June 21, 2023

Vermont Public Utilities Commission

Regarding Case # 23-1870-PET

PUC,

Based on the clear reading of Act 102, 2018, and Act 31, 2019, the PUC must deny the Burlington Electric Department's request to transfer additional TEPF money to funds its District Energy System (DES) support program. Even if these acts allowed a transfer, the request should be denied because BED, relies on faulty carbon accounting methods that under-estimate the DES carbon emissions factor by over 300%.

Act 102, 2018 reads in part:

> In addition, the Commission may authorize an entity appointed to deliver such services under subdivision (d)(2)(B) of this section to use monies subject to this subsection for the conversion of thermal energy customers using fossil fuels to district heat if the majority of the district's energy is from biomass sources, the district's distribution system is highly energy efficient, and such conversion is cost effective.

The act creates a three part test, and the DES fails two of these; it is not cost effective and it is not "highly efficient."

We find very similar language in Act 31, 2019:

> In addition, the Commission may authorize an entity appointed to deliver such services under subdivision (d)(2)(B) of this section to use monies subject to this subsection for the engineering, design, and construction of facilities for the conversion of thermal energy customers using fossil fuels to district heat if the majority of the district's energy is from biomass sources, the district's distribution system is highly energy efficient, and such conversion is cost effective.

Depending on whose counting, the McNeil plant is between 23%[1] and 26%[2] efficient and a DES would only increase efficiency to 26% to 29%. By all accounts, McNeil is a highly **inefficient** electric plant and the adding a district heat system to McNeil only creates a highly **inefficient** district heating system.

BED's own studies[2] reveal that the DES is only 26% efficient, about 60 points below EPA recognized efficiency rating of 85% for efficient wood-burning thermal systems. This proposed system can never

1 https://www.sevendaysvt.com/vermont/in-a-warming-world-new-thinking-imperils-vermonts-wood-fueled-energy-market/Content?oid=28671780

2 Lane, Damon, and Adam Sherman. *VEIC Assessment of Lifecycle GHG Emissions from Joseph C. McNeil Generation Station*. 4/29/2022. Page 11. www.burlingtonelectric.com/wp-content/uploads/VEIC-Final-Memo-to-BED-LCA-of-GHG-emissions-4.29.22-.pdf

and will never be energy efficient in any meaning of the term efficient: it burns wet wood and pumps steam 2 miles to its destination before heating any buildings.

In addition to being highly inefficient, the DES, with an estimated price tag of $42,000,000 is also not cost effective. While I am not aware of economic feasibility studies of alternatives to the DES that the hospital or BED may have done, it is common sense that it if the hospital decided tho burn wood rather than natural gas, *it would be much less expensive* for the hospital to site boilers on site rather than bury two miles of steam pipe below city streets in order to pump steam from the McNeil plant. $42,000,000 would pay for a lot of on-site geothermal that would actually reduce CO_2 emissions.

For these reason, the BED petition must be denied. There is a third reason this petition should be denied: the DES will increase CO_2 emissions compared with the status quo when Vermont is actively attempting to reduce CO_2 emissions.

VGS commissioned First Environment carbon intensity model of the proposed DES. The FE CI model is itself modeled on the GREET model, which was designed to calculate greenhouse gases in the transportation sector. The Department of Energy, which advocates for an increased use of domestically made biofuel to replace foreign oil, recently included a tab into the GREET model for electric-generating plants powered by biomass. You can find the GREET Excel model here: https://greet.es.anl.gov/greet_excel_model.models

10 VSA 582(g) requires greenhouse gas accounting protocols that achieve transparent and accurate life cycle accounting of greenhouse gas emissions, including emissions from gasses from the use of fossil fuels ***and from renewable fuels such as biomass***.

For policy reasons unrelated to the actual science, the GREET model *does not include scope 1 CO_2 emissions*, i.e. CO_2 emissions at the stack generated by burning biomass, which in 2021 were over 453,000 tons of CO_2 at the McNeil plant. Attached is the Bio_electric xlsm sheet. Rows 24-34 show which greenhouse gases the GREET model calculates. **CO_2 is not among them.** Consequently, the GREET model does not comply with 10 VSA 582(g).

The calculation method used by VGS and BED do not comply with state statute 10 VSA 582(g). While the ANR is just now starting the work to create these rules, "[o]n adoption, such protocols shall be the official protocols to be used by any agency or political subdivision of the State in accounting for greenhouse gas emissions." The PUC should not ignore the spirit of this statute by ignoring the stack emissions at McNeil.

Replacing the hospital natural gas boilers with the DES will increase emissions two ways. First: burning wood has a carbon emission factor of roughly 2.5 times greater than natural gas. That is, for the same energy output, wood creates 2.5 times more greenhouse gases than natural gas does. Using figures in the VEIC memo[2] and including EPA-reported CO2 emissions which are not included in the VEIC calculations, McNeil has a carbon emissions intensity (CI) of 1,617 $kgCO_2e/MWH$ based on an average of 248,700 MWH of power. Compared with a CI of 428 $kgCO_2e/MWH$ for marginal power produced on the New England grid with natural gas, **McNeil has an carbon emissions intensity 3.75 times larger than BAU based on the BED memo.**

Second: Depsite the hype, the DES does not use “waste heat.” The McNeil plan will run more often and consume for fuel if the DES is connected to it. This increased usage will increase emissions at McNeil by about 20,000 tons annually above a take-no-action, business-as-usual approach of the University continuing to use natural gas on site.

The proposed plan will benefit a single entity, the UVM Medical Center, at a cost of $42 million dollars. This is not the least cost option. This does not benefit the public good. A least cost option would site the boiler onsite at UVM, not pump steam two miles up hill. If UVM chose to run its boilers with wood, a least cost option would be to use dry wood chips or wood pellets on site, rather than rely on wet wood at McNeil. Given that wood burning emits more CO2 than natural gas (and emits more than every other common fuel), a least cost option would include solar hot water and geothermal integration at UVM, not pump steam 2 miles from a 23% efficient electric plant.

For these reason the PUC must deny the petition.

Thank you.

Pike