South Carolina Electric Utility
Energy Efficiency Programs

February 13, 2020 Webinar
## Agenda

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00 am</td>
<td>Welcome and logistics</td>
</tr>
<tr>
<td>9:05 am</td>
<td>South Carolina Utility Landscape</td>
</tr>
<tr>
<td>9:15 am</td>
<td>Investor-owned utility (IOU) EE programs</td>
</tr>
<tr>
<td>9:45 am</td>
<td>Santee Cooper EE programs</td>
</tr>
<tr>
<td>10:00 am</td>
<td>Electric cooperative EE programs</td>
</tr>
<tr>
<td>10:15 am</td>
<td>Municipal utility EE programs</td>
</tr>
<tr>
<td>10:30 am</td>
<td>Q&amp;A (please send via “chat” function)</td>
</tr>
<tr>
<td>11:00 am</td>
<td>Webinar concludes</td>
</tr>
</tbody>
</table>
Speakers

• Jen Weiss, Nicholas Institute for Environmental Policy Solutions
• Catherine Reed and Stacey Washington, Energy Office, SC Office of Regulatory Staff
• Therese Griffin and Sheryl Shelton, Dominion Energy
• Tim Duff and Lynda Shafer, Duke Energy
• Jim Rabon, Santee Cooper
• Mike Smith, Electric Cooperatives of South Carolina
• Eric Budds, Municipal Association of South Carolina
South Carolina Utility Landscape

Catherine Reed  
Deputy Director, Energy Office  
South Carolina Office of Regulatory Staff

Stacey Washington  
Energy Specialist  
South Carolina Office of Regulatory Staff
South Carolina Utility Landscape

SC Energy Efficiency Roadmap
Utility Subject Matter Expert Webinar

Stacey Washington & Catherine Reed
Energy Office
SC Office of Regulatory Staff
Generation Mix
## Utilities

<table>
<thead>
<tr>
<th>2018 Electricity Landscape</th>
<th>Investor Owned</th>
<th>State Owned Utility</th>
<th>Municipal (Public)</th>
<th>Electric Cooperative</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of entities</td>
<td>4</td>
<td>1</td>
<td>21</td>
<td>20</td>
<td>46</td>
</tr>
<tr>
<td>2018 Number of customers</td>
<td>1,653,037</td>
<td>183,815</td>
<td>162,689</td>
<td>802,321</td>
<td>2,801,862</td>
</tr>
<tr>
<td>Percentage of customers</td>
<td>59%</td>
<td>7%</td>
<td>6%</td>
<td>29%</td>
<td></td>
</tr>
</tbody>
</table>
Utility Territories
# Utility Customers

<table>
<thead>
<tr>
<th>Utility</th>
<th>Customers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electric Cooperatives</td>
<td>802,321</td>
</tr>
<tr>
<td>Dominion Energy South Carolina</td>
<td>722,196</td>
</tr>
<tr>
<td>Duke Energy Carolinas</td>
<td>698,444</td>
</tr>
<tr>
<td>Duke Energy Progress</td>
<td>226,225</td>
</tr>
<tr>
<td>Santee Cooper</td>
<td>183,815</td>
</tr>
<tr>
<td>Municipalities</td>
<td>162,689</td>
</tr>
<tr>
<td>Lockhart</td>
<td>6,172</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2,801,862</strong></td>
</tr>
</tbody>
</table>
Investor-Owned Utilities (IOUs)

- Four IOUs in South Carolina
  - Dominion Energy
  - Duke Energy Progress
  - Duke Energy Carolinas
  - Lockhart Power

- Regulated by the PSC
Public Utility

- Santee Cooper (a.k.a., SC Public Service Authority)

- Not regulated by the PSC

- Board governs and approves programs and rates, etc.

- Board candidates
  - appointed by the Governor
  - deemed fully qualified by Public Utilities Review Committee
  - confirmed by the Senate
Electric Cooperatives

- 20 Cooperatives in SC
- Member-owned
- Not regulated by the PSC
- Board governs and approves programs and rates, etc.
- Members elect the board
- Under new legislation the ORS audit department has the ability to audit co-op financials
- ORS Consumer Services will also handle bill complaints from co-op members
Municipal Electric Utilities

• 21 municipal electric utilities in SC

• Not regulated by the PSC

• Municipality governs and approves programs and rates, etc.

