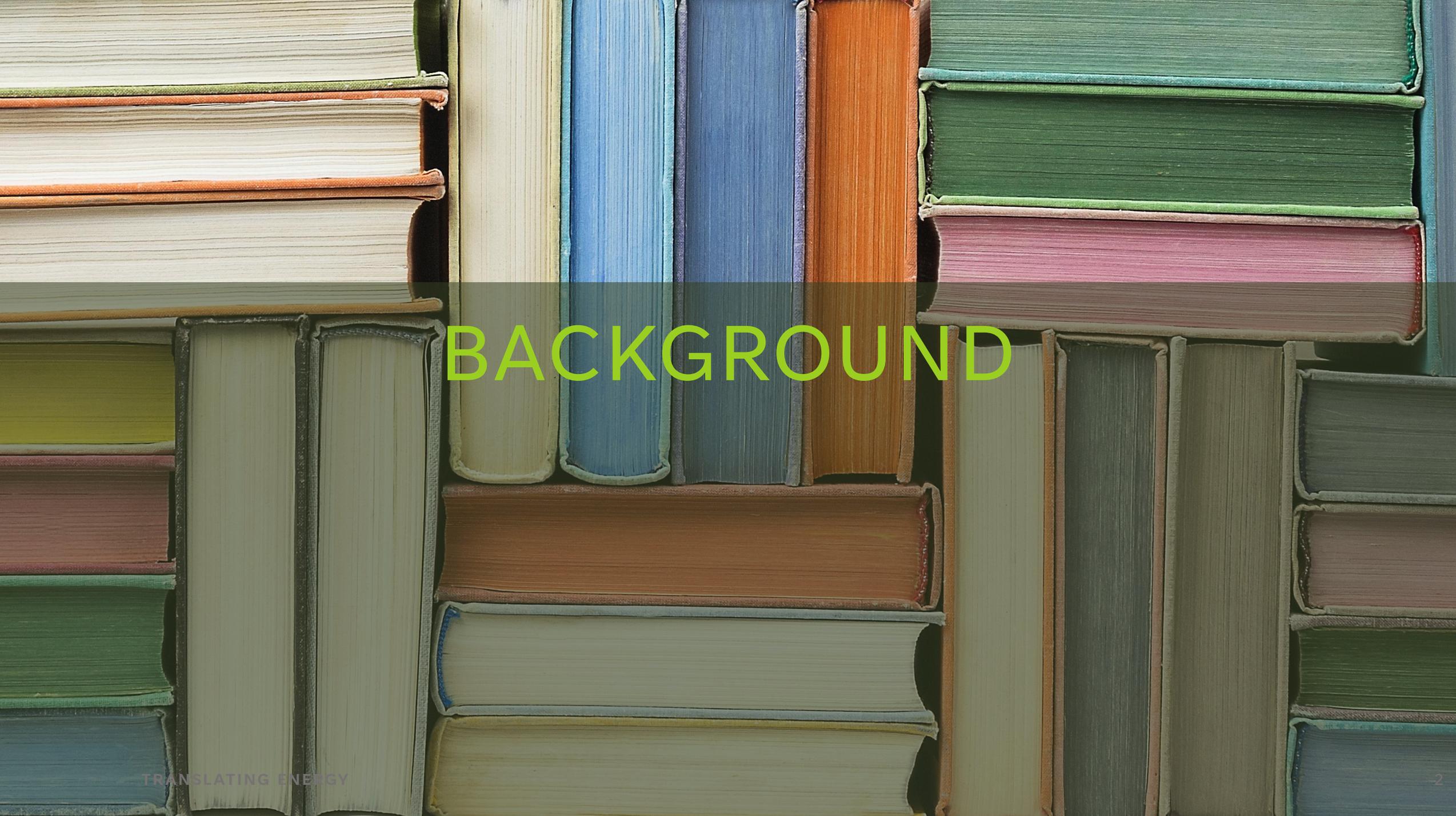


# PIPES, PEOPLE & POTENTIAL

THE ROLE OF HEAT NETWORKS, WASTE HEAT POTENTIAL AND  
PEOPLE CHALLENGES

Dr Joel Hamilton PhD  
Director, Translating Energy



# BACKGROUND

## ABOUT US

We help turn stakeholder needs into energy and sustainability solutions, by translating technical and commercial solutions to help clients make informed decisions

We work in the following areas:

**Renewable Energy and Storage | District Energy Networks | Energy Efficiency and Process Optimisation | Cooling**



## ABOUT ME

I am an enthusiastic engineer,  
With a passion to steer  
The path of sustainability clear.  
With a PhD complete  
In low temperature renewable waste heat,  
And international industrial experience  
With analytical capabilities to determine a  
project's coherence.

