



**TOWN OF BOONE
SUSTAINABILITY, ECONOMICS AND ENVIRONMENT COMMITTEE
MEETING AGENDA**

The Sustainability, Economics and Environment Committee will meet on **Thursday, January 10, 2019 at 5:30 p.m.** in the Council Chambers located at 1500 Blowing Rock Road. The following items will be on the agenda:

- 1. Call to Order**
- 2. Adoption of Agenda**
- 3. Approval of Meeting Minutes**
 - December 13, 2018
- 4. Election of Officers**
- 5. Discussion of the Energy Action Plan**
- 6. Other Matters by Commission Members or Staff**
 - Set agenda for next meeting
- 7. Adjournment**

**TOWN OF BOONE
BOONE TOWN COUNCIL AND THE BOONE SUSTAINABILITY, ECONOMICS AND
ENVIRONMENT COMMITTEE JOINT MEETING
THURSDAY, DECEMBER 13, 2018
5:30 P.M.**

Council Members Present:	Loretta Clawson – Mayor Pro Tem, Lynne Mason, Connie Ulmer, Sam Furguele and Marshall Ashcraft
Members Present:	Chairperson Quint David, Vice-Chairperson Harvard Ayers, Benjamin Scarboro, Nicolas Stover, Lee Ball and Nancy LaPlaca
Staff Members Present:	Jane Shook – Director of Planning & Inspections, Marty Little – Planner and Marlene Crosby-Committee Secretary

Call to Order

Mayor Pro-Tem Loretta Clawson called to order the joint-meeting of the Boone Town Council and the Boone Sustainability, Economics and Environment committee, held in the Town Council Chambers Room located at 1500 Blowing Rock Road at 5:39 p.m.

Adoption of Agenda

Member Scarboro made a motion, seconded by Member Ball to approve the agenda as written.

Vote:

Aye – All

Nay – None

The motion passed.

Approval of Minutes

Vice-Chairperson Ayers made a motion, seconded by Member Scarboro to approve the November 8, 2018 meeting minutes as written.

Vote:

Aye – (Ayers, David, Prickett, Scarboro)

Nay – None

Abstain – (Ball, Stover)

The motion passed.

Discussion of the Energy Action Plan

Chairperson David began discussion on the energy action plan. He said the Sustainability, Economics and Environment committee have been following the EPA community energy strategic plan book. He said the Town is in stage seven of the strategic plan which is identifying financing, and now they can create a proposed implementation timeline and final plan.

Chairperson David noted that at the SEEC meeting in October of 2018, Mr. Ed Miller, General Manager of New River Light and Power, gave a presentation on the proposed solar project on Blowing Rock Road, which included using partnership opportunities that could help the Town achieve their solar goals. Chairperson David noted that it would be a good thing to consider other financing options that might save tax payer dollars. Chairperson David noted that the Town of Boone has set a goal to have 100 percent clean energy by 2050. Discussion was held later in this meeting regarding whether the goal date should be 2030 or 2050.

Member LaPlaca arrived at the meeting at approximately 5:45 p.m.

Mr. John Ward, Boone Town Manager, began his presentation on the Council-approved recommendation from the SEEC regarding Staff and the Town Manager working on budget numbers for the potential local solar project with Appalachian State University, Watauga County and NTE, a vendor for solar power. Mr. Ward said he has prepared some budget numbers for Council's review.

Mr. Ward explained that if the Town can move forward fairly quickly in the beginning of the New Year 2019, along with locking in the price and the commitment on behalf of the Town of Boone, he said he is fairly certain there could be movement in constructing the community solar facility.

Mr. Ward explained that the new community solar facility would initially create 200 KW of power that is expandable to 500 KW of power (permanently attached). He said the 200 KW solar garden would generate 300 KW hours. It would be about 700 solar panels on two acres for the maximum site. It would be a 250 percent increase in everything at ASU and the Town of Boone currently.

Mr. Ward said in order for NTE to construct said facility, the Town would need to purchase the solar power that is generated from it. He said it is a 20-year commitment. He said if the Town commits to the 200 KW hours, there is a potential to get NTE to go ahead with the most cost-efficient method of potentially constructing the entire 500 KW at one time. He said it depends on what the Town is willing to commit to. Mr. Ward said by purchasing of solar power, it would move the Town further ahead with their solar goals. He said we can offset right under 300,000 KW between 12 and 15 thousand per year which would be a supplement for existing energy costs. He noted there is a possibility that during the switch from Duke Power to NTE, there may be a rate reduction to further offset and make it more financially attainable.

Mr. Ward said instead of setting aside \$100,000.00 that was designated for the solar goals, we could work toward a goal of incorporating this money into the overall energy budget of the Town and still have some options for this money.

Member Furguele asked if there was an initial outlay. Mr. Ward said the main thing that would be required is the commitment from the Town.

Mr. Ward said in 2022, when New River switches over from Duke Power to NTE, the Town would be ready to start making the payment. Member Ball noted that per the contract, ASU has to own the solar garden first before it can go to the Town.

Mr. Ward explained the process for the additional solar power to become available for the community. He said there would be an option for the community to purchase green energy on their utility bills. He further explained that NTE is looking to make strides in the community about renewable energy. He said now is the time to maximize the opportunity for renewable energy. He talked about the solar garden being located in a high visibility area and the tie-in of the hydro plant removal on Payne Branch Road becoming a solar location. He said both of these solar locations will encourage the community to purchase green energy.

Member LaPlaca asked Mr. Ward what the difference is between what we are paying now and the solar cost. Mr. Ward said three and one-half cents.

Chairperson David explained that there are two electric power companies servicing the Town of Boone. The power companies are Blue Ridge Electric Membership Corporation and New River Light and Power Company. He pointed out that the Town also uses fuel and propane.

Member Furguele asked about the power usage of the Town from Blue Ridge Electric Membership Corporation. Chairperson David said that the SEEC has not come to an exact conclusion of the power usage from BREMCO at this time.

Member Furguele asked if there was a way for the entire Town operation to be served by New River Light and Power and ultimately NTE. Mr. Ward said he does not think this is a possibility because of some of the jurisdictional service areas that are in place. Mr. Ward said there are some potential options being explored at the landfill. Chairperson David said there are some community solar farms that have been built in Ashe County.

Mr. Ward explained that there is a power easement already in place at the Payne Branch Road property owned by ASU. He said the solar panel array on Blowing Rock Road would be facing the highway causing, huge publicity to encourage green energy, and would be a great educational tool. He talked about installing a digital calculator to show the public how much power is being generated along with how much carbon is being offset.

Mr. Ward explained that at the location of the solar garden on Blowing Rock Road, some of the trees would need to be removed. He said that in one of the discussions with New River Light and Power, they would do a study and replace the trees that were removed and plant them on Town property, which will offset the carbon footprint.

Member Furguele asked if there is an actual contract or memorandum of understanding with New River Light and Power initially. Mr. Ward explained that there has been a presentation at the SEEC committee meeting, then discussed in general at this joint-meeting. Mr. Ward said with approval, he and the Staff would begin working with ASU on the documents that would be the Town commitment. Mr. Ward said the documents would not come with financing up front, it would just give ASU the feeling of moving forward to solidify everything with NTE to potentially facilitate construction.

Discussion ensued on the price of solar. Mr. Ward said that his intention is to lock in the price with ASU and New River Light and Power for twenty years. Member LaPlaca talked about the price possibly escalating over time. Vice-Chairperson Ayers noted that in the future the price of solar could be half the price that it is now. Mr. Ward said for this reason, he is suggesting to phase the project. He said if it is not phased out, the Town would need to set aside \$100,000 to offset the solar costs.

Mr. Ward explained that he has formulated the numbers to where there must be an additional subsidiary added to the existing energy bill. He said this is the way that this can be generated without having a possible \$3 to \$5 million capital project to install on land that the Town does not currently have.

Discussion ensued on offsetting the energy usage in the Town of Boone. Chairperson David referred to the October 2018 presentation, he pointed out that the Town is using \$750,000 in electricity, \$173,000 on propane, \$246,000 on diesel and gas, and \$500,000 on water and wastewater plant per year. Chairperson David said in the ten years since an energy plan was first part of the 2030 plan action items, Boone has spent nearly \$10 million dollars on energy (permanently attached).

Member Ball asked if most of the propane is used for space heating. Mr. Ward said there is a combination of electric and natural gas used for space heating. Mr. Ward explained that there is a dryer for the bio-solids at the waste treatment plant that uses the propane.

Chairperson David explained that the Town budget is broken down per Town owned building. Mr. Ward said he had the Town budget put in a format that the SEEC members could do calculations.

