new energy conservation plan and (2) reduce their energy consumption by 10 percent by 2030, as compared to 2015 levels.[23]

22. Community Action Agencies are nonprofit organizations created by President Lyndon B. Johnson's signing of the Economic Opportunity Act of 1964. These agencies receive federal funds through Community Services Block Grants (CSBG) and other federal funding, like DOE's Weatherization Assistance Program (WAP), to provide low-income individuals/families with a mix of assistance, encouragement, and incentives to become self-sufficient. https://communityactionpartnership.com/about-us/.
23. SC Code Section 48-52-620 requires all state agencies, school districts, and public colleges and universities to develop energy conservation plans to reduce their energy consumption by one percent annually during fiscal years 2009–2013 and by a total of a 20% reduction in energy use by 2020, as compared to 2000 levels. See South Carolina Code of Laws, Title 48 – Environmental Protection and Conservation, Article 6 – State Government Energy Conservation, https://www.scstatehouse.gov/code/t48c052.php.

NP/PE Recommendation 2: Update Section 48-52-640 to Include Adopting LED and More Efficient Technology

Update current legislation to require the use of LED and other more efficient technologies as they become available. Section 48-52-640 contains provisions pertaining to the replacement of incandescent bulbs with compact fluorescent bulbs (CFLs). This recommendation would update the legislation to require the use of LED and other more efficient technologies as they become available.

NP/PE Recommendation 3: Allow Flexible Funding for EE projects

Provide public entities some flexibility in funding for energy efficiency upgrades. Update SC Code Section 48-52-630, a law that prohibits the reduction in a state agency's budget by the full amount of money saved through implementation of energy conservation measures, to include more specificity on the percentage of allowable reduction and allow a certain amount of funds to be earmarked for continued efficiency upgrades, enabling additional savings and strengthening the resilience of these public institutions.

NP/PE Recommendation 4: Separate Metering for New Construction / Major Renovations

Encourage public entities to install individual building meters when a public entity undergoes a major facility construction or renovation project. The working group recommends the installation of individual building meters when a public entity undergoes a major facility construction or renovation project to assist in efforts to conserve energy and water through more effective assessment and management strategies. This recommendation, if adopted, would mean that on a new construction or major renovation project a separate meter for each utility (e.g., electricity, natural gas, fuel oil, water, or energy products created through processing) shall be installed. Where possible, AMI (Automated Meter Infrastructure) meters should be installed.

NP/PE Recommendation 5: Standards for Leased Spaces

Develop guidelines and a checklist that public entities and nonprofit organizations can employ to inform their decisions about energy efficiency about prospective leased space before signing a lease. This recommendation is a reworked recommendation from the 2016 Energy Plan. It differs from the original recommendation in that it takes a preliminary step toward this goal, with the Energy Office developing the resources and providing guidance as a first step and gathering initial information as a pilot project.

Utility Programs (UP) Working Group

UP Recommendation 1: Commercial & Industrial Opt-Out and Self-Direct Study

Convene a study committee to examine commercial and industrial customers' current EE measures (both within and beyond current utility programs), potentially economically viable opportunities, and program needs or changes. The goal of the study is to identify opportunities to increase participation in utility programs and decrease energy consumption. A review of SC utility opt-out customers indicates there may be large groupings of customers, such as schools or grocery stores, that would choose to opt-in if simple changes are made to either how they are communicated

with or to the measures that are significant to their operations. While not currently available in SC, self-direct programs should be evaluated as an option.[24]

UP Recommendation 2: EE Resource Standard (EERS)

Convene a study committee to recommend an annual energy efficiency target for all investor-owned utilities, Santee Cooper, electric cooperatives, and gas local distribution companies. This is a modification of a 2016 Energy Plan recommendation, removing a specific percentage target, recognizing that the easiest and least-expensive measures (with shortest payback) have largely been incorporated into programs, and recognizing that different utilities have different baselines and different customer bases.

UP Recommendation 3: Utility Cost Effectiveness Testing Study

Convene a study committee to help determine if current cost effectiveness testing methodologies are adequately capturing the benefits of energy efficiency. The study would: 1) compare the pros and cons to the utility, the ratepayer, and the state as a whole of various cost effectiveness testing alternative methodologies; 2) recommend the most appropriate test(s), including the option of a customized test; and 3) determine if adopting a uniform test statewide would be advantageous.

UP Recommendation 4: Technical Reference Manual

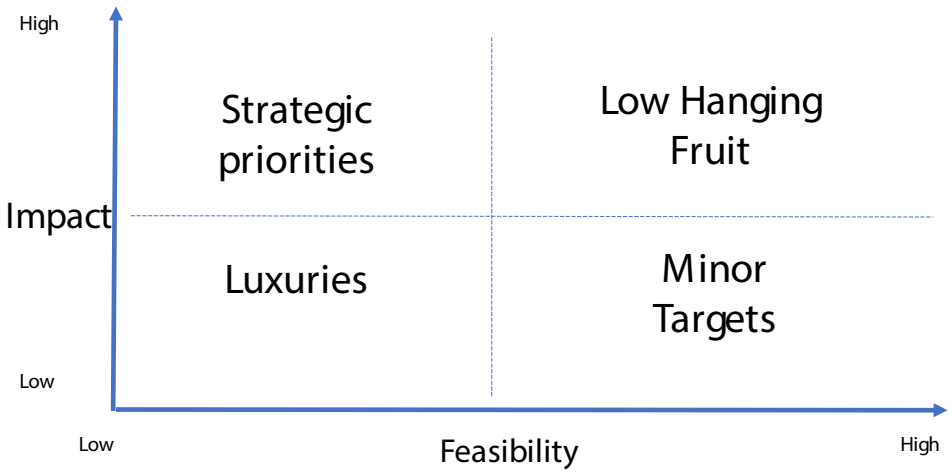
Develop and adopt a Technical Reference Manual (TRM) for South Carolina that will standardize savings metrics for defined energy efficiency measures. The TRM should contain agreed-upon, transparent, and consistent inputs and formulas for calculating electric savings, peak demand savings, and natural gas savings for commonly available EE measures. The TRM should streamline the design and evaluation of utility energy efficiency programs, reduce administrative and engineering costs associated with the defined measures, and encourage additional investment in energy efficiency. The measures included should have widely documented savings and be largely noncontroversial.

Feasibility/Impact Matrix

Following each presentation on the 20 recommendations from the working group team leads, the workshop participants used the virtual "annotate" feature on Zoom to prioritize each recommendation using a feasibility/impact matrix. Each recommendation was rated comparing its relative feasibility (Low to High) and impact (Low to High) according to the matrix in Figure 6, below.

24. According to ACEEE, self-direct programs let large industrial or commercial customers direct their DSM/EE tariff toward energy efficiency investments at their own facilities rather than putting them into a broader aggregated pool of funds. https://www.aceee.org/toolkit/2020/02/self-direct-programs-large-energy-users.

Figure 6. Feasibility/Impact Matrix for EE Recommendations



While the virtual format did not allow the group to work in teams to prioritize the recommendations relative to each other as originally planned, the online feedback was helpful in categorizing each recommendation. Based on the feedback from the stakeholders, the recommendations were placed into quadrants to help group the recommendations and identify trends in feasibility and impact:

Low hanging fruit—the highest impact recommendations with the highest feasibility.

- EWD 2: Statewide strategy for coordinating EE workforce development training and education
- EB 2: Sharing of Energy Usage History
- EB 3: Valuation of Energy Efficiency in Appraisals
- EEEB 1: Label, Sticker Disclosures
- EEEB 2: One Stop Shop
- EEEB 3: Weatherization Program Funding
- FM 1: Evaluate the Expansion of On-Bill Financing Programs
- FM 2: Assess the Feasibility, Costs, and Benefits of Establishing a SC Green Bank
- NPPE 1: Energy Use Reduction Goal
- NPPE 2: Lighting Update
- NPPE 5: EE Guidelines for Leased Space
- UP 1: C&I Opt-Out/Self-Direct Study
- UP 3: Cost-Effectiveness Testing Study

Strategic priorities—high impact recommendations that may be more difficult to implement or require other actions (including other recommendations) to occur. In addition, these may require larger investments or a longer timeframe to achieve results.

- EWD 1: Metric Development and Integrated Marketing
- EB 1: Commercial Building Labeling Pilot Study
- EB 4: Updated Edition of the Commercial Energy Code in South Carolina
- NPPE 3: Allow Flexible Funding for EE Projects
- UP 2: Energy Efficiency Resource Standard (EERS)

Minor targets—easy to realize recommendations that may not have the highest impact but may still be important for other reasons, including to accomplish the strategic priorities.

- NPPE 4: Require Separate Metering for New Construction/Major Renovations

Luxuries—recommendations with high cost or difficult to achieve, with likely little return.

- UP 4: Technical Reference Manual (TRM)

For a complete list of recommendations and the stakeholder feedback on impact/feasibility matrix, please see Appendix E and F.

EE Recommendation Prioritization Survey Results

While the matrices helped to inform relative feasibility/impact for each individual recommendation, additional feedback was needed to help prioritize the recommendations collectively. Following the June 2020 virtual workshop, a survey was sent out to participants that included the following questions. The prioritization results below are based on the 27 responses received.

Question 1: Please rank the twenty SC EE Recommendations from highest (1) to lowest (20) based on the recommendation's impact and feasibility (top 10 summarized below).

(1) EE/EB 2: One Stop Shop

(2) EWD 2: Statewide Strategy for Coordinating EE Workforce Development Training and Education

(3) EB 4: Updated Edition of the Commercial Energy Code

(4) EE/EB 3: Weatherization Program Funding

(5) NP/PE 1: Energy Use Reduction Goal

(6) FM 1: Evaluate the Expansion of On-Bill Financing Programs

(7) EB 2: Sharing Energy Usage History

(8) FM 2: Assess the Feasibility, Costs, and Benefits of Establishing a South Carolina Green Bank

(9) EWD 1: Metric Development/Integrated Marketing

(10) EB 1: Commercial Building Labeling Pilot Study

Question 2: Please rank the nine SC EE Recommendations that require ***legislative or regulatory approval*** from highest (1) to lowest (9) based on the recommendation's impact and feasibility (top five summarized below).

(1) EB 4: Updated Edition of the Commercial Energy Code

(2) NP/PE 1: Energy Use Reduction Goal

(3) NP/PE 3: Allow Flexible Funding for EE Projects

(4) NP/PE 2: Lighting Update

(5) UP 2: EE Resource Standard (EERS)

Question 3: Please rank the 11 SC EE Recommendations that ***DO NOT require legislative or regulatory approval*** from highest (1) to lowest (11) based on the recommendation's impact and feasibility (top five summarized below).

(1) EE/EB 2: One Stop Shop

(2) EWD 2: Statewide Strategy for Coordinating EE Workforce Development Training and Education

(3) EE/EB 3: Weatherization Program Funding

(4) EB 1: Commercial Building Labeling Pilot Study

(5) (tie) EB 2: Sharing Energy Usage History

(5) EE/EB 1: Residential Labeling, Sticker Disclosures

In addition to the prioritization questions, the survey asked respondents to indicate potential "champions" to direct the next steps to be taken for implementation of each recommendation. While not all stakeholders participated in the survey, the results guided the formulation and organization of the final recommendations for this report and formed the basis of the EE Roadmap recommendations outlined in the next section.

THE SOUTH CAROLINA ENERGY EFFICIENCY ROADMAP

The following summarizes the final roadmap towards a more impactful EE strategy for South Carolina. It should be noted that even with a set of shared goals, the diverse viewpoints represented in the EE roadmap process created healthy debate as the ideas and strategies were refined. Each recommendation may or may not represent consensus from all of the participants that were involved in the development of the recommendations. In addition, some of the participants acted only in an advisory and/or learning mode and were not able to accept or reject recommendations outside of a more formal arena. The ongoing discussions in and of themselves were valuable parts of the process and all parties should feel free to continue to air their views in the other arenas where EE matters are discussed and decided as the roadmap is implemented.

It is important to note that the recommendations reported here are not the only solutions to consider when advancing EE in South Carolina. Other potential solutions that were discussed within the working groups are included in the Appendix G and should continue to be evaluated as potential projects in the future. Other parties may have additional ideas and suggestions that can augment these recommendations or offer new solutions. All of these ideas are welcomed and encouraged.

EE Recommendation Focus Areas and Champions

The recommendations below span working groups, but they also differ in how they can be implemented. Some require little, or no, legislative action, while others may require an administrative rulemaking to be successful. The remaining set of recommendations will require some form of legislative, regulatory, or executive action. Based on the connections and interdependencies between the recommendations, the recommendations have been grouped together into eight focus areas as shown in Table 7. Within each focus area, the working groups identified key champions and necessary decision makers who may play a critical role in the implementation of the recommendations. It should be noted that where there is a specific entity or person listed, that entity or person volunteered to serve in the role of a champion. Where no specific entity was identified to champion the idea, the working group members included an organization that may be impacted by the recommendation. The listing of champions and impacted organizations is not exhaustive.

Table 7. South Carolina EE Focus Areas and Recommendations

Focus Area	Recommendation	Potential Champions[25]	Who will take action
Accessible Financing	Evaluate the expansion of on-bill financing programs (FM 1, p. 64)	Utilities, EE advocates, consumer/LMI advocacy groups	Energy Office (facilitate study committee), Utilities (program)
	Assess the feasibility, costs and benefits of establishing a South Carolina Green Bank (FM 2, p. 66)	Finance experts, utilities, EE advocates, consumer advocacy groups, LMI advocates, efficiency contractors, clean energy developers	Energy Office (facilitate study committee)
Building Codes and Labeling	Update version of commercial energy code (EB 4, p. 59)	**AIA SC**	Possible legislative action needed
	Commence a commercial building labeling pilot/study (EB 1, p. 55)	Energy Office, NASEO	Utilities
	Develop a residential labeling/ sticker disclosure pilot (EE/EB 1, p. 60)	**Sustaining Way** Energy Office, realtors, homebuilders, SEEA, affordable housing advocates	Possible legislative action may be needed after the pilot is complete
Enhanced Data Tracking	Share energy usage history for commercial properties (EB 2, p. 56)	Utilities, realtors	Realtors, landlords, utilities
	Adopt a Technical Reference Manual to standardize savings metrics for all utility EE measures (UP 4, p. 80)	Utilities, consumer advocacy groups and EE/DSM stakeholders, a cross-section of residential and C&I customers, EM&V experts	Public Service Commission of SC approval will be required

25. All organizations indicated in bold volunteered to serve as champions during the stakeholder/working group discussions.

Focus Area	Recommendation	Potential Champions[25]	Who will take action
Legislative Action	Re-establish the state's energy conservation goals for state agencies, public colleges and universities and public-school districts (Section 48-52-620) (NP/PE 1, p. 68)	**AIA SC** SC conservation groups	SC General Assembly
	Update Section 48-52-640 to include LEDs as lighting replacement requirement (NP/PE 2, p. 69)	**AIA SC** SC conservation groups	SC General Assembly
	Establish an energy efficiency resource standard (UP 2, p. 76)	Large energy users group, consumer advocacy groups, SC conservation groups, utilities	SC General Assembly
Public Entities	Enable public entities to have flexibility in funding EE upgrades (NP/PE 3, p. 70)	SC conservation groups	SC General Assembly
	Install individual meters for new construction/major renovation of public buildings (NP/PE 4, p. 71)	**AIA SC**	Energy Office (educational support), SC General Assembly
	Develop energy conservation guidelines for public entities to consider when leasing new space (NP/PE 5, p. 73)	Energy Office, NASEO, SEEA	Energy Office
Studies	Commence a commercial and industrial customer opt-out study (UP 1, p. 74)	Utilities, the SC manufacturers, the large energy users, parties who routinely engage in utility EE/DSM dockets	Public Service Commission
	Convene a study committee to evaluate and update utility cost-effectiveness testing methodologies (UP 3, p. 79)	Utilities, consumer advocates, and parties who routinely engage in utility EE/DSM dockets	Public Service Commission

Focus Area	Recommendation	Potential Champions[25]	Who will take action
Weatherization Programs	Institute a "one stop shop" for all low-income residential weatherization programs (EE/EB 2, p. 62)	**SC DHEC** SC Association of Community Action Partnerships, SC Office of Economic Opportunity, SC Dept. of Administration, SC Housing, Municipal Association	Energy Office
	Evaluate the alternatives to optimize weatherization funding from federal and utility sources (EE/EB 3, p. 63)	**Sustaining Way** SC Association of Community Action Partnerships, Office of Economic Opportunity, utilities	US Dept. of Energy
Workforce Development, Training, and Education	Coordinate a statewide strategy for EE workforce development education and training (EWD 1, p. 52)	**Greenville Tech** Energy Office, SC Dept of Education, SC Dept of Employment and Workforce, SC State Technical College System, SC Association of Community Action Programs, SC Commission on Higher Education	Community colleges, universities, K–12 schools, employers
	Develop statewide metrics for tracking and communicating EE goals and outcomes (EWD 2, p. 54)	SC Energy Efficiency Advisory Committee	Academia, utilities, community organizations
	Increase awareness of EE training options for real estate appraisers (EB 3, p. 57)	SC Appraisal Board, Energy Office	Appraisers, community colleges

CONCLUSIONS AND NEXT STEPS

The SC EE Roadmap is neither a starting point nor a destination. It is a framework for mapping out the potential pathways towards greater investment in EE in order to maximize its full potential. The recommendations set out in this report represent the work of over 70 EE stakeholders throughout the state and should be used to inform legislative, regulatory, and programmatic change. As we continue to work together to achieve our shared objectives, additional discussions should occur around new ideas that can augment these recommendations or offer new solutions. It is important that the state continue to innovate and encourage ideas from all stakeholders as we all work together to help the state achieve any current or future economic and environmental goals.