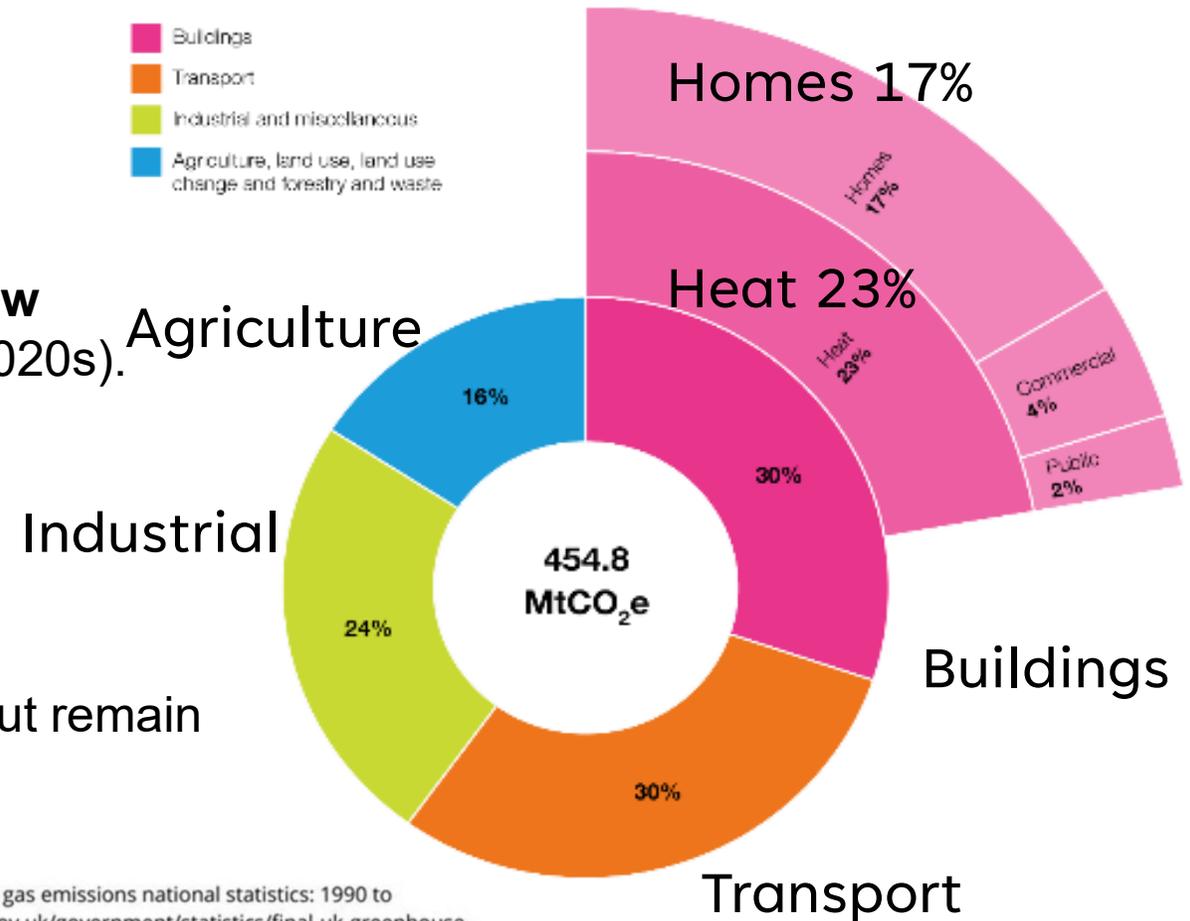
I am practiced in thermal and electric plant design  
Keeping renewables in mind.  
As well as process optimisation  
Which fuels my fascination  
In good use of resource allocation.