Discussion ensued on changing the 100 percent clean energy goal end date from 2050 to 2030. Member Furguele asked Mr. Ward if this proposed change is feasible. Mr. Ward said he can make the numbers work with the caveat that the Council could be putting the pressure on themselves to raise the funds to meet the goal. Members Furguele and Ball said they were in favor of having strong goals to meet the action items of the 2030 plan.

Mr. Ward pointed out that about \$125,000 total was spent on the solar array that was constructed on Depot Street in Downtown Boone. Chairperson David said that it cost \$10.00 per

watt installed. Chairperson David noted that there is the possibility that there could be a monetary donation for solar equipment for a solar project in the Town.

Mr. Ward talked about the possibility of the Town using LEED-type construction, when constructing buildings on the Bolick property. Member Ball pointed out that LEED-type construction will be necessary when insulation is upgraded in buildings and in new construction.

Mr. Ward asked for direction from Council for him to work on the draft document to bring back before them for discussion and possible approval.

Discussion ensued on the Town hiring a person to handle Sustainable topics. Mr. Ward said the money he would spend on a person for that position could be spent on, for example, the things needed from New River Light and Power.

Member LaPlaca informed the members that when you talk about carbon, the coal use is going down, but natural gas use is going up. She said the multiplier that is being used for the CO2 equivalent is about 25x or 30x whereas the IPCC's is 86x. She noted that this information was reported in 2014. She explained that when the utility companies talk about carbon they are only talking about the carbon that is coming out of the stack.

It was the consensus of the Council members and the SEEC members for Mr. Ward to move forward with working on a draft document to formalize the process for the proposed solar garden. Mr. Ward said he will report to Mr. Miller at New River Light and Power to discuss the draft document.

Member Furguele said that he thinks the 2030 and 2050 plan years warrant more discussion. Mr. Ward offered to put this topic on the January 2019 Council agenda.

Vice-Chairperson Ayers began discussion on electric and hybrid vehicles. He said that electric vehicles are three times as efficient as gasoline. He said that he researched electric buses and he referred to a twelve-page document that was emailed to the SEEC members (permanently attached). He went to a bus company located in South Carolina called Proterra to gain information on the electric buses. He said a regular bus costs around \$450,000 and an electric bus costs about \$100,000 more. He said there is some concern that the electric buses are not as powerful as regular buses. He noted that there are leasing opportunities for the electric buses.

Vice-Chairperson Ayers began discussion on electric and hybrid cars. He went to Shelby, North Carolina to test drive an electric car. He said that 40 of 50 vehicles that need to be replaced in the Town of Boone are police cars. He said that Boone Ford can order the electric and hybrid vehicles. Mr. Ward stated that he was going to propose a hybrid vehicle for the Police Department to use as a test vehicle which would replace an older SUV. Mr. Ward said at this time the hybrid vehicle only comes in two-wheel drive and the police officers would not have been able to make it to work in deeper snows like the Town of Boone recently had. Mr. Ward noted a concern for officers who take vehicles home and how will they charge them at their

homes. Mr. Ward said that vehicle chargers would need to be added to the officer's homes to charge the vehicles which would impact the officer's electric usage.

Member Furgiuele suggested that the Council discuss creating incentives for police officers to live in the Town. He said the police officers that live in Town should be driving the electric vehicles. He talked about an exchange of vehicles. Mr. Ward said there can be an exchange of vehicles. Mr. Ward noted the Toyota Prius is now made in all wheel drive. Mr. Ward noted that the technology will catch up over time.

Chairperson David talked about the importance of solar storage. He said if you can store the power for peak times, you would not have to run the natural gas power plant.

Discussion ensued on replacing Town vehicles. Member Scarboro asked what types of vehicles that the Town currently has in its fleet. Mr. Ward named a Ford Explorer, GMC Sierra, Dodge pickup and Chevrolet Tahoe. Mr. Ward explained the use of these vehicles. Member Scarboro suggested working up what the gains would be by replacing these vehicles would be helpful. Mr. Ward agreed that this is a smart model to research. Mr. Ward talked about the Ford Fusion police package being a viable option; but you need to factor in the super charged alternator that runs the electrical equipment in the vehicle such as the computer and lighting system.

Chairperson David said he was in favor of the Town purchasing the Ford Fusion vehicle. He was in favor of reviewing each vehicle in the Town fleet and calculating the mileage and creating an estimated savings plan in fossil fuels and carbon. Mr. Ward suggested involving the Town departments to set up a game plan to get this savings information.

Vice-Chairperson Ayers noted that the cost of his vehicle charger was about \$600.00 or \$700.00. He said he can charge his Chevrolet Volt in four hours. He said every time he charges his electric vehicle, it costs \$1.50 for 15 kilowatt hours and he charges his vehicle twice a week for a total of 30 kilowatt hours and \$3.00 a week.

Mr. Ward talked about the Town's fuel and repair and maintenance budget lines being affected and he said he believes that the savings of using hybrid vehicles will help pay for the repair and maintenance of the hybrid system.

Member Ball asked Mr. Ward how many police vehicles can be purchased in the regular market. Mr. Ward explained that in the police fleet there are administrative vehicles, with the largest amount being patrol vehicles. Mr. Ward said a decision has to be made on whether to purchase a patrol vehicle that is large enough to transport or have another source to transport when needed. Mr. Ward said computer mounts and cages for K-9 units need to be factored in.

Member Ball asked about potential gas shortages in the Town and if there is a tracking mechanism in place. Mr. Ward explained that there is a tracking mechanism in place for gasoline usage for the police vehicle fleet. Mr. Ward also added that there is a reserve of gasoline in place at the Speedway stations for Town vehicles to be used for public safety.

It was the consensus of the Council and the SEEC for Mr. Ward to move forward with working on the budget numbers for the potential purchase of a Ford Fusion hybrid police vehicle.

Council Member Mason said that she would like to see an inventory of the Town vehicles. She also noted that she would like to see the departments of the Town involved in providing information on ways to save Town dollars. Member Furgiuele agreed with Council Member Mason on this topic.

Discussion ensued on electric vehicle chargers in the Town. Member Ball said that vehicle chargers are located at Legends parking lot and at the River Street parking deck both located on the University property and on Depot Street in Downtown Boone.

Mr. Ward noted that he would have some draft documents prepared for the Council and SEEC to review very soon on the proposed solar project and hybrid vehicles.

Discussion of Earth Day 2019

Chairperson David noted that Earth Day is on Monday, April 22, 2019. He suggested having Earth month and having activities every week.

Mr. Marty Little, Planner for Town of Boone, explained that there was a lack of publicity at the last Earth Day event in September of 2018. He presented to Council that if an Earth Day date could be set the publicity could begin right away for said event. Mr. Ward said in addition to Town of Boone Cultural Resources Department publicizing the event, Ms. Lane Weiss, Downtown Boone Development Coordinator could also begin to publicize the event with the Downtown Boone Development Association.

Member Furgiuele suggested the Town investing in a banner to advertise the event at the King Street level. Mr. Ward agreed with Member Furgiuele on the Town investing in a banner, he also mentioned that having the event at a time when the University population can be a part of the event. Mr. Ward suggested having Earth Day activities around a time, when there are other events going on in the Town for example during the Jones House summer concerts.

Discussion ensued on closing Depot Street between King Street and Queen Street. Ms. Jane Shook, Director of Planning and Inspections, explained that the budget for closing the street would be a lot different for Council to consider than just holding the Earth Day events at the Jones House.

Ms. Shook explained that at the last Earth Day event, there were complaints about the loudness of the band music, when trying to communicate at the event tables.

Council Member Mason suggested having the Earth Day events all month long and do a variety of sustainable things. Member Ball noted that a lot of things are happening in April of each year. Chairperson David suggested asking the Cultural Resource Department for their recommendations on the proposed date and budget for the event. Mr. Ward agreed with

Chairperson David on including the thoughts of the Cultural Resources Department for said event. Member Ball suggested the possibility of including an Earth Day event on the first Friday in April. Member Furguele was in agreement of closing the street. Council Member Mason talked about the educational component of having the event on Depot Street near the solar array and having the university solar vehicle at the event.

Mr. Ward noted that he would have some draft documents prepared for the Council and SEEC to review very soon on the proposed solar project and hybrid vehicles.

Other Matters by Committee Members or Staff

There were no other topics discussed at this meeting.

Adjournment

Mayor Pro-Tem Clawson adjourned the meeting at 7:32 p.m.

Loretta Clawson, Mayor Pro-Tem

Quint David, SEEC Chairperson

Marlene Crosby, Committee Secretary

The Boone Clean Energy Project 12-13-18

John Ward and I have begun working on the two major aspects of what the Council funded, The Boone Clean Energy Project, which began this fiscal year and will end at the end of 2030.

