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**Sent:** May 8, 2023 1:16 PM (UTC-04:00)  
**Attached:** Feedback Letter 100% renewable plan (2).pdf, 3\_14\_23 - Full Strat Plan\_comments.pdf, Big Picture 100% renewable feedback.pdf

Good afternoon Sam.

Please see the attachments offering feedback on the 100% Renewable Plan.

Looking forward to seeing the latest round of revisions. Please share them as soon as possible so we have time for thoughtful review ahead of the June 7<sup>th</sup> meeting.

Best,



**Jackie Hamstead**

she/ her

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## Sustainability Office

5/5/2023

Sam,

After review of the March 14<sup>th</sup> version of the 100% Renewable Energy Plan, the City and County are sharing feedback that may inform The Blue Horizons Project's future engagement with this initiative.

Firstly, we want to acknowledge the real challenges of creating a data-driven and user-friendly 100% Renewable Plan. Unquestionably, significant work has gone into this Plan. This feedback is aimed at enriching the final product. More detailed notes are in the attachments, and we plan on bringing constructive suggestions to the upcoming review session.

For the Plan to be a valuable tool for local governments, the scope must be focused on locally attainable measures, where government has authority to assist in achieving this challenging, private sector 100% renewable energy goal. We have compiled initial recommended revisions in the attached review. In addition to the overarching scope concerns, as written in the March 14<sup>th</sup> draft, the proposed strategies need improvements in key areas. For example, where data or analysis methodology is incomplete or not yet fully defined, it should be strengthened and clarified. All claims and references should be cited. We expect that editorial and readability concerns have been addressed in subsequent revisions, but they are noted for convenience.

As currently constructed, we are concerned that neither the City nor the County would be able to support or endorse this document. Recognizing the amount of time and effort already invested in this effort, the City and County would like to see the Plan process completed by the end of June, so that the BHPCC can refocus their efforts on program and project implementation.

Thank you for your continued interest and effort in serving our community,

Jeremiah, Bridget, Jackie, and Kiera





# 100% Renewable Energy by 2042 Strategic Plan for Buncombe County, NC

March 2023 1st Full Draft

Author: Green Built Alliance  
with support from the Blue Horizons Project Community Council

March 1, 2023



## Acknowledgement of Native American Land

Commented [dg1]: Sam to check in with connections at EBCI



The Blue Horizons Project Community Council humbly acknowledges that the land we are on is the ancestral land of the Anigiduwagi, more commonly known as the Cherokee. This land was acquired through violence, oppression, coercion, and broken treaties.

For thousands of years, the Cherokee thrived in **ᏔᏅᏍᏏ (To Ki Ya Sdi)**, “the place where they race,” or Asheville, as it is known today.

1. <https://storymaps.arcgis.com/stories/e9913eb717dc4e68aeb7a7c7d3f42c3>
2. (<https://www.exploreasheville.com/articles/post/ancient-asheville-celebrating-the-choerokee-influence-on-southern-appalachia/>)

## Strategic Plan

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ADD J AND FOCUS GROUP PARTICIPANTS

add Image of meetings or workshops

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## Acronyms:

BAU – Business as Usual  
BBC – Better Buildings Challenge  
BC – Buncombe County  
BHP – Blue Horizons Project  
BHPCC – Blue Horizons Project Community Council  
BIPOC – Black, Indigenous, and People of Color  
BTU – British Thermal Units  
CAO – Community Action Opportunities  
CCS – Carbon Capture and Storage  
CEI – Clean Energy Impact  
COA – City of Asheville  
COP – Coefficient of Performance  
CPCN – Certificate of Public Convenience and Necessity  
CSMG – Critical Services Microgrid Group  
DEP – Duke Energy Progress  
DER – Distributed Energy Resource  
DOE – Department of Energy  
DSM – Demand Side Management  
EE – Energy Efficiency  
EEAS – Energy as a Service  
EIA – Energy Information Association  
EITF – Energy Innovation Task Force  
ESN – Energy Savers Network  
EV – Electric Vehicle  
EVSE – Electric Vehicle Supply Equipment  
FBRMPO – French Broad River Metropolitan Planning Organization  
GBA – Green Built Alliance  
GBH – Green Built Homes  
GHG – Green House Gas  
GSA – Green Source Advantage  
GW – Gigawatts  
GWH – Gigawatt Hours  
HAARP – Heating/Air Repair and Replacement Program  
HELOC – Home Equity Line of Credit  
HPWH – Heat Pump Water Heater  
HVAC – Heating Ventilation and Cooling

ICE – Internal Combustion Engine  
IRA – Inflation Reduction Act  
KPI – Key Performance Indicators  
KW – Kilowatts  
KWH – Kilowatt Hours  
LEED – Leadership in Energy and Environmental Design  
LMI – Low- and Moderate-Income  
LOSCVC – Land of Sky Clean Vehicle Coalition  
MHO – Mountain Housing Opportunities  
MMT – Million Metric Tons  
MPO – Metropolitan Planning Organization  
MSD – Metropolitan Sewer District  
MW – Megawatts  
MWDC – Megawatts DC  
MWH – Megawatt Hours  
NC – North Carolina  
NCDEQ – North Carolina Department of Environmental Quality  
NCDOT – North Carolina Department of Transportation  
NCUC – North Carolina Utilities Commission  
NEVI – National Electric Vehicle Infrastructure Program  
NREL – National Renewable Energy Laboratory  
PPA – Power Purchase Agreement  
PV – Photovoltaic  
Q&A – Questions and Answers  
RE – Renewable Energy  
REC – Renewable Energy Credit  
RFP – Request for Proposal  
RFQ – Request for Quote  
ROI – Return on Investment  
SAF – Sustainable Aviation Fuels  
SEER – Seasonal Energy Efficiency Ratio  
UCD – United Community Development  
USGBC – United States Green Building Council  
VMT – Vehicle Miles Traveled  
WNC – Western North Carolina  
WWC – Warren Wilson College  
WWTP – Wastewater Treatment Plant



## Definitions of Key Terms: (Equity, Renewable Energy, Energy Efficiency)

**Equity:** 'Equity is “the state of being just, impartial, and fair.” Buncombe County’s Racial Equity Plan envisions operationalizing “systems, policies, and practices that support equity for all people and an organizational culture that embraces diversity and inclusion.'

**Renewable Energy:** Means a solar electric, solar thermal, wind, hydropower, geothermal, or ocean current or wave energy resource; a biomass resource, including agricultural waste, animal waste, wood waste, spent pulping liquors, combustible residues, combustible liquids, combustible gases, energy crops, or landfill methane; waste heat derived from a renewable energy resource and used to produce electricity or useful, measurable thermal energy at a retail electric customer's facility; or hydrogen derived from a renewable energy resource. Renewable energy does not include peat, fossil fuel, or nuclear energy. (North Carolina’s Renewable Energy Portfolio Standard)

**Energy Efficiency:** Energy efficiency is the use of less energy to perform the same task or produce the same result. Energy-efficient homes and buildings use less energy to heat, cool, and run appliances and electronics, and energy-efficient manufacturing facilities use less energy to produce goods (Energy.Gov).

**Electrification:** Electrification is the shift from any non-electric source of energy to electricity at the point of final consumption, and it is an emerging trend in energy markets around the world (NREL). For example, shifting from a gas-powered lawn mower to an electric one, or shifting from a gas-powered bus to an electric one, or shifting everything that uses some non-electric source (often fossil fuel) of energy to using electricity as the source of energy.

**Greening the Grid:** This a phrase used to refer to transitioning our electric grid (the infrastructure which provides us with electricity) to one that no longer uses fossil fuels (coal, natural gas, etc.) and instead uses renewable energy (see above definition).

# Executive Summary



Buncombe County has committed to a goal of 100% renewable energy by 2042. The Blue Horizons Project Community Council's (BHPCC's) mission is to address the current climate crisis by supporting the community in achieving this goal, primarily through community engagement and collaboration with Buncombe County, the City of Asheville, and Duke Energy. The BHPCC will promote and support those efforts while ensuring that social justice and equity are at the forefront of all work undertaken.

This document presents the Strategic Plan for the community to meet these goals as well as the strategy of the BHPCC. Concisely, the Plan is to identify the where the community hopes to be in 2042, where it is now, and how to make the transition to 100% renewable energy by 2042 by analyzing and recommending the implementation of a series of initiatives, policies, and community engagement.

This report builds upon a report dated September 30, 2019, titled "Moving to 100 Percent: Renewable Energy Transition Pathways Analysis for Buncombe County and the City of Asheville" developed by "The Cadmus Group" under a contract with the City of Asheville and Buncombe County, to be referred to here as "Moving to 100 Report." The "Moving to 100 Report" was commissioned in response to two resolutions: (1) by the Buncombe County Commission to move County operations to 100% renewable energy by 2030 and the

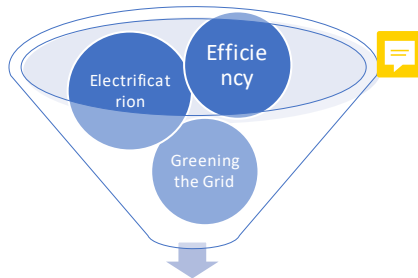
community as a whole to 100% renewable energy by 2042 and (2) by the City of Asheville City Council to move the City operations to 100% City operations by 2030 and to support the County in its effort to move the community to 100% renewable by 2042. This Plan will rely upon and build on the work of the “Moving to 100 Report” as it relates to community goals. It will not cover efforts to meet the City and County goals other than how they contribute themselves to the community goals. Some parts of what is below will represent an expansion of the areas covered by the “Moving to 100 Report,” whereas other parts will make minor changes or add missing elements. More specifically, the Strategic Plan expands the focus of the “Moving to 100 Report” to achieve the equity and 100% renewable energy goals, as follows:

- All sectors of energy use are considered, expanding the analysis to transportation, and building energy use ~~other than~~ <sup>Beyond</sup> electricity and natural gas.
- The key role of electrification in reducing energy use is further developed.
- Efficiency programs and conservation are given greater emphasis.
- The target audience is expanded from the City and County to the entirety of the community of Buncombe County

Important findings discovered throughout the creation of the planning effort and this document include:

- Meeting the energy transition goal is a huge challenge that requires all sectors of the local economy to change in terms of how we heat our homes, power our businesses and factories, utilize our land resources, and transport ourselves from one place to another. This transition must be done in an equitable manner. This will be a community-wide effort beyond the control of any entity.
- The three main technical pathways of achieving our 100% RE goal are - energy efficiency, electrification, and greening the grid.
- Electrification and efficiency improvements can reduce the total energy required for the transition to renewable energy by about 50% ●
- The remaining step to 100% renewable energy, after electrification and efficiency, is to green the electric grid.

Figure 1 Ex Sum - EE, Electrification, Greening the Grid Funnel - Bottom Line



**Bottom line:** While more research is needed to confirm these numbers, the result is likely to be a much lower cost of energy for Buncombe County residents than if electrification and renewable energy are adopted, on top of the health, climate, energy security, jobs, and resiliency benefits of the energy transition.

The Strategic plan establishes the importance of embracing, efficiency, electrification, and greening the grid, but there is a considerable amount of work to be undertaken to arrive at the future in which that is a reality. One of the goals of the Strategic Plan is to recommend tangible actionable ways to get the community from where we are currently to the 100% renewable energy goal. To do so, The BHPCC considered over 75 potential initiatives and analyzed over 40 of the most promising ones to better understand potential: feasibility, scalability, equity impact, and cost vs benefit. A second phase of analysis was also performed to give a better understanding of how the coordination of these initiatives, such as timeline, implementing departments and organizations, activities to be taken, financial costs and benefits, and additional resources needed. 15 of these potential initiatives ranked the highest and can give guidance on where and how best to focus our energies. Of the 42 potential initiatives analyzed, 13 have a 'High' favorability of potential for equity impact (though they may not have ranked 'High' overall). The BHPCC's goal is to achieve 100% RE by 2042 for Buncombe County in a just and equitable manner. Therefore, we recommend that the 15 highly ranked overall initiatives AND the 13 'High' ranked Equity Impact initiatives be put into action as quickly as possible. If there is not capacity or capital to implement all the initiatives, then we recommend focusing energy and efforts on the 14 overlapping initiatives that are highly ranked overall with a 'High' Equity Impact ranking as portrayed below in figure 2. For further information including detailed analysis and discussion see the Next Steps for Success section and APPENDIX D.

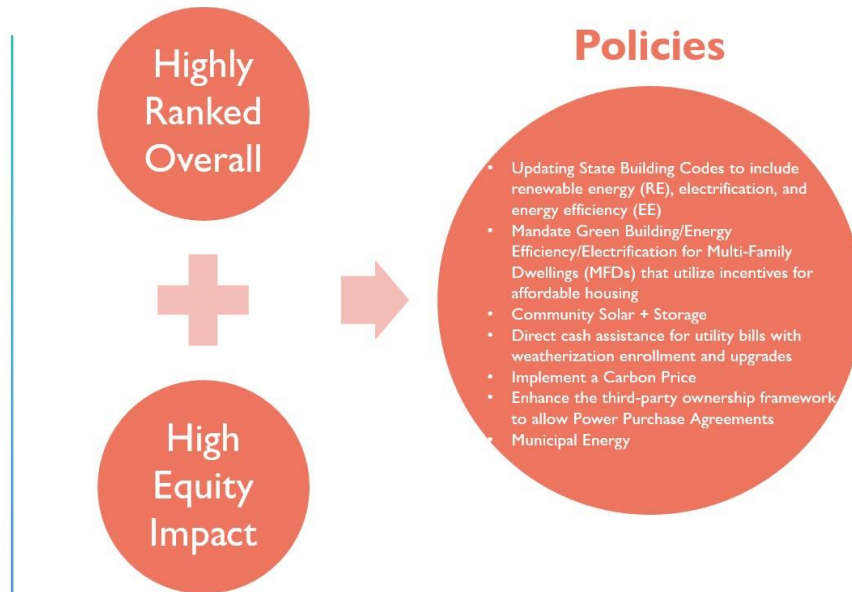
Figure 2 Ex Sum - Initiatives - Highly Ranked Overall + High Equity Impact



The BHPCC along with the City and County governments do not have the ability to fully fund or mandate the transition to 100% renewable energy currently. This transition will require efforts throughout our community. To encourage (or require) those changes, the BHPCC believes that additional legislative and policy changes at all levels of government will be needed. To assess those potential changes, the 15 **most promising** policies were analyzed in a similar format to the initiatives analysis to better understand potential: feasibility, scalability, equity impact, and cost vs benefit. For further details of this analysis see Part Five: Potential Policy Changes. Nine of the 15 policies analyzed ranked the highest.

The BHPCC's goal is to achieve 100% RE by 2042 for Buncombe County in a just and equitable manner. As has been seen in the past with policy changes (H951, Inflation Reduction Act, etc.) policy changes at the local, state, and federal level can have an immense impact on the success of the goal and how we go about achieving it. Therefore, we recommend that the **Nine highly ranked overall policies and the 'High' ranked Equity Impact policies be lobbied for** the by the BHPCC and its members. For further information including detailed analysis and discussion on the polices and see the Next Steps for Success section and APPENDIX D.

Figure 3 - Ex Sum - Policies - Highly Ranked Overall + High Equity Impact



The initiatives and policies mentioned above in Figures 2 and 3 can all begin or be passed within the next 1-5 years (near-term) and / or 5- 10 years (medium-term). The strategic plan details the reasons on not only why these initiatives can begin / be passed, but also how that might be done – and the sooner the better for the community at large.

While policy changes are needed to ensure the success of the BHPCC initiatives and other actions toward our goals, we must also mobilize our community to move forward with whatever policies are in place. The BHPCC has identified a robust community engagement effort as a key element of our overall strategy. People and businesses must take advantage of the incentives and participate in the programs that are on offer. Community engagement through personal connections, talks to community organizations, tabling at events, traditional media placements and social media all come together to help create a movement to mobilize all of the various actors in our community to make the changes needed to meet our goals. It's on all of us, the people who live and work in Buncombe County.

The Strategic Plan develops a series of pathways and actions to be undertaken between now and 2042 to meet the ambitious goal of 100% renewable energy in a just and equitable way. The Plan identifies the essential technical pathways of embracing energy efficiency, electrification, and greening the grid. Within these technical pathways there are several recommendations on actions to be taken as well as additional information providing insight into

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timeline and implementation. However, the key strategy to be implemented across all actions is to take a whole systems approach that incorporates three vital areas of action: (1) initiatives to be implemented, (2) policy changes to be implemented or supported, and (3) community engagement. This plan shows that if these three areas of action overlap one another and are integrated into every step and decision made, we believe that Buncombe County can successfully achieve its goal of 100% renewable energy by 2042 in a manner that is just, equitable, and benefits all members of our local, national, and global community.

# Part One: Strategic Plan Process

## Process Steps



A great deal of effort and energy went into the process of creating this Strategic Plan.

The BHPCC and its Strategic Plan Committee felt it was important to have a strong foundation and thorough process to arrive at the results shared in the Strategic Plan. The methodology, process, and parameters of the Strategic Plan are described below.

The following is the overall process of the Plan:

- Analyze current baseline energy use in Buncombe County.
- Understand technical pathways to 100% Renewable.
- Develop a vision of a future 100% Renewable Energy System.
- Understand local priorities to guide strategy.

- Catalog current initiatives and successes and determine priority for continuing or strengthening.
- Develop criteria to assess different proposals for action.
- Nominate new and potential initiatives and evaluate each for prioritization.
- Determine necessary legislative and policy changes at the local, state, and federal level needed.
- Prioritize new and potential action initiatives based on evaluations.
- Determine ways to engage the community with all the above.
- **Continue to develop Key Findings and recommendations** based on overall development of the above as well as new and emerging information and technologies.

### **Local Priorities** for Meeting the 100% Renewable Energy Goal



The Blue Horizons Project Community Council (BHPCC) understands that public input and listening to the needs and desires of the community is an essential part of creating and successfully implementing a Strategic Plan. Much work has been accomplished, and is ongoing, to listen to the community about its interests, desires, needs, priorities, etc. The following is a summation of past and ongoing work by the BHPCC, GBA, the Cadmus group, and the City and County. We rely heavily on this body of work combined with ongoing **Community Engagement** to establish the priorities for evaluating potential components of this plan. This will be expanded upon in further detail later in the Plan in Part Three.

As mentioned previously in this Strategic Plan, Buncombe County and the City of Asheville hired a consulting agency, the Cadmus group, to create a report on the pathways of getting the City and County to its goal of 100% renewable energy by 2042. The Cadmus Group is a reputable consultancy for this kind of work. We chose to lean heavily on their extensive research in determining the local priorities. The following is an excerpt from the “Moving to 100 Report.”

“During the development of the Moving to 100 Report, Buncombe County and the City of Asheville consulted with local stakeholders through workshops, interviews, and a public survey on their priorities for transitioning to 100 percent renewable energy. These stakeholders represented a range of organizations including Buncombe County, the City of Asheville, environmental organizations and initiatives, nonprofits, higher education, and community groups. Stakeholders named a range of impacts they hope the actions taken will have on the local governments and the broader community, including:

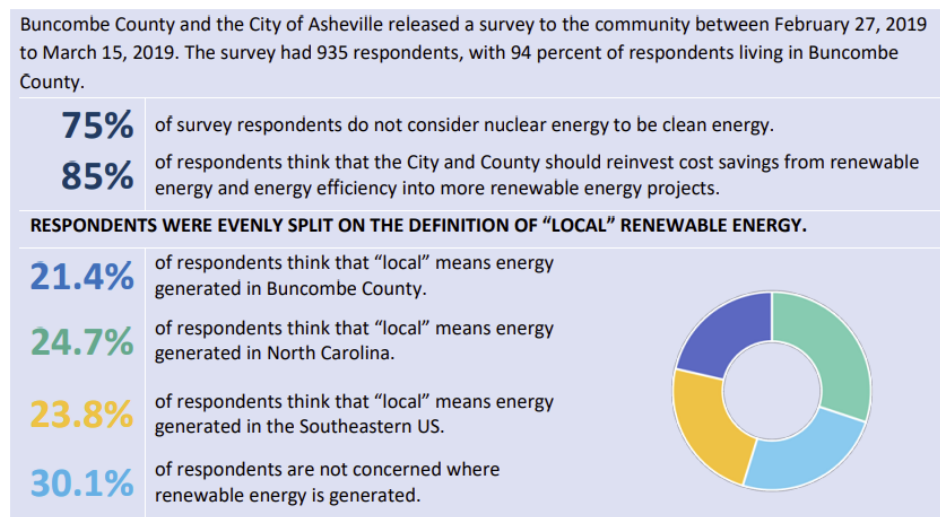
- **Local Renewable Energy Development.** Stakeholders emphasized the importance of locally developed renewable energy projects that would help the County and City achieve their renewable energy goals while supplying other local economic, health, environmental, and educational benefits. The specific definition of “local” varied among stakeholders who prioritized this issue. Twenty-one percent of survey respondents defined “local” renewable energy as energy generated within Buncombe County, 25 percent defined it as being generated within North Carolina, and 24 percent defined it as within the Southeastern United States. Workshop participants and interviewees noted the importance of involving the community within decision-making, as well as the importance of educating the community on renewable energy and energy efficiency as a means for more local renewable energy adoption.
- **Affordability and Equity.** Stakeholders emphasized that actions taken to increase the amount of renewable energy throughout the county should be affordable in terms of cost to tax- and ratepayers, and equitable in terms of the allocation of both costs and benefits. Equity was defined by stakeholders in several ways. First, equity means that low-income households should benefit from and not be burdened by additional costs for renewable energy access and efficiency measures (e.g., low or no cost options to participate). Stakeholders also defined equity as helping to make sure housing in the City and County is affordable, safe, and healthy and that air quality is clean for all. Finally, equity means that all voices need to be heard in planning and implementation processes, particularly those of communities of color and low-income households.
- **Efficiency First.** Stakeholders noted that the City and County should continue to prioritize energy efficiency technologies and behaviors to reduce overall energy consumption. As part of this, the City and County should help remove barriers to participation in efficiency and weatherization programs, particularly for low-income households.

- **Engagement and Collaboration with the Utilities.** Stakeholders noted the importance of engaging the utilities in discussions related to the renewable energy transition. Specifically, they expressed an interest in building on the work of the Energy Innovation task Force (EITF) and creating more incentives for local renewable energy generation. Environmental Issues. Stakeholders identified concerns about the natural environment as a reason to support the renewable energy transition (i.e., by reducing greenhouse gas emissions), and as an important consideration in implementing strategies to increase renewable energy in the County's energy mix. Stakeholders expressed an interest in renewable energy as a method of preserving the environment by reducing greenhouse gas emissions and helping to mitigate climate change and hoped to see positive environmental impacts in the County, such as improved air quality and eventually reduced climate change impacts, as a result of implementing renewable energy throughout the County.
- **Resiliency.** Stakeholders expressed an interest in energy storage to improve the resiliency of local governments and the broader community, and to reduce dependence on the grid and be less impacted in the event of grid failures" ("Moving to 100 Report", page 25-26, 2019).



The BHPCC believes that reduction in carbon emissions is the primary benefit of 100% renewable energy. Carbon emissions are a metric that is an addition to the metrics considered in the Moving to 100 Report. Obviously, the end goal of 100% renewables implies zero carbon emissions as well, but during the transition actions that move us toward 100% renewable may have different impacts on carbon emissions. Actions that reduce carbon emissions should be prioritized during the transition.

Figure 4 – Process - Results from 2019 Buncombe County and City of Asheville Survey



(Cadmus p 26, 2019)

Buncombe County’s 2043 Comprehensive Plan is in the final stages of its creation. Several different themes emerged from the first and second public input windows. Some of the themes relevant to the community-wide goal of getting to 100% renewable energy by 2042 are as follows:

- Participants expressed that they wanted to protect the County’s environment, including air, water, and soil.
- Participants were concerned about the cost of living and wanted to see affordable housing options.
- The community desires more safe and affordable ways to travel to places, including biking, walking, and riding a bus or taking public transit.
- Remove barriers to entering the workforce and enable Buncombe County workers to earn higher wages, by partnering with regional institutions and providing support services like affordable and quality childcare, transit access, and training opportunities.
- Expand energy efficiency in new construction and renewable energy resources across the County.

(Buncombe County 2043 Comprehensive Plan Draft p 12-21, 2023)

A word cloud was also created from the first public input window and can be seen below:

Figure 5 – Process - **Buncombe County 2043 Comprehensive Plan (Draft)** Public Input Word Cloud



(Buncombe County 2043 Comprehensive Plan Draft p 18, 2023)

Blue Horizons Project staff and volunteers have collected community input via tabling at existing events around Buncombe County, Home Energy Chats, and presentations to various groups. Prominent needs expressed from community members included the following:

- Expanded rebates for residential solar and energy efficiency.
- More rate transparency from the utility and willingness of the utility to work to meet the renewable goals.
- Expanded bike and pedestrian infrastructure.
- Continued investment in low-income programs like Energy Savers Network (ESN).
- Guidance on credits, rebates, etc., especially regarding the Inflation Reduction Act (IRA).
- Transparency and public communications from the City and County regarding current projects and sustainability investments.

A word cloud was created summarizing conversations from FY23:

The feelings, thoughts, and priorities of the community have played a vital role during the creation of the Strategic Plan and were referred to during the evaluation of potential action initiatives. The influence of such community priorities has helped to shape the Strategic Plan in every way possible. We understand that this work does not end at the finalization of the Strategic Plan but is just beginning. More information on the ongoing efforts to listen to the community can be found in Part Three.

The BHPCC is committed to diversity and inclusion. In that effort, staff at GBA and volunteers at BHPCC have worked to meet with members of different community groups and expand the number and diversity of voices on the BHPCC. However, this outreach has **not been very successful**, and we feel a weakness of this report is that all voices have not been included.

To help address this weakness, and to set the group on a path to better equity and inclusion, BHPCC has hired Dr. J Hackett to conduct an equity review of the Blue Horizons Project Community Council practices and an equity review of this report, The 100% Renewable Energy Strategic Plan. We believe this is a start, the tip of the iceberg. We must start somewhere, and we hope that a continued commitment by the group will help bring all voices to the table.

## Limitations

### Process

The process of creating the 100% Renewable Energy by 2042 Strategic Plan has been extensive and highly collaborative. It could not have been accomplished without the collaboration and support of many individuals and organizations. It should be acknowledged, however, that while investing in a collaborative result is highly beneficial, it can also cause delays and can provide results that are less precise or focused.

In one of its first meetings, the BHPCC Strategic Plan Committee adopted the group motto of: *"Talk about a dream, try to make it real - we will leave no stone unturned or pathway unexplored while planning for 100% renewable energy. We will collaborate, listen, and hold each other accountable while being respectful of everyone's perspective and time."* There is much in this motto that one can reflect upon, but for the intentions of the Strategic Plan it seems worth highlighting *'we will leave no stone unturned or pathway unexplored.'* We strove our best to do so and to explore all pathways. Yet we are only so many, and we are human and imperfect. As such, this report too is imperfect and undoubtedly has holes, gaps, and missing pieces. It most certainly could benefit from even more perspectives and additional voices, especially those from BIPOC (Black, Indigenous, and People of Color) communities. We intend for this Strategic Plan to be an ongoing effort, a living document, and we intend to continue to expand the voices and perspectives that are considered as we move forward.

### Equity

At the outset of our work on the Strategic Plan we relied heavily on the voices of others (Cadmus, Buncombe County 2043 Comprehensive Plan, etc.) to provide a broader set of voices. We also planned on implementing a listening project to provide additional voices from communities that were underrepresented in the BHPCC and the Strategic Plan committee. Due to several unforeseen circumstances that part of the process was not able to happen when originally intended. However, at the beginning of 2023 we were able to hire a consultant to pick up the mantle and begin the much-needed work of integrating diverse voices who would help look at the Plan through an equity lens. Moving forward, any future work on the Strategic Plan needs to include a more diverse set of voices and prioritize equity in all undertakings. It is understood that this will take time, but we hope that as the Plan evolves and improves, this equity and diversity aspect will evolve and improve as well in a more meaningful and tangible manner.

Commented [dg5]: Brad, I reworded this some, let me know what you think

Commented [dg6R5]: Did some more

## Data

There were several conversations during the beginning of the creation of the Strategic Plan about data. Data is needed to best understand and inform the Plan. Data needed spans across all sections of the Strategic Plan and the better and more detailed the data, the better and more detailed the Plan can be. However, all the data we were hoping for to best inform the Strategic Plan was not readily available. Much of this revolves around energy, such as energy use on a granular level across all sectors and time scales. Energy produced is also difficult to procure, such as how much renewable energy is produced in Buncombe County, how much of it is being fed to the grid (Duke Energy), and how much of it is separate from what Duke claims in its renewable energy percentage? What is the potential capacity of renewable energy production within Buncombe County? Data needed was also relevant to other sections as well, such as community engagement, new or potential initiatives, financial logistics for funding, etc. The decision was made during the initial Strategic Plan conversations that we will try to get the data to the best of our ability, and if we are able to acquire the data – then we will incorporate it into the plan. For the areas that we were not able to get the desired data, assumptions were made (see APPENDIX A). Despite a lack of data in many essential areas, we did the best we could with the data that was available, and focused on actions that we knew would be beneficial no matter the data (e.g., energy efficiency, electrification, and community engagement).

## Part Two: Key Findings



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*"The three main technical pathways of achieving our 100% RE goal are - energy efficiency, electrification, and greening the grid."*

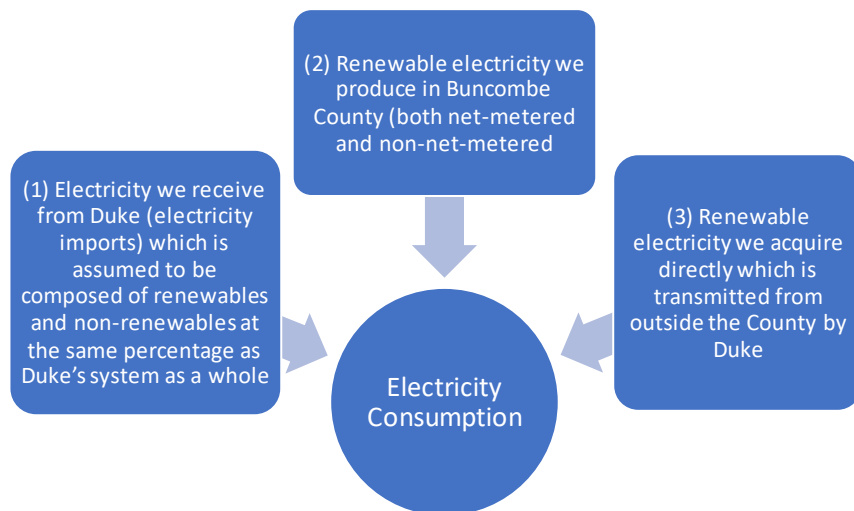
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The key findings of the planning effort and this document are as follows:

16

- Meeting the energy transition goal is a huge challenge that requires all sectors of the local economy to change in terms of how we heat our homes, power our businesses and factories, utilize our land resources, and transport ourselves from one place to another. This transition must be done in an equitable manner. This will be a community-wide effort beyond the control of any entity.
- The three main technical pathways of achieving our 100% RE goal are - energy efficiency, electrification, and greening the grid.
- Electrification and efficiency improvements can reduce the total energy required for the transition to renewable energy by about 50%
- The remaining step to 100% renewable energy, after electrification and efficiency, is to green the electric grid. It will be helpful to consider our electricity consumption as composed of the three components shown in figure 7 below:

Figure 7 - Process – Components of electricity production required to satisfy the demand for consumption.

