CITY OF PORTSMOUTH, NEW HAMPSHIRE
BLUE RIBBON RENEWABLE ENERGY COMMITTEE
OCTOBER 17, 2017 MEETING

DATE: **October 17, 2017**
TIME: **6:30 – 8:30 PM**
PLACE: **CONFERENCE ROOM A**

MEETING MINUTES

I. CALL TO ORDER

Present:

1. Maria Stowell
2. Josh Denton
3. Peter Britz
4. Patrick Ellis
5. Joe Harrison
6. Stephen Roberson
7. Ben D'Antonio
8. Suzana Mihajlica

II. APPROVAL OF THE MINUTES OF SEPTEMBER 19, 2017

1. All are in favor of adopting minutes. One change that Josh will make: in the very beginning, where it talks about the sentence that was deleted from the committee charge.

III. COMMITTEE CHARGE

"The Mayor's Blue Ribbon Renewable Energy Committee is charged to report back to the City Council for adopting a phased Renewable Energy Policy to be implemented by City Staff when applicable. The Renewable Energy Policy will rely on a combination of various generation sources such as solar, wind, geothermal, hydro, biomass, biogas, landfill gas, sewage gas, or solid waste to energy."

IV. BUILDING ENERGY EFFICIENCY

Josh will start by reading a portion of the 2015 Master Plan, chapter on resiliency. "Current land use regulations in Portsmouth encourage, but do not require, the use of sustainable design practices. Portsmouth should consider mandating building and site measures consistent with LEED certification standards, the Sustainable Sites Initiative, or a comparable national system.

Existing land development regulations could be revised to require sites to pursue certification in these rating systems or demonstrate that projects are providing an equivalent level of sustainable development without going through with the rating system certification process (this approach is already incorporated in the Gateway Planned Development option). The regulations could be revised to provide incentives for designing consistent with these standards such as providing for reductions in permit fees, additional developable floor areas or reduced setback requirements for projects that incorporate exceptional sustainable design standards."

Josh is going to turn it over to Peter Britz to give a brief overview of zoning so people understand what is out there currently and understand some incentives out there that are related to (or not) sustainable energy.

1. Current and Proposed Zoning Regulations and Building Incentives
    i. Zoning applies to business, family properties, when it comes to the zoning it comes to the businesses or people that live there, but not the bigger site developments.
        1. In the zoning ordinance is the purpose section. It lays out the sustainability the city has as an eco municipality. It's a natural step for communities, not digging up resources, reducing the amount of man made chemicals, treating people fairly, and respecting nature and natural resources.
        2. In article 9, it's not an incentive, but guidelines for wind energy systems for residential siting.
        3. Outdoor lighting, dark sky friendly. The purpose is to reduce glare, minimize light trespass, prevent degradation of the night sky. You're not spilling light beyond your property and it's not going up into the sky but back down into the ground.
        4. The biggest incentive is 50% reduction in parking for gateway property that is near public transportation.
    ii. Siting regulations in the purpose section of that achieving high quality site appearance that conserves natural resources, conserves energy.
        1. The biggest and all applicants have to provide detailed statements that describe green components and whether it's certifiable as LEED, what they're doing to reduce water usage in landscaping. How they produce insite onsite electricity. Energy efficient lighting, green roof, energy efficient windows. Not a requirement but calls people out to see what they're doing.
        2. Outdoor lighting all have to be dark sky friendly certified.
        3. Those are the highlights of what we have right now in our ordinance.
        4. They are due for a rewrite, so add more requirements and incentives in the next round.

iii. Some incentives that are given for affordable housing or having open space, is allowing buildings to go taller or larger, some cities allow the same for buildings that do that with energy efficiency.
iv. The city council is reviewing energy efficiency standard upgrades.

2. Energy Efficiency Incentives (Buildings & Energy) by Karen
   i. How buildings use energy. Ways in which we measure that and assess it and how that info might be used to form policies
   ii. Impact of building energy usage
      1. U.S. as a whole buildings and construction materials are almost half. If you go into buildings itself, residential: heating and cooling take up the most energy usage. Plug loads (comps, cooking, TV, washers/dryers, refrigerators, lighting)
      2. Commercial buildings it's pretty similar, the plug loads are worse. Lighting is worse. Commercial buildings often have a lot of artificial lighting.
   iii. How can I use less energy
      1. Items that have the most impact are on the bottom, and the ones that are renewable are on the top. A lot at the bottom is behavior of people and construction. To make renewable energy effective you have to reduce the load to make that ratio work.
      2. The first step is building occupant behaviors: shutting off lights, closing windows, basic stuff people forget.
      3. The next thing is that it's sealing the building, blocking the drafts. Sometimes hard on an old building, but it's more important than insulation.
      4. After that, add more insulation, get more efficient windows and walls,
      5. Then you get into your mechanical equipment
      6. And then, the energy load is minimal and then you can add the renewable components.
      7. The main focus is reducing energy load. As you're looking ahead to create policies, that has to be the number 1 focus. How do you reduce the energy load on your building.
      8. There are a lot of ways to do that.
      9. We have a lot of existing buildings in Portsmouth, our biggest challenge is addressing existing building stock. Get an energy audit and figure out where you're losing your energy.
      10. More windows is bad, less windows is good. Glass building are the bane of energy builders!
   iv. How can buildings use less energy?
      1. Blower door test, to test how drafty building is.
      2. Data monitoring. This is a series of mechanical equipment in a building and if they're performing up to snuff, they're itemized