John has begun planning a 200-500 kW solar array to be sited on US 321 just beyond (south of) the south Town Limits. Electricity made at this highly visible PV solar site will be used by nearby Town facilities and possibly house a charging station for our electric cars. He has been working with Ed Miller of New River Light and Power, and has also made contact with NTE, our utility-to-be, replacing Duke Energy/Blue Ridge Energies on January 1, 2022.

We may be purchasing a solar system from NTE over the dozen years of the Boone Clean Energy Project. We ultimately want to produce all the electrical energy the Town needs including providing electricity to charge our electric plug-in vehicles, which will include mostly police cars and several sedans. We are hoping to purchase two Ford-Fusion-based electric hybrids, one a fully police equipped, and one a normal Ford Fusion hybrid sedan without police gear. So all of our electricity will be carbon-free solar energy by 2030 except when we use the gasoline while driving the hybrid cars.

I have been busy working on finding our electric vehicles including these two types of cars, and we even made a trip to the Proterra electric bus factory in Greenville, SC, which may be part of our efforts through Appalcart which the Town of Boone helps fund. We have also begun limited fundraising for the Boone Clean Energy Project.

The Boone Clean Energy Project

A Proposal to Transition Town of Boone Energy Use from 100% Fossil Fuels and Nuclear to 100% Clean Renewable Energy in all Energy Sectors by the End of 2030

Introduction

On December 15, 2016, The Town of Boone (Boone) approved a resolution:

“Let it be resolved that the Boone Town Council endorses the following:

Section 1. The State of North Carolina and the United States shall establish a transition from a fossil-fuel based economy to 100% clean renewable energy for an all energy sectors-based economy, by December 31, 2050, to avoid climate catastrophe, to promote job creation and economic growth, and to protect the Earth for current and future generations from climate catastrophe.”

This endorsement for “North Carolina and the United States” establishes this as an aspirational goal. Boone, the first community in our country to so endorse this resolution, thus established itself as a state and national leader in the pursuit of clean renewable energy. The next step proposed herein is for the Town of Boone to continue this national leadership by becoming one of the first communities to reach this goal on-the-ground by 2030.

Three of us put this 16-page study in spring of 2017, two Appalachian State University interns, one my intern, Jason Mask a volunteer, and one, Tyler Cook of Town of Boone, and myself. This study established the total energy that the Town used annually including electrical energy and vehicle fossil fuel energy (gasoline and diesel). This number came to 11,500 kWh.

We are proposing herein that the Town of Boone produce all energy that it uses by installing mostly solar and perhaps wind energy. By the time all the proposed changes are made to Boone’s energy system (including improvements in building efficiency, and shifting from combustion fuels to electricity for the vehicle fleet), the amount of energy capacity will be about 7.0 MW (megawatts) or 7,000 kW. We are projecting that these changes will be completed by December 31, 2030. This timing is seen by us as a goal.

Current and Future Energy Economy

Currently, Boone is served by two utilities for its electricity needs, Blue Ridge Energies and New River Light and Power (NRL&P). Blue Ridge Energies provides 2/3s of that energy and NRL&P, the other 1/3.

Blue Ridge Energies

BRE provides energy for Boone's water and sewer treatment needs. Except for limited solar installations, all BRE power comes directly from Duke Energy. Boone pays 2/3s of its current electric bill to BRE.

BRE is currently re-working their relationship with customers who produce renewable (solar or wind) energy. Currently this arrangement is on a buy-all, sell-all basis (5 cents/kWh), but this will likely change for at least the larger customer/producers to a net-meter arrangement at a rate to be established by the re-working process which is likely to be complete later in 2018. If Boone sells their renewable power (wind or solar) prior to the completion of the re-working process, it will be at the buy-all, sell-all rate. We have been in touch with Jason Lingle of BRE, and he told us recently that Boone could sell as much energy as it makes at the 5 cents/kWh rate.

New River Light & Power

NRL&P provides electrical service in the Boone corporate limits. NRL&P service is surrounded on all sides by BRE service. All of the Town of Boone power currently comes from Duke Energy through BRE. I spoke with Ed Miller (NRL&P Manager) recently and he assured me NRL&P would purchase all electrical energy that Boone anticipates producing in 2018 for 5 cents/kWh on a buy-all, sell-all basis, the same as BRE.

This will change as of January 1, 2022, when all NRL&P energy will start coming from NTE, with no further involvement with BRE or Duke Energy. Thus the rules and regulations will be those of NTE. Those arrangements are not yet established, but we understand that NTE will be considerably more involved in clean renewable energy than Duke, as they plan to make solar energy available to their customers from a 70 MW solar plant in eastern North Carolina, likely in Brunswick County near Wilmington, NC.

Major Transitions: Vehicle Fleet and Solar Energy Development

Vehicle Fleet

Boone has about 50 vehicles that we would consider for electric, all of which are combustion vehicles, as they run on gasoline and diesel, both of which emit large amounts of CO₂, a major greenhouse gas. About 40 of these vehicles are police cars. Several needed by Town staff are mostly small sedans. Transitioning to electric vehicles has three big advantages: 1) the efficiency of combustion vehicles (power to the drive wheels) is about 20%, whereas that of electric vehicles is about 60%; 2) electric vehicles will run on 100% clean renewable energy, i.e. no carbon; 3) electric vehicles are expected to have a longer life expectancy than combustion ones due to no need for an engine, i.e. no pistons, cylinders no valves, etc.

Currently, electric vehicles are more expensive than combustion. But due to the expected popularity of electric vehicles, they are expected to reach parity with combustion by about 2025. Many countries, especially in Europe, are mandating that all vehicles be electric by 2035 or 2040. Currently, electric vehicles are two-wheel-drive and are small sedans. However both Chevrolet and Ford are expecting to produce the full line of 4WD and sizes of trucks and cars by 2022. Electric hybrid police cars are coming out from Ford as this is being written

Even electric buses are surging in production—in the last few months, Los Angeles ordered 95 electric buses. One small South Carolina community, Seneca, has 100% (6) electric buses. The Town of Boone pays a part of AppalCart expenses along with Watauga County and ASU, and perhaps could encourage them to move in the electric bus direction. The only viable electric bus company in the US is Proterra, located in Greenville, SC. We visited the factory in November of this year and it's likely this company will assist us in identifying and communicating with funding sources if we purchase their product.

Solar Energy

Significant solar development will occur over the 2018 to 2030 time period. Solar energy is already a mature technology, but one can expect that significant improvements will occur over the 12 years of our Project. Efficiency of solar photovoltaic (PV) collectors are currently in the range of 15 to 20%, meaning that they convert 15-20% of the incoming sunlight to electricity. Already we are seeing collectors on the market with up to 30+% efficiencies in some of the more expensive products and a large improvement is expected soon—well within the dozen years of the Project. The average single solar panel now produces about 300+ watts, so that if

you count collectors and divide by three, you reach the approximate kW capacity of a recently-installed solar array. Soon this number will be 500 watts/collector so your divider becomes a kW for every two panels. When I bought my first rooftop collectors only six years ago here in Boone, the number was one kW for every four collectors.

Concerning price, over the six years I have owned the collectors on my roof, the price has come down from about \$3,000/kW to about \$2,000/kW—this price includes hardware plus installation—a significant reduction. But by 2025, the price may be as low as \$1,000/kW or less. This is, believe me, a huge reduction which will render the costs/kW of any fossil fuel, even natural gas, uncompetitive. In fact, many utilities such as Duke Energy, which are planning to retain their attachment to coal, natural gas, and nuclear will be left holding the bag, with what we call stranded assets in these 20th Century technologies in the rapidly changing 21st Century. One of the main reasons for this is that obviously solar does not require the purchase of fuel. The sun is free!!

Project Costs

The proposed Boone Clean Energy Project has a major plus-- it will have 12 years to reach its goal. This is especially helpful in that we will be able to take advantage of trends, including lower cost and higher efficiency in both solar energy and electric car development.

Solar first: If we priced out our need to install 7 MW of solar capacity (7,000 kW), counting on the basis of today's cost, \$2,000/kW, Boone would pay about \$12,000,000 for the solar. On the other hand, if we take the predicted 2025 cost of about \$1,000/kW, we would pay about \$7,000,000 or perhaps less over the dozen years;

EVs second: The cost savings of EVs would also be significant, but a bit harder to calculate given the long time period and the newness of the industry. Since Boone would project the cost of combustion vehicles as their needs for the future, and since electric vehicles will be equal to those costs by about 2025, over the period of the project, electric vehicle cost will be only a little more than combustion, and fuel costs for electric will be considerably less over the 12 years especially if we produce our own power. Thus one could posit no additional cost over-all for electric to actually less (a savings), dependent on the cost of gasoline and diesel. By the end of the Project, the Town would have mostly electric vehicles which would provide

for tremendous savings due to fuel cost which would be zero if, as we plan, the Town owns the collectors.