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APPENDIX A. ENERGY EFFICIENCY RECOMMENDATIONS FROM THE 2016 SC STATE ENERGY PLAN[26]

Working Group		Recommendation	Challenge(s)	Approach(es)	Status
Efficient Building	1	Recommendation for Changing the Review and Adoption Process of the Energy Code in South Carolina	Statutory requirement of 2006 IECC for all new and renovated buildings. Code removed from normal adoption process.	Move the amendment and adoption of the International Energy Conservation Code (IECC) back to the Building Codes Council (BCC).	Requires Legislative/ Regulatory Action
	2	Building Energy Efficiency	Need to maximize efficiencies in South Carolina city buildings.	Mimic Envision Charlotte to focus on waste, water, air, and energy.	Active
	3	Trade Ally Certification to Maximize Efficiency Gains	Need to maximize energy efficiency savings achieved from installed efficiency measures.	Develop a South Carolina trade-ally certification process.	Active
	4	Building Energy Labeling	Lack of information in real estate markets on building energy use.	Identify and propose model energy-labeling approaches.	Active
	5	Workforce Development	Difficulty finding local qualified contractors. Vulnerable communities need new job opportunities.	Explore ways to integrate workforce development into low-income EE programs.	Active

26. Office of Regulatory Staff, "Energy in Action: South Carolina State Energy Plan," 2016. http://www.energy.sc.gov/files/Energy%20Plan%2003.02.2018.pdf.

Working Group		Recommendation	Challenge(s)	Approach(es)	Status
Energy Equity/Energy Burden	1	Converted EE Manufactured Housing Tax Credit to Direct Rebate	Low participation in current tax credit program.	Convert EE manufactured housing tax credit to direct rebate.	Requires Legislative/ Regulatory Action
	2	Environmental Justice Assessment	Energy and transportation decisions may inadvertently affect environmental justice communities. Limited coordination among multiple agencies.	Establish a statewide environmental justice advisory panel that will serve as a "think tank" and resource center for environmental justice issues.	Active
	3	Multifamily Housing EE	Multifamily communities are underserved by existing energy efficiency programs.	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.	Requires Legislative/ Regulatory Action
	4	Enhanced Energy Efficiency Incentives in Rental and Public Housing Projects	EE initiatives in rental and public housing are restricted by existing funding.	Examine opportunities to provide incentives and resources to local government and NGOs for rental and public housing EE projects.	Requires Legislative/ Regulatory Action
	5	Enhancing Inter-Organization Collaboration through a Weatherization Assistance "One-Stop Shop"	Weatherization Assistance Programs (WAP) may face barriers to implementation of key projects due to unforeseen circumstances.	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.	Active

Working Group		Recommendation	Challenge(s)	Approach(es)	Status
Utility Programs	1	Opt Out for Industrial Customers	Limited awareness of industrial EE programs. No system in place to verify opted-out industrial customers' EE measures.	Convene a study committee to examine industrial customers' EE needs.	Active
	2	Energy Efficiency Portfolio Standards	No energy savings targets in SC.	Propose legislation to set a preliminary target of 1.5% energy savings for all utilities.	Requires Legislative/ Regulatory Action
	3	Natural Gas and Propane Efficiency Programs	Lack of clarity regarding the potential for demand-side efficiency programs to reduce natural gas and propane consumption.	Require efficiency potential studies for natural gas and propane at reasonable intervals and pursue all cost-effective efficiency options.	Complete

Working Group		Recommendation	Challenge(s)	Approach(es)	Status
Financing Mechanisms	1	Create a State Tax Credit for Energy Efficiency for Residential Homeowners	Minimal state incentives exist for homeowners or landlords for EE upgrades.	Adopt state tax credits for EE upgrades for existing residences.	Requires Legislative/ Regulatory Action
	2	Encourage On-Bill Financing Programs	Consumer interest rates on the loans are capped at 4% above the one-year Treasury rate.	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.	Requires Legislative/ Regulatory Action
	3	Public Benefits Fund	SC lacks a revenue stream to advance EE policy goals.	Convene a stakeholder working group to explore best practices and the possibility of rolling out a PBF.	Requires Legislative/ Regulatory Action
	4	EE Use/Potential Study	Utilities' DSM plans are based on outdated and inadequate EE potential studies.	Discuss best practices for EE potential studies and require new potential studies at least once every 3 years.	Complete
	5	Funding for Low-Income Residential Energy Efficiency Upgrades	Lack of consistent, financing capital for residential energy efficiency programs in low- to moderate-income communities.	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.	Requires Legislative/ Regulatory Action
	6	Property-Assessed Clean Energy (PACE) Programs	Utility customers are often challenged or unable to access EE financing.	Propose commercial and residential PACE legislation and provide implementation guidance to local governments.	Requires Legislative/ Regulatory Action

Working Group		Recommendation	Challenge(s)	Approach(es)	Status
Nonprofit and Public Entities	1	Convene the Green Purchasing Taskforce	State entities are unable to purchase energy-efficient items if they are not on state contract.	Convene the green purchasing taskforce and add vendors of energy-efficient items to the state contract.	Pending
	2	Incentive for State Entities	State schools, government and public buildings, or state entities are not eligible for tax incentives or any kind of rebates for EE projects/ installations.	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.	Requires Legislative/ Regulatory Action
	3	Energy Audits	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.	SFAA should approve a policy to allow OSE to prequalify firms.	Requires Legislative/ Regulatory Action
	4	Recommendation for Minimum Energy Requirements for Leased Facilities	Many state entities operate in leased space, which may or may not take into account energy-related operating costs.	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%.	Pending
	5	Energy and Water Conservation through More Effective Measurement and Analysis of Use	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.	Amend the Energy Independence and Sustainable Construction Act to require that separate meters are installed when a building undergoes major facility construction/ renovation.	Requires Legislative/ Regulatory Action

APPENDIX B. SOUTH CAROLINA ENERGY EFFICIENCY STAKEHOLDER SURVEY RESULTS (N=25)

The following are the actual responses from a stakeholder survey distributed in November 2019. They have not been modified from their original format.

How would you describe the current successes of energy efficiency in South Carolina?

High grid power prices have led to several energy efficiency investments

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)

SC's process for SC Guaranteed Energy, Water and Wastewater Conservation Services projects is a good method for implementing energy saving performance contracts

EE had been gaining momentum and I think that can be attributed to support and encouragement from agencies such as the Energy Office

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.

Grants although small are good

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.

Adaption of energy saving lighting strategies in some school districts, employing control strategies to reduce energy expenditures and some 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

Successful EE programs, equipment improvements (Energy Star Ratings), etc. can be realized by recognizing the flatlining of utility Load Forecast data

Acknowledgement that SC needs to consider and improve energy efficiency

How would you describe the current challenges of energy efficiency in South Carolina?

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.

Because some issues cannot be negotiated to common agreement, this process is limited to solve some of the stickier issues such as building energy codes which is locked in at IECC 2009.

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. IOU websites can be intimidating to navigate and it is difficult for citizens and small business owners to gather all available resources into one package (example REAP grant funding + IOU rebates).

SC has some of the worst old housing stock plus a high percentage of manufactured housing that is difficult to retrofit.

Those who live in the least efficient homes are often the ones who have the least ability to invest in EE measures

Utilities have shown leadership through EE education and incentive/rebate programs but this are limited since we cannot expect our customers to support the common good through rate basing these programs.

Lack of funding

Low cost of energy

Difficult to change culture

Lack of knowledge about new products

Current policy discussions about future energy policy often overlook the fundamental importance of energy efficiency and therefore threaten to undermine the policies that have made EE succeed.

Few incentives for landlords to renovate homes for renters

Working mainly with entities that have limited resources

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. Also, a lot of the tax incentives that are available for residents and businesses are not available to K-12 districts so it is a challenge for districts to employ alternative energy strategies (i.e. solar).

State has faced challenges actually implementing the Energy Plan initiatives

EE oftentimes takes a back seat to clean energy development like solar.

Lack of coordination among the groups/coalition for a consistent message and advancement of the issue

The challenge is how to continue EE efforts, while recognizing the increased costs of new measures will be more difficult to justify.

*What *opportunities* do you perceive currently exist with respect to South Carolina policies that encourage energy efficiency?*

The Energy Plan has not been fully utilized

The PSC has some leverage to encourage EE from IOUs

Better utilization of our Office's Master Lease program could produce more EE results

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

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.

Make resources MUCH easier to navigate

The real opportunity lies with new construction

Require LEED Gold or Platinum instead of Silver

Give energy savings dollars back to State govt entities so that they can fund more projects

Require State agencies to reduce energy use by even more than they have and have it third party verified

Electric Cooperatives' Pay As You Save (PAYS) and similar programs

Enhanced public education

From a K-12 perspective the state has provided loan programs and grants to assist in funding capital projects that implement energy measures. The state energy office also has tools to help that are at no cost to districts (i.e. energy audits). But few districts are taking advantage of these.

Update commercial and residential building energy codes

Leverage Dominion's acquisition of SCE&G to increase utility spending on EE programs (similar to VA)

There are small successes (like Help My House) that can/should be scaled

Technological advancements should enable more efficient off-peak use of energy

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

*What *barriers* do you perceive with respect to additional energy efficiency?*

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

The need for unanimous agreement on solutions

Lack of motivation (EE gets pushed to back burner)

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.).

Builders have no incentive to maximize energy efficiency beyond code requirements since the don't pay the utility bills

In general citizenry undervalues energy in the United States. We pay $200 a month for our cell phones yet complain about a $100 electric or gas bill (yet EE is not a priority)

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.

A lack of regulatory support for keeping EE profitable for utilities (and regulatory bottlenecks in general)

Funding to bring older homes up to energy efficient code. We have the volunteers, but not the funding. The need is greater than our capacity

Affordability is the biggest barrier.

What would you see the need to do in order to catalyze forward movement in energy efficiency in South Carolina?

Funding and leads by the utilities, in particular the coops need to improve programs in rural areas.

We believe that greater funding/financing opportunities and products should exist to initiate energy efficiency projects in a more comprehensive manner.

One-in-five SC families live in a manufactured home. Our state has outdated ordinances which either prohibit or hinder the replacement of an old manufactured home with a new, energy efficient one. If these jurisdictions would update some of these decades-old ordinances, they could allow homeowners to replace some of the oldest, least efficient homes in these residential zones.

Better education

Tax breaks / tax credits

Increase available grants from the state

Leadership at the executive and legislative branches.

Legislative priority on long term energy and operational savings on state projects (life cycle versus first cost) and adoption of current version of energy codes.

A dramatic incentive (such as more incentive for HVAC replacement) as well as a very visible advocate to bridge the fear and intimidation gap.

A state EE target may be what it takes to achieve the dramatic incentive combined with regulatory change.

EE needs to become part consciousness of the average citizen, not just among advocates and EE wonks. Education needs to start early.

Incentivize the energy companies to save energy

Clearly define the benefits of EE, get regulators on board with those benefits, and find the ways that utilities, co-ops, and interest groups can work together on EE even if they can't work together in any other arena.

Remove energy audits from the realm of investor-owned utilities who have no vested interest in helping families use less energy. They hope for the opposite.

Establish policies encouraging and investing in weatherization for low-income, renters, and other hard-to-reach customers as well as rehabbing senior's residences to improve energy efficiency and keep them in their homes.

For K-12 districts, a funding vehicle for capital projects that would allow all districts to focus attention on projects that could save energy.

Investigate adding carbon pricing policies

Revise legislation for energy conservation plans to require reducing energy use for all state agencies and K-12 however, provide funding and incentives to encourage participation; continue collecting energy data from public agencies

Offer annual or biannual training sessions to assist agencies in develop new or revised energy plans

Find more affordable ways to build energy efficient homes and have more inspectors locally to reduce cost of certification.

APPENDIX C. LIST OF PARTICIPATING ORGANIZATIONS

Addison Homes

American Council for an Energy Efficient Economy (ACEEE)

American Institute of Architecture (AIA)

American Association of Retired Persons (AARP)

Appleseed Legal Justice Center

Building Industry Association

Business Development Corporation

Carolina Community Actions

Chesterfield/Marlboro Economic Opportunity Council

City of Charleston

City of Columbia

Clemson University

Conservation Voters South Carolina

Conservatives for Clean Energy

Dominion Energy

Duke Energy

EDENS

Electric Cooperatives of SC

Environmental and Energy Study Institute

Facility Services Group

Fort Jackson

Greenville Technical College

Habitat for Humanity

Kimberly Clark

Manufactured Housing Institute

Medical University of SC (MUSC)

Municipal Association of SC

New Alpha Community Development Corporation

Piedmont NG

Priority Solutions

Richland County School District 1

Santee Cooper

Savannah River National Lab (SRNL)

Schneider

Shealy Electric

Sierra Club

SC Association of Community Action Partnerships

SC Coastal Conservation League

SC Department of Agriculture

SC Department of Commerce

SC Department of Consumer Affairs

SC Department of Health and Environmental Control (EJ Hub)

SC Energy Users Committee

SC Green Building Council

SC Home Builders Association

SC Interfaith Power & Light (SCIPL)

SC Office of Economic Opportunity

SC Office of Regulatory Staff (Regulatory)

SC Office of Regulatory Staff (State Energy)

SC Small Business Chamber of Commerce

SC Small Business Development Center

SC State Housing Finance and Development Authority

SC Treasurer's Office

Southeast Energy Efficiency Alliance (SEEA)

Southeast Rural Community Assistance Project, Inc.

Southern Alliance for Clean Energy (SACE)

Southern Environmental Law Center

Spartanburg Water

Sustainability Institute (SC)

TRANE

Upstate Forever

Vermont Energy Investment Corporation (VEIC)

Winthrop University

APPENDIX D. FINAL RECOMMENDATION EVALUATION CRITERIA

Objective: Develop a standardized process for prioritizing solutions that offer the greatest potential with respect to energy efficiency in South Carolina.

Evaluation Criteria

Summary Information

One sentence summary of the recommended strategy.

One to two sentence summary of the existing barriers that are addressed if this recommendation were implemented

Which of the three shared objectives does the recommendation address?

Is this a continuation of a recommendation from the 2016 Energy Plan or is it a new recommendation?

Basic Information

Is this a statewide or local initiative?

What is the target sector (residential / commercial / industrial / all)? Please explain if this is an intermediary target and if so, what is the ultimate target?

What is the lead advocating organization? What is the lead implementing organization?

Does this already exist in some form in South Carolina? Is it an expansion of an existing policy or program or a new creation?

Prerequisites

Is legislative action required? Define required action.

is SC Public Service Commission action required? Define required action.

Is another external entity's action required? Define required action.

Does another working group's recommendation need to occur prior to implementation? Which one(s)?

Does this recommendation need to occur prior to another's implementation? Which one(s)?

Timeline

What is a reasonable start date?

What is a reasonable completion date?

Impact Analysis

Environmental: Potential environmental benefits (positive and negative) including GHG emission reductions, health implications, contributions to resiliency or other environmental impacts (High/Medium/Low)

Economic: Potential impact on the state-wide economy including utility rates, business development, workforce development and other economic impacts. (High/Medium/Low)

Equity: How well does the recommendation address equity: "the fair distribution of the burdens and benefits from energy production and consumption." Please include other equity concerns as appropriate. (Positive / Negative / Neutral)

Implementation

Ease of Implementation (High/Medium/Low)

Speed of Implementation (High/Medium/Low)

Funding

How likely is this initiative to get funded (High/Medium/Low)?

Level of funding needed (High/Medium/Low)

Identify the funding source(s) (if known)

What are the upfront costs (and who pays)?

What are the ongoing costs (and who pays)?

What are the additional resources needed (staff, etc)

APPENDIX E. THE SC ENERGY EFFICIENCY ROADMAP RECOMMENDATIONS

The recommendations of each working group as submitted by the working group in June 2020 are presented below. Some edits were applied to the recommendations for readability of this report. Please note that the final recommendations outlined in this report represent impactful and largely agreed upon ideas, although not all recommendations reflect consensus from all parties.

Education and Workforce Development (EWD) Working Group

EWD Recommendation 1: Metric Development / Integrated Marketing

Summary

Develop education and workforce metrics and integrate marketing efforts. Educating consumers and the public as a whole on EE is a positive, but metrics and tracking processes must be developed to create change. All actions need to be judged on outcomes, even those as simple as increased website views. Messaging about EE should remain consistent, focusing on a few key points. EE marketing should be tailored to different audiences to increase the impact.

