The benefits of Zero Carbon Design and Construction
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**Why Renewable Energy:**
Commercial and Residential buildings account for 29% of greenhouse gas emissions when including fuel used to create electricity.

*(C2ES Climate Innovation 2050)*

Yes, we want to conserve energy, but we also need to create clean energy
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We can reduce the emissions (and get to zero) in the operation of buildings if we take some relatively simple steps in design and construction:

1. Build more energy efficient, all electric buildings
   - Good thermal envelope – well sealed, insulated, thoughtful about orientation
   - Right sized – Houses don’t need to be tiny but make every space count and have purpose
   - Energy efficient all electric heating, cooling and hot water systems
   - Right sized appliances
2. Get our electricity from renewable sources
   - Great if anyone can produce their own...
   - But if they can’t; work with their utility provider to purchase renewable energy
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We can reduce the emissions (and get to zero) in the operation of buildings if we take some relatively simple steps in design and construction:

1. The final step to balance the carbon emissions that living and working in a building produce is to purchase offsets.
   Buying offsets for the carbon we couldn’t eliminate in the previous steps invests in other greenhouse gas reduction / capture activities
   • Even if these are not local, they are aiding in solving a global problem
   • If they are local, even if they are more expensive, this is a great option to impact our local environmental awareness and economy

As the cost of carbon offsets goes up, the desire to make further improvements in steps 1 – 3 above should go up. Dollars spent on reducing energy consumption, purchasing renewable energy, improving water efficiency, driving less miles in fossil fuel powered vehicles all reduce carbon emissions generated and reduce required offsets.
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We followed these steps for Bradford Station and will be net zero for carbon emissions.

This is a market rate apartment building with no grants or assistance in the development cost.

You can be environmentally responsible and profitable without government or philanthropic resources.
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- Secure bicycle storage
- Porch and patio units
- Juliette balconies
- 100% fresh air - no recirculation between units or from common spaces
- Fiber optic internet
- Stainless steel appliances
- Washer & dryer in unit
- Luxury vinyl tile
- LEED Certified building*
- Walking distance to restaurants and entertainment: City Built Brewing Company, Eastern Kille Distillery, Zoko 822, Grand Rapids Garage Bar & Grille and more

*pending

Bazzani
Building Sustainable Communities
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There are several components to the heating, ventilating, and air conditioning (HVAC) system, carefully selected for Bradford Station Apartments to provide CLEAN CONDITIONED air to the occupants in an ENERGY EFFICIENT manner. This system addresses safety concerns associated with Sick Building Syndrome and now the COVID crisis; as well as providing the energy efficiency required for a Net Zero Carbon building.
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**FRESH AIR**
All living spaces need fresh air to prevent sick building syndrome. We encourage people to open their windows in the spring and fall when the temperature outside does not require any heating or cooling. However, most of the time, indoor spaces need to be either heated or cooled. In order to balance the need for FRESH AIR in a space, and reduce the energy cost associated with heating and cooling outside air, each unit is equipped with an ENERGY RECOVERY VENTILATOR. The **Whisper Comfort Energy Recovery Ventilator** pulls in unconditioned fresh air from outside at the same time it exhausts stale air from the inside. While the stale air from inside doesn’t mix with the fresh air from outside, the energy is exchanged inside the unit providing warm fresh air in the winter; and cool, dry air in the summer.
HEATING AND COOLING

The Mitsubishi Mini Split heat pump: This ductless system has a wall mounted fan unit that is located in each unit. It recirculates air inside the unit and either heats or cools as required by the thermostat. Each fan unit is connected to its own rooftop condenser by refrigerant lines that either add heat (in the winter) or extract heat (in the summer).
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AIR DISTRIBUTION
Each bedroom has a fan that pulls air from the ceiling of the living room and delivers it into the bedroom for fresh, temperature controlled air to the bedroom when the door is closed. This fan can be turned off by the occupant to save energy when the bedroom is unoccupied or the door is open.

These three systems working together provide the following for our apartments:
1. A constant supply of fresh air into each unit that is never ducted, mixed or shared with another apartment
2. An energy efficient system that saves the tenant money every month on the electric bill
3. Individually controlled heating and cooling for each apartment
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A few other things we are doing:

- We put a heater in each bathroom below the towel bar, so you can keep the bedroom cool for sleeping year round, and have a warm bathroom and towel after getting out of the shower.
- The bathroom has its own exhaust fan with a humidistat to run automatically when the bathroom is steamy, or a switch to turn on/off by the user.
- The laundry dryers from GE circulate air internally to take water out of the clothes and dump it down the drain, rather than sending the air outdoors. This saves energy by not exhausting the fresh conditioned air in the apartment directly outside when the dryer is running, and reducing the number of openings from the apartment to the outside where heat can leak in or out.
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The last and most important design consideration:

Our tenant’s who will occupy our building
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- Attractive exterior
- Desirable interior finishes
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Our tenant’s who will occupy our building

- Attractive exterior
- Desirable interior finishes
- Useful Amenities
  - Bicycle Storage
  - Porch and Patio Units
  - Fiber Optic Internet
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The last and most important design consideration:

Our tenant’s who will occupy our building

- Attractive exterior
- Desirable interior finishes
- Useful Amenities
  - Bicycle Storage
  - Porch and Patio Units
  - Fiber Optic Internet
- Healthy Building
  - 100% Fresh Air
  - No Recirculation Between Units
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By harnessing the power of business, B Corps use profits and growth as a means to a greater end: positive impact for their employees, communities, and the environment.
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**Why generate local offsets:**
Simply creating offsets by whatever means is a direct reduction in our total greenhouse gas emissions. Kent County DPW is already doing great work in this area. So here are a bunch of rhetorical questions to keep the discussion going:
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Why generate local offsets:
Simply creating offsets by whatever means is a direct reduction in our total greenhouse gas emissions. Kent County DPW is already doing great work in this area. So here are a bunch of rhetorical questions to keep the discussion going:

• Can the local programs be increased/modified and the offsets be made available to local businesses? Based on discussions I have had with local companies about getting to net zero carbon they lose interest with the final step of purchasing offsets that are not local because they want their investment to stay local. Is it better to donate to a local food pantry that makes a huge difference for their neighbors, or purchase offsets that are a very small part of a wind or solar farm half way around the world?
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- USGBC-WM is working on creating local offsets
- Are there other offset generating projects that could be undertaken but are not funded? Could they be funded based on the creation and sale of the offsets?
- What would these projects look like?
- Who could invest in them?
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• Can making local offsets available help to raise awareness in our community? Not just about the need to reduce greenhouse gas emissions, but also highlight a relatively simple path for reaching net zero.
  1. Measure
  2. Purchase offsets
  3. Reduce
  4. Purchase less offsets
  5. Repeat step 3
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What else can we be doing to reduce greenhouse gas emissions?
For Bazzani Building Company, our focus on future projects is the reduction of Scope 3 emissions: embodied carbon in the products we use in our projects and the greenhouse gas emissions of the construction projects for our trade subcontractor partners.

This graphic from compareyourfootprint.com outlines Scope 1, 2 and 3 carbon emissions.
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Recap:

- Why Renewable Energy
- Steps to reduce greenhouse gas emissions
  - Building Design and Construction
  - Power source
- Offsets
  - Creating local offsets

Thank you!

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