• SC Association of Municipal Power Systems
Office of Regulatory Staff (ORS)

- ORS represents consumers of investor-owned utilities before the Public Service Commission
- Departments:
  - Consumer Services
  - Safety
  - Transportation
  - Telecommunications
  - Energy Office
Investor Owned Utility EE Programs – Dominion Energy

Therese Griffin
Manager, Energy Efficiency and Demand Side Management
Dominion Energy

Sheryl Shelton
Manager, Demand Side Management Administration / EM&V
Dominion Energy
Demand Side Management
SC Utility SME Webinar – February 13, 2020
# DSM Program History

<table>
<thead>
<tr>
<th>Timeline Review</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2008</strong></td>
<td>Company commits to complete a thorough and comprehensive review of potential DSM programs and bring the results to the Commission in 2009</td>
</tr>
<tr>
<td><strong>June 2009</strong></td>
<td>Submitted proposed suite of DSM Programs to SCPSC for approval</td>
</tr>
<tr>
<td><strong>July 2010</strong></td>
<td>Received PSC approval of portfolio of DSM programs for three years (PY1-PY3)*; settlement agreement included an opt-out provision for industrial customers</td>
</tr>
<tr>
<td><strong>Fall 2010</strong></td>
<td>Launched residential, commercial, industrial programs</td>
</tr>
<tr>
<td><strong>May 2013</strong></td>
<td>Submitted application to SCPSC to continue DSM programs with revised portfolio (PY4-PY6)</td>
</tr>
<tr>
<td><strong>Nov 2013</strong></td>
<td>The Commission voted to approve the Company’s DSM Application and programs for six more years (PY4-PY9)</td>
</tr>
<tr>
<td><strong>June 2018</strong></td>
<td>DSM Potential Study Kickoff (PY10-PY14)</td>
</tr>
<tr>
<td><strong>June 2019</strong></td>
<td>DSM Potential Study and Application filed with SCPSC</td>
</tr>
<tr>
<td><strong>Dec 2019</strong></td>
<td>Launch Program Year 10</td>
</tr>
</tbody>
</table>

*Program Year = December 1 – November 30.*
DSM Cost Recovery Mechanism

- Program Costs
- Net Lost Revenues
- Shared Savings Incentive

\[ \text{DSM Rate by Class} = \frac{\text{Program Costs} + \text{Net Lost Revenues} + \text{Shared Savings Incentive}}{\text{KWH Sales}} \]
Evaluation, Measurement & Verification (EM&V)

**May – File Annual EM&V Report**

- 6 months after the end of each program year – currently in PY10
- 1st DSM Order (2011) requires 3rd party evaluation with an EM&V plan be in place prior to the programs launching - RFP lead to Opinion Dynamic (PY1-PY9)
- Following the Annual Portfolio EM&V report, individual Program Guidance Reports are completed, as needed.
- 3-5% of the total Portfolio budget is spent on EM&V
- Activities based on the program % of savings to the total portfolio savings, more rigor and review goes to the top energy savings programs Ex. C&I programs received the most oversight, Low-income the least
EM&V Results thru PY8

- Over 21,500 HEC visits completed
- Over 48K Heating and Cooling rebates issued with average time of 4 weeks for processing
- Over 10K appliances recycling
- Of the $113M invested $72M or 64% = customer rebates with PY8 = 73%
## DSM Prior Programs

### 6 Residential / 2 C&I Programs

<table>
<thead>
<tr>
<th>PROGRAMS</th>
<th>Rebates/Incentives</th>
<th>Education</th>
<th>In-Home/On-site Services</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RESIDENTIAL</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Home Energy Check-up</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Heating &amp; Cooling and Duct Work</td>
<td>✓</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Neighborhood Energy Efficiency</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Home Energy Report</td>
<td></td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Appliance Recycling</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>EnergyWise Savings Store</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>(online store, business offices, community)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>C&amp;I</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EnergyWise for Your Business</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small Business Energy Solutions</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>
# DSM Potential Study Expanded Programs