Background

Conversations regarding EE often revolve around "educating" the public on opportunities, funding, resources, etc. While educating the public is beneficial, cultivating changes in consumer behavior requires a well-developed process with tangible, actionable and realistic metrics. This process is akin to an integrated marketing strategy to create awareness for available programs/services.

The scale of the metrics and public awareness campaign should be solely dependent on the topic. The larger the outreach audience (e.g. the state as a whole), the simpler the message and metrics need to be. The smaller the audience (e.g. one neighborhood) the more intricate the metrics and message can become. Here are two examples: State Campaign https://www.scprt.com/tourism/logos-and-usage. A neighborhood: http://historicelmwoodpark.org/

Specific actions for implementation and key participants

The following are a number of pieces to consider for an integrated marketing strategy. Each action taken should be followed by a measurement of consumer activities such as purchases, views or clicks. These metrics should tie back into the desired outcomes slowly guiding organization activities.

- Event Sponsorships/Public Speaking Engagements
    - Black expos (Columbia/Charleston)
    - Home & garden shows
    - Senior citizen communities
    - Homeowners associations
    - Customer assistance presentations

- Educational Resources
    - Energy Saver tool (SC Energy Office): https://energysaver.sc.gov/
    - Home energy check-up (utilities)
    - Online energy tips & quick projects guide: www.DominionEnergySC.com/EnergyTips
    - Hosting small seminars at events noted in first section
    - Management of high bill complaints
- Metrics
    - Google analytics – Tracking website visits and pinpointing pages customers visit, online tools accessed, downloads and monitoring monthly changes to these metrics.
    - Marketing/advertising with specific calls to action that can be measured such as vanity URLs/phone numbers.
    - Metrics/monitoring of participation levels in DSM/EE programs.
    - Customer satisfaction surveys
    - Bill inserts/bill messages

Alignment with other recommendations / objectives and prerequisites

This recommendation helps fulfill EE Roadmap Objective 1 through the expanded education of energy consumers and energy efficiency benefits. Key steps include:

- Develop and segment target audiences, starting with the basic residential / commercial / industrial, and draw out the different audiences.
    - For example: Residential-> Owners/Renter/Apartments-> New/Old-> Retirees, Family, Single occupant
- Within each group, decide how each would prefer to be engaged and develop a metric that would track actions following engagement.
    - For example: targeting homeowners by visiting larger neighborhood meeting, leaving pamphlet with website information.
- Track website traffic for one week after.

This process of Developing Metrics-Taking Action-Reviewing Outcomes should be repeated with every step taken, crafting a more effective and outcome drive organization.

EWD Recommendation 2: Statewide Strategy for Coordinating EE Workforce Development Training and Education

Summary

Coordinate education/training efforts between K–12 educators, higher education institutions, and employers. Through partnerships, academic institutions and employers should work together to identify currently available EE education and training materials and develop a centralized resource list with assigned responsibility for collecting and updating this information. These partnerships can further help to identify high-growth energy efficiency career pathways and find funding opportunities to provide financial support for workforce training for job seekers, especially for underserved populations and small businesses.

Background

Past training efforts resulted in participants who were unable to obtain employment following their training because there was little demand for services addressed by the training. By involving employers in the implementation of education and training efforts, this recommendation strives to focus on workforce development where there is a market in place for services and job opportunities available for trainees. There is no current comprehensive resource list available of statewide energy efficiency training and education opportunities, and there is currently no coordinated effort to promote related career pathways, although there are some efforts already in place for related careers such as HVAC technicians. There is a need to ensure career paths at all levels including entry level positions that can help create employment opportunities for low-income individuals in South Carolina. In this way, the energy efficiency workforce development initiative can create many opportunities, helping reduce the state's energy footprint while simultaneously helping its human capital recover from the unemployment crises caused by the COVID 19 pandemic and obtain sustainable, living wage, employment.

There are some related training/education efforts already happening in SC (such as weatherization and solar technician training), and there are already some funding mechanisms available (such as Workforce Pathways Grant funding for tuition costs for high-growth job training). Weatherization training is extremely expensive at present, with very few vendors dominating the field. There may be opportunities to expand upon the existing landscape of credentialing programs in SC and provide an alternative certification at a reduced cost by partnering with South Carolina Association of Community Action Programs that are already providing holistic training from a Weatherization Program perspective.

Specific actions for implementation and key participants

- Identify currently available EE education/training in a centralized resource list with assigned responsibility for collecting and updating this information (2020–2021 academic school year)
- Promote partnerships between K–12 educators, higher education institutions, and employers that identify high-growth energy efficiency career pathways (2020-2021 academic school year)
- Find funding opportunities to provide funding for workforce training to job seekers, especially for underserved populations and small businesses (FY21)

The key participants for the implementation of this recommendation would be the SC Department of Energy, SC Department of Education, SC Department of Employment and Workforce, SC State Technical College System, SC Association of Community Action Programs, SC Commission on Higher Education, and employer networks in EE-related sectors. It is unknown at this time who the lead implementing organization would be. Service providers, trade employers, and educators will need to participate in this effort. Coordination of current training/education should not be difficult to implement if staff can be available to undertake these responsibilities. Speed of implementation may take some time since buy-in will be needed from employers and educators may need to develop new training programs.

Alignment with other recommendations/objectives and prerequisites

This is a modification of recommendations in the 2016 Energy Plan to 1) develop SC trade ally certifications with training developed and provided by the state and 2) integrate workforce development and EE efforts through an environmental justice lens. This recommendation is aligned with all three EE Roadmap Objectives.

Efficient Buildings (EB) Working Group

EB Recommendation 1: Commercial Building Labeling Pilot Study

Summary

Consider a pilot study to evaluate the potential of a standardized commercial building labeling program for commercial buildings greater than 50,000 square feet. The program would inform a potential purchaser/renter—early in the process—of an existing commercial building's cost to operate which includes historical (at least 12 months) energy use. The building's energy usage could be compiled using tools such as Energy Star Portfolio Manager and identified on a scale as compared to similar buildings and displayed on a standardized label. The pilot study may target an interested municipality in coordination with its electric/natural gas provider(s). It could also consider providing training to building buyers, renters, realtors, lenders, etc., focused on the benefits of energy efficiency associated with commercial buildings.

Background

Currently, South Carolina does not have a commercial building labeling program. Hence, this program would encounter similar barriers associated with launching any new program. This recommendation proposes to initially consider a pilot study program at the local level to better define major obstacles and foster relationship with key stakeholder to determine if the program is scalable to the statewide level. This recommendation targets the commercial energy sector.

Various online resources are available such as the US Environmental Protection Agency's ENERGY STAR program https://www.energystar.gov/buildings/facility-owners-and-managers/existing-buildings/learn-benefits and the US Department of Energy (DOE) Building Energy Asset Score program https://www.energy.gov/eere/buildings/building-energy-asset-score. According to its website, the DOE Building Energy Asset Score is a national standardized tool that may store user-provided data and generate an asset score and system evaluation of the envelope, mechanical and electrical systems for commercial buildings. The tool could also identify cost-effective upgrade opportunities and help building owners gain insight into the energy efficiency potential

of their buildings. The Asset Score can be used for new construction projects and existing buildings with the following commercial and residential uses:

Office	Library
Retail	Lodging
Multifamily	Medical office
Assisted living	Parking garage
City hall	Police station
Community center	Post office
Courthouse	Senior center
Educational (including K-12 schools)	Warehouse (unrefrigerated)
House of worship	Mixed-use (of the above types)

Specific actions for implementation and key participants

The Energy Office could be the lead implementor of this recommendation, with key participants including local entities, local real-estate board/association, lenders and service providers. The ease and speed of implementation is highly dependent upon a voluntary entity, acceptance of local real-estate board/association, and the ability of service providers to release historical energy information.

Alignment with other recommendations/objectives and prerequisites

This pilot study meets EE Roadmap Objective 1 by enhancing the visibility of energy usage in commercial buildings and ultimately better inform potential building purchasers/renters (as well as realtors and lenders) of energy efficiency impacts. It meets Objective 2 by providing energy use comparisons of similar buildings which may reveal cost-effective energy efficiency investments prior to and/or after change in ownership/rental status of the building. It also meets Objective 3 through the introduction of greater transparency of energy usage and cost in commercial buildings—which are large energy users—may lead to reduced energy usage and/or cost-effective investments. These outcomes may lower a service provider's resource requirements which ultimately reduces the energy burden on all ratepayer classes.

This recommendation has no prerequisites, but it is similar to a recommendation provided by the Energy Equity/Energy Burden working group that is proposing a similar labeling approach for residential buildings (EE/EB 1).

EB Recommendation 2: Sharing Energy Usage History

Summary

Encourage a building owner/property manager to provide up to 12 months (most recent) of energy usage (electric, gas) per buyer/renter request or provided in realty listing information. The sharing of 12-months of building energy use upon listing of a property for sale or rent would add transparency to the decision-making process for the consumer with regard to energy-efficiency and the burden of paying energy costs associated with that building. While it is believed that

this information will guide the consumer to the most cost-effective purchase decision, in most cases this will also be the most energy-efficient decision as well and therefore will have a positive environmental impact as it makes energy-efficient buildings more appealing to potential buyers/renters.

Background

In the United States, many states have disclosure policies which require building owners to disclose their building's energy consumption to prospective buyers or lessees.[27] These laws improve a purchaser's awareness of the energy use of homes and buildings, which can have a significant impact on its economic value and can make comparison between property values more transparent. Currently residential and commercial properties in South Carolina are sold without a requirement to disclose energy use information.

Specific actions for implementation and key participants

This recommendation will focus on requiring the building owner to provide up to 12-months of usage history per buyer/renter request or in listing information. Implementation will require the state to work with REALTORS Association to get them on-board with sharing this type of information in listing documents as a normal procedure. In addition, educational materials must be developed to help make the public aware that they can ask for this information when purchasing or renting a building and why that information should be important to them (i.e. recurring operational costs of that space or building).

Alignment with other recommendations/objectives and prerequisites

This recommendation can help increase energy efficiency in South Carolina by adding transparency to the purchasing or renting process in regard to the energy use of the buildings being considered by the consumer. Having this knowledge may not necessarily lead the purchaser to the most energy-efficient choice, but it will help them factor the cost into their decision more easily.

EB Recommendation 3: Energy Efficient Appraisals

Summary: Increase awareness of green appraisal training opportunities and encourage SC appraisers to take this training. The appraisal board currently has continuing education available that teaches appraisers how to identify and quantify energy efficient features in appraisals. Having a coordinated understanding of the value of energy efficiency and opening the path of measuring and conveying that value through the appraisal and lending processes gives transparency to the process and greater accessibility to energy efficient buildings for all consumers. When consumers have appraisals that reflect the full value of buildings, they have all the information needed to select the most energy-efficient option available.

Background

The need for building appraisals that take energy efficiency into account is an important step in the full realization of the value of energy efficient buildings. Without that value being accounted for by appraisers, the overall need to include those efficiencies in initial construction or in

27. ACEEE State and Local Policy Database, Building Energy Disclosure, accessed December 22, 2020. https://database.aceee.org/state/building-energy-disclosure.

renovations loses importance and could be left out altogether. By including the value of energy efficiency in buildings, it becomes a much more important factor for the life of the building and is much more likely to be included in initial construction and/or renovations.

Training courses and a certification in energy efficiency in both commercial and residential buildings is available through the national and state appraisal boards. Getting the certification(s) is optional and costs money and time to achieve. Because of these factors and a lack of demand for the certification(s) from lenders and the public, there are very few appraisers in our state that have these credentials or that have taken the courses.

The challenge is three-fold. First, there are not many appraisers in South Carolina who have taken the available training to be able to adequately valuate energy efficiency of buildings in their appraisals. Second, the general public is not aware that appraisers could have this training/certification and therefore do not know to ask for an appraiser with these credentials, if they were so inclined to do so. Third, because of the first and second points, lenders are not inclined to work with energy efficient credentialed appraisers.

This recommendation is all about the value of buildings as it pertains to energy efficiency. In order for a builder/architect/owner to implement energy efficient construction or remodeling in their buildings, they need to see tangible value in doing so. Having appraisers that recognize and account for the value that energy-efficient measures add to the functionality and cost-effectiveness of buildings, builders and owners are more likely to incorporate them into construction and renovation.

Specific actions for implementation and key participants

The Energy Office (or implementing group) would need to work with the SC or National Appraisal Board to promote and bring awareness to their existing training. This group would bring together the necessary stakeholders (Appraisal Boards and lending institutions) to get their buy-in to the need for more green certified appraisers, to use more green certified appraisers and help get more appraisers to take the green appraiser certification classes that are currently available.

Since the classes already exist and there is an organization able to offer the classes, the key to implementation of this recommendation is coordination between the stakeholders. The Appraisal Boards, as well as lending institutions that find value in having green-certified appraisers, could promote the availability of those classes to appraisers.

Alignment with other recommendations/objectives and prerequisites

Some of the promotion of these classes to appraisers and the importance of having appraisals performed by green-certified appraisers to lenders and to the public could fall to our Education and Workforce Development working group or could be handled in the implementation phases by the SC Energy Office.

EB Recommendation 4: Adopt Updated Edition of the Commercial Energy Code

Summary

Update the 2009 version of the International Energy Conservation Code (IECC) in effect in South Carolina to the 2018 version of the IECC for commercial buildings. Updating the energy code for commercial buildings, which are among the highest users of energy in the state and among the most expensive to operate, reduces the energy burden for building owners and operators, and has a positive impact on the health and economic vitality of all South Carolinians.

Background

In 2009, Governor Sanford signed H.3550 into law which requires future updated versions of the IECC be adopted by statutory amendment through the Energy Advisory Council of the South Carolina Public Utilities Review Committee. During the 2012 legislative session, the General Assembly updated the energy code to the 2009 version of the IECC, which references American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) Standard 90.1-2007. This version of the IECC is currently the code of record for South Carolina.

Freezing the energy code at the 2009 version has had a significant impact on the state's ability both to ensure that commercial buildings are designed and constructed to up-to-date codes and standards, and to benefit from the cost savings of operating and maintaining properties built to newer editions of the IECC. Additionally, freezing the energy code puts designers, developers, and builders at a market disadvantage should they work across multiple states. Because each of the states surrounding South Carolina has adopted a more up-to-date commercial code, designers and builders operating in multiple states are already well acquainted with the requirements of more advanced codes and are building to these codes in Tennessee, North Carolina, and Georgia. Having to build to different standards can be a competitive disadvantage for developers and builders operating in multiple states.

Specific actions for implementation and key participants

Legislative action is required to update building codes in South Carolina. A bill must be passed by the House and Senate and signed by the governor updating the energy code to the 2018 IECC (which references ASHRAE Standard 90.1-2016) for commercial buildings only. The implementing entity must work with Senate staff to draft legislation to update to the 2018 IECC (which references ASHRAE Standard 90.1- 2016) for introduction in the legislative session in January 2021.

Code officials in South Carolina jurisdictions will need to be trained on the updated code. This will also require technical and informational assistance to legislative staff and policymakers by the State Energy Office and building energy code experts.

Alignment with other recommendations/objectives and prerequisites

Updating the commercial energy code is aligned with all three of the shared EE objectives and would result in significant energy use and cost savings which would incentivize cost-effective efficiency investments.

Energy Equity / Energy Burden (EE/EB) Working Group

EE/EB Recommendation 1: Residential Labeling, Sticker Disclosures

Summary

Develop an energy labeling program/sticker disclosure pilot program for renters and purchasers of residential properties. The labels should be simple, categorical, and focus on monetary savings to help residents easily assess the energy use in their home. Being presented with energy efficiency information can lead to additional questions and opportunities for education on how home features and behaviors can affect the energy efficiency of residential dwellings. Since many of labels and disclosures already exist (e.g., the U.S. DOE Home Energy Score), "champions" are needed to promote these disclosures, especially to home builders and owners of rental properties, as well as qualified energy assessors that can continue to provide valid energy efficiency assessments. Changes in legislation may be considered after a successful pilot is completed

Background

The lack of awareness or information on the energy performance of properties generally means energy efficiency considerations are a low priority for those making home buying, property leasing, retrofit or upgrade decisions.[28] Further, there is no uniform state program that provides information on how efficiently a home is performing or predicts future home operating costs for occupants, prospective buyers, and the realtor/appraiser community.[29] This recommendation should help overcome these barriers.

Currently, some new residential homes in SC have a label in the electrical box that identifies the specifications of items that affect energy efficiency. This label is not in plain language, is presented after the home is built, and is only present in new homes. Moreover, the labeling provides no guidance to consumers on whether this home overall will save the consumer on energy costs and how it might compare to other homes.

More effective energy efficiency labeling is simple, categorical and focuses on monetary savings from energy efficiency improvements.

Mandatory and voluntary energy usage labels and disclosure programs are not new or uncommon. For example, Kansas, South Dakota, Alaska, New York, Vermont and other states have instituted energy use labeling in one form or another.[30] Some US cities have also instituted labeling requirements, including Austin, Minneapolis, Portland, and Chicago.[31] Further, the Department of Energy (DOE) also provides an energy label for homes (see below).[32] Unfortunately, these programs are not applied consistently and can be costly.