More recently, the Town has started considering the possibility of purchasing the needed solar energy from an outside source in North Carolina, potentially from New River Light and Power's utility-to-be after January 1, 2022, NTE (named after the first name initial of three children of the NTE leadership). The Town may also consider the buy-in of 5 - 7MW of capacity of the projected 70 MW unit of NTE. The installation of this project is yet several years (2 - 3) in the future, but is shaping up at this early stage of the Town's planning. John Ward has already commenced discussions with NTE, and they are supportive of our purchase of our solar system from their 70 MW system.

Outside funding of the Project

Funds exist in several places for projects such as ours. North Carolina has \$98 million from the VW "Clean Diesel Debacle" as I call it. It is unclear at this time how this money would be allocated, but since one of the highest priorities of the VW project is replacing combustion vehicles with 100% electric ones, we seem to be positively situated. This is true for buses as well as cars and trucks. The Federal Transit Authority through its consumer protection goals has a so-called Low-No program which makes grants to modernizing transportation concerns such as ours. North Carolina Governor Roy Cooper has recently established Executive Order 80 which encourages just such changes as we plan to make in developing clean renewables, and replacing combustion vehicles with electric ones. In fact I am talking with Mr. Cooper's Energy Assistant, Jeremy Tarr, about just what kinds of encouragement the EO 80 will offer to projects such as ours.

Project Scheduling

We have not yet had an opportunity to look at where we will install the Project solar panels if we build our own. We will be looking at Boone-owned buildings to see how best we can do rooftop, at parking lots for canopies on Boone lots and perhaps other large lots belonging to commercial and Appalachian State University and Caldwell Community College locations. Whenever Boone builds new facilities, e.g., on the Bolick property, we should have solar included on rooftops and other related locations (parking lot canopies, ground locations). The new buildings and

parking lots should be designed to maximize solar exposure. Many of the decisions on locating the solar panels will be made the first year or two of the Project which is starting now.

The First Year

As we begin on a 12 year effort to start the change that will lead to the world's energy system of the future, i.e. the building of a renewable energy system based on our local resources like solar and perhaps wind, we all know that if one changes an important part of human endeavors, it will affect others in significant ways. One of the most important ways is that the ability to produce clean renewable energy will make possible a means of revolutionizing our transportation system, namely shifting from polluting and climate- change- exacerbating fossil fuels such as gasoline and diesel to electric.

The change from utility grid power to renewable sun- and wind-powered electricity is the basis of our ambitious Project, in fact the only such project in our state at this time of which I am aware. I will finish this proposal with several specific suggestions. I would expect this little list to generate evaluation of its ideas, and perhaps lead to other ideas both of how we do it, and what else we could do that the Boone Council and staff might like to propose. I want to make it clear that we on the Boone Sustainability Committee look to you, the Boone Council and staff as our partners, for ideas of related aspects of this project we might want to consider.

*** Begin building a renewable energy system of solar and perhaps wind that will provide electric power for all the Town's needs, including to empower an electric transportation system for the Town's approximately 40 police vehicles plus other vehicles and small trucks, and perhaps for electric buses.

*** Include a well-designed plan to utilize as appropriate solar sites from available existing Town rooftops, to plans from the ground up for any planned Town buildings such as those on the old Bolick property, parking lot covers, and ground-based solar. We hope to install a 200 to 500 kW solar array in or near the Town limits on U.S. 321 S so as to make a good splash of about 500 (200 kW) to 1500 (500 kW) collectors in this highly visible location.

*** Begin during this fiscal year or as soon as possible to purchase electric vehicles. Include the development of a three-five year plan to purchase these vehicles, and install solar charging stations at appropriate locations.

For this year, I am delighted that we have \$100,000 approved for the project for this fiscal year. Based on recent discussion of the Sustainability Committee, we need to develop a plan that can follow the above suggestions, basically to set an inventory of the potential sites for solar installation, carefully consider and investigate the bulk purchase of an electric system from our new utility of 2022, and a three-to-five-year plan for purchase of electric vehicles.

Respectively Submitted,

Dr. Harvard Ayers, Professor Emeritus of Anthropology and Sustainability
Appalachian State University

Boone has about 50 vehicles that we would consider for electric, all of which are combustion vehicles, as they run on gasoline and diesel, both of which emit large amounts of CO₂, a major greenhouse gas, as they are fossil fuels. About 40 plus of these vehicles are police cars, plus several needed by Town staff and small pickups. Transitioning to electric vehicles has three big advantages: 1) the efficiency of combustion vehicles (power to the drive wheels) is about 20%, whereas that of electric vehicles is about 60%; 2) electric vehicles run on 100% clean renewable energy, i.e. no carbon; 3) electric vehicles are expected to have a longer life expectancy than combustion ones due to no need for an engine, i.e. no pistons, cylinders no cams, etc.

Currently, electric vehicles are more expensive than combustion. But due to the expected popularity of electric vehicles, they are expected to reach parity with combustion by about 2025. Many countries, especially in Europe, are mandating that all vehicles be electric by 2035 or 2040. Currently, electric vehicles are two-wheel-drive and are small sedans. However both Chevrolet and Ford are expecting to produce the full line of 4WD and sizes of trucks and cars by 2022. Even electric buses are surging in production—in the last few months, Los Angeles ordered 95 electric buses. One small South Carolina community, Seneca, has 100% (6) electric buses. The Town of Boone pays a part of AppalCart expenses along with Watauga County and ASU, and perhaps could encourage them to move in the electric bus direction. The only viable electric bus company in the US is Proterra, located in Greenville, SC.

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Concerning price, over the six years I have owned the collectors on my roof, the price has come down from about \$3,000/kW to about \$2,000/kW—this price includes hardware plus installation—a significant reduction. But by 2025, the price may be as low as \$1,000/kW or less. This is, believe me, a huge reduction which will render the costs/kW of any fossil fuel, even natural gas, uncompetitive. In fact, many utilities such as Duke Energy, which are planning to retain their attachment to coal, natural gas, and nuclear will be left holding the bag, with what we call stranded assets in these 20th Century technologies in the rapidly changing 21st Century. One of

the main reasons for this is that obviously solar does not require the purchase of fuel. The sun is free!!

Project Costs

The proposed Boone Clean Energy Project has a major plus-- it will have 13 years to reach its goal. This is especially helpful in that we will be able to take advantage of trends, including lower cost in both solar energy and electric car development.

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EVs second: The cost savings of EVs would also be significant, but a bit harder to calculate given the long time period. Since Boone would project the cost of combustion vehicles as their needs for the future, and since electric vehicles will be equal to those costs by about 2025, over the period of the project, electric vehicles will be only a little more than combustion, and fuel costs for electric will be considerably less over the 13 years especially if we produce our own power. Thus one could posit no additional cost over-all for electric to actually less (a savings), dependent on the cost of gasoline and diesel. By the end of the project, the Town would have mostly electric vehicles which would provide for tremendous savings due to fuel cost which would be zero if, as we plan, the Town owns the collectors.

More recently, the Town has started considering the possibility of purchasing the needed solar energy from an outside source in North Carolina, potentially from New River Light and Power's utility-to-be after January 1, 2022, NTE (named after the first name initial of three children of the NTE leadership). The Town may also consider the buy-in of 5 - 7MW of capacity of the projected 70 MW unit of NTE, which is likely to be in the eastern part of our state. The installation of this project is yet several years (2 - 3) in the future, but is shaping up at this early stage of the Town's planning.

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Funds exist in several places for projects such as ours. North Carolina has \$98 million from the VW "Clean Diesel Debacle". It is unclear at this time how this money would be allocated, but since one of the highest priorities of the VW project is replacing combustion vehicles with 100% electric ones. This is true for buses as well as cars and trucks. The Federal Trade Commission through its consumer protection goals has a so-called Lo-No program which makes grants to modernizing transportation concerns such as ours.

Project Scheduling

We have not yet had an opportunity to look at where we will install the Project solar panels if we build our own. We will be looking at Boone-owned buildings to see how best we can do rooftop, at parking lots for canopies on Boone lots and perhaps other large lots belonging to commercial and ASU and Caldwell Community College locations, and ground properties. Whenever Boone builds new facilities, e.g., on the Bolick property, we should have solar included on rooftops and other related locations (parking lot canopies, ground locations). The new buildings and parking lots should be designed to maximize solar exposure. Many of the decisions on locating the solar panels will be made the first year or two of the Project which is starting now.

