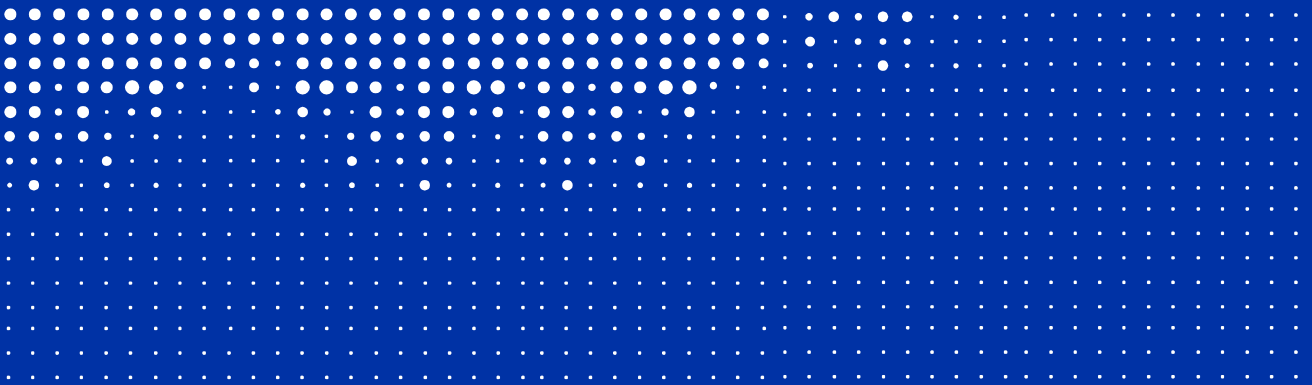


# Why Waste Heat?

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07768 760515



## What we do...

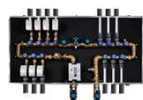


**AirMaster**  
Smart Mechanical  
Ventilation

**AIRMASTER**



**LoadTracker CHP**  
Combined Heat & Power



**FloCon Watchman**  
Ongoing commissioning

**SAV**



**Energy Metering**  
System Optimisation

**kamstrup**



**Danfoss FlatStations**  
Heat Interface Units &  
Pressure Independent  
Radiator Valves

**Danfoss**



**EnergiRaven**  
Energy Monitoring &  
Accounting Tool

**EnergiRaven**



**Mitsubishi**  
Heat Pumps

**MITSUBISHI  
ELECTRIC**



**Kurve Technologies**  
App Based PAYG

**KURVE**  
TECHNOLOGIES



**Värmebaronen**  
Electric Boilers

**VÄRMEBARONEN**

Intro to SAV and Mission Statement = OPTIMISE INDOOR LIVING WITH MINIMAL ENERGY WASTEAGE

## Large Scale CO2 Heat Pumps

**H300 AW-WW**



**Capacity**  
300 kW

**Dimensions**  
2.5/4.8/1.3 m

**H600 AW-WW**



**Capacity**  
600 kW

**Dimensions**  
2.5/4.8/1.3 m

**H1200 AW-WW**



**Capacity**  
1,200 kW

**Dimensions**  
2.5/8.0/1.3 m

**H1800 AW-WW**



**Capacity**  
1,800 kW

**Dimensions**  
2.5/10.0/1.3 m

Fenagy large scale  
CO2 ASHP – 300-1800kW  
GWP = 1

# Regional Offices



South East - Head Office

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## Danfoss White Paper on Waste Heat



### Excess heat is the world's largest untapped source of energy

In the EU alone, excess heat amounts to 2,860 TWh/y, almost corresponding to the EU's total energy demand for heat and hot water in residential and service sector buildings<sup>5</sup>. Much of this excess heat could instead be captured and reused.



### The solutions already exist

Heat recovery technologies exist that can use excess heat from industries, wastewater facilities, data centers, supermarkets, metro stations and commercial buildings. Excess heat can be reused to supply a factory with heat and warm water or exported to neighboring homes and industries through a district energy system. This paper presents concrete policy measures to accelerate the use of excess heat across sectors, benefitting citizens and businesses with lower energy costs and accelerating the green transition.