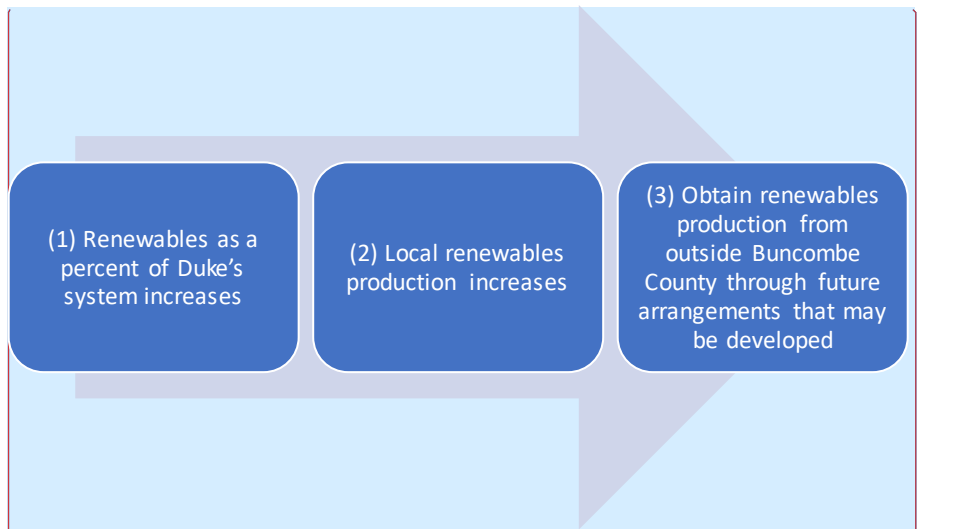


Commented [dg7]: Your comment for the graphic below was: "These are not the components of electricity consumption. I would say that this should be titled "Components of electricity production required to satisfy the demand for consumption. " or something like that."

Should the bullet point be changed to reflect your statement above?

- We will move toward our renewable energy goals as shown in figure 8 below:

Figure 8 - Process - Moving toward RE goals.



Commented [GU8]: This graph and the top seems to be redundant

Commented [dg9R8]: I added this in because Jamie suggested we give this section more flair. It was a separate bullet point from your key findings in V1 White paper. But I'm not opposed to removing it if you think it's redundant

- Important programs suggested by the “Moving to 100 Report” have gotten underway since it was written, and some have already been completed. These programs need to be both continued and strengthened. Such programs include but are not limited to:
  - Over 12 MW of solar installed by or on City and County assets and a feasibility study for floatovoltaics (floating solar)
  - The beginning of electrification of fleets by the City and County
  - Resolution for all County funded schools to have solar and for all new buildings to be LEED gold.
  - Implementation of the [Solarize Asheville-Buncombe campaign](#).
  - Solar added on the homes of low-income residents through the Neighbor 2 Neighbor Program
  - Numerous efforts to make City and County buildings more energy efficient as part of ongoing efforts (including a feasibility study by the County for electrification plus storage for its buildings).
  - Funding and expansion of Energy Saver Network programs to provide weatherization and HVAC replacements for increased energy efficiency and electrification.
  - Home Energy Chats for personal home energy consultations
  - Duke solar, storage and microgrid development

- Successful transition from the Energy Innovation Task Force, an ad hoc community collaboration, to the Blue Horizons Project Community Council
- Ongoing community engagement efforts

These current programs/initiatives will be explored more thoroughly when we turn our focus to Part Four and list in more detail the projects that are already underway and have been completed. )

- Innovative programs need to be launched to address major areas of current energy consumption. For each program, BHP's role could be as an encourager of the program or as a direct implementer, recognizing the limitation of BHP staff and funding.
- Improving energy efficiency and implementing local renewable energy projects can have significant local benefits (e.g. increased financial savings / income, health and wellness, cleaner air and water, energy security, jobs, workforce development, and resiliency) and continue to be favored as key elements of the strategy especially if there are additional benefits specifically for communities who have been disproportionately affected by the negative impacts of climate change and fossil fuel industries.
- The BHPCC considered over 75 potential initiatives and analyzed the 42 most promising ones. 15 of these potential initiatives ranked the highest and can give guidance on where and how best to focus our energies.
- Of the 42 potential initiatives analyzed, 13 have a 'High' favorability of potential for equity impact.
- The BHPCC also considered several potential policy changes. The 15 most promising policies were analyzed in a similar format to the initiatives. Nine of the 15 policies analyzed ranked the highest.
- Of the 15 policies analyzed, nine have a 'High' favorability of potential for equity impact.
- All But six of the highest ranked potential initiatives and policies can happen in the Near-Term (within the next 1-5years) and the remaining six in the Medium-Term (5-10 years).
- There are many opportunities that allow limited funds to be focused on efforts that improve equity and social justice while increasing renewable energy and reducing carbon emissions. These opportunities will be expanded upon and more specifically stated in Part Three, Next Steps for Success, and in APPENDIX D.
- Our current energy use is dominated by transportation fuels at around half, with electricity and natural gas representing about one fourth of energy demand each.
- Transportation was beyond the scope of the "Moving to 100 Report." A major goal of this report is to create a framework that includes transportation and other sectors that were deemed out of scope, but that allows us to build on the important framework that the "Moving to 100 Report" established.

Commented [GU10]: Naming the programs would be beneficial here, even if discussion is later. (Jamie)

Commented [dg11R10]: How's this? Too much?

Commented [SR12R10]: a good list

Commented [GU13R10]: I would shorten it further and then point to where in the current initiatives and previous successes section we can find the full list.

Commented [dg14R10]: I shortened it some from the full list, do you think it should be shortened even more?

Commented [dg15R10]: Reword the first bullet here

Commented [dg16]: Update after policy feedback

- In developing a “business as usual” (BAU) forecast for energy demand, we find that energy use will grow slowly, if at all, and that current trends in efficiency and technology will more or less offset population growth. If population growth is faster than assumed, then energy use will grow faster as well.
- There is a lack of available data in general. Efforts should be made to acquire data, especially in energy use, renewable energy production, and Buncombe County’s capacity for renewable energy production.
- Recent changes at the state level provide impetus for a much cleaner electricity grid, so that as we get closer this goal for a cleaner grid, electrification of end-uses would become the most important technical component of the strategy (If the grid (currently Duke Energy) uses 100% renewable energy - then all that needs to happen is to electrify everything and we have done it).
- Zero or near zero carbon emissions are much easier to obtain than 100% renewable or nearly 100% renewable energy based on scenarios proposed by Duke in their 2022 Carbon Plan proposal. Duke is proposing zero carbon by 2050 and a substantial reduction by 2042, but much of their energy production will come from zero carbon existing and new proposed nuclear plants. Nuclear is a zero-carbon form of energy but is not renewable energy.
- Implementing the energy transition will require substantial capital investment, but the overall cost of energy for Buncombe County governments, residents, and businesses will likely decline from today - energy costs will be lower in the 100% renewable case than in the business as usual (BAU) scenario (no longer paying for gasoline for example). Electricity to power cars will cost less, even if electric rates are higher than they are today.

Commented [dg17]: Do we need a closing paragraph here?

## ‘What Can you Do?’

Our final key finding deserves its own section and is discussed here. Every person, business, or other organization in Buncombe County can contribute to the solution. It is on all of us to do what we can. Doing our part not only benefits the community at large, but the individuals as well. Figures 9-11 show in graphic form some of the main ideas, of how the members of our community can help make our shared dream of 100% renewable energy real.

Figure 9 - What Can You Do - Residents

# WHAT CAN YOU DO? RESIDENTS

Residents, businesses, and organizations in Buncombe County have an opportunity to benefit from and participate in achieving our county wide goal while also helping our community and society move to a more sustainable and equitable future. Here are just a few of the opportunities to take advantage of and support.



## ELECTRIFY IT

- Switch from fossil fuels to electricity for anything and everything that you can (new heat pump hot water heater, heat pump HVAC, electric vehicle (EV)).
- Depending on your income you may qualify for upfront rebates and/or tax credits - you might even be able to get some things (like a new heat pump hot water heater) for FREE!



## GET FREE ENERGY UPGRADES ON YOUR HOME

- Several programs (dependent on income and other specific requirements) offer FREE home energy upgrades and/or consultations for your home, even if you rent! These could include weatherization, heat pump HVAC systems, free solar array, etc.
- If you do not meet the requirements to have these done in your home, consider volunteering or donating to help others in your community.



## STRIVE NOT TO DRIVE

- Reduce car trips.
- Walk or bike whenever possible.
- Consider taking the bus, carpooling, or driving an EV.

Commented [dg18]: Summer to work on infographic

Commented [GU19R18]: I would put this above the Key Findings as something like "What you can do today to help" or something actionable.

Commented [dg20R18]: It has been moved, and I will ask Summer to make the suggested edits to the names and exclamation points, etc.

Figure 10 - What Can You Do - Businesses

# WHAT CAN YOU DO?

## BUSINESSES

Residents, businesses, and organizations in Buncombe County have an opportunity to benefit from and participate in achieving our county wide goal while also helping our community and society move to a more sustainable and equitable future. Here are just a few of the opportunities to take advantage of and support.



### ELECTRIFY IT

- Switch from fossil fuels to electricity for anything and everything that you can (new hot water heater/s, heat pump for HVAC, electric vehicle (EV) fleets).
- Tax credits may be available to help with the conversion to all-electric.



### TAKE ADVANTAGE OF THE DUKE ENERGY SMALL BUSINESS ENERGY SAVER PROGRAM

The program includes 3 main components:

- A free energy assessment from an approved contractor.
- Free recommendations for ways to improve your energy efficiency based on the assessment.
- Duke includes turnkey installation through contractors and pays up to 80% of selected improvements upfront.



### INCREASE YOUR ENERGY EFFICIENCY

- Take part in ENERGY STAR benchmarking (Portfolio Manager) or a community challenge like Better Buildings Challenge (BBC) to reduce your energy use and save on overhead costs and be publicly recognized. Free Marketing!

Figure 11 - What Can You Do - Local Govt

## WHAT CAN YOU DO? LOCAL GOVERNMENT

Residents, businesses, and organizations in Buncombe County have an opportunity to benefit from and participate in achieving our county wide goal while also helping our community and society move to a more sustainable and equitable future. Here are just a few of the opportunities to take advantage of and support.



### ELECTRIFY IT

- Switch from fossil fuels to electricity for anything and everything that you can (new hot water heater/s, heat pump for HVAC, electric vehicle (EV) fleets).
- Tax credits and money are available to help with the conversion to all-electric.



### PROMOTE EXPANDED EV CHARGING INFRASTRUCTURE

- In addition to cost and unfamiliarity, much of the resistance to switching to EVs is founded on the perceived lack of charging infrastructure.
- Continuing to promote the expansion of that infrastructure is critical to acceptance.



### IMPLEMENT AND LOBBY FOR POLICIES TO SUPPORT THE TRANSITION TO 100% RE

- The overall energy policies at a local, state, and federal level will have a massive impact on our ability to meet the community's 100% renewable energy goal.
- The recent passage of the federal Inflation Reduction Act (IRA) creates an unprecedented level of new funding and incentives for the renewable energy transition and for energy efficiency.

## Part Three: A Whole Systems Approach - Getting to 100% Renewable Energy by 2042

The creation of Strategic Plan started with the end in mind. It is difficult to plan for a goal if we do not know what that is. The Strategic Plan committee envisioned a future (2042) of 100% renewable energy in Buncombe County. Through modeling, we know that the three technical pathways include embracing energy efficiency, electrification, and greening the grid. But what does that actually look like in Buncombe County? The Strategic Plan committee took a whole systems approach and found that actions are needed in three essential actions areas to accomplish our goal. These areas are: (1) initiatives to be implemented, (2) policy changes to be implemented or supported, and (3) community engagement. It is important to look at these three actions as integrated and integral to each other. For example, the successful implementation of initiatives and policy changes cannot be accomplished without community engagement. Successful community engagement cannot be accomplished without meaningful initiatives and policy changes that benefit the community. The three actions are intertwined with one another, and each is vital to the success of the other and to the overall success of achieving our 100% renewable energy goal.

Figure 12 - Whole Systems Approach - 3 areas for 100% RE



## New Initiatives



Every journey must begin with a single step, and the BHPCC Strategic Plan is no exception. From the beginning, members have been interested in how to make tangible progress toward the goal of 100% Renewable Energy. To identify those next steps, the BHPCC went through a lengthy process of study, research, communication, and collaboration to identify the most promising potential initiatives to achieve the goal in a just and equitable way. Major contributions to the process included integrating the legacy work of the Energy Innovation Task Force (EITF – the predecessor to the BHPCC), the ongoing work of BHPCC members and committees, as well as numerous local organizations and institutions. The list of potential initiative was refined throughout several meetings, emails, surveys, and conversations from nearly 100 potential initiatives down to just over 40. The Strategic Plan committee, with input from the other BHPCC members and committees and other outside organizations, then analyzed the most promising ones to better understand potential: feasibility, scalability, equity impact, and cost vs benefit. A second phase of analysis was also performed to give a better understanding of the coordination and needs of these initiatives such as timeline, implementing

departments and organizations, activities to be taken, financial costs and benefits, and additional resources needed. Fifteen of these potential initiatives ranked the highest. Those selected give guidance on where and how best to focus our energies. Of the 42 potential initiatives analyzed, thirteen have a 'High' favorability of potential for equity impact (many of which overlap with the fifteen highest overall ranking initiatives).

Once the list of new potential initiatives was created, trends and patterns were noticed, and they **naturally** fell into several different categories / topics. Also, these topics were chosen because they align with the technical pathways (greening the grid, efficiency, and electrification) energy using sectors (residential, commercial, industrial) summarized in "**Part Four - Technical Strategy Overview**" and developed in detail in APPENDIX A. The topics are organized in this Strategic Plan as:

1. Utility Scale Renewable Energy and Storage
2. Residential and Commercial Renewable Energy and Storage
3. **Low-Income Energy** Efficiency / Renewable Energy.
4. Building Efficiency and Electrification
5. Transportation.
6. Industry and **Aviation**

Individuals knowledgeable in each topic volunteered to help analyze each initiative, and in some situations **knew where or who to ask** for additional insight. The knowledge and experience of over 100 community members (and sometimes experts from outside the community) went into the assessment of these initiatives. The analyses were then reviewed by a BIPOC led **focus group** to give further equity insight. For more detailed information and discussion on the two phases of analysis see APPENDIX D. A summary of the analyses for the initiatives is under each topic below.

In attempts to quantify the results of the analysis, so that they could be compared and prioritized, we have a value to each ranking:

**\*Points are based on rankings in each of the Four Phase 1 categories (Potential Feasibility, Potential Scalability, Potential Equity Impact, and Potential Cost Vs. Benefit).**

**High = 3, Medium = 2, Low = 1**

\* Categories that had two rankings (e.g., Low-Medium, or Medium-High) erred on the side of caution and used the lower of the two rankings for scorekeeping and analysis purposes. For example, a scalability ranking of Low-Medium was only given 1 point.

Topic 1: Utility Scale Renewable Energy and Storage



*Table 1 - Initiatives – Utility Scale RE and Storage Analysis Results*

Initiative	Potential Feasibility	Potential Scale of Impact	Potential Equity Impacts	Cost vs Benefit	Total Ranking Points
<b>1 Transmission Scale Solar</b>	Medium	Medium	Low	High	9
<b>2. Floatovoltaics</b>	High	Low	Low-Medium	Low	6
<b>3. Agrivoltaics</b>	High	High	High	Medium	11
<b>4. Green Source Advantage Choice Expansion</b>	Medium	Low	Low	Low	5
<b>5. Renewable Energy Credits (RECS) and Power Purchase Agreements (PPAs)</b>	High	Medium	Low	Low	7

### **Initiative 1: Transmission-Scale Solar (>20MWac)**

**Description:** These are very large solar installations requiring large blocks of land, hundreds of acres, to install. The advantage is that these are the lowest cost solar options available. However, such large blocks of land will be difficult to come by, limiting our ability to develop such projects locally. However, Duke programs or other sorts of purchased power agreements might be available to allow us to develop such projects elsewhere and count them toward our goals.

### **Initiative 2: Floatovoltaics**

**Description:** A transmission scale solar installation floating on bodies of water (floatovoltaics) could possibly be developed on Lake Julian and / or the North Fork Reservoir. Buncombe County has paid for a feasibility study to look further into this possibility and to gain insight and information. We hope that the feasibility study has included the potential of pumped storage in the reservoir system that has already been equipped with the hydro power that is necessary to recapture the energy.

### **Initiative 3: Agrivoltaics**

**Description:** Agrivoltaics is the installation of solar on working agricultural land designed to allow farm equipment to pass underneath and for agricultural practices to continue. Agrivoltaics can be slightly more expensive than utility scale solar farms, but it is cheaper than rooftop solar. This practice brings all the value of solar benefits - raises between 10-50 cents per kw/h of solar.

Due to our limited space and geographical difficulties in our county, Agrivoltaics is a simple solution and a very promising initiative that would provide a myriad of benefits. As this is accelerated, it dramatically reduces the market for biofuels (MT has data and numbers) and has global implications for land conservation.

Installed on just 2% of existing farmland, it is estimated that agrivoltaics could produce enough energy to cover more than 100% of energy needs globally. Local generation capacity could be determined as part of a feasibility study for RE generation capacity within Buncombe County.

Agrivoltaic systems are currently utilized for a wide variety of agricultural crops; berries, grains, row crops, orchards, forage, hay, native pollinator plants/seed production, and 'Conservoltaics' to conserve land and habitat, often used for native pollinator restoration. These Agripollinator gardens can be installed along greenways (or other areas, sound barriers, right of way, etc..) and serve as great demonstration projects.

#### **Initiative 4: Green Source Advantage Choice Expansion**

**Description:** This is one way to develop transmission scale solar outside of Buncombe County using a new Duke Energy program.

The new version (proposed Jan 2023) would allow customers to contract with either Duke Energy or third-party solar or wind developers for up to 100% of their energy use, instead of 30%. The new Green Source Advantage Choice program would also add an option for battery storage, which would help companies use renewable energy 24 hours a day, instead of just when there's sun or wind.

#### **Initiative 5: Renewable Energy Credits (RECs) & Power Purchase Agreements (PPAs)**

**Description:** Purchasing the Environmental Attributes from grid-connected renewable generators (commonly known as Renewable Energy Credits or RECs) allows the City/County to claim the benefits of those carbon free resources. Depending on the resource's technology, location and online date, these claims can be used to qualify for recognition programs such as the EPA's Green Power Partnership and are a great first step in showing our constituents the path to decarbonization.

Topic 2: Residential and Commercial Renewable Energy and Storage



Table 2Initiatives – Residential and Commercial RE and storage - Analysis Results

Initiative	Potential Feasibility	Potential Scale of Impact	Potential Equity Impacts	Cost vs Benefit	Total Ranking Points
1. Solarize - Bulk Buying	High	Medium	Medium	High	10
2. Appalachian Offsets	High	Medium	Medium	Medium	9
3. Microgrids	High	High	High	Medium	11

### **Initiative 1: Solarize Campaigns**

**Description:** Solarize is a residential solar bulk-buying discount installation program. It would build on the successful prior initiative completed in 2022 that installed 1.3 MW of solar in Buncombe County.

### **Initiative 2: Appalachian Offsets**

**Description:** Appalachian Offsets applies carbon offset donations and funds directly to local renewable energy projects. It is an existing program of Green Built Alliance and could be expanded to encourage private donations to support many kinds of decarbonization actions in Buncombe County that could also move us toward our RE goals.

### **Initiative 3: Microgrids**

**Description:** A microgrid is “A local cluster of energy resources that can operate independently, microgrids keep the power flowing to single or multiple nearby customers when the central grid fails. Microgrids also act as a tool to help energy customers manage costs, participate in energy prosperity, and reduce carbon emissions. In addition, they are designed not only for backup power, but to operate under “blue sky” conditions, providing important services to the central grid, and they can be a particularly valuable resource when the grid is under strain or needs flexibility to balance resources. In this way, microgrids typically provide customers with some combination of three core benefits, including resilience, cost savings and clean energy.”

(ThinkMicrogrid 2021)

Microgrids address local priorities and provide local benefits (resilience, cost savings, workforce development, etc.).

### Topic 3: Low-Income Energy Efficiency / Renewable Energy



Table 3 - Initiatives – Low Income EE/RE Analysis Results

Initiative	Potential Feasibility	Potential Scale of Impact	Potential Equity Impacts	Cost vs Benefit	Total Rankning Points
1. Energy Savers Network - Current State	High	Low	High	High	10
2. Energy Savers Network - Future State	High	Medium	High	High	11
3. Energy Savers Network - Deeper Retrofits	High	Medium	High	Medium	10
4. Community Action Opportunities	High	Medium	High	Medium	10
5. Neighbor to Neighbor Solar	High	Low	High	Low	8

#### **Initiative 1: ESN-Current State**

**Description:** Energy Savers Network (ESN) provides a suite of energy efficiency upgrades and education at no cost to all low-income clients and identifies options for greater savings such as heating repair or replacement. We coordinate with community partners to identify households with high energy burdens. Originally ESN only provided Tier 1 upgrades (lower-cost simple basic retrofits) which are performed by staff and volunteers. Recently ESN has begun to provide a limited amount, subject to funding available, for deeper upgrades (higher-cost more advanced retrofits) which are contracted out to HVAC professionals, home repair specialists, and insulation contractors. This could be described as Tier 1+. ESN currently performs upgrades for ~200 households per year. We have completed over 850 since 2016. This initiative represents a continuation of ESN activities at more or less the current level. It requires continued funding from BHPCC collaborators, especially the City, the County, and Duke Energy.

#### **Initiative 2: ESN - future state of growth**

**Description:** If we want to meet our 2042 goal and ⅓ of the population would likely qualify for our services we would need to be operating at a pace of over 1000 homes/year. This program really involves expanding the number of homes that Energy Savers serves per year to get closer to the 1000 mark or so.

#### **Initiative 3: ESN - Deeper Retrofits**

**Description:** In contrast to expanding the number of homes ESN serves each year, this program expands what ESN does for each family, thereby expanding the amount of savings for each home (i.e., installing insulation, HVAC Replacement, Heat Pump Water Heater Replacement)

#### **Initiative 4: Community Action Opportunities (CAO)**

**Description:** Increased collaboration with this community partner, that utilizes federal funding, will allow us to conduct deeper energy-efficiency retrofits for more people. From [CAO's website](#): The work may include testing the safety and efficiency of the primary heating system; air sealing walls, floors and ceiling; installing ventilation fan; insulating attics, walls, floors, heating ducts, pipes and water heaters; installing vapor barriers; testing and installing smoke alarms and carbon monoxide detectors; replacing old energy-consuming refrigerators; and Heating/Air Repair and Replacement Program (HARRP). PLEASE NOTE that they currently do NOT replace heating and air conditioning with electrical options; they only replace with the household's current system (gas and oil for example).

#### **Initiative 5: Neighbor to Neighbor Solar**

**Description:** This initiative would be to continue and expand an ongoing a Blue Horizons Project program to provide solar installations for low-income households funded by grants and donors. Green Built Alliance selects a solar installer to do the work and manages the process at no cost to the homeowner.

## Topic 4: Building Efficiency and Electrification

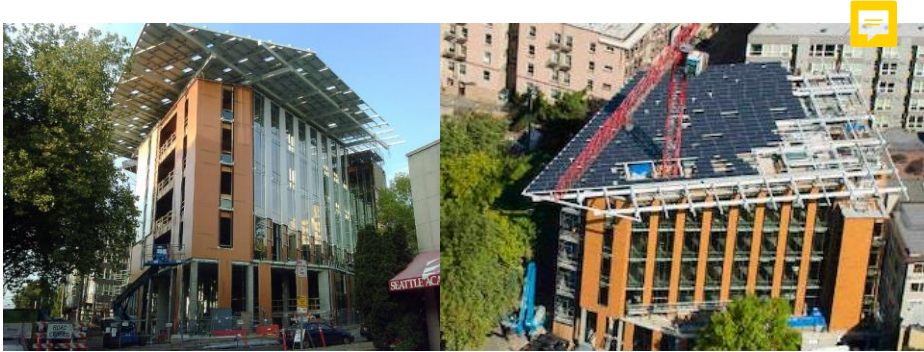


Table 4 - Initiatives – Building Efficiency and Electrification Analysis Results

Initiative	Potential Feasibility	Potential Scale of Impact	Potential Equity Impacts	Cost vs Benefit	Total Ranking Points
1. Better Buildings Challenge (BBC)	Low	Medium - High	Medium	unclear	6
2. ENERGY STAR benchmarking (portfolio manager)	Medium	Medium - High	Medium	High	9
3. LEED / LEED for Cities	Medium	Medium	Medium	High	9
4. Heat Pump Hot Water Heater Promotion & Bulk Buying Program	High	Medium	High	High	11
5. Heating Electrification	Medium	High	High	High	11
6. Moderate Income energy upgrades and consultations	High	Low	Medium	High	9

7. Work with planning departments to provide education to applicants for new construction and major remodels	Medium	Medium	Low	Low	6
8. Duke multifamily retrofit Demand Side Management Program	High	Medium	High	Medium	10
9. Duke Energy Small Business Energy Savers Program	High	Medium	Medium	High	10

#### Initiative 1: Better Buildings Challenge (BBC)

**Description:** The Better Buildings Challenge is an initiative through the DOE targeted at building portfolio owners, however municipalities can also join the challenge, encouraging commercial building owners in the municipality to participate. Atlanta has done this for example and a link to their website for more info is [provided below](#). The program connects these municipalities/building owners with technical and industry experts to develop cost-effective energy solutions and earn recognition. To join the challenge, municipalities email the DOE directly for more info. Partners who sign up commit to publicly pledging to improve energy intensity by at least 20% within 10 years, publicly announce an initial showcase project within 6 months & initiate within 12 months, announce the use of one or more energy efficiency implementation models within 6 months, make available portfolio-wide, building level energy performance info within 12 months and track on an annual basis.

#### Initiative 2: ENERGY STAR benchmarking (Portfolio Manager)

**Description:** ENERGY STAR Portfolio Manager allows building owners to benchmark [\(measure and compare\)](#) their energy use (as well as water use, waste and materials, and greenhouse gas emissions) via an online platform. This information then can be used to target efficiency

improvements and compare year-to-year performance. Buildings that earn an ENERGY STAR score of 75 or higher are eligible for ENERGY STAR certification.

### **Initiative 3: LEED / LEED for Cities**

**Description:** LEED for Cities is a program for local jurisdictions (cities or counties) that helps guide and then recognizes sustainable plans and initiatives that address natural systems, energy, water, waste, transportation, and quality of life. Similar to the LEED building rating systems, this is a rating system that mirrors those major topics and looks at sustainability through a more holistic lens, vs our targeted energy initiatives.

This could be an overarching program for the county to use that further supports our individual initiatives. Specifically, the county could look at implementing or integrating different credit strategies into their sustainability plans including green policies and incentives (for existing private buildings, new private development, and **public buildings**), energy & greenhouse gas emissions performance (tracking), energy efficiency, renewable energy, grid harmonization, and equity / quality of life.

### **Initiative 4: Heat Pump Water Heater (HPWH) promotion & bulk buying program**

**Description:** This is an **intentional program** to accelerate the adoption of Heat Pump Water Heaters for everyone in Buncombe County.

Heat Pump Water Heaters lower water heating energy use by up to 75% compared to a traditional electric or gas water heater. It's one of the most cost-effective ways to reduce carbon emissions and achieve our community energy goals.

### **Initiative 5: Heating Electrification**

**Working with HVAC contractors to change **fossil** systems to electric (heat pumps or mini splits)**

**Description:** Significant incentives and cost savings are available for homeowners and housing providers to change fossil fuel (oil, propane, and gas) heating systems to electric ones (heat pumps and mini splits). On average, 5% of all heating systems are upgraded each year. With so many systems being changed each year there is a big opportunity for making headway on electrification of heating systems.

HVAC contractors are the front line in changing out old, broken, or inefficient systems. They also can support clients with quality information about how to save energy, money, and access Duke Energy HVAC replacement incentives and IRA tax credits and rebates.

### **Initiative 6: Moderate income energy upgrades and consultations**

**Description:** Promoting IRA and Duke Smart Saver rebates, Home Energy House calls Home Energy Chats, customer experience for homeowners, A tool like NYSEDA (<https://www.nyserda.ny.gov/All-Programs/home-energy-efficiency-upgrades>) would be ideal, or even a worksheet on paper like Rewiring America last page of this doc (<https://content.rewiringamerica.org/reports/Rewiring%20America%20Go%20Electric%20Digital%20Guide.pdf>). This is shifting from a live resource (Home Energy Chats) to a static, or self-direct resource (online tool, worksheet) to help people decide “what next” on their renewable energy personal journey.

**Initiative 7: Work with the planning department on education for applicants (i.e., providing checklists) for new construction and major remodels.**

**Description:** Education of residents and developers for new construction and major remodels to encourage green and sustainable building practices that increase energy efficiency, money savings, and resiliency. Provide the Green Built Homes (GBH) and/or Energy Star checklist for the City and County officials to provide as a tool and resource that could educate residents on what they should consider doing and facts about why they should do it. This would be an educational tool keyed to climate/buildings in WNC as well as incentives and financing options. Such a tool could be enhanced for affordable housing as well. Information provided should also include a list of relevant rebates and incentives through Duke Energy Progress and through the Inflation Reduction Act (IRA).

**Initiative 8: Duke multifamily retrofit and DSM program.**

**Description:** Expand utilization of Duke’s demand side management (DSM) programs, particularly in multifamily new construction development. Currently, participation requires landlord/owner sign-off, which creates a barrier for renters who would like to participate in this program. Participation is incentivized with an annual bill credit (up to \$75). By pre-installing Energywise devices and pre-enrolling new apartments into Energywise, the barrier to renters can be eliminated. There is currently no incentive or obligation for multifamily developers to do this.

**Initiative 9: Duke Energy Small Business Energy Saver Program**

**Description:** Duke Energy has a Small Business Energy Saver Program that includes 3 main components:

1. A free energy assessment from an approved contractor.
2. Free recommendations for ways to improve your energy efficiency based on the assessment.

3. Duke includes turnkey installation through contractors and pays up to 80% of selected improvements upfront.

## Topic 5: Transportation



Transportation is the largest source of greenhouse gases in North Carolina and the largest source of non-renewable energy use in Buncombe County. For most individuals and households, purchasing a car or getting from place to place is their second largest expenditure, and often exceeds the carbon footprint of their home. Many businesses have large fleets of vehicles and the huge burdens of vehicle cost and the fuel and maintenance.

These cost in carbon and financially give us great opportunity to see real changes quickly. Electrifying fleets, developing vehicle miles traveled reduction plans, and building infrastructure that is both denser and providing sidewalks and bike paths are all strategies that will help the BHP meet the 2042 goal of 100% clean fuel.

Table 5 - Initiatives – Transportation Analysis Results

Initiative	Potential Feasibility	Potential Scale of Impact	Potential Equity Impacts	Cost vs Benefit	Total Rankning Points
1. Electrification of Public Transit for buses, small vans, etc.	Medium	Low	High	High	9
2. Push for more EV adoption, both personal and business	High	High	Medium	Low	10
3. Promote expanded EV charging infrastructure	High	Medium	High	High	10
4. Reduce Vehicle Miles Traveled (VMT) Per Capita	Low	High	High	High	10
5. Increase Trips of Walking and Biking	Medium	High	High	Medium	10

**Initiative 1: Electrification of Public Transit for buses, small vans, etc.**

**Description:** Build a compelling cost-benefit analysis, perhaps with incentives, to persuade conversion of fleets to EVs. Leverage efforts and results from cities/counties across the country to make the case.

**Initiative 2: Push for more EV adoption, both personal and business**

**Description:** While using fossil fuels for transportation must be ended to meet our RE goals, the switch from internal combustion engines (ICE) to electric vehicles (EVs) is a giant leap for most vehicle buyers, involving many factors, among them being a simple lack of awareness of what the change will mean to their lives and the resulting benefits. Elevating awareness among the

driving public will contribute to increased adoption, including delivery companies - especially those with pre-existing solar.

#### **Initiative 3: Promote expanded EV charging infrastructure.**

**Description:** In addition to cost and unfamiliarity, much of the resistance to switching to EVs is founded in the perceived lack of charging infrastructure. Continuing to promote expansion of that infrastructure is critical to acceptance.

#### **Initiative 4: Reduce Vehicle Miles Traveled (VMT) Per Capita**

**Description:** The Blue Horizons Project seeks to accomplish its goals through three mechanisms: emphasizing efficiency, electrifying everything, and greening the grid. Improved transportation efficiency rests on three pillars: 1) reduced demand for motorized travel (fewer passenger miles traveled); 2) more effective use of motor vehicles when they are deployed (increased load factor); and 3) improved vehicle energy efficiency (watt-hours/mile). VMT per capita captures many aspects of the first two pillars in a single metric.

