Livy Johnson
Ashby Public School
Ashby, MN, USA
Belgium, Clean Energy

Using Torrential Wind and Rainfall for Power

Belgium is a small country in western Europe. Lying just south of the Netherlands, and east across the English Channel from England. Its climate is characterized by strong west winds and because of its location, it receives frequent and abundant rainfall. Rainfall is something that varies from year to year but in the past years it has shown tendencies of rising (World Bank) Belgium has two vastly different geographical areas (Belgian Geography). The Muese River separates these two different lands. To the northwest lies a flat, fertile region that is great for agricultural production, and to the south east is the hills and trees that Belgium has to offer.

Belgium is a first world country and is further along than many places. They practice sustainable agriculture by producing sugar beets, grains and potatoes. 45% of the country's land is used for farming and 65% of farms produce livestock. The Belgian diet mainly consists of red meat, so livestock farming is a very good choice for this country. A majority of belgian families also go out to eat every Sunday and eat 4 meals a day. The average size for a Belgian family is 2.5 people.

A majority of the Belgian population have access to electricity. Electricity in Belgium comes from many, many different sources (Belgian: Power). The two main sources of energy are nuclear energy and gas. Belgiums location gives it ample oppurtunity to be a clean country. They are located on the coast as well as getting lots of wind and rain action from the west. Only a measly 12.6% of their power comes from wind and 0.4% comes from hydroelectric power sources (Belgian: Power).

Belgium has so much potential to exponentially increase their use of clean energy. The reason this is so important is because if Belgium can rely solely on the earth and themselves, it leaves the rest of the world to deal with countries that need more help with food security. Relying on both water and wind can leave the air in Belgium cleaner, the people happier, and the country able to sustain itself and help others.

Belgium is currently turning a blind eye to all of the possible, better and easier solutions to this energy crisis. As of today Belgium has 100 million euros invested in research being conducted by the SCK-CEN Research Centre. They are planning on using this money to research “sustainable” nuclear energy (SMR Research). The Belgian government wants this money to be used for discoveries in the field of small modular reactors. Possible research areas include

reactors that do not use water as a coolant and instead use a liquid metal or gas. Using other coolants could create more air pollution than before, especially if the coolant is gas.

I think this funding should be removed from nuclear research and in turn used to produce cleaner energy. The two areas of clean energy they should focus on harnessing are hydroelectric power and wind power. Using two things that occur often in this country to power it is both healthier and more precidented. Wind turbines are definitely pricey. The cost is roughly £2,370,000 for capital expenditures which include the building of the turbine and assessing of the land (Catapult). There will also be maintenance costs that are not accounted for in this number.

With the 100,000 that the Belgian government has invested in just the research and development portion of nuclear energy, so many turbines could be running on offshore winds for a fraction of the cost and this is real energy, not just the idea of it. These wind turbines also last around 27 years which is a decent amount of time for them to continue producing energy. One of these turbines on average will produce an average of 4,471MWh per year (Catapult).

Because of the torrential rains that Belgium experiences, they should attempt to find some way to use that as power. Belgium currently has 399 wind turbines spread over 9 offshore zones (IEA Wind). The country should spend roughly £474,000,000 to build 200 new turbines. This is a fantastic start which will increase the country's wind powered energy production by 25%. At least £250,000,000 should be set aside for routine maintenance and repairs on new and old turbines. With the remaining money I propose doing research in another realm of renewable energy. Hydro-electric power.

Belgium experiences a lot of rain and is also located on the English channel allowing it ample access to potential water powered sources (World Bank).I would like to see water power in Belgium quadruple by 2033. One way to harness this power is water wheels on the coast. Currents flowing through the English channel are very powerful and could be used easily. The money from this project that should be used for figuring out the most efficient material to make water wheels out of. I think if we can find a way to channel the downpours would be an innovative way to use clean energy.

Rain has a lot of power when it comes down. An invention similar to a water wheel, that collects power from rain and sends it into reserve generators to be used when needed. Obviously as of right now rain cannot be a main source of power, but starting to harness that will allow for progress in a previously unknown field of technology. In the future this could become a larger source of energy than ever, but for right now we need to start using the remainder of the funding to research this new field.

Clean energy is so important to today's industry. Wind and water are ample sources in Belgium and need to start being used. If we reroute the funding from nuclear projects to the research and creation of more wind and water energy we will be better off in the future. Leading the country out of the darkness of nuclear waste and into the light of water and air will be beneficial to being one of the first countries to be self sufficient and prosperous.

Works Cited

"Belgium Geography, Maps, Climate, Environment and Terrain from Belgium | - CountryReports." *Www.countryreports.org*, www.countryreports.org/country/Belgium/geography.htm. Accessed 1 April 2023.

"World Bank Climate Change Knowledge Portal."

Climateknowledgeportal.worldbank.org,

climateknowledgeportal.worldbank.org/country/belgium/climate-data-historical#:~:text=

Belgium%20has%20a%20temperate%20maritime. Accessed 1 April 2023.

"Belgium: Power Production Share by Source 2021." *Statista*, www.statista.com/statistics/1234898/belgium-distribution-of-electricity-production-by-source/#:~:text=Nuclear%20energy%20is%20the%20main. Accessed 2 Apr. 2023.

"Belgium Government Allocates Funding for SMR Research : New Nuclear - World Nuclear News." *Www.world-Nuclear-News.org*,

www.world-nuclear-news.org/Articles/Belgium-government-allocates-funding-for-SMR-resea. Accessed 4 Apr. 2023.

CATAPULT. "Wind Farm Costs - Guide to an Offshore Wind Farm BVG Associates."

Guide to an Offshore Wind Farm, guidetoanoffshorewindfarm.com/wind-farm-costs.

Accessed 2 April 2023

"Belgium." *IEA Wind TCP*, iea-wind.org/about-iea-wind-tcp/members/belgium/#:~:text=By%20the%20end%20of%202021. Accessed 2 Apr. 2023.