



# North Carolina Energy Efficiency Roadmap

**Stakeholder Workshop #2**

May 23, 2019

# Today's Objectives

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

# Today's Agenda

- Brief Summary of Work
- Recommendation Presentations
- Feasibility Matrix Exercise
- Implementation Timeline
- Concluding remarks

# Ground Rules

- Be present
- All ideas are great ideas
- Help the group stay on track
- Keep time in mind
- Place items in parking lot to discuss later

# Our Energy Efficiency Definition

Reducing the energy used by equipment and/or processes while maintaining or improving the user's level of comfort and end-use functionality at a lower customer cost.

Reduction in the rate of energy used may be achieved by substituting more advanced technology or by reorganizing the process to reduce waste heat, waste cooling, or energy.

Demand response is a form of energy efficiency.

Conservation as a result of a user reaction to a price increase is not considered energy efficiency.

Electrification is not part of this EE Roadmap Process.

# NC EE Roadmap Timeline



# NC's Shared Objectives (10/26/18)

1. Align interests to create an energy efficiency conducive climate
2. Increase access for hard to reach sectors
3. Develop a uniform standard for tracking/benchmarking EE costs and benefits

# 11 Thematic Working Groups

Theme 1: EE Education Campaign (Onte Johnson, NCSEA)

Theme 2: Workforce Training (Tim Gasper, Siemens)

Theme 3: Building Code Improvement (Ryan Miller, NCBPA)

Theme 4: Centralized Admin & Cross-Collaboration (Gennelle Wilson, NI)

Theme 5: EE Portfolio Standard or Target (Kimberly Conley, NC CETC)

Theme 6: Address Energy Poverty (DeAndrea Salvador, RETI)

Theme 7: Equitable EE Programs for all Sectors (Terry Albrecht, WRP)

Theme 8: Equitable & Accessible EE Financing Programs (Josh Burton, NCHFA)

Theme 9: Cost/Benefit Analysis (Bridget Herring, City of Asheville)

Theme 10: Data Access and Analysis (Daniel Brookshire, NCSEA)

Theme 11: Standardized tracking of EE (Kate Konschnik, NI)

# Some Guiding Principles

- Be open to new ideas and transparent in discussing your own
- Be ready to learn
- Step out of your comfort zone
- Agree to disagree
- Elevate voices so all are heard
- Focus on overall impact
- Make equitable decisions

# Final Recommendation Presentations

- Each presenter has three minutes per recommendation.
- During the presentation, use the sticky-notes and sharpies to:
  - Ask clarifying questions
  - Provide different viewpoint
  - Identify additional resources
  - Offer yourself as an SME for implementation (please put name on sticky)
  - Anything else you'd like to ask/inform the team
- Ideas/suggestions can be anonymous or you can provide your name
- Put the recommendation number on the sticky and place it on large "Super Sticky" on the wall during a break

# Final Recommendation Presentations – Part 1

**Recommendation 1: E3: Energy Efficiency Everywhere:**  
Increase EE education and career awareness in K-12 and Community Colleges  
**Theme:** Education Campaign / Workforce Development

**Recommendation Description:**

- *Currently, lack of options for K-12 teachers for professional development and CC two year degrees*
- Training program for educators with a certification program (K-12)
- Online sharing platform for energy efficiency activities and lessons (K-12)
- Educate students on energy efficiency topics to reduce consumption outside of the classroom.
- Create specialized track /two year degree at community college (CC)
- Supports long-term increases in awareness and individual actions

**Feasibility:**

**K-12:**

- Professional development would need a dedicated, full trainer (funding required)
- Partner with universities and state agencies already providing teacher workshops to deploy faster

**Community Colleges:**

- 1-3 years (min 1 year)
- Can only work with industries & business within respective counties
- Many steps with NCCCSO to develop two year degree program in NC

**Impact**

- Increase environmental literacy and critical thinking skills for students (K-12)
- Increase opportunities for teachers to teach EE.
- Increase interests in environmental and energy focused careers
- Increase awareness of environmental justice. (K-12)
- Increased actions to improve EE at home, reducing GHGs.
- Increase in trained workforce with skills required for EE related jobs (CC)

~1-3  
Years

**K-12:** Once organization had funding and put in place staff, workshops could begin within 6 months. Development of this program would support long-term growth of EE related workforce and support other EE initiatives. Activity could start early 2020.

**Community Colleges:** 1 year minimum, 1-3 years development realistic. Creating a specialized track within existing curriculum program typical “fast-tracks” review and approval process

## Recommendation 2: Public Education Energy Manager Deployment

### Theme: Education Campaign

#### Recommendation Description:

- Deploy state-trained energy managers to serve two significant public building stocks:
  - 114 K-12 School Districts
  - 58 Community Colleges
- On-the-ground energy managers would serve in many locations where energy management has not been conducted and supply added capacity in other locations

#### Feasibility:

- Expand upon the Utility Savings Initiative methods, leveraging existing training and reporting networks
- HB241 could be a viable financing mechanism
- DEQ could coordinate the overall program with input from DPI and the Community College System

#### Impact

- Statewide impact: every NC county would benefit
- Lower utility costs are returned to counties while the state invests in program costs
- Energy managers can work on-the-ground to advance additional EE goals within education systems

~2 Years

The first year would require program drafting and authorizing work to be conducted. It is estimated that following authorization, agencies would collaborate to establish programmatic details and then recruit and train new energy managers.

## Recommendation 3: Energy Efficiency Toolkits

### Theme: EE Education Campaign

#### Recommendation Description:

- Today, there are EE resources available online, but there are barriers to overcome:
  - Limited/no access to the internet
  - Financial barriers
  - Language barriers
  - Information overload
- An EE “toolkit” would contain EE education and outreach material, scripts, presentations, and activities that are specific to each sector
- Each toolkit will be relevant to individuals’ situations, easy to understand, and provide actionable steps to reduce energy consumption.

#### Feasibility:

- The EE Toolkits are easy to implement:
  - Gather existing information from current websites and other resources
  - Develop the sector-specific kits
  - Test the kits with community organizations
  - Distribute the kits via a website or through community organizations
- No legislative or regulatory action is required.

#### Impact

- The EE Kits will increase accessibility to energy saving information and will motivate individuals to follow the actionable steps, which will result in GHG reductions.
- By empowering residents and small business owners with ways to save energy and lower their energy bills, they will experience less financial strain and insecurity.

#### Timeline

Once funding is acquired, the solution could be implemented in about 6 months and should be revisited and reengaged annually.