so that they can be tweaked or replaced so that it's functioning efficiently.

3. Deep energy retrofits. Insulating air leaks. It's the sequence of how you layer the walls, insulation, and roof.
4. Building envelope. Wrap insulation around the studs so you don't get bridging and you trap the heat so it doesn't escape. Spray foam blocks all the drafts, but it can trap moisture and create mold if you put it in the wrong place.
5. If you have a poorly done air-tight house, it can be very bad, if you don't have mechanical ventilation system, don't bother.
6. If you just want to block drafts (half the battle) it's very minimal. If you want to add insulation to roof (twice as effective as doing the walls). You can spend a lot of money doing this, but there are levels. A retrofit of an old building, you would spend more than on a new building. There's a range depending on what you want.
7. If you have a cold attic, it goes right into the atmosphere. What works better is to insulate to the top of the roof and put your mechanical systems in there. It's trickier to
8. Glazing is moving fast. This industry is doing a great things in the past few years. A lot of technology is coming into the U.S. Netherlands and Germany are way ahead of us. If you want to look for very efficient products look there. This is a section through the glass, there's double glazed, triple glazed, etc. The trend is going toward quadruple glazed. An acrylic thin film. The gas between them is not air, but argon on crypton, but in some that have nothing. It's very thin, so you can replace historic windows without buying the bigger clunky ones.
    a. It is a little more thick than usual glass, so not every frame will accommodate it.
9. Design buildings to look like a thermos. The shape of the building depends. Long skinny narrow buildings are the worst. The fatter and rounder it is the better. Depends on how you orient it to the sun. Position them in a way to benefit from the sun (look at shadows).
10. Mechanical systems and ventilation. If you're going to put it anywhere it should be insulated.
    a. Zoning doesn't count mechanical things on the roof as part of the height.
11. Lighting and electrical loads. (lighting is 7-10 % of building energy usage) and plug loads are 22-35%
12. HVAC zoning: divide building into areas so you can regulate. sensors can monitor who is in there, how much co2 in the room. Everyone wants operable windows, where you can just open them in the spring and fall. There are times when the AC

is on but people leave the windows open. Or more extreme, if someone opens a window, the AC shuts off. There are ways to tie that together, it's hard to have both with human behavior.

13. For hotels, it would be a building code issue to require them to have Co2 energy (Joe), a lot of them do it because it saves them a ton of money.
14. Measurement and verification: There are a lot of cloud based programs that tie into monitoring your devices. It can tell you what parts are using the most energy and might inspire occupants to change behavior or equipement. It's important to have feedback because without it you don't know if you've succeeded or improved.
15. Occupant habits. hours of use or operation, seasonal temp, electronic devices
16. Solar: options photovoltaic, solar hot water. It's tough in portsmouth to get the land area to have enough renewable energy devices to support your building. Even so, the solar arrays don't work as well on super tall buildings, but better on shorter wider buildings, unless there's open land you can put it.
17. Similar with wind turbines. These can be controversial, they generate noise. They're not very efficient, but they help a little bit.

v. Implementation of onsite renewables
    1. Geothermal is really cool and works great if you have some land. It takes real estate. you have to have loops go out or down.
    2. Geothermals are extracted where basically there's a pipe with fluid in it, in the ground it's a constant 54 degrees, you send that fluid through the 54 degree earth or water, it comes back into your house and can run through radiators and it cools the air. in the winter, you send that same fluid through 54 degree earth, it heats up a little, but it lessens the load on your furnace or water heater in your house. It doesn't do everything but it reduces the work that others have to do. You have to have enough wells to make it pay for itself. if you partner it with solar to power it.
    3. Offsite: when you're transmitting energy from off site with renewables, and if your building is using means of heating or cooling your building other than electricity, there's transmission loss when you're converting to other fuel types or other machine types. The most energy efficient buildings are pure electric, there's no natural gas because if you're trying to mix the two you lose while converting.
    4. There are some buildings (residential) that are being built with no fossil fuels