The First Year

As we begin on a 12 year effort to start the change that will lead to the world's energy system of the future, i.e. the building of a renewable energy system based on our local resources like solar and perhaps wind, we all know that if one changes an important part of human endeavors, it will affect others in significant ways. One of the most important ways is that the ability to produce clean renewable energy will make possible a means of revolutionizing our transportation system, namely shifting from polluting and climate- change- exacerbating fossil fuels such as gasoline and diesel to electric.

The change from utility grid power to renewable sun- and wind-powered electricity is the basis of this ambitious project, in fact the only such project in our state at this time of which I am aware. I will finish this proposal with several specific suggestions. I would expect this little list to generate evaluation of its ideas, and perhaps lead to other ideas both of how we do it

and what else we could do that the Boone Council and staff might like to propose. I want to make it clear that we on the Boone Sustainability Committee look to you Boone Council and staff as our partners, for ideas of related aspects of this project we might want to consider.

*** Begin building a renewable energy system of solar and perhaps wind that will provide electric power for all the Town's needs, including to empower a transportation system for the Town's approximately 40 police vehicles plus other cars and small trucks, and perhaps for electric buses.

*** Include a well-designed plan to utilize as appropriate all solar sites from available existing rooftops, to plans from the ground up for any planned Town buildings such as those on the old Bolick property, parking lot covers, and ground-based solar. We hope to install a 200 to 500 kW solar array in or near the Town limits on U.S. 321 S so as to make a good splash of about 500 (200 kW) to 1300 (500 kW) collectors in a highly visible location.

*** Begin during this fiscal year or as soon as possible, hopefully for this fiscal year, to purchase electric vehicles. Include the development of a three-five year plan to purchase electric vehicles, and install solar charging stations at appropriate locations.

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Respectively Submitted,

Dr. Harvard Ayers, Professor Emeritus of Anthropology and Sustainability
Appalachian State University

The Boone Clean Energy Project

A Proposal to Transition Town of Boone Energy Use from 100% Fossil Fuels and Nuclear to 100% Clean Renewable Energy in all Energy Sectors by the End of 2030

Introduction

On December 15, 2016, The Town of Boone (Boone) approved a resolution:

“Let it be resolved that the Boone Town Council endorses the following:
Section 1. The State of North-Carolina and the United States shall establish a transition from a fossil-fuel based economy to 100% clean renewable energy for an all energy sectors-based economy, by December 31, 2050, to avoid climate catastrophe, to promote job creation and economic growth, and to protect the Earth for current and future generations from climate catastrophe.”

This endorsement for “North Carolina and the United States” establishes this as an aspirational goal. Boone, the first community in our country to so endorse this resolution, thus established itself as a state and national leader in the pursuit of clean renewable energy. The next step proposed herein is for the Town of Boone to continue this national leadership by becoming one of the first communities to reach this goal on-the-ground by 2030.

Three of us put this 16-page study in spring of 2017, two Appalachian State University interns, one my intern, Jason Mask a volunteer, and one, Tyler Cook of Town of Boone, and myself. This study established the total energy that the Town used annually including electrical energy and vehicle fossil fuel energy (gasoline and diesel). This number came to 11,500 kWh.

We are proposing herein that the Town of Boone produce all energy that it uses by installing mostly solar and perhaps wind energy. By the time all the proposed changes are made to Boone’s energy system (including improvements in building efficiency, and shifting from combustion fuels to electricity for the vehicle fleet), the amount of energy capacity will be about 7.0 MW (megawatts) or 7,000 kW. We are projecting that these changes will be completed by December 31, 2030. This timing is seen by us as a goal.

Current and Future Energy Economy

Currently, Boone is served by two utilities for its electricity needs, Blue Ridge Energies and New River Light and Power (NRL&P). Blue Ridge Energies provides 2/3s of that energy and NRL&P, the other 1/3.

Blue Ridge Energies

BRE provides energy for Boone's water and sewer treatment needs. Except for limited solar installations, all BRE power comes directly from Duke Energy. Boone pays 2/3s of its current electric bill to BRE.

BRE is currently re-working their relationship with customers who produce renewable (solar or wind) energy. Currently this arrangement is on a buy-all, sell-all basis (5 cents/kWh), but this will likely change for at least the larger customer/producers to a net-meter arrangement at a rate to be established by the re-working process which is likely to be complete later in 2018. If Boone sells their renewable power (wind or solar) prior to the completion of the re-working process, it will be at the buy-all, sell-all rate. We have been in touch with Jason Lingle of BRE, and he told us recently that Boone could sell as much energy as it makes at the 5 cents/kWh rate.

New River Light & Power

NRL&P provides electrical service in the Boone corporate limits. NRL&P service is surrounded on all sides by BRE service. All of the Town of Boone power currently comes from Duke Energy through BRE. I spoke with Ed Miller (NRL&P Manager) recently and he assured me NRL&P would purchase all electrical energy that Boone anticipates producing in 2018 for 5 cents/kWh on a buy-all, sell-all basis, the same as BRE.

This will change as of January 1, 2022, when all NRL&P energy will start coming from NTE, with no further involvement with BRE or Duke Energy. Thus the rules and regulations will be those of NTE. Those arrangements are not yet established, but we understand that NTE will be considerably more involved in clean renewable energy than Duke, as they plan to make solar energy available to their customers from a 70 MW solar plant in eastern North Carolina, likely in Brunswick County near Wilmington, NC.

Major Transitions: Vehicle Fleet and Solar Energy Development

Vehicle Fleet

Boone has about 50 vehicles that we would consider for electric, all of which are combustion vehicles, as they run on gasoline and diesel, both of which emit large amounts of CO₂, a major greenhouse gas. About 40 of these vehicles are police cars. Several needed by Town staff are mostly small sedans. Transitioning to electric vehicles has three big advantages: 1) the efficiency of combustion vehicles (power to the drive wheels) is about 20%, whereas that of electric vehicles is about 60%; 2) electric vehicles will run on 100% clean renewable energy, i.e. no carbon; 3) electric vehicles are expected to have a longer life expectancy than combustion ones due to no need for an engine, i.e. no pistons, cylinders no valves, etc.

Currently, electric vehicles are more expensive than combustion. But due to the expected popularity of electric vehicles, they are expected to reach parity with combustion by about 2025. Many countries, especially in Europe, are mandating that all vehicles be electric by 2035 or 2040. Currently, electric vehicles are two-wheel-drive and are small sedans. However both Chevrolet and Ford are expecting to produce the full line of 4WD and sizes of trucks and cars by 2022. Electric hybrid police cars are coming out from Ford as this is being written

Even electric buses are surging in production—in the last few months, Los Angeles ordered 95 electric buses. One small South Carolina community, Seneca, has 100% (6) electric buses. The Town of Boone pays a part of AppalCart expenses along with Watauga County and ASU, and perhaps could encourage them to move in the electric bus direction. The only viable electric bus company in the US is Proterra, located in Greenville, SC. We visited the factory in November of this year and it's likely this company will assist us in identifying and communicating with funding sources if we purchase their product.

Solar Energy

Significant solar development will occur over the 2018 to 2030 time period. Solar energy is already a mature technology, but one can expect that significant improvements will occur over the 12 years of our Project. Efficiency of solar photovoltaic (PV) collectors are currently in the range of 15 to 20%, meaning that they convert 15-20% of the incoming sunlight to electricity. Already we are seeing collectors on the market with up to 30+% efficiencies in some of the more expensive products and a large improvement is expected soon—well within the dozen years of the Project. The average single solar panel now produces about 300+ watts, so that if

you count collectors and divide by three, you reach the approximate kW capacity of a recently-installed solar array. Soon this number will be 500 watts/collector so your divider becomes a kW for every two panels. When I bought my first rooftop collectors only six years ago here in Boone, the number was one kW for every four collectors.

Concerning price, over the six years I have owned the collectors on my roof, the price has come down from about \$3,000/kW to about \$2,000/kW—this price includes hardware plus installation—a significant reduction. But by 2025, the price may be as low as \$1,000/kW or less. This is, believe me, a huge reduction which will render the costs/kW of any fossil fuel, even natural gas, uncompetitive. In fact, many utilities such as Duke Energy, which are planning to retain their attachment to coal, natural gas, and nuclear will be left holding the bag, with what we call stranded assets in these 20th Century technologies in the rapidly changing 21st Century. One of the main reasons for this is that obviously solar does not require the purchase of fuel. The sun is free!!

Project Costs

The proposed Boone Clean Energy Project has a major plus-- it will have 12 years to reach its goal. This is especially helpful in that we will be able to take advantage of trends, including lower cost and higher efficiency in both solar energy and electric car development.

