

Strengthening Communities Video Hui, September 2021

Emerging international trends in community energy

A presentation to stimulate discussion

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energy for good

improving lives & environments

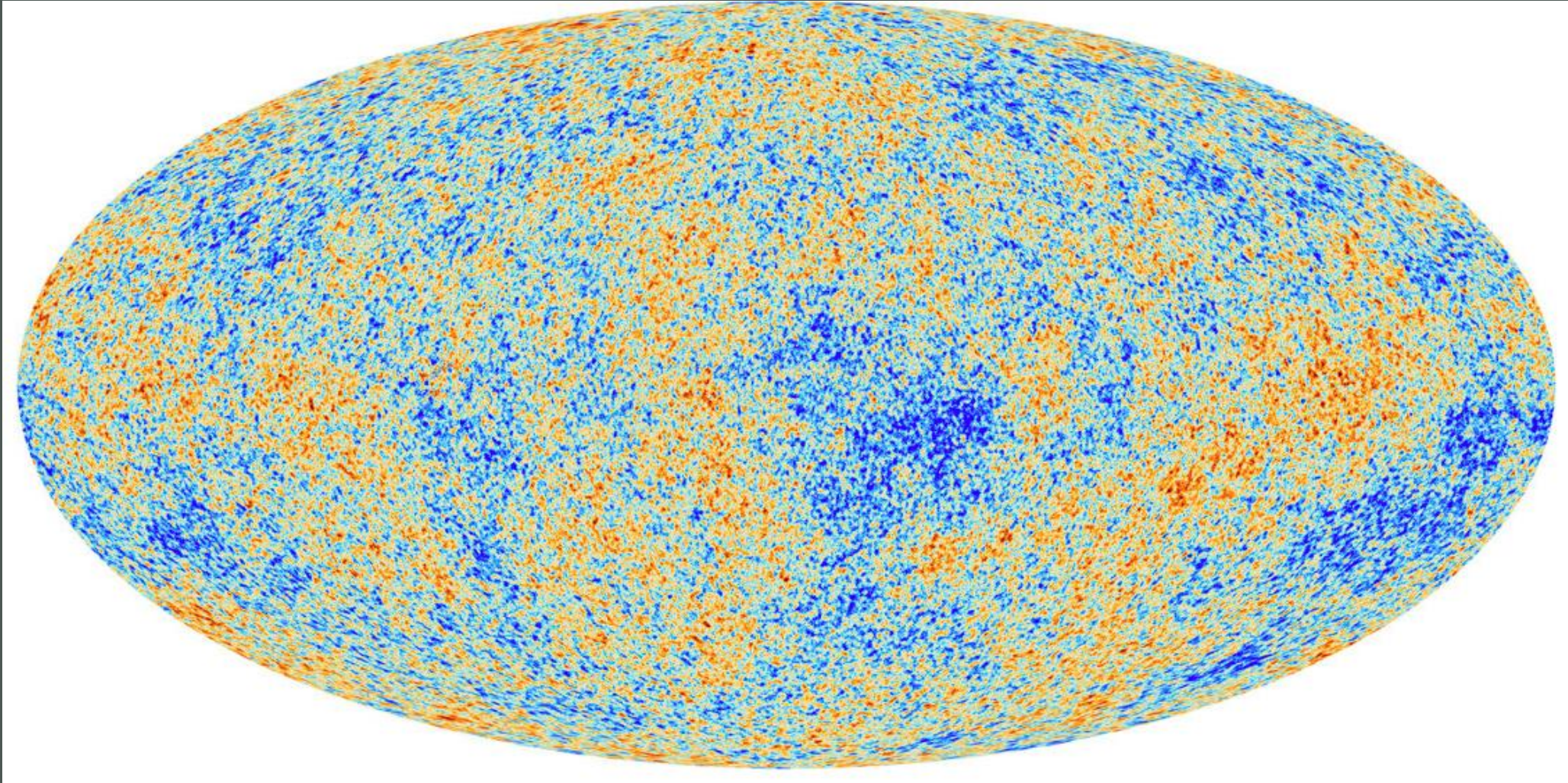
What I hope you will get from this presentation

1. the Big Picture – my views, which you may, or may not agree with
2. a top-down overview of the driving forces supporting community energy initiatives internationally
3. examples of responses to the challenges and how we might learn from these when developing community energy projects

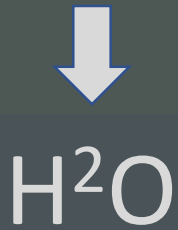
Hopefully, some time for questions and discussion