#### **Initiative 5: Increase Trips of Walking and Biking**

**Description:** Transportation planning and decisions have historically minimized both the realities and potential of biking and walking to get to work, play, and school. Replacing trips in cars with sport shoes and pedals can have a dramatic effect on clean energy and carbon goals and can save individuals huge amounts of money in fuel, parking, and car ownership – the second largest expenditure item in most budgets. The difficulties cut across all energy goals. Do people live close to work? Is walking or biking safe, and what can be done to make it safer? Are there resources available to fill the gaps in need?

Asheville Buncombe needs to embrace pedestrians and cyclists commuting by adding greenways and bike paths on the arteries from where people live to downtown and other centers of work. Supporting high density housing on the existing and planned commuting paths is vital. There are financial rewards for both those who commute without a car and the businesses who employ green commuters. It will take comprehensive planning and building now to make these pathways possible in the future. Additionally, supporting these behaviors with a bus system will make both more successful.

## Topic 6: Industry and Aviation



Industry and Aviation are large energy consuming Sectors that are present within Buncombe County, but so far, no specific initiatives are identified in the Plan. For the county to reach its 100% RE goal, it is imperative that these sectors are an important piece of the puzzle, although electrification opportunities beyond Buildings Energy Systems Decarbonization are emerging. It is recommended that the BHPCC, Buncombe County, and the City of Asheville continue to monitor progress in these sectors for new information, emerging technologies, and projects that could be implemented within our region, and be ready to act as opportunities become available.

The Industry Sector is the larger of the two, estimated (APPENDIX A, Table 1) to be 20.6% of overall energy demand. Of that 20.6%, 17% is direct consumption of electricity, 57% is natural gas, and 26% is oil and propane. The BHPCC has limited visibility into all the industrial processes that drive industrial energy use, but at a national level most of the non-electric energy use is for Process Heat at various temperatures. In our region in particular, we do not have industry with the highest temperature Process Heat needs (e.g., metals and concrete manufacturing) hence the now emerging Industrial Heat Pump applications may well solve all our industrial process heat needs.

A recent project proposed by IntelliProducts Inc, a local innovation firm led by active BHP volunteers, has examined energy use in the brewery sector for a DOE grant application, increasing our overall knowledge base and confirming significant fossil fuel use for regional Industrial Process Heat. That team determined that all the brewing process heat, as well as building heat loads in industrial buildings, could be Electrified using standard heat pumps for building heat and emerging high temperature heat pumps for Process Heat. Electrification of building and Industrial Process Heat in Buncombe County represents a major opportunity for energy efficiency and decarbonization.

**Commented [GU21]:** This reference needs to be changed now that we have moved much of Part One into the Appendix. Second comment - this section is too detailed given how little detail there is for the other initiatives.

**Commented [dg22R21]:** But this section isn't an initiative, it's a whole topic...we just don't have any initiatives for it - so that's why we were writing about it instead.

**Commented [dg23R21]:** I might bring this up in the strat plan meeting next week to let others weigh in...Im not opposed to moving it to the appendix

**Commented [dg24]:** Brad: "It seems to me that the remainder of this section should be moved to the appendix for initiatives (D) . This is supposed to be a summary and we are presenting detail that is out of line with the rest of the section,"

-But since we have no specific initiatives to analyze, we talked about adding a few paragraphs to discuss some possibilities... I'm not opposed to moving it, just remember that having a write up here is something we talked about in lieu of specific analyzed initiatives

Potential opportunities to monitor in the aviation sector include drop-in jet fuels called SAF (sustainable aviation fuels), made from low CI ethanol and bio-oils, and new Electric Short Distance Airplanes. SAF are interchangeable with fossil fuels. They are currently being utilized and can be used on any existing plane. AVL hosts many airlines doing short flights to Charlotte, Atlanta, Newark, and Florida, and these are good candidates for the emerging electric planes now being tested in Europe.

Important and relevant actions that could be taken now and in the near-term at the Asheville Regional Airport. Buncombe County and the City of Asheville have representation on the Greater Asheville Regional Airport Authority and should be encouraging a transition to 100% renewable energy for all airport functions. Such measures could include:

- Encouraging the Greater Asheville Regional Airport Authority to develop a carbon reduction plan.
- Install electric high-efficiency heating and cooling (currently ongoing).
- Electrification of fleet vehicles like baggage and ground maintenance trucks.
- Installing on-site renewables (parking deck and potentially some ground mount PV), this could potentially produce a surplus for the County.
- Perform a feasibility study for creating a microgrid for the airport (see a description and analysis of microgrids at initiative # 3 under the topic 'Residential and Commercial Renewable Energy and Storage').
- Provide rapid EV charging stations, and an EV priority area for taxi, car share, and shuttle van services. Increase shuttle and bus services regionally.
- Display information on low-carbon tourism and transit alternatives for travelers.
- Institute a 'no idling policy' for pick-up.

Another option is for the local governments to require an assessment for all required travel to compare the energy consumed associated with each potential travel option, to choose the least emitting option, and then to offset the energy consumption of the chosen method of travel (including flights). Although changing the aviation industry seems infeasible, there are still many things that can be done to prepare for a transition to more sustainable travel including implementing actions that are currently feasible and readily available. This approach can be applied to the industry sector as well and should be done since the industry and aviation sectors will need to be addressed in order to achieve the goal of 100% RE in Buncombe County by 2042.

## Policy Changes



The overall energy policies at a local, state, and federal level will have a huge impact on our ability to meet the community 100% renewable energy goal. Indeed, enacting the short-term state level policy changes suggested in the “Moving to 100 Report” estimated that the five changes recommended (and listed at the end of Part Three of this report) would result in achieving around 35% of the total renewable energy goal, far outdistancing the other strategies considered.

Recent events have created a much more favorable policy environment for achieving the renewable energy goals. The passage into law of H951 in NC codifies a much greater percentage of carbon free energy that Buncombe County will be importing from Duke Energy by 2042. It is likely that, as Duke’s fossil energy declines, much of that replacement energy will be from renewable sources, although it is also possible that a good portion of that new energy will be nuclear. In any case, it is a vastly different result from the projections for Duke that are used in the “Moving to 100 Report.” Additionally, the recent passage of the federal Inflation Reduction Act (IRA) creates an unprecedented level of new funding and incentives for the renewable energy transition and for energy efficiency. Nevertheless, most analysts believe that these are still not sufficient to make national and state goals by 2050, let alone 2042. Thus, additional policy changes are likely to still be needed.

The following are some additional policy changes that the BHP believes merit consideration at the local, state, or national level:

*Insert updated policy templates/analysis/details*

**Commented [dg25]:** Brad: Where do we stand on the policy recommendations?

- Michelle has organized a policy task force to take this on. I reached out to her today (3/13) to get an update. They have not met yet, but she will be coordinating that soon.

## Community Engagement



Community engagement with Buncombe County residents, community groups, and businesses is critical to achieving the county's goal of reducing energy demand and transitioning to 100% renewable energy by 2042. The Blue Horizons Project (BHP) was created to enlist public support and provide easy access to resources that allow everyone to be a part of creating a clean energy future.

In order to educate, engage and inspire action, we need to raise the visibility of the Blue Horizons Project, so people understand who we are, what we are trying to accomplish and how we can help them. As such, the BHP's community engagement efforts focus on two important aspects of this work: 1) raising awareness and expanding reach to build trust, credibility, and influence and 2) engaging community members in energy-efficiency and clean-energy education and action that promotes diversity, equity, and inclusion.

Because community engagement lies at the heart of why the Blue Horizons Project was created, it is a cross-cutting function that will play a substantial role in all BHP-led initiatives.

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The following activities support the overall vision of the energy transition described in this strategic plan and specific initiatives and policy recommendations emerging from this Plan:

### **Communications**

- Create a 30-second version of an updated BHP video to replace the 3:30-min version on the website by the end of 2023.
- Because BHP is a Green Built Alliance program, work with a local graphic designer to update and better align the BHP logo with GBA branding by adding a leaf (on or near the sun) and possibly adding similar colors by the end of 2023.
- When there is news to share, promote it on the BHP website, through BHP's digital media platforms and directly to local media outlets and key reporters to garner media interviews and secure earned media coverage.
- Run at least 1 local print advertisement and 1 local radio advertisement per year to showcase clean energy progress in the region and promote the community climate challenge and/or countywide event (see Phase II).

### **Community Engagement**

- Lead and manage a month long, peer-to-peer community climate challenge, where people sign up to track and submit their climate-friendly actions on a weekly basis.
- With non-profit partners who share similar goals and objectives, plan, and host – or co-host – at least 1 annual climate action-focused, countywide event that could include:
  - Prominent speakers from the City and County, including a live Q&A.
  - Expo booth showcasing a diverse array of private and public entities working to advance a just, clean energy future.
  - Award ceremony recognizing the top, most impactful local clean energy projects and companies of the year.
  - Eco-friendly prize raffle for residents who actively participated in the community climate challenge.
  - Live music from a well-known local band.
- Conduct an annual environmental justice survey to better understand the unique needs and challenges of communities experiencing disproportionate environmental harms and risks.
  - Share survey findings with the City and County.
  - If applicable, update the BHP Strategic Plan to ensure it addresses the findings.

- Promote survey findings within vulnerable communities to educate and engage residents in programs that help lower the energy burden, such as GBA's Energy Savers Network.
- Participate in and conduct outreach at least 10 relevant, local community events, speaking engagements, festivals, fairs, farmer's markets, and other forums per quarter, including BHP presentations to community groups, churches, non-profit organizations, and businesses.
  - Ensure Community Council members represent BHP by attending at least one GBA event per year.
- Cast a wide net to reach Buncombe County and Asheville residents using an array of digital media platforms, including BHP's website, Facebook, Instagram, YouTube, email newsletters and paid digital advertisements.
- Increase engagement with BHP's digital media platforms by 5% quarterly, from a July 1, 2022, baseline, for a 20% cumulative increase across all platforms annually by:
  - Spotlighting at least 1 impactful clean energy project (e.g., solar, wind, electrification, microgrid, geothermal, storage, etc.) per month by telling stories from the people behind the project, who are both leading and benefiting from it.
  - Posting before, during and/or after relevant events, including key takeaways.
  - Producing and promoting at least 1 Home Energy Advice video per quarter.
  - Promoting relevant articles, blog posts, op-eds, community climate challenge highlights and community resources.
  - Sharing and boosting important news and announcements with targeted, digital advertisements.
- Perform 40 home energy chats with City and county residents annually.
- Meet the outreach and performance goals laid out in the ESN contract.

The BHP will track awareness, engagement, and action for each of the relevant initiatives listed above to develop a baseline throughout the year. Key performance indicators (KPIs) will then be developed for all relevant initiatives by the end of 2023. The BHP will use the KPIs to evaluate performance and adjust, as necessary, on a semi-annual basis.

## Part Four: Our Current Situation

As of the 2023 version of this plan, we are just beginning to make progress in moving to 100% Renewables. As we outline in Part Five - Technical Strategy Overview and in APPENDIX A, renewables are still a **small portion** of our overall electricity production and electricity is itself is around only one quarter of our overall energy consumption. We have a long way to go. Nevertheless, we have new policies in place at the federal and state levels and our community is beginning to engage in the effort. Here we document some of the initiatives and policy successes we have achieved as part of our efforts.

### Current Initiatives and Previous Successes



When looking today at the Pathway A and B initiatives from the “Moving to 100 Report” there is significant reason for hope. Many of the current initiatives in that report (Pathway A) are now completed successes or ongoing initiatives as of this current version (03/2023) of the Plan and several of the proposed initiatives (Pathway B) are now ongoing efforts or have been

completed. Several of the legislative recommendations have been achieved or superseded. This is part of a dynamic process which must continue to achieve our community's renewable energy goals. But just being included as a "current initiative" is obviously not enough. We must continue to nourish and scale up many of these initiatives. This will be much of the work of the BHPCC. Indeed, nourishing, monitoring, and scaling up ongoing initiatives are a core part of our strategy.

It is important to note that the successful initiatives enumerated below are only a part of what is going on in our community to meet the goals. Every economic sector in our community can participate in the energy transition toward 100% and it is beyond the BHPCC's current capability to track even most of them. This includes all the green buildings, home retrofits, rooftop solar projects, EV purchases, HVAC conversions to electric from fossil fuels, and many more. We celebrate and encourage all of these and many more as we enumerate some of the ones that have come from our direct efforts.

Success of BHP Initiatives to Date (03/2023)

The below successes represent efforts that our community collaboration has achieved. Most of these efforts are voluntary contributions to the movement toward meeting the goals of the Blue Horizons Project from members of our collaboration. All of these are successes of our community, although the primary movers vary depending on the initiative. For example, the City and County governments have implemented numerous solar projects as the primary movers of those efforts. The City and County governments also provided funds for a Solarize campaign, but most of the funds for that successful effort came from homeowners throughout Buncombe County. Duke Energy has been the primary mover on a number of efforts. These efforts are all listed here because it is our community as a whole - businesses, non-profits, utility companies, City / County government, landlords, renters, and homeowners who are coming together to move our community toward the goals of the Blue Horizons Project.

Our successes to date include:

**Completed initiatives:**

- Buncombe County
  - 5 MW solar at leased landfill property (see "Duke Energy's contributions..." below)
  - 7 MW of solar installed on county buildings - 16 county facilities, 7 community college facilities, 22 City/county schools, 10-12 fire stations underway.
  - Passage of sustainable fleet resolution, 4 F150 EV trucks purchased.
  - Resolution for all schools to have solar and for all new buildings to be LEED gold.
  - Continued funding with the City of Asheville of Blue Horizons Project

- City of Asheville
  - .21 MW solar installed on City buildings in conjunction with Buncombe County Project, including 57.5 KW solar array on transit station canopy.
  - 4 electric buses added to the fleet.
  - Obtained [SolSmart Gold certification](#)
  - Partnered with Buncombe County and the Blue Horizons Project to implement the [Solarize Asheville-Buncombe campaign](#).
  - Partnered with Buncombe County to explore the [feasibility of floating solar](#).
  - Numerous efforts to make city buildings more energy efficient as part of ongoing efforts to meet the City's carbon goals.
- A successful solarize campaign operated by GBA with City and county funding during which 180 households installed solar totaling 1.45 MW
- Zz MW of residential and non-profit solar added in Buncombe County (need help with these numbers)
- Yy MW of solar added on the homes of low-income residents through the Neighbor 2 Neighbor Program
- Duke Energy's contributions as contained in Duke's final report to the NCUC for the Western Carolina Modernization Plan:
  - Retirement of the Lake Julian coal plant and replacement by highly efficient combined cycle natural gas generation
  - Duke canceling of plans for a Peaker plant at Lake Julian based on a variety of reasons, including the efforts of the BHPCC's predecessor, the Energy Innovation Task Force
  - 5 MW of solar developed by Duke on the landfill property which is leased from the county to Duke for that purpose.
  - Duke solar, storage and microgrid development.
    - 1. Mt. Sterling Picogrid, Haywood County, 10 kW Solar PV and 95 kWh Battery Storage Facility
    - 2. Asheville Rock Hill Battery, Buncombe County, Sited at utility-owned substation, 9 MW Battery Storage Facility
    - 3. Hot Springs Microgrid, Madison County, 2 MW Solar PV and 4 MW Battery Storage Facility
    - 4. Riverside Battery, Buncombe County, sited at utility-owned substation, 5 MW Battery Storage Facility, Anticipated In-Service Date – 2022
    - 5. Asheville Solar and Battery, Buncombe County, sited at utility-owned CC plant, Approximate Capacity – 9 to 10 MW Solar PV and 17 to 18 MW Battery Storage Facility, CPCN filed, Anticipated In-Service Date – 2024A

Commented [dg26]: Add numbers

Commented [dg27R26]: I emailed GBA staff for these numbers

Commented [dg28R26]: Jamie is working on getting them

- 6. Craggy Battery, Buncombe County, sited at utility-owned substation, Approximate Capacity – 25 MW Battery Storage Facility, Anticipated In-Service Date – 2026
- Over 850 low-income dwellings receiving “Tier One” (basic EE and weatherization) upgrades through Energy Savers Network
- Expansion and funding of Energy Savers Network offerings to home and HVAC repair and HVAC replacement for increased energy efficiency and electrification.
- Greatly expanded capacity of Energy Savers Network from a small team of volunteers to an ongoing staff size of 4 professionals with two vans, combined with a much larger volunteer effort.
- Successful transition from the Energy Innovation Task Force, an ad hoc community collaboration, to the Blue Horizons Project Community Council
- Home energy chats program launched with 52 engagements as of 12/31/2022.
- Ongoing community engagement efforts including outreach at 25 festivals and fairs, and 30 presentations to local community groups.



## Ongoing Initiatives



- The City and County solar rooftop program and other efforts to meet the 2030 100% renewable energy for City and County operations goal is ongoing. This continuing effort is being led by City and County staff. Achieving the 2042 community goal requires this goal to be achieved as well.
- Duke solar - a 10 MW solar facility at Duke's Lake Julian plant is in the planning stage with a Certificate and Public Convenience and Necessity (CPCN) filed in early 2023.
- Energy Savers Network is continuing to provide "Tier One" - basic energy upgrades to low-income households in Buncombe County. A recently launched effort by ESN adds "Tier One Plus" measures that allow HVAC replacement and repair in addition to home repairs that are needed but not directly related to energy upgrades. Ongoing additional funding will be needed for ESN to continue to operate at its current pace.
- The "Neighbor-2-Neighbor" Solar program provides low-income and BIPOC focused households in Asheville City and Buncombe County with 3.95 KW rooftop solar PV systems. The goal of this program is to reduce the reliance on fossil fuel systems and reduce electricity costs for these households.

- Community outreach programs of the Blue Horizons Project including the “Home Energy Chat” program are ongoing. Home Energy Chats are free, unbiased home energy consultation calls, anyone can sign up, and GBA staff give a custom look at each persons’ house, providing resources to help moderate-to-high income households make the best energy-saving decisions for their home.

## Policy Achievements



Pathway C in the “Moving to 100 Report” outlines several policy changes that were identified as being helpful in meeting the goal. Some of these previously suggested policy changes continue to be needed while other additional policies have been added to ‘Part Five - Potential Legislative and Policy Changes.’ The following are some of the key policy changes that were identified in that report along with their **status**:

- State-wide mandate requiring solar installation on all new construction.
  - No knowledge of any progress on this policy recommendation.
- Increasing the State Renewable Energy Portfolio Standard.
  - This policy recommendation has been somewhat superseded by the passage of H951 and the subsequent Duke Carbon Plan proceeding which focuses on achieving 70% reductions in carbon emissions (versus 2005) by 2030 and 100% by 2050. This will almost certainly involve higher renewable energy penetrations than the REPS did, although some of the main reductions in carbon emissions could

come from nuclear energy. It should be noted that former EITF Co-Chair Julie Mayfield, now a State Senator, was instrumental in achieving this legislative progress.

- Allowing Third-Party Ownership of Solar via Power Purchase Agreements.
  - This is presumably superseded by Duke's Green Source Advantage Program. More research is needed.
- Implementing a State Green Bank.
  - This effort is underway in the form of the North Carolina Clean Energy Fund (<https://www.nccleanenergyfund.com/>) with the bank being established, top executives chosen, and funding identified. The City of Asheville's Sustainability Director, **Bridget Herring**, is a board member.
- Enabling Community Shared Solar.
  - Duke has announced a community shared solar program pilot (40MW). To date this program has not been pursued because compensation rates have been at avoided cost which is too low to easily justify the expenses of a program. Under the recently passed Inflation Reduction Act (IRA), however, community solar programs have additional credits above the standard 30% if they provide a minimum number of subscriptions to those of low income. This could lead to economic viability even at avoided cost compensation. Exploring this opportunity is a current initiative.
- Other.
  - **Substantial policy success has been achieved** since the previous report, primarily the funding under the Inflation reduction Act (IRA) for solar, wind, nuclear, batteries, transmission, electric vehicles, home rewiring, efficiency, and electrification of vehicles and buildings. **Such legislation was not contemplated in the "Moving to 100 Report" but it will aid in the community efforts to achieve the goals.**



## Part Five: Technical Strategy for the Transition to 100% Renewable Energy



Buncombe County's current energy system is dominated by transportation (gasoline and diesel mostly) at almost 50% of energy consumption with electricity and natural gas in the 20-25% range each. Propane and fuel oil in buildings makes up the remainder of energy use. Renewable electricity is provided through solar farms, renewable energy imported as part of Duke Energy sales, some rooftop solar, and a small number of renewable fuels.

Buncombe County's energy system can be completely transformed from where it is today, but the pace of change will need to be drastically increased. The analysis performed shows that we need to adopt a wide range of measures to add renewable energy to the system, make our energy use far more efficient, and convert all current uses of fossil fuels to electricity. We need to be making major investments every year for the next 20 years to meet the goal.

This analysis is partially based on the 100% Renewable methodology developed by Dr. Mark Z Jacobson at Stanford University. The reader is encouraged to read Dr. Jacobson's energy plan for the US and his detailed textbook on the subject. Dr. Jacobson has also released a plan for North Carolina showing the steps needed and implications of a conversion to 100% Renewable for NC.

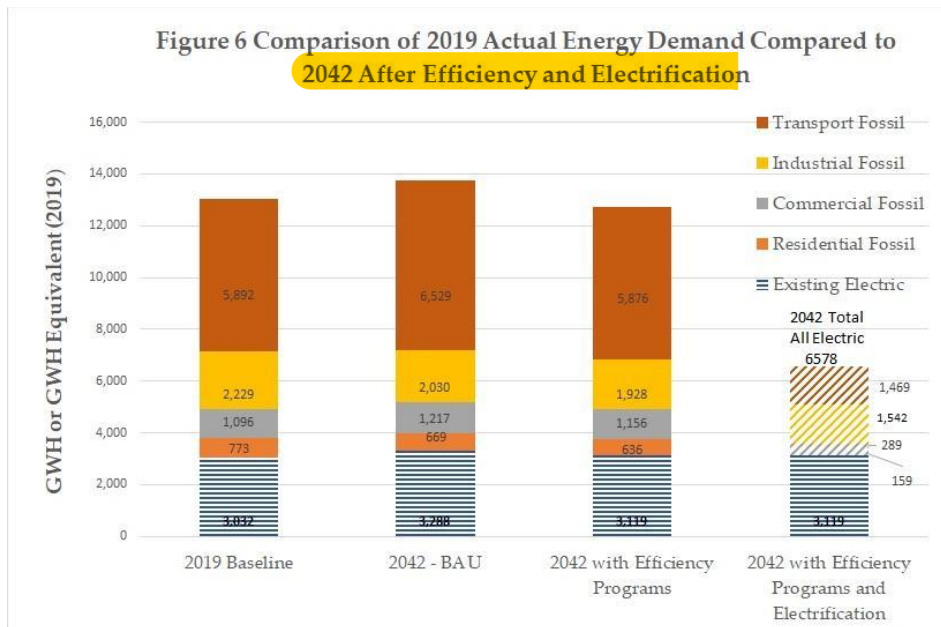
Numerous different paths to get Buncombe County to a 100% renewable energy system by 2042 are possible, but they all will be achieved by doing some combination of the following technical pathways:

- Efficiency—reducing the amount of energy used to power our lifestyles.

- Electrification— electrify everything. Ending the use of fossil fuel for everything, usually through adopting superior electric alternatives.
- Greening the grid—ending the use of fossil fuel use on the grid.

Figure 13 below shows the reduction in energy that can be achieved by the addition of the first two pathways, efficiency, and electrification. If the assumed efficiency and electrification are implemented, it reduces total energy demand in 2042 by about 50%. The greatest part of this decline comes from the reduction of energy use provided through electrification. For example, heat pumps use as little as 1/3 the energy of gas furnaces and electric vehicles use as little as 1/4 the energy of gasoline powered cars.

Figure 13 - Tech Strategy Overview - Comparison of Buncombe County Actual Energy Demand Compared to 2042 After Efficiency and Electrification



Commented [dg29]: Brad, I think this is another figure that I don't have access to in order to change the number in the figure itself. Maybe you could just delete the figure numbers inside all together and I can renumber in the plan depending on where they are

Electrification also may include using renewable electricity to create gas or liquid fuel (e.g., hydrogen through electrolysis), so it does not mean that there is no combustion, it just means there are no fossil fuels. It is also likely that biofuels will be used in the future energy system, especially ethanol and methane from animal waste. The scale of these alternatives is likely to be limited, so their future use is likely to be focused on the “hard to electrify” sectors of industry and transport, including high-temperature industrial processes, shipping, long-haul

trucks, and air transportation. It is worth noting that Buncombe County will still depend on Duke Energy for many aspects of our electricity system, including imports of power to satisfy electricity needs to the extent that local renewables are not sufficient. Those power imports may include non-renewable electricity, so success might also depend on the ability to “offset” those non-renewable imports from Duke in some way.

We can become more efficient, green the grid, and electrify everything if our society pursues four broad measures:

- Invest in energy efficiency and conservation through individual actions, community organizations, and government funding.
- Implement strong incentives or regulations to guide countless private and public sector decisions to become more efficient, electrify, and green the grid.
- Build support among members of the community for the public expenditures and private actions needed to achieve our goals.
- Make public sector investments in research and in removing barriers to the transition.

All those measures could be adopted at the local level in sufficient quantities to meet the renewable energy goal. However, it will be much easier and less costly if there are supportive federal and state policies adopted to support what we do locally. Two legislative successes were achieved in 2022 – the recent passage of North Carolina H951 and the related NC Carbon Plan ordered by the NCUC at year end and the passage of the Bipartisan Infrastructure Bill and the Inflation Reduction Act by Congress. The passage of these bills is not enough, however. To implement the actions funded in these state and federal measures, action will be needed at the local level that also focuses on local priorities such as social justice and equity (discussed more fully in the ‘Local Priorities’ section) which will require additional cost and intense effort. While the energy transformation is likely to happen even without this effort and supportive measures, it will happen too slowly to meet the 2042 goals and would likely happen so much later in this century our fight against climate change, which inspired our goal of 100% renewable energy by 2042, would be severely hampered.

This analysis of the technical pathways to 100% renewable is presented more fully in APPENDIX A.

## Part Six: Next Steps for Success



Commented [dg30]: Maybe add in the piece Ben is working on for doing an inventory on current RE produced within BC

Commented [dg31R30]: Brad: "would be better to put Ben's contribution in the current initiatives section wouldn't it? Also, we could begin to weave that into the modeling, either this go round or next."

- Well current initiatives and successes is about things that have already happened. I think he is saying we should do an inventory of what we are currently producing, and a feasibility study of what BC could potentially generate - That's no so much a previous success as it is something that still needs to be done...

The work on the Strategic Plan was completed by a group of dedicated individuals who are arguably experts in their respective fields and in some way or another are involved in the work of the Blue Horizons Project. A substantial portion of the work that went into the Plan was from the Blue Horizons Project's 100% renewable energy by 2042 Strategic Plan committee who helped lay the groundwork and drive the process. Throughout the process, existing committees helped immensely with parts that were more directly related to their fields. For example, the Technology Committee gave tremendous insight into several proposed action initiatives which involve technology. The Community Engagement Committee worked heavily on the Community Engagement Section of this Plan. As needs arose, new committees were created such as the Transportation Committee which was heavily involved in adding to the action initiatives under the transportation topic. At times we felt it best to reach out to other partnering organizations for additional insight and information and did so on countless occasions. All this is to say that the work that has gone into the creation of this report has been extensive and is the result of highly collaborative efforts. It could not have been accomplished without the collaboration and support of countless individuals and organizations.

The tireless work of the contributors to the Strategic Plan was undertaken in part to provide guidance on actions to be taken to meet the renewable energy goals and to do so in a

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just and equitable way. After the passing of the community-wide resolution for Buncombe County to be 100% renewable energy by 2042, many were at a loss for what to do next or how to go about achieving the goal. The “Moving to 100 Report” provided a solid foundation upon which this Strategic Plan build to try to inform the community where to focus energy, effort, and capital and in what time frame.

As previously described in this report, the BHPCC considered over 75 potential initiatives and analyzed over 40 of the most promising ones to better understand potential: feasibility, scalability, equity impact, and cost vs benefit. A second phase of analysis was also performed to give a better understanding of how the coordination of these initiatives, such as timeline, implementing departments and organizations, activities to be taken, financial costs and benefits, and additional resources needed. 15 of these potential initiatives ranked the highest and can give guidance on where and how best to focus our energies. Of the 42 potential initiatives analyzed, 13 have a ‘High’ favorability of potential for equity impact. The BHPCC’s goal is to achieve 100% RE by 2042 for Buncombe County in a just and equitable manner. Therefore, we recommend that the highly ranked overall initiatives and the ‘High’ ranked Equity Impact initiatives be put into action. If not, all initiatives can be put into action, then we recommend focusing energy and efforts on the overlapping initiatives that are highly ranked overall AND have a ‘High’ Equity Impact ranking. For further information including detailed analysis and implementation recommendations see Part Four: New Initiatives. The highly overall ranked initiatives and ‘High’ ranked Equity Impact initiatives are outlined as follows in accordance with their recommended timeframe:

**\*Points are based on rankings in each of the Four Phase 1 categories (Potential Feasibility, Potential Scalability, Potential Equity Impact, and Potential Cost Vs. Benefit).**

**High = 3, Medium = 2, Low = 1**

\* Categories that had two rankings (e.g., Low-Medium, or Medium-High) erred on the side of caution and used the lower of the two rankings for scorekeeping and analysis purposes. For example, a scalability ranking of Low-Medium was only given 1 point.