## Recommendation 4: Create Energy Efficiency Apprenticeship Programs

### Theme: Workforce Development

#### Recommendation Description:

- Create an energy efficiency apprenticeship program to provide work-based learning experience through collaboration between industry partners, ApprenticeshipNC, industry organizations and learning institutions from K-12 to University
- Addresses challenges faced by EE employers in identifying appropriately skilled talent for their projects
- Provides a structured career path to the development of trained individuals with appropriate skills for employment in EE industry companies

#### Feasibility:

- Medium – High Ease of Implementation
- North Carolina has a robust and growing apprenticeship environment among employers of many types. This team is accustomed to facilitating and assisting with program development like this program
- ApprenticeshipNC will continue to engage EE employers and assist them to develop programs in the existing apprenticeship structure, partnering with K-12, Higher Ed and Workforce entities

#### Impact

- High impact over time
- Economic benefit to Employers : ROI on training is approximately one year. At \$1.47-2.00 return for every dollar spent on training in apprenticeship
- Economic benefit to local communities: employment option that is accessible to all; including target populations such as youth, re-entry, Vets
- High retention rates – 91%

#### Timeline

This timeline is significantly impacted by employer participation, since they are the owners of any apprenticeship program. The process of engaging and targeting EE employers can be undertaken immediately, with additional communication and support bolstered by any potential grant activity which can be identified.

## Recommendation 5: Public Education Workforce Data and Economic Impact Study

### Theme: Workforce Development

#### Recommendation Description:

- Develop standards, methods and dataset for evaluating EE employment and talent pool
- Presently NC lacks metrics relative to energy efficiency such as: number of companies engaged in this work, number of available jobs, and number of skilled individuals
- Perform a workforce economic impact study for baseline results that allow for evaluation when further initiatives are developed relative to EE skilled workers and EE employers. (Such as outreach projects or apprenticeship programs)

#### Feasibility:

- Highly feasible: No pre-requisites required and no recommendations are corollary
- Funding sources must be identified from foundations, industry groups, non profits, or government
- Department of Commerce Labor and Economic Analysis Division would lead first portion defining methodology.
- Another party would be required for study implementation.

#### Impact

- High ease of implementation
- Long term impact
- Contributes to overall reduction in usage through building energy efficiency improvement workforce planning
- Provides data necessary to monitor programs designed to develop increased numbers of workers in the EE industry

#### Timeline

Twelve months for metric definition & study methodology, scope, analysis and improvement recommendations.  
Ongoing reporting on annual or bi-annual basis

## Recommendation 6: Raising EE awareness on NC Building Code Council

### Theme: Building Code Improvement

#### Recommendation Description:

- Improve the North Carolina Building Code Council's support of energy efficiency by:
  - Adding an Energy seat
  - Increasing the EE education of all existing members
  - Establishing new actionable goals that prioritize EE
- Barriers Addressed:
  - Lack of support for EE
  - Lack of understanding for EE
  - Lack of NCBCC pathway for EE
- Benefits to EE in NC:
  - Impacts all new construction buildings and their occupants.
  - Impacts existing buildings when renovations or permits pulled.
  - Offer energy benefits and NEBs.

#### Feasibility:

- High:
  - Adding an Energy seat is simple legislation, but takes political will and action.
  - Increasing education and establishing goals require will, priority and time.
- Implementation:
  - Legislation for Energy seat.
  - Governor's office directives for NCBCC prioritization.
  - NCDOI and advocate support for education and action.
- Stakeholders:
  - NCBCC, Legislature, Governor's Office, NCDOI, Energy code advocates, Local governments

#### Impact

- Of the \$13.9B in EE savings identified by NCBPA in 2018, \$10.0B was for new construction energy code improvement.
- Mandatory access increases via minimum energy code standards across the state to improve energy burden, but, at a cost.
- Improved opportunities for local jurisdictions to go above and beyond minimum code.
- Benefits:
  - Energy savings
  - Carbon and energy generation reductions
  - Local job creation
  - Economic development

#### Timeline

- Adding an Energy seat was attempted in 2019 session but is now targeted for 2020.
- Increasing education, priority and setting goals can happen at any time, keeping in mind the NCBCC meets quarterly and these roles are all voluntary and unpaid.

# Recommendation 7: Pathway to net-zero energy-ready new buildings by 2042

## Theme: Building Code Improvement

### Recommendation Description:

- Establish a pathway to NZE by:
  - Requiring “proper” energy code inspection, verification and/or rating in all new buildings.
  - Increasing EE support and action of state and local code stakeholders (all).
  - Improve NC’s code alignment with national standards (e.g. move back to 3 year cycle).
  - Action steps: NZE targets, existing buildings, full commissioning, etc.
- Barriers Addressed:
  - Lack of support and priority for EE.
  - Lack of code focus on existing buildings and non-residential.
  - No defined NC pathway for NZE.
- Benefits to EE in NC:
  - Sets targets and actionable steps.

### Feasibility:

- Medium:
  - Code standards are a clear pathway for targeting NZE.
  - Garnering support from “all” state and local code stakeholders is challenging.
  - Legislative priority needs to be established.
- Implementation:
  - Legislative action for NZE goals and regulations.
  - Code development via NCBCC.
  - Education and support from local governments and code officials stakeholders.
- Stakeholders:
  - NCBCC, Legislature, Governor’s Office, NCDOI, Energy code advocates, Local governments

### Impact

- Mandatory access increases via minimum energy code standards across the state to improve energy burden, but, at a cost.
- Improved opportunities for local jurisdictions to go above and beyond minimum code.
- Improved access and code/regulatory support for EE AND renewables/CE.
- Benefits:
  - Energy savings
  - Carbon and energy generation reductions
  - Local job creation
  - Economic development

### Timeline

- NZE “ready” or mandate by 2042 at the earliest.
- Legislative, regulatory and NCBCC steps can begin any time.
- Current code cycle is 6 years with opportunities to amend code via NCBCC or Legislature.

# Recommendation 8: Review of NC Legislative Process for Building and Energy Codes

## Theme: Building Code Improvement

### Recommendation Description:

- Review Legislature's code role to:
  - Improve stringency and oversight of how Legislature can change/impact code.
  - Identify action that can improve NCBC's statutory responsibilities to set and oversee code.
  - Determine if a 90-day energy, health and life safety review by NCBC could be implemented.
- Barriers Addressed:
  - Legislature can override code at any time without oversight from NCBC.
  - If EE development does not take place at NCBC, it could, or could not, via the Legislature.
- Benefits to EE in NC:
  - Could increase, or decrease, EE code opportunities.