**7 Residential / 3 C&I Programs**

<table>
<thead>
<tr>
<th>Expanded Programs Scenario</th>
<th>Key Differences in Expanded Scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appliance Recycling</td>
<td>Expanded participation</td>
</tr>
<tr>
<td>Heating &amp; Cooling</td>
<td>Higher incentives; electric resistance heating - &gt; Air Source Heat Pump measures added, Heat Pump Water Heater added</td>
</tr>
<tr>
<td>Home Energy Check-up</td>
<td>Tier 2 measures added New!; additional direct install measures New!</td>
</tr>
<tr>
<td>Home Energy Reports (opt-out)</td>
<td>Transition from opt-in to opt-out model by 2023</td>
</tr>
<tr>
<td>Neighborhood Energy Efficiency</td>
<td>Expanded participation</td>
</tr>
<tr>
<td>EnergyWise Savings Store (online)</td>
<td>Smart thermostats New!</td>
</tr>
<tr>
<td><strong>Multifamily New!</strong></td>
<td><strong>New program</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Expanded Programs scenario</th>
<th>Key differences in Expanded scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>EnergyWise for Your Business</td>
<td>Added Agricultural offering New!; Higher incentives &amp; expanded participation for lighting, other end uses</td>
</tr>
<tr>
<td>Small Business Direct Install</td>
<td>Higher incentives; expanded participation</td>
</tr>
<tr>
<td><strong>Municipal LED Lighting New!</strong></td>
<td><strong>New program</strong></td>
</tr>
</tbody>
</table>
Non-energy benefits included in TRC

1. Public water and wastewater savings
   • Measures that save energy by reducing water consumption such as low-flow showerheads

2. Natural gas savings
   • Measures in gas-heated buildings such as higher R-value insulations, air sealing, or duct sealing

3. Avoided and deferred equipment replacement costs
   • Measures that have longer estimated useful lives (EULs) than the technologies they are replacing, meaning they will require fewer replacements over the efficient equipment lifetime (i.e., avoiding purchase of baseline efficiency equipment) such as LED bulbs
Challenges and Constraints

• Industrial Opt-outs
• Declining avoided costs/cost effectiveness
• Appliance standards – lighting, HVAC
• Rigorous EM&V and impact of net to gross
• Customer behaviors
• Hard to reach customers – low to moderate income, small businesses
• Lack of awareness and education
EE and Resource Planning

• Act 62 – 2020 Integrated Resource Plan
  • EE scenarios – High, Medium and Low

• Peak Demand
  • Interruptible Load
  • Standby Generation
  • Time of Use Program

• DR assessment in Potential Study
  • Opportunity to implement new programs and expand Time of Use with AMI implementation
DESC Energy Conservation - Rates

• **RATE 6 (Energy Saver/Conservation)** - seasonal rate designed to give residential customers whose homes meet stringent energy conservation requirements a savings over Rate 8. Customers requesting this rate must have their homes certified as meeting the Rate 6 requirements by a Dominion Energy South Carolina representative. These requirements include substantial insulation in ceilings, walls and floors, as well as double glass or storm windows, sufficient attic ventilation, weatherstripping, air conditioning and other home weatherization requirements.

• **RATE 7 (Time of Use)** - residential service time-of-use demand rate that bills a demand charge for on-peak kW and an energy charge for on/off peak kWh. The on-peak and off-peak hours vary depending on summer or winter season. This rate is designed to encourage usage during off-peak hours. The rate requires a written contract for a period of not less than one (1) year.

• **RATE 16 (General Service Time-of-Use)** - seasonal time-of-use rate available to nonresidential customers having an on-peak demand of less than 1,000 KW. This is an energy-only rate.

