What is a Heat Network?

Heat networks supply heating and hot water to multiple buildings from a centralised heat source. Rather than each home having its own boiler, hot water is produced centrally and distributed to homes and other properties via a network of insulated pipes.

How will it work in Tanygrisiau?

Tanygrisiau has ideal local resources for a heat network. Hot water will be supplied by a heat pump system, using Llyn Ystradau / Tanygrisiau Reservoir as a source. A heat pump, powered by electricity, moves heat from a large source to a smaller circuit at a higher temperature. This is very efficient and uses much less electricity than heating water directly with electricity. The scheme will be developed and operated by a Community Energy Service Company (CESCo), which is a community-owned Not-For-Profit. The CESCo can buy most of the electricity needed from nearby hydro plants and use it to heat properties for a lower cost than installed heating systems. It is a local and inclusive, community-owned energy system. The hot water will be distributed via a network of insulated pipes, to provide heating and hot water to homes and businesses.

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What are the benefits of a heat network?

Most houses in Tanygrisiau have electric storage heaters, oil, coal, or LPG systems. These heating systems can be expensive to use, are typically inefficient, require regular maintenance and safety inspections, and emit high levels of CO_2.

A heat network can provide cheaper heating using locally-generated hydro electricity purchased directly by the CESCo. The CESCo aims to make a comfortable and healthy level of heat affordable to all. This means making heating equitable and removing reliance on fossil fuels and reducing the emission of greenhouse gases. The network technology is reliable and the equipment within properties is simple – the CESCo will be responsible for its maintenance and its lifetime is expected to be more than 20 years.