### Feasibility:

- Low:
  - Legislature is authorized to set law, including code.
  - Little political will for lessening Legislature's authority or implementing reviews.
- Implementation:
  - Legislature would need to amend current rules and regulations.
  - NCBC and NCDI would participate in establishing new procedures.
- Stakeholders:
  - NCBC, Legislature, Governor's Office, NCDI, Energy code advocates, Local governments

### Impact

- Action could increase or decrease EE impact and action on a short and long-term basis.
- Increased support for EE's role in improving energy burden and equity.
- Benefits would ideally include:
  - Decreased EE code reductions originated by the Legislature without NCBC review and input.
  - Increased support for EE's role in code through improved analysis and value via NCBC and NCDI review and input.

### Timeline

- Legislation could be targeted for 2020 with implementation taking place later in the year.

## Recommendation 9: Establish an Energy Efficiency Advisory Council (EEAC)

### Theme: Centralized Coordination & Administration of EE Programs

#### Recommendation Description:

- A diverse body with representation from utilities, state agencies, EE experts and advocates.
- Oversee, monitor, and report on progress of EE recommendations throughout implementation.
- Share best practices on EE and make additional recommendations into the future.
- Supports the work of the Energy Policy Council.

#### Feasibility:

- Can be created without legislative action
- DEQ would play the role of lead implementing agency, identifying the members of the Council, and providing technical support in the form of staff.
- Funding could come from a variety of places: DEQ budget, or if a clean energy fund is advanced.

#### Impact

- High value in ensuring that the adopted recommendations are implemented in a timely and efficient manner, securing the potential of GHG reductions.
- Ensure continuous attention to EE in NC, and provide additional recommendations in the future, as needed.

#### Timeline

6-9 months to draft charter, identify and appoint the council members, and convene the first meeting. Early-to-mid 2020 first meeting.

# Recommendation 10: Create Project Management Coordination System for Delivery of Energy Efficiency, Urgent Repair and Weatherization Programs

## Theme: Centralized Coordination & Administration of EE Programs

### Recommendation Description:

- Create a project management system to increase coordination between service providers, contractors, utilities, and relevant state agencies.
- Ability to manage waitlists, track housing data, coordinate the provision of services, etc.
- Critical components:
  - Unified application
  - Unified waiver for data sharing
- Limited, private access – only service providers of EE, urgent repair and weatherization

### Feasibility:

- Use pilot in Chatham Co. and program in Asheville to inform design
- Implementing org: likely DEQ
- Stakeholders: Utilities, service providers (contractors), and other relevant state agencies involved in design
- Challenging to coordinate the variety of players
- No action from legislature or NCUC required

### Impact

- Will uncover major efficiencies and fiscal savings in program delivery
- Improve the state's ability to reach more of its underserved and hard-to-reach population more quickly
- Meaningful reductions in GHG emissions
- Improved equity in EE programming

### Timeline

- Stakeholder process to inform system design (6-9 mos); system development (6-9 mos); pilot; roll-out
- Each agency with a role in weatherization, urgent repair, and other EE programs could contribute to the cost of developing the platform and rolling it out.
- Upfront costs: system development; ongoing costs: maintenance and improvement of the platform.

# Recommendation 11: Create a standardized measurement and evaluation process for evaluating EE, Urgent Repair and Weatherization programs

## Theme: Energy Burden & Centralized Administration of EE Programs

### Recommendation Description:

- Currently no effective methodology to evaluate publicly-funded EE program performance
- Solution:
  - Standardized application
  - Standardized data waiver
- Programs that could benefit: Duke's Helping Home Fund, Weatherization (WAP), Equipment Replacement (LIHEAP), & Urgent Repair
- Before & after data -> M&V to measure efficacy & understand opportunities for program improvement

### Feasibility:

- Easily designed and implemented at low cost
- Will require:
  - Agency collaboration & coordination with utility stakeholders
  - Sharing and securing shared data
  - Data QA/QC
- DHHS & DEQ will lead, with support and buy-in from other relevant agencies and service providers
- No action from NCUC or Legislature is necessary

### Impact

- Profound impact in terms of creating new opportunities to understand the efficacy and challenges experienced in the delivery of our publicly-funded EE programs
- If implemented in conjunction with Rec 10 will enhance EE program delivery
- Benefits:
  - Will enable more efficient utilization of funds
  - Will create more financial savings for beneficiaries

### Timeline

- Application & Waiver design – 6-9 months; lead by DHHS, DEQ, utilities, and any other relevant agencies and stakeholders
- Roll out & scale-up – 12 months
- Process concludes in ~2021 & enhanced M&V using data collected begins

## Recommendation 12: Create an Energy Efficiency “Utility” for NC Municipal Utilities and Electric Co-ops

### Theme: Centralized Coordination & Administration of EE Programs

#### Recommendation Description:

- Some munis and co-ops do not, or are unable to, offer EE programming.
- Among those that do, there are varying degrees of efficacy and impact.
- We propose creating a distinct entity that is responsible for assisting NC municipal utilities and electric cooperatives (non-IOUs) with planning and developing EE customer programs. Participation is voluntary.
- Would provide technical assistance and support services like design and creation, scale up, and EMV.

#### Feasibility:

- Can either be a governmental agency or a private non-profit; will influence implementing organization
- Lead implementing org would be the EE utility
- Initial support in hiring and direction-setting from EEAC (Rec 9) and DEQ
- Can be easily implemented
- If govt body -> legislative action may be required for authorization and funding
- If non-profit -> no action from legislature or NCUC required

#### Impact

- Expands opportunity to engage in EE programming to North Carolinians currently living in territories with limited or no EE programming
- Increased GHG reductions from EE in areas not served by IOUs

#### Timeline

- Timeline: a year to get off the ground with staff, and then a year or two more to really gain traction
- Cost: funding for 3 full-time employees for first 2-3 years (could be grant-funded or funding from legislature)

# Break

Be back at 10:45!!

# Final Recommendation Presentations – Part II

## Recommendation 13: Match EE opportunities/programs to address unique sector needs

### Theme: Equitable EE programs for all sectors

#### Recommendation Description:

- Advance more robust and tailored EE rebates, incentives and other programs for underserved and disproportionately energy-burdened sectors with a priority focus on
  - **low-income multifamily,**
  - **mobile homes,**
  - **agricultural sector,**
  - **Plus a host of others**
- Addresses underserved sectors and disproportionately energy-burdened sectors with better project economics.
- Will drive more EE project implementation motivated by more favorable cost/benefit economics and/or effective delivery in these target underserved sectors.