5. Maria: At Pease, they have a geothermal cooling system, that has worked great. there are at least 2 buildings that have geothermal that have the closed loop with glycol in the pipes.

vi. Measuring energy efficiency
    1. Energy modeling is the best tool in the toolbox, uses in LEED, basically all the energy rating systems use modeling.
    2. If you don't want to do the full energy model (can be expensive) there are comcheck and rescheck, which are user friendly, less information, cloud based software, type in parameters of your building and it gives you those values. Mass requires this if you
    3. Rating systems: LEED, energy star for homes/commercial buildings. use based programs (Green Guide for Health cAre, Collaborative for High Performance Schools, STARS. Net Zero or net zero ready (the only thing missing is the actual mechanics like the solar panels) is the goal/challenge of the 2020 paris accord. living building challenge. State energy code (IECC international energy code 2009). At the statehouse they're voting on adopting the 2015 series of the IECC codes. They go as a bundle, they all reference each other. The committee on the codes voted to recommend all the 2015 codes except the energy code, there are those still fighting for it. There are towns all across the country that have not waited for their states, in NH it is legal to do that, Durham has done that, they follow the 2012 code. The biggest changes between now and 2009 were done in 2012, so durham is way ahead of that. If you don't want to adopt the code that's further than the state, you can do a stretch code.
    4. A stretch code is an amendment that makes it go further, has additional restrictions/requirements. California is a great state to look at that has a whole slew of other resolutions. They're leading the edge on energy. Vermont and Mass are both coming ahead as well.
    5. Joe: we follow the 2009? yes, the state standard.
    6. 2015 energy code is catching up to LEED. The goal in mind is that energy … by the year 2030, all new buildings are net zero, that's a hefty goal, even more than the Paris accord. That's how the energy codes are being written now, every 3 years they're being rewritten.
    7. LEEd does interior environmental quality, stormwater, chemicals, etc.

vii. Energy incentives, tools and strategies for local implementation:
    1. Zoning ordinance for developer incentives for new construction and additions solar and wind in historic district
    2. Municipal tax credits for retrofits

3. Payback lifecycle cost analysis
4. Building owner, occupant and developer education
5. State level advocacy on energy codes and renewable energy credits.
6. Joe is more in favor of incentives than restrictions because developer are so concerned with ROI that they'll go for it.
7. Ben: why did they reject just the energy? They're worried about costs, there are concerns for that, there are studies that show either way. There are a lot of opponents who are really concerned for the first cost. Affordable housing is a huge problem, and we don't want to add cost to that, but it's important to look at the cost of owning a building and not just buying it. educating occupants is important of the advantages of an efficient building.
8. Power companies offer rebates for making your house more energy efficient.

viii. Case studies
1. Green communities: Burlington VT, star and appledore islands, and UNH/durham

ix. Further resources
1. Architecture 2030: the 2030 challenge
2. AIA-NH and NH Environmental guild educational programming
3. 2030 District Initiative
4. Urban climate initiative
5. NH the jordan institute

x. Patrick: do you have a sense for a reasonable payback for what kind of energy savings we're talking about? for 3=5 year there's an x% reduction. Obviously you can spend a huge amount and have reduction but it could be a 20 year payback?
1. There are some companies that will do that for their system (like solar). If you do a whole house, you might want to get someone involved who can do an energy model. There's some software out there where you could

xi. Stephen: outside of new buildings, looking at retrofitting, and changing behavior, my takeaway is that there's a tech gap. Is that relatively accurate? there's just the ability to store energy to have that capability, the tech is just not there, the cost is too high, the paybacks are way too long?
1. The technology is there. Net zero is tough because of building to land ratio, sometimes you have to have your outside renewables but those take space so in an urban city it's really hard to do, but you can get really close. It's not technology, it's ceiling to air gaps. Of course it's going to improve, long term a lot of that tech will approve. Our trade agreements affect the

economy of it all. I don't think that tech is the limiting thing, Tesla has a totally clear glass that is it cost effective> not yet, but it's getting there. Just like computers used to be cost prohibitive

