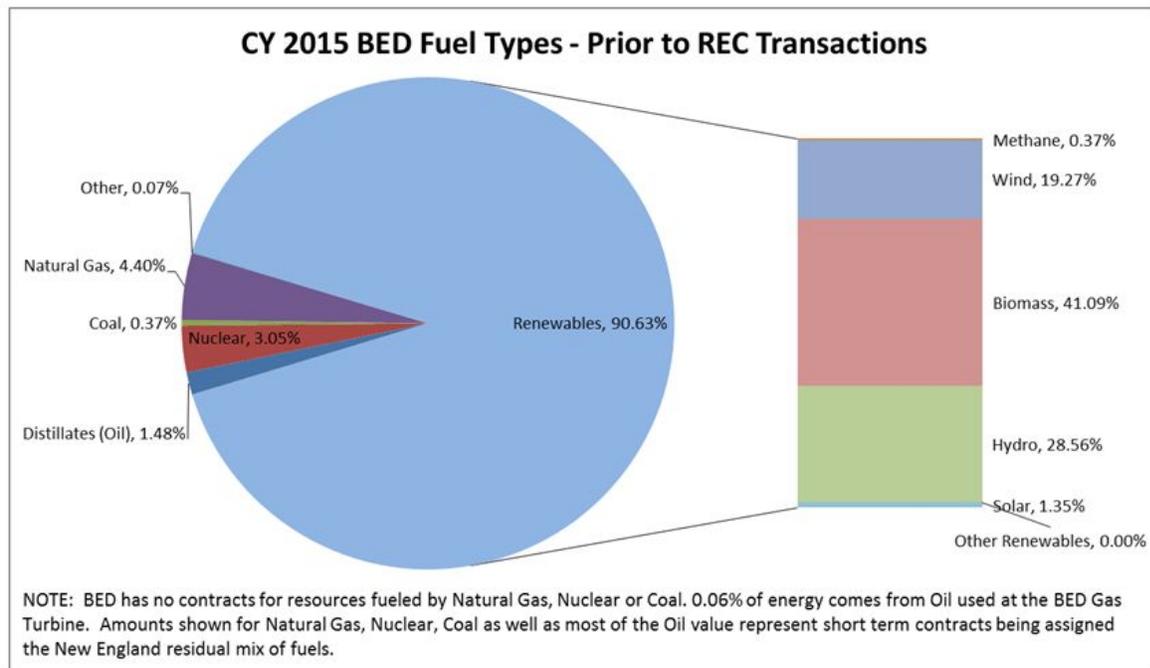


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Champlain College

Burlington's Electricity: Renewable but Not Clean What does this Mean for Champlain College?

About Burlington's energy

It is commonly known that Burlington, Vermont has 100% renewable energy, but is it that simple? Through my research, it most definitely is not. Burlington was proud to claim the title of the first US city to be run off of 100% renewable electricity, and this aids in Champlain College's reputation as well, but it is much more complex than its face value. When someone tells me they are investing in renewable energy, I think of solar power or wind power or hydropower, not necessarily burning trees. This is where the problem may lie.



Let me start out by giving the numbers. The above image shows what resources the Burlington Electric Department (BED) gets its energy from prior to selling any of their excess energy - which is when Burlington produces more energy than it consumes and that extra energy is sold elsewhere. Of the renewables section, 41.09% is biomass, which has the biggest percentage chunk of the sources. Next is hydropower at 28.56% which is mostly generated from a station on the Winooski River, wind at 19.27%, and solar at a meager 1.35%.

Strangely enough, methane is listed as a renewable in this chart, but this is because it is referring to landfill methane. When objects break down in a landfill environment, they produce methane which can then be burned to create electricity and put carbon dioxide in the air rather than the methane. Methane is actually worse for our atmosphere than carbon dioxide so this

process of burning the methane for energy is better than the alternative, but it is by no means “clean.”