#### Feasibility:

- For IOU's, new targeted programs could follow current EE/DSM business models and NCUC approval processes. Some efforts (e.g., low-income multifamily) might maximize use of existing incentive programs. Other targets (e.g., mobile homes) might take more time to leverage partnerships and pilot direct install approaches.
- CO-OP and Municipal utilities will need new business models.
- Legislation not required, but statewide policy /advisory council will be needed to drive program development.

#### Impact

- Targeted EE programs could have a strong impact in many underserved markets: Multifamily, mobile home, ag sector, houses of worship, rural customers, small business, and even some industrial.
- This proposal can have large impacts on GHG reduction, equity, and improves economic competitiveness and livability.

#### Timeline

Mid-2020 roll out for more the less complex programs which use existing business models/funding approaches. Other more dynamic program offerings with additional stakeholder partners and funding sources may have 18 month+ lead time.

## Recommendation 14: Evaluate the inclusion of new criteria to EE program approval process at NCUC

### Theme: Equitable EE programs for all sectors

#### Recommendation Description:

- Evaluate the inclusion of new program filing review criteria, which addresses equity, accessibility and inclusiveness (among all applicable social, economic, demographic or geographic groups), as part of new EE program reviews by the NC Utilities Commission.
- By including climate equity criteria in the EE Program filing process, new programs can be better designed to address these issues for the particular sector focus of the new program.
- Seeks to address low-income equity issues, underserved, and hard-to-reach sectors.

#### Feasibility:

- Led by the NCUC within the current operating context of IOU EE/DSM/DR program portfolios using rider-financed programs with IOUs.
- Legislation not required, but this recommendation requires much more research, evaluation and consideration on the necessity of new review criteria and the potential outcomes and consequences of implementing new criteria. Also requires buy-in from all stakeholder groups.
- Separate from or in addition to current low-income carve-outs.

#### Impact

- The recommendation will have a medium impact on advancing the reduction in GHG gases due to increased EE program uptake and could accelerate EE equipment installations in many sectors/groups with a positive impact on economic development.

#### Timeline

Work on this recommendation could start in January 2020, with an objective to implement by January 2021.

**Recommendation 15: Utilize utility demand-side management budgets for low-income EE improvement approaches**  
**Theme: Equitable EE programs for all sectors**

**Recommendation Description:**

- Utilize demand response and load-control budgets for EE improvements to reduce peak demand and overall energy consumption at low-income single and multifamily residences that are identified through meter data as having disproportionately high contribution to peak.
- This approach creates an alternative source of funding from utilities to address low-income access to EE improvements.

**Feasibility:**

- The approach can be applied statewide with best applications led by rural cooperatives and municipal providers.
- Legislation not required.
- Utilities would need to pilot programs first to understand how much impact EE improvements would have as DSM tool before allocating significant budgets to projects.

**Impact**

- EE measures in the low-income residential sectors will increase resiliency and economic security of these residents and have very positive effect on climate equity.
- GHG reduction potential is low-medium, but peak demand benefits would be a very important cost control measure for utilities.

**Timeline**

Programs using this value proposition could begin in 2020 with pilot program roll-outs.

## Recommendation 16: Heat Pump Water Heater (HPWH) Rental Program and EE/DSM tool

### Theme: Eliminate Energy Burden

#### Recommendation Description:

- Deploy “smart” equipped Heat Pump Water Heaters (HPWH) as an EE and Demand Side Management (DSM) tool targeted in low- to moderate-income communities (LMI) through the use of a utility-sponsored equipment rental program.
- The reduction in the upfront cost of the equipment would dramatically increase the adoption of HPWH in LMI communities helping each household significantly reduce energy use for heating water resulting in savings to the resident.

#### Feasibility:

- HPWH technology is widely available with a variety of configurations for varied deployment.
- Utility scale rental programs utilizing DSM thermal storage have been successfully deployed in other jurisdictions.

#### Impact

- Significant energy savings for LMI and CO2 emission reductions through EE can be achieved.
- Using HPWH as deployable DSM to shift loads off peak through thermal storage, additional utility cost savings and/or funding for LMI programs could be realized.

#### Timeline

18 months for development and deployment.

## Recommendation 17: Address energy burden in low-income communities and manufactured housing through greater investments in the NC Housing Trust Fund

### Theme: Eliminate Energy Burden

#### Recommendation Description:

- The most effective way to create affordable housing that is energy-efficient for North Carolina's low income and energy burdened communities and those living in inefficient manufactured homes is through the North Carolina HTF.
- The trust fund has a long history of creating high-quality multi and single-family affordable housing opportunities for low-income communities across all of North Carolina.
- By investing in the HTF, the state can meet many of the challenges of energy efficiency in low-income communities while also creating jobs and new opportunities that healthy housing provides.

#### Feasibility:

- Requires an investment of funds from private, state, or federal sources

#### Impact

- Through 2017 the HTF has created over 34,000 housing units and supported 22,000 jobs across NC.
- For every \$1 million:
- 108 households are assisted;
  - \$5,169,000 in affordable housing real estate value is generated;
  - 110 jobs are supported; and
  - \$455,000 in state and local revenue is generated

#### Timeline

The HTF is in operation and can immediately deploy additional funding.

## Recommendation 18: Support the creation of a NC-based Clean Energy Fund

### Theme: Equitable Access to Energy Efficiency Finance

#### Recommendation Description:

- A NC-based Clean Energy Fund should be established to issue loans, provide credit enhancements, and invest in clean energy projects in order to promote energy efficiency, energy conservation, and a reduction in energy consumption.
- An independent nonprofit organization could be created to administer the program.
- Alternatively, enabling legislation could establish a public purpose “Green Bank” which could be administered by a third-party administrator or an independent government agency.
- Capitalization for existing Clean Energy Funds and Green Banks has come from sources including rate tier differentials, interest earned from a founding allocation, voluntary round up of utility bills or savings from peak load demand realized through the use of energy efficiency/demand-side management.
- Public capital can be leveraged via a loan loss reserve or other credit enhancement to attract private capital or the capital of CDFI’s, private foundations and other public purpose lenders in NC, reducing risk to private lenders and inducing participation.

#### Feasibility:

- While the Clean Energy Fund can be established by the Governor’s office or the state legislature, it is best implemented by a third party non-profit organization.
- This organization can be staffed with one-two full time employees, but would also require an advisory board to provide technical and financial guidance. If established as a nonprofit organization, both the ease and speed of implementation of the Fund are medium.
- If legislative action if Green Bank is public/private partners, the implementation will be a more burdensome, but possibly have access to additional resources.