• **RATE 21 (General Service Time-of-Use Demand)** - seasonal time of use rate available to nonresidential customers having a minimum contract demand of 50 KVA and a maximum demand of less than 1,000 KVA. This is a combination demand and energy rate.
<table>
<thead>
<tr>
<th>Program</th>
<th>TRC</th>
<th>Sum of Incremental for Program Years 10–14</th>
<th></th>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Non-Incentive $</td>
<td>Incentive $</td>
<td>Total $</td>
<td>MWh</td>
<td>MW</td>
</tr>
<tr>
<td>Appliance Recycling</td>
<td>1.11</td>
<td>$2,547,062</td>
<td>$2,425,774</td>
<td>$4,972,836</td>
<td>14,149</td>
<td>1.7</td>
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<tr>
<td>H&amp;C and Water Heating</td>
<td>1.02</td>
<td>$3,386,440</td>
<td>$11,702,348</td>
<td>$15,088,788</td>
<td>27,271</td>
<td>13.5</td>
</tr>
<tr>
<td>Home Energy Check-up</td>
<td>1.00</td>
<td>$6,808,468</td>
<td>$9,015,591</td>
<td>$15,824,059</td>
<td>27,406</td>
<td>6.1</td>
</tr>
<tr>
<td>Home Energy Reports</td>
<td>1.88</td>
<td>$895,740</td>
<td>$3,847,221</td>
<td>$4,742,962</td>
<td>24,473</td>
<td>9.3</td>
</tr>
<tr>
<td>Neighborhood Energy Efficiency</td>
<td>5.90</td>
<td>$969,974</td>
<td>$3,730,671</td>
<td>$4,700,645</td>
<td>24,439</td>
<td>2.8</td>
</tr>
<tr>
<td>Online Store</td>
<td>8.15</td>
<td>$345,799</td>
<td>$1,533,467</td>
<td>$1,879,266</td>
<td>19,799</td>
<td>1.7</td>
</tr>
<tr>
<td>Multifamily</td>
<td>1.76</td>
<td>$1,527,150</td>
<td>$3,442,875</td>
<td>$4,970,025</td>
<td>18,627</td>
<td>2.9</td>
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<tr>
<td>Residential Portfolio</td>
<td>1.84</td>
<td>$16,480,633</td>
<td>$35,697,946</td>
<td>$52,178,580</td>
<td>156,164</td>
<td>37.8</td>
</tr>
<tr>
<td>EnergyWise for Your Business</td>
<td>1.84</td>
<td>$18,672,720</td>
<td>$35,828,135</td>
<td>$54,500,855</td>
<td>252,196</td>
<td>57.1</td>
</tr>
<tr>
<td>Small Business Direct Install</td>
<td>1.91</td>
<td>$4,910,887</td>
<td>$8,184,812</td>
<td>$13,095,699</td>
<td>71,541</td>
<td>20.6</td>
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<tr>
<td>Municipal LED Lighting</td>
<td>2.37</td>
<td>$5,035,877</td>
<td>$14,957,202</td>
<td>$19,993,079</td>
<td>19,070</td>
<td>–</td>
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<tr>
<td>C&amp;I Portfolio</td>
<td>1.89</td>
<td>$28,619,484</td>
<td>$58,970,149</td>
<td>$87,589,633</td>
<td>342,807</td>
<td>77.7</td>
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<tr>
<td>Total Portfolio</td>
<td>1.88</td>
<td>$45,100,117</td>
<td>$94,668,095</td>
<td>$139,768,212</td>
<td>498,971</td>
<td>115.5</td>
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</tbody>
</table>
Investor Owned Utility EE Programs – Duke Energy

Tim Duff
General Manager of Retail Customer and Regulatory Strategy
Duke Energy

Lynda Shafer
Strategy & Collaboration Manager
Duke Energy
Three Components of Energy Efficiency Recovery Mechanism:

- **Cost Recovery**
  - Recover the costs associated with offering customer programs (incentives, program administration and EM&V)
  - DEP amortizes program costs and earns return (WACC) on unamortized balance

- **Lost revenue Recovery**
  - Recovery of up to 36 months of net lost revenues.
  - Allows utility to be made whole for under recovery of fixed costs associated with EE savings
  - Reduced for found revenue activities (activities that increase customer consumption)

- **Shared Savings**
  - Company incentive is based on net benefits provided to the overall utility system by EE programs
  - Aligns shareholder interest with customer interests by promoting highly cost effective delivery of programs
• **Shared Savings** is an incentive structure that enables Duke to earn an incentive equal to a pre-defined percentage of the net benefit (NPV of Avoided Costs less Program Costs) generated from EE and DR programs.

