

Climate Change Committee Meeting 23 May 2023

Presentation by Cllr Allan Marshall

During the last Climate Change Committee meeting, the potential use of the Milwr Tunnel water run-off for a hydro-electric scheme was discussed. The amount of water flowing was quoted as 24 million gallons (110 million litres) per day flowing into the Dee Estuary at Bagillt. The Milwr Tunnel is part of a quarry and mine drainage tunnel complex reaching as far as Loggerheads near Mold.

I referred to basic laws of physics and formulae for potential energy and kinetic energy and estimated that a 10-metre diameter wheel with a bucket size of 1 cubic metre, weighing 1 tonne, would generate around 5kW of power. Detailed calculations would be needed to establish the feasibility of such a scheme.

The Principle of Conservation of Energy means that “Energy cannot be created or destroyed; rather, it can only be transferred or transformed from one form to another”.

Current renewable energy capture strategies appear to be focussed on generation of electricity using wind and solar energy, with electrically powered air-sourced heat pumps being supported by UK Government grants. However, recent press reports suggest that Heat Pumps are not as effective as originally thought with installers needing to fit larger radiators and feeder pipes to compensate for the lower heating water flow temperature. They are also not effective when the outside air temperature is very cold, and the external units require heating to prevent freezing.

I once sat through a sales presentation by a Heat Pump Representative who told me how the system would work. The cost was around £15,000 and would need replacing all my (intentionally oversized) radiators and fitting 15mm pipes instead of the existing 10mm microbore pipes. I was advised that the operating ‘flow temperature’ of the central heating water would be around 45C so needed larger radiators and pipes to work. I declined the proposal and decided to see if my existing radiator and piping would work with a lower temperature.

I reduced the operating temperature from 70C to 50C and did not adjust the room thermostat or TRVs. There was no noticeable difference in comfort. However, the gas consumption had reduced by 29% over the following year. I did this around 18 months before the UK Government’s advertising campaign to reduce boiler flow temperatures to 60C recently. It took about 10 minutes to do the adjustment and I have been saving energy since then and will be doing so in the future. This was the most cost-effective energy saving change that I have ever made.

Flintshire is part of the North Wales coal field where fossil fuel was slowly created over millions of years and quickly mined and burnt over a few hundred years. The closed mine workings are now probably full of water that is permanently warmed from the earth’s core and offers a nearly unlimited source of geo-thermal energy.

The Specific Heat Capacity of liquid water is understood to be 3,600 times that of air which means that much more heat can be recovered from water than from air. Streams and rivers accumulate heat from the environment and through gravity as they progress downhill. Chilled water holds more oxygen than warm water so

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repeatedly extracting heat and cooling the water as it runs along the watercourses is beneficial to fish and aquatic species.

Coal mining areas are in all areas of Flintshire from Point of Air, Talacre in the North to Treuddyn/Coed Talon, Llanfynydd, and Leeswood in the South so access to this source of geothermal energy may be available to all Flintshire Wards.

Below are some hyperlinks relating to geothermal energy:

- [Interactive Map Viewer | Coal Authority \(bgs.ac.uk\)](#)
- [Geothermal in the UK | GeoScienceLtd](#)
- [BBC - Search results for geothermal](#)
- [North East using its mining heritage to create Geothermal Green energy | ITV News Tyne Tees](#)

Climate change is contributing to unpredictable weather with less sunshine and greater incidence of storms leading to crop failures. New techniques in 'Vertical Farming' whereby large, covered warehouses comprising vertical storage areas with computer-controlled lighting, watering and heating provide the conditions for continually growing crops on a conveyor belt basis. Geothermal energy and heat pumps could provide the heat. Solar PV, Wind Turbines, Hydroelectric waterwheels, and turbines could sustainably provide the electricity to provide the lighting to provide a sustainable, green, carbon-capture facility that provides a continuous food supply for local residents and food for animals. See [Vertical farming - Wikipedia](#) for further details.

Tidal energy capture relies on the gravitational energy forces associated with the moon's orbit. Perhaps consideration should be given to having lagoons along the Dee estuary that would provide electrical energy whilst filling up and emptying. Geothermal coils could be used to extract heat from the water.

Flintshire County Council Climate Change Committee resolves to recommend to Cabinet and the Environment & Economy Scrutiny Committee take note of the above and widen their scope on what represents renewable energy capture systems in Flintshire.

Cllr Allan Marshall

17 May 2023.