#### Impact

- A Clean Energy Fund has environmental, economic and equity benefits. For example, the economic impact of jobs created from clean energy fund investment has been quite substantial, especially in states with unrealized potential in renewable energy and energy efficiency.
- In Connecticut, employment in the solar industry has grown by approximately 30% since the creation of the CT Green Bank.
- The societal benefits of clean energy investment—including health and safety benefits, air quality benefits, and reduced energy burden for underserved populations

#### Timeline

Once established by the state, a Clean Energy Fund can be up and running in less than a year. The capitalization of the fund and the timing depends on how startup capital is provided. The team recommends that an analysis of the landscape (both the financing need and the appetite of financing partners) be established within the first six months. While the first year operating and administration costs of the fund may need to be funded through private grants, it is the intent for the Fund to be fully sustainable (self-funding) in the long term.

## Recommendation 19: Support expanded access to creative utility financing programs across many sectors

### Theme: Equitable Access to Energy Efficiency Finance

#### Recommendation Description:

- Ease of project identification, delivery, and financing are major barriers to EE project adoption
- Utilization rates of EE programs are lower when financing is complicated or handled through non-integrated 3rd party providers.
- On-bill tariff programs such as Roanoke Electrical Cooperative's "Upgrade to Save" program provide a case for expanding and supporting similar programs. Similar residential/commercial "Pay As You Save" programs operated in East Kentucky and Arkansas have improved EE implementation rates in low to moderate income sectors.
- Each utility would need to develop its own program.
- While it is currently used primarily as a funding mechanism for residential rate-payers, these on bill tariffs can serve a historically hard to serve area including: single family, multi-family (renters), small business and commercial customers.
- A start up loss reserve could be statewide either as a standalone fund or as part of a larger Clean Energy Fund or Green Bank.

#### Feasibility:

- Research: Could be commissioned and performed by state universities and shared with electric utilities. Possible federal grant or other research grant could cover costs.
- Networking with Third Party Providers: Could be addressed by membership trade associations or by the state energy office
- Loss Reserve/Guarantee: Funded by State Energy Office or through allocation by General Assembly. Could be a one-time allocation.
- Capitalization for Program Costs: Utilities, Public Funds or a state-wide Clean Energy Fund (public/private investment)

#### Impact

- On-Bill would present significant business development opportunities for local contractors and raters.
- Clients served by On-Bill have little to no other options for addressing EE if they are renters, higher income than the Weatherization limits, or a smaller commercial project than handled by typical EE lenders.

#### Timeline

Research could be commissioned immediately and provided over the next 5 years as typical payback is up to 8 years and Roanoke's program is currently 3 years old. Governor/Legislative demonstration of support could be communicated at any time. Utilities could build programs over the next 2 to 5 years. A loss reserve/guarantee fund could be established in the next 1 to 3 years to incentivize the development of programs.

## Recommendation 20: Flexible NC Agency Funding for EE Projects

### Theme: Equitable Access to Energy Efficiency Finance

#### Recommendation Description:

NC Agencies are mandated to save 40% of their 2003-2004 energy use/sqft by 2025. The two most significant barriers to achieving energy savings are EE project funding and EE project management. This recommendation focuses mainly on these two barriers and recommends several potential solutions.

- Allow NC Agencies to carry an EE reserve fund
- Allow for annual OSBM increases that reflect known utility rate increases
- Allow utility savings realized by NC Agencies to remain available to the Agency for additional EE projects similar to legislation enabled by H1292-2010 for the UNC system
- Provide funding for Agencies to hire PM staff for energy efficiency project execution
- Allow Agencies to use utility opt out savings to hire EE PM staff and to fund EE projects
- Better and more widespread use of the Energy Savings Performance Contracting (ESPC) process, P3, Design-Build-Own-Operate (DBOOM) and Energy as a Service contracts.

#### Feasibility:

- OSMB action needed:
  - Allow for annual OSBM increases that reflect known utility rate increases
  - Provide funding for Agencies to hire PM staff for energy efficiency project execution
- Legislative action needed:
  - Allow NC Agencies to carry an EE reserve fund
  - Allow utility savings realized by NC Agencies to remain available to the Agency for additional EE projects similar to legislation enabled by HB1292-2010 for the UNC system

#### Impact

- Typical EE/ ESPC project savings are in the 25-30% savings range. NC Museum of Art experienced utility savings over 60% savings over the 12-year term (financing recently 100% paid) and the NCDOT Roadway LED project Counsel of State approved in July 2017 electricity savings are in the 50-55% range. DBOOM, P3 and Energy as a Service contracts also have significant savings potential.

#### Timeline

Several steps of recommendation could be started immediately by OSBM and before next legislative session bills like HB 1292-2010 could be adapted for coverage of other governmental and quasi-governmental buildings. A lead agency could work on research and networking to share strategies for energy performance-based contracting.

## Recommendation 21: State Building Pilot to Standardize EE Metrics and Reporting Practices

### Theme: Cost/Benefit Analysis - EE Impact on Grid and Societal Cost Inclusion

#### Recommendation Description:

- Standardize what and how energy information is reported, including factors beyond energy consumption and current measures implemented to determine life cycle cost and benefits.
- Creates central database and a universally recognized standard for public sector to follow.
- Emphasis on public buildings supports the 40% reduction in public building energy use.

#### Feasibility:

- Supports proposed legislation to reduce energy use in state buildings by 40%.
- May include the expansion of UNC system reporting mechanism.
- DEQ would likely lead the implementation, identifying additional stakeholders and providing technical support.
- Collaboration encouraged with Commerce on non energy items to track.

#### Impact

- Improves accuracy in tracking environmental and economic impact.
- If an option for all public buildings, it may increase access to energy information for smaller jurisdictions that otherwise couldn't afford energy analysis.

#### Timeline

Establish a stakeholder working group to develop uniform tracking and reporting framework (3-6 months). If additional staff resources are required funding may need to be requested in fiscal year 2021.

## Recommendation 22: Establish Fuel-Neutral Statewide EE Fund to Address Energy Burden & Equity Concerns

Theme: Cost/Benefit Analysis - EE Impact on Grid and Societal Cost Inclusion

### Recommendation Description:

- An energy source-neutral rider for all carbon-based energy to provide greater equity in addressing equity burden.
- The state or 3rd party collects rider for all carbon-based fuels.
- Energy burden would be based on total carbon-fueled energy consumption, not a specific fuel or energy provider.

### Feasibility:

- Will require legislative support.
- NCUC will guide implementation once legislation is enacted.
- Stakeholder support among utility providers and LMI service providers is essential.