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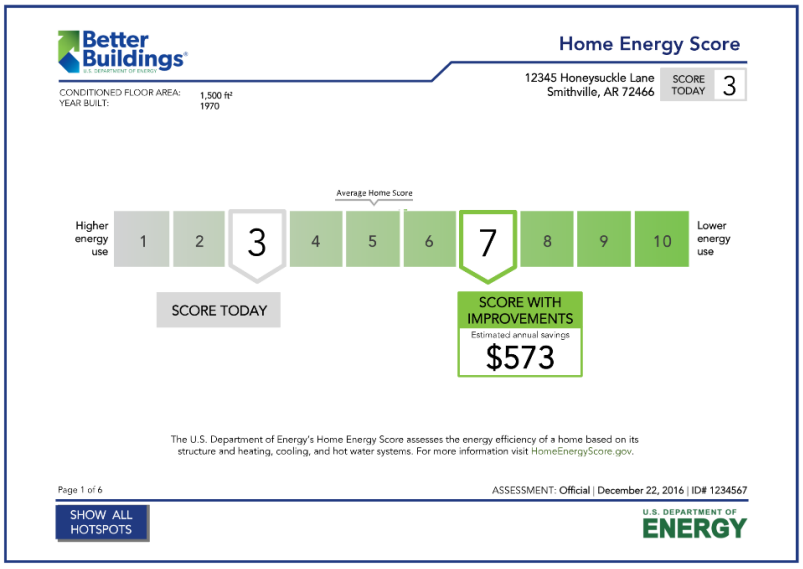
28. National Association of State Energy Officials (NASEO). Residential Energy Disclosure Policies in States and Cities website. https://www.naseo.org/issues/buildings/home-energy-labeling.
29. South Carolina Energy Office. 2014 Draft South Carolina Voluntary Energy Labeling Initiative.
30. National Association of State Energy Officials (NASEO). Residential Energy Labeling: Strategies for Scalability. http://www.naseo.org/data/sites/1/documents/publications/NASEO-Residential-Energy-Labeling-Strategies-for-Scalability2.pdf.
31. National Association of State Energy Officials (NASEO). Residential Energy Disclosure Policies in States and Cities website. https://www.naseo.org/issues/buildings/home-energy-labeling.
32. United States Department of Energy. Better Buildings. https://betterbuildingssolutioncenter.energy.gov/home-energy-score/home-energy-score-about-score.

Ideally this initiative will be implemented statewide, however, pilot studies can be initiated in cities that already have limited energy efficiency programs (e.g., CharlestonWISE) or have committed to conserve energy and reduce greenhouse gases (Columbia). Implementation of voluntary programs are also possible. Any pilot should be evaluated by behavioral economists employing randomly controlled studies.



Evidence from controlled studies suggests that consumers do not, on the whole, change behavior based on energy labeling, but that labeling leads producers to provide consumers with much more energy-efficient products. The ultimate target sector for this initiative is residential home builders, remodelers and owners of rental properties.

Specific actions for implementation and key participants

The U.S. Department of Energy has developed a Home Energy Score (HES) for residential properties. The HES rates a property on a scale from 1–10. This score is based on a standard assessment of energy-related assets to easily compare energy use across the housing market. The idea for this recommendation would be to use the electric utility home energy assessment programs to develop a HES for properties that are assessed. Dominion Energy and Duke Energy along with a few electric cooperatives have assessment programs. This idea would have to be vetted by the utility cost effectiveness tests. If this idea proves cost effective, we could do a pilot with a utility, and work with a municipality and/or realtor to have this information provided at the time of listing. If upgrades are implemented as a result of the assessment, the utility could potentially include a Home Energy Score after upgrades.

After speaking with NASEO about energy labeling programs, it was noted that a state mechanism could be established that would provide a framework for interested municipalities to use to establish their own energy labeling program. This could also act as a voluntary statewide program. Oregon has established a framework, and a few municipalities, including Portland, have established their own programs. Arkansas also has a statewide program (see https://www.adeq.state.ar.us/energy/incentives/score.aspx). Items in the mechanism include training, databases, and education programs. It would take time to set up the mechanism, but it would provide basic knowledge to the state, and allow interested municipalities to implement a program. Through this program, participating municipalities will also establish that the home energy score will be presented to home seekers at the time of listing.

This working group anticipates a labeling program that is a hybrid of the Home Energy Score and the State Voluntary Program. The SC Energy Office would be the lead implementing organization. SC Energy Office would be a necessary stakeholder. Other stakeholders can include realtors in SC, the Homebuilders Association of SC, the Southeastern Energy Alliance, the Sustainability Institute, affordable housing advocates, and/or industry disruptors such as Zillow.com.

Alignment with other recommendations/objectives and prerequisites

This recommendation is aligned with the goals of the SC State Energy Plan as laid out in SC Code Section 48-52-210 and advances several of those goals, especially: "(3) ensure that demand-side options are pursued wherever economically and environmentally practical."

The EE/EB group does not anticipate need for legislation, action from the Public Service Commission, or actions from the other working groups to implement this recommendation. However, legislative action would greatly increase the likelihood of effectiveness of the program, especially after a successful pilot.

EE/EB Recommendation 2: One Stop Shop

Summary

Develop a one stop shop, a single application for low-income residents to apply for services such as Low-Income Home Energy Assistance Program (LIHEAP), Weatherization Assistance Program (WAP), and home rehabilitation programs. Having knowledge of these programs and making it easier to access these services can help low-income individuals identify and receive incentives for upgrading their home and reduce their energy consumption. Additionally, home assessments and assistance can be coordinated to minimize home visits and time away from work. Information on energy efficient practices and incentives can also be incorporated into this service to further reduce energy burdens.

Background

A one stop application is a recommendation from the 2016 Energy Plan that was not addressed in the 2017/2018 implementation phase. This recommendation addresses a knowledge gap that exists concerning the programs available to low-income households. In addition, the barrier of having to contact different offices and complete many applications, which request the same information, will also be addressed.

One Stop does not currently exist in SC. The Energy Office is working on a website that will provide information on energy efficiency and home rehabilitation programs. This initiative will take this website a few steps further and connect people with the services.

The NC Justice Center is implementing a pilot of a one stop. SC would like to work with NC to implement a pilot in SC. Ultimately, One Stop would be a statewide initiative. Initially, this program would start locally as a pilot.

Specific actions for implementation and key participants

A partnership/board of advisors would be created to advocate and implement this recommendation. Necessary stakeholders include the SC Association of Community Action

Partnerships, SC Office of Economic Opportunity, SC Energy Office, SC DHEC, SC Housing, Habitat for Humanity, SC IFPL, Duke Energy, Dominion Energy, Electric Cooperatives, Municipal Power Association, and the SC Homebuilders Association.

Resources and information from the NC Justice Center can be used.

The upfront costs would be minimal. Members of the advisory board may be able to absorb the start-up costs through their administrative structure. Also, Federal COVID-19 stimulus funds may be available. The One Stop would be an add-on to a site that is in progress, EnergySaver.sc.gov. The SC Energy Office can add to this site based on the agreement they have with the developer.

Alignment with other recommendations/objectives and prerequisites

No legislative action is required unless it is needed for funding.

EE/EB Recommendation 3: Weatherization Program Funding

Summary

Develop an alternative solution to overcome the issue that utility weatherization funding cannot be used for low-income home weatherization when DOE Weatherization Assistance Program (WAP) funding is used. Utility program funding counts as program income for Community Action Agencies (CAAs) and is subtracted from DOE funding if used. Because of this administrative barrier, the utility funding is not being used by the CAAs for weatherization assistance. To overcome this barrier, this group will look at alternatives for the utility funding. For example, the SC Association of Community Action Partnerships (SCACAP) could partner with the utility companies to administer the weatherization funds because SCACAP does not receive DOE funding and would not be subject to the same administrative constraint.

Background

DOE Weatherization Assistance Program funding for low-income residents is available to CAAs through the SC Office of Economic Opportunity (OEO). In SC, there is also weatherization funding from utility programs. The utility program funding counts as program income for CAAs and is subtracted from DOE funding if used. This process amounts to a DOE administrative barrier and results in a lower utilization of utility weatherization programs. A work around with Duke Energy Carolinas through the SC Association of Community Action Partnerships (SCACAP) is in discussion. In addition to this eliminating this barrier, it would be good to change the regulation and allow HVAC system replacement. There is money from OEO for HVAC but it can only be used in an emergency and the work has to be done within 48 hours.

Based on research, this administrative barrier appears to be unique to South Carolina. The barrier is dependent on the utility, its service area, and funding sources.

Specific actions for implementation and key participants

The lead advocating and implementation organization likely will be the SCACAP. Other stakeholders will include utilities, SC Office of Economic Opportunity, and the SC Energy Office. The hard part of implementation will be finding a solution to the current situation with the Department of Energy and/or finding other agencies that can use the funding. The speed of implementation is dependent on how quickly we can identify alternatives.

Alignment with other recommendations/objectives and prerequisites

Legislative action would not be required, however action from the Department of Energy would be required or an agency that can use the funding.

Finance Mechanisms (FM) Working Group

FM Recommendation 1: Evaluate the Expansion of On-Bill Financing Programs

Summary

Conduct a study to improve the effectiveness and accessibility of on-bill financing (OBF)—including on-bill repayment and on-bill tariffs—across multiple sectors in South Carolina. OBF seeks to reduce energy burdens for LMI households and provide an option for households with limited access to other energy efficiency financing options. SC Code of Laws §58-37-50 allows electric utilities to offer OBF of energy-efficient home improvements to their customers. Currently, OBF is offered for many residential customers by the electric cooperatives through the Help My House program. This recommendation would assess the feasibility of offering OBF through investor-owned and municipal utilities.

Background

This recommendation is a continuation of one of the eight top-tier recommendations from the 2016 Energy Plan: "Funding for Needed Energy Upgrades." The recommendation called for a study committee to examine:

- potential solutions to the problem of financing energy efficiency improvements, including whether changes to the OBF statute and program design could encourage expansion of the programs;
- whether low-interest sources of financing may be available to utilities that want to make these programs available to their customers; and
- how low-income residents may be more effectively served regardless of utility provider.

The implementation committee for this recommendation proposed revisions to the existing on-bill financing statute (SC Code of Laws §58-37-50) to expand the effectiveness of the programs by raising the permissible interest rate for loans from 4% to 6%. The intent of this change was to make the programs more viable for electricity providers and to allow the financing of service plans and extended warranties. The revisions were not introduced in the General Assembly.

SC Code of Laws §58-37-50 allows electric utilities to offer OBF of energy-efficient home improvements to their customers. Currently, OBF is offered for many residential customers by the electric cooperatives through the Help My House program. Loan capital for the pilot program came primarily from a US Department of Agriculture loan, supplemented by South Carolina co-op funds. The pilot led to a nationwide program with continuous funding, the Rural Energy Savings Program.

According to the US Department of Energy, "Traditional residential financing programs and incentives are often inaccessible for low- and moderate-income [LMI] families who may be credit-challenged and unlikely to have sufficient savings to provide the required upfront payment.

Programs often are particularly inaccessible to those living in rental units, further reducing access for low-income households that live in such units." On-bill financing (OBF) programs may provide energy efficiency benefits to customers regardless of income level, particularly because some types of OBF—like on-bill tariff programs—can be designed that do not depend on consumer credit or require building owner investment.

On-bill tariffs are tied to the meter, instead of the customer, so the obligation of repayment is based on the bill payment history, not by the creditworthiness of the customer. The low amount of resulting defaults allows access to lower interest rates for a much broader group of people, many of whom would not otherwise have access to affordable financing for energy efficiency improvements.

Current barriers to these programs are:

- Availability of low-interest funds for entities other than electric cooperatives to use as lending capital
- Analysis of whether the interest rate caps in current law are high enough to support the program costs
- Allocation of upfront costs for programs that focus on audits to qualify efficiency upgrade projects based on ability to increase efficiency; i.e., the question of who pays for the initial audit

Specific actions for implementation and key participants

A study could address the following considerations, among others:

- how LMI households may be more effectively served regardless of utility provider
- the needs of electric power providers, such as clarification about authority, performance data, and loss protection; an examination of one or many on-bill structures, including on-bill repayment (through a third party) and on-bill tariffs

The lead advocating organization would be the Energy Office. Lead implementing organizations would be electricity providers. Necessary stakeholders would be Energy Office staff, electricity providers, efficiency and environmental advocates, consumer advocates, LMI advocates, and efficiency upgrade contractors, among others.

Alignment with other recommendations/objectives and prerequisites

While legislative action might be a recommendation of this study, no legislative or external action is required to begin this study.

Prior to regulated utilities offering on-bill financing, PSC approval and stakeholder support must be secured, which, among other things, is presumed to depend on the following:

- Mitigating perceived or real risks to the security of loaned funds/investments in efficiency upgrades
- Ensuring that increased costs are balanced by reduced energy bills

- To the extent that there are program costs that are shared by the customer base, demonstrating that programs are cost-effective according to energy efficiency rider requirements

Unregulated power providers, such as electric cooperatives, are not required to seek PSC approval, but would require approval from their respective governing bodies.

FM Recommendation 2: Assess the Feasibility, Costs, and Benefits of Establishing a South Carolina Green Bank

Summary

Conduct a study to assess the feasibility of a South Carolina-based "Green Bank." A Green Bank may have the potential to fund highly impactful projects to reduce GHG emissions while spurring economic growth. Some existing green banks have an explicit objective to serve disadvantaged communities and ensure a just transition. The Green Bank would issue loans, provide credit enhancements, and invest in clean energy and EE projects to benefit SC government agencies, businesses, congregations, communities, nonprofits, and consumers.

Background

A Green Bank, defined as a mission-driven institution to deploy clean energy (including energy efficiency), does not currently exist in South Carolina. While there are several programs and agencies with similar objectives, they are distinct from a Green Bank in many important ways.

Throughout the SC EE Roadmap process, several challenges and barriers to energy efficiency were identified, with potential accompanying roles for a South Carolina Green Bank:

Challenge/Barrier	Potential Role for a Green Bank
Tax-exempt and public entities have limited access to capital and are unable to take advantage of financial incentives	Increase access to low-cost capital for public entities
Private-sector energy developers and commercial and industrial customers may be unable to secure affordable capital from private sources	Increase access to low-cost capital for clean energy deployment and procurement
Residential energy burdens are high in SC and disproportionately affect low-income communities	Provide flexible financing for all residential customers. Offer a loan loss reserve for power providers offering on-bill financing

A market and feasibility assessment could help identify the most pressing needs and most effective structure for a Green Bank in the state. Following examples in Colorado and Nevada, an independent nonprofit organization could administer the program. Alternatively, a public purpose Green Bank could be administered by a third-party administrator or government agency.

Specific actions for implementation and key participants

The South Carolina Energy Office is statutorily enabled to examine new energy financing mechanisms in the state. Per Section 48-52-420(4) of the South Carolina Code of Laws: The South Carolina Energy Office has a duty to "examine and consider the desirability and feasibility of mechanisms for tax incentives, low-interest loans, and other financing means for cost-effective energy consideration and efficiency and use of renewable and indigenous energy resources, and advocate their implementation when deemed appropriate."

Subsequently, the Energy Office is a potential lead organization for any studies to implement a Green Bank. However, the Energy Office would need to seek third-party experts, such as the Coalition for Green Capital, in conducting a feasibility study/market analysis. Stakeholder input and feedback would likewise be essential; these stakeholders would include many of the participants in the SC Energy Efficiency Roadmap process and may also need to include additional stakeholders with SC-specific financial expertise.

Initial seed funding of a SC Green Bank could come from a variety of different sources including public funds and private foundations. Public capital can be leveraged via a loan loss reserve or other credit enhancement to attract private capital or the capital of community development financial institutions (CDFI's), private foundations, and other public purpose lenders in SC, reducing risk to private lenders and inducing participation in the energy efficiency marketplace.

Ongoing capitalization for existing Clean Energy Funds and Green Banks has come from interest earned from a founding allocation, regional cap-and-trade programs, public benefit charges, and savings from peak load demand realized through the use of energy efficiency/ demand-side management.

Based on discussions from the EE Roadmap process, there are several existing state government financing agencies/programs whose purpose may overlap with that of a Green Bank, including Energy Office programs (e.g., ConserFund, ConserFund Plus, and the Energy Efficiency Revolving Loan), SC Conservation Bank, SC Infrastructure Bank, Master Lease Program, SC Housing Trust Fund, or several bond-issuing authorities in the state, such as the Jobs-Economic Development Authority or SC Resource Authority, that may be able to issue "green bonds." It is advisable to work with these institutions to identify financing gaps and potential areas for cooperation. Because the State of South Carolina possesses a AAA credit rating, capital may be secured at the lowest cost by working with or through the State.

Capitalization for an SC Green Bank could also be provided through voluntary contributions, such as an opt-in "round-up" program through energy bills, corporate partnerships, or general fundraising efforts.