I have worked on many sides,  
Of the Net Zero path we stride  
From delivering engineering solutions  
To developing commercial models,  
And navigating contractual potholes,  
To supporting government delivery  
Of capital projects and policy.  
I offer a combination of commercial, technical,  
legal and policy solutions  
to support the work of your institution.

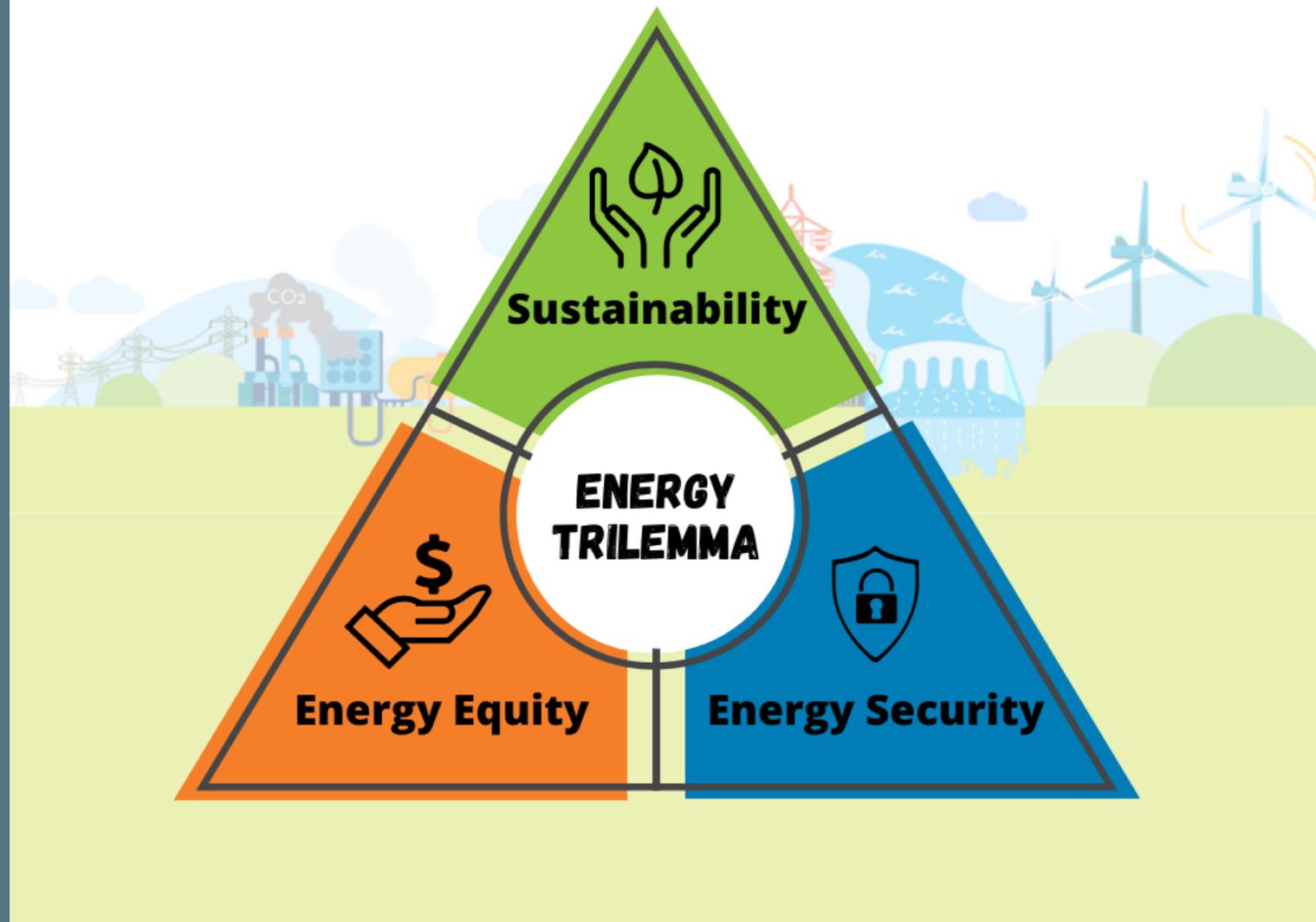


# Net Zero and decarbonising buildings: the challenge

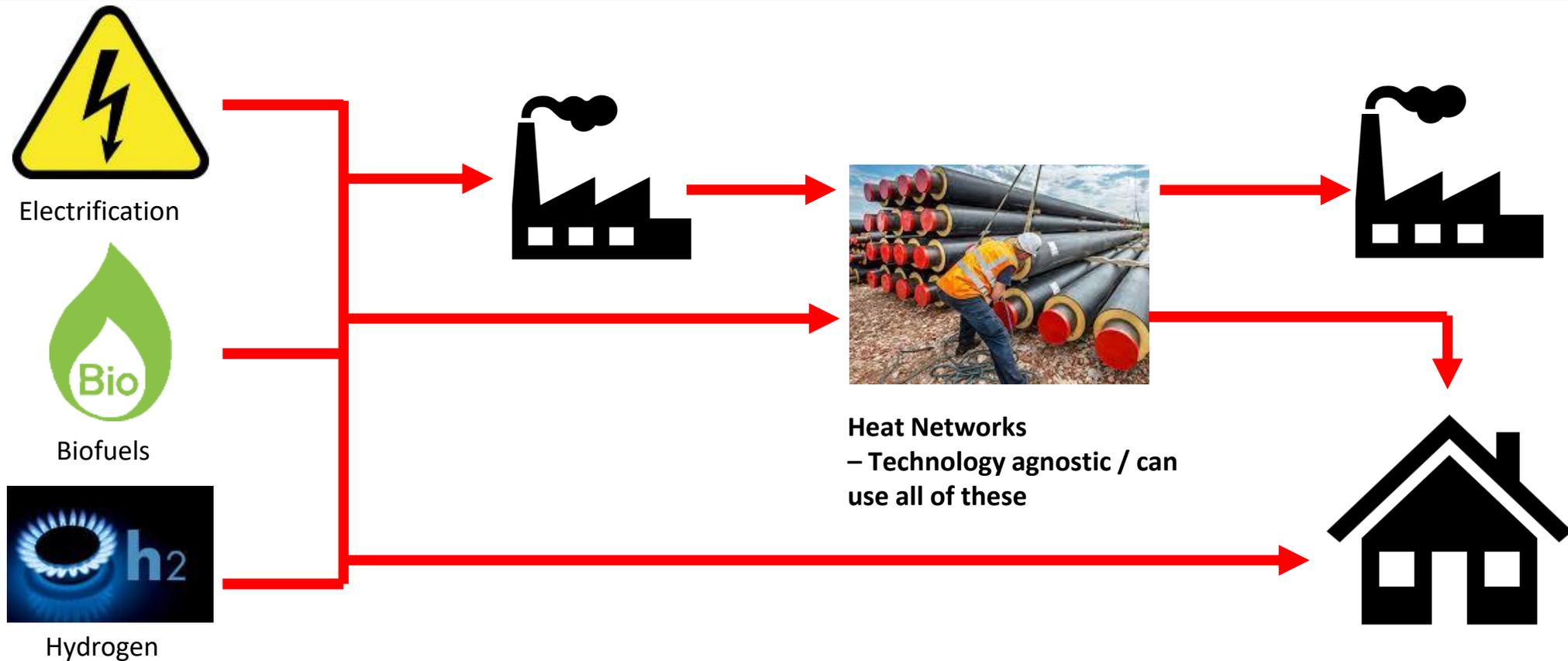
- Net Zero means nearly **all buildings need to be decarbonised by 2050.**
- There are around **30 million buildings in the UK**, responsible for **~30% of our national emissions**
- Government is committed to delivering **300,000 new homes** each year from 🙋♂ (previously the mid-2020s).
- **20% of 2050's homes** are still to be built
- **80% of the homes in 2050** already exist
- **Supply chains** for key technologies are growing but remain at an early stage of development.
- **85% of buildings** are **heated by gas**