• Shared Savings revenue is based on:
  - kWh impacts (avoided energy costs) generated by EE programs,
  - kW impacts (avoided capacity and T&D costs) generated by EE programs,
  - Program and M&V costs, and
  - Allowed Shared Savings percentage

\[
\text{Shared Savings Revenue} = \text{X}\% \times (\text{Avoided Cost - Program Costs})
\]

• Duke Energy Carolinas operates under shared savings incentive structures that will allow DEC to earn an incentive equivalent to 11.5% of the net benefit achieved through its EE and DR programs on a pre-tax basis.

• Duke Energy Progress operates under shared savings incentive structures that will allow it to earn an incentive equivalent to 11.75% of the net benefit achieved through its EE and DR programs on a pre-tax basis.
Avoided Costs

- Used to determine Cost Effectiveness of EE measures
- Used for Shared Savings EE revenue calculations
- There are three types of Avoided Costs
  - *Avoided Energy Cost* = kWh impacts * Cost per kWh of energy generation
  - *Avoided Capacity Cost* = kW impacts * Cost per kW of capacity construction
  - *Avoided T&D Cost* = kW impacts * Cost per kW of T&D construction
No Cost to Participant

• Income Qualified Programs and Weatherization
  □ By neighborhood
  □ Recently approved to include new measures including smart thermostats

• Home Energy House Call
  □ Recently approved to perform blower door test and install upgraded measures at additional cost

• Energy Efficiency Education
  □ K12 program with kit for home installation

• My Home Energy Report

• Multi-family Residences

• Energy Wise Home and Power Manager
  □ Demand response provided by switches
  □ Gives on bill credit to participants
Low Cost to Participant

• Residential New Construction
  - Incentive for meeting or exceeding NC High Efficiency Residential Option (“HERO”) standard
  - In DEP only

• Energy Efficient Appliances and Devices
  - Online Store, Retail

• Residential Smart $aver
  - HVAC, duct, water heaters, pool pumps
  - Uses a trade ally network and referral system (FindItDuke.com)
Non-Residential Programs

- **Small Business Energy Saver**
  - Provides incentives and vendor offers financing for remaining expense

- **Smart $aver Prescriptive**
  - Lighting, HVAC, Food Service, Pumps and Drives, IT, and Process equipment

- **Smart $aver Custom**
  - Smart $aver Performance Incentive
  - Energy Assessments
  - Design Assistance

- **Energy Wise Business and Power Share**
  - Demand response gives credit for curtailing load

- **CIG Demand Response Automation**
  - Monitor and control electric load
Pay for Performance Income-Qualified Program
- 3 year pilot in NC
- Pays nonprofits for EE upgrades based on the savings per kwh

Non-residential Upstream Channel
- Midstream discounts account for 44% of prescriptive incentives in 2019
- Developing approach to capture sales direct from manufacturers

Expansion of Small Business Energy Saver Model
- Allow vendor to offer incentives and third-party financing to more than small businesses
- In very early development
Santee Cooper EE Programs

Jim Rabon
Manager, Conservation and Energy Efficiency, Retail Operations
Santee Cooper
Who is Santee Cooper
86 Years Old (1934)
1,650 employees
Reliable – 18 minutes/year/customer
Of 2,000+ Public Power Electric Utilities
- 4th in Megawatt-hour Sales
- 6th in Electric Revenues
2020 Energy Efficiency Plan

Cumulative Energy Savings (GWh)

<table>
<thead>
<tr>
<th>Year</th>
<th>Residential Incremental for Yr</th>
<th>Commercial Incremental for Yr</th>
<th>Savings from Previous Years</th>
<th>Goal per Strategic Plan (209 GWh Savings in 2020)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>$13M</td>
<td></td>
<td></td>
<td>$258 million</td>
</tr>
<tr>
<td>2010</td>
<td>$18M</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td>$20M</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td>$14M</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>$27M</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>$29M</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>$31M</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td>$38M</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>2017</td>
<td>$43M</td>
<td></td>
<td></td>
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<tr>
<td>2018</td>
<td>$25M</td>
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</table>

209 GWh Goal met in 2018!

* Reduced inception-thru-2017 Energy Savings by 0.4 GWh due to attrition.