### Reusing excess heat is energy efficiency in its purest form

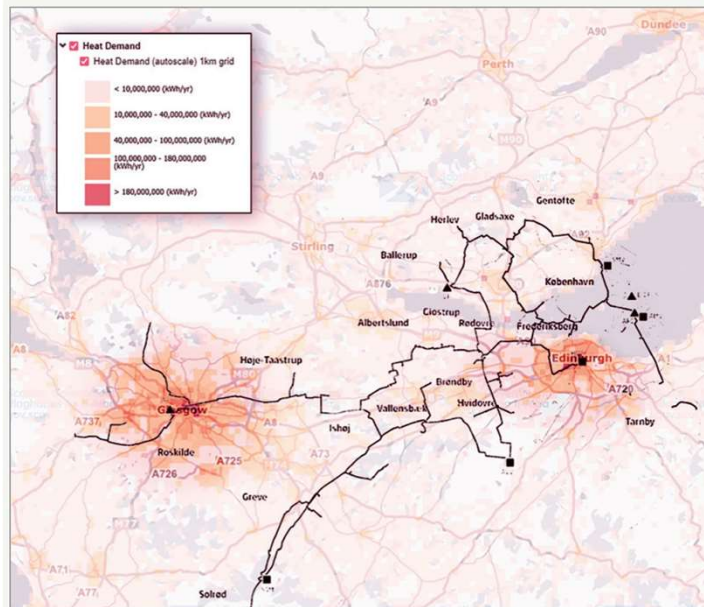
A global push for higher efficiency can help avoid almost 30 million barrels of oil per day (that corresponds to triple Russia's average production in 2021) and 650 bcm of natural gas per year – around four times what the EU imported from Russia in 2021<sup>6</sup>.

EU waste heat = 2,860TWh/y almost equal to all of EU's residential heat and DHW demands.

Q1 Why Waste Heat? = why do we waste so much available heat? Industrial revolution, cheap plentiful supply, economics

Q2 Why Waste Heat? = why don't we use Waste Heat, the World's largest untapped energy source?

## Copenhagen's Heat Highway



energiraven.com

### Proposed Heat Highway Example

This image shows an example of a Danish heat highway overlaid onto a heat map of Glasgow and Edinburgh. This illustrates how such a heat highway might connect two cities within the UK.

Heat map image courtesy of the Scottish Government.

To harvest this heat and match available heat sources with areas of high demand we need to consider Heat Highways.

Copenhagen's Regional Heat Highway is over 40 miles long. The region is home to 1.2m people with 98% of city centre homes heated by a Heat Network.

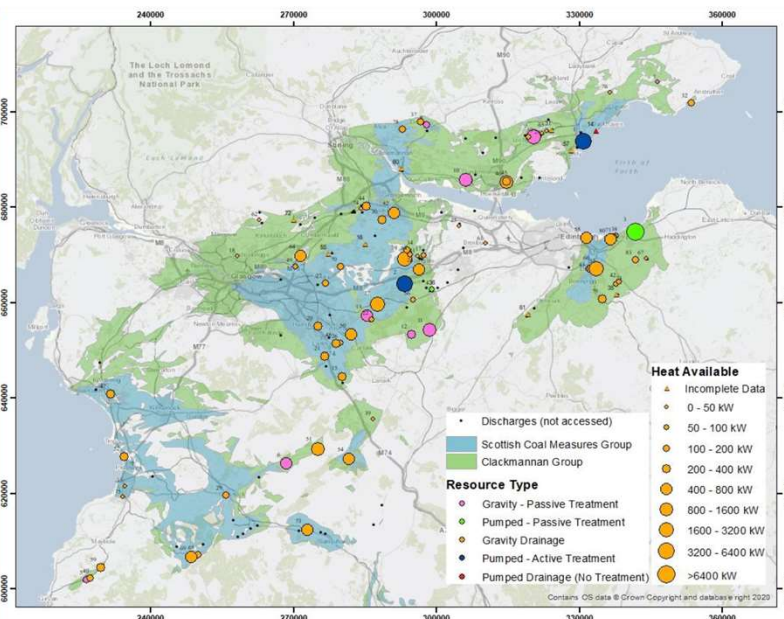
This is not a new concept and Copenhagen Region Heat Highway is not even the biggest in Denmark.