## Highly Ranked Overall Initiatives to Implement

**In the Near-Term (Next 1-5 years) enact these highly ranked overall initiatives:**

Table 6 - Next Steps - Highly Ranked Overall (Initiatives - Near-Term)

Initiatives	Total points	Timeline
Heat Pump Water Heater (HPWH) promotion & bulk buying program	11	Near-Term
ESN - future state of growth	11	Near to Medium-Term
Microgrids	11	Near to Medium-Term
Heating electrification Working with HVAC contractors to change fossil systems to electric (heat pumps or mini splits)	11	Near to Medium-Term
Promote expanded EV charging infrastructure	11	Near to Medium-Term
Agrivoltaics	11	Near to Long-Term
Duke multifamily retrofit and DSM program.	10	Near-Term
Duke Energy Small Business Energy Saver Program	10	Near-Term
Neighbor to Neighbor Solar	10	Near-Term, Ongoing
ESN - Deeper Retrofits	10	Near-Term, Ongoing
ESN-Current State	10	Near-Term, Ongoing
Increase Trips of Walking and Biking	10	Near-Term, Ongoing
Community Action Opportunities (CAO)	10	Near to Medium Term, Ongoing

Commented [dg32]: Brad, I see your point about floatovoltaics....yes perhaps we bring it up with him sometime soon

In the Medium-Term (Next 10-20 years) enact these highly ranked overall initiatives:

Table 7 - Next Steps - Highly Ranked Overall Initiatives - Medium-Term

Initiatives	Total points	Timeline
ESN - future state of growth	11	Near to Medium-Term
Microgrids	11	Near to Medium-Term
Heating electrification Working with HVAC contractors to change fossil systems to electric (heat pumps or mini splits)	11	Near to Medium-Term
Promote expanded EV charging infrastructure	11	Near to Medium-Term

Community Action Opportunities (CAO)	10	Near to Medium Term, Ongoing
ENERGY STAR benchmarking (Portfolio Manager)	10	Medium-Term
Reduce Vehicle Miles Traveled (VMT) Per Capita	10	Medium-Term

**In the Long-Term (Next 10-20 years) enact these highly ranked overall initiatives:**

**Table 8 – Next Steps - Highly Ranked Overall Initiatives - Long-Term**

Initiatives	Total points	Timeline
Agrivoltaics	11	Near to Long-Term

## Initiatives Specifically with a ‘High’ Equity Impact to Implement

**In the Near-Term (Next 1-5 years) enact these high equity impact ranked initiatives:**

**Table 9 – Next Steps - ‘High’ Equity Impact Initiatives - Near-Term**

Initiatives with High Equity Impact	Total Points	Timeline
Heat Pump Water Heater (HPWH) promotion & bulk buying program	10	Near-Term
Duke multifamily retrofit and DSM program.	10	Near-Term
Electrification of Public Transit for buses, small vans, etc.	9	Near-Term
Increase Trips of Walking and Biking	10	Near-Term, Ongoing
ESN-Current State	10	Near-Term, Ongoing
ESN - Deeper Retrofits	10	Near-Term, Ongoing
Neighbor to Neighbor Solar	10	Near-Term, Ongoing
ESN - future state of growth	11	Near to Medium-Term
Microgrids	11	Near to Medium-Term
Heating electrification	10	Near to Medium-Term
Working with HVAC contractors to change fossil systems to electric (heat pumps or mini splits)		
Promote expanded EV charging infrastructure	11	Near to Medium-Term
Community Action Opportunities (CAO)	10	Near to Medium Term, Ongoing

Agrivoltaics	11	Near to Long-Term
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**In the Medium-Term (Next 10-20 years) enact these high equity impact ranked initiatives:**

*Table 10 – Next Steps - 'High' Equity Impact Initiatives - Medium-Term*

Initiatives	Total points	Timeline
ESN - future state of growth	11	Near to Medium-Term
Microgrids	11	Near to Medium-Term
Heating electrification Working with HVAC contractors to change fossil systems to electric (heat pumps or mini splits)	10	Near to Medium-Term
Promote expanded EV charging infrastructure	11	Near to Medium-Term
Community Action Opportunities (CAO)	10	Near to Medium Term, Ongoing
Reduce Vehicle Miles Traveled (VMT) Per Capita	10	Medium-Term

**In the Long-Term (Next 10-20 years) enact these high equity impact ranked initiatives:**

*Table 11 – Next Steps - 'High' Equity Impact Initiatives - Long-Term*

Initiatives	Total points	Timeline
Agrivoltaics	11	Near to Long-Term

Figure 14 – Next Steps - Overlap of Initiatives Highly ranked overall and High Equity Impact



The BHPCC also considered several potential policy changes that would make great gains in getting Buncombe County to its goal of 100% RE by 2042. The 15 **most promising** policies were analyzed in a similar format to the initiatives to better understand potential: feasibility, scalability, equity impact, and cost vs benefit. A second phase of analysis was also conducted to look at the timeline, implementing departments and organizations, and when applicable - activities to be taken, financial costs and benefits, and additional resources needed. For further details of this analysis see Part Five: Potential Policy Changes. 10 of the 15 policies analyzed ranked the highest overall and **0 of the policies have a 'High' Equity ranking. The BHPCC's goal is to achieve 100% RE by 2042 for Buncombe County in a just and equitable manner.** As has been seen in the past with policy changes (H951, Inflation Reduction Act, etc.) policy changes at the local, state, and federal level can have an immense impact on the success of the goal and how we go about achieving it. Therefore, we recommend that the **9** highly ranked overall policies and the 'High' ranked Equity Impact policies be lobbied for by the BHPCC and its members. For further information including detailed analysis and discussion on the policies and see the 'Moving Forward to Success' section and APPENDIX D. The highly overall ranked policies and 'High' equity impact policies are outlined as follows in accordance with their recommended timeframe:

**\*Points are based on rankings in each of the Four Phase 1 categories (Potential Feasibility, Potential Scalability, Potential Equity Impact, and Potential Cost Vs. Benefit).**

High = 3, Medium = 2, Low = 1

\* Categories that had two rankings (e.g., Low-Medium, or Medium-High) erred on the side of caution and used the lower of the two rankings for scorekeeping and analysis purposes. For example, a scalability ranking of Low-Medium was only given 1 point.

## Highly Ranked Overall Policies to Implement or Support

In the Near-Term (Next 1-5 years) enact/support these highly ranked overall policies:

Table 12 - Next Steps - Policies w/ High Impact Overall - Near-Term

Policies	Points	Timeline
Updating State Building Codes to include renewable energy (RE), electrification, and energy efficiency (EE).	12	Near-Term
Mandate Green Building/Energy Efficiency/Electrification for Multi-Family Dwellings (MFDs) that utilize incentives for affordable housing	11	Near-Term
Implement a Carbon Price	11	Near-Term
Permitting Reform	10	Near-Term
Direct cash assistance for utility bills with weatherization enrollment and upgrades	10	Near-Term, Ongoing
Community Solar + Storage	10	Near-Long-Term, Ongoing

In the Medium-Term (Next 10-20 years) enact/support these highly ranked overall policies:

Table 13 - Next Steps - Policies w/ High Impact Overall - Medium-Term

Policies	Points	Timeline
Change the wording of our community-wide goal from '100% renewable energy' to '100% Decarbonized Energy'	11	Medium-Term
Municipal Energy	10	Medium-Term, Ongoing
Enhance the third-party ownership framework to allow Power Purchase Agreements	10	Medium-Term, Ongoing

In the Long-Term (Next 10-20 years) enact/support these highly ranked overall policies:

Table 14 - Next Steps - Policies w/ High Impact Overall - Long-Term

Policies	Points	Timeline
Community Solar + Storage	10	Near-Long-Term, Ongoing

## Policies Specifically with a ‘High’ Equity Impact to Implement or Support

In the Near-Term (Next 1-5 years) enact/support these high equity impact ranked policies:

Table 15 - Next Steps - Policies w/ High Equity Impact - Near-Term

Policies	Points	Timeline
Updating State Building Codes to include renewable energy (RE), electrification, and energy efficiency (EE).	12	Near-Term
Implement a Carbon Price	11	Near-Term
Mandate Green Building/Energy Efficiency/Electrification for Multi-Family Dwellings (MFDs) that utilize incentives for affordable housing	11	Near-Term
Direct cash assistance for utility bills with weatherization enrollment and upgrades	10	Near-Term, Ongoing

In the Medium-Term (Next 10-20 years) enact/support these high equity impact ranked policies:

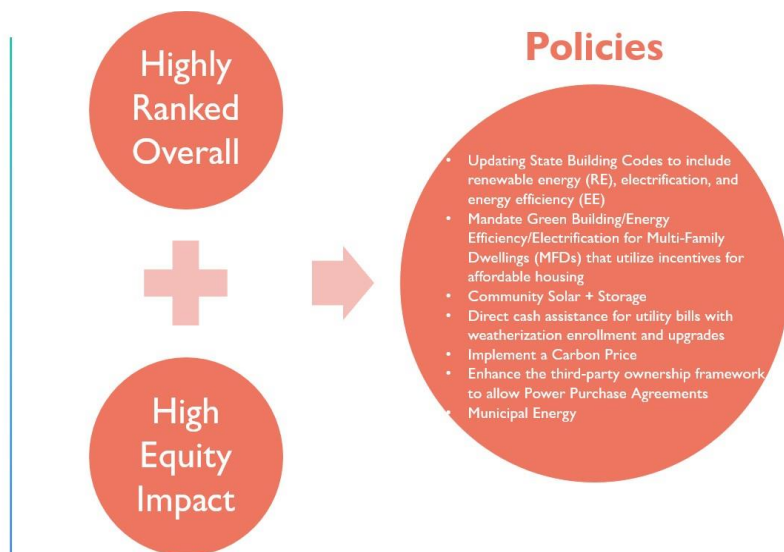
Table 16 - Next Steps - Policies w/ High Equity Impact - Medium-Term

Policies	Points	Timeline
Establish a community land trust to support renewable energy projects	9	Medium-Term

Establish a community land trust to support renewable energy projects	9	Medium-Term
Municipal Energy	10	Medium-Term, Ongoing
Enhance the third-party ownership framework to allow Power Purchase Agreements	10	Medium-Term, Ongoing
Community Solar + Storage	10	Medium-Term, Ongoing

**In the Long-Term (Next 10-20 years) enact/support these high equity impact ranked policies:**  
 -No policies with a 'High' Equity Impact ranking were 'Long-Term.'

Figure 15 – Next Steps - Overlap of Policies Highly ranked overall and High Equity Impact



## Funding

To make the transition to the clean energy economy significant financial resources will be needed to support the movement away from fossil fuels to renewables. Funding will need to come from market investments, philanthropy, federal, state, and local governments, and utility investments. Fortunately, many of these sectors are aligned in values with the clean energy economy. Now it is time for all sectors to channel funding into energy efficiency, renewable energy, electrification, storage, and EV transportation.

While it is beyond the scope of this plan to quantify the financial investment needed for the transition the following opportunities should be pursued for maximum investment in the policies, technologies, projects, programs, and behavioral changes needed to reach the 100% goal.

- Local government funding- Continued and expanded support from Buncombe County and the City of Asheville are integral to this effort. With local government funding a baseline of support has been established to get this effort off the ground. With continued support a message is sent to businesses and residents that this is a priority for our community.
- Utility Funding- Duke Energy provides funding for some energy efficiency programs. The company has also made some investments in local PV and storage. For Duke to reach its own carbon free goal
- Foundation- While foundations will most likely be a small part of the funding piece, they can help fund program implementation support through nonprofits like GBA.
- Federal Government Funding- the Bipartisan Infrastructure Law and the Inflation Reduction Act both have funding for program support and tax incentives for installed equipment such as PV, EV charging stations, EVs, heat pumps, heat pump water heaters, etc. Promoting this funding to residents and businesses is essential to make sure our community receives the greatest allocation possible of these resources.
- Financial Institutions and the Green Bank-Loans for residential, commercial, and industrial energy efficiency and renewable energy projects will help grow adoption of these technologies.
- Private Donors- In the 10-20 years the greatest transition of wealth in US history will occur as middle- and upper-class individuals pass their inheritance onto their families

and the causes they care about. We will do our best to motivate private donors to support the clean energy transition.

- Individuals and businesses. Perhaps the greatest source of funding will come from individuals and businesses making investments on their own behalf in energy efficiency, electrification, and renewable energy. We will need to do everything we can to inform, encourage, and incentivize these private investments.

# Appendices

## APPENDIX A: Detailed review of Technical Strategy and assumptions for Part Five – Technical Strategy Overview

### Buncombe County Energy Demand in 2018

Before we can understand the requirements to achieve the renewable energy goals, we must assess where Buncombe County is today. Our approach builds on the components of energy demand discussed in the “Moving to 100 Report,” adding in an estimate of energy demand for the sectors that were not covered, i.e., sectors other than electricity and natural gas. A full understanding of energy demand is not complete without also considering petroleum products such as gasoline, diesel, propane, and heating oil which represent an exceptionally large component of energy demand. Unfortunately, data is not readily available for these sectors, so this analysis approximates each of these, to produce an estimate of total energy demand in Buncombe County for 2018 as shown in Table 1. APPENDIX B details the data sources and assumptions used to develop the Table 1 baseline energy estimates. Note that all units are expressed as MWH equivalent. Natural gas, oil, and propane have all been converted into equivalent units of electricity. This is for two reasons: (1) It helps to have a uniform measurement of energy regardless of the source, and (2) the goal of renewable energy dictates that most (if not all) energy will be in the form of electricity. APPENDIX A goes into more detail regarding the rationale for using the electric equivalent as the form of measurement.

Many assumptions were required to develop the baseline 2018 data from the data available at a county level. The Duke and Dominion data represent just under 46% of total energy use, with another 45% represented by transportation alone. Most of the data, other than what is coming from Duke and Dominion, is available at a state level but not at a county level and had to be estimated based on Buncombe’s share of the state. For example, the transportation energy consumption is based on Buncombe County’s share of statewide vehicle registrations times statewide energy use for transportation. APPENDIX B provides a full description of the data sources and assumptions in this analysis.

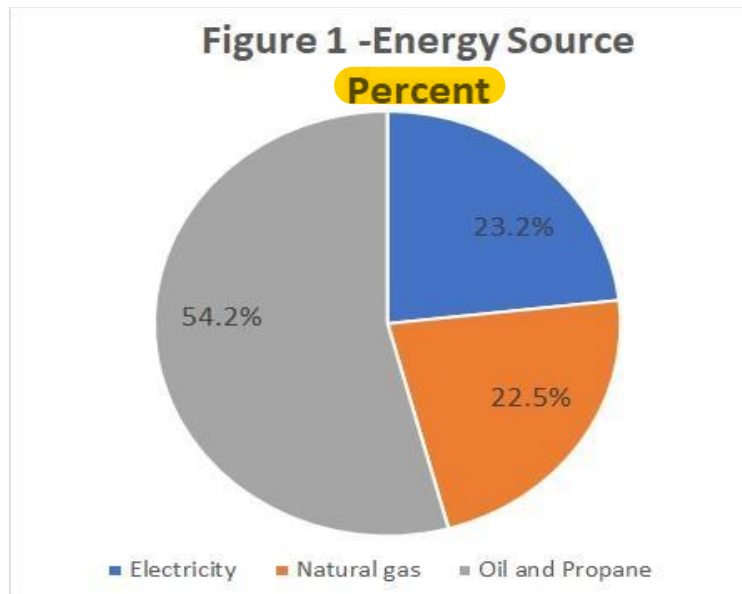
Table 17 – APPENDIX A - Baseline year (2018) MWH Equivalent - County Total

Table 1 - Baseline Year MWH Equivalent - County total					
	Percent	Total	Electricity	Natural gas	Oil and Propane
Community		13,017,985	3,026,276	2,933,200	7,058,510
Industrial	20.61%	2,683,566	454,593	1,522,903	706,070
Residential	16.44%	2,139,960	1,366,550	535,882	237,528
Commercial e	17.20%	2,239,142	1,165,178	850,664	223,300
City	0.20%	26,163	15,842	10,321	
County	0.22%	28,837	17,006	11,831	
Utility Use	0.03%	3,711	2,112	1,599	
Duke SL	0.04%	4,953	4,953		
Transportation	45.26%	5,891,613			5,891,613
<b>TOTAL</b>		<b>13,017,943</b>	<b>3,026,234</b>	<b>2,933,200</b>	<b>7,058,510</b>
Percentages		100.0%	23.2%	22.5%	54.2%

Commented [dg33]: Brad, I don't have access to these tables as they are your images, so I cannot update the numbers in the tables themselves

Combining the City, county, and utility use values into commercial, we show the energy source and energy sector breakdowns for Table 1 in Figure 1 and Figure 2.

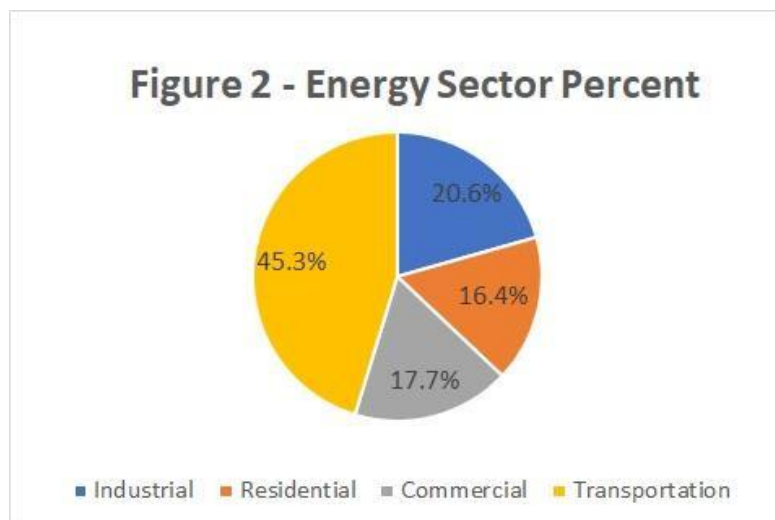
Figure 1– APPENDIX A - 1 Buncombe County Energy use by Source (%)



Commented [dg34]: Brad, I thought I had access to all of these pie charts, but I cant seem to find them. Do you? (Im trying to find them so that I can take out the heading in the image with Figure #s)

Alternatively - we could just say Figure 1 - Appendix and have multiple Figure 1s....  
OR  
I could recreate the whole image from scratch...

Figure 2 APPENDIX A - Buncombe County Energy Use by Sector (%)



Before proceeding to a forecast, it is helpful to simplify Table 1 by doing some aggregations, first combining the different fossil fuel types into a single “direct fossil fuel use”

category. The ‘commercial’ sector in tables 2 and 3 below is made up of the combined use of the City, the County, street lighting, and Duke Energy’s company use.

*Table 18 – APPENDIX A - Buncombe County 2019 Energy Demand by sector in MWH (or MWH equivalent)*

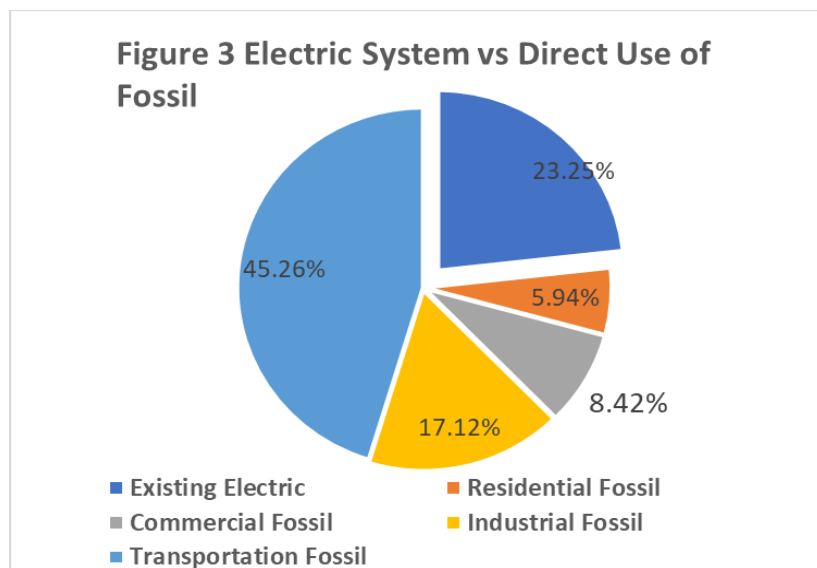
Table 2 - 2019 Energy Demand in MWH or MWH Equivalent			
	Electric	Fossil	Percent Electric
Residential	1,366,550	773,410	45.2%
Commercial	1,205,091	1,096,115	39.8%
Industrial	454,593	2,228,973	15.0%
Transport	0	5,891,613	0.0%
Total	3,026,234	9,990,110	100.0%

Also, to further simplify Table 2 by expressing all electricity demand as one number, as shown in Table 3 and Figure 3.

Table 19 – APPENDIX A - Buncombe County 2019 Energy Demand by Source in MWH (or MWH equivalent)

Table 3 - 2019 Energy Demand in MWH or MWH Equivalent		
	Total	% of Total
Existing Electric	3,026,234	23.2%
Residential Fossil	773,410	5.9%
Commercial Fossil	1,096,115	8.4%
Industrial Fossil	2,228,973	17.1%
Transportation Fossil	5,891,613	45.3%
Total	13,016,344	100.0%

Figure 3 – APPENDIX A - Buncombe County Electric Use vs Direct Use of Fossil Fuel by Sector (%)



It is also worth noting that transportation is an exceptionally large share of total energy use, roughly twice the energy of the total electric sector.

#### Buncombe County Business as Usual (BAU) Energy Demand in 2042

Commented [dg35]: Brad, they actually are bold in the word doc, guess it doesn't come through to the pdf very well...

This analysis will take the simplest possible approach to forecasting Buncombe County's BAU energy demand for 2042. For each of the major sectors of Table 3 (Existing Electric, Residential Fossil Fuel, Commercial Fossil, Industrial Fossil, and Transportation Fossil Fuel Use), we will (1) compute 2019 energy use per capita for each sector, (2) estimate the 2042 energy use per capita for each sector based on continuation of past trends, and then (3) multiply each sector's 2042 projected energy use per capita by an estimated 2042 Buncombe County population.

The easy part of this is population and baseline energy use per capita. According to the North Carolina Office of State Budget and Management, Buncombe County's 2019 population of 262,659 (about half the population of Wyoming) will grow to 309,404 by 2042, an increase of 18%. If a higher forecast of population growth were assumed, then BAU energy demand would be commensurately higher.

We can calculate the baseline energy use per capita in each sector by dividing energy use by population. The forecast of changes in energy use per capita must also be derived. This forecast will incorporate changes in energy efficiency in each sector plus changes in consumer behavior with respect to energy that we might expect in the absence of a major shift or change like the one Buncombe County is trying to make.

As noted in the EIA forecast at a national level, energy use per unit of economic output is expected to continue to decline, while overall electricity and industrial energy use is expected to increase in their BAU forecast. In deriving Table 4 we assume a continuing but slower trend through 2042 by extrapolating per capita energy use from 2019 to 2042 at one half of the rate of decline in such use for the state of NC from 2000 to 2019. Then we apply the Buncombe County population forecast to get the 2042 BAU value, which shows a BAU increase in energy use of about 5%.

Table 20 – APPENDIX A - Forecast of 2042 Buncombe County BAU Energy Demand

Table 4 - Forecast of 2042 BAU Energy Demand				
	Per capita energy use decline rate 2019-2042	Per Capita Energy Use 2019	Per Capital Energy Use 2042	Total Energy Use BAU 2042 - MWH
Existing Electric	-0.36%	11.59	10.68	3,281,853
Residential Fossil	-1.33%	2.96	2.18	668,995
Commercial Fossil	-0.25%	4.20	3.96	1,217,062
Industrial Fossil	-1.11%	8.53	6.60	2,029,534
Transport Fossil	-0.26%	22.56	21.24	6,528,859
Totals		49.83	44.65	13,726,303

Commented [dg36]: Brad is this still accurate with the proposed Carbon Plan?

The forecast of BAU energy use in 2042 illustrates the challenge ahead for Buncombe County. It incorporates continued significant improvements in energy efficiency which find their way into the forecast through the decline in per capita energy use. Those improvements imply a continuation of the successes of the last 20 years as a *starting point*. The community of Buncombe County will have to work just as hard for the next 20 as it did for the last 20 to be able to start from that point. To go beyond that, **there is needed a growing and dedicated** local/regional workforce for the transition, supportive federal and state policies, financial support, and an engaged and willing public that prioritizes efficiency and renewable energy for all sectors of the economy.

The current amount of renewable energy in the system is slightly under 2%, applying the “Moving to 100 Report” estimate of 4% just for electricity and natural gas to the full energy demand. This Strategic Plan starts from that point and builds a series of actions to get to 100% renewable energy by 2042.

The Strategic Plan will measure the contribution of each technical pathway to improving the renewable energy percentage and to reducing carbon emissions. It is estimated that the baseline 2018 carbon emissions for Buncombe County to be 2.986 MMT (million metric tons). Under the BAU 2042 forecast, carbon emissions increase by 9.5%, which is faster than the rate of energy growth because it assumes no new growth is provided by nuclear, which means the zero-carbon portion of Duke’s portfolio would be declining (Note: the no growth in new nuclear scenario was presented in the Duke Carbon Plan hearing by several intervening organizations. Duke presented only scenarios showing significant increases in nuclear. The NCUC did not pick any specific scenario in its ruling). The bottom line is that if “Business as Usual” continues, carbon emissions, energy consumption, and renewable percentage will all be going in the wrong direction. APPENDIX B provides the Strategic Plan’s derivation of CO2 intensity while APPENDIX

C provides more detail on the general approach to keeping score for the two metrics that are considered —percent renewable (goal of 100%) and carbon emissions (goal of zero).

### Technical Pathways for 100% Renewable and Zero Carbon

Buncombe County's 100% Renewable goal can be achieved by combining the three major technical pathways to get us to 100% renewable and 100% carbon free energy:

- Investments in Energy Efficiency
- Electrification of all end-uses
- Greening the Electric Grid.

Each technical pathway can be broken down by sector (e.g., transportation, residential, commercial, utility, etc.). The community and the BHPCC can pursue multiple programs within each sector / technical pathway combination. The choice of which programs to focus on and pursue will be a work in progress for the next 20 years. For each sector / technical pathway the Strategic Plan will postulate a degree of success that will lead the community of Buncombe County to the achievement of the 100% renewable energy by 2042 goal. The numbers below are just an illustration of one combination of programs to achieve our goal. The Strategic Plan will look at each step for its contribution to increasing the renewable energy percentage. The Strategic Plan will first consider efficiency improvements and electrification to get to an estimate of electricity demand in 2042 that will need to be met by a 100% renewable grid to achieve the goal.

### Efficiency Improvements Beyond Business as Usual (BAU)

The BAU forecast for declines in per capita energy use implies a continuation of the efficiency improvements over the last twenty years. There are many opportunities for greater efficiency, and indeed this is already a major part of the Blue Horizons Project (BHP) programs, including Energy Savers Network (ESN) and Home Energy chats. From an equity perspective, BHP may want to continue to lead with low-income programs, but there are opportunities throughout the county in all economic sectors. Reducing the need for automobile transportation and increasing the use of mass transit could be an avenue in the transportation sector. The current and planned efforts for all such programs will be delineated in Part Three. The Strategic Plan assumes, for now, the following reductions in overall energy demand for such programs:

1. Current electricity use – 5%
2. Residential direct fossil use – 5%
3. Commercial direct fossil use – 5%
4. Industrial direct fossil use – 5%
5. Transportation direct fossil use – 10%

The transportation assumption is higher because of the opportunities arising from greater population density leading to reductions in vehicle miles travelled (VMT) per capita and greater utilization of mass transit. Using our model of energy use, adding in ingredients for these pathways results in 1.77% renewable energy (vs 1.72% BAU) and CO<sub>2</sub> emissions of 3.032 MMT

(vs 3.27 MMT in the BAU case). These programs result in a decrease in overall energy use by 7.4% from BAU.

## Electrification

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***“Even if Buncombe County’s electric grid is converted to renewables, there still exists the industrial, transportation, residential, and commercial sectors that are using fossil fuels directly, which accounts for 76% of total energy use in 2042 in the BAU case. Buncombe County needs to move all those sector numbers to zero and have the electric sector be 100% carbon-free. Until that is done, 100% renewable energy will not be achieved.”***

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Before we can understand the magnitude of the challenge of the clean energy transition, we need to understand electrification, which will be briefly summarized here. Even if Buncombe County’s electric grid is converted to renewables, there still exists the industrial, transportation, residential, and commercial sectors that are using fossil fuels directly, which accounts for 76% of total energy use in 2042 in the BAU case. Buncombe County needs to move all those sector numbers to zero and have the electric sector be 100% carbon-free. Until that is done, 100% renewable energy will not be achieved.

The superiority of electricity for the various tasks that it is used for can be illustrated by the example of a Tesla Model 3, which goes four miles per kwh, compared to a thirty-mile-per-gallon car of comparable size, which uses four times as much energy per mile. Or consider that a high-efficiency heat pump with a COP (Coefficient of Performance - a method used to measure heat pump efficiency) of 4.0, uses only 20% of the energy of an 80% efficient gas furnace. Industrial use of electricity can often find similar efficiencies, although it becomes more difficult when elevated levels of industrial heat are required, which is why there is an assumed smaller efficiency gain.

The next step is to make assumptions about efficiency gains from electrification as follows:

- Residential and Commercial – 75%.
- Industrial – 20%.
- Transportation – 75%.

Under these assumptions, which are close to similar assumptions made by Jacobson in his work, final demand for energy for activities that currently use fossil fuels directly is reduced significantly! The reader is encouraged to refer to a much deeper dive, including comparison of these assumptions to more comprehensive and detailed studies by referring directly to Jacobson

or to the work from the National Renewable Energy Laboratory (NREL) called “The Electrification Futures Study.”

As one can imagine, electrification would already have happened if it were easy. There are obviously issues with this, and the most important one is the lack of efficiency in our current fossil-fuel-dominated electric system. If these end uses were powered by electricity today, the increased efficiency of electrification would be counterbalanced by the efficiency loss from converting fossil fuels to electricity at the power plant, as well as the energy loss from transmitting electricity from power plants to the place where it is used. These efficiency losses in our current electric system can be dramatically reduced by greening the grid while we convert other end uses to electricity.

#### Electricity Demand after Efficiency Improvements and Electrification

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*“Embracing efficiency programs and electrifying everything reduces overall energy use by more than half: 52% from business-as-usual and 53.3% from 2018 actuals.”*

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Bringing it all together, the forecast of the total demand for electric energy that must be satisfied by Buncombe County’s 100% renewable and carbon-free electric system is 6,579 GWH, a sharp reduction from the BAU value of 13,735 GWH before electrification and additional efficiency, as shown in Table 5. Notes (1) For Table 5 and Figure 6, we are using GWH for easier graphical display (versus MWH). (2) In the final column, the units are in actual GWH for the fossil categories, representing the amount of electricity required to meet the demand of end-uses formerly satisfied by the direct use of fossil fuels. In that final column, total energy demand and total electricity demand are the same. (3) Carbon reductions from electrification represent an estimate of Duke’s electric system based on a continuation of Duke’s 2019 energy mix.

Commented [Au37]: Should we incorporate Duke's Carbon Plan here?

Commented [dg38R37]: Brad: "This is beyond current scope I believe. Certainly it would take a good deal of work to pull off. "

-Im not sure what your suggesting - are you saying we should remove this...or just that we don't need to incorporate Dukes Carbon Plan...?

Table 21 Comparison of Buncombe County 2019 Actual Energy Demand (GWH) Compared to 2042 After Efficiency and Electrification

Table 5 - Comparison of 2019 Actual Energy Demand (GWH) Compared to 2042 After Efficiency and Electrification Steps				
	2019 Baseline	2042 - BAU	2042 with Efficiency Programs	2042 with Efficiency Programs and Electrification
Existing Electric	3,032	3,288	3,119	3,119
Residential Fossil	773	669	636	159
Commercial Fossil	1,096	1,217	1,156	289
Industrial Fossil	2,229	2,030	1,928	1,542
Transport Fossil	5,892	6,529	5,876	1,469
Totals	13,022	13,733	12,714	6,578
All units in GWH				

Or in graphical format in Figure 6:

Figure 6 Comparison of Buncombe County Actual Energy Demand Compared to 2042 After Efficiency and Electrification

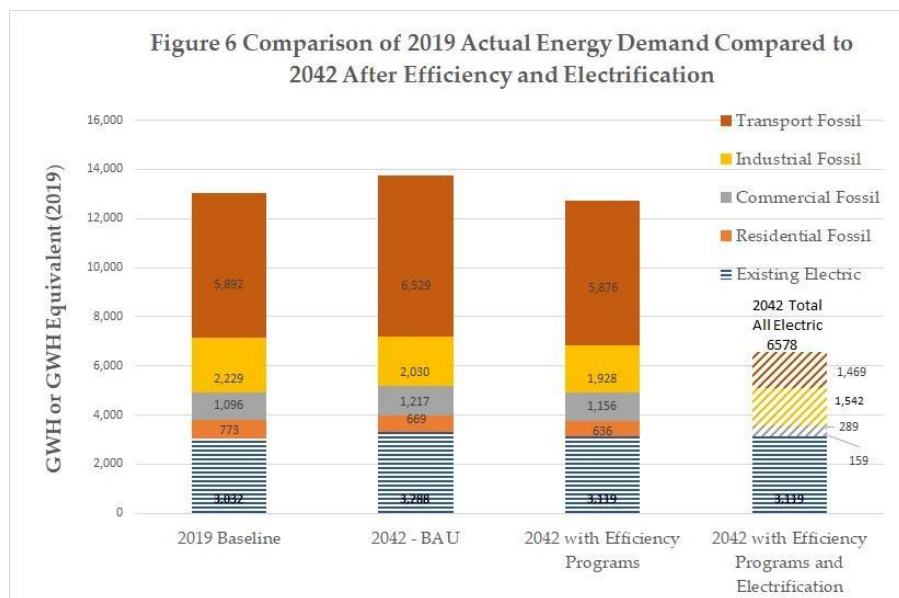


Table 5 and Figure 6 show the true power of energy efficiency and electrification in meeting our goals, by dramatically reducing the amount of energy that needs to be supplied by renewable electricity. An electrified economy with a green grid is a far more energy-efficient economy. Embracing efficiency programs and electrifying everything reduces overall energy use by more than half: 52% from business-as-usual and 53.3% from 2018 actuals. The favorable reductions from the BAU forecast notwithstanding, the 6,579 GWH still represents a more than doubling of electricity demand, from 3,032 in 2018. This more than doubling of the Buncombe County electric system creates new challenges for the electric system in the county that will need to be addressed over the next 20 years.

### Greening The Grid in Buncombe and Importing Electricity to Buncombe County

Our business as usual (BAU) forecast of electricity demand for a fully electrified energy system is the starting point for understanding how much renewable electricity production is needed. In addition to converting existing electricity production to renewables, renewable energy needs to grow to meet the increased demand for electricity. As shown in Table 5, renewable energy currently accounts for 1.75% of total energy demand and will grow to 7.5% in the fully electrified scenario for 2042. This is based on the elimination of fossil fuel and assumes Duke's current mix of renewable electricity in the total.