Customer Savings $258 million
Santee Cooper Energy
Efficiency Programs - Current

www.SanteeCooper.com
Santee Cooper EE Programs
For My Home

Rebates
Santee Cooper offers rebates through our Smart Energy Existing Homes Program for qualifying equipment installed in your home. Our rebates include High Efficiency Electric Heat Pumps, Duct Replacements, Smart Thermostats and Heat Pump Water Heaters.

Heat Pumps
Learn More

Smart Thermostats
Learn More

Duct Replacement
Learn More

Heat Pump Water Heaters
Learn More

Energy Efficient Heat Pumps

Pump Up the Savings
Most of your electric bill comes from heating and cooling. If your heat pump is older than 10 years, you may want to consider replacing it with a more energy efficient heat pump. There are several energy efficient options available that could save you energy and money.

Heat Pump Measures
Rebate Amount
Variable Speed Mini-Split Heat Pump: > 16 SEER, > 5 HSPF
$40 per 1/2 ton
Variable Speed Mini-Multi-Split Heat Pump: > 16 SEER, > 5 HSPF
$20 per 1/2 ton
Single Phase Heat Pump: > 15 SEER, > 5 HSPF (Split Systems)
$300 per installed system
Single Phase Heat Pump: > 15 SEER, > 5 HSPF (Packaged System)
$300 per installed system
Geothermal Heat Pump: ENERGY STAR® certified Geothermal system
$600 per installed system
Hybrid Heat Pump: > 15 SEER, > 5 HSPF
$500 per installed system
Hybrid Heat Pump: > 17 SEER, > 9 HSPF or ENERGY STAR®
$500 per installed system

House Call

02132020-21800-41
Santee Cooper EE Programs
Loan Program

Loans
Rebates and Loans Go Hand in Hand
Low-interest loans are available to qualifying Santee Cooper customers.

Current Loan Rate: 2.75%

Energy Efficient Loans
Santee Cooper offers loans to approved customers to help with the expense of replacing energy efficient
2020 Plan:
Santee Cooper started its Reduce the Use Program in 2009 as part of the 2020 Energy Efficiency Plan which offered rebates to customers for installing qualifying energy efficiency measures.

2030 Plan: Beneficial Electrification e.g. Electric Vehicles

2030 Plan: Demand Response Programs e.g. Load Mgt using Smart T-stats

2030 Plan: Small Business Energy Saver

2030 Plan: Focus will be to develop programs that support our customers’ needs and desire to interface more actively with their electricity provider.
## Buying a Light Bulb

Should I buy Incandescent or LED?

<table>
<thead>
<tr>
<th></th>
<th>Incandescent Light Bulb</th>
<th>LED Light Bulb</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost Per Bulb</td>
<td>![Money Symbols]</td>
<td>![Money Symbols]</td>
</tr>
<tr>
<td>Utility Fuel Needed</td>
<td>![Train Symbols]</td>
<td>![Train Symbol]</td>
</tr>
<tr>
<td>Lighting Power Costs</td>
<td>![Money Symbols]</td>
<td>![Money Symbols]</td>
</tr>
<tr>
<td>Lifespan of a Bulb</td>
<td>~1,000 Hours</td>
<td>~25,000 Hours</td>
</tr>
</tbody>
</table>
Making an Energy Efficiency Program

Energy Efficiency Potential

- Not Technically Feasible
- Not Cost Effective
- Market Barriers
- Budget and Resource Constraints
- Program Potential

Power and Fuel Savings > Cost of the Program
Power and Fuel Savings < Cost of the Program
Questions?
Electric Cooperative EE Programs

Mike Smith
Manager, Conservation and Energy Efficiency, Retail Operations
Electric Cooperatives of South Carolina
A Model for Weatherizing South Carolina Homes

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The cooperatives of South Carolina
24% of our membership lives in a manufactured home
Energy Burden in South Carolina

• Almost half of the Help My House homes are manufactured
• No credit checks means that fixed income, low income, and moderate income households are included
• An example of a member on a fixed income
  – Low monthly bill $250, high bill $600
  – Annual electric bill of $3800 on fixed income less than $12,000/year
2011: Central Electric’s HMH 125 home pilot
Origins: The HMH Pilot (2011)

- Research effort by Central Electric Power, our G&T
- Testing the program model
- 8 of 20 S.C. co-ops
- 125 homes
Our questions to answer: HMH Pilot

• Can energy efficiency be a “generation” resource, not just a member service? (touch a third of our membership)

• Can we intentionally target candidate homes, accurately model energy and demand savings, find (or train) a contractor base to perform the work, and execute with persistent savings?