Solar first: If we priced out our need to install 7 MW of solar capacity (7,000 kW), counting on the basis of today's cost, \$2,000/kW, Boone would pay about \$12,000,000 for the solar. On the other hand, if we take the predicted 2025 cost of about \$1,000/kW, we would pay about \$7,000,000 or perhaps less over the dozen years;

EVs second: The cost savings of EVs would also be significant, but a bit harder to calculate given the long time period and the newness of the industry. Since Boone would project the cost of combustion vehicles as their needs for the future, and since electric vehicles will be equal to those costs by about 2025, over the period of the project, electric vehicle cost will be only a little more than combustion, and fuel costs for electric will be considerably less over the 12 years especially if we produce our own power. Thus one could posit no additional cost over-all for electric to actually less (a savings), dependent on the cost of gasoline and diesel. By the end of the Project, the Town would have mostly electric vehicles which would provide

for tremendous savings due to fuel cost which would be zero if, as we plan, the Town owns the collectors.

More recently, the Town has started considering the possibility of purchasing the needed solar energy from an outside source in North Carolina, potentially from New River Light and Power's utility-to-be after January 1, 2022, NTE (named after the first name initial of three children of the NTE leadership). The Town may also consider the buy-in of 5 - 7MW of capacity of the projected 70 MW unit of NTE. The installation of this project is yet several years (2 - 3) in the future, but is shaping up at this early stage of the Town's planning. John Ward has already commenced discussions with NTE, and they are supportive of our purchase of our solar system from their 70 MW system.

Outside funding of the Project

Funds exist in several places for projects such as ours. North Carolina has \$98 million from the VW "Clean Diesel Debacle" as I call it. It is unclear at this time how this money would be allocated, but since one of the highest priorities of the VW project is replacing combustion vehicles with 100% electric ones, we seem to be positively situated. This is true for buses as well as cars and trucks. The Federal Transit Authority through its consumer protection goals has a so-called Low-No program which makes grants to modernizing transportation concerns such as ours. North Carolina Governor Roy Cooper has recently established Executive Order 80 which encourages just such changes as we plan to make in developing clean renewables, and replacing combustion vehicles with electric ones. In fact I am talking with Mr. Cooper's Energy Assistant, Jeremy Tarr, about just what kinds of encouragement the EO 80 will offer to projects such as ours.

Project Scheduling

We have not yet had an opportunity to look at where we will install the Project solar panels if we build our own. We will be looking at Boone-owned buildings to see how best we can do rooftop, at parking lots for canopies on Boone lots and perhaps other large lots belonging to commercial and Appalachian State University and Caldwell Community College locations. Whenever Boone builds new facilities, e.g., on the Bolick property, we should have solar included on rooftops and other related locations (parking lot canopies, ground locations). The new buildings and

parking lots should be designed to maximize solar exposure. Many of the decisions on locating the solar panels will be made the first year or two of the Project which is starting now.

The First Year

As we begin on a 12 year effort to start the change that will lead to the world's energy system of the future, i.e. the building of a renewable energy system based on our local resources like solar and perhaps wind, we all know that if one changes an important part of human endeavors, it will affect others in significant ways. One of the most important ways is that the ability to produce clean renewable energy will make possible a means of revolutionizing our transportation system, namely shifting from polluting and climate- change- exacerbating fossil fuels such as gasoline and diesel to electric.

The change from utility grid power to renewable sun- and wind-powered electricity is the basis of our ambitious Project, in fact the only such project in our state at this time of which I am aware. I will finish this proposal with several specific suggestions. I would expect this little list to generate evaluation of its ideas, and perhaps lead to other ideas both of how we do it, and what else we could do that the Boone Council and staff might like to propose. I want to make it clear that we on the Boone Sustainability Committee look to you, the Boone Council and staff as our partners, for ideas of related aspects of this project we might want to consider.

*** Begin building a renewable energy system of solar and perhaps wind that will provide electric power for all the Town's needs, including to empower an electric transportation system for the Town's approximately 40 police vehicles plus other vehicles and small trucks, and perhaps for electric buses.

*** Include a well-designed plan to utilize as appropriate solar sites from available existing Town rooftops, to plans from the ground up for any planned Town buildings such as those on the old Bolick property, parking lot covers, and ground-based solar. We hope to install a 200 to 500 kW solar array in or near the Town limits on U.S. 321 S so as to make a good splash of about 500 (200 kW) to 1500 (500 kW) collectors in this highly visible location.

*** Begin during this fiscal year or as soon as possible to purchase electric vehicles. Include the development of a three-five year plan to purchase these vehicles, and install solar charging stations at appropriate locations.

For this year, I am delighted that we have \$100,000 approved for the project for this fiscal year. Based on recent discussion of the Sustainability Committee, we need to develop a plan that can follow the above suggestions, basically to set an inventory of the potential sites for solar installation, carefully consider and investigate the bulk purchase of an electric system from our new utility of 2022, and a three-to-five-year plan for purchase of electric vehicles.

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Respectively Submitted,

Dr. Harvard Ayers, Professor Emeritus of Anthropology and Sustainability
Appalachian State University

Welcome



TOWN OF BOONE SUSTAINABILITY, ECONOMICS AND ENVIRONMENT COMMITTEE MEETING AGENDA

The Sustainability, Economics and Environment Committee will meet on **Thursday, October 11, 2018 at 5:30 p.m.** in the Planning & Inspections Department – Upstairs Conference Room located at 680 W. King Street. The following items will be on the agenda:

1. **Call to Order**
2. **Adoption of Agenda**
3. **Approval of Meeting Minutes**
 - September 13, 2018
4. **Discussion of the Energy Action Plan**
5. **Other Matters by Commission Members or Staff**
 - Set agenda for next meeting
6. **Adjournment**

Sustainability, Economics, and Environment Committee

Current Membership (8 of 8)

Council:

Sam Furgiuele,
Marshall Ashcraft

Christian Gentry
Christian.gentry.e@gmail.com
Appointed: 12-15-16
Expires: 12-15-19

Nancy LaPlaca
laplaca.nancy@gmail.com
Appointed: 5-17-2018
Expires: 6-30-2021

Chair: Quint David
Q5quint@gmail.com
Appointed: 1-18-18
Expires: 6-30-20

John Prickett
Johnprickett222@gmail.com
Appointed: 9-28-17
Expires: 1-21-20

Lee Ball
balllf@appstate.edu
Appointed: 6-15-17
Expires: 6-30-2019

Vice-Chair: Harvard Ayers
harvardgayers@gmail.com
Appointed: 10-19-17
Expires: 6-30-20

Nicholas Stover
stoverna@appstate.edu
Appointed: 1-18-18
Expires: 1-18-19

Immediate Past Chair: Benjamin Scarboro
constablemoore@gmail.com
Appointed: 9-17-15
Expires: 6-30-20



Committee Charge:

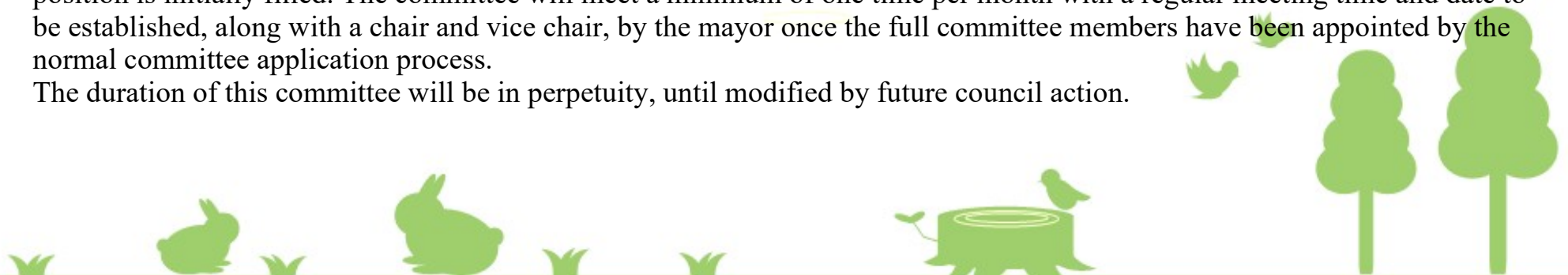
-Town of Boone's Committee on Sustainability, Economics, and the Environment-(S.E.E. Committee)

1. Establish both short and long-term goals and recommendations that the Town of Boone may implement to improve the sustainability and resilience of our community. Maintain and update these goals, as approved by council, in a publicly accessible place on the town website.
2. Conduct public focus groups and surveys on various areas of sustainability-related issues, research and debate methods of community improvement, and present the town council with those recommendations and findings as they are finalized.
3. Establish a yearly public sustainability forum, to be held each Fall quarter at a minimum, that representatives and citizens may participate in for the purpose of reporting effectiveness of current measures and receiving broad public input for new measures.