# ENERGY TRILEMMA

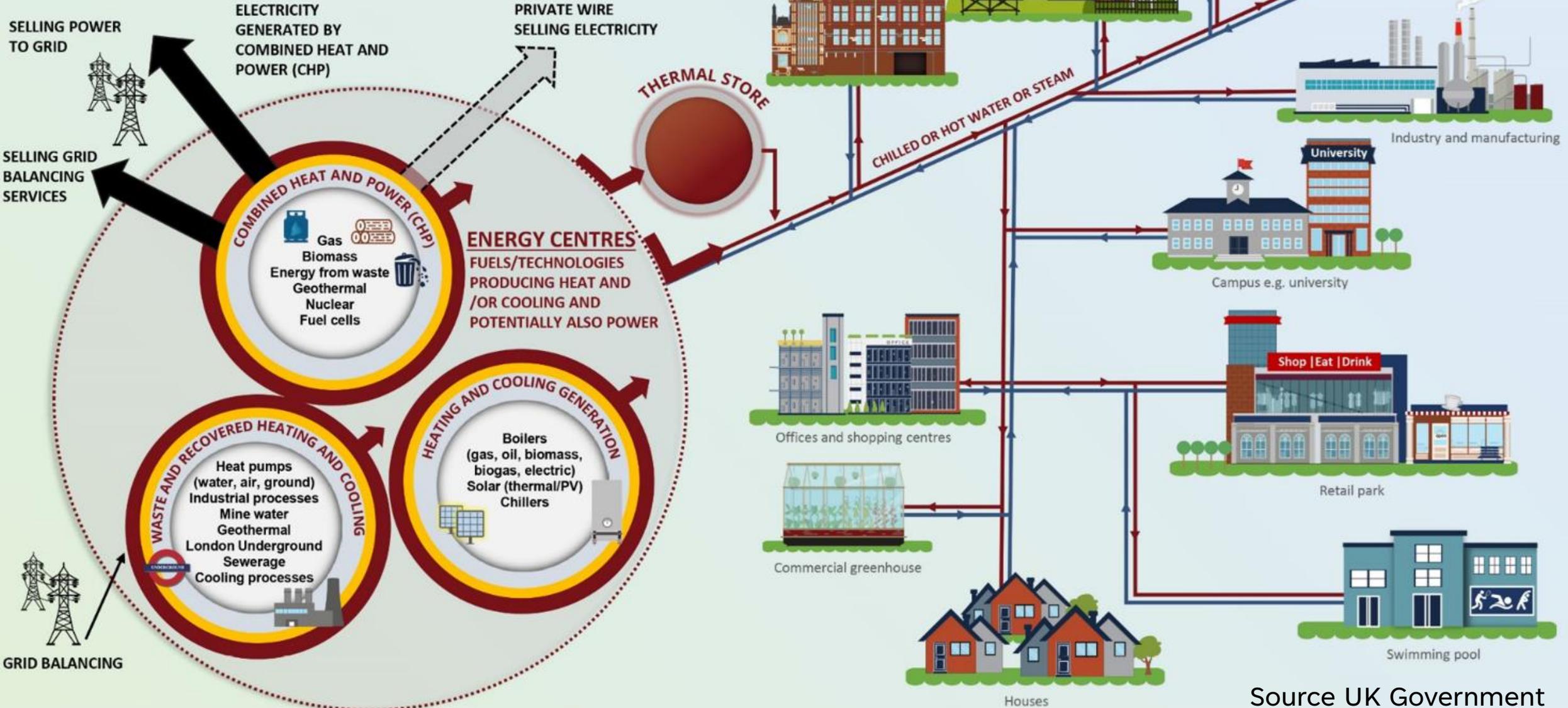


# WHAT ARE THE HEAT DECARBONISATION OPTIONS



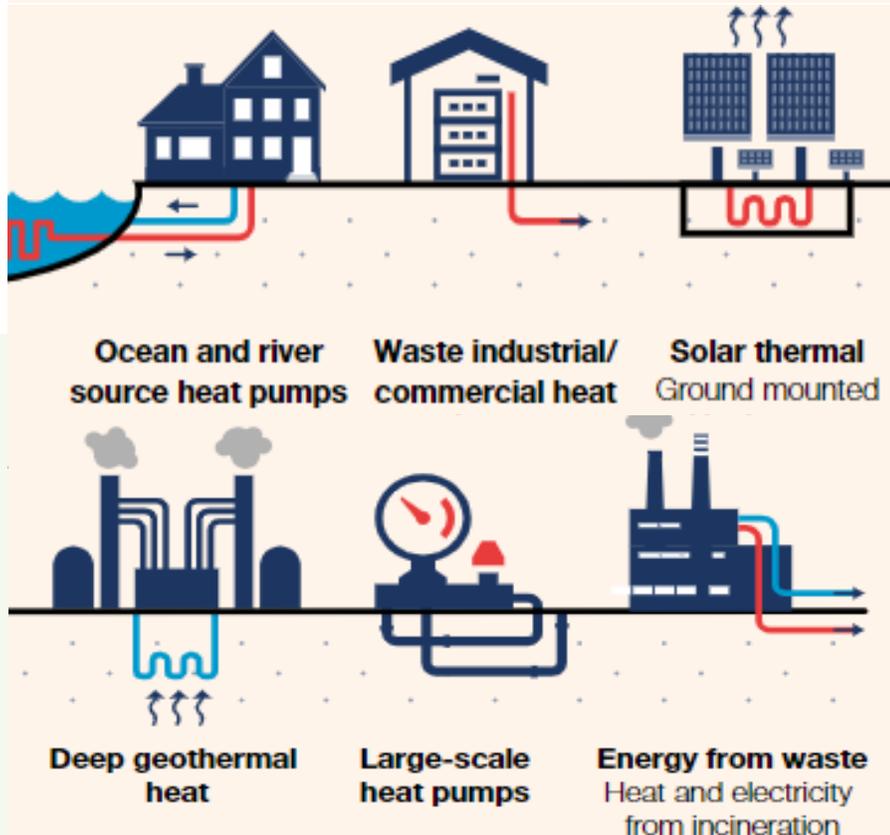


# WHAT IS A HEAT NETWORK?



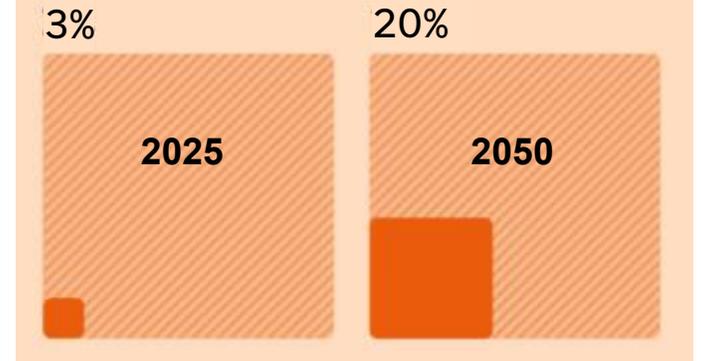
# ROLE OF HEAT NETWORKS IN UK

Taking advantage of natural and waste heat sources that individual solutions can not.



## The role for Heat Networks

- Enabling lower costs for heat network customers through accessing cheaper heat sources
- Providing system benefits and lower costs for all consumers
- Adaptable to different future energy pathways
- Decarbonisation at scale
- **New build – easier to install but low demand**
- **80% of the buildings in 2050 are already built**



## Potential investment



£60-£80 billion investment opportunity to 2050.

*Likely to be higher!*

# WASTE HEAT POTENTIAL

Analysis by sector

**Total: 282 TWh per year** (*theoretical max*)

**UK Total: 760 TWh per year**

- Paper and pulp
- Lime
- Crematoria
- Food and drink
- Underground railways
- Cement
- Other mineral industries
- Chemical
- Iron and Steel
- Cold stores
- Substations
- Supermarkets
- Data centres
- Treatment works
- Incinerator
- Power station