Alignment with other recommendations/objectives and prerequisites

Although legislative action may assist in the creation of a Green Bank, it is not required. Additionally, stakeholders in this process judged it to be unlikely that funding for a Green Bank would be provided via legislative action. SC Public Service Commission would not be required unless a Green Bank is determined to affect programs or funds from regulated utilities.

At this point, this recommendation does not have a prerequisite; rather, it is likely that other recommendations from the SC EE Roadmap will depend on a Green Bank or similar pool of funds.

Nonprofit and Public Entities (NP/PE) Working Group

NP/PE Recommendation 1: Establish Goal to Promote EE in Public Buildings

Summary

Develop a successor goal to the 2008 "20 by 2020" energy use reduction goal. The new goal would require state agencies, public colleges and universities, and public-school districts to (1) develop a new energy conservation plan and (2) reduce their energy consumption by 10 percent by 2030, as compared to 2015 levels.

Background

In 2008, the SC Energy Efficiency Act (Section 48-52-620) mandated that state agencies, school districts, public colleges & universities (1) develop energy conservation plans and

(2) reduce their energy consumption by 20 percent by 2020, as compared to 2000 levels. The SC Energy Office provides technical assistance to these entities and collects their energy consumption data annually. Based on findings from the 2019 report, these public entities have collectively reduced their energy use per square foot by 21 percent and have reduced energy spending per square foot by 9 percent. In all, these public entities have collectively achieved the 20 percent goal mandated by the General Assembly.

As this legislative goal expires at the end of the 2020 calendar year, this working group has identified the need to have a successor program that furthers the legislative intent set out by the 2008 legislation. This new proposed goal of 10 percent acknowledges that technology related to energy efficiency has grown to allow public entities to achieve EE measures with further efficiency gains at a low cost—i.e., the "low-hanging fruit." Public entities that reduce demand through efficiency will: (1) Create lower emissions for improved health, (2) Build resilience to stress on energy supply networks, (3) Build resilience to grid disruptions, (4) Retain more resources for improved resilience measures. It is possible to consider asking for a report of KW as well.

Specific actions for implementation and key participants

It is anticipated that this legislation could not be introduced before January 2021, and would not pass until June 2021, at the earliest. This recommendation would not necessarily require additional resources, as the 2008 legislation included no funding or resources. The affected entities would continue to report their energy consumption to the SC Energy Office on an annual basis. The SC Energy Office already has the system in place to collect, analyze, and report entities' energy consumption data.

The Conservation Voters of South Carolina have indicated support for EE legislation and could serve as a champion. Additionally, the SC Conservation Coalition, an umbrella organization comprised of key SC conservation organizations could serve as a champion, as well. Many of the stakeholders who were instrumental in the success of the original 2008 legislation are included in this group and would likely be supportive of this successor program.

Alignment with other recommendations/objectives and prerequisites

An amendment to existing legislation would be required. No other action is anticipated. It should be noted that several other legislative recommendations from this working group could be combined into one piece of legislation, thereby consolidating efforts into one.

NP/PE Recommendation 2: Update Legislation to Include Adopting LED and More Efficient Technology

Summary

Update current legislation to require the use of LED and other more efficient technologies as they become available. Section 48-52-640 contains provisions pertaining to the replacement of incandescent bulbs with compact fluorescent bulbs (CFLs). This recommendation would update the legislation to require the use of LED and other more efficient technologies as they become available.

Background

Section 49-52-640 (D) contains provisions that are outdated pertaining to the replacement of incandescent bulbs with compact fluorescent bulbs (CFLs). Not only are CFLs less efficient than LEDs, they are generally unavailable, as are incandescent bulbs. This recommendation simply updates existing state law. Suggested changes are shown below.

SECTION 48-52-640. Energy conservation products marketed to State; certification and procurement requirements.

(D) Each state agency head shall require the agency's procurement officer or other person authorized to purchase supplies for the agency to replace an incandescent or compact fluorescent bulblamp (CFL) light bulb or linear fluorescent lamp used by the agency with a light emitting diode (LED) compact fluorescent bulb lamp or more efficient technologies as they become available when the current incandescent bulb lamp needs to be replaced, and if the agency determines use of a compact fluorescent bulb is more cost effective over a five-year period than use of an incandescent bulb. A state agency may purchase another type of lighting product incandescent bulbs for the agency if the agency verifies, in writing, that compelling circumstances, such as specialized research uses, require the use of some other fixtureincandescent bulbs.

Specific actions for implementation and key participants

It is anticipated that this legislation could not be introduced before January 2021, and would not pass until June 2021, at the earliest. No additional funding or staff resources will be required.

The Conservation Voters of South Carolina have indicated support for EE efficiency legislation and could serve as a champion. Additionally, the SC Conservation Coalition, an umbrella organization comprised of key SC conservation organizations could serve as a champion, as well. Many of the stakeholders who were instrumental in the success of the original 2008 energy use reduction legislation are included in this group and would likely be supportive of this related program. Additionally, as no funding is being requested, the ease and speed of passage could be higher.

The Energy Office would advise agencies on the change, using the opportunity to provide additional information about efficient lighting. The Energy Office would continue to support lighting upgrades through its outreach, technical assistance, and funding programs.

Alignment with other recommendations/objectives and prerequisites

An amendment to existing legislation would be required. No other action is anticipated.

It should be noted that several other legislative recommendations from this working group could be combined into one piece of legislation, thereby consolidating efforts into one.

NP/PE Recommendation 3: Allow Flexible Funding for EE projects

Summary

Provide public entities some flexibility in funding for energy efficiency upgrades. Update SC Code Section 48-52-630, a law that prohibits the reduction in a state agency's budget by the full amount of money saved through implementation of energy conservation measures, to include more specificity on the percentage of allowable reduction and allow a certain amount of funds to be earmarked for continued efficiency upgrades, enabling additional savings and strengthening the resilience of these public institutions.

Background

Currently in the SC Code of Laws, Section 48-52-630 prohibits that a state agency's budget be reduced by the amount of money saved through implementation of energy conservation measures. There is a concern that while the full amount of energy dollars saved through a project cannot be taken from an agency's budget, the law does not specify how much. Therefore, this working group is requesting more specificity, to prohibit an agency's budget from being reduced by more than X percent of its dollar savings from the implementation of energy efficiency projects. This working group additionally recommends that this section of Code be further amended to require that at least Y percent but up to 100 percent of those savings be utilized for implementation of additional energy efficiency measures if there are additional energy measures that can be accomplished within five years of the original savings. Suggested changes are shown below. The exact percentages will be determined by the implementation team.

SECTION 48-52-630. Energy conservation savings; division; reinvestment.

An agency's budget must not be reduced by ~~the full amount of~~ money saved through energy conservation measures. In order to ~~Appropriate financial incentives to~~ encourage the reinvestment of energy costs savings into additional energy conservation areas, agencies at a minimum must reinvest ----% up to 100% into additional energy conservation and cost savings measures. ~~must be provided.~~ The remaining Eenergy savings must be divided among the agency, the general fund, and debt retirement of capital expenditures on energy efficiency. Agencies must be encouraged to reinvest all ~~their~~ savings into energy conservation areas, where practical.

SECTION 48-52-635. State agency to carry forward and retain savings realized from energy conservation measures.

Pursuant to Section 48-52-630, an agency's savings realized in the prior fiscal year from implementing an energy conservation measure as compared to a baseline energy use as certified by the State Energy Office, may be retained and carried forward into the next ~~5current~~ fiscal years. This savings, as certified by the State Energy Office, must first be used for debt retirement of capital expenditures, if any, on the energy conservation measure, after which time savings m~~ust~~ay be ~~used for agency operational purposes and~~ where practical, reinvested into energy conservation areas. The agency must report all actual savings in the energy portion of its annual report to the Office of Regulatory Staff.

Specific actions for implementation and key participants

It is anticipated that this legislation could not be introduced before January 2021, and would not pass until June 2021, at the earliest. No additional funding or staff resources will be required.

The Conservation Voters of South Carolina have indicated support for EE efficiency legislation and could serve as a champion. Additionally, the SC Conservation Coalition, an umbrella organization comprised of key SC conservation organizations could serve as a champion, as well. Many of the stakeholders who were instrumental in the success of the original 2008 energy use reduction legislation are included in this group and would likely be supportive of these changes that would better enable entities to implement energy conservation measures.

Alignment with other recommendations/objectives and prerequisites

An amendment to existing legislation would be required. No other action is anticipated.

It should be noted that several other legislative recommendations from this working group could be combined into one piece of legislation, thereby consolidating efforts into one. For example, this proposed legislative change could accompany the proposed recommendation on energy use legislation requiring a 10% reduction in energy use by 2030 over 2015 for state agencies, public school districts, and public colleges and universities.

NP/PE Recommendation 4: Separate Metering for New Construction / Major Renovations

Summary

Encourage public entities to install individual building meters when a public entity undergoes a major facility construction or renovation project. The working group recommends the installation of individual building meters when a public entity undergoes a major facility construction or renovation project to assist in efforts to conserve energy and water through more effective assessment and management strategies. This recommendation, if adopted, would mean that on a new construction or major renovation project a separate meter for each utility (e.g., electricity, natural gas, fuel oil, water, or energy products created through processing) shall be installed. Where possible, AMI (Automated Meter Infrastructure) meters should be installed. Meters should not be required for very small structures such as small storage sheds.

Background

State agencies may not be able to identify opportunities to conserve energy and water or measure the effects of conservation measures already installed because several buildings owned by a single agency may share energy or water meters. Without individual meters, it is difficult to accurately assess energy and water use in the buildings, or to measure the effects of energy and water efficiency measures.

It is quite common for a state agency, college, or public school to share water and energy meters across several buildings. Very few older projects have been equipped with separate meters, which means that data for energy and water use cannot be accurately assigned to individual buildings. Often energy and facility managers have allocated energy use among buildings sharing a meter, but it is not an ideal way to determine current energy or water use and prevents managers from assessing the effectiveness of energy retrofits. Moreover, the lack of individual meters impedes even the use of national benchmarking software such as Portfolio Manager, which is strongly supported by the US Department of Energy.

An existing section of the SC Code of Laws (SECTION 48-52-620 (B)(1)) states:

In order to monitor energy consumption, the State Energy Office must determine those state buildings that require individual metering. Metering must be installed by the agency, the cost of which must be borne by the agency responsible for the utility bill for the building.

Several years ago, the Energy Office evaluated the cost of this measure and found it to be too high for agencies to implement without supplemental funding when no other changes were planned. Therefore, no further effort was made to require agencies to install separate meters. However, the addition of energy efficient building requirements drew a distinction between "substantial renovation" and more routine renovations and highlighted the feasibility of installing separate metering when major facility renovations are undertaken. The University of South Carolina incorporated a requirement for individual metering after significant renovation in its building policy, and other public entities may have enacted similar requirements. In addition, some energy efficient building certification programs require separate metering.

The working group recommends the installation of individual building meters (or submeters if multiple tenants are involved) to assist in efforts to conserve energy and water through more effective assessment and management strategies. Where possible, AMI (Automated Meter Infrastructure) meters should be installed, as the detailed, granular data that can be obtained from AMI could make sub metering far more useful in terms of measuring energy consumption. Meters should not be required for very small structures such as small storage sheds.

Specific actions for implementation and key participants

This recommendation contains two components: (1) Energy Office action and (2) legislative action.

(1) Energy Office action: The Energy Office, through its outreach, technical assistance, and funding programs, could encourage all public entities to all agencies to consider the value of individual metering and requesting that they retrofit buildings with individual meters whenever possible. The Energy Office should be the lead agency for this effort, relying on authority in Section 48-52-620. Some agencies may have difficulty funding the addition of individual meters. The Energy Office may explore the possibility of utilizing existing funding sources to assist entities with funding the addition of individual meters.

(2) Legislative action: The Conservation Voters of South Carolina have indicated support for EE efficiency legislation and could serve as a champion. Additionally, the SC Conservation Coalition, an umbrella organization comprised of key SC conservation organizations could serve as a champion, as well. Many of the stakeholders who were instrumental in the success of the original 2008 energy use reduction legislation are included in this group and would likely be supportive of this related program.

Alignment with other recommendations/objectives and prerequisites

This recommendation is a reworking of a recommendation that resulted from the 2016 Energy Plan. No action is required for the Energy Office action component of this recommendation.

Legislative action would be necessary in order to require the installation of meters as a part of a major facility retrofit. An amendment to existing legislation would be required.

It should be noted that several other legislative recommendations from this working group could be combined into one piece of legislation, thereby consolidating efforts into one.

NP/PE Recommendation 5: Standards for Leased Spaces

Summary

Develop guidelines and a checklist that public entities and nonprofit organizations can employ to inform their decisions about energy efficiency about prospective leased space before signing a lease. This recommendation is a reworked recommendation from the 2016 Energy Plan. It differs from the original recommendation in that it takes a preliminary step toward this goal, with the Energy Office developing the resources and providing guidance as a first step and gathering initial information as a pilot project.

Background

Many public entities and nonprofits utilize leased space, with arrangements made between agencies and lessors on the basis of monthly payments, convenience, and other factors. Often, little attention is paid to energy and water costs. Frequently these charges are included in the monthly payment, making it even harder to track efficiencies (or inefficiencies) which might affect the long-term costs of leasing a building.

Both as a way of holding costs down, and as a way of maintaining attention on energy and water use, public entities entering into a lease agreement should know about energy use per square foot so buildings can be fairly compared when making leasing decisions. The Energy Office has a database of use per square foot data for state buildings which can be used as a baseline for comparison.

Ideally, public entities should aim for leased space that uses no more energy than that used by the median of State buildings in the Energy Office database. However, that may not always be practical.

As an interim measure, it is recommended that the Energy Office develop a checklist that public entities and non-profit organizations can employ to gather as much information as possible about prospective leased space before signing a lease. The Energy Office should compile this guidance and the checklist materials from vetted, successful examples from other states. The findings from the checklist would be reported to the Energy Office. Based on this information, the state may choose to establish more clear-cut guidelines in the future to encourage building owners interested in leasing space to government agencies to pay more attention to controlling energy use in the building overall, and to encourage tenant agencies to pay attention to limiting energy use where possible.

Specific actions for implementation and key participants

The Energy Office would serve as the lead organization on this effort and would work on developing and vetting the guidelines and checklist with stakeholders representing the affected public entities. The Energy Office would also develop these guidelines in consultation with

resources provided through the National Association of State Energy Officials, Southeast Energy Efficiency Alliance, and others.

Alignment with other recommendations/objectives and prerequisites

There is no prerequisite for this recommendation. This activity is consistent with both the enabling legislation of the Energy Office as well as its mission.

Utility Programs (UP) Working Group

UP Recommendation 1: Commercial and Industrial Opt-Out and Self-Direct Study

Note: The working group did not reach a collective consensus on this recommendation.

Summary

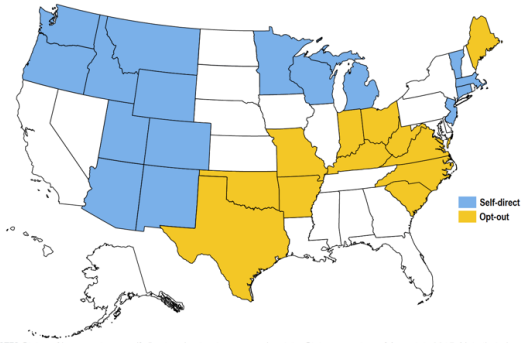
Convene a study committee to examine commercial and industrial customers' current EE measures (both within and beyond current utility programs), potentially economically viable opportunities, and program needs or changes. The goal of the study is to identify opportunities to increase participation in utility programs and decrease energy consumption. A review of SC utility opt-out customers indicates there may be large groupings of customers, such as schools or grocery stores, that would choose to opt-in if simple changes are made to either how they are communicated with or to the measures that are significant to their operations. While not currently available in SC, self-direct programs should be evaluated as an option.

The study committee should analyze best practices nationally, including both policies and best practice efficiency savings performance results as well as the effectiveness of utility EE programs for industrials in states that do not have opt-out. The Committee will make recommendations to improve the effectiveness of South Carolina EE policies and will provide recommendations to utility programs for these customer segments. "Utility" means investor-owned utilities, Santee Cooper, and the electric cooperatives and includes gas LDCs. Large industrial electricity users are defined as those using 1 million kWh or more per year and large industrial gas users are defined as those using an average of 50 dkth per day (firm or interruptible).

Background

Utilities report that opting-out of the EE and DSM riders by the large industrial customers impacts their ability to achieve their EE targets. The opt-out numbers are significant. Duke Energy provided data for their most recent EE/DSM docket indicating that in 2019, 10,446,567,023 kWh of their total 14,697,398,282 kWh non-residential retail sales (or 71%) opt out of the EE rider. Dominion reported in their 2020 DSM filing that 438 large commercial and industrial accounts had opted out of their DSM program. These customers represent approximately 23%—almost one quarter—of DESC's total retail load.