xii. Ben: Are there other initiatives that the city could leverage for existing buildings are the utility and energy programs are they funded do people know about them, could we raise awareness to leverage that opportunity. How do you think we can have the most value to get those building loads down? If it's building stock and we have a lot of it, how do we leverage that?
    1. Education is a huge part of that. you can have a website, or seminars,some ways they can make their existing houses more energy efficient, whether it's changing out mechanical unit, adding insulation, The existing buildings are going to be tough. esp the masonry buildings, you can destabilize if you try to insulate too much.
    2. Joe: All of us pay a system benefit charge, that money goes into utility efficiency program. Basically the program will pay up to half of the energy efficiently cost, up to $8,000. It's first come first served. Your house has to be inefficient enough to qualify. NH Saves, through Eversource. They run out of money almost every year, usually by june or july. You have to time it. We all pay into these programs, one thing the city could do is promote that and show people how to access them.
    3. Peter: RFP to a bank and we might be able to access lower rate money to do it.
    4. Patrick: the responsibility to pay back the bank is attached to the owner, you'd have to build in some credit score criteria and you'd want it to meet a certain cost benefit analysis.

xiii. Josh: there was legislation that passed that allows communities to adopt … they went with sustainability committee 2.5 years ago. around a year and a half ago, PACE, some states have actual banks and they allow property owners to take money from that to invest projects which have to meet certain standards. The problem with NH it wouldn't allow municipalities to contribute, required private funders. NH where the ranking of liens actually were. te investment stayed with the property, built into it, so the ROI might take 20 years, while the owner might want to sell it before that. Banks weren't comfortable with the secondary lien. As a committee we could ask
    1. Patrick: In New Franklin we did something like that to replace old equipment. We did major upgrades and the savings from reduced energy use are paying for it. The city has a very low bonding rate, not every community could do that, but Portsmouth could.

xiv. Ben: If at the state level, if the energy piece hasn't been adopted, can portsmouth address some of the issues, at least looking at the issue and trying to support it and ways we can address some of the financial barriers. That seems like something we could incorporate into our recommendation.
    1. The energy code has the prescriptive approach is easier to understand: your wall has this much insulation and your roof is this, and it's how the codes have been written for decades.
    2. Then there's the performance approach which requires the energy model, you need someone who know show to do it and requires money, but the loophole is that it can be used to make your building very energy efficient. It can be demonstrated if it's used the right way it won't add cost. If it's not used in the wisest way it can add cost.

V. POLICY DISCUSSION

Ben: can you help me understand what the longer term approach is here? We are attempting to have something to bring back to city council in december? We only have 2 more scheduled meetings, we can have more, but we are to be done by the end of the year. The next meeting will be half presentation and mostly writing the policy. The last meeting will be changing and finalizing the policy. In January, Josh would bring it forward, do a work session. The council will have a crack at it and will be able to change portions of it. Any policy we adopt will have a lot of options. The issue will be how to actually complete our policy. Josh can keep work on drafting things, people can take what they have an expertise in, and in the next meeting we'll look at those edits. By next meeting, let's improve upon this current draft.

One option is to have it on google docs so we can track changes. Everyone can pick a portion of what they want to focus on and go from there. Everyone can make suggestions on their focus area. The actual format, it doesn't have to be the way it currently is, but Josh wants to see if this son the right path if the general items are in line with what we want to do. Starting broad and going down into more specific areas.

Ben: What's the difference between Peter's and Josh's?
Peter went ahead and started drafting a document while Josh was doing his own.

Ben: do you have a vision what you want the policy to ultimately look like?
Josh's preference is the more in depth the better, a lot of these concepts are better to. If it's short, it's more of a statement, he'd rather have a significant amount of details so we can show how you can get there. these are recommended actionable steps.

Patrick: I understand what you're saying Ben, he's confused about where the policy is. Having something comprehensive is good, we may not be involved in the next step. There's good info there already. This looks like a good supporting document to policy but not like a policy. This is the implementation of the policy.

Peter: There's a lot of info on how to implement. One concern is it directs staff, the policy should be clear on the direction, but not the actual order. The other thing is the money that's assigned makes it harder for the next committee.

Ben: as a starting point this is a very useful document. I would tend to prefer something closer to what Patrick articulated. The organization is good, the vision, the building stock, transportation, etc. It's where the carbon emissions are. Vision helps us get from our charge to the expansive ideas that are inside this document. At the same time, there are things in here that are prescriptive. I look forward to providing feedback and input. To patrick's point, there would be value to a succinct executive summary. Here's the policy and here's a strategic action plan to provide recommendations.

Josh: change the wording to be less prescriptive.

Ben: would it be permissible for us to provide other ideas? Josh: yes absolutely, please do.