# WASTE HEAT POTENTIAL

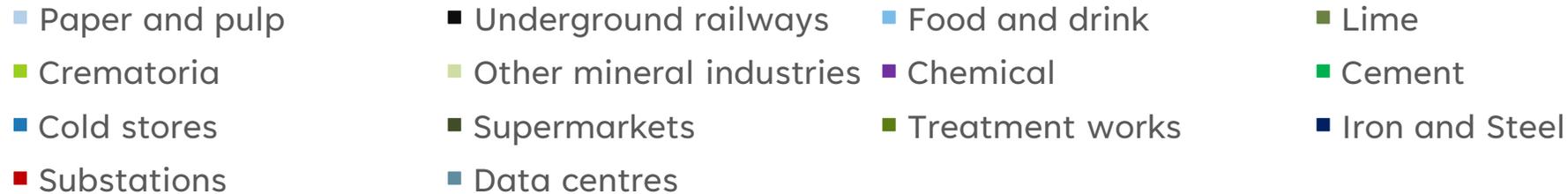
Analysis by sector (TWh per year)  
- removed power stations

- Paper and pulp
- Lime
- Crematoria
- Food and drink
- Underground railways
- Cement
- Other mineral industries
- Chemical
- Iron and Steel
- Cold stores
- Substations
- Supermarkets
- Data centres
- Treatment works



# WASTE HEAT POTENTIAL FINANCIAL BENEFIT

- Compared to heat delivered by ASHP at 70°C
- Electricity tariff of £0.20/kWh and OPEX considered
- Power stations & incinerators £10.5bn annual saving. Remaining £1bn





# THE GAME

# THE PEOPLE PART

# PROBLEM

## INCREASING DEMAND

### **Net Zero → Electrification**

Electricity demand is increasing, at a national and international level

## COSTS

### **Currently linked to gas**

Should be a function of energy source

## FINANCIALS

**Who pays:** generation & transmission infrastructure?

Who benefits?

Who is responsible?

## CUSTOMERS

### **Residential (voters)**

Commercial (economic growth)

Industrial (economic growth)

Public sector and Research (economic growth)

## RESOURCES

**What's needed, how is it shared and impact**

Materials, land, people, etc.

## STAKEHOLDERS

### **Different interests**

Central government, local government, investors, local communities, environmental organisations, businesses, etc.



# PLAYER MOTIVATIONS

## CUSTOMERS

**Cheap and reliable** energy  
Some want minimal  
environmental impact

## GOVERNMENTS

**(Local and national) remain  
in power**  
Environmental protection,  
economic growth, lowering  
voter bills

## INVESTORS

**Maximise return** without  
jeopardising portfolio

## LOCAL COMMUNITIES

Supportive and receive benefit

# PLAYERS: CORE STAKEHOLDERS



CENTRAL GOVERNMENT  
Always Wrong



LOCAL GOVERNMENT  
Well Meaning



ENERGY GENERATORS  
Wholesaler



ENERGY RETAILERS  
Market Traders



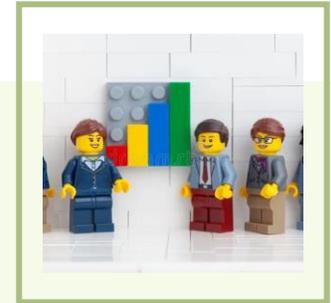
INDUSTRY  
Loud and Powerful



SMALL BUSINESSES  
Many



VOTERS  
Key



INVESTOR  
Money People

# INFLUENCERS



COMMUNITY GROUPS  
Passionate



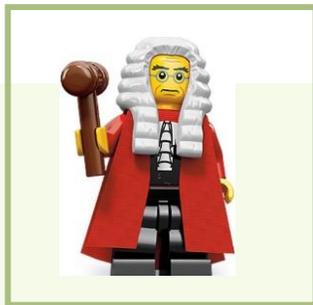
ENVIRONMENTAL ORGS  
Well Meaning



TECHNOLOGY PROVIDERS  
Agenda (snake oil)



TECHNICAL ADVISOR  
Stressed & incompressible



LEGAL ADVISOR  
Expensive &  
incomprehensible



COMMERCIAL ADVISOR  
Expensive & happy



FINANCIAL ADVISOR  
Expensive & important



MEDIA  
Carnage creator

# SUMMARY

Heat is responsible for a significant amount of our carbon emissions.

Heat networks are a useful tool in both energy security, decarbonisation at scale and pollution reduction.

Waste heat has a huge potential in the UK.

Understanding people, needs to be at the core of the solutions.

THANK YOU

Dr Joel Hamilton

+44 7724 31 84 90

joel@translatingenergy.com

www.translatingenergy.com

Contact details  
QR Code