What concerns me most is the amount of biomass that is being used to fuel the city. This biomass refers to trees which are burned to produce energy. This seems efficient when it comes to ridding of waste wood and scraps, also referred to as ‘slash.’ However, this doesn’t seem sustainable on a large scale. According to an article by Politico Magazine, 1,800 tons of pine and tinder are ground into wood chips and thrown into a furnace each day. This is done primarily at the McNeil plant. The article also states that this wood is sustainably sourced from a 60-mile radius area of land.

There are many issues that I see stemming from this method of renewable energy. Firstly, when a tree is cut down and burned, all of its stored carbon is released as carbon dioxide. As you may have heard from climate news, this makes climate change worse. A New England ecologist said about this issue, “Being renewable [...] is not the same as being clean and carbon-free.” Wood and trees that have died will release carbon dioxide into the air when they decompose so we might as well burn this to get energy from it in the process, but not all slash should be taken and burned because the break down of the materials adds nutrients back into the soil and helps prevent erosion. Additionally, Burlington needs 1,800 TONS a day! According to an article by Al Jazeera America, an international news site, “Roughly 70 percent of the wood used at the McNeil plant comes from non-merchantable trees and harvest residues, with the balance coming from purchases of sawmill residues and urban wood waste.” These trees and residues are often from logging industry waste and tree parts that cannot be sold as timber from things like yard waste. However, this 70% statistic means trees have to inevitably be cut down to account for the rest. Moreover, I can’t imagine there is a consistent source of slash that can add up to that many tons of wood a day. And even if reforestation efforts were taken, the article says, “In such cases, even if new trees are replanted, it can take many decades — and even a century or more in some cases — for the new growth to cancel out the emissions from what was harvested and burned.”

Secondly, burning trees is vastly inefficient. Only 25% of the energy potential is actually converted to electricity through the burning process because so much is lost as heat waste which is less efficient than the typical coal-fired plant. Dr. Sidney Bosworth, a Plant and Soil Science professor from the University of Vermont, told me, “From a sustainable perspective, one issue is that with this plant, a lot of heat is lost in the conversion to electricity. When built, I think Burlington looked into setting up a heat capture system but I was told it wasn’t economically feasible at the time. But I don’t really know.” Maybe it is an idea that needs to be further questioned given the general lack of solid information. Al Jazeera also stated that “a study produced in 2014 by the American Lung Association and the Massachusetts-based Partnership for Policy Integrity concluded that the plants often emitted more local air pollution than comparable coal-fired plants, but that they also release as much as 50 percent more carbon dioxide.” McNeil does have air quality control systems, and, according to BED’s web page about McNeil, has emissions that are 1/100th of the allowable federal level. The plant is making great advancements towards reducing their emissions, but is our reliance on this type of energy too much?

States such as Massachusetts have set strict regulations with biomass to limit its use due to the unclean and generally inefficient nature of it. I am not, by any means, saying biomass should not be used as energy at all, but I do feel that there should be stricter regulations on it as well as a lower reliability on it. Christina Erickson, Champlain College's Director of Service & Sustainability Learning, stated, "I think, like most things, the answer about biomass is "it depends" - depends on the sourcing, especially. I've heard that most people are generally happy with McNeil. There has long been a plan to try and capture the steam that it generates to heat other buildings." Furthermore, we can say we are run off of 100% renewable energy, but this does not mean that energy is clean or carbon neutral, and this has to become something people question. The biomass industry has a rightful place in the arena of renewable energy, but being a city that others may look towards for guidance may spark the others to turn towards biomass themselves. Whether or not this can be sustained relies heavily on the sourcing and I don't see biomass as the best option to have over a third of our electricity produced from.

What does Champlain College get its energy from?

Having the city where our college resides be based on 100% renewable energy seems to bode us well in our environmental impact already, but we have our own initiatives.