## Heat Available from Mine Water– Join The Dots!

### Mine Water Geothermal Sources at the Surface

Coal Authority treatment schemes or gravity discharges

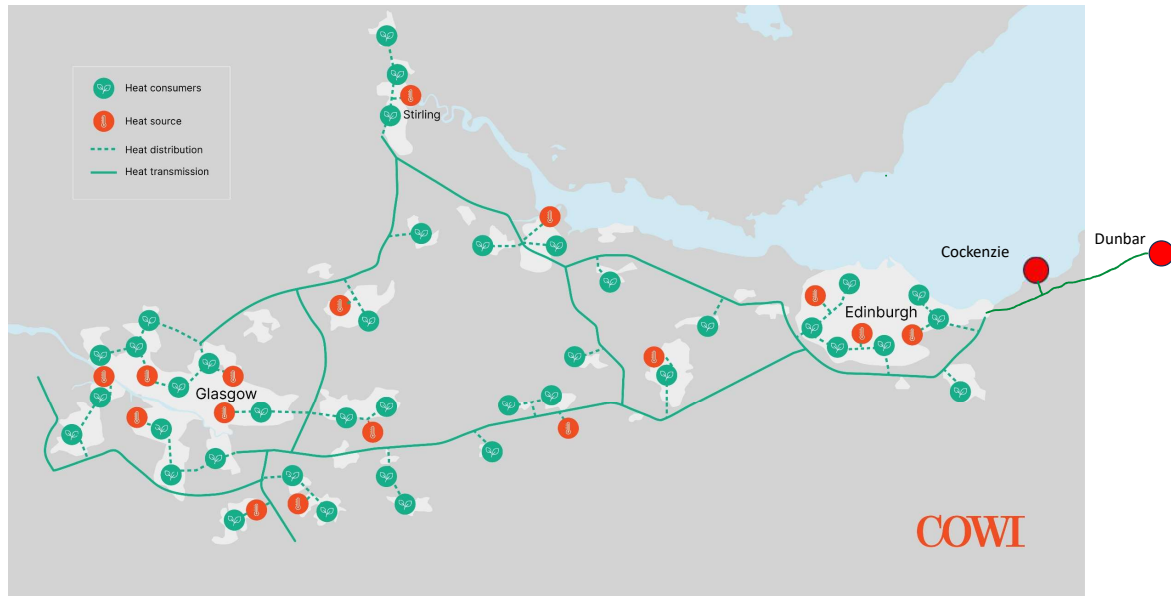
Circle Size  
=  
Heat available



Existing warm mine water can be used by WSHP to efficiently extract heat. Added benefit of bringing jobs to old deprived mining towns and helping create a new “Green” Industrial Revolution.

## Scotland's Heat Highway

SAV



East Lothian Heat Highway - LHEES  
Millerhill Heat Network



## Dunbar's Viridor Energy from Waste (EfW) Plant



- Waste capacity = 325ktpa
- Electrical generation = 31MW
- Heat generation = 108MW
  
- The electricity generated goes to the grid.
- The heat generated drives the steam turbines, the rest (20MW), gets dumped to atmosphere.
- 20MW is enough to heat 25% (10k) of homes in East Lothian

x3 bigger than Millerhill. Viridor will be paid for their heat and can expect to make around £1M pa.

Other industries will be attracted to locate in areas where they can more easily meet their net zero and sell their waste heat.

For example, H2 production – 1GW plant in Esbjerg, Denmark, located there as they could sell 260MW heat to the City Heat Highway. They make 8% profit (approx 10m Euro) from this sale each year and can sell the H2 for cost price.

If Scotland wants join the H2 market, how can we compete without Heat Highways?

## Recent adverts in

- Private Eye
- The Guardian
- The Telegraph

In the era of global boiling...  
...we're still freezing in our homes.

Power stations, factories, wastewater plants, supermarkets, and data centres are just a few industries generating incredible amounts of waste heat.

We boast a proud heritage of canals, railroads, and mines: visionary infrastructure projects that elevated our industrial sectors – not to mention our quality of living. If we're serious about making our heating green, affordable, and sustainable, we can bolster our economy and continue this tradition by building expansive, inter-city Heat Highways. They harvest waste heat from commercial and industrial customers, transporting it directly to large population centres.

We have a remarkable opportunity to make fuel poverty a thing of the past. So why do we still dump heat to atmosphere?

[www.energiraven.com/highways](http://www.energiraven.com/highways)

 **EnergiRaven**



“We boast a proud heritage of canals, railroads, and mines: visionary infrastructure projects that elevated our industrial sectors – not to mention our quality of living. If we’re serious about making our heating green, affordable, and sustainable, we can bolster our economy and continue this tradition by building expansive, inter-city Heat Highways. They harvest waste heat from commercial and industrial customers, transporting it directly to large population centres.

We have a remarkable opportunity to make fuel poverty a thing of the past. So why do we still dump heat to atmosphere? “

Recent advert in Private Eye. Also adverts and editorials in The Guardian and Telegraph – that could be Grangemouth in the distance and Edinburgh homes are freezing.

## Some of Edinburgh's existing Heat Networks



Over 100 small heat networks (less than 500 homes each) in Edinburgh. In 2007 the Sullivan Report recommended small Heat Networks to start with and then join up to make a City Wide Heat Network. Let's join the dots.

# Thank you for your attention.

Any questions?

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