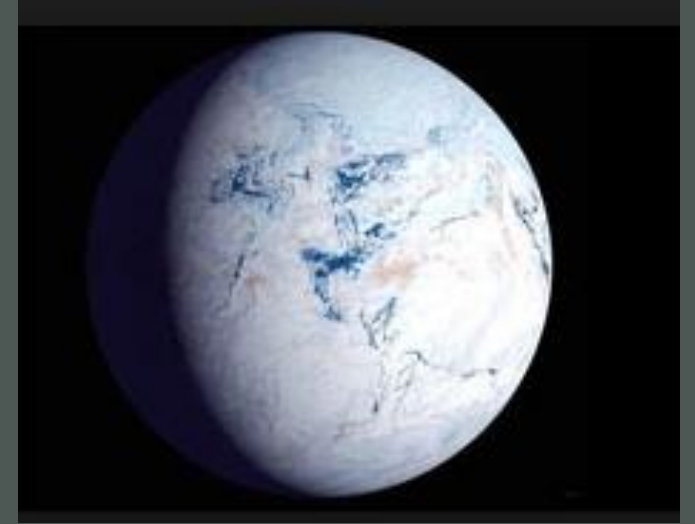
The Big Picture



Climate Change – Example 1 Bacteria



Climate Change – Example 2 - Vegetation



↓
 CO_2



↑
 C



↑
 O_2



Climate Change – Example 3 Humans



HC & O²



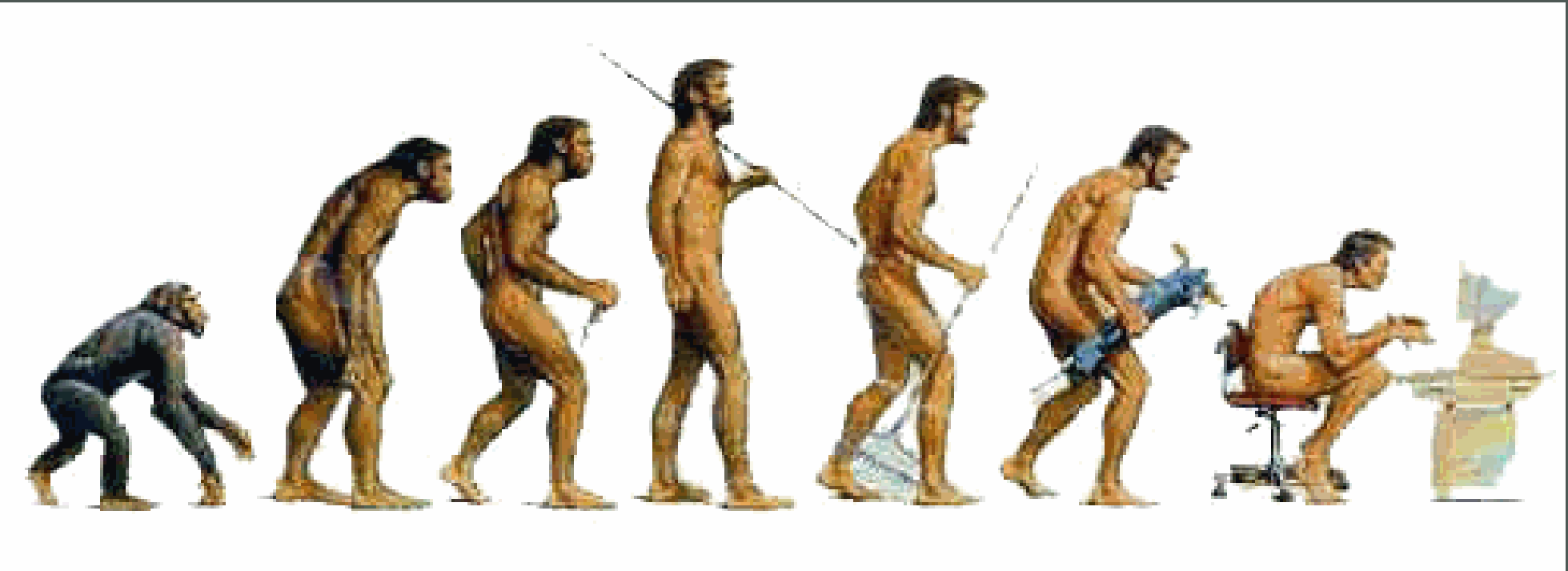
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CO²

The “three planetary crises” of climate change, biodiversity loss and pollution are reinforcing one other and driving further damage to the environment and to our health... UN Environment Programme April 2021





There is a strategic framework driving actions



Global leadership



- Conference of the Parties (COP) national commitments and monitoring
- IPCC provides policymakers with scientific assessments on climate change and proposes adaptation and mitigation options
- UN Sustainable Development Goals
 - SDG 7 – universal access to affordable, reliable, sustainable and modern energy
- IEA provides analysis, data, policy recommendations, and proposes solutions for secure and sustainable energy for all