### Impact

- Creating a unified fund to measure and alleviate energy burden will make resources available to those with the highest overall need. Additionally, this is the community that is most impacted by climate change.

### Timeline

Stakeholder recruitment and initial discussion can begin immediately, in partnership with Theme 8's recommendation for a Clean Energy Fund.

## Recommendation 23: Include Valuation of Non-Energy Benefits (NEB) in EE Investments

### Theme: Cost/Benefit Analysis - EE Impact on Grid and Societal Cost Inclusion

#### Recommendation Description:

- Develop methodology to calculate benefits to public health, economic development, environmental health and increased property value for EE investments at the utility scale and at the building level.
- Challenges status quo metrics limited to avoided energy and grid cost by standardizing valuation of NEB.

#### Feasibility:

- Will require legislative action.
- Once legislation is enacted, NCUC will provide guidance on implementation.
- DEQ could facilitate stakeholder engagement prior to legislative action and provide technical assistance on balance valuation of “negawatts”.

#### Impact

- Provides an economic mechanism to more accurately capture externalized costs and benefits associated with EE investments.

#### Timeline

This will be a long term effort. A working group comprised of utility providers, healthcare providers and environmental regulators will need to find common ground before soliciting support from the General Assembly.

## Recommendation 24: Cost-effectiveness testing / Utility EE programs

### Theme: EE Standard or Target

#### Recommendation Description

- Many sectors are not able to take advantage of programs for various reasons (cost, lack of program awareness, etc.)
- NCUC to select a consultant to conduct / review new cost-effectiveness testing regulations and protocols.
- Quantify and qualify all of the benefits of EE utility programs
- Align policy goals with utility programs

#### Feasibility:

- NC Utilities Commission would help provide access to information, oversee research and report to utilities and stakeholders
- Relatively short implementation period once a petition is filed as part of a current or future docket, or enactment of legislation.
- Diverse stakeholders required to weigh-in

#### Impact

- Improved participation in EE programs
- Workforce economic benefits inc. job creation in the EE sector based on new / additional programs
- Incorporate equity as part of programs
- Reduce GHGs and reduce energy consumption as part of EO #80

Timeline

6-8 months

## Recommendation 25: Required / Mandatory Energy Efficiency Resource Standard

### Theme: EE Standard or Target

#### Recommendation Description:

- Develop mandatory EERS of 10% electric energy savings and 10% demand reduction for IOUs. With 5% electric and demand reduction for munis / coops by 2030, below a baseline of each utility's total gross sales for 2020.
- Includes a low-income carve-out for electric energy savings of 2% (of the 10% target) for IOUs and 1% (of the 5%) for muni / coops.

#### Feasibility:

- Requires new legislation and new rule making by NCUC.
- Funding mechanism for utility cost recovery and incentives will be a part of the new legislation and dev. of EERS program goals.
- Low-income carve-out will require oversight.
- Lead implementer: Utilities or a third-party entity to create a statewide, uniform approach

#### Impact

- Energy reductions lead to lower emissions and overall improved societal health for all North Carolinians.
- Workforce gains
- Strengthened communities through direct investment
- Help to stabilize grid during peak

Timeline

2022-2032

**Recommendation 26: Establish Minimum EE Goals within current REPS**  
**Theme: EE Standard or Target**

**Recommendation Description:**

- Within state’s REPS framework, incorporate a 25% minimum, up to 40% maximum, EE contribution beg. in 2021 subject to cost-effectiveness screens

**Feasibility:**

- Leg. action required to establish. NCUC would be involved in reviewing changes to program costs.
- Funding source would be addressed through current DSM / EE Rider.
- Costs minimal and ongoing costs would be similar to current REPS to include rebates, utilities program admin., and recovery of lost utility revenue.

**Impact**

- Currently impacts 1 IOU (Dominion) as DEP, DEC are already meeting 25% requirement (+18%)
- Potential to reduce GHG emissions
- Potential to reduce energy consumption in state owned buildings (EO #80)

Timeline

2021

## Recommendation 27: Download my Data Functionality

### Theme: Data Access

#### Recommendation Description:

- Electric, water, and natural gas utilities must provide access to at least 24 months of electricity demand and consumption data
- Data provided in a standardized XML format (Green Button Download My Data or similar standard)
- Utilities provide a basic guide of how to access and use this data for energy efficiency opportunities and benchmarking
- Customers should be provided with the “freshest” and most granular interval data where the metering infrastructure makes that possible

#### Feasibility:

- Primarily requires updating IT infrastructure and customer portals and will rely on existing or planned meters
- Duke Energy has committed to this functionality
- Requires utilities to lead the implementation with NCUC or primary regulator approval for cost recovery
- Utilities, customers, interest groups need to collaborate on exact format for data, which NCUC could standardize

#### Impact

- Energy efficiency opportunities identified through increased data access have been estimated to save customers between 6% - 18%
- Provides easily accessible utility consumption data for all types of customers, not just those who can afford investment to monitor their use

#### Timeline

Since recommendation does not require additional hardware investments, the necessary IT upgrades would hopefully be complete by end of 2020

## Recommendation 28: Database of Utility Rates

### Theme: Data Access

#### Recommendation Description:

- Require all electric, water, and natural gas utilities to publish all of their rate schedules in a standardized machine-readable XML format and publish any updates to these rates in a central database
- To take advantage of data access provided in Rec. 27, customers will need easy access to up to date rates for CBAs of EE/DSM opportunities
- Will simplify and improve accuracy of \$ savings estimates

#### Feasibility:

- Most utilities already publish up to date rate information on their websites
- This will primarily just require conversion of those rates into an XML/machine readable format
- NCUC will need to establish rules/format of the rate information and house the rate database
- Utilities not regulated by NCUC should be strongly encouraged to submit rates or establish a legislative requirement

#### Impact

- Energy efficiency opportunities identified through interval data access have been estimated to save customers electric between 6% - 18%
- Providing easy access to rate information and guidance on how to use rates to calculate \$ savings should help EE/DSM opportunities be more accessible

#### Timeline

It will likely take through 2020 for NCUC to establish rules and formatting requirements. Utilities would begin formatting and submitting their rate information in Q1 2021 and finish by Q3 2021. If NCUC has capacity, utilities could also submit up to date rate tariffs to NCUC for formatting and placement in database

## Recommendation 29: Evaluate Automatic Energy Data Transfer

### Theme: Data Access

#### Recommendation Description:

- Downloading of customer data requires additional steps by customers to share their data with personally selected apps or EE/DSM service providers
- Automating this data transfer like the Green Button Connect My Data reduces download burden and keeps data up to date
- NC utilities have expressed concerns with automation, so stakeholders should collaborate on evaluating these concerns