Patrick: Did that mission statement was it specific to the municipal entity or the city proper entire. Policy is what we want to do, it's not guidance. I'm wondering if we need 2 policies, one that is the municipal entity and then another one to address the community at large. The city has a goal to move the other 99% to net zero. So we almost have 2 documents, one that is very achievable because the city is able to do the things to get there, and the other to find creative solutions to incentivize the community to be more energy efficient/ net zero.
Ben: at the outset it was very specific, our charge was to explore those concepts, it would be appropriate for us to distinguish between those. on a municipal level here are the policies/recommendations on the community level here are the aspirations/goals. That would be very useful to put in this document and that distinction is critical here. If that sentence was cut out, let's talk about that.

Josh: part of what's driving this is the 2020 plan, is the residents desire to get to net zero. okay with having sections devoted to the city and the community respectively.

Ben: We can raise the level of awareness of those energy retrofits, as a way to encourage the city to work toward getting us to net zero. We can use the education and awareness piece and studying incentives and codes.

Joe: The city's 1% seems achievable, and would be a great example and would probably have a big impact with business owners. People are going to see what we're doing.

Stephen: How are we going to pay for it? Seeing the amount of energy we're dealing with, really drives home that this is a substantial undertaking. So, my question is part of the policy defining the cost and how we plan to pay for it or are we just bringing recommendations?

Josh: Currently, going with the latter. It's very aspirational when you look at the figures, which is why they are in the document, so people realize how much effort/money it will take.

Maria: Much more specific about the anaerobic digester at Pease. I think it follows about not being so prescriptive about what we're saying. But when you talk about the AD it's always at Pease, which is an assumption that's where it will be, she recommends to talk about it being in Portsmouth, not at Pease. They have concerns because any kind of proposal would need to be reviewed and approved by board of directors. There are federal regulations that are imposed on the value of the land, must go to the airport.

Patrick: it doesn't necessarily have to be at Pease, but ideally it's located at a treatment plan. I don't know there'd have to be land outside of the current treatment plant.

Maria: just because you can fit it into the footprint, it could be a detriment to the airport and neighbors. I recommend you not assume this use is appropriate for Pease and site

Joe: interested in hearing about the approval process for these kinds of things at Pease.

Maria: Every time we bring a proposal, they vett it and the staff looks at both sides and makes recommendations to the board. For this, it would probably be similar to having the wastewater treatment plant turned into a treatment plant for the whole city. We're there to run the airport.
Absent from the discussion are the benefits to Pease. Here is my full statement:

"The draft policy discusses, as one of three large scale renewable energy generation sources, a regional anaerobic digester at Pease. Absent from the

discussion are the impacts or benefits of the facility to the tradeport. I have shared the content of the draft policy with the PDA Exec Director, who expressed his concerns with siting this use at Pease and cautioned that any determination would require tenant input and approval of the PDA Board of Directors.

Among the federal regulations applicable to land development at Pease is a requirement that land acquired from the Air Force through the Public Benefit Transfer be used for the sole purpose of supporting the Airport. Any proposed use that does not bring an economic benefit to the Airport cannot be approved.

During the city's examination of scenarios available to address the Pierce Island wastewater treatment plant improvements, there was an assumption that the use of land at Pease was an option. As it turned out, the PDA Board, although never presented with a formal request, made it known that such a proposal would not likely be approved.

The Draft policy seems to assume that Pease is a suitable location for an anaerobic digester. I caution you to not assume that this use is appropriate for Pease, and recommend that the siting of the facility be left for future consideration."

Josh: I'm glad you shared that with the PDA board. What is required up front and we're glad that you brought that to us.

Ben: For clarity, your preference is that the document be silent on Pease entirely or can be aspirational (i.e. "explore Pease as an option")

Maria: Pease could be explored as one of many options.

Ben: ON the back side of peter's memo under renewables, the 3rd cullet sets 'investigate renewable energy offsets" what do you mean by offsets?

Patrick: Ways we can pay for our energy by buying it from a vendor who uses from a solar or wind producer. The language is probably incorrect.

Stephen: National index of certificates would be pretty cheap. If you're looking at offsetting via credits to just the city, or the residential, and you want to cite it to state of NH or Maine wind but it's palatable. That's stuff I can easily contribute to with real numbers.

Josh: We'd want to combine these two documents with a much more succinct summary.

Josh will send out a word version for everyone to add their comments and

track changes then we'll combine everyone's comments into one document.

VI. FUTURE AGENDA ITEMS

1. November 14, 21, or 28, 2017, Transportation
   Tuesday 28th will be our meeting. 7:30-9:00. Josh will check councilor Cyr for his availability. Peter will check the room availability.

VII. ADJOURNMENT

NOTICE TO THE PUBLIC WHO ARE HEARING IMPAIRED: Please contact Dianna Fogarty at 603-610-7270 one week prior to the meeting for assistance.