• Will member satisfaction increase or decrease by offering this program?

• Can the cost of energy saved pay for the work performed with a low interest 10 year loan?
Help My House Basics

1. Convenient
   - On-bill repayment (2010 S.C. law)
   - Improves comfort and energy savings

2. Consistent Quality
   - Trained, qualified contractors
   - Co-op manages QA, QC

3. Affordable Financing
   - Low-interest loan tied to the meter;
     Transfers if home sells
   - No money down, no credit checks required
FAST-PAYBACK IMPROVEMENTS

• Seal and insulate home & duct work
• Install vapor barriers
• Replace electric furnaces w/heat pumps
• Repair or replace older heat pumps
Results: The HMH Pilot (2011)

<table>
<thead>
<tr>
<th>Annual Energy Savings</th>
<th>Annual Net Savings</th>
<th>Annual Loan Repayment</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1,157</td>
<td>$288</td>
<td>$869</td>
</tr>
</tbody>
</table>
THE AVERAGE HMH PILOT HOME...

- Reduced energy use by more than 30%
- Had a combined electric bill and loan payment lower than the electric bill *alone* before EE improvements
- Saved participants more than $200/yr. *after* loan payments
- Was more comfortable to live in
Question:

Where have EE programs been used to reduce or supplant peak demands?
**Demand Savings**

Average Summer Day Load Shape

Average Winter Day Load Shape

*From comprehensive pilot report by Collaborative Efficiency, 2013)*

**All values are per home averages for a typical meteorological year.*
DEMAND SAVINGS – Targeted

Smart Thermostats

Water Heater Control
Question:

In addition to telling us about the current utility programs, could you also tell us the number of homes affected by each of those programs in the most recent year and the proportion of those homes receiving services which are low-income and/or low-moderate income households?
**KEY FACTORS: RISK MANAGEMENT**

1. Loans tied to power meter
   - Transferrable
   - No need for credit checks

2. Electric bill payment history

3. No pay, no power
   - 2010 S.C. law permits disconnects for non-payment of utility loans
   - National default rates on power bills are less than 1/10th of 1%
## UPDATE: THE HMH PROGRAM TODAY

<table>
<thead>
<tr>
<th>Homes/Loans Completed</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2011 Pilot Program</strong></td>
<td>125</td>
</tr>
<tr>
<td>Aiken Electric</td>
<td>319</td>
</tr>
<tr>
<td>Santee Electric</td>
<td>255</td>
</tr>
<tr>
<td>Black River</td>
<td>66</td>
</tr>
<tr>
<td>*York Electric</td>
<td>10</td>
</tr>
<tr>
<td>*Lynches River Electric</td>
<td>12</td>
</tr>
<tr>
<td>Little River Electric</td>
<td>7</td>
</tr>
<tr>
<td><strong>Running Total</strong></td>
<td><strong>794+</strong></td>
</tr>
</tbody>
</table>

*December 2019
* Inactive programs
Total Program Metrics Annually

- 794 Homes Weatherized
- Over $7M loaned
- Average Loan $9,200
- Savings => “by design”
  - 6,338 GWh
  - 4,716 mtCO2
  - Equivalent to 475 average co-op homes
Rural Energy Savings Program (RESP)

- 0% interest
- 5% interest cap to members - 3.75-5.00%
- Functions like a line of credit
- Up to 10 years to loan with 10 year term
- $15.5M reserved for eight S.C. co-ops
- Carve out for each co-op ranges from $750k to $5M
Question:

I am interested in the opportunities for financing programs, particularly for the **underserved and hard-to-reach customers**, that have not been reached by the traditional utility rebate programs and customer outreach initiatives. Historically, utility financing programs (i.e. on-bill) have focused on **whole-house energy efficiency measures**, but now a new crop of programs that also finance solar rooftop panels, beneficial electrification projects, and battery storage devices, are emerging in various parts of the country. What are the SC utilities doing or planning in this area?
Rural Energy Savings Program (RESP)