Overview of Large-Customer Self-Direct Options for Energy Efficiency Programs



NOTES Status of large-customer self-direct and opt-out programs, by state. Status current as of August 1, 2015. Note that plans for self-direct programming are under way in New York. Earlier in 2015, the New York Public Service Commission directed electric utilities to offer a self-direct program for commercial and industrial customers by 2017.

Source: ACEEE

Many opt-out customers counter that the cost of the rider compared to the measures available is not cost-effective for them. The large industrials also note that because of their size and the importance of energy costs to their bottom line, they do invest significantly in EE outside of the utility programs, but currently there is no accounting or reporting for those investments. Many larger C&I customers are hesitant to provide information about their EE investments as they may be part of a proprietary process and part of their competitive advantage. Two other challenging segments are the landlord/tenant situation as well as the "complacent industrial"—a C&I customer that simply may not have the staff capability and bandwidth to devote to analyzing the costs and benefits of efficiency investments.

This has not been attempted in South Carolina on a significant scale, though it was discussed in the 2016 State Energy Plan. South Carolina is one of twelve states nationwide that has an opt-out provision, so it is worth examining why most states do NOT offer this. According to ACEEE tracking, the opt-out provision is prevalent in many Southern states, while self-direct programs are more dominant in western states and the Great Lakes and none exist in the South (see map)

Additionally, approximately 16 states have some form of a "self-direct" program that allows large industrials flexibility and customization of EE/DR investment. ACEEE has catalogued these programs and offers design and cost recovery recommendations.

The target sectors—C&I stakeholders—must represent interests from different industries across the state, including opt-ins and opt-outs as well as IOU customers, Santee Cooper customers, electric cooperative customers and gas LDC customers, in order to be truly helpful. If possible, industrials that contribute to peak event loads should be included.

Specific actions for implementation and key participants

Implementation of this recommendation could be a joint effort between the Energy Office, the utilities (including cooperatives) and outside advocacy groups who maintain an interest in or intervene in the PSC EE/DSM dockets. The lead implementing organization could be the Energy Office, possibly with the help of the SC Department of Commerce as a bridge to large industrials.

Stakeholders must include a wide range of South Carolina businesses reasonably representing the range of significant end-uses of electricity and natural gas that can be made more efficient. To be most effective, small commercial, large commercial, and small, medium and large industrial should be analyzed separately. Preliminary conversations indicate that each segment has different drivers for their EE investment decisions. In addition, special attention must be paid to C&I stakeholders who are in a landlord/tenant situation as well as industrials that routinely contribute to peak load events. Landlords/tenants may be the most difficult group to design EE measures for that 1) meet cost test criteria and 2) will be embraced by either the landlord or tenant (or both).

Implementation should be easy. The biggest challenge will be gathering information from C&I stakeholders who do not wish to share their EE investment information for proprietary reasons. Getting participation from some of South Carolina's largest companies may also be difficult, but the SC Department of Commerce and/or the SC Manufacturers Alliance may be able to assist with the convening of stakeholders.

Implementation of the committee itself could proceed quickly. The speed of their work will depend upon the response of the identified stakeholders and whether all parties prioritize the effort. Implementation of the committee's recommendations (through changes to the utilities' EE programs) will take several years and must proceed through PSC dockets.

Alignment with other recommendations/objectives and prerequisites

This recommendation is a continuation of one from the 2016 Energy Plan. No legislative or PSC action is required, but the PSC will need to approve any changes to programs and/or tariffs.

UP Recommendation 2: EE Resource Standard (EERS)

Note: The working group did not reach a collective consensus on this recommendation.

Summary

Convene a study committee to recommend an annual energy efficiency target for all investor-owned utilities, Santee Cooper, electric cooperatives, and gas local distribution companies. This is a modification of a 2016 Energy Plan recommendation, removing a specific percentage target, recognizing that the easiest and least-expensive measures (with shortest payback) have largely been incorporated into programs, and recognizing that different utilities have different baselines and different customer bases.

Background

The biggest challenge for energy efficiency efforts is that much of the low hanging fruit has been plucked. Lighting replacement, especially the switch from incandescent bulbs to LEDs, has resulted in easy, fast efficiency gains.

The utilities have also identified barriers and challenges at the program level. Duke Energy: "Energy efficiency requirements are complex and not as easy as simply adopting a targeted reduction in energy savings. For an EERS to be meaningful it must be part of a broader statewide policy associated with energy efficiency. Key issues such as the assessment of feasible goals and available potential for energy efficiency, customer opt-outs, constructs to determine energy savings, customer bill impacts, and program cost effectiveness are just a few of the parameters that need to be included in a comprehensive policy, if an effective EERS were to be established. Additionally, an EERS is static and can prove problematic during economic downturns when customers are struggling economically and do not have the financial means to undertake efficiency projects and participate in the utility programs that would allow it to meet annual requirement. Based on experience in other states, Duke Energy has seen that ensuring a constructive regulatory mechanism is in place is a far more effective means to optimizing the amount of Energy Efficiency that is realized through utility programs."

Dominion Energy South Carolina (DESC) notes that the company's February 2020 release of its goal to achieve net zero emissions by 2050 supports a strong case that they are already doing what an EERS would accomplish, and a state mandate would be redundant and increase regulatory complexity. Further, their recent EE potential study did not support some of the higher possible EERS targets. "Following the results of the DSM Potential Study, DESC currently has an Order in place to evaluate 1% of energy savings. The SCPSC Order states that the next DESC Potential Study shall evaluate technical potential, economic potential, and maximum achievable potential

to maximize cost effective gains in energy efficiency with a 1% goal or more of energy savings. Any recommendation from the group that exceeds what is already in place, would require substantial regulatory review—to essentially re-regulate what was recently evaluated. There would be limited value to our customers to go through another regulatory proceeding evaluating the DSM portfolio in advance of the time horizon for the next potential study.

And Piedmont Natural Gas adds that retail natural gas consumption per customer has declined due to appliance efficiency and building code improvements, while commodity prices and rates have also declined. "Piedmont does not believe that an EERS would reduce usage over and above the current trend in a cost- effective manner. Ultimately EE programs are funded by customers and an assessment of customers' appetite to fund additional EE programs should be determined before moving forward. Additional EE programs and an EERS come at a cost. Natural gas utilities would need confidence in a viable mechanism for cost recovery to implement, fund and manage larger EE programs and an EERS. Again, Piedmont does not believe that an EERS for natural gas utilities would be cost effective. Industrial natural gas customers have generally been opposed to sharing EE program costs since they already spend significant dollars on EE relating to their bottom line."

PNG notes the difficulty with the landlord/tenant relationship that is described in the Opt-Out and Self-Direct Study recommendation and adds that current performance contracting mechanisms and CPACE (Commercial Property Assessed Clean Energy programs) may be more effective in achieving efficiency gains without utility involvement and customer cost sharing. Further investor-owned natural gas utilities are only two among sixteen operating in South Carolina. Natural gas authorities, commissions of public works, and municipal systems should weigh in on an EERS given the number of customers they collectively serve. Since many non-IOUs are small, how they would fund EE efforts and support program costs is unclear.

There currently is not a statewide energy efficiency portfolio standard, but Duke Energy Carolinas and Duke Energy Progress had been working toward aspirational targets that were agreed to in the settlement agreement crafted in response to the Duke Energy and Progress Energy merger in 2012. The Merger Settlement with SACE, South Carolina Coastal Conservation League, and Environmental Defense Fund called for annual energy savings of at least 1% of prior-year retail sales beginning in 2015 and cumulative savings of at least 7% over the period from 2014 through 2018.

While 28 states have an electricity EERS, most were enacted 10 or more years ago (see map). The exception is the new EERS adopted in the Commonwealth of Virginia in March of 2020 (not shown on map), which joins North Carolina as the only two Southern states with an EERS. North Carolina's EERS was established in 2007 and is embedded within the state's renewable energy portfolio standard (a portion of each utility's renewable

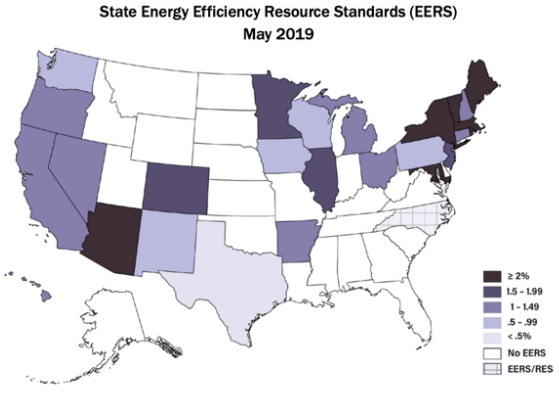


Figure 1. States with electric EERS policies in place (as of May 2019).

Map created by ACEEE

energy requirement can be met with energy efficiency). The NC Clean Energy Plan, mandated by Executive Order 80 and released in October of 2019, includes a recommendation for the establishment of a separate EERS, indicating a strengthening Southern trend and one that is complementary to South Carolina geographically.

Eighteen states have a natural gas EERS, none of which are in the Southeast (closest to the Southeast is Arkansas). A summary of state EERS for both electric and gas utilities (with the exception of the newest EERS in Virginia) can be found here: https://www.aceee.org/sites/default/files/state-eers-0519.pdf.

For maximum impact and consistency, an EERS should be established that applies to IOU's, electric and gas cooperatives, Santee Cooper, and potentially municipal electric and gas providers. The target for each utility, however, might differ depending upon each utility's baseline and customer base. A variety of models exist nationally. An EERS would apply to all sectors (residential, commercial and industrial).

Specific actions for implementation and key participants

Policy change of this scale is best accomplished through an inclusive stakeholder process in South Carolina. The lead advocating organization(s) would depend on where the initiative starts. If the establishment of a SC EERS becomes a recommendation of the Governor, then it is likely a state agency would take the lead role in organizing the process, if not directly advocating. Agencies include the SC Public Service Commission and/or the Office of Regulatory Staff. Without this Executive push, lead advocating organizations would likely be the segment of the conservation community that has been engaging on energy issues for the past several years. This group has a broad and inclusive scope and includes entities such as the Coastal Conservation League and Upstate Forever, Audubon SC, AARP, the NAACP, the Southern Alliance for Clean Energy, the Sierra Club, and many others.

The lead implementing organization would likely be the SC Public Service Commission. They would oversee an annual compliance docket for each impacted utility. The necessary stakeholders include all named above and each impacted utility.

Ease of implementation is medium to low in the short-term. This is a significant change for many of the state's utilities, and, combined with the rules and nature of the South Carolina Statehouse, success will require a great deal of collaboration. That said, the fact that this concept is gaining traction in both Virginia and North Carolina does make the process easier but requires alignment as different EERS at state levels could be problematic for the utilities. Duke Energy operates in North Carolina and Dominion Energy operates in Virginia and North Carolina. Consistency of programs and regulations across service territories eases administrative burdens. Indeed, consistent programs and regulations across both North and South Carolina has significant benefits since Duke's physical system operates in both states. From a design and implementation standpoint, the bigger challenge will be for Santee Cooper, the electric cooperatives, and the gas LDCs. An additional complicating factor will be assigning benefit and responsibility between the electric cooperatives and the utilities from which they purchase wholesale electricity (Santee Cooper and Duke).

Speed of implementation is heavily dependent upon the success of a collaborative process. Fortunately, South Carolina does excel at this type of process as is evidenced by the passage of both Act 236 in 2014 and the Energy Freedom Act in 2019. Passage of an EERS would also likely require a holistic look at the many elements that can make an energy efficiency program successful, including cost-effectiveness testing, avoided cost methodologies, cost recovery, evaluation, measurement and verification (EM&V) methods, advanced metering and sub-metering availability, etc. But it can be done, likely in a "medium" timeframe.

Alignment with other recommendations/objectives and prerequisites

Given the historical relationship of the SC PSC to the legislature, legislation mandating an EERS is needed. Once an EERS is established, the PSC would need an annual compliance process. The utilities would then be required to develop programs that comply with the EERS. ORS and possibly the Department of Consumer Affairs Utility Customer Advocate be a intervenors (in addition to other third parties).

This effort could be complemented by the Financing subcommittee's recommendations to the extent that they make financing EE easier.

UP Recommendation 3: Utility Cost Effectiveness Testing Study

Note: The working group did not reach a collective consensus on this recommendation.

Summary

Convene a study committee to help determine if current cost effectiveness testing methodologies are adequately capturing the benefits of energy efficiency. The study would: 1) compare the pros and cons to the utility, the ratepayer, and the state as a whole of various cost effectiveness testing alternative methodologies; 2) recommend the most appropriate test(s), including the option of a customized test; and 3) determine if adopting a uniform test statewide would be advantageous.

Background

The cost effectiveness testing situation in South Carolina is currently confusing. The Total Resource Cost test (TRC) is currently used in the cost recovery mechanism, but ORS uses the Utility Cost Test (UCT) to evaluate the investor-owned utilities' EE/DSM programs. Another test utilized in some states is the Societal Cost Test. None of these tests necessarily account for all of the non-energy benefits and benefits that can be found in measures that utilize advanced technology and grid interaction. If this is the case, a custom model may be in order. New Hampshire, for example, recently passed an order removing certain participant costs from the TRC since they cannot symmetrically account for non-energy benefits.

There is a growing body of subject matter experts nationwide on this issue. In the Summer of 2020, the National Efficiency Screening Project released a new National Standard Practice Manual that incorporated cost effectiveness assessment for energy efficiency as well as demand response, distributed generation, distributed storage, and beneficial electrification. They included sections addressing the growing use of multiple on-site EE/DSM measures and non-wires alternatives and guidance on how to value them. New metrics to consider include time and location impacts as well as speed, precision, duration and response time.

Lawrence Berkeley National Lab has released new research on the value of grid-interactive buildings as a source of load flexibility with common methods for determining a value for those resources that provide demand flexibility for grid services. EPA published a technical report outlining public health benefits per kWh of EE in April of 2019. And Wood Mackenzie has identified demand response potential at the state level for both residential and non-residential customers in the context of shifting load during the COVID-19 crisis. Both Duke Energy and Santee Cooper were identified as having high DR potential, and South Carolina in general has between 100MW and 1 GW of potential in both the residential and non-residential categories.

Specific actions for implementation and key participants

This recommendation could be a joint effort between ORS, the PSC-regulated utilities, and outside advocacy groups who maintain an interest in or intervene in the PSC EE/DSM dockets. The lead implementing organization would be ORS, preferably with an order requesting the effort issued by the PSC. Stakeholders should include the utilities, outside advocacy groups and EE/DSM intervenors, a cross-section of residential and C&I customers, and numerous subject matter experts.

Alignment with other recommendations/objectives and prerequisites

No legislative or PSC action is required, but the PSC will need to approve any changes to cost effectiveness testing. The Office of Regulatory Staff has the authority to convene this study committee but it would be advisable to have the PSC approve the study as well. This recommendation pairs well with both the Opt-Out/Self-Direct Study (UP 1) and the EERS (UP 2) recommendation. It would be most effective and beneficial to have this recommendation completed before the Opt-Out/Self-Direct Study and the EERS recommendation. This recommendation is closely tied to the Technical Resource Manual (UP 4) recommendation and the two could provide complementary results.

UP Recommendation 4: Technical Reference Manual

Note: The working group did not reach a collective consensus on this recommendation.

Summary

Develop and adopt a Technical Reference Manual (TRM) for South Carolina that will standardize savings metrics for defined energy efficiency measures. The TRM should contain agreed-upon, transparent, and consistent inputs and formulas for calculating electric savings, peak demand savings, and natural gas savings for commonly available EE measures. The TRM should streamline the design and evaluation of utility energy efficiency programs, reduce administrative and engineering costs associated with the defined measures, and encourage additional investment in energy efficiency. The measures included should have widely documented savings and be largely noncontroversial.

Background

Currently, the IOUs utilize two different cost effectiveness tests as their primary tests, and then the issues related to the resulting energy efficiency measure portfolios are litigated before the SC Public Service Commission in each utility's EE/DSM docket. As such, there are differences between the utilities' programs as well as between the assumptions they use to create and

evaluate their programs. In addition, non-regulated utilities are not required to provide EE/DSM programs and many (with the notable exception of Santee Cooper and some electric cooperatives) may not even attempt to provide measures to customers simply due to the daunting nature of the EM&V process.

In 2008–2009, the three utilities, Duke, SCE&G and Progress came together and developed the SC Measures Database (SCMDB). The database included the standard details that would be contained in a technical Reference manual for hundreds of measures, both residential and non-residential. Each utility then used the SCMDB to further develop their individual DSM programs for their unique customers. The utilities did not have a need to continue to update the database as a group as each had individual SCPSC Orders and requirements to follow. The utilities now use third party evaluation to update the energy and demand savings specific to each utility's customers and service territory.

A number of other states have adopted a Technical Reference Manual to simplify EE/DSM filings. Some of these states include Vermont (which was the first state to do this in 2000), Maine, Massachusetts, Rhode Island, Ohio, Iowa, Illinois, the District of Columbia, and Missouri (which did so in 2017). Missouri might serve as an appropriate model due to some similarities in cost recovery mechanisms. Both South Carolina and Missouri allow recovery of lost revenue from reduced retail sales and an "earnings opportunity" associated with investments in demand-side resources.