#### Feasibility:

- These issues will likely be at least partially addressed in the NCUC Docket Rulemaking proceeding for Commission Rules Related to Electric Customer Billing.
- Proceeding will take place over the summer of 2019
- Utilities and stakeholders should continue to evaluate these issues throughout 2019 and work to address issues that may not be resolved by the NCUC and utilities that aren't directly regulated by NCUC

#### Impact

- TBD depending on the level of data access provided. Ultimately the benefits of this data access will be greatest if that data is provided in real, or nearly real, time and will diminish as the data ages
- States and utilities that have implemented Green Button Connect My Data have seen more EE/DSM benefits than just having Download my Data functionality

#### Timeline

Evaluation and NCUC proceeding hopefully complete by end of 2019

## Recommendation 30: Collect Existing Data on Energy Use, Energy Savings, and EE Measures in NC

### Theme: Standardized Tracking/Reporting of EE

#### Recommendation Description:

- Identify the basic info needed to tell NC's "energy efficiency" story (e.g. electricity/fuel use, savings, EE measure type, costs/benefits).
- Pull info from existing private and public reporting mechanisms.
- Create "snapshot" metrics (i.e., per capita electricity use in the residential sector)
- Would more readily enable analysis.

#### Feasibility:

- Information about energy use, savings, and EE measures is collected, but in different formats & locations
- Team 11 has compiled a spreadsheet of existing reporting.
- DEQ and the Department of Commerce could collect the underlying data.
- No new authority needed.
- Modest cost.

#### Impact

##### Data Collection Could:

- Help NC track progress on the EO80 GHG target, educate, and inform investments and incentives,
- Suggest improvements to existing reporting regimes, and
- Reveal new areas of opportunity for EE.

#### Timeline

Existing information could be collected by end of 2019.

## Recommendation 31: Establish an Online Data Repository for Energy Efficiency Metrics

### Theme: Standardized Tracking/Reporting of EE

#### Recommendation Description:

- Create a user-friendly online repository for data collected in Rec 30 + data suggested by other teams.
- Provide a “virtual” home for this and future data.
- Enable creation of charts, reports.
- Firms might use the tool for new ideas in EE; local governments might track progress relative to other communities; students might conduct research.

#### Feasibility:

- Team would need website, data cleaning, and database management experience.
- Some existing reporting is not publically available; data manager could seek confidentiality agreements and share only aggregated data.
- Where the repository is housed (DEQ, Commerce, a university or third party entity) will depend in part on who can protect confidential data.
- No new authority needed.

#### Impact

##### Data Sharing Could:

- Help NC track progress on the EO80 GHG target, educate, and inform investments and incentives, and
- Reveal new areas of opportunity for EE.

#### Timeline

Initial repository could launch, populated with readily accessible and publically available data, by 3Q 2020.

## Recommendation 32: Expand the Energy Savings Data Repository to Include Voluntary Reporting

### Theme: Standardized Tracking/Reporting of EE

#### Recommendation Description:

- Build out the repository described in Rec 31 by encouraging voluntary reporting.
- Enable basic reporting directly to the repository; alternatively, could promote an outside tracking mechanism as the “gold standard” (Portfolio Manager?)
- Commerce could conduct periodic EE surveys.
- Reward participants with recognition, incentives.

#### Feasibility:

- Will need to deploy different strategies to encourage reporting – education, incentives, recognition.
- In partnership with DEQ, the Department of Commerce could be particularly effective in outreach to small businesses and landlords of multi-family housing.
- No new authority needed for voluntary reporting.

#### Impact

- Expanded Reporting Could:
- Help NC track progress on the EO80 GHG target, educate, and inform investments and incentives;
  - Reveal new areas of opportunity for EE.
  - Open doors to new EE resources for small business and other harder-to-target entities.

#### Timeline

Rec 32 could begin in parallel to Rec 31, and continue into the future.