– Application window will reopen early 2020 – Letter of Intent
– Approximately $100M – current or former RUS borrowers, entities that provide retail electric service to rural areas
– Anticipated application deadline September 30, 2020
– Variety of eligible measures but utility must justify the cost effectiveness to the end user:
  • Building envelope upgrades
  • Lighting
  • Permanently installed energy storage
  • On- and off-grid renewable energy systems
  • Water and Waste Efficiency
  • Manufactured home replacement

For more information visit:
USDA https://www.rd.usda.gov/programs-services/rural-energy-savings-program
EESI https://www.eesi.org/Rural-Energy-Savings-Program
Question:

What is the impetus for the private sector to try and sell fewer kWhs rather than more kWhs to its rate base(s)? This notion seems to be reinforced by the fact that the energy efficiency programs currently in place seem to be very, very small (like only 10,000 families) and are often given out as a last resort for families struggling with summer bills.
Question:

We are being pressured by outside organizations (i.e. Sierra Club) to commit to **100% renewable energy**. As a school district with limited resources this is not realistic. What programs or assistance is available to government buildings to increase their use of renewable resources?
Improving Energy Efficiency in Existing Homes using On-bill Financing

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Municipal Utility EE Programs

Eric Budds
Deputy Executive Director
Municipal Association of South Carolina
Municipal Electric Utilities
Municipal Electric Utilities

• **Background**
  - 21 Municipal Electric Utilities operate in SC
  - MEUs among oldest electric systems in state
  - Some systems date to the 1890s
Municipal Electric Utilities

Legal Authority

- Article VIII, SC Constitution grants to cities and towns
  - the authority to acquire, own, and operate electric utilities, and
  - the sole authority to grant or deny consent to other utilities to use the streets and public property within their municipal limits for utility purposes
Municipal Electric Utilities

Legal Authority

• State Statutes – General Municipal Powers 5-7-60

• Title 58 – Public Utilities, Chapter 27 – Electric Utilities and Electric Cooperatives
Municipal Electric Utilities

Service Territory

• Generally limited to:
  ▪ Customers within incorporated municipal boundaries
  ▪ New premises in annexed areas
  ▪ Unassigned territory
Municipal Electric Utilities

Governance

• Governed by elected municipal officials
  ▪ 14 MEUs by a city or town council
  ▪ 7 MEUs by a commission or board of public works

• Elected council or board responsible for:
  ▪ Establishing policies
  ▪ Setting rates
  ▪ Broad oversight
  ▪ Hiring management staff
Municipal Electric Utilities

Characteristics

- Collectively MEUs:
  - Serve approximately 170,000 customers
    - Largest – City Of Rock Hill, approximately 34,000 customers
    - Smallest – Due West, approximately 435 customers
  - Operate exclusively as electric distribution systems
  - Own no significant generation assets
Municipal Electric Utilities

Power Supply

• MEUs purchase wholesale power by long term contract

• Wholesale power suppliers include:
  ◆ Piedmont Municipal Power Agency – 10
  ◆ NTE Carolinas – 3
  ◆ Dominion Energy SC – 2
  ◆ Duke Energy Carolinas – 2
  ◆ Santee Cooper – 2
  ◆ Distribution Coops – 2

• An MEU’s generation portfolio mirrors that of the wholesale supplier
Municipal Electric Utilities

Power Supply

• Most MEUs have SEPA allocations
• An MEU’s generation portfolio mirrors that of the wholesale supplier(s)
Municipal Electric Utilities

South Carolina Association of Municipal Power Systems

• SCAMPS is a nonprofit corporation created to foster cooperation between the MEUs

• SCAMPS’ Primary functions include:
  ▪ Emergency mutual aid assistance
  ▪ Education and training
  ▪ Shared legal services
  ▪ Legislative advocacy
Municipal Electric Utilities

South Carolina Association of Municipal Power Systems

• Contracts with the Municipal Association of SC for management and operational support

• Municipal Association of SC has no regulatory authority over SCAMPS members
Municipal Electric Utilities

Energy Efficiency Programs

• Local policy decision
• EE decisions impacted by:
  ▪ Terms of all requirements wholesale power contracts
  ▪ Cost benefit of program
Questions?
Thank you to our speakers and all of you!!