A TRM would reduce uncertainty and could also result in improved coordination and program planning between the state's utilities, increasing EE investment and savings even more. A small sample of examples of measures commonly found in TRMs include ceiling insulation, storm windows, water heater wraps, and efficient clothes dryers for residential programs and LED exit signs, strip curtains for walk-in freezers, and programmable thermostats for commercial and industrial programs.

Dominion has suggested that instead of a TRM, there would be value in creating a DSM Best Practices Manual that would include or state what standard measures should be included in all DSM portfolios, defining methods of implementation and enrollment, etc., for each specific program type and what standard measures should be contained within each program, and details on how each program should be evaluated. This would not require a TRM, nor the length of time or expense that creating a TRM would have.

This is a statewide initiative that would apply to the regulated utilities, but the manual could easily be used by non-regulated utilities (such as the municipal utilities and the cooperatives). It would apply to all customer segments.

Specific actions for implementation and key participants

Implementation of this recommendation could be a joint effort between ORS, the PSC-regulated utilities, and outside advocacy groups who maintain an interest in or intervene in the PSC EE/DSM dockets. The lead implementing organization would be ORS, preferably with an order approving the effort issued by the PSC.

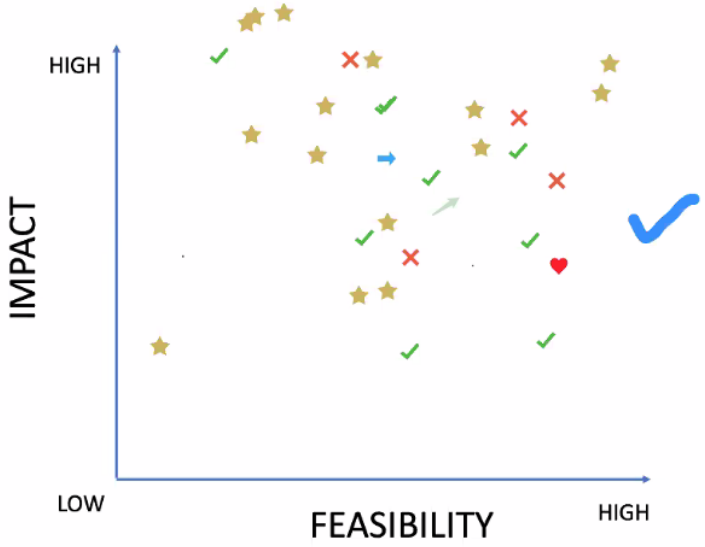
Stakeholders should include the utilities (regulated IOUs, Santee Cooper, the electric cooperatives and the municipal utilities), the Utility Consumer Advocate, outside advocacy groups and EE/DSM intervenors, a cross-section of residential and C&I customers, and efficiency measure providers and EM&V experts (in addition to a qualified consultant).

Alignment with other recommendations/objectives and prerequisites

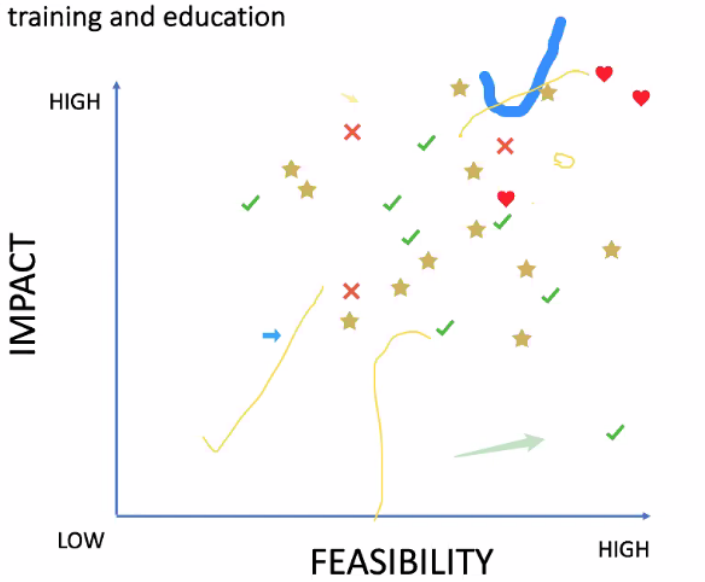
No legislative action is required, however the PSC would need to agree that a TRM is a worthwhile investment and tool. ORS would likely be the agency to oversee the process and to apply for federal funding if available. This recommendation complements both the Cost Effectiveness Testing Study (UP 3) and the EERS (UP 2) recommendations.

APPENDIX F: THE SC ENERGY EFFICIENCY FEASIBILITY/IMPACT MATRICES

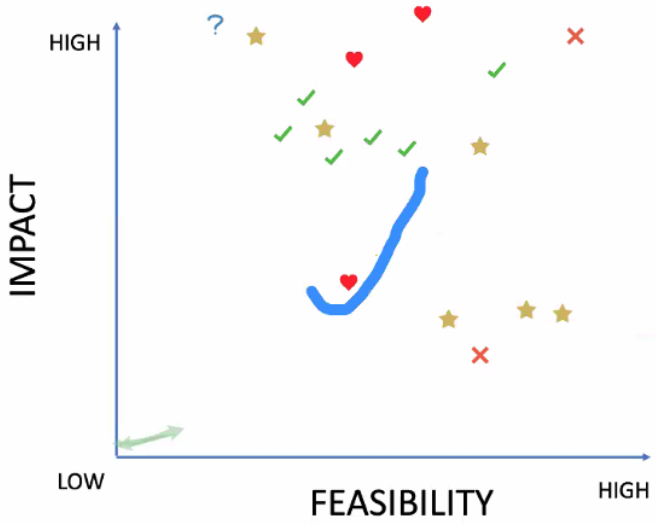
Recommendation EWD 1: Metric Development / Integrated Marketing



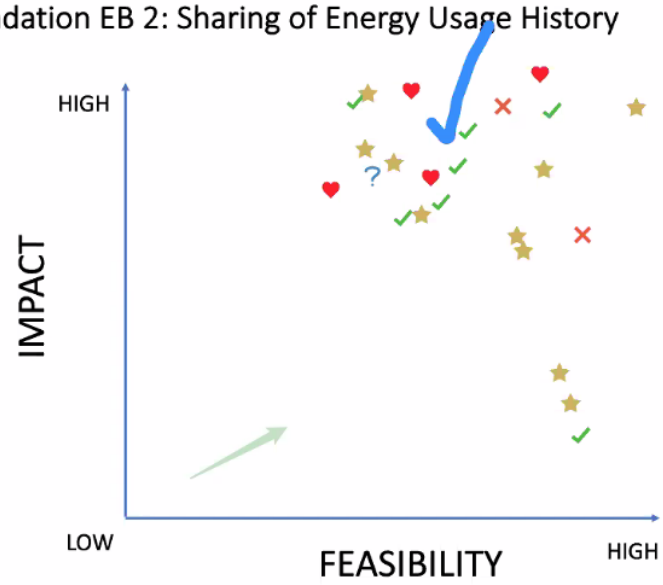
Recommendation EWD 2: Statewide strategy for coordinating EE workforce development training and education



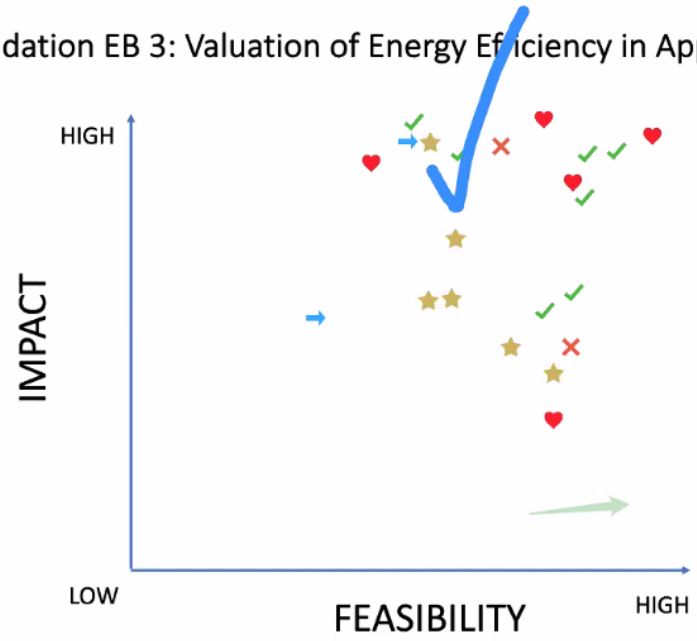
Recommendation EB 1: Commercial Building Labeling Pilot Study



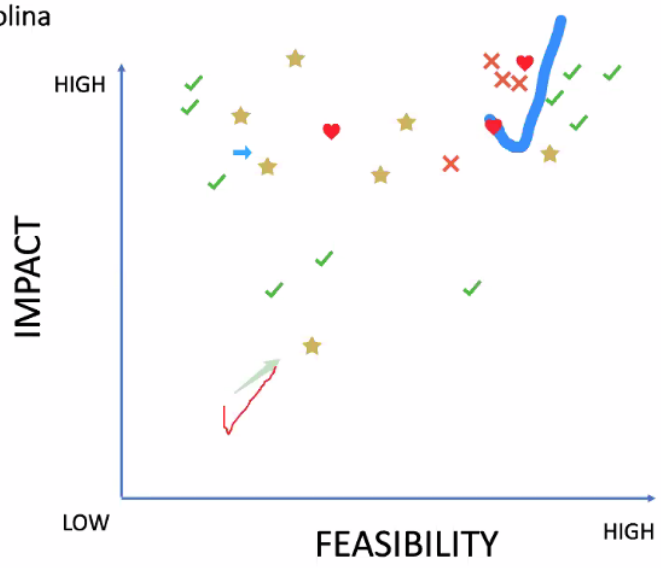
Recommendation EB 2: Sharing of Energy Usage History



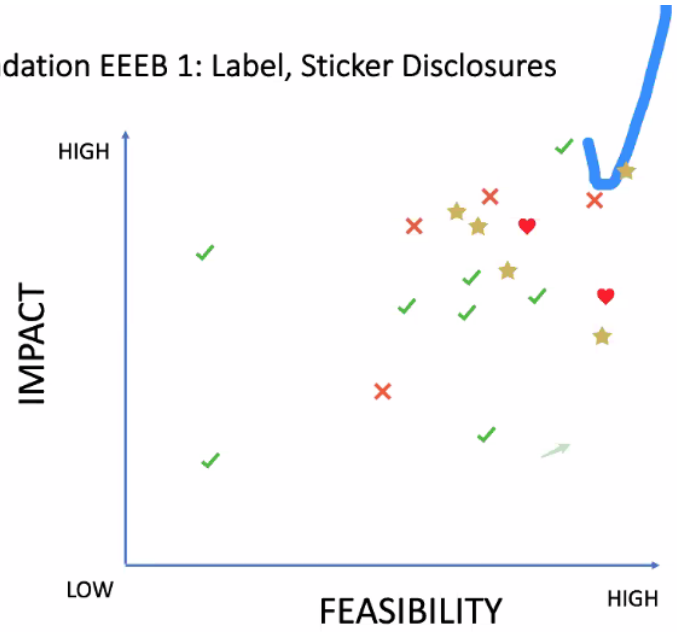
Recommendation EB 3: Valuation of Energy Efficiency in Appraisals



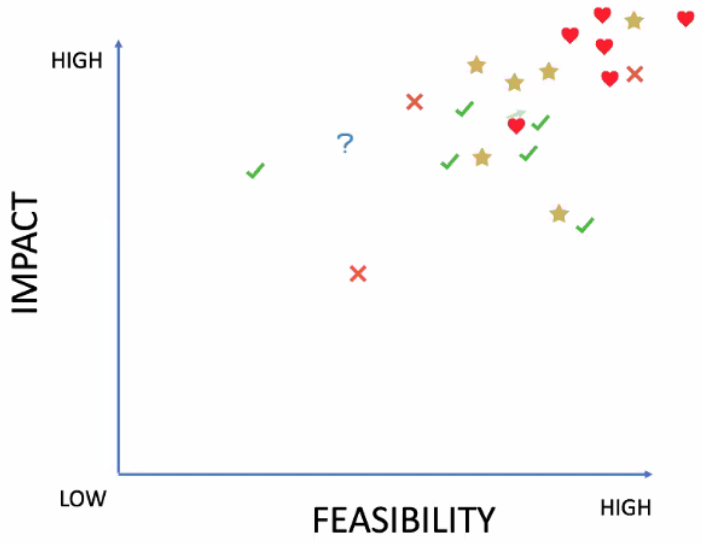
Recommendation EB 4: Adopt Updated Edition of the Commercial Energy Code in South Carolina

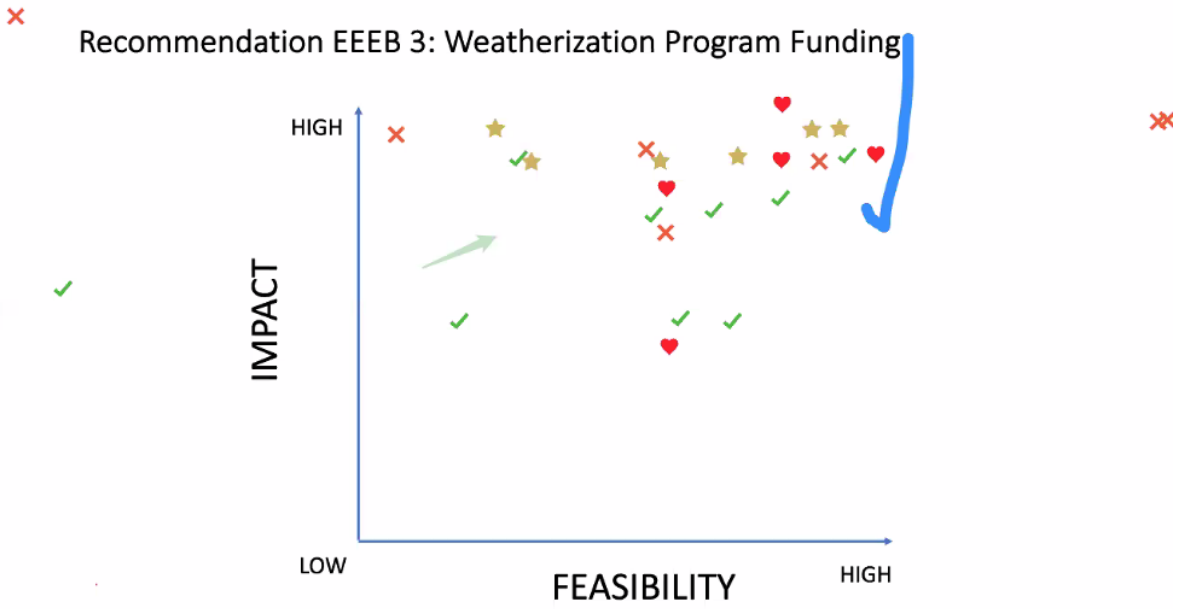


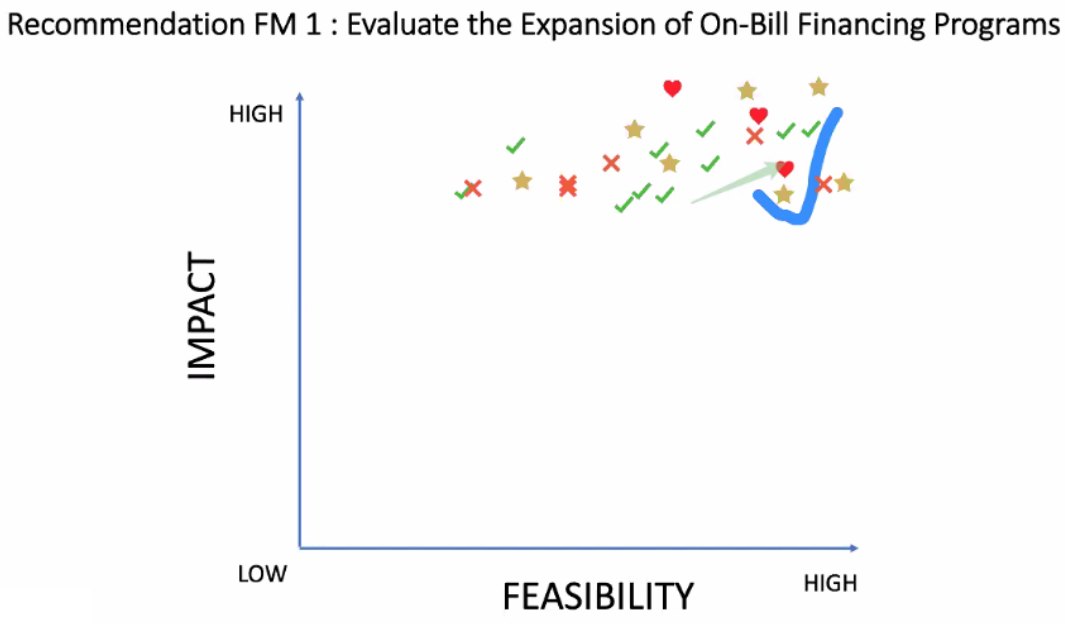
Recommendation EEEB 1: Label, Sticker Disclosures