First, we have a program called the Green Revolving Fund that finances energy efficiency, renewable energy, and other sustainability projects on campus. Additionally, Perry, Juniper, Valcour, Butler, and Whiting are all heated and cooled by geothermal energy which is a closed loop system that utilizes the earth's natural heat. We are also working on making our transportation sector more eco-friendly. For example, students already get free city bus transportation and discounted rates for the BikeShare and CarShare programs. Champlain College now has a position of the Sustainable Transportation Coordinator who is continuously working on new initiatives within the transportation sector. Furthermore, we are actively working towards reducing our overall energy use like with our annual Kill-A-Watt Challenge while improving our renewable infrastructure.

We have taken our own initiative to improve our environmental standings which, with the research I have found with Burlington's electricity, is a great decision. Champlain College still has lots to change, and we are currently working on changes in both reducing our energy usage as well as making our sources more efficient, but hopefully we can start making even more eco-friendly changes since the municipal electricity source isn't as clean as it may come off to be.

In order for Champlain College to truly make a difference, we need to lead by example and not rely on Burlington's initiatives, and we have been doing a decent job at that. As long as we keep our momentum going, we can create a great campus for our students and be a good role model for the community. Moreover, we need to focus on reducing our energy use as well so that the amount of biomass doesn't need to be used in the first place.

Why having energy that is BOTH renewable and clean matters

In a world where climate change is still politicized and we have active climate change deniers, I feel this section is necessary. Since the industrial revolution, we have released countless amounts of greenhouse gases like carbon dioxide into our atmosphere. These are

called greenhouse gases because they trap in heat much like a greenhouse, and this has been detrimental to our environment and human living conditions. Growing seasons have shifted, polar ice caps are melting, ocean rising is already forcing people out of their homes, there are stronger weather phenomena like hurricanes and droughts, and so much more that we can already see. Not only is this affecting the polar bears you see in pictures standing on a small piece of ice, but this affects us and some don't even acknowledge it.

Our society is heavily run on fossil fuels which is what contributes primarily to the greenhouse gas emissions in our atmosphere. To make matters worse, these fossil fuels do not have an endless supply. Whether or not we want to keep using them, we will not be able to sustain our lifestyles much longer. All of this points to finding a renewable and clean source of energy. Renewable will ensure our energy supply can be sustained and clean will prevent more greenhouse gas emissions. Turning towards clean, renewable energy would help the earth, but it would also give us a better chance at sustaining our own existence. Burlington's energy, though renewable, is not clean, and this is something that needs to be addressed.

Source Links

- <https://www.fastcompany.com/3042029/how-burlington-vermont-became-the-first-city-in-the-us-to-run-on-100-renewable-electricity>
- <https://www.burlingtonelectric.com/our-energy>
- <https://www.burlingtonelectric.com/our-energy-portfolio>
- <https://www.politico.com/magazine/story/2016/11/burlington-what-works-green-energy-214463>
- <http://america.aljazeera.com/articles/2015/4/20/a-city-goes-renewable-but-raises-questions-about-impact-of-biomass-power.html>
- http://www.go100percent.org/cms/index.php?id=77&tx_ttnews%5Btt_news%5D=257&chash=70c73ba3cc8f2fb3d258c736a9ee7ff6

Erickson, Christina 

Yesterday at 3:16 PM



For the blog (good read/energy) Burlington's Electricity: Renewable by Not Clean by Holly Francis '20

[Details](#)

To: wsgreen Unknown, Cc: Holly Francis

 Siri found new contact info in this email: Christina Erickson cerickson@champlain.edu

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Ben - please copy & paste from the attached doc.

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----- Forwarded message -----

From: **Holly Francis** <holly.francis@mymail.champlain.edu>
Date: Wed, Oct 10, 2018 at 2:22 PM
Subject: Adding my Burlington/Champlain Energy to the Blog?
To: Erickson, Christina <cerickson@champlain.edu>

I was talking to Zoe and she said to see if my article could be put into our blog. Let me know what you think!



Burlington's
Energy.docx

This is an email between me and Christina Erickson who confirmed the publishing of my article in this blog: <https://sustain.champlain.edu>

*Note: it will be up soon

I also sent my article into the campus publication Chivomengro and am waiting to hear a response: <https://chivomengro.com>