The committee will comprise of eight (8) individuals and two council liaisons. A preference will be given to three (3) applications who have a professional background in sustainability initiatives, and one (1) with established ties to ASU sustainability programs. Members are not required to reside within the town limits, and may be from the community at large. Three members will carry a one-year term and three members will carry a two-year term.

Sub-committees may be formed, and participation from the public at large highly encouraged. A quorum requires the town code minimum of 50% of the committee in attendance, and committee terms are for one year beginning at the time the position is initially filled. The committee will meet a minimum of one time per month with a regular meeting time and date to be established, along with a chair and vice chair, by the mayor once the full committee members have been appointed by the normal committee application process.

The duration of this committee will be in perpetuity, until modified by future council action.



Energy Action Plan & 100% RE

Quick history on Energy Plan & 100% RE

~2009- '2030 plan' action item: Establish an energy task force and develop a renewable energy plan.

~2010-Tenets of sustainability:

Energy: We envision the Town of Boone to be a community whose innovative approaches to energy are upheld as leadership practices. Citizens will be aware of individual and aggregate energy use, engaged in methods for utilizing energy effectively, and educated on new and renewable means of energy production. These efforts will focus on operating our community infrastructure more sustainably while also enabling individuals to utilize these methods and knowledge in their own homes and businesses.

~2014 Sustainability task force reforms: – Public Survey Results –

Medium term goal Solar on Queen St

Short Term Goal Local incentives for energy efficiency and energy production

~2017 – New Goals Ratified by council Aug 17th 2017

Short Term: Another public/private solar project like in the Depot st. parking lot, preferably on the Greenway or other high-traffic location in town.

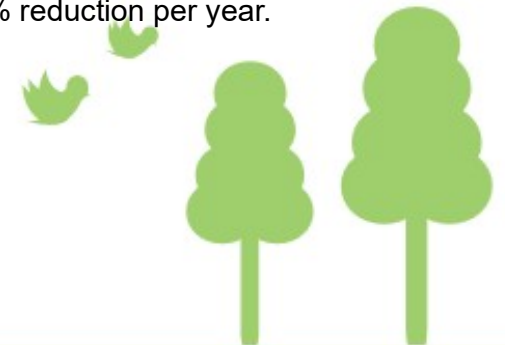
Long Term: 1. Investigate PACE financing. 2. Put together the energy action plan from the 2030 plan action items list, and include 100% renewable sources for Boone by 2050.

ALSO: Monitor and manage carbon emissions and compile a zero carbon report similar to Asheville with 2% reduction per year.

2018 – 100k Allocated by Town Council for 2018-2019 fiscal year–

-Directed by council to focus and finish Energy Action Plan

Here we are!



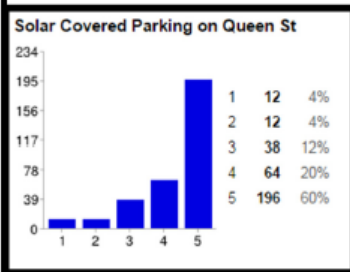
2014 Goals

Area	Short Term Goal	Medium Term Goal
Transportation	Community Bike Initiative	Greenway Expansion Plan, and actual expansion.
Energy	Local incentives for efficiency and energy production.	Solar Covered Parking Project on Queen St. Or similar green energy initiative.
Water	Point source pollution study within TOB limits.	Watershed restoration plan in partnership with regional groups.
Food	Curbside composting program for restaurants.	Community center with a focus on winter farmer's market and other local food initiatives.
Education and Outreach	Information and links on TOB website outlining sustainability-oriented plans and initiatives from the TOB and local community organizations.	Collaborative and yearly sustainability focused community workshop held around earth day in April. Official TOB Earth Day events.

Boone Sustainability Task Force Report Nov. 2014

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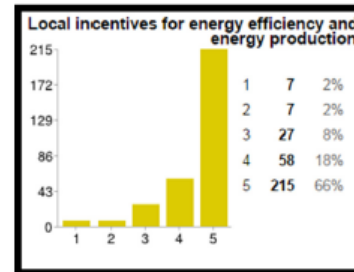
ENERGY



80%

We envision the Town of Boone to be a community whose innovative approaches to energy are upheld as leadership practices. Citizens will be aware of individual and aggregate energy use, engaged in methods for utilizing energy effectively, and educated on new and renewable means of energy production. These efforts will focus on operating our community infrastructure more sustainably while also enabling individuals to

utilize these methods and knowledge in their own homes and businesses.



84%

- Local incentives for energy efficiency and energy production (Short-Term) – (planning/inspections) Have staff prepare a list of incentives other municipalities are using to encourage the adoption of energy efficiency and energy production to present to council for consideration. Permit fee discounts, permit prioritization, development ordinance density bonuses, and quick-permitting incentives for green building features were some ideas that needed further staff input.
- Solar Covered Parking Queen St. (Long-Term) – Instruct town staff (manager and planning) to conduct a feasibility study and report back to council including potential costs, savings, and partnerships of a photovoltaic project located in downtown Boone. Queen street and the town-owned parking lot beside the post office have been identified as potential sites, but other sites and possibilities should be considered if applicable.

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100% Goal Resolution

- December 15, 2016 5:30 PM -Approved
- Harvard Ayers appeared before Council to request they approve a resolution supporting a North Carolina goal of 100 percent clean energy by 2050 and the creation of green jobs. Mayor Pro Tem Mason asked if Council would like to amend the agenda to take action on this resolution. Upon a motion by Council Member Mizelle, seconded by Council Member Clawson, Council moved to add this item to Council Matters in order to take action.
- RESULT: APPROVED [UNANIMOUS]
- MOVER: Jeannine Underdown Collins, Council Member
- SECONDER: Loretta Clawson, Council Member
- AYES: Lynne Mason, Loretta Clawson, Charlotte Mizelle, Jennifer Teague, Jeannine Underdown Collins



100% Goal for Town

- Part of 2017 Sustainability Goals: Approved on Council Consent Agenda Aug 17, 2017

RESULT: APPROVED [UNANIMOUS]

MOVER: Loretta Clawson, Council Member

SECONDER: Charlotte Mizelle, Council Member

AYES: Mason, Clawson, Mizelle, Collins



2017 Goal Summary

Area	Short-Term Goal	Long-Term Goal
Transportation	Promote town wide League of American Bicyclist Bike Month for May, and install bike shelter/maintenance Station in public location.	1. Review existing highway expansion plans, and 2. create greenway/green infrastructure plan.
Energy	Another public/private solar project like in the Depot st. parking lot, preferably on the Greenway or other high-traffic location in town.	1. Investigate PACE financing. 2. Put together the energy action plan from the 2030 plan action items list, and include 100% renewable sources for Boone by 2030 . 2050
Water	Water meter replacement program. Many gallons are wasted due to freezing of lines and this would eliminate much of that.	1. UDO change for 30% of new parking to be permeable. 2. Review of storm-water and runoff quality requirements.
Food	Curbside Composting Program. Coordinate with Appalachian State program and involve county school system if possible.	Community center with a focus on winter farmer's market and other local food initiatives.
Education	Information and links on TOB website outlining sustainability-oriented plans and initiatives from the TOB and local community organizations.	Collaborative and yearly sustainability focused community workshop held around earth day in April. Official TOB Earth Day events.
Environment	Investigate Boone participating in the bee city usa certification, and review of town-wide tree plans.	Monitor and manage carbon emissions and compile a zero carbon report similar to Asheville
2% reduction?		



2% Carbon Reduction

Nov 19, 2015 5:30 PM Town Council Regular Meeting

Harvard Ayers presented a Carbon Fee and Dividend Resolution for Council's consideration. He noted that Council would be endorsing the collection of a fee for all fossil fuels extracted, which will eventually make people conserve more and turn to solar, wind, electric cars and other means. Mayor Pro Tem Brantz felt that the Council needed more information before approving the resolution. Council members Mason and Clawson stated they would also like additional information. Town Manager John Ward stated he would get a list of questions from Council and get with Harvard on those questions in order to provide Council with more information.

January 21, 2016 5:30 PM Approved

Harvard Ayers appeared before Council to request their approval of a Carbon Fee and Dividend Resolution, which would show the Council's support for the concept.

SEE Committee DISCUSSION ON BIO-DIESEL AND CARBON REDUCTION THURSDAY, NOVEMBER 9, 2017

Motion and Vote:

Member Gentry made a motion, seconded by Member Prickett to recommend to Council to set a goal to reduce the carbon footprint by two-percent in the Town of Boone.

Vote:

Aye – All

Nay – None

The motion passed.

Ms. Turner noted that this proposed recommendation would be on the Council's December 2017 agenda.