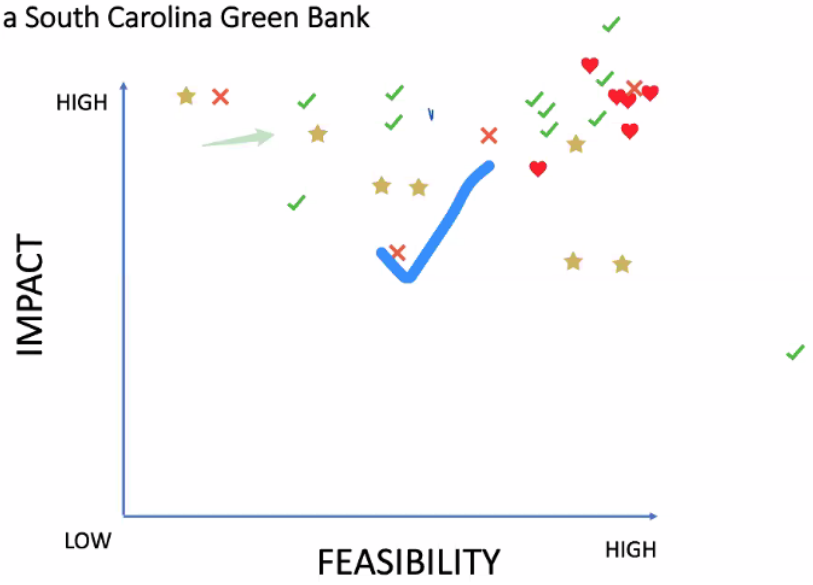
Recommendation EEEB 2: One Stop



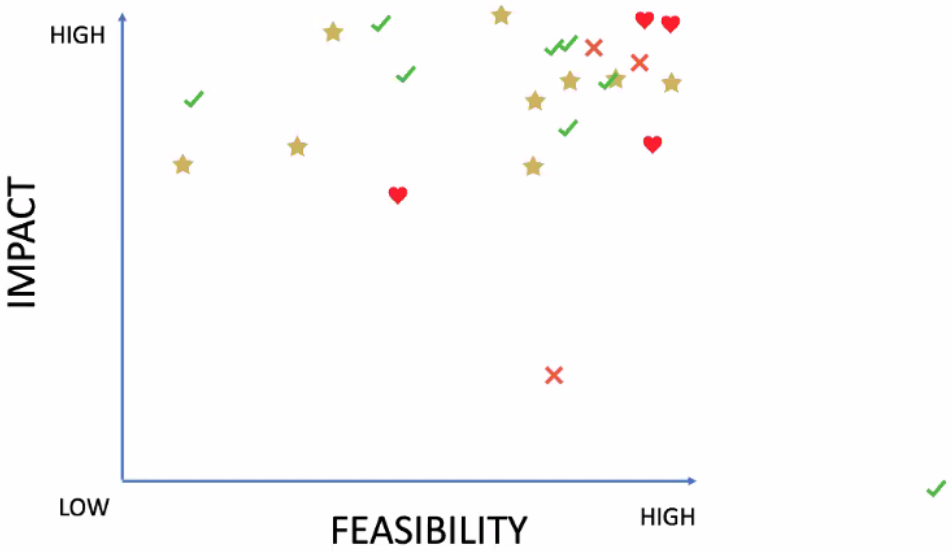

Recommendation EEEB 3: Weatherization Program Funding
HIGH
IMPACT
LOW
FEASIBILITY
HIGH


Recommendation FM 1 : Evaluate the Expansion of On-Bill Financing Programs
HIGH
IMPACT
LOW
FEASIBILITY
HIGH

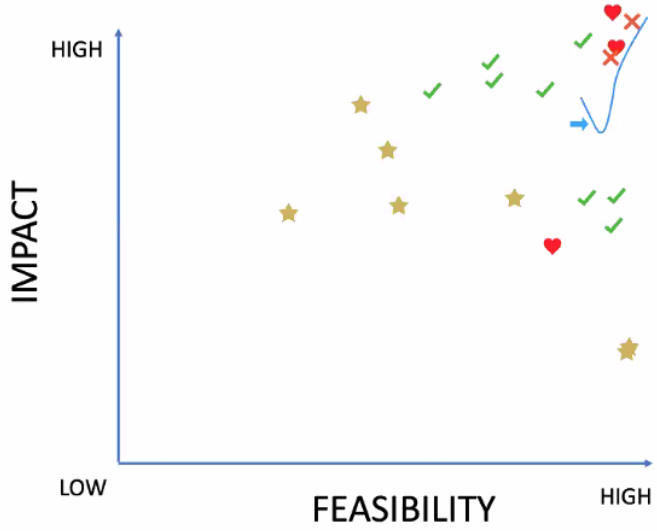
Recommendation FM 2: Assess the Feasibility, Costs, and Benefits of Establishing a South Carolina Green Bank



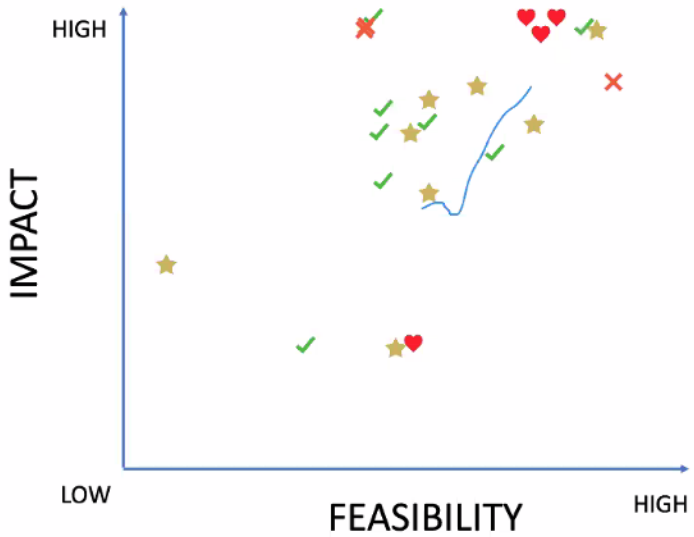
Recommendation NPPE 1: Energy Use Reduction Legislative Goal



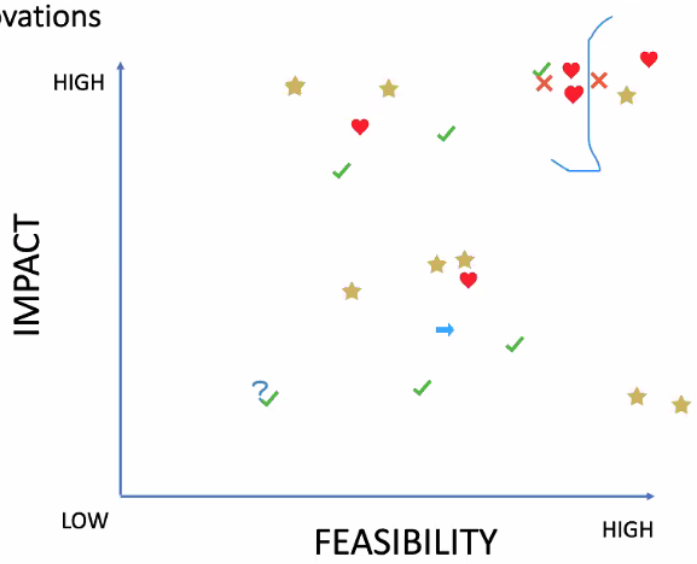
Recommendation NPPE 2: Legislative Change re CFLs



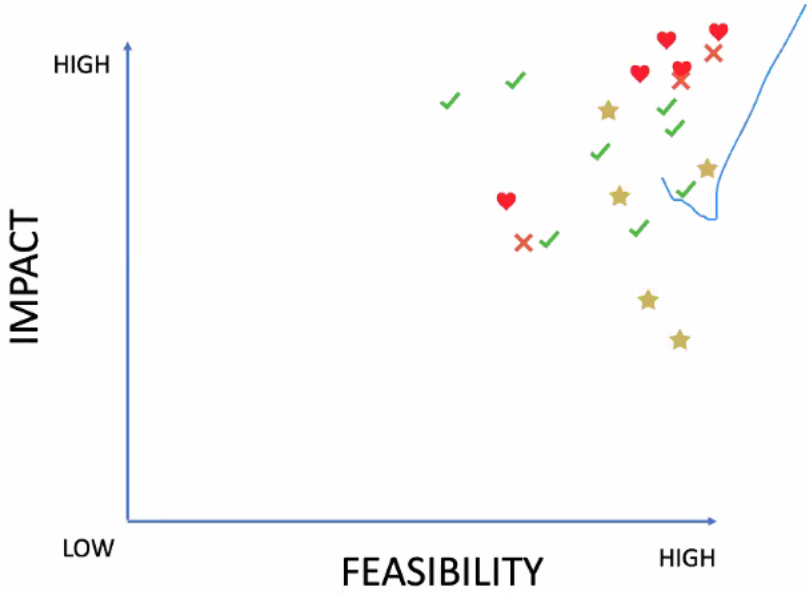
Recommendation NPPE 3: Allow flexible funding for EE projects



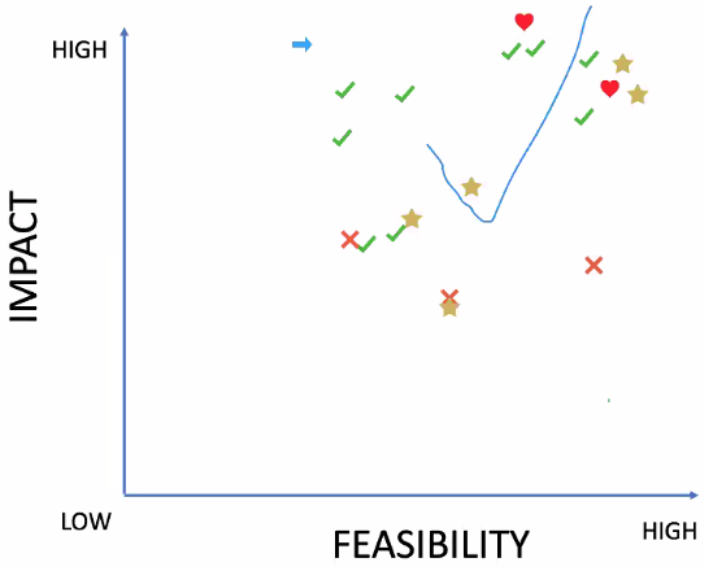
Recommendation NPPE 4: Separate Metering for New Construction / Major Renovations



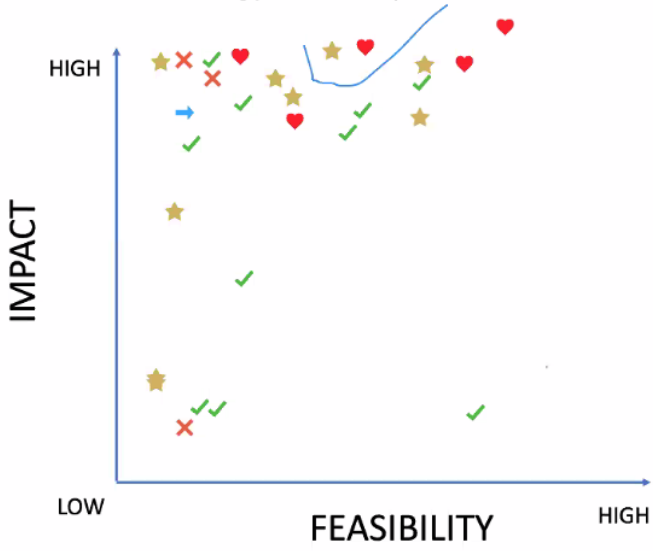
Recommendation NPPE 5: EE Guidelines for Leased Spaces



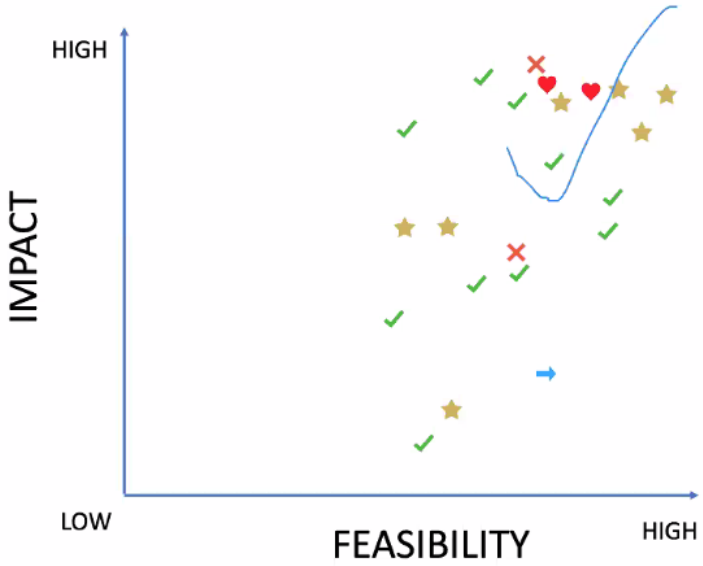
Recommendation UP 1: Opt-Out/Self-Direct Study



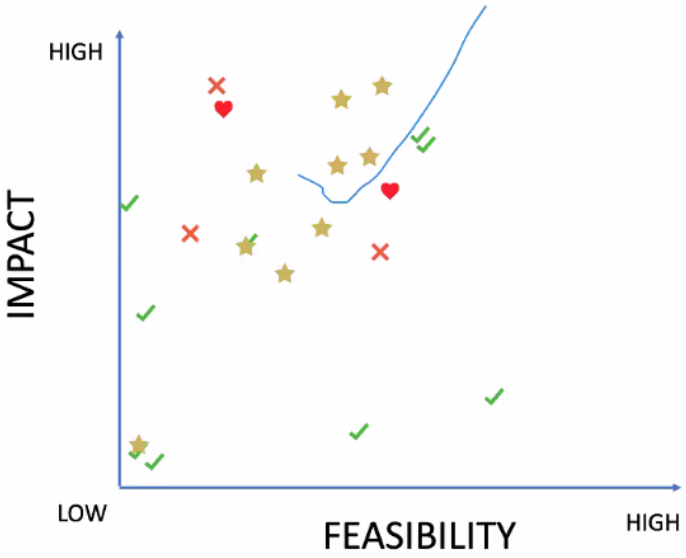
Recommendation UP 2: Energy Efficiency Resource Standard (EERS)



Recommendation UP 3: Cost-Effectiveness Testing Study



Recommendation UP 4: Technical Reference Manual (TRM)



APPENDIX G. OTHER RESOURCES

The following media and documents are archived on the Nicholas Institute website:

SC Green Banks and On-Bill Webinar

SC Utility SME Webinar 2/13/20

SC EE Workshop PowerPoint 6/4/20

Working Group Breakout Summary 11/18/19

SC Shared Objectives Brainstorming Discussion

EE Workshop 11/18/19

South Carolina EE Roadmap Advisory Committee

Eric Budds	Municipal Association of South Carolina
Patrick Cobb	AARP
Bill Cummings	Kimberly Clark and SC Energy Users Committee
Robert Davis*	SC Dept of Commerce
Joy Finch*	Greenville Technical College
John Frick*	Electric Cooperatives of South Carolina
Therese Griffin*	Dominion Energy South Carolina
Keisha Long*	SC Department of Health and Environmental Control
Shelley Robbins*	Upstate Forever
Kurt Vetter	Priority Solutions
Christine von Kolnitz*	Medical University of South Carolina
Bin Wilcenski*	Building Industry Association of Central South Carolina

SC Energy Office, South Carolina Office of Regulatory Staff

Rick Campana*	Energy Specialist, SC Energy Office
Nanette Edwards	Executive Director
Dawn Hipp	Chief Operating Officer
Anthony James*	Director of Energy Policy, SC Energy Office
Trish Jerman	Consultant to SC Energy Office
Darcy Jones*	Energy Policy Analyst, SC Energy Office
Catherine Reed*	Deputy Director, SC Energy Office
Stacey Washington*	Energy Specialist, SC Energy Office

* Designates participation as both a member of the EE Advisory Committee and an EE Working Group Team Lead

Nicholas Institute for Environmental Policy Solutions

The Nicholas Institute for Environmental Policy Solutions at Duke University is a nonpartisan institute founded in 2005 to help decision makers in government, the private sector, and the nonprofit community address critical environmental challenges. The Nicholas Institute responds to the demand for high-quality and timely data and acts as an "honest broker" in policy debates by convening and fostering open, ongoing dialogue between stakeholders on all sides of the issues and providing policy-relevant analysis based on academic research. The Nicholas Institute's leadership and staff leverage the broad expertise of Duke University as well as public and private partners worldwide. Since its inception, the Nicholas Institute has earned a distinguished reputation for its innovative approach to developing multilateral, nonpartisan, and economically viable solutions to pressing environmental challenges.

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