# Lunch

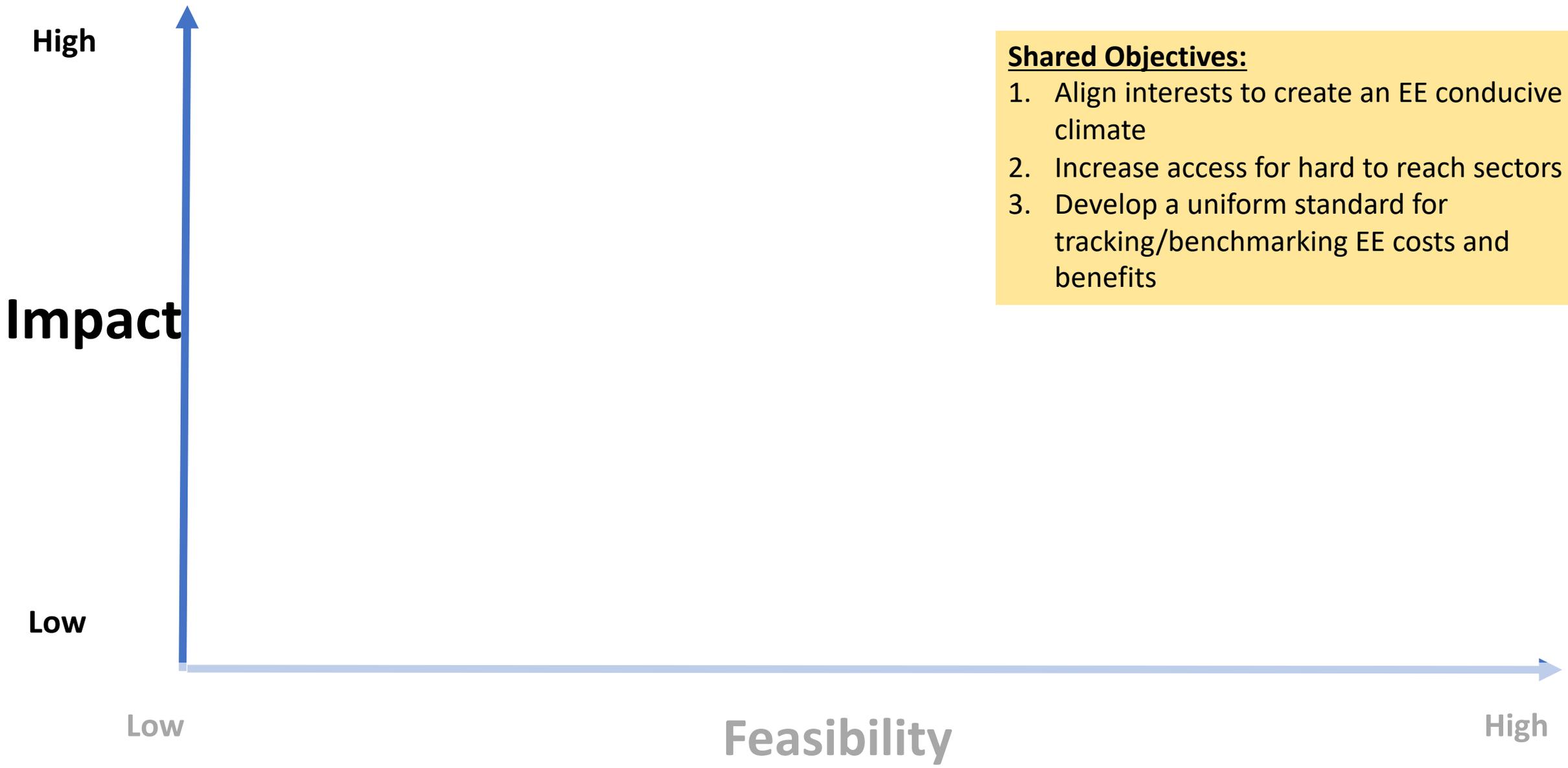
Be Back at 12:45

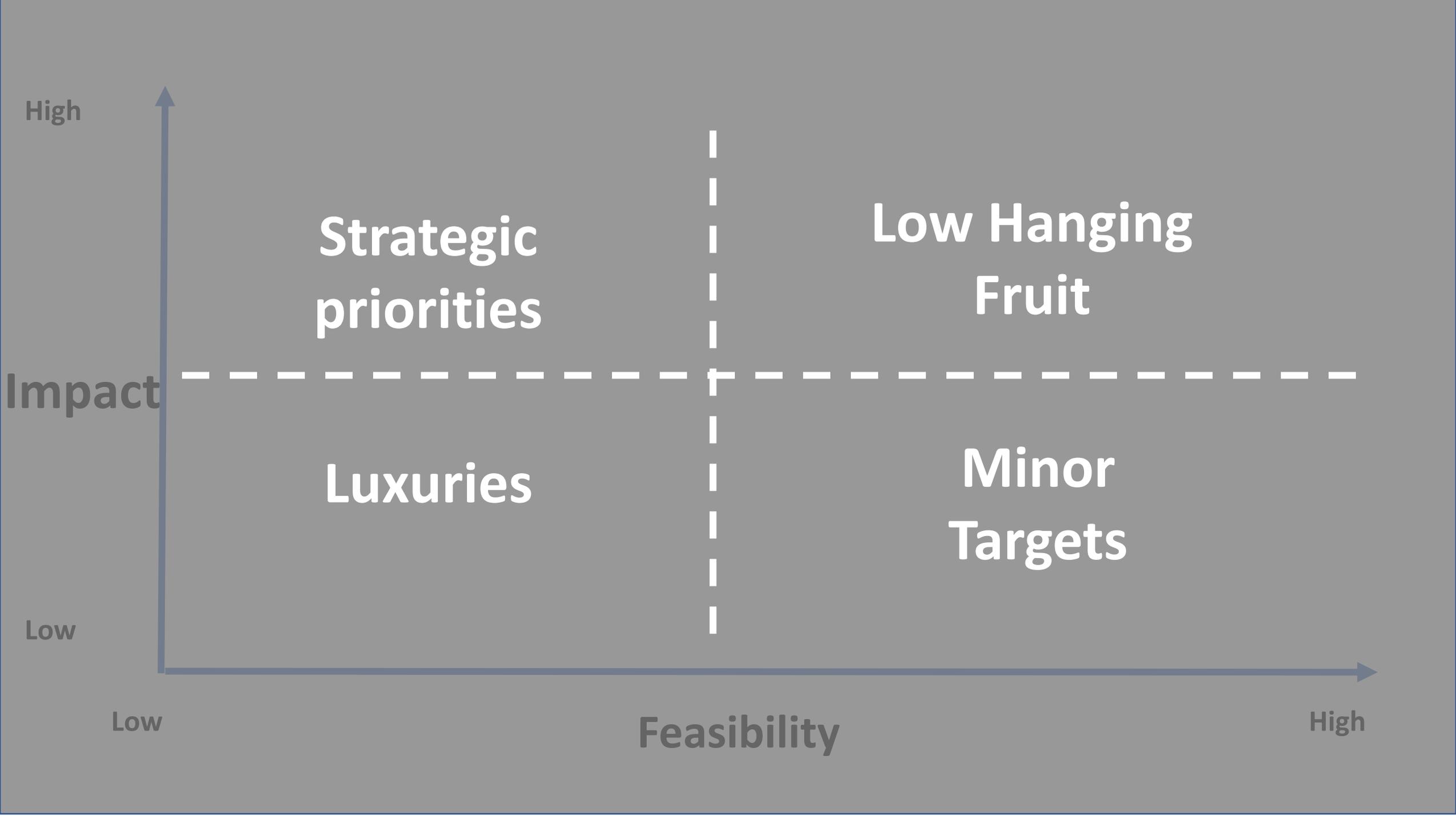
# Feasibility Matrix Exercise

Tips & Tricks:

- Pick a timekeeper
- Use the full recommendation information packet to aid deliberation
- Place one concept in the middle, and begin to place all other recommendations relative to one another.







# Break

Be back at 3:00

# Implementation Timeline

# Next Steps

- Steering Committee Meeting – June 6, 2019
  - Review results from feasibility matrixes
  - Revise recommendations as needed
  - Develop "short list" of recommendations that will go into Clean Energy Plan
- Presentation to Clean Energy Plan Stakeholder Group – June 26, 2019
- Roadmap Draft – early July
  - Peer review
  - Steering Committee review
- Final Roadmap due to DEQ – July 31, 2019
- Implementation??

# Thank you!

| Steering Committee | Working Group Team Lead     |
|--------------------|-----------------------------|
| Tim Duff           | Terry Albrecht              |
| Jack Floyd         | Daniel Brookshire           |
| Paula Hemmer       | Josh Burton                 |
| Bridget Herring *  | Kimberly Conley             |
| Kate Konschnik *   | Tim Gasper                  |
| Laura Langham      | Onte Johnson                |
| Caroline Macklin   | Deandrea Salvador           |
| Ryan Miller *      | Gennelle Wilson             |
| Al Ripley          | Kate Cobb                   |
| Kat Stahl          | * Also a Working Group Lead |

THANK YOU!!!