Cant find council vote- may need to re-approve



RESOLUTION NO. 18-_____

RESOLUTION ESTABLISHING A 100% RENEWABLE ENERGY GOAL FOR THE CITY OF ASHEVILLE

WHEREAS, the City of Asheville adopted a resolution to increase the Municipal Carbon Footprint reduction goal to 4% on April 12, 2011; and

WHEREAS, the City of Asheville adopted a resolution Supporting a Clean Energy Economy on October 22, 2013; and

WHEREAS, the City of Asheville adopted a resolution for a Community Clean Energy Policy Framework on October 27, 2015; and

WHEREAS, the City of Asheville adopted a resolution establishing a joint City, County and Utility Energy Innovation Task Force for the purpose of researching, prioritizing, recommending and implementing recommendations to create energy efficiency, demand side management and renewable energy opportunities to reduce energy use in Buncombe County on March 22, 2016; and

WHEREAS, the City of Asheville adopted a resolution supporting a state goal of 100% renewable energy by 2050, increased protection for standing forests and the creation of green jobs on June 13, 2017; and

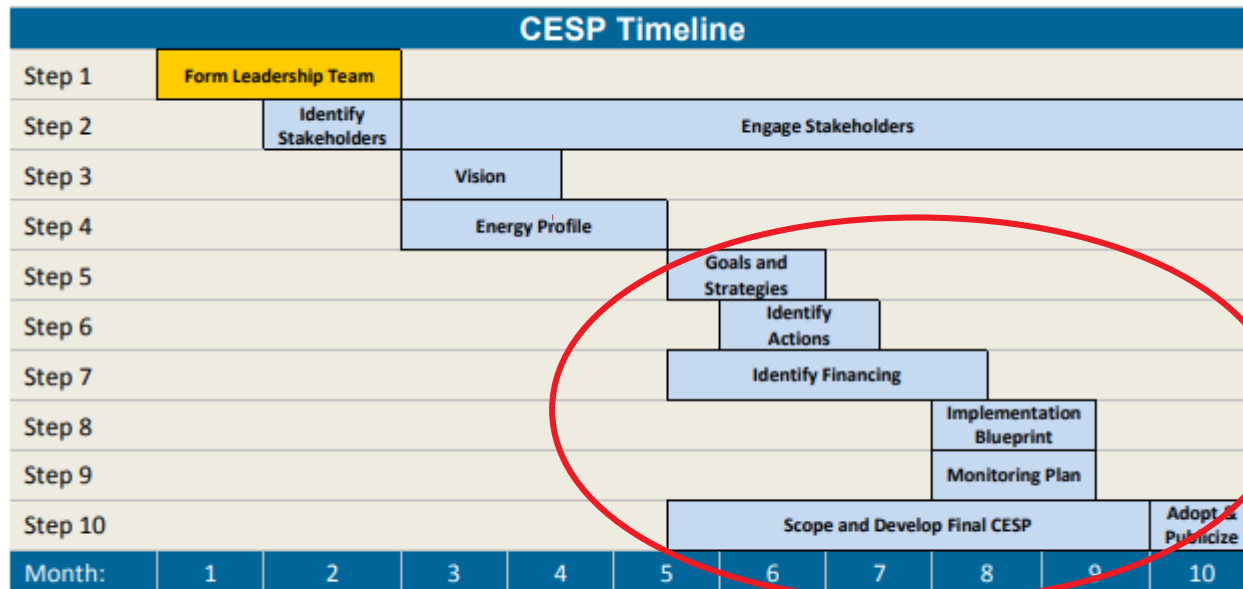
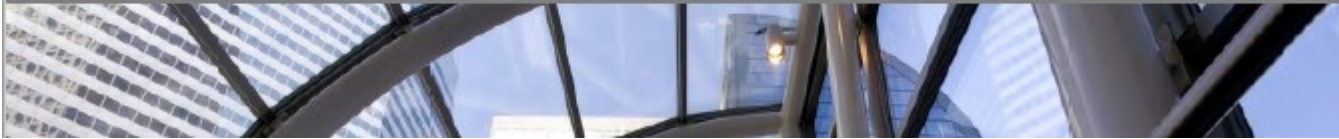
WHEREAS, the City of Asheville adopted a resolution re-affirming the City's commitment to reducing climate pollution in alignment with Council's vision, and, continued support of the principles of the Paris Agreement and the participation of the U.S.A. as a party to the Paris Agreement on June 13, 2017;

Actionable Items

1. Ask for motion for Chair and Vice Chair to re-draft combined resolution to present to council for 100% by 2050 (or 2030), and include 2% Carbon reduction goals previously approved by committee.
2. Energy Action planning is following EPA Guide To Community Energy Strategic Planning... next steps are actions and financing.



Guide To Community Energy Strategic Planning



Potential action and financing to discuss today

Boone NC Municipal Utility Expenses

Compiled 6-7-2017 by Quint David for Sustainability, Energy, Environment Committee
Numbers are approximated.

2014 Actual:	Electricity	NG/Propane	Fuel/Gas
Dept/Div			
Dept 400 Gov Body	944		
Dept 401 Admin			1,600
Dept 402 Finance			30
Dept 403 Tax collection			
Dept 404 Legal			
Dept 405 Elections			
Dept 406 Fire Station 1	9,301	1,600	
Dept 407 Blowing Rock Rd B	14,498	803	
Dept 408 Brown bldg	12,046	11,287	
Dept 409 Jones House	3,168	242	
Dept 410 Town Hall Bld	15,171		
Dept 415 Fire Station 2	5,272	1,656	
Dept 417 Post Office	5,730	2,913	
Dept 420 Fire Station 3	1,828	661	
Dept 500 Public Safety			86,626
Dept 350 Fire Dept			27,353
Dept 360 Planning			6,449
Dept 600 public works			
Div 401 Street Dept	148,188		45,255
Div 404 Fleet Maintenance			2,199
Div 405 Facility Maint			27,554
Div 801 Public Utilities			1,200
Div 802 Water Ops	21,879		20,050
Div 803 Sewer	8,882		20,050
Div 804 Water Treatment Pl	160,235		3,024
Div 805 Waste Water Treat	333,589	153,986	4,793
Total	\$740,731.00	\$173,148.00	\$246,183.00
price per unit	0.1	2.5	2.25
units	7,407,310.00	69,259.20	109,414.67
Total \$			\$1,160,062.00

Solar SIMPLE Cost Estimate

Avg sun hours per day	4.5
Avg sun hours per year	1642.5
kwatts needed for kwh	4,509.78
Est. cost per watt	1.2 *note: based on google not accurate.
est cost solar full price	\$5,411,733.33
Payoff Time	7.31 years

Note: Estimate is for illustrative purposes only. I highly recommend a professional payback study that includes insurance, maintenance, and other costs.

Carbon Estimate/Equivalents :

Note: from EPA Greenhouse Gas Equivalency Calculator Website

TOB Electricity: 7,407,310kwh \$740k/yr
6,077 tons =
1180 cars - 595 homes - 142k trees

TOB NatGas: 69,259 Therms \$173k/yr
4,198 tons=
815 cars – 411 homes – 98k trees

TOB FuelGas: 109k gallons \$246k/yr
1,072 tons =
208 cars – 105 homes – 25k trees

Total = 2,203 cars – 1,111 homes – 265k trees

Note: 500kw solar * 4.5 sun hrs a day *365 = 821,250kwh
= 9% total TOB municipal electricity use
131 cars, 66 homes, 16k trees (600/11k tons = 5.5% carbon reduction)

Actionable Items

1. Ask for motion for Chair and Vice Chair to re-draft combined resolution to present to council for 100% by 2050 (or 2030), and include 2% Carbon reduction goals previously approved by committee.
2. Energy Action planning is following EPA Guide To Community Energy Strategic Planning... next steps are actions and financing.

We have been presented with an opportunity- should we recommend council give staff the go-ahead for cost studies, partnership opportunities, and to allocate some of the 100k budget for this? Any issues/concerns to include?



Thank You!



**TOWN OF BOONE
SUSTAINABILITY, ECONOMICS AND ENVIRONMENT COMMITTEE
MEETING AGENDA**

The Sustainability, Economics and Environment Committee will meet on **Thursday, October 11, 2018 at 5:30 p.m.** in the Planning & Inspections Department – Upstairs Conference Room located at 680 W. King Street. The following items will be on the agenda:

- 1. Call to Order**
- 2. Adoption of Agenda**
- 3. Approval of Meeting Minutes**
 - September 13, 2018
- 4. Discussion of the Energy Action Plan**
- 5. Other Matters by Commission Members or Staff**
 - Set agenda for next meeting
- 6. Adjournment**