By 2042, our Plan will be for zero fossil fuel or nuclear power. The ability to achieve this goal in Buncombe County will depend on how it accounts for the composition of imports of electricity from Duke versus production of renewable electricity locally or regionally. The first step is to develop an assumption for the composition of Duke's production by the year 2042 to answer the question: "How much of Buncombe County's imports of electricity will be renewable in 2042?" The "Moving to 100 Report" assumed that imports of electricity from Duke were proportional to Duke's forecast production based on Duke's Integrated Resource Plan.

The 2022 Carbon Plan from the North Carolina Utilities Commission (NCUC) suggests a vastly different mix for Duke by 2042. APPENDIX B calculates Duke's share of fossil fuels in their mix by assuming that Duke's reduction in emissions follows a linear path from 2030 to 2050 (between 70% and 100%) leading to an 88% reduction in 2042. It also assumes that by 2042 the only fossil fuel used by Duke comes from highly efficient combined cycle natural gas plants like the one at Lake Julian. Then it allocates the statewide emissions for Duke to Buncombe County, and converts the emissions to fossil energy production, to derive a hard limit of 853 GWH fossil fuel production allocated to Buncombe County imports from Duke.

The allocation of Duke Energy's nuclear production to Buncombe County is problematical because the role of nuclear power in Duke's electricity production is not yet decided in the Carbon Plan proceedings. The NCUC did not endorse any single plan, and intervenor plans differ dramatically from Duke's plan as far as nuclear is concerned. Intervenor and Duke all assumed the existing nuclear fleet would be operating past 2050. However, Duke relied extensively on new small modular reactors in their projections whereas intervenors for

the most part did not, relying on combinations of wind, solar, storage, and renewable imports instead.

For purposes of this exercise, we assume that Duke does not add new nuclear and that the existing nuclear fleet is retained. That allow us to make an additional assumption that Duke's nuclear production allocated to Buncombe County is the same as it was for 2018. The percentage of renewable imports from Duke grows to 66% in this scenario. This is mostly because the use of fossil fuels is limited by the achievement of the H951 goal, and the use of nuclear power is limited by assuming no new nuclear plants by 2042.

It should be noted that the large nuclear portion of "non-renewable" imports will nevertheless be "zero-carbon." One option to drive up the renewable percentage of total energy is to consider Duke's existing nuclear plants to be "renewable" because they do not have additional carbon emissions. Classifying nuclear as renewable would allow all plans to come closer to achieving the 100% renewable goal. BHPCC has not chosen to do that in the Strategic Plan because there are strong beliefs held within the community of Buncombe County that nuclear is not renewable energy and should not be considered as such. It is assumed that there would be backlash associated with changing from a "renewable energy" focus to "decarbonization." Specifically, regarding natural gas expansion that is included in the NC Carbon Plan. In some ways, someone could make the argument that it is counterproductive to strive for renewable energy when the state is striving for carbon reduction. However, it's essential for a plan that wants to address climate change and wants to have an environmental justice focus. A decision to change the goal is best left to the Buncombe County Commission to change the wording of the 100% Renewable resolution if that is their choice, but for now the decision has been made to focus on 100% renewable energy and that is the basis for this Strategic Plan.

The resulting scenario shows a dramatic decline in emissions and an increase in the percentage of renewables. The results are shown in detail in Table 6. It must be noted that these results could only be achieved with the electrification efforts happening first. Duke's conversion to renewables on its own, without electrification, shows much less of a benefit because most electricity production and emissions would continue to be provided directly by fossil fuels.

Table 22 Technical Pathways to 100% Renewable Energy and Zero Carbon

Table 6 - Technical Pathways to 100% Renewable and Zero Carbon								
	Fossil Plus Nuclear Imports	Renewables Imports	Total Electricity Imports	Renewable Percent of Imports	Local Net Metered Renewables	Local Non-Net-Metered Renewables	Renewables Percent of Total Energy	Total Emissions (MMT)
2019 Baseline	2,798	208	3,016	6.9%	6	10	7.4%	2.98
2042 BAU	3,046	226	3,272	6.9%	7	10	7.4%	3.27
2042 Plus Efficiency	2,887	215	3,102	6.9%	7	10	7.4%	3.03
2042 Plus Electrification	6,108	454	6,561	6.9%	7	10	7.2%	2.29
2042 Plus H951	2,260	4,302	6,561	65.6%	7	10	65.6%	0.59
2042 Plus Local Renewables	-21	-40	-61	NA	874	5,765	100.3%	-0.01
Note: Units are GWH except Emissions in MMT								

### Adding in Local Renewables Production

The final step in achieving the 100% renewable energy goal is to incorporate local renewable energy production. Two main types of renewable energy will be considered – renewable energy that is net-metered (mainly rooftop solar) and renewable energy that is non-net-metered (i.e., solar or wind farms). The following two scenarios corresponding to the two pathways, also shown in Table 6, will assume that the composition of electricity imports is fixed—that is, for whatever the imports are, 13% is fossil, 21% is nuclear, and 66% is renewable. If a fixed composition of imports is assumed, then achieving full 100% renewable energy would require completely eliminating imports, at least on an annual time scale. This is theoretically possible (with significant land-use impacts), even if Duke continues to manage the whole system. That goal is reached by assuming (with net-metering) the installation of solar rooftops or community solar gardens which would be equivalent to 50,000 homes with 8KW installations and 1,500 businesses with 100 KW installations, for a total of 550 MW of net-metered power. Then for non-net metered, there is assumed 40 MW of hydro, 500 MW of wind, and 2,080 MW of solar farm installations. With reasonable capacity factors, the combination of net-metered and non-net-metered renewable energy provides sufficient GWH production to totally cancel out all net electricity imports from Duke Energy, as shown in Table 6. Alternately, this amount of energy could be produced with about 3,300 MW of utility scale solar alone, which, combined with the 550 MW of net-metered solar, would equal almost 4GW of solar. These amounts of renewable energy, whether a blend of solar, wind, and hydro, or just solar alone, is highly problematical from a land-use perspective.

Remember, this analysis is based on having utility scale renewables substitute for ALL electricity imports from Duke. What if we redefine the problem so that local renewables only need to offset non-renewable imports from Duke? In that case we will need about 1.1 GW of local utility scale solar to meet our goals in this scenario. if we were to only offset fossil imports

**Commented [GU39]:** It's unclear if this is in Buncombe County or outside from the previous text.

"If a fixed composition of imports is assumed, then achieving full 100% renewable energy would require completely eliminating imports, at least on an annual time scale."

We don't have a pathway to get to this level of local renewables right now. We should be careful to what assumptions we put forward.

Or maybe I misunderstand. -Jamie

**Commented [dg40R39]:** Brad, see comments below

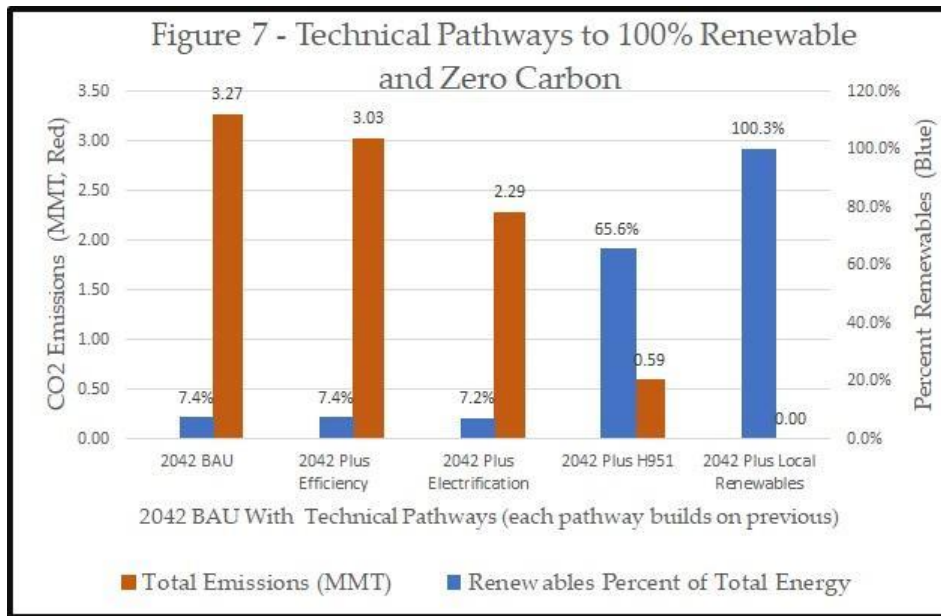
**Commented [dg41]:** @Brad@EnergySaversNetwork maybe you can take a stab at this... Jamie is the second to comment specifically on this section and perhaps it could use some revision. On top of Jamies point about assumptions, this leaves out the possibility of RECs or PPAs, or GSA - all of which would come via electricity imports.

As mentioned in an earlier part of this report, and as we have talked about in a few recent meetings - 'local' is a vague term, and the public perception of its definition is also vague- some say within NC. Under that definition one could do a GSA or other RECs, especially with a local developer and still reap some local benefits - while also importing 100% RE electricity with no fossil or nuclear...

Or am I missing something?

from Duke and ignore the nuclear imports, then we would only need about 420 MW (.42 GW) of local solar.

Table 23 Emissions Vs. Renewable Energy: Technical Pathways to 100% Renewable Energy and Zero Carbon



Whether the number is over 3 GW, or just 1.1 or 0.4 GW, that's a whole lot of renewable energy. For comparison the average size rooftop solar array in Buncombe County is about 9KW, that means that 1.5 GW is over 155,000 and over 3 GW would be more than 333,000 homes (keep in mind that often these solar systems aren't offsetting 100% of the power needs of that home – this number is solely a comparison about how much energy 1.4 or 3 GW is). If a typical solar farm is 20 MW on 160 acres, then that 1.5 GW would require about 12,000 acres. As a point of reference, the total land area for farms in Buncombe County is about 72,000 acres, so we would need to devote almost 17% of land area to solar farms to hit 1.5 GW.

Regardless of how much we eventually add, there are many advantages to local renewables, partially enumerated below:

- Helps to address social justice and equity issues.
- Opportunity for income or bill reductions for local residents.
- Jobs for local installers.
- Reduced need for transmission from Duke or new fossil or nuclear plants in the county (the doubling of the electric grid will require this in the absence of local renewables).
- Increased resilience to disaster through micro-grid potential with local renewables.

**Commented [dg42]:** Brad, in the conversation I had with Ben, he mentioned the notion that adding in specific numbers here may actually distract or even detract from the goal of what we are hoping to accomplish. Especially if we haven't done a full inventory of how much RE is currently produced in BC and a study of potential RE production in BC....

Thoughts?

**Commented [dg43R42]:** I like your idea of adding floatovoltaics

- Positive impacts on tourism and public opinion in general. Large renewable energy installations will be greatly visible to the public.

And there are many challenges as well:

- Need for land. Buncombe County population density is higher than state or nation and some land is restricted due to mountains, forests, and parks.
- Need for local transmission upgrades. Some areas that are ideal for renewables production will need access to the grid, which will require transmission upgrades throughout the county.
- Possible need for transmission from Duke. Local production of renewables will likely require greater transmission from Duke, depending on seasonality and time of day issues. More transmission (and storage) will likely be needed to accommodate higher penetrations of local renewables.
- If solar is the only renewable source considered, then the amount of solar needed will be much higher due to the limited solar available in winter months.
- Cost. It is entirely possible that the cost of renewable energy locally, given constraints, will be more than the option of importing renewable energy from elsewhere. That will almost certainly be the case for wind energy.

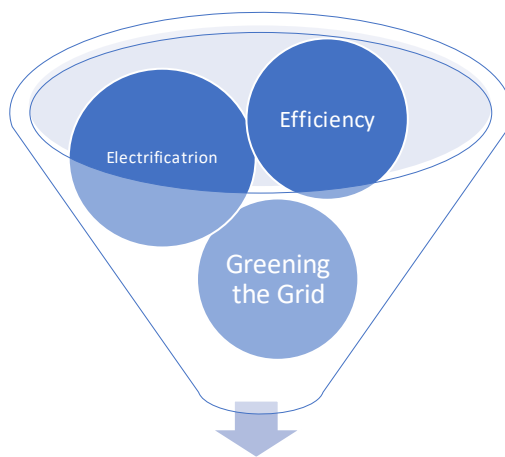
The 2042 electric system would need to produce over twice as much energy as the electric system today (even as overall energy use declines dramatically). While that might sound like a huge number, it can be achieved with 3.42% annual growth in overall electric production from 2018 to 2042. For reference, the US electric system grew at a 1% annual rate from 1990 to 2018, but it grew at a 4.5% annual rate from 1960 to 1990. A rate of growth of 3.4% is within the range of our historical experience. The growth we are expecting from renewable energy will be even greater, at 150 MW per year, far in excess of what we are doing today. Assuming a blended cost of \$1,500 per KW before incentives, that would require investment from entities in our community of \$225,000,000 per year.

If you take the energy consumed by each fuel in Buncombe County from Table 1 in 2018 and apply the average cost of energy for electricity (\$.10 per KWH), natural gas (\$1.00 per therm), and gasoline (\$3.00 per gallon) we can calculate an energy spend of over \$1,000,000,000 per year in Buncombe County. In our 2042 scenario, all this energy cost will be paid through electricity bills. The overall cost of energy we pay in this future could easily be less than the total that we are paying today, without considering any of the climate or health benefits of the transition. Jacobson comes to this conclusion for North Carolina as a whole, calculating that overall energy bills will be reduced from a total of \$56.5 billion per year to \$26.9 billion per year after the complete transition.

What would the community of Buncombe County be spending in 2042 on energy in our fully electrified system at current rates? The answer is simply the 6,579 GWH or final electric demand times \$.10 per KWH at current rates, which equals \$657.9 million per year, less than 2/3 of the \$1 billion we are spending today. Also, there are several reasons to assume that our electric rates could be lower than they are today, consistent with Jacobson's modeling of even greater cost decreases, including:

- Electric production fixed costs will be spread over a much larger base.

- Solar and wind and battery costs are headed down, not up.
- Fossil fuel costs are headed up due to depletion, environmental regulation (such as methane leakage restrictions), and potential carbon pricing.
- Buncombe County's consumers and businesses will no longer have to pay for the natural gas infrastructure through monthly fixed charges.
- This analysis does not consider health, climate change, or resiliency benefits. Jacobson provides further analysis on this point and determines that a similar future electric system will result in the US spending 66% less on energy than today, a number which rises to 88% when the cost of climate and health benefits are included.



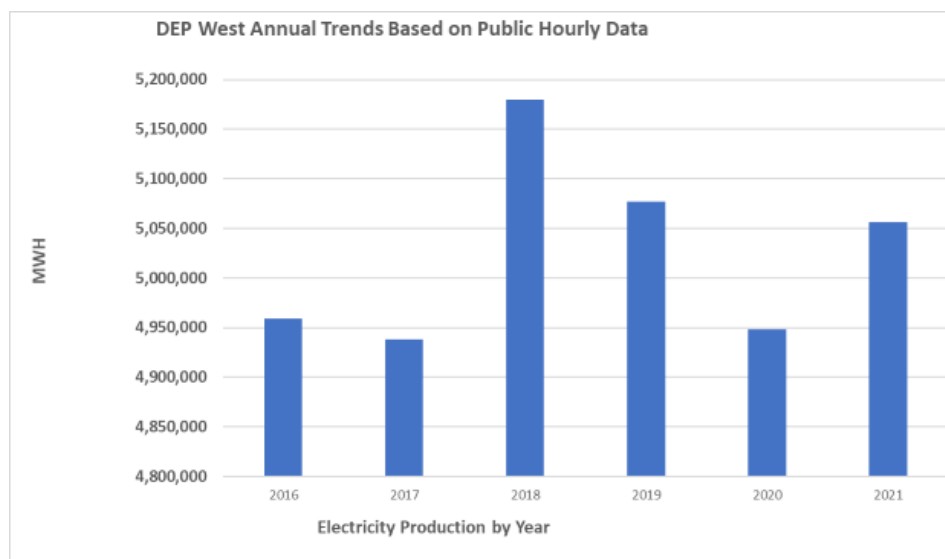
**Bottom line:** While more research is needed to confirm these numbers, the result is likely to be a much lower cost of energy for Buncombe County residents than today if electrification and renewable energy are adopted, on top of the health, climate, energy security, jobs, and resiliency benefits of the energy transition.

## APPENDIX B: Assumptions and Data for APPENDIX A

### Baseline Energy Use

Electricity. Electricity data by class is from the "Moving to 100 Report" for 2018 and is for electricity usage supplied by Duke Progress West for Buncombe County. As noted in the "Moving to 100 Report," this data was obtained from correspondence with Duke Energy. It

would be helpful to update the data for subsequent years, but we believe the data for 2018 is a good indicator because another source of data—the hour-by-hour demand for electricity in the DEP west region (of which Buncombe County is a large percentage)—shows 2018 actually higher than 2021 even though the region continues to grow. This regional data can be accessed at <https://www.eia.gov/opendata/qb.php?sdid=EBA.CPLW-ALL.D.H> . Brad Rouse maintains an evaluation of this data to aggregate the hourly values into monthly and annual totals. Here are the annual trends from the data we have for 2016- 2021.



The key thing to note is the minor variability from the mean of -1.75% in 2017 to +3.1% in 2018 with 2021 being very close to the mean. Buncombe County, at about 3,026,000 MWH in 2018 represents around 60% of the total. While we would prefer to have updated data from Duke, this data we do have suggests we are not in the midst of any sort of breaking new trend in energy consumption in Buncombe County.

Commented [dg44]: Brad to update chart

**Natural gas.** Data is from the “Moving to 100 Report,” but there was an additional correspondence from Bridget Herring that I have noted, which provided a report breaking down energy use in 2018 by residential, commercial, and industrial, which is the source of these numbers.

Propane and Fuel Oil. Residential propane and fuel oil sales for NC from EIA are allocated to Buncombe County by share of NC homes using propane for heat according to the US census (2.1% propane and 7.8% fuel oil). Commercial and industrial propane and fuel oil sales for NC from EIA are allocated to Buncombe County by share of NC population living in Buncombe County.

Transportation fuel. Transportation fuel for NC is allocated to Buncombe County by population share.

#### Business-as-usual (BAU) forecast numbers.

Population history and forecast numbers for Buncombe County and NC are provided by the North Carolina Office of State Budget and Management. See <https://www.osbm.nc.gov/facts-figures/population-demographics/state-demographer/countystate-population-projections>. The population forecast shows a slight decline in the population of Buncombe County relative to NC.

The forecast of energy use for Buncombe County is developed by first projecting the change in energy use per capital for each sector. The historical trend in energy use per capita was developed from NC energy data from EIA. The period 2000-2018 was a period of rapid decline in energy use per capital, and this analysis assumed that those rates of decline would be halved from 2018-2042.

#### Efficiency improvements beyond BAU and Electrification

Assumptions in this analysis are provided in the text of the document.

#### Carbon Intensity and Greening the Grid Assumptions

The analysis includes a calculation of carbon emissions in million metric tons (MMT) for Buncombe County. The calculation is performed separately for direct fossil fuels and for the grid. The direct fossil fuels calculation is based on the following estimates of MMT of CO<sub>2</sub> emissions per TWH (thousand GWH) equivalent energy consumption:

- (1) Residential .17
- (2) Commercial .17
- (3) Industrial .15
- (4) Transportation .23

Based on carbon intensity estimates from EIA statewide data for carbon emissions and energy consumption.

Carbon intensity for the electric sector is based on the estimated electricity production from fossil fuels allocated to Buncombe County. The carbon emissions for the 2018 baseline are assumed to be based on Duke's fossil fuels with coal and gas each at a ½ share of the fossil fuels allocated to the county. This results in a carbon intensity of .35 for the 2018 baseline and 2042 BAU forecast.

In the 2042 greening the grid scenarios (after Duke's HB951 commitment), fossil fuels are assumed to come completely from natural gas and to be limited to an amount of fossil fuels that would satisfy Duke's HB951 commitments for 2030 (70% reduction) and 2040 (100%

reduction). It is assumed for 2042 that Duke's limit of carbon emissions is 88% (12/20 of 100% and 8/20 of 70%) of the 2005 statewide value allocated to Buncombe County. This results in a carbon intensity of .10 for electricity imports once Duke's HB951 commitment is incorporated.

For scenarios of reductions of Duke imports due to local renewables production, the share of fossil (13.7% nuclear (22.6%), and renewables (63.7%) of electricity imports is held constant at the same ratio, so the carbon intensity of imports remains constant as imports are reduced due to local renewables production.

### Measuring heat versus measuring electricity

We have chosen to use units of electricity as our basic unit of measurement for energy. The use of heat as a measure of energy is outdated. We are moving to an electric world by greening the grid and electrifying everything. In that electric world, the heat content of a fuel is less and less relevant. Our energy system will no longer be converting fuels to heat to get electricity, nor will we be using fossil fuels directly for heating or to power machines. Using BTUs to measure things is a vestige of our fossil fuel past. Wind, water, geothermal, and solar do not need to create heat first to boil water to spin a turbine to produce electricity. Wind and water spin turbines without boiling water. Solar photovoltaics produce electricity directly. Geothermal and solar thermal produce heat directly. There is just no need to look at energy use in terms of heat content.

Instead, we will focus on measuring electricity directly by talking about:

- kilowatt hours (KWH) which is the energy of 1,000 watts, for an hour,
- megawatt hours (MWH), which are thousands of KWH,
- gigawatt hours (GWH), which are thousands of MWH and millions of KWH,
- and terawatt hours (TWH), which are thousands of GWH.

For the remaining uses of fossil fuels, we will convert them from BTUs to equivalent electric KWH by dividing the BTU numbers by 3,412—the number of BTU required to produce one KWH. When passing electricity through a resistor, we create “resistance heat.” One KWH of electricity used in resistance heating produces 3,412 BTU of heat.

There are far more efficient ways of producing heat with electricity than passing through a resistor. A heat pump might produce 13,600 BTUs per KWH compared to only 3,412 per KWH from resistance heat. When showing energy use, we will take any energy expressed in BTUs and convert it to equivalent KWH. Then, we factor in the increased efficiency of electric end-uses like heat pumps or electric vehicles. It is a two-step process.

Just for reference, the US consumption of energy of 100,274 quadrillion BTU in 2019 mentioned above can also be expressed as  $(100,274 \times 1,000,000,000,000) / (3,412 \times 1,000,000,000) = 29,288$  TWH equivalent. However, the end use energy consumed was somewhat lower, at 22,694 TWH, because of the fossil energy being wasted by the conversion of fossil fuels to electricity. In our assessments we will use the end use energy being consumed as

our denominator and the end use energy produced by renewables as the numerator to calculate our percent renewable goal

$$\% \text{ Renewable} = \text{Buncombe County Renewable Energy Production} / \text{Buncombe County Total Energy Consumption.}$$

Since achieving our goal requires all electricity to be produced using renewables only and renewables produce electricity with 100% efficiency, we will ignore the fossil losses in electricity production to calculate % Renewable, although we will consider them for measuring carbon emissions.

## APPENDIX C: Parameters for BHPCC Strategic Planning Process

### Parameters

To conduct the analysis required for the Strategic Plan, parameters must be set. There were numerous decisions about how the process should be conducted and what it should include. Several meetings were held to discuss these topics at the outset of the strategic planning process and a brief overview of the results are as follows:

#### Geographical Parameters

We want to focus on energy that is consumed within Buncombe County. We need to be consistent with the recommendations of the "Moving to 100 Report." We should measure our progress by energy consumed in Buncombe County, not energy produced. As noted, that approach is consistent with the Cadmus Report prepared for the City and County.

This will include the energy consumed in the hotels and buildings that benefit from the tourist industry but should not make efforts to differentiate that the energy used by the tourism industry.

This means, as indicated, that our goal does not include shutting down the DEP Lake Julian plant. The County never indicated this would be its objective, and any decision to retire the plant is beyond the County's control.

Measuring by energy consumed, not produced, also means that we should not count renewable energy that may be produced in the County but is sent to the DEP grid for statewide consumption, except to the extent of the County's load ratio share. An example is the Woodfin landfill solar facility. See Cadmus Report pp. 34-35.

We should try to track the renewable energy, which is produced in Buncombe County, but be aware that this energy may be recorded by the county, City, and Duke Energy. We may need to capture the renewable energy which is not counted by the county, City, and Duke Energy, but that amount may be small and hard to find.

Finally, we should measure energy consumed in Buncombe County by County residents and businesses.

## Time period for energy use data

We should build the framework of data analysis on an annual basis. We need to be practical and acknowledge what level of data we can consistently get from Duke Energy. We should ask Duke if they can provide the energy consumption data on a monthly basis, but not plan for this.

Being winter-peaking, seasonal data would be helpful

## Energy Units Used

We agreed upon using Megawatts or Megawatt Hours, but we should develop or reference a conversion table for therms, BTUs, Carbon dioxide equivalent, and other important energy and carbon measurements.

## What is renewable energy?

Renewable energy is mostly able to be provided through production of electricity from renewable sources including wind, solar, hydro, biomass, tidal, and geothermal. Thus, 100% renewable energy means that most uses of energy will need to be in the form of electricity or from fuels which are produced using renewable electricity (such as hydrogen produced through electrolysis). Some direct use of fossil fuels, however, will be replaced by direct use of biomass, including wood or biogas for heating, direct solar water heating, ethanol for cars, and biogas for heating. This form of renewable energy is likely to be a much smaller percentage of the total, but still needs to be considered in our accounting. (Note: Sources of energy that we often consider to be renewable, such as solar, are not actually renewable, but they are “inexhaustible” on human time scales. Eventually, the sun will run out of fuel.)

Our definition of renewable energy follows that of how the state of North Carolina established in the Renewable Energy Portfolio Standard:

'Renewable energy resource' means a solar electric, solar thermal, wind, hydropower, geothermal, or ocean current or wave energy resource; a biomass resource, including agricultural waste, animal waste, wood waste, spent pulping liquors, combustible residues, combustible liquids, combustible gases, energy crops, or landfill methane; waste heat derived from a renewable energy resource and used to produce electricity or useful, measurable thermal energy at a SL2007-0397 Session Law 2007-397 Page 3 retail electric customer's facility; or hydrogen derived from a renewable energy resource. 'Renewable energy resource' does not include peat, a fossil fuel, or nuclear energy resource.'

(Note that this excludes Nuclear Power)

**Types of renewable energy we will consider:**

- Imports of renewable electricity from Duke. This portion will be estimated as a share of total electricity imports based on the overall share that Duke Progress' renewable electricity is of total Duke Progress electricity.
- Net metered production of solar or other renewable electricity. This information will have to be estimated, as Duke electricity sales data show this as a reduction in electricity demand, and then added back into the total data from Duke.
- Non-net-metered renewable electricity consumption —typically solar farms where the power is sold directly to Duke.
- Renewable fuels. Ethanol or hydrogen or wood is used for combustion.

### Scorekeeping

The basic scorekeeping of the Plan is to calculate the percentage of total energy consumed in Buncombe County that is renewable. The goal is met when that percentage is at or above 100%. The denominator is energy consumed, while the numerator is renewable energy produced for consumption.

A secondary scorekeeping metric —Buncombe County CO2 emissions in millions of metric tons (MMT) —is also utilized.

#### Expressing this algebraically.

The following condition would need to be true for us to meet the goal:

**Buncombe County Renewable Energy / (Buncombe County Total Energy Consumption) > = 100%** ("**> =**" means greater than or equal to)

This can also be expressed as:

**(2) Buncombe County Renewable Energy > = Buncombe County Total Energy Use**

The "Moving to 100 Report" introduced the concept of Offsets, which is some form of energy produced or otherwise purchased in Buncombe County that will offset any excess of **Buncombe County Total Energy Use** over **Buncombe County Renewable Energy**. Utilizing offsets has not been the preferred method of the community, which prefers the benefits of locally or regionally produced renewable energy versus amorphous offsets which are not necessarily reliable and do not produce local benefits.

### Offsets

The "Moving to 100 Report" discussed different kinds of offsets. Their report noted that the community seemed to favor local or regional electricity production instead of the use of offsets.

## Data availability

Keeping score depends on data availability going forward. Some data may be directly available from partners, including DEP and Dominion. Some components of renewable energy may need to be self-reported to Buncombe County by producers, or reported by DEP. For other data we will use proxies such as percent of homes heated by propane or fuel oil, percent of businesses that use various fuel types for heat or industrial processes, or percent of cars that are registered as EVs. One role of the BHPCC could be to lobby for enhanced data availability provided under future laws passed by the NCGA or ordinances of Buncombe County.

## APPENDIX D: Details and Discussion for New Initiatives in Part Four: New Initiatives

### Topics:

1. Utility Scale Renewable Energy and Storage
2. Residential and Commercial Renewable Energy and Storage
3. Low-Income EE/RE
4. Building Efficiency and Electrification
5. Transportation

### Topic 1: Utility Scale Renewable Energy and Storage

#### Initiatives:

1. Transmission-Scale Solar (>20MWac)
2. Floatovoltaics
3. Agrivoltaics
4. Green Source Advantage Choice Expansion
5. RECs & PPAs

#### Initiative 1: Transmission-Scale Solar (>20MWac)

**Description:** Unless technology vastly improves, it is currently infeasible to develop utility-scale solar in Asheville/Buncombe. We will need to look at buying Renewable Energy Credits (RECs) through Duke's Green Source Advantage (GSA) program, where most of the projects are being developed in Southeast North Carolina (for DEP projects, which is currently a req). Due to cost of land and geotechnical challenges, building transmission/utility scale solar in Buncombe County would be difficult.

#### Phase 1 Analysis: Initiative Ranking

Analysis Area	Favorability Ranking (Low,	Description of how/why action initiative received the ranking given
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	<u>Medium, or High</u>	
<b>Potential Feasibility</b>	<b>Medium</b>	One of the most feasible pathways for our community to currently procure RE is through the Green Source Advantage program, which will be challenging since we'll need to aggregate 40-80MWac worth of demand to sign a GSA PPA.
<b>Potential Scale of Impact</b>	<b>Medium</b>	At the end of the day, we'll need to procure approx. 6-7 GW of Solar to meet our 100% community goal. By aggregating large energy buyers in AVL/Buncombe and signing GSA PPAs for 80MW QFs, we can make sizable strides towards the goal. Due to topographical and geotechnical challenges, solar has limited scalability. But if we were to blend other RE resources (waste energy, digester at WWTP), as well we could have a higher potential for scalability.
<b>Potential Equity Impacts</b>	<b>Low</b>	This would have a minimal impact on improving or hurting equity in the community.
<b>Cost Vs. Benefit</b>	<b>High</b>	Might be relatively expensive in the short term, but a 10-year PPA at around today's avoided cost is going to fare well over the length of the PPA given that energy costs will likely increase. Further consideration is required to investigate budgets, values, local benefits, and financial impacts, etc.

**Phase 2 Analysis - What is needed to make this initiative happen.**

<u>Analysis Area</u>	<u>Summary</u>	<u>Discussion</u>
<b>Timeline (Near-Term, Medium-Term, Long-Term, Ongoing)</b>	Medium - long - term, ongoing	
<b>Implementing Departments and Partnering Organizations</b>	Duke, private local developers, local govts, NC green bank?	

<b>Activities to be undertaken to support the initiative</b>	Talk with local govts about zoning	It may be worth engaging with Duke about increasing PV RFP at Lake Julian. 20 MWDC could go on 3 phase before worrying about capacity but need to look at points of interconnect to tie into Duke's lines. Look into the map of distribution lines for potential projects. <b>Identify land within Buncombe County that is feasible for utility scale solar (maybe use contracting groups to use their tools to run a feasibility study specific to land within Buncombe County). We don't know until we look.</b>
<b>Financial Costs and Benefits to those involved</b>		
<b>Additional Resources and Support Needed</b>		

#### **Initiative 2: Floatovoltaics**

Description: A \$100k RFP has been issued by Duke Energy and Buncombe County to design a floatovoltaics system on Lake Julian and on the North Fork Reservoir. Buncombe County has paid for a feasibility study to look further into this possibility and to gain insight and information. We hope that the feasibility study has included the potential of pumped storage in the reservoir system that has already been equipped with the hydro power that is necessary to recapture the energy.