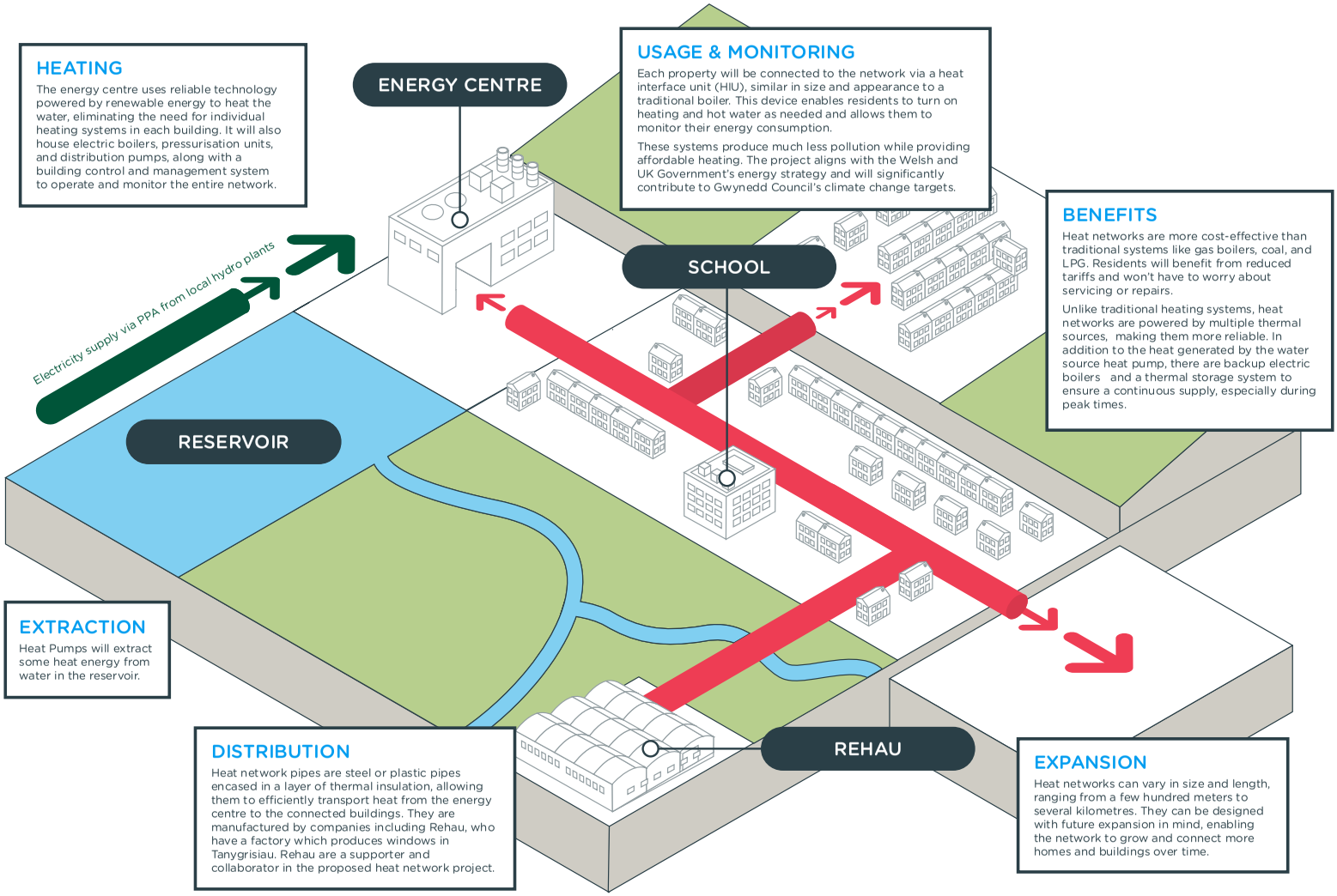
Connection and metering

The community heat network enters your home through a system called a **'heat interface unit' (HIU)**. This transfers heat from the network to your home's heating system. It provides heat and hot water controls and contains a smart meter to measure the amount of heat used. The CESCo will offer a basic rate for a base level of heat which will keep your home at a healthy temperature. This will cost less than your current heating options. There will also be an option to pay to 'boost' the heating for a hotter house.

The HIU is similar in size and appearance to a gas boiler. It can replace a boiler or be fitted inside a meter cabinet and will be maintained and serviced by the scheme's heat network maintenance contractor, appointed by the CESCo.

Retrofit measures and costs

Most houses will require some insulation and window upgrades, as well as radiator upgrades to make sure they work well with the heat network system. Improving the thermal efficiency of your home will reduce your heat consumption and the amount you spend on energy. The CESCo will coordinate all available grants and some other investment to pay for this work. The investment will be repaid using the difference between the price the CESCo pays for electricity and the price at which it sells the generated heat. This means no upfront costs to homeowners, and heating bills will be lower long term and stable throughout the year.



HEATING

The energy centre uses reliable technology powered by renewable energy to heat the water, eliminating the need for individual heating systems in each building. It will also house electric boilers, pressurisation units, and distribution pumps, along with a building control and management system to operate and monitor the entire network.

USAGE & MONITORING

Each property will be connected to the network via a heat interface unit (HIU), similar in size and appearance to a traditional boiler. This device enables residents to turn on heating and hot water as needed and allows them to monitor their energy consumption.

These systems produce much less pollution while providing affordable heating. The project aligns with the Welsh and UK Government's energy strategy and will significantly contribute to Gwynedd Council's climate change targets.

BENEFITS

Heat networks are more cost-effective than traditional systems like gas boilers, coal, and LPG. Residents will benefit from reduced tariffs and won't have to worry about servicing or repairs.

Unlike traditional heating systems, heat networks are powered by multiple thermal sources, making them more reliable. In addition to the heat generated by the water source heat pump, there are backup electric boilers and a thermal storage system to ensure a continuous supply, especially during peak times.

EXTRACTION

Heat Pumps will extract some heat energy from water in the reservoir.

DISTRIBUTION

Heat network pipes are steel or plastic pipes encased in a layer of thermal insulation, allowing them to efficiently transport heat from the energy centre to the connected buildings. They are manufactured by companies including Rehau, who have a factory which produces windows in Tanygrisiau. Rehau are a supporter and collaborator in the proposed heat network project.

EXPANSION

Heat networks can vary in size and length, ranging from a few hundred meters to several kilometres. They can be designed with future expansion in mind, enabling the network to grow and connect more homes and buildings over time.