#### **Phase 1 Analysis: Initiative Ranking**

<b><u>Analysis Area</u></b>	<b><u>Favorability Ranking (Low, Medium, or High)</u></b>	<b><u>Description of how/why action initiative received the ranking given</u></b>
<b>Potential Feasibility</b>	<b>High</b>	Floatovoltaics is an emerging market that is taking off around the globe, especially in areas like WNC that have geotechnical challenges. There is already transmission at Lake Julian. Further details to come from the results of the feasibility study.

<b>Potential Scale of Impact</b>	<b>Low</b>	There are not many lakes/reservoirs within Buncombe County, so there is minimal potential for scalability
<b>Potential Equity Impacts</b>	<b>Low - Medium</b>	Local RE provides local benefits. However, it would be a large amount of money and time spent on something that will return minimal MWs.
<b>Cost Vs. Benefit</b>	<b>Low</b>	Should be explored further once feasibility study is complete.

**Phase 2 Analysis: What is needed to make this initiative happen.**

<u><b>Analysis Area</b></u>	<u><b>Summary</b></u>	<u><b>Discussion</b></u>
<b>Timeline (Near-Term, Medium-Term, Long-Term, Ongoing)</b>		Buncombe County is drafting an engagement contract with D3 and other engineering consultants to undertake a near term feasibility study and early-stage development work on a potential floating PV project at the area on Lake Julian not utilized for outdoor recreation due to the presence of a berm separating this part of the lake from the main water body. Key steps include securing a site agreement with Duke Energy which has jurisdiction over the water body, filing an interconnection application with Duke Energy and engaging utility scale developers to identify a potential partner who would finance, construct, and operate the system. The Lake Julian project would likely be in the 5 - 15 MW range. The county may also pursue a potentially much larger project (up to 60 MW) in partnership with the City of Asheville, but this would occur on a later time frame.
<b>Implementing Departments and Partnering Organizations</b>		Buncombe County Sustainability Office. The county has engaged with Duke Energy about the potential project. Duke staff did not express interest in being the developer/ owner of a floating PV project but expressed openness to proving cooperation with the

		county around a county led feasibility study and development initiative.
<b>Activities to be undertaken to support the initiative</b>		County to engage engineering partners to <b>initiative</b> an interconnection study and associated project due diligence.
<b>Financial Costs and Benefits to those involved</b>		The initial costs of the interconnection application and engineering analysis would be borne by the county. <b>By undertaking the early-stage development work, the vision is to create a shovel ready project over the next couple of years that could then be attractive for an experienced utility scale company to take on in terms of constructing, operating and financing the project.</b>
<b>Additional Resources and Support Needed</b>		

### Initiative 3: Agrivoltaics

**Description:** Any agricultural piece of land that stays in production while also having elevated solar arrays to allow farm equipment to pass underneath and for agricultural practices to continue. Agrivoltaics can be slightly more expensive than utility scale solar farms, but it is cheaper than rooftop solar. This practice brings all the value of solar benefits - raises between 10-50 cents per kw/h of solar.

Due to our limited space and geographical difficulties in our county, Agrivoltaics is a simple solution and a very promising initiative that would provide a myriad of benefits.

As this is accelerated, it dramatically reduces the market for biofuels (MT has data and numbers) and has global implications for land conservation.

Installed on just 2% of existing farmland, it is estimated that agrivoltaics could produce enough energy to cover more than 100% of energy needs globally.

Agrivoltaics systems are currently utilized for a wide variety of agricultural crops; berries, grains, row crops, orchards, forage, hay, native pollinator plants/seed production, and 'Conservoltaics' to conserve land and habitat, often used for native pollinator restoration. These Agripollinator gardens can be installed along greenways (or other areas, sound barriers, right of way, etc..) and serve as great demonstration projects.

### Phase 1 Analysis: Initiative Ranking

<b><u>Analysis Area</u></b>	<b><u>Favorability Ranking (Low, Medium, or High)</u></b>	<b><u>Description of how/why action initiative received the ranking given</u></b>
<b>Potential Feasibility</b>	<b>High</b>	This is a maturing technology (not new). Hardware already exists, with software coming soon. Basic components already exist, it just needs to be scaled up. Warren Wilson College (WWC) is currently in the feasibility phase to install an agrivoltaics microgrid on their campus that would serve as an educational resource for local farmers on best practices thereby potentially providing immense educational opportunities for our local farmers and beyond.
<b>Potential Scale of Impact</b>	<b>High</b>	<b>Tremendous amounts</b> of farmland exist within our county. Farmers and communities can benefit from revenue produced from agrivoltaics. 2% of National farmland converted to agrivoltaics would take care of the entire nation's energy demand. Distributing Agrivoltaics systems throughout farmland would <b>reduce the need for new high-voltage transmission lines as they would be located on land where power distribution infrastructure already exists.</b> <a href="#">Aluminum carbon conductors</a> (further information <a href="#">here</a> ) increase the carrying capacity of existing distribution networks. Agrivoltaics markets are currently thriving in Co-ops and are highly scalable for our community and beyond.
<b>Potential Equity Impacts</b>	<b>High</b>	<b>Local</b> workforce development in installation of systems and the potential of farm-market opportunities (value added crops).  Educational opportunities - what farmers are doing, promoting solar canopy gardens on school grounds which would also serve the local community and can be integrated into curriculum.  This was given a 'High' potential impact also because most rural farming communities are low-income. The potential for rural economic development is large.
<b>Cost Vs. Benefit</b>	<b>Medium</b>	A 'Medium' rating is given because agrivoltaics is cheaper than rooftop solar, but not quite as cheap as large-scale utility solar. However, the additional benefits of agrivoltaic

		<p>systems are greater than any other type of utility-scale solar (improved national security, cyber/natural disaster resiliency, preserving farmland, water conservation, etc.)</p> <p>Any analysis of solar should incorporate the true value of its benefits which are not accurately accounted for in current the utility rate base (there are about a dozen analyses done on this that range between 12 and 50 cents/per kwh benefits).</p>
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**Phase 2 Analysis - What is needed to make this initiative happen.**

<u>Analysis Area</u>	<u>Summary</u>	<u>Discussion</u>
<b>Timeline (Near-Term, Medium-Term, Long-Term, Ongoing)</b>	<p>Near Term</p> <p>Medium - Long - Term</p>	<p>Near Term – Encourage local universities to establish regional agrivoltaic research stations and trials to verify crop and energy performance (3-5 years)</p> <p>Medium Term- Distribute research finding and best practices via research station digital twins to farmers and policy makers.</p> <p>Long Term - Upgrade utility rate base, farm policy, and financing programs needed to facilitate rapid scaling and adoption of agrivoltaic technology.</p>
<b>Implementing Departments and Partnering Organizations</b>	<p>Duke, French Broad EMC, Rural co-ops/Swannanoa/French Broad Co-op, local farmer associations, local educational institutions, Land use and conservation organizations, WWC, CSMG</p>	<p>Other noteworthy potential partnering orgs:</p> <ul style="list-style-type: none"> <li>• Appalachian Sustainable Agriculture Project</li> <li>• Work Colleges Consortium</li> <li>• Southeastern African American Farmers’ Organic Network</li> <li>• National Women in Agriculture Association</li> <li>• National Young Farmers Coalition</li> <li>• National Sustainable Agriculture Coalition</li> <li>• Appalachian College Association</li> </ul>



		<ul style="list-style-type: none"><li>• Appalachian Regional Commission</li><li>• Southern Appalachian Highlands Conservancy</li><li>• Carolina Farm Stewardship Association Farmers Market Coalition</li><li>• Critical Services Microgrid Group</li><li>• Univ. of North Carolina at Asheville</li><li>• North Carolina State University</li><li>• Land of Sky Regional Council (western NC) National Rural Electric Cooperative Association</li><li>• Critical Services Microgrid Group</li></ul>
<b>Activities to be undertaken to support the initiative</b>	Educational outreach, initiate independent study/analysis of the undervalued benefits to the grid of solar and agrivoltaics, improve transmission infrastructure	<p>Educational outreach to policy makers, farmers, the public, and utility commissions to highlight the benefits of a distributed renewable energy model for grid planning/expansion that can deliver increased national security, grid resiliency, preservation of ag-land production, reduced NIMBY pushback for future solar development, zero carbon emissions, and more. National laboratories initiate independent study/analysis of the undervalued benefits to the grid of solar in general and agrivoltaics specifically.</p> <p>Utilities will need to add new cabling and new substations (but much cheaper than new transmission). <a href="#">Aluminum carbon conductors</a> (further information <a href="#">here</a>) could help with transmission.</p>

<b>Financial Costs and Benefits to the Organizations</b>	High Benefits	<p>Grant and philanthropic funding of university agrivoltaic research programs create a magnet for student enrolment, garners international media attention and builds reputation. Rural electric coops increase investment in generation and become major energy producers. Farm organization and communities are strengthened as farmer revenues increase.</p> <p>Any utility that moves in this direction and allows a rate base to support agrivoltaics will:</p> <ul style="list-style-type: none"> <li>-Reduce fuel use and reduce rates</li> <li>-Improve resilience</li> <li>-Have financial gains because agrivoltaics is less expensive or equal cost to building new utility facilities with transmission lines and can be done much more quickly and will be equal to or less expensive than current operations.</li> </ul>
<b>Additional Resources and Support Needed</b>		<p>New USDA and Farm Bureau programs to promote and provide grants and low-cost financing for farmer investment in agrivoltaic systems. Incentives for rural electric coops to invest in upgrading distribution assets to support the adoption and rapidly scaling of agrivoltaic systems in their service areas.</p>

#### **Initiative 4: Green Source Advantage Choice Expansion**

**Description:** The current (pilot) program – limited to “large energy users” – from 2019 has just four customers: the City of Charlotte, Wells Fargo, Bank of America, and Duke University. None have completed projects yet, mainly because of solar supply chain and cost issues.

The new version (proposed Jan 2023) would allow customers to contract with either Duke Energy or third-party solar or wind developers for up to 100% of their energy use, instead of 30%. The new Green Source Advantage Choice program would also add an option for battery

storage, which would help companies use renewable energy 24 hours a day, instead of just when there's sun or wind.

In a separate filing, Duke also proposed a separate program called Clean Energy Impact. It would give businesses and consumers the option to buy renewable energy credits that would allow them to support solar and wind development.


#### Phase 1 Analysis: Initiative Ranking

<u>Analysis Area</u>	<u>Favorability Ranking (Low, Medium, or High)</u>	<u>Description of how/why action initiative received the ranking given</u>
Potential Feasibility	Medium, at best	Large-scale energy users have not found the program financially compelling enough to move forward. New consumer option for buying renewable energy credits is not really new. The program appears to largely leave it up to the energy users to find its own 3rd party sources
Potential Scale of Impact	Low	Nearly 4 years into the NC pilot program and very little has materialized. Not clear how new options will move significant resources into renewable development.
Potential Equity Impacts	Low	Low consumer adoption rates in similar programs elsewhere
Cost Vs. Benefit	Low	Initial cost estimates continue to rise, delaying action, potentially flipping the cost-benefit equation into the red for large energy users

Renewable energy sourcing option available to Commonwealth Edison (Illinois) consumers:  
<https://cleanchoiceenergy.com/go/renewable-energy-commonwealth-edison>

#### Phase 2 Analysis: What is needed to make this initiative happen.

<u>Analysis Area</u>	<u>Summary</u>	<u>Discussion</u>
Timeline (Near-Term, Medium-Term, Long-Term, Ongoing)	Ongoing	Commercial user program participants continue to claim they will continue to pursue alternative sources. The effort in Charlotte, at least, seems to be focused on developing new solar farms ... There are

		evidently no 3rd party providers to turn to in NC (see Clean Choice Energy link, in IL, above). <b>What are the current options in WNC?</b>  Consumer opt-in to buy RECs will only happen with measurable advertising and PR effort, and only if cost is negligible.
<b>Implementing Departments and Partnering Organizations</b>		
<b>Activities to be undertaken to support the initiative</b>		
<b>Financial Costs and Benefits to the Organizations</b>		
<b>Additional Resources and Support Needed</b>		

#### Initiative 5: Renewable Energy Credits (RECs) & Power Purchase Agreements (PPAs)

**Description:** Purchasing the Environmental Attributes from grid-connected renewable generators (commonly known as Renewable Energy Credits or RECs) allows the City/County to claim the benefits of those carbon free resources. Depending on the resource's technology, location and online date, these claims can be used to qualify for recognition programs such as the EPA's Green Power Partnership and are a great first step in showing **our constituents** the path to decarbonization.

#### Phase 1 Analysis: Initiative Ranking

<u>Analysis Area</u>	<u>Favorability Ranking (Low, Medium, or High)</u>	<u>Description of how/why action initiative received the ranking given</u>
<b>Potential Feasibility</b>	High	High
<b>Potential Scale of Impact</b>	Low-High	Low to Medium (3rd Party REC Procurement, Duke Clean Energy Impact Plan)

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		High (Duke Green Source Advantage Plan) - Path to 24/7
<b>Potential Equity Impacts</b>	<b>Low</b>	Low
<b>Cost Vs. Benefit</b>	<b>High, Medium, or Low</b>	TBD

**Phase 2 Analysis: What is needed to make this initiative happen.**

<u><b>Analysis Area</b></u>	<u><b>Summary</b></u>	<u><b>Discussion</b></u>
<b>Timeline (Near-Term, Medium-Term, Long-Term, Ongoing)</b>	Immediate	3rd Party REC contracts can be entered into immediately. Duke Clean Energy Impact (CEI) and Green Source Advantage (GSA) Plans were just submitted to the NCUC on 1/31/23 and are yet to be approved.
<b>Implementing Departments and Partnering Organizations</b>	City and County Finance Departments, DEP,	
<b>Activities to be undertaken to support the initiative</b>		3rd Party RECs - an RFP could be conducted to award based on the lowest price and/or other criteria (location, etc....) Duke Plans - conversations with DEP to see if they would agree to include RECs/PPAs from geographically proximate resources would improve relevancy.
<b>Financial Costs and Benefits to the Organizations</b>	TBD	Costs - Incremental costs of RECs/PPAs Benefits - Would allow BHPCC and Duke to work together to highlight benefits of grid scale renewables to local ratepayers. GSA Plan would begin movement to 24/7 renewables
<b>Additional Resources and Support Needed</b>	Limited	Administration of a 3rd Party RFP

## Topic 2: Residential and Commercial Renewable Energy and Storage

### Initiatives:

1. Solarize- bulk buying
2. Appalachian Offsets
3. Microgrids

### Initiative 1: Solarize Campaigns

**Description:** Solarize residential solar bulk-buying, crowdsource discount installation program.

### Phase 1 Analysis: Initiative Ranking

<u>Analysis Area</u>	<u>Favorability Ranking (Low, Medium, or High)</u>	<u>Description of how/why action initiative received the ranking given</u>
Potential Feasibility	High	Green Built Alliance implemented a highly successful campaign in 2021. Suggestions have been made to repeat the campaign every 2-3 years, so 2024 is a good year to do it again.
Potential Scale of Impact	Medium	In the last campaign, a total of 183 property owners signed contracts to advance toward owning a system through the community-led discount solar energy purchase program. That's the equivalent of 2,009,732 kWh produced annually and an estimated \$251,215 in annual utility bill savings for owners of their new rooftop solar energy systems.  With the IRA providing additional financial resources, installing solar could be up to 30-50% cheaper for homeowners depending upon which qualification for incentives they meet.
Potential Equity Impacts	Medium	Leasing solar is a better equity impact than retail sales. Financing is also out of reach for many low-income families. However, there are not a lot of efforts to reach moderate-income households, and this program is perfect for this demographic.
Cost Vs. Benefit	High	A solarize campaign needs someone to run the marketing to homeowners (\$70k/year staff expenses) but otherwise all expenses are taken on by the property owner, not a public entity, and since it is still an economic benefit for them, this seems negligible.

**Phase 2 Analysis: What is needed to make this initiative happen.**

<u>Analysis Area</u>	<u>Summary</u>	<u>Discussion</u>
<b>Timeline (Near-Term, Medium-Term, Long-Term, Ongoing)</b>	Near Term	Determine the start date and work backward from there based on the previous program.
<b>Implementing Departments and Partnering Organizations</b>	Solar installer(s), GBA, Duke Energy Progress, Solar Crowdsourc	
<b>Activities to be undertaken to support the initiative</b>	Secure funding for the coordinating staff member.	
<b>Financial Costs and Benefits to those involved</b>	Net positive over 25 years, but high initial capital outlay.	Solar has a 20–25-year time horizon. The average residential solar power system payback is about 8.7 years, but it varies by location and property. So, the typical payback period is about 6 – 10 years.
<b>Additional Resources and Support Needed</b>		

**Initiative 2: Appalachian Offsets**

**Description:** Applies carbon offset donations and funds directly to local renewable energy projects.

**Phase 1 Analysis: Initiative Ranking**

<u>Analysis Area</u>	<u>Favorability Ranking (Low, Medium, or High)</u>	<u>Description of how/why action initiative received the ranking given</u>
<b>Potential Feasibility</b>	High	This project is already being delivered by Green Built Alliance. St. Paul's Missionary Baptist Church in the Burton Street Neighborhood received a \$25k payment toward their 8.6 kWh system through the program. United Way's solar installation is in the planning stage.

<b>Potential Scale of Impact</b>	<b>Medium</b>	Provides access to nonprofits that wouldn't be able to afford it. However, it is limited by generosity from individual donors.
<b>Potential Equity Impacts</b>	<b>Medium</b>	A medium ranking is given because of its indirect equity benefit which comes from increasing the capacity of nonprofits serving specific communities that amongst other things also provide equity benefits to LMI and BIPOC communities.
<b>Cost Vs. Benefit</b>	<b>Medium</b>	Solar is traditionally an expensive option compared to weatherization, however, the long-term nature of the energy production and zero cost outlay by the recipient balance this cost.

**Phase 2 Analysis: What is needed to make this initiative happen.**

<b><u>Analysis Area</u></b>	<b><u>Summary</u></b>	<b><u>Discussion</u></b>
<b>Timeline (Near-Term, Medium-Term, Long-Term, Ongoing)</b>	Ongoing	Additional carbon offsets sold. Marketing efforts would need to be ramped up.
<b>Implementing Departments and Partnering Organizations</b>	Green Built Alliance	If the IRA creates a market for renewable energy credits and increases the refundable tax credit by up to 50%, this program could reach many more nonprofit organizations.
<b>Activities to be undertaken to support the initiative</b>	Marketing	There is need in the community, but funders need to be found to buy RECs from GBA.
<b>Financial Costs and Benefits to the Organizations</b>	Free to organizations, up to 25 years of energy production.	<p>Solar installs are free to the organization receiving them, so they get all that solar production for 20-25 years with very little cost.</p> <p>The cost varies by system capacity, etc. but right now it's about \$2.80 per watt installed.</p> <p>Weatherization is a much quicker payback, so emphasizing participation in these County and Duke programs would be essential to pair with a solar installation.</p>

<b>Additional Resources and Support Needed</b>	More donations	
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### Initiative 3: Microgrids

**Description:** A microgrid is “A local cluster of energy resources that can operate independently, microgrids keep the power flowing to single or multiple nearby customers when the central grid fails. Microgrids also act as a tool to help energy customers manage costs, participate in energy prosperity, and reduce carbon emissions. In addition, they are designed not only for backup power, but to operate under “blue sky” conditions, providing important services to the central grid, and they can be a particularly valuable resource when the grid is under strain or needs flexibility to balance resources. In this way, microgrids typically provide customers with some combination of three core benefits, including resilience, cost savings and clean energy.”

(ThinkMicrogrid 2021)

Microgrids address local priorities and provide local benefits (resilience, cost savings, workforce development, etc.).

### Phase 1 Analysis: Initiative Ranking

<u>Analysis Area</u>	<u>Favorability Ranking (Low, Medium, or High)</u>	<u>Description of how/why action initiative received the ranking given</u>
<b>Potential Feasibility</b>	<b>High</b>	The technology already exists, equipment is here and readily available. It just requires planning and investment. There are also EAAS - companies who will finance the project while simultaneously producing money and energy savings. Microgrids provide stacked benefits that can gain support by the WHOLE community. There also exist additional IRA incentives and rebates for local govts. (For PV, batteries, and microgrid controllers). Installing and implementing microgrids will be cash Positive on several projects from day 1.
<b>Potential Scale of Impact</b>	<b>High</b>	Microgrids can be utilized on all applications, one could start with just 1 location (fire station e.g.), and scale from there with education and experience learned. There is an added convergence of various technologies to synergize for optimization of cost-effective opportunities for the community AND the grid, as well as continuous technological improvements that will accelerate the benefits.

<b>Potential Equity Impacts</b>	<b>High</b>	<p>A 'High' rating was given because disadvantaged and under-resourced communities have been disproportionately affected by the externalities of fossil fuel energy generation and waste. Microgrids can be a clean, safe, and healthy energy investment instead.</p> <p>Equity and land tenure - microgrids promote keeping people on their land and aging in place.</p> <p>They can also include co-location of e-mobility including eBikes, EV carshares, etc.... supporting increased means of transportation without the need for purchasing vehicles.</p> <p>Microgrids can also be used to provide EVSE for EV car share before EV's become affordable. Once EV's are affordable, the EVSE will already be there. This is a great model for installing EVSE at Multi-Unit Dwellings.</p>
<b>Cost Vs. Benefit</b>	<b>Medium</b>	<p>The upfront cost is higher than centralized large utility scale solar systems, but cheaper than SMRs and other carbon capture and storage with NG. Because the energy is created, stored, and used locally, the community receives direct benefits. Utility-scale clean energy helps in general, but not necessarily for local community members. DER's are also a form of local control, it is power in Buncombe County's 'backyard.' These energy systems will operate in Texas even when ERCOT freezes up and fails, for example</p>

**Phase 2 Analysis: What is needed to make this initiative happen.**

<u><b>Analysis Area</b></u>	<u><b>Summary</b></u>	<u><b>Discussion</b></u>
<b>Timeline (Near-Term, Medium-Term, Long-Term, Ongoing)</b>	Near to Medium-Term	<p>Near-Term: Buncombe County is currently conducting a feasibility study for electrification plus storage for its facilities. Microgrids would be a good addition to this study if it is not already being considered.</p> <p>Microgrids for First Responders ASAP, 2nd and 3rd responders can be phased in. All equipment is readily available.</p> <p>Medium-Term: Demonstration could be done on public facing and public affecting projects. There is someone in the community who is currently working with other municipalities in the country to implement microgrids on Wastewater</p>

		Treatment facilities providing several benefits to the municipalities including financial gains, health gains, increased resilience, etc....)
<b>Implementing Departments and Partnering Organizations</b>	City of Asheville, Buncombe County, CSMG, Fed (IRA) up to 40% check	<p>Find a willing partner.</p> <p>Organizations could combine an electric police car or first response vehicle with a microgrid-based EVSE. That is an ideal combination to see how the microgrids support the use of EV's and then provide all the other stack of benefits.</p> <p>Warren Wilson College is in the feasibility investigation stage with an agrivoltaics microgrid project and is successfully implementing a Mobile Microgrid Work Vehicle Project (in partnership with UNCA and CSMG)</p>
<b>Activities to be undertaken to support the initiative</b>	Engage with CSMG, Host design charrettes to get an action agenda	<p>Assess the County's utility distribution &amp; transmission power lines that can be upgraded with highly efficient <a href="#">Aluminum carbon conductors</a> (and <a href="#">here</a>).</p> <p>Host a seminar at the Sherril Center to gather information</p>
<b>Financial Costs and Benefits to those involved</b>	See above	<p>Multi-million-dollar grant opportunities available. Fed (IRA) pays for up to 40% of the project. The upfront cost is higher than centralized large utility scale solar systems, but cheaper than SMRs and other carbon capture and storage with NG. Because the energy is created, stored, and used locally, the community receives direct benefits of resilience, cost savings, and clean energy. DER's are also a form of local control, it is power in Buncombe County's 'backyard.'</p>
<b>Additional Resources and Support Needed</b>	<b>State, local, &amp; national governments</b>	<p>Provide national and state incentive for microgrid development of all community critical services, police, fire, water, wastewater, health, schools.</p> <p><b>Establish a national Green Bank to finance rapid development of microgrids for critical services.</b></p>

### Topic 3: Low-Income EE/RE


#### Initiatives:

1. Energy Savers Network (ESN) - Current State
2. Energy Savers Network (ESN) - future state of growth
3. Energy Savers Network (ESN)- Deeper Retrofits
4. Community Action Opportunities (CAO)
5. Neighbor to Neighbor Solar

#### Initiative 1: ESN-Current State

**Description:** Energy Savers Network (ESN) provides a suite of energy efficiency upgrades and education at no cost to all low-income clients and identifies options for greater savings such as heating repair or replacement. We coordinate with community partners to identify households with high energy burdens. Originally ESN only provided Tier 1 upgrades (lower-cost simple basic retrofits) which are performed by staff and volunteers. Recently ESN has begun to provide a limited amount, subject to funding available, for deeper upgrades (higher-cost more advanced retrofits) which are contracted out to HVAC professionals, home repaired specialists, and insulation contractors. This could be described as Tier 1+. ESN currently performs upgrades for ~200 households per year. We have completed over 850 since 2016.

#### Phase 1 Analysis: Initiative Ranking

<u>Analysis Area</u>	<u>Favorability Ranking (Low, Medium, or High)</u>	<u>Description of how/why action initiative received the ranking given</u>
Potential Feasibility	High	Ongoing program with 200 homes/yr. saving 15% energy-efficiency that can continue at the current rate as long as the funding and support from the community and government will continue.
Potential Scale of Impact	Low	The current rate of homes completed takes too long to have a meaningful aggregate impact that will help us meet the 100% renewable goal. 
Potential Equity Impacts	High	Helps reduce the energy cost burden for low-income citizens who may not otherwise be able to make energy-efficiency upgrades. It also improves health outcomes for our overall community as well as income opportunities for our BIPOC community through UCD (United Community Development, a BIPOC owned non-profit that is a sub-contractor to ESN).

<b>Cost Vs. Benefit</b>	<b>High</b>	Overall this has a positive financial, environmental, and local impact on our community because it <b>has a high ROI</b> . Moderate energy bill savings are +/-15% with low cost per kilowatt hour (\$800/household). It also has intangible benefits for our volunteers that engage in the process to help their community.
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**Phase 2 Analysis: What is needed to make this initiative happen.**

<u><b>Analysis Area</b></u>	<u><b>Summary</b></u>	<u><b>Discussion</b></u>
<b>Timeline</b>	Near term, Ongoing	
<b>Lead Implementing Organization</b>	Green Built Alliance	
<b>Partnering Organizations</b>	SVCM, Eblen, CAO, Habitat, MHO, Manna, ABCCM, Duke, City & County, and many more	
<b>GBA/BHP Role</b>	Implementor & Marketer	
<b>Activities to be undertaken to support the initiative</b>	Continue community outreach and fundraising	
<b>Financial Costs and Benefits to those involved</b>	Free Service to clients, costs to City & county and other financial contributors	
<b>Additional Resources and Support Needed</b>	Ongoing funding & continued volunteer support	
<b>Legislation or policy changes needed</b>	No	

**Initiative 2: ESN - future state of growth**

**Description:** If we want to meet our 2042 goal and ⅓ of the population would likely qualify for our services we would need to be operating at a pace of over 1000 homes/year. This program really involves expanding the number of homes that Energy Savers serves per year to get closer to the 1000 mark or so.

**Phase 1 Analysis: Initiative Ranking**

<u>Analysis Area</u>	<u>Favorability Ranking (Low, Medium, or High)</u>	<u>Description of how/why action initiative received the ranking given</u>
Potential Feasibility	High	With sustained funding and quintupling our staff and volunteers, it's possible to increase ESN's current goals to 1000 over several years.
Potential Scale of Impact	Medium	Medium impact to the household and low overall impact to the goal.
Potential Equity Impacts	High	The potential equity impacts are high for this program because its purpose is to reduce the energy burden for low-income households.
Cost Vs. Benefit	High	The potential equity impacts are high for this program because its purpose is to reduce the energy burden for low-income households.

**Phase 2 Analysis: What is needed to make this initiative happen.**

<u>Analysis Area</u>	<u>Summary</u>	<u>Discussion</u>
Timeline	Near and Medium-Term	In the near-term we need to maximize funding from the IRA and other sources while building up our capacity to increase staffing and volunteer to meet our goals.
Implementing Departments and Partnering Organizations	Green Built Alliance	GBA provides day to day implementation of ESN. The program also collaborates with many other local nonprofits and social service agencies to identify clients.
Activities to be undertaken to support the initiative	Additional funding is needed to grow the impact and number of clients by ESN	The federal IRA is a potential source of funding to grow ESN. A good portion of this funding will move through local and state governments. We have been in contact with the City of Asheville, Buncombe County and NCDEQ to request

		consideration of support for ESN growth from the IRA.
<b>Financial Costs and Benefits to the Organizations</b>	Free Service to clients, costs to City & county and other financial contributors	
<b>Additional Resources and Support Needed</b>	Increased funding, staffing & volunteers	

### Initiative 3: ESN - Deeper Retrofits

**Description:** Expanding the amount of savings for each home (i.e. installing insulation, HVAC Replacement, Heat Pump Water Heater Replacement)

#### Phase 1 Analysis: Initiative Ranking

<u>Analysis Area</u>	<u>Favorability Ranking (Low, Medium, or High)</u>	<u>Description of how/why action initiative received the ranking given</u>
<b>Potential Feasibility</b>	<b>High</b>	Based on the IRA and Duke programs extra funding, this could be a very real possibility.
<b>Potential Scale of Impact</b>	<b>Medium</b>	The impact to the resident is high but the impact to the County is medium.
<b>Potential Equity Impacts</b>	<b>High</b>	This could dramatically impact energy bill savings and energy security for low-income households since heat is about 50% of a residential energy usage and replacing that source with a long-lasting efficient one will make a big impact.
<b>Cost Vs. Benefit</b>	<b>Medium</b>	High impact for the household with a higher cost per kilowatt hour saved.

#### Phase 2 Analysis: What is needed to make this initiative happen.

<u>Analysis Area</u>	<u>Summary</u>	<u>Discussion</u>

<b>Timeline</b>	Near-Term, Ongoing	
<b>Implementing Departments and Partnering Organizations</b>	Green Built Alliance, Dogwood Health Trust, City & County, Duke, Community Action Opportunities (CAO)	This expansion begins to overlap with the current activities of CAO. Careful coordination with CAO is required in designing this expansion.
<b>Activities to be undertaken to support the initiative</b>	Obtain funding from IRA and Duke	
<b>Financial Costs and Benefits to the Organizations</b>	Financial benefits per dollar spent is less than for ESN basic activities but still positive for clients	
<b>Additional Resources and Support Needed</b>	Increase our vendors and staff to complete the work	

#### **Initiative 4: Community Action Opportunities (CAO)**

**Description:** Increased collaboration with this community partner, that utilizes federal funding, will allow us to conduct deeper energy-efficiency retrofits for more people. From [CAO's website](#): The work may include testing the safety and efficiency of the primary heating system; air sealing walls, floors and ceiling; installing ventilation fan; insulating attics, walls, floors, heating ducts, pipes and water heaters; installing vapor barriers; testing and installing smoke alarms and carbon monoxide detectors; replacing old energy-consuming refrigerators; and Heating/Air Repair and Replacement Program (HARRP). PLEASE NOTE that they currently do NOT replace heating and air conditioning with electrical options; they only replace with the household's current system (gas and oil for example).

#### **Phase 1 Analysis: Initiative Ranking**

<b><u>Analysis Area</u></b>	<b><u>Favorability Ranking (Low, Medium, or High)</u></b>	<b><u>Description of how/why action initiative received the ranking given</u></b>
<b>Potential Feasibility</b>	<b>High</b>	Since federal funding is increasing through recent legislation, this program has high potential.
<b>Potential Scale of Impact</b>	<b>Medium</b>	The impact to the resident is high but the impact to the County is medium.

<b>Potential Equity Impacts</b>	<b>High</b>	This could dramatically impact energy bill savings and energy security for low-income households since the energy-efficiency retrofits go further.
<b>Cost Vs. Benefit</b>	<b>Medium</b>	High impact for the household with a higher cost per kilowatt hour saved.

**Phase 2 Analysis: What is needed to make this initiative happen.**

<u>Analysis Area</u>	<u>Summary</u>	<u>Discussion</u>
<b>Timeline</b>	Near to Medium Term, Ongoing	With likely expansion in the near to medium-term
<b>Implementing Departments and Partnering Organizations</b>	Community Action Opportunities (CAO) and their vendors	One of the partnering organizations could end up being Energy Savers Network/GBA
<b>Activities to be undertaken to support the initiative</b>	Careful coordination between CAO and ESN	
<b>Financial Costs and Benefits to the Organizations</b>	Financial benefits per dollar spent is less than for ESN basic activities but still positive for clients	
<b>Additional Resources and Support Needed</b>	CAO will need to increase their capability for any expansion	

**Initiative 5: Neighbor to Neighbor Solar**

**Description:** A Blue Horizons Project program to provide solar installations for low-income households funded by grants and donors. Green Built Alliance selects a solar installer to do the work and manages the process at no cost to the homeowner.

**Phase 1 Analysis: Initiative Ranking**

<u>Analysis Area</u>	<u>Favorability Ranking (Low, Medium, or High)</u>	<u>Description of how/why action initiative received the ranking given</u>

<b>Potential Feasibility</b>	<b>High</b>	Is very feasible but limited by the amount of funding we provide and finding qualified households that are south facing with newer roofs.
<b>Potential Scale of Impact</b>	<b>Low</b>	The impact to the resident is high but the impact to the County is low because of the limited qualifying households.
<b>Potential Equity Impacts</b>	<b>High</b>	Helps low-income households get free energy.
<b>Cost Vs. Benefit</b>	<b>Low</b>	Higher cost for the community but with high impact for the household and per kilowatt hour saved.

**Phase 2 Analysis: What is needed to make this initiative happen.**

<b><u>Analysis Area</u></b>	<b><u>Summary</u></b>	<b><u>Discussion</u></b>
<b>Timeline</b>	Ongoing	
<b>Implementing Departments and Partnering Organizations</b>	Green Built Alliance & Solar Installer	
<b>Activities to be undertaken to support the initiative</b>	Solve the problem of limited qualified candidates (i.e. newer roofs, homeowner, etc.)	
<b>Financial Costs and Benefits to the Organizations</b>	High benefit to the client but at a high cost to the community	This should be compared to other opportunities for helping low-income people such as expanding ESN or Community Solar
<b>Additional Resources and Support Needed</b>	How better to find qualified candidates.	

**Topic 4: Building Efficiency and Electrification**

**Initiatives:**

1. Better Buildings Challenge (BBC)
2. ENERGY STAR benchmarking (Portfolio Manager)

3. LEED / LEED for Cities
4. Heat Pump Water Heater (HPWH) promotion & bulk buying program
5. Heating electrification
6. Moderate income energy upgrades and consultations
7. Work with the planning department on education for applicants (i.e., providing checklists) for new construction and major remodels.
8. Duke multifamily retrofit and DSM program.
9. Duke Energy Small Business Energy Saver Program

#### Initiative 1: Better Buildings Challenge (BBC)

**Description:** The Better Buildings Challenge is an initiative through the DOE targeted at building portfolio owners, however municipalities can also join the challenge, encouraging commercial building owners in the municipality to participate. Atlanta has done this for example and a link to their website for more info is provided below. The program connects these municipalities/building owners with technical and industry experts to develop cost-effective energy solutions and earn recognition. To join the challenge, municipalities email the DOE directly for more info. Partners who sign up commit to publicly pledging to improve energy intensity by at least 20% within 10 years, publicly announce an initial showcase project within 6 months & initiate within 12 months, announce the use of one or more energy efficiency implementation models within 6 months, make available portfolio-wide, building level energy performance info within 12 months and track on an annual basis.

- [Atlanta example: https://www.atlantabbc.com/initiatives/implementation-model/](https://www.atlantabbc.com/initiatives/implementation-model/)

A quote from the Southface Institute in 2017 showed that they would need ~\$70,000 to organize, promote and implement the program. The Land of Sky Clean Vehicles Coalition (LOSCVC) has also worked on a similar program in the past and would be a good partner to involve.

#### Phase 1 Analysis: Initiative Ranking

<u>Analysis Area</u>	<u>Favorability Ranking (Low, Medium, or High)</u>	<u>Description of how/why action initiative received the ranking given</u>
Potential Feasibility	Low	This seems like a heavy lift. It would require the county (or a 3rd party manager) setting up the implementation model, to include a reporting process, technical support, educational materials, etc. We could potentially create our own version of this however as part of the “badging” idea that has been suggested. For example, if commercial

		building owners report / track their energy use, they receive an X badge. If they reduce their energy use by 20%, they receive Y badge and get further recognition, etc.
<b>Potential Scale of Impact</b>	<b>Medium or High</b>	The commitment is to reduce building energy use by 20%. According to Buncombe county's report <a href="#">here</a> , 34% of the county's energy use is from commercial buildings.
<b>Potential Equity Impacts</b>	<b>Medium</b>	This is focused primarily on building owners and helping businesses save money and energy. If resources are set up with partners to help small business owners, minority owned businesses, etc. track and reduce energy use, that could have a positive equity impact (see initiative #9 for small business energy savers program).
<b>Cost Vs. Benefit</b>	<b>Unclear</b>	It is unclear what funds that would be needed to implement a program such as this. There would need to be significant staffing resources to set up the program and then maintain it. It wouldn't be a revenue generating program unless buildings paid a fee for an energy audit, 3rd party verification of data, etc.

**Phase 2 Analysis: What is needed to make this initiative happen.**

<b><u>Analysis Area</u></b>	<b><u>Summary</u></b>	<b><u>Discussion</u></b>
<b>Timeline</b>	Long-term	If the county wanted to sign up for this program, preparation work would need to be done beforehand.
<b>Implementing Departments and Partnering Organizations</b>	Local governments, Chamber of Commerce (or other business groups), Explore Asheville (for hotels)	Bringing together this coalition for implementing the BBC would require significant coordination. A full-time person at the Chamber of Commerce, a local government, or Green Built Alliance (GBA) would be needed for the program to have a substantial impact.
<b>Activities to be undertaken to support the initiative</b>	Create a working group dedicated to creating an implementation plan	

<b>Financial Costs and Benefits to those involved</b>	High initial costs	Per the general notes above, a quote from the Southface Institute in 2017 estimated \$70k needed to implement and promote this program.
<b>Additional Resources and Support Needed</b>		

#### **Initiative 2: ENERGY STAR benchmarking (Portfolio Manager)**

**Description:** ENERGY STAR Portfolio Manager allows building owners to benchmark (measure and compare) their energy use (as well as water use, waste and materials, and greenhouse gas emissions) via an online platform. This information then can be used to target efficiency improvements and compare year-to-year performance. Buildings that earn an ENERGY STAR score of 75 or higher are eligible for ENERGY STAR certification.

#### **Phase 1 Analysis: Initiative Ranking**

<u><b>Analysis Area</b></u>	<u><b>Favorability Ranking (Low, Medium, or High)</b></u>	<u><b>Description of how/why action initiative received the ranking given</b></u>
<b>Potential Feasibility</b>	<b>Medium</b>	This service is easy to access, user-friendly, and free - all that is needed is some basic building info and utility readings to track and share data. Feasibility will depend on how this initiative is used. For example, would there be an incentive for buildings to report energy use data and if so, is that provided by the county or Duke? Would GBA need to assist the process? Land of Sky Waste Reduction Partners could potentially help with the process and technical resources.
<b>Potential Scale of Impact</b>	<b>Medium or High</b>	Although this will certainly get building owners thinking of their energy use, it is unclear how that will affect making changes to become more efficient. But you can't improve what you don't measure so this would be a great first step. There are lots of great resources for improving energy efficiency as well. If we link this energy reporting to ENERGY STAR resources as well as BHP resources / initiatives, this could be effective.

<b>Potential Equity Impacts</b>	<b>Medium</b>	From an "accessible" lens (meaning minimal barrier to entry), this service is easy to access, user-friendly, and free - all that is needed is some basic building info and utility readings to track and share data (could be used by big and small business owners alike). There is an additional equity piece if we were able to partner with a pro-bono certifier for small business owners, minority owned businesses, disadvantaged neighborhoods, etc. (this comes into play if you want to be ENERGY STAR certified).
<b>Cost Vs. Benefit</b>	<b>High</b>	Cost appears relatively low to implement (admin, IT, and depending on incentives). If this route were taken, there would be a need to understand how this data would be used in the broader initiative. For example, is the county requesting this data be exported to them? What will be done with the data? Or do building owners simply show proof of tracking? Is this just a resource we point building owners to? Benefits of improved energy efficiency could be high as the need to address the impact of existing building energy loads increases.

**Phase 2 Analysis: What is needed to make this initiative happen.**

<u>Analysis Area</u>	<u>Summary</u>	<u>Discussion</u>
<b>Timeline (Near-Term, Medium-Term, Long-Term, Ongoing)</b>	Medium-Term	The ENERGY STAR Portfolio Manager is a trusted platform with lots of resources that can be used. The timeline is going to be dependent on how we would implement this tool to meet our goals.
<b>Implementing Departments and Partnering Organizations</b>	County, Duke, local PE/RA volunteers, Waste Reduction Partners	<p>This could be led by several entities – e.g., County, Duke, GBA.</p> <p>Can we partner with individuals or organizations to provide free PE/RA services for ENERGY STAR certification? (Requires a site visit and verification of application)</p> <p>The only cost associated with ENERGY STAR is if a building is certified, which requires a Licensed Professional (registered professional engineer or registered architect) to do a site visit and sign-off on the application. Consider: would someone be willing to</p>

		partner with us to provide this service for free for eligible building owners?
<b>Activities to be undertaken to support the initiative</b>	Need to understand the broader initiative	<p>It is unclear how the initiative would be implemented. This is really just a tracking measure that should be part of a larger initiative. Here's an example from Austin, TX: <a href="https://austinenergy.com/en/energy-efficiency/ecad-ordinance/for-commercial-buildings">https://austinenergy.com/en/energy-efficiency/ecad-ordinance/for-commercial-buildings</a></p> <ul style="list-style-type: none"> <li>• Program would be voluntary but consider incentives / policies that the county could provide.</li> <li>• Ultimately, this could be a benchmarking tool used for a larger initiative for getting the existing non-residential building stock on a path towards energy efficiency.</li> <li>• Review how it could align with commercial MLS</li> </ul>
<b>Financial Costs and Benefits to the Organizations</b>	Admin costs	
<b>Additional Resources and Support Needed</b>		It would be great if there could be an incentive for buildings to report energy use data. GBA/Duke/local governments could potentially assist in the process.

### Initiative 3: LEED / LEED for Cities

**Description:** LEED for Cities is a program for local jurisdictions (cities or counties) that helps guide and then recognizes sustainable plans and initiatives that address natural systems, energy, water, waste, transportation, and quality of life. Similar to the LEED building rating systems, this is a rating system that mirrors those major topics and looks at sustainability through a more holistic lens, vs our targeted energy initiatives.

This could be an overarching program for the county to use that further supports our individual initiatives. Specifically, the county could look at implementing or integrating different credit strategies into their sustainability plans including green policies and incentives (for existing private buildings, new private development, and public buildings), energy & greenhouse gas emissions performance (tracking), energy efficiency, renewable energy, grid harmonization, and equity / quality of life.

Notes/Resources:

- Other NC jurisdictions that are certified: Charlotte, Raleigh, Durham, Greensboro, Winston-Salem, Orange County

- v4.1 LEED for Cities Guide (scroll down to “Get Started” section for the guide link): <https://www.usgbc.org/leed/rating-systems/leed-for-cities-communities>
- LEED for Cities 2023 Cohort Applications now open but closes on Feb 24. Maybe consider next year. If selected for the program, cities/counties receive a large number of benefits including yearly USGBC membership, registration fees, certification fees, dedicated technical support, monthly meetings with USGBC and other cities in the program, additional guidance and support, etc.:
- <https://www.usgbc.org/articles/apply-leed-cities-2023-local-government-leadership-program>
- [https://www.usgbc.org/sites/default/files/2022-12/2023%20Application\\_LEED%20for%20Cities%20Local%20Government%20Leadership%20Program.pdf](https://www.usgbc.org/sites/default/files/2022-12/2023%20Application_LEED%20for%20Cities%20Local%20Government%20Leadership%20Program.pdf)

#### Phase 1 Analysis: Initiative Ranking

<b><u>Analysis Area</u></b>	<b><u>Favorability Ranking (Low, Medium, or High)</u></b>	<b><u>Description of how/why action initiative received the ranking given</u></b>
<b>Potential Feasibility</b>	<b>Medium</b>	The Feasibility is Medium and dependent upon a couple of factors. There is a potential that Asheville / Buncombe County is already doing some of the credits and/or planning to consider many of the strategies included. If that is the case, this would be more feasible. It would also be more feasible if the county applied for the cohort and got accepted into the program, as this will guide them through the process. If there is not strong alignment with Buncombe County’s current initiatives and credits and/or we don’t apply for the cohort, the feasibility would be low.
<b>Potential Scale of Impact</b>	<b>Medium</b>	This has the potential to have a holistically high impact. But for energy initiatives specifically for the Strategic Plan, that is just a part of this rating system. Those strategies would include things such as green policies / incentives (for new development & county owned buildings), energy & greenhouse gas performance (tracking Scope 1 and Scope 2), energy efficiency, renewable energy, and grid harmonization.
<b>Potential Equity Impacts</b>	<b>Medium</b>	The LEED rating system has a whole section dedicated to “quality of life” which encompasses many equity pieces such as affordable housing and transportation,

		environmental justice, civic and community engagement, etc.
<b>Cost Vs. Benefit</b>	<b>Potentially high</b>	<p>If Buncombe County applies and is selected for the cohort program, this could be an opportunity for the cost related to the LEED specific fees to be highly favorable. Additionally, this cohort program provides support for how to earn certification, which reduces the staff hours required compared to figuring it out on our own. However, staff resources would still be needed to coordinate this effort. There's a link in the description above for more information.</p> <p>Another option would be for the county to apply strategies from the rating system as needed and to use the rating system as a guide.</p> <p>Without being accepted into the cohort, the price would be somewhere around \$15,000 for LEED registration and certification only (not including staff resources, etc.).</p>

**Phase 2 Analysis: What is needed to make this initiative happen.**

<u>Analysis Area</u>	<u>Summary</u>	<u>Discussion</u>
<b>Timeline</b>	Long-term	If the county wanted to sign up for this program, I think we would need to do some homework beforehand.
<b>Implementing Departments and Partnering Organizations</b>	Buncombe County Duke Energy USGBC (if certifying)	
<b>Activities to be undertaken to support the initiative</b>		Apply for the program, do a deep dive into the credits with the City to understand the feasibility
<b>Financial Costs and Benefits to those involved</b>		Staff resources, program costs to implement new strategies, certification (if applicable)
<b>Additional Resources and Support Needed</b>		

#### **Initiative 4: Heat Pump Water Heater (HPWH) promotion & bulk buying program**

**Description:** This is an intentional program to accelerate the adoption of Heat Pump Water Heaters for everyone in Buncombe County.

Heat Pump Water Heaters lower water heating energy use up to 75% compared to a traditional electric or gas water heater. It's one of the most cost-effective ways to reduce carbon emissions and achieve our community energy goals.

The overall reduction in energy usage is affected by details of the HVAC efficiency of the building and on the installation location, e.g., in a closet or basement. Taking HVAC load into account suggests that the savings in energy will be in the range of 50% (for very inefficient HVAC such as electric baseboard) to 70% (for very efficient HVAC such as ground source heat pump).

Why are Heat Pump Water Heaters (hybrid) so efficient? Their advanced technology absorbs heat from the air and transfers it into the water in the storage tank making them significantly more energy efficient.

The Heat Pump Water Heater also provides dehumidification to the space. In a basement, this is an added bonus. It does cool as well, which should be considered in placement of the appliance. Basement or (sufficiently sized) crawlspace is an ideal location in our region.

Water heating typically accounts for about 15 to 25% of a monthly energy bill. An ENERGY STAR-qualified heat pump (hybrid) water heater is one of the most efficient water heaters available.

Replacing even a brand-new, working water heater is cost effective due to the significant operational cost savings involved.

Significant financial incentives exist for replacing water heaters with more efficient Heat Pump Water Heaters. Duke Energy has a \$350 Rebate for the replacement of hot water heaters. The Inflation Reduction Act has a tax credit of \$2,000 and an upfront discount of \$1750, the max covered is 50%, up to 14,000 across all electrification projects.

If you already have an electric water heater, it's a simple swap out. You still need to get a permit from the City or County even if you're doing it yourself. If you have a gas water heater, a Heat Pump Water Heater may require an additional electric circuit. If a water heater is currently in a small space, a little work to add sufficient airflow may be necessary.

A request for Proposal (RFP) will be released to identify plumbers who agree to be part of the program. This includes picking up the water heaters from the distributor, doing the installations, getting permits, and providing documentation for incentives and tax credits.

A full-time staff member will need to be hired to promote the adoption of Heat Pump Water Heaters. The scope of work would include:

- Identifying qualified plumbers to do the installations (through an RFP, RFQ or through a referral basis). Duke Energy has trade allies that install HPWH, perhaps they could be prequalified.
- Marketing and promotion of the campaign via events, the media, social media, etc.
- Channeling potential clients to contractors
- Tracking adoption of this technology
- Ensuring that operating materials about the systems as well as tax resources are available.

Hopefully funding can be obtained from foundation or government grants.

This program can launch in summer or fall of 2023.

The bulk buying program could also fit into a larger program that provides training for tradespeople, mass marketing of the technology and a program to ensure that all new affordable housing units built in Asheville and Buncombe County use this technology.

A proposal from the BHP Technology committee has been made to place a hold on 250 units to receive a bulk buying discount. After this initial round of units are installed, we will re-evaluate the savings and funding needed.

#### Phase 1 Analysis: Initiative Ranking

<b><u>Analysis Area</u></b>	<b><u>Favorability Ranking (Low, Medium, or High)</u></b>	<b><u>Description of how/why action initiative received the ranking given</u></b>
<b>Potential Feasibility</b>	<b>High</b>	The technology and economics are good and the tax incentives and upfront rebates with IRA are substantial. There are also local installers familiar with installing HPWHs.
<b>Potential Scale of Impact</b>	<b>Medium</b>	The scale of the impact is higher than most programs proposed in this Plan. Especially expanded from bulk-buy to general promotion for 10 years of heat pump water heaters to take maximum advantage of the IRA.
<b>Potential Equity Impacts</b>	<b>High</b>	The installation of a HPWH drastically reduces energy consumption and therefore utility bills.

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		<p>Low-income residents could get one for free. Energy Saver's Network (ESN) could track which homes are 'heat pump water heater ready' so that they can be eligible and ready for this program.</p> <p>*Could* work for a mobile home with a 110V but the height might be a problem.</p> <p>If a mechanism can be sorted out for ESN to make this a standard offering, it would be a "High" favorability for equity.</p>
<b>Cost Vs. Benefit</b>	<b>High</b>	The return on investment is approximately 3 years, especially with the IRA incentives.

**Phase 2 Analysis: What is needed to make this initiative happen.**

<b><u>Analysis Area</u></b>	<b><u>Summary</u></b>	<b><u>Discussion</u></b>
<b>Timeline (Near-Term, Medium-Term, Long-Term, Ongoing)</b>	Near-Term	To begin around summer or fall 2023 and going through 2025. Promotion of the units can occur after 2025, although the bulk buying portion of the program should be complete by that time.
<b>Implementing Departments and Partnering Organizations</b>	GBA/BHP  Buncombe County Tradespeople	<p>Retail plumbing supply companies and manufacturers will be contacted to purchase the units. Ideally the plumbers would purchase and store the equipment.</p> <p>Identify licensed plumbers and contractors via an RFP, RFQ or referral process.</p>
<b>Activities to be undertaken to support the initiative</b>	Hire a full-time staff person, Launch the program	<p>Public outreach - drive demand</p> <p>Visit 1 or 2 CEOs of local plumbing companies to plant seed and get feedback</p>
<b>Financial Costs and Benefits to those involved</b>	<p>Energy Savings for customers</p> <p>Plumbers open a new or expanded business</p>	<p>Money going into the local economy through installations and energy bill savings and short ROI.</p> <p>Potential to charge a fee per heat pump water heater to help fund BHP program.</p>

	line for heat pump water heaters	Financing could be done through the Green Bank, HELOC, credit card, on bill financing, etc....
<b>Additional Resources and Support Needed</b>	Green Bank funding to pay for upfront costs.  Traditional financing - e.g. Self-help	What would it take to add on-bill financing? Ask the County and the water utility.

#### Initiative 5: Heating Electrification

##### Working with HVAC contractors to change fossil systems to electric (heat pumps or mini splits)

**Description:** Significant incentives and cost savings are available for homeowners and housing providers to change fossil fuel (oil, propane, and gas) heating systems to electric ones (heat pumps and mini splits). On average, 5% of all heating systems are upgraded each year. With so many systems being changed each year there is a big opportunity for making headway on electrification of heating systems.

HVAC contractors are the front line in changing out old, broken, or inefficient systems. They also can support clients with quality information about how to save energy, money, and access Duke Energy HVAC replacement incentives and IRA tax credits and rebates.

#### Phase 1 Analysis: Initiative Ranking

<u>Analysis Area</u>	<u>Favorability Ranking (Low, Medium, or High)</u>	<u>Description of how/why action initiative received the ranking given</u>
<b>Potential Feasibility</b>	<b>Medium</b>	<p>This market is highly developed. We inserted “Medium” here due to the resistance of HVAC professionals to specifying only high efficiency equipment.</p> <p>While resistance to change remains among HVAC tradespersons, owners, managers, and salespersons, it will most likely be the homeowners, contractors, and architects requesting / requiring the higher efficient offerings to bring a more notable moving to this proverbial needle. However, an educated salesperson can be quite effective when not</p>

		caught off guard by these inquiries and able to provide the answers to any related questions.
<b>Potential Scale of Impact</b>	<b>High</b>	<p>The potential scale is 'High' on a couple of fronts. One being in the reduction of energy demand certainly, and as stated, the HVAC system is the largest consumer of energy demand in the home.</p> <p>Another way is because Asheville and Buncombe County have become the leader in this arena, the resources provided and the talent committed to these initiatives, will have impact to surrounding areas and neighboring cities.</p> <p>They (neighboring areas to Asheville) have increasingly followed our lead and will continue to do so.</p> <p>If this initiative were to gain traction and support from professionals the potential scale of impact can be high based on heating systems being the largest use of energy in the residential sector and how many HVAC systems get replaced.</p>
<b>Potential Equity Impacts</b>	<b>High</b>	<p>HVAC upgrades can be made for renters, owners, and all income levels. IRA tax incentives and upfront rebates can have a high equity impact for point of sale and installation costs. Most capital benefits will probably be gained by homeowners and property managers, while ongoing operational benefits will be gained by the occupant. GBA's low-income heating repair and replacement program provides free upgrades of highly efficient equipment to a certain number of income qualified residents (based on GBA capacity).</p> <p>We do not yet know all the logistics of how exactly the IRA funds (rebates and tax incentives) will be implemented, and how that occurs will affect the equity impacts the specifics of IRA tax incentives and utility rebates will be the driver here. As these logistics and specifics are rolled out, getting the fundamental 'nuts and bolts' of these specifics to the varied contractors, homeowners, etc. will be key of course. Vendors, Manufacturers, and Contractors all seem to be aware that 'it's in the pipeline and soon to come'.</p>

<b>Cost Vs. Benefit</b>	<b>High</b>	<p>More efficient equipment has substantial Duke Energy incentives and tax credits as well as IRA rebates and tax incentives to offset high upfront costs.</p> <p>Having a streamlined location for a homeowner / contractor to access details and the necessary math may prove helpful.</p> <p>Understanding math of energy, (number of BTUs in a gallon of oil or propane vs what is lost through the flue vent) has been very helpful to our company in converting customers to electric Heat Pumps. These fossil fuels, when accurately assessed with all associated math concerning cost of operation, are indeed more costly to operate and service than are the offerings in electric Heat Pumps.</p>
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**Phase 2 Analysis: What is needed to make this initiative happen.**

<b><u>Analysis Area</u></b>	<b><u>Summary</u></b>	<b><u>Discussion</u></b>
<b>Timeline (Near-Term, Medium-Term, Long-Term, Ongoing)</b>	Near-Term, Ongoing	It will take a couple of years or so to iron out the majority of the issues we are currently facing (inventory issues due to the pandemic, new rating called SEER 2, shifting away from old refrigerants to newer and better refrigerants, etc.) that may slow down heating electrification. However, there is readily available highly efficient electric heating that can drastically reduce energy costs as well as tax incentives and upfront rebates from the IRA. The time to act is as soon as possible (especially once IRA rebates roll out)
<b>Implementing Departments and Partnering Organizations</b>	GBA/BHP to lead community engagement efforts. Duke Energy. HVAC contractors are essential to the success of the program	
<b>Activities to be undertaken to</b>		<ul style="list-style-type: none"> <li>Organize meetings, continuing education, engagements with HVAC contractors and other organizations/jurisdictions working on</li> </ul>

<b>support the initiative</b>		<p>similar efforts so that we can understand what is slowing down implementation of electric highly efficient HVAC systems. What are the pros and cons to trying to implement such an effort?</p> <ul style="list-style-type: none"> <li>• Then implement a strategy based on knowledge learned.</li> <li>• Get a list of local HVAC contractors and plumbers.</li> <li>• Create a flier on benefits of electrification of HVAC.</li> <li>• As it is more challenging to convert / educate all dealers, starting with the top 5 volume local residential companies could provide max dividend and the quickest at that.</li> <li>• Manufacturers must make certain that installers understand the products and provide trainings.</li> <li>• Having an engaging electric utility representative teach me HVAC contractors at their level some things they might not know is powerful and effective.</li> </ul>
<b>Financial Costs and Benefits to the Organizations</b>	Long term costs and benefits of electrification for the consumer is positive	<ul style="list-style-type: none"> <li>• While this may require higher upfront cost, the monthly cost will be the same or lower and long-term cost will be lower.</li> <li>• An excerpt from a local seasoned HVAC contractor: "Back in 1995 the local utility was known as CP&amp;L at that time and later consolidated under what is currently Duke - Progress. They had a 2-day class The class also addressed common misperceptions about Heat Pumps and how the 'newer' ones (at this time comparing back to a model from the early 80's) were better, more improved and why, doing load j calculations, and the utility's grassroot efforts. at this time, they were offering a Heat Pump loan to the consumer at 6% financing, 5-year term and the bill would be added to the customer's electric bill - Get a</li> </ul>

		<p>new system and have a positive cash flow as a result.... sold a TON of Heat Pumps.”</p> <p>This program financially benefited all parties – the customer, the HVAC contractors, the manufacturers, and the utility in financial and other ways.</p>
<b>Additional Resources and Support Needed</b>		<ul style="list-style-type: none"> <li>• Newer Heat Pumps can be more difficult to install. For the higher efficient models, the setups can be more tedious, finicky, and ultimately confusing to an undertrained installer. Training for installers is needed.</li> <li>• It is also important to understand how building codes will evolve in the future as localities promote and move towards electrification Contractors are programmed and conditioned to be satisfied with meeting the current and existing codes.</li> <li>• More and more studies are coming out showing the negative health effects of gas combustion in homes. This information should be shared more broadly so to be widely accepted and understood.</li> </ul> <p>We need to know:</p> <ul style="list-style-type: none"> <li>• How can we get more HVAC contractors be amenable to handing out a flier created by GBA/BHP of why/how this makes financial sense?</li> <li>• Understand how IRA will implement its programs</li> </ul>

#### **Initiative 6: Moderate income energy upgrades and consultations**

**Description:** Promoting IRA and Duke Smart Saver rebates, Home Energy House calls Home Energy Chats, customer experience for homeowners, A tool like NYSERDA (<https://www.nyserda.ny.gov/All-Programs/home-energy-efficiency-upgrades>) would be ideal, or even a worksheet on paper like Rewiring America last page of this doc (<https://content.rewiringamerica.org/reports/Rewiring%20America%20Go%20Electric%20Digital%20Guide.pdf>). This is shifting a live resource (Home Energy Chats) to a static, or self-direct resource (online tool, worksheet) to help people decide “what next” on their renewable energy personal journey.

**Phase 1 Analysis: Initiative Ranking**

<b><u>Analysis Area</u></b>	<b><u>Favorability Ranking (Low, Medium, or High)</u></b>	<b><u>Description of how/why action initiative received the ranking given</u></b>
<b>Potential Feasibility</b>	<b>High</b>	This is shifting a live resource (Home Energy Chats) to a static, or self-direct resource (online tool, worksheet) to help people decide “what next” on their renewable energy personal journey. The feasibility is high because it is just an upgrade to an initiative that is currently in place.
<b>Potential Scale of Impact</b>	<b>Low</b>	This initiative is about education, community engagement and doing outreach to help people make a personal shift. While personal shifts matter, the biggest shifts are going to come from systematic, industrial, and commercial energy shifts.
<b>Potential Equity Impacts</b>	<b>Medium</b>	Moderate income households are not well represented in our current EE portfolio. They’re served by Duke Programs, but they may not know those programs even exist. This has a medium impact on equity to match the moderate income of the participants. Also, renters need more support for doing energy efficiency upgrades.
<b>Cost Vs. Benefit</b>	<b>High</b>	The costs here could be very low, but provide exceptional results to self-directed, self-funded, at-home energy improvements.

**Phase 2 Analysis: What is needed to make this initiative happen.**

<b><u>Analysis Area</u></b>	<b><u>Summary</u></b>	<b><u>Discussion</u></b>
<b>Timeline (Near-Term, Medium-Term, Long-Term, Ongoing)</b>	Near and medium term	Access to utility and low-income resources are currently available and not fully subscribed. Many IRA funding blocks haven’t been implemented yet. Feb 15 is 180 days from passage and many agencies must implement IRA programs by that date.
<b>Implementing Departments and</b>	Community agencies, local and	GBA is lead on community engagement. Duke has incentives and programs that need

<b>Partnering Organizations</b>	state governments, and contractors.	promotion. The IRA will be coming from local governments.
<b>Activities to be undertaken to support the initiative</b>	Community engagement - consumers and tradespeople	Through marketing, social media, events, etc. reach consumers. See if Duke can do a bill insert in early to mid-2023.  Reach out to tradespeople and organizations to increase participation in utility and gov't EE rebate programs for homes.
<b>Financial Costs and Benefits to the Organizations</b>	Easy addition to existing services for tradespeople.  Outreach and marketing needed.	Additional revenue streams for small business/trades people.  Long-term savings for customers.  Costs for PR and marketing for the programs.
<b>Additional Resources and Support Needed</b>	Make a tool for people to self-search what they can do right now.	Funding for an online tool and physical worksheet to help folks navigate the myriad programs available.

**Initiative 7: Work with the planning department on education for applicants (i.e., providing checklists) for new construction and major remodels.**

**Description:** Education of residents and developers for new construction and major remodels to encourage green and sustainable building practices that increase energy efficiency, money savings, and resiliency. Provide the Green Built Homes (GBH) and/or Energy Star checklist for the City and County officials to provide as a tool and resource could educate residents on what they should consider doing and facts about why they should do it. This would be an educational tool keyed to climate/buildings in WNC as well as incentives and financing options. Such a tool could be enhanced for affordable housing as well. Information provided should also include a list of relevant rebates and incentives through Duke Energy Progress and through the Inflation Reduction Act (IRA).

**Phase 1 Analysis: Initiative Ranking**

<u>Analysis Area</u>	<u>Favorability Ranking (Low, Medium, or High)</u>	<u>Description of how/why action initiative received the ranking given</u>

<b>Potential Feasibility</b>	<b>Medium</b>	The potential for providing quality information to planners and building officials to provide applicants is high. However, expectations for having the officials provide the information to applications is probably low. GBH is available for single family and multifamily projects, including affordable housing.
<b>Potential Scale of Impact</b>	<b>Medium</b>	If permit applicants receive a GBH checklist early enough in the development process it could encourage them to certify their project. Homes that meet the rating system perform on average 30% better than code-built buildings. Since new homes will be in place for 30-100 years any improvements made during construction can have long lasting benefits.
<b>Potential Equity Impacts</b>	<b>Low</b>	Affordable housing that meets GBH or Energy Star certification are cheaper to operate and maintain. The largest certifier of GBH is Habitat for Humanity. Ensuring that green housing is available for all people in all communities is essential.
<b>Cost Vs. Benefit</b>	<b>Low</b>	Low cost, potentially medium benefit.

**Phase 2 Analysis: What is needed to make this initiative happen.**

<b><u>Analysis Area</u></b>	<b><u>Summary</u></b>	<b><u>Discussion</u></b>
<b>Timeline (Near-Term, Medium-Term, Long-Term, Ongoing)</b>	Near Term	Meeting with City and County planning and building departments to discuss providing a checklist to applicants would be helpful and to list current available rebates and incentives.
<b>Implementing Departments and Partnering Organizations</b>	City of Asheville, Planning and Development. Sustainability Depts and Officers of the same.	Green Built Alliance (GBA), the implementer of Green Built Homes, will provide checklists and a list of current available rebates and incentives to planning departments and offer ongoing support if affordable housing applicants need consultation.
<b>Activities to be undertaken to</b>	Meet with planning officials. Determine if they feel	The City of Asheville is considering an expansion of its “public benefits” incentive process beyond hotels and focusing on

<b>support the initiative</b>	comfortable providing GBH and/or energy star checklists	multi-family developments. Engaging and supporting City planners early on can encourage effective implementation. This would provide incentives for developments who implement energy efficiency/electrification/renewable energy.
<b>Financial Costs and Benefits to the Organizations</b>		
<b>Additional Resources and Support Needed</b>		

**Initiative 8: Duke multifamily retrofit and DSM program.**

**Description:** Expand utilization of Duke's demand side management (DSM) programs, particularly in multifamily new construction development. Currently, participation requires landlord/owner sign-off, which creates a barrier for renters who would like to participate in this program. Participation is incentivized with an annual bill credit (up to \$75). By pre-installing Energywise devices and pre-enrolling new apartments into Energywise, the barrier to renters can be eliminated. There is currently no incentive or obligation for multifamily developers to do this.

**Phase 1 Analysis: Initiative Ranking**

<u>Analysis Area</u>	<u>Favorability Ranking (Low, Medium, or High)</u>	<u>Description of how/why action initiative received the ranking given</u>
<b>Potential Feasibility</b>	<b>High</b>	Existing Duke program (Energywise) has been piloted with multifamily developers (MHO) for both existing occupied buildings and new construction. Could easily be expanded to see greater adoption by all multifamily developers in Asheville/Buncombe.
<b>Potential Scale of Impact</b>	<b>Medium</b>	While it could have a big impact on the number of units enrolled in DSM, new apartments are generally energy efficient, so not the greatest strain on the grid during times

		of peak demand. Possibly impactful in the aggregate, but not as impactful on a per unit basis.
<b>Potential Equity Impacts</b>	<b>High</b>	Expanding use of EnergyWise among renter households would target higher numbers of BIPOC households, as well as lower income households. The associated bill credit going to renters would be a small, but positive way to help lower income and BIPOC households manage increase in electric bills as rates increase.
<b>Cost Vs. Benefit</b>	<b>High, Medium, or Low</b>	Unsure.

**Phase 2 Analysis: What is needed to make this initiative happen.**

<u>Analysis Area</u>	<u>Summary</u>	<u>Discussion</u>
<b>Timeline (Near-Term, Medium-Term, Long-Term, Ongoing)</b>	Near-Term	Would need to connect dots between Duke's program staff and City/County planning staff to see how Energywise participation can be strongly encouraged for new multifamily developments. The City of Asheville is considering an expansion of its "public benefits" incentive process beyond hotels and focusing on multi-family developments. Engaging and supporting City planners early on can encourage effective implementation. Otherwise, it is just a matter of helping boost participation in an existing Duke program.
<b>Implementing Departments and Partnering Organizations</b>	Duke Energy, Asheville Planning Dept/Development Services, Buncombe County Planning/Permit staff	Duke Energy, Asheville Planning Dept/Development Services, Buncombe County Planning/Permit staff
<b>Activities to be undertaken to support the initiative</b>	Outreach to market-rate developers to see if they even know about the existing Duke programs and assess barriers to implementation.	

<b>Financial Costs and Benefits to those involved</b>	No cost to developer, annual bill credit (\$50-\$75) to tenant paying electric bills	
<b>Additional Resources and Support Needed</b>	Unsure	

#### **Initiative 9: Duke Energy Small Business Energy Saver Program**

**Description:** Duke Energy has a Small Business Energy Saver Program that includes 3 main components:

4. A free energy assessment from an approved contractor.
5. Free recommendations for ways to improve your energy efficiency based on the assessment.
6. Duke includes turnkey installation through contractors and pays up to 80% of selected improvements upfront.

Highlight this program in our resources. Build upon it if possible.

Program info: <https://www.duke-energy.com/business/products/small-business-energy-saver>

Several case studies are shown at the bottom of the resource page, including Hi-Wire brewing: <https://desitecore10prod-cd.azureedge.net/-/media/pdfs/for-your-business/sbes-hi-wire-case-study.pdf?rev=46f99977446742b3996896e9f1004a89>

#### **Phase 1 Analysis: Initiative Ranking**

<b><u>Analysis Area</u></b>	<b><u>Favorability Ranking (Low, Medium, or High)</u></b>	<b><u>Description of how/why action initiative received the ranking given</u></b>
<b>Potential Feasibility</b>	High	This is an ongoing program that is currently offered by Duke Energy. We should seek to amplify this program in our Strategic Plan and / or discuss how it can further grow.
<b>Potential Scale of Impact</b>	Medium - High	Commercial buildings are a large chunk of building stock in the county (commercial buildings are 34% for example according to this <a href="#">resource</a> ). We have to make sure these are targeted in an effective and meaningful way. This

		program specifically targets “small business owners” so we need to understand what qualifies as a “small business” to understand the full impact opportunity.
<b>Potential Equity Impacts</b>	Medium	This program is catered towards small businesses and helps upfront the cost of energy efficient upgrades so that the expected savings have a shorter pay-back period (for example, the case study pay-back periods were 1-2 years). Can this be further expanded upon in any way? For example, are there minority owned businesses that may fall outside of “small businesses” that should be considered?
<b>Cost Vs. Benefit</b>	High	Because this is an existing program funded through Duke Energy, the costs are low from a BHP standpoint. The benefits are not revenue generating but they do help us attack the commercial buildings as part of our “embrace energy efficiency” initiative.

**Phase 2 Analysis: What is needed to make this initiative happen.**

<u>Analysis Area</u>	<u>Summary</u>	<u>Discussion</u>
<b>Timeline</b>	Near-term	The program exists; therefore we would just be highlighting this as a resource. Consider opportunities to build upon the program.
<b>Implementing Departments and Partnering Organizations</b>	Duke BHP	
<b>Activities to be undertaken to support the initiative</b>	Minimal, consider talking to the Duke Energy representative to better understand the implementation and limitations of the program	Minimal, consider talking to the Duke Energy representative to better understand the implementation and limitations of the program
<b>Financial Costs and Benefits to those involved</b>	Large financial benefits for small businesses who are eligible for Duke incentives (up to 80%).	Large financial benefits for small businesses who are eligible for Duke incentives (up to 80%).

<b>Additional Resources and Support Needed</b>	Questions for Duke: <ul style="list-style-type: none"> <li>• What qualifies as “small business”?</li> <li>• Need to better understand what “up to” 80% means.</li> </ul>	
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## Topic 5: Transportation

Links to additional resources:

[MPO plan](#)

[Land of Sky clean vehicles coalition.](#)

Transportation is the largest source of greenhouse gasses in North Carolina. For most individuals and households, purchasing a car or getting from place to place is their second largest expenditure, and often exceed the carbon footprint of their home. Many businesses have large fleets of vehicles and the huge burdens of vehicle cost and the fuel and maintenance.

These cost in carbon and financially give us great opportunity to see real changes quickly. Electrify fleets, developing vehicle miles traveled reduction plans, and building infrastructure that is both denser and providing sidewalks and bike paths are all strategies that will help the BHP meet the 2042 goal of 100% clean fuel.

### Initiatives:

1. Electrification of Public Transit for buses, small vans, etc.
2. Push for more EV adoption, both personal and business
3. Promote expanded EV charging infrastructure
4. Reduce Vehicle Miles Traveled (VMT) Per Capita
5. Increase Trips of Walking and Biking

### Initiative 1: Electrification of Public Transit for buses, small vans, etc.

**Description:** Build a compelling cost-benefit analysis, perhaps with incentives, to persuade conversion of fleets to EVs. Leverage efforts and results from cities/counties across the country to make the case.

### Phase 1 Analysis: Initiative Ranking

<u>Analysis Area</u>	<u>Favorability Ranking (Low, Medium, or High)</u>	<u>Description of how/why action initiative received the ranking given</u>

<b>Potential Feasibility</b>	<b>Medium</b>	<p>ART has an existing EV program - limited to some extent by bus manufacturers and the size of EV buses (EV bus size is incompatible with some mountain roads within Buncombe County, some electric buses are too long (35') for certain routes.)</p> <p>Mountain Mobility is constrained by availability of EV options but has a plan in place to have 67% of its fleet on "alternate fuels" by 2026. Ford E-Transit and Mercedes eSprinters are now sold only in commercial cargo van configuration, not as human transport, but both could become available by 2024. Lightning Motors is another current option.</p> <p>The process of procuring buses is quite involved and is usually done so in conjunction with other municipalities.</p>
<b>Potential Scale of Impact</b>	<b>Low</b>	<p>Asheville and Buncombe County are, by and large, poorly configured for significant conversion from private vehicles to public transportation, but the political will and the region can support this to overcome difficulties. Furthermore, while increasing ridership on existing transit service lowers energy consumption and emissions, adding new transit service only lowers overall energy consumption and emissions if it reduces total passenger miles traveled enough to offset the lower efficiency (higher energy consumption and emissions per passenger mile) of transit. Essentially, ridership would need to increase enough to offset the energy it would require adding and operating additional service times and routes.</p>
<b>Potential Equity Impacts</b>	<b>High</b>	<p>Bus transit is critical to creating an equitable transportation infrastructure.</p>
<b>Cost Vs. Benefit</b>	<b>High</b>	<p>The Inflation Reduction Act provides tax and rebate incentives, along with other potential grants.</p> <p>EV initial price differential is proving to be far outweighed by lower cost of operation and maintenance.</p> <p>Financial Benefit is Medium to High, Environmental benefit is dependent on ridership. High ridership = High benefit. Low</p>

		ridership = low benefit. Buncombe County has relatively low ridership  Equity Benefits are High due to increased air quality. If transit is used in conjunction with density, that is ideal for all benefits.
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**Phase 2 Analysis: What is needed to make this initiative happen.**

<u>Analysis Area</u>	<u>Summary</u>	<u>Discussion</u>
<b>Timeline (Near-Term, Medium-Term, Long-Term, Ongoing)</b>	Near term	Near term (2024) for eSprinter vans. These may be available before 2024 and Mountain Mobility might be very interested, however, they require extra hardware installed. Mountain Mobility may be subject to Buncombe County fleet requirements and might have telematics.  Many of the buses will need to be replaced in the near future anyways, so replacing them with electric buses during that time would be ideal.
<b>Implementing Departments and Partnering Organizations</b>	ART Mountain Mobility Local cabbies? Other region's transportation departments	Other regions need to be buying buses at the same time, as the process is very involved and often requires bulk purchases from multiple regions at once.
<b>Activities to be undertaken to support the initiative</b>		
<b>Financial Costs and Benefits to those involved</b>	High	The financial Benefit to City of Asheville and Buncombe County is High due to lower operational costs for EV transit as well as improved air quality for local residents.
<b>Additional Resources and Support Needed</b>		<a href="http://www.electrifyfleet.org/fleet_roadmap">www.electrifyfleet.org/fleet_roadmap</a> <a href="https://lightningemotors.com/lightningelectric-class4-shuttle/">https://lightningemotors.com/lightningelectric-class4-shuttle/</a>

		Other regions need to be buying buses at the same time, as the process is very involved and often requires bulk purchases from multiple regions at once.
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#### **Initiative 2: Push for more EV adoption, both personal and business**

**Description:** The switch from internal combustion engines (ICE) to electric vehicles (EVs) is a giant leap for most vehicle buyers, involving many factors, among them being a simple lack of awareness of what the change will mean to their lives and the resulting benefits. Elevating awareness among the driving public will contribute to increased adoption, including delivery companies - especially those with pre-existing solar.

#### **Phase 1 Analysis: Initiative Ranking**

<u>Analysis Area</u>	<u>Favorability Ranking (Low, Medium, or High)</u>	<u>Description of how/why action initiative received the ranking given</u>
<b>Potential Feasibility</b>	<b>High</b>	Lack of awareness of the capabilities of EVs is often one of key difficulties in adoption. BHP and the LOS CVC can create good case studies about the EVs and the newest models as they become available. The economics for ownership makes a strong case for purchasing once the decision is made.
<b>Potential Scale of Impact</b>	<b>High</b>	Business and government fleets are a great place to start and show success. Often vehicle fleets have better resilience when difficulties happen. EV fleets are also mostly immune from the periodic fuel shortage experienced in the mountains of North Carolina. EV also fit fleet use very well.
<b>Potential Equity Impacts</b>	<b>Medium</b>	There currently exist several obstacles for low-income folks to adopt EVs -such as high EV purchase prices and limited current charging infrastructure for non-homeowners. However, used EVs are available, as well as IRA incentives, and future increased charging infrastructure. People who rent will have difficult charging where they live.
<b>Cost Vs. Benefit</b>	<b>Low</b>	Lots of effort for outreach with low benefit. However, it does expand geometrically, one person converts 2, converts 4, etc.

**Phase 2 Analysis: What is needed to make this initiative happen.**

<b><u>Analysis Area</u></b>	<b><u>Summary</u></b>	<b><u>Discussion</u></b>
<b>Timeline (Near-Term, Medium-Term, Long-Term, Ongoing)</b>	Near term and ongoing	Increase awareness. In some places this threshold (for mass awareness of the benefits of EVs) has been crossed, and in others it has yet to be crossed. The efforts will need to be continuing as EVs enter new vehicle markets and the possibility of purchasing used EVs expands.
<b>Implementing Departments and Partnering Organizations</b>	LOSCVC MPO EV owners' groups Plug in NC	
<b>Activities to be undertaken to support the initiative</b>	Continue/Increase support for existing organizations	Continuing to support the Blue Ridge EV club. Western Carolina Tesla club. Continue/increase support of LOSCVC.  It would be great if ESN's next vehicle were an electric van.  Get testimonial from Jackie Hamstead about the Buncombe County process of fleet electrification to share with others and to help figure out a path forward.
<b>Financial Costs and Benefits to the Organizations</b>	IRA \$  Local business cases on financial benefits	IRA incentives for local governments and non-tax entities.  Using Dynamite roaster's model as a financial argument to share with other businesses.
<b>Additional Resources and Support Needed</b>		Educate residents/businesses to be EV ready.  Potential program for dealerships to lease vehicles and claim tax credit...  Could we do anything to increase EVs/hybrids sent to our region? Bulk purchases?

		<b>BHPCC/transportation committee work with Green Bank to help finance (with IRA incentives)</b>
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**Initiative 3: Promote expanded EV charging infrastructure.**

**Description:** In addition to cost and unfamiliarity, much of the resistance to switching to EVs is founded in the perceived lack of charging infrastructure. Continuing to promote expansion of that infrastructure is critical to acceptance.

**Phase 1 Analysis: Initiative Ranking**

<u>Analysis Area</u>	<u>Favorability Ranking (Low, Medium, or High)</u>	<u>Description of how/why action initiative received the ranking given</u>
<b>Potential Feasibility</b>	<b>High</b>	<ol style="list-style-type: none"> <li>1. “Perceived” is the operative word here. DC fast charging infrastructure is already in place to enable convenient road trips most anywhere in the country with all three plug types (Tesla, CCS, and CHAdeMO). Tesla and CCS installations are expanding at an extremely rapid rate (CHAdeMO will most likely languish now that Nissan is moving to CCS). The primary real need right now is for Level 2 charging in workplaces and multifamily residential developments, to enable convenient charging for people who don’t own their own homes.</li> <li>2. Now that the cars are becoming much more widespread, education can easily correct the misperceptions, and multifamily developers will soon be seeing increased demand from potential tenants.</li> <li>3. BHP can assist and acknowledge landlords and rental companies for providing EV charging infrastructure in rental units.</li> </ol>
<b>Potential Scale of Impact</b>	<b>Medium</b>	With societal (and auto industry) momentum already tilting toward EVs, homeowners are very likely to electrify regardless of our involvement. On the other hand, our advocacy for workplace and multifamily L2 charging could significantly speed up adoption among the 1/3 of the population that rents.

<b>Potential Equity Impacts</b>	<b>High</b>	EVs provide significant operational cost savings to their owners. Used EVs (especially the short-range models) can be purchased at significant discounts to new ones. New car depreciation is one of the only places in society where trickledown economics works. Regardless of range, EVs are an effective option only for people with convenient, reliable L2 charging (or the ability to use L1 charging for 8-12 hours per day on a near-daily basis).
<b>Cost Vs. Benefit</b>	<b>High</b>	This is all about the networking (people to people, not chargers to the cloud); hence, very low cost for a substantial benefit.

**Phase 2 Analysis: What is needed to make this initiative happen.**

<u><b>Analysis Area</b></u>	<u><b>Summary</b></u>	<u><b>Discussion</b></u>
<b>Timeline (Near-Term, Medium-Term, Long-Term, Ongoing)</b>	Near- to Medium-Term	<p>Near-term: continuation of EV familiarization and demonstration activities will help to continue the rapid transition of the vehicle market. Given the present rate of adoption, it won't be needed for long.</p> <p>Continuing near- and medium-term outreach to workplaces and multifamily developers will significantly speed up that aspect of infrastructure development.</p> <p>Develop a recognition and reward program, perhaps a list of rental properties that allow/encourage EV ownership</p>
<b>Implementing Departments and Partnering Organizations</b>	Electrify America ChargePoint Blink Tesla Blue Ridge EV Club, Land of Sky Clean Vehicles Coalition NCDOT-NEVI Program	<p>NCDOT is about to publish its NC Clean Transportation Plan under the NEVI [National EV Infrastructure] Program. North Carolina expects to receive up to \$109 million to build out EV infrastructure along its approved corridors.</p> <p><a href="https://www.ncdot.gov/initiatives-policies/environmental/climate-change/Pages/clean-transportation-plan.aspx">https://www.ncdot.gov/initiatives-policies/environmental/climate-change/Pages/clean-transportation-plan.aspx</a></p>

<b>Activities to be undertaken to support the initiative</b>	Near-term and Ongoing	<p>Dig into what Raleigh is doing, since it seems that they are somehow mandating EV charging infrastructure for new development, despite it being above/different what NC code requires.</p> <p>Promote and support: National Drive Electric Week, Drive Electric Earth Day, and similar events</p> <p>Blue Horizons outreach to workplaces and multifamily housing developers</p> <p>Determine how BHP can piggy-back on the NC Clean Transportation Plan</p>
<b>Financial Costs and Benefits to the Organizations</b>		
<b>Additional Resources and Support Needed</b>	<p>People willing to get out in the community and talk about the change,</p> <p>City/county policies to incent/mandate (see link to Salt Lake City efforts)</p>	<p><a href="https://www.ksl.com/article/50550369/salt-lake-city-mulls-major-change-to-electric-vehicle-infrastructure-policy">https://www.ksl.com/article/50550369/salt-lake-city-mulls-major-change-to-electric-vehicle-infrastructure-policy</a></p>

#### Initiative 4: Reduce Vehicle Miles Traveled (VMT) Per Capita

**Description:** The Blue Horizons Project seeks to accomplish its goals through three mechanisms: emphasizing efficiency, electrifying everything, and greening the grid. Improved transportation efficiency rests on three pillars: 1) reduced demand for motorized travel (fewer passenger miles traveled); 2) more effective use of motor vehicles when they are deployed (increased load factor); and 3) improved vehicle energy efficiency (watt-hours/mile). VMT per capita captures many aspects of the first two pillars in a single metric.

#### Phase 1 Analysis: Initiative Ranking

<u>Analysis Area</u>	<u>Favorability Ranking (Low,</u>	<u>Description of how/why action initiative received the ranking given</u>
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	<b><u>Medium, or High</u></b>	
<b>Potential Feasibility</b>	<b>Low -Medium</b>	<p>The most effective way to reduce VMT per capita would be to encourage more development in more established, urban areas (Downtown Asheville, N Asheville, W Asheville, Black Mtn, Weaverville, some others) as reflected in the <a href="#">French Broad River Metropolitan Planning Organization (FBR MPO) Land Use Study (2019)</a> and the <a href="#">NCDOT VMT Reduction Study (2021)</a></p> <p>Is it possible to link additional infrastructure to outlying areas with an increased commitment to busses/van/ vanpools and other transportation demand programs to help minimize the effect of people commuting into Asheville for work. This would really need to come from Duke, MSD, County, City, and water resources – but the effect is possibly high (not as high as focusing on density and urban villages).</p>
<b>Potential Scale of Impact</b>	High	Reducing VMT would be beneficial by helping to reduce energy demand as well as other pollutants, such as particulate matter. Demand for roadway widening would be reduced as well.
<b>Potential Equity Impacts</b>	High	Reducing vehicle pollutants would improve air quality, especially in neighborhoods closer to interstates.
<b>Cost Vs. Benefit</b>	High	The changes would be primarily to local land use policies.

**Phase 2 Analysis: What is needed to make this initiative happen.**

<b><u>Analysis Area</u></b>	<b><u>Summary</u></b>	<b><u>Discussion</u></b>
<b>Timeline (Near-Term, Medium-Term, Long-Term, Ongoing)</b>	Medium Term, Ongoing	<p>Upzone and allow greater development by-right in more of the region's city centers.</p> <p>Creating policies and savings for employees to carpool, vanpool, or telecommute will have the double benefit of reducing VMT and providing additional parking spaces for customers.</p> <p>Business and governments who prioritize</p>

		telecommuting when possible can significantly reduce VMT (although telecommuting's primary benefit is reducing peak-hour demand).
<b>Implementing Departments and Partnering Organizations</b>	Local Govs, FBRMPO, NCDOT, ConnectBuncombe.org Bicycle-share programs?	Buncombe County has tracked the VMT reduction during the pandemic and continued VMT reductions through their telecommuting policy. Creating draft policies and statements about both the savings and highlighting that increased effectiveness of staff would help reduce VMT. All efforts to create and promote pedestrian, bicycle, group commuting, ride-share services, et.al.
<b>Activities to be undertaken to support the initiative</b>		Promote "Missing-middle development" regulations which allow for more density on a smaller land footprint, which decreases the cost per inhabitant. It also encourages denser, less car-dependent architecture. Ref: <a href="https://carolinaforward.org/blog/housing-bill-nc-needs/">https://carolinaforward.org/blog/housing-bill-nc-needs/</a>  Identify and support vehicle-use reduction programs
<b>Financial Costs and Benefits to the Organizations</b>		
<b>Additional Resources and Support Needed</b>		

#### **Initiative 5: Increase Trips of Walking and Biking**

**Description:** Transportation planning and decisions have historically minimized both the realities and potential of biking and walking to get to work, play, and school. Replacing trips in cars with sport shoes and pedals can have a dramatic effect on clean energy and carbon goals and can save individuals huge amounts of money in fuel, parking, and car ownership – the second largest expenditure item in most budgets. The difficulties cut across all energy goals. Do

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people live close to work? Is walking or biking safe, and what can be done to make it safer? Are there resources available to fill the gaps in need.

Asheville Buncombe needs to embrace pedestrians and cyclist commuting by adding greenways and bike paths on the arteries from where people live to downtown and other centers of work. Supporting high density housing on the existing and planned commuting paths is vital. There are financial rewards for both those who commute without a car and the businesses who employ the green commuters. It will take comprehensive planning building now to make these pathways possible in the future. Additionally, supporting these behaviors with a bus system will make both more successful.

#### Phase 1 Analysis: Initiative Ranking

<u>Analysis Area</u>	<u>Favorability Ranking (Low, Medium, or High)</u>	<u>Description of how/why action initiative received the ranking given</u>
<b>Potential Feasibility</b>	<b>Medium -High</b>	The region has relatively little bicycle and pedestrian infrastructure and a relatively low share of bike/ped trips (by some measures (i.e. a shared bicycle systems such as Blue Bikes that goes hand in hand with bus transit on major routes such as Downtown to Arden via Biltmore Ave)) meaning increasing infrastructure could help to increase the number of bike/ped trips. Given a “High” potential feasibility ranking because the percentage of trips by walking and biking is relatively low, even in more densely populated areas. Current infrastructure is also relatively low compared to like-sized cities. Lots of improvements are on the way; creating more opportunities therefore, trips are only likely to increase.
<b>Potential Scale of Impact</b>	<b>High</b>	More trips by walking and biking would help to reduce energy demand across the county.
<b>Potential Equity Impacts</b>	<b>High</b>	Improving bicycle and pedestrian infrastructure could reduce bike/ped fatalities and injuries, which disproportionately impact minority and low-income residents.
<b>Cost Vs. Benefit</b>	<b>Medium</b>	Bike/Ped infrastructure can be expensive (Haw Creek and Johnston Road sidewalk projects are coming in at approximately \$3 million per mile) but new greenways are averaging roughly 8k-12k trips/week.

**Phase 2 Analysis: What is needed to make this initiative happen.**

<b><u>Analysis Area</u></b>	<b><u>Summary</u></b>	<b><u>Discussion</u></b>
<b>Timeline (Near-Term, Medium-Term, Long-Term, Ongoing)</b>	Ongoing	The pathway to support car free commuting needs to be ingrained into the planning process – adding access and resources as new residential and commercial properties are approved, when roads are built, or renovated sidewalks and bike paths need to be added – in case where this is not possible greenways and other paths need to be planned and built.
<b>Implementing Departments and Partnering Organizations</b>	Local Govs, FBRMPO, NCDOT, ConnectBuncombe.org Bicycle-share programs?	All efforts to create and promote pedestrian, bicycle, group commuting, ride-share services, et.al.  Local Govs, FBRMPO, NCDOT, ConnectBuncombe.org, Asheville on Bikes, Blue Ridge Bike Club, Bike rental services, bicycle-share programs, possible an Environmental Justice lens can be helpful.
<b>Activities to be undertaken to support the initiative</b>		Develop policies based on best practices and research that incorporate bike and pedestrian infrastructure into building the clean energy city of the future. These policies and research tools can be used to leverage funds as grants become available and money from the NC DOT- FHA funds become available lie the STP-Direct Apportionment finds. also Identify and support vehicle-use reduction programs
<b>Financial Costs and Benefits to the Organizations</b>		Building bike and pedestrian infrastructure is expensive – not as expensive as the roads which are competing for the same funds. It is difficult to acquire funds when most homes and buildings also need vehicle access.
<b>Additional Resources and Support Needed</b>		It might be helpful to have a public commitment pledge or bike pedestrian efficiency formula to help provide data that shows the infrastructure will be used.



## Feedback on BHP's 100% Strategic Plan

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Below is big-picture feedback. See the annotated PDF for additional comments. This does not include feedback on the equity-related content or policy section since those are under review/ development.

- Structure document to be more reader-friendly:
  - Images and figures: All should be labeled, captioned, high resolution, relevant, and clearly illustrate a concept.
  - Needs a unifying voice.
    - Different authors use different tones, tenses, formatting, and styles.
    - There is an inconsistent interpretation of ranking criteria, particularly cost-benefit.
    - The level of detail varies considerably across sections.
  - Dozens of spelling, formatting, syntax, and grammatical errors. Use of capital letters is often incorrect or inconsistent.
  - The document shifts from first person to third person voice. A third-person voice is more standard for a technical document.
  - **Be more concise**. Information is repetitive. Key points are buried under extra verbiage.
- Data
  - Information should be fact-checked and claims need to be supported by data. (i.e. “most rural farming communities are low-income”.)
  - Any research, data, or other’s ideas need to be properly cited.
  - Data and claims should be locally relevant if you are using it to support feasibility of an initiative in Buncombe County (i.e. stats on agrivoltaics)
  - The discussion around dealing with data challenges (pg 15) is problematic. Stating, “despite a lack of data in many essential areas, we did the best we could...” leaves the reader unsure of how they should interpret your findings.
- Executive Summary:
  - Exact phrasing from other parts of the document have been copied and pasted into this section. Those ideas should be concisely summarized in this section.
  - Some of this section reads more like background context than a high-level summary (i.e. details from the Cadmus report).
- Part One: Plan Process
  - Consider retitling this section “Introduction” and putting all essential background information here.
  - Describing a collaborative process as a “limitation”, a “cause of delay”, and “cause of less precise or focused” findings is problematic, particularly as you lead into a section on equity. Properly planned and executed collaboration should do none of those things.
- Part Two: Key Findings:
  - It is unclear what the goal of this section is and how those goals differ from the Executive Summary.
  - This section feels out of sequence. Consider moving to the end of the document and combining with Part 6.
  - There are 4 pages of bullet points with no subheadings which makes it difficult to follow. Consider organizing the bullets by themes.

- There is a lot of content with limited value because it either states the obvious or is redundant.
- Part Three: A Whole Systems Approach to 100% Renewable Energy
  - The grouping of the topics isn't intuitive (i.e. grouping residential with commercial but separating low-income and grouping industrial with aviation.) The offered explanation of "they naturally fell into categories/ topics" doesn't provide any actual support for this decision.
  - There is no discussion in the main document around how ranking criteria (feasibility, scalability, equity, cost/ benefit) are defined or justification for a given ranking. This is critical to the value of the ranking system.
  - Some of the initiative descriptions read like general definitions while others read like recommendations/ action items.
  - Separating ESN into 3 initiatives is confusing and is inconsistent with how other initiatives are formatted.
  - If the goal of the section is to guide the decision making, the recommendations and targets need to be more specific. For example:
    - "Promote expanded EV charging infrastructure" is too broad to be of value. Offer guidance that would help set priorities for action: Where (residential, tourist attractions, rural areas, underserved communities)? What type (level-2, DCFC)? How (incentives, education, policy)? What are the targets (i.e. 50% increase by 2025)?
    - Multiple solutions are buried under the Better Buildings Challenge (lighting, data management, wastewater energy, solar, ground source heating/ cooling, etc). Discuss which strategies make the most sense for Buncombe County.
  - The Community Engagement Section has a different tone and seems to target a different audience. All the initiatives listed here are internal to BHP unlike the rest of the document.
- Part Four: Our Current Situation
  - This would be valuable for the reader to see prior to section 3.
  - Remove specific references (i.e. the Pathways) to the Cadmus report. Don't assume the reader is familiar with that.
  - The subheading "Successes of BHP Initiatives to Date" mostly lists work done outside of BHP.
  - Having a highly specific yet incomplete list is misleading. Think about the goals of this section and consider summarizing or highlighting a few key successes that help tell the story you want to tell.
  - You've chosen to organize into "complete", "ongoing", and "policy" but there is overlap among those categories. Consider reorganizing.
- Part Five: Technical Strategy
  - It is unclear what the goal of this section is and what the key takeaways should be for the reader.
  - It is stated that the analysis is "partially-based" on methodology established by Dr. Jacobson. However it doesn't explain by whom, how, or why the methodology was adapted.

- There is a lot of uncited data and uncited claims in this section.
- Part Six: Next Steps for Success
  - The Plan recommends that all initiatives with a high ranking for equity be put into action regardless of feasibility and cost analysis. Can you explain why you think this is best practice?
  - The plan recommends “focusing energy and resources on initiatives that are highly ranked overall and have a high equity ranking”. Under this methodology, you are double-counting equity because equity is also reflected in the overall rank.
  - The tables in the section are repetitive and difficult to follow. Reformat.
  - This is the final section of the plan. It ends with a bullet point about private donors. The document would benefit from a conclusion.
- Appendix C: Many of the parameters detailed here are important context that should be summarized in the main body of the document (i.e. geographic scope of the plan, recommendation to review data annually, how % renewable goal will be calculated).
- Appendix D: Discussion around feasibility, impacts, potential partnerships for the proposed initiatives is important context for the main body of the document. Summarize key points and use a consistent level of detail for each initiative description/ analysis.