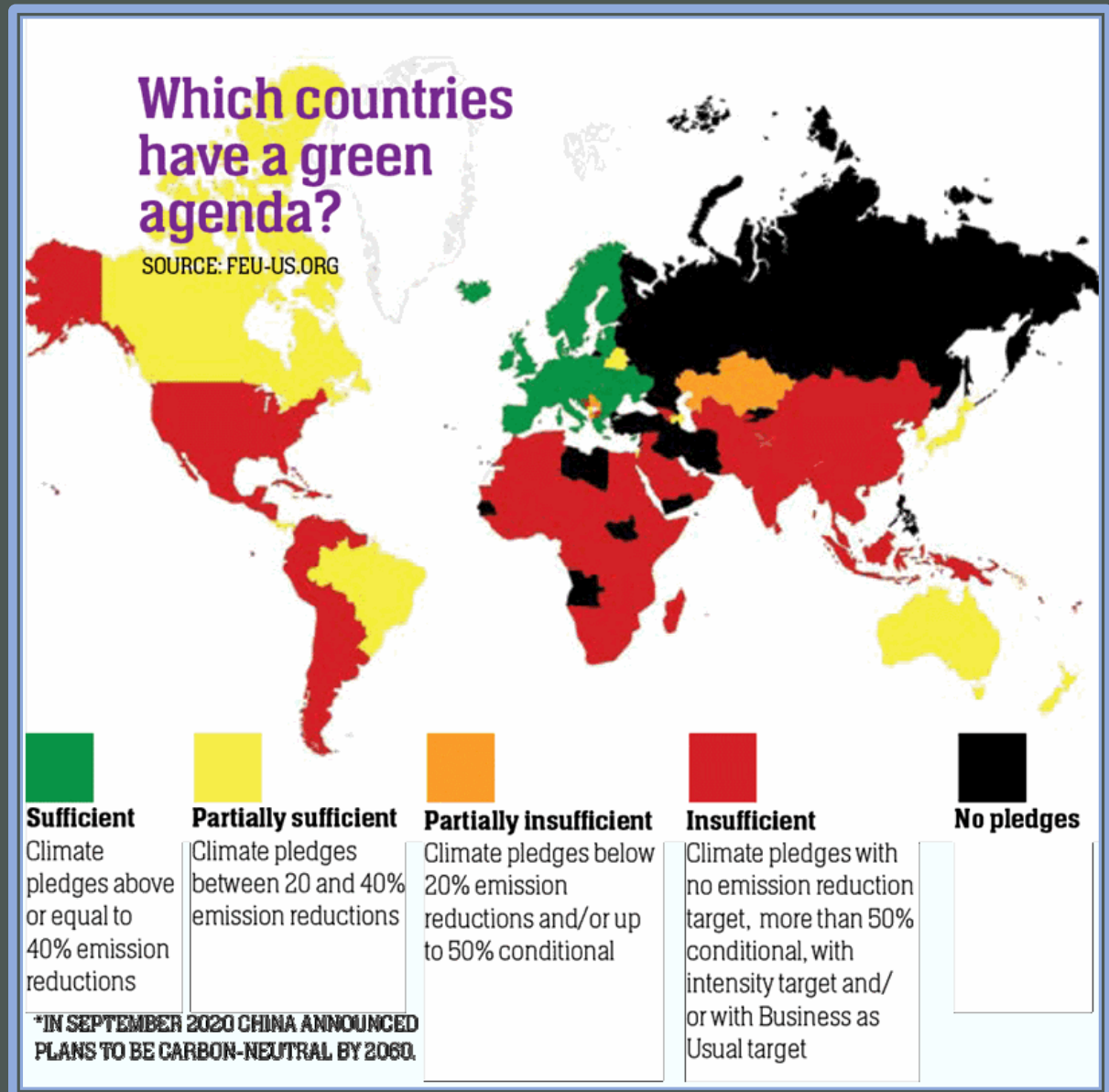


How are we doing on climate change?

- European champions!
- Come on the yellows
- USA needs to catch up in the second half
- Hey blacks, get in the game!

UK and EU are the benchmark and we should be interested in what they are doing.

Picture sourced from the Institute of Engineering and Technology (IET)



United Kingdom

Net-zero goal by 2050 and 5-yearly carbon budgets

Plan to reduce economy-wide greenhouse gas emissions by at least 68% of 1919 levels by 2030.

Key strategies:

- building on the UK's strengths
- energy technology and innovation at the centre of the UK decarbonisation policy

- the UK government is pledging £265m funding each year to support renewable energy production in the hope of quadrupling British offshore wind production by 2030
- £270m 'Green Heat Network Fund' intended to support low-carbon technologies such as heat pumps, photovoltaics and geothermal energy
- National Grid planning to recover waste heat from transformers to heat homes and provide hot water
- green skills programme targeting unemployed youth



SDG 7 Universal access to sustainable energy

- the five focus areas of SDG 7 are:
 - energy access
 - energy transition
 - enabling the Sustainable Development Goals (SDGs) through inclusive, just, energy transitions
 - innovation, technology and data
 - finance and investment
- *affordable clean energy access for all is the foundation for achieving a global energy transition that is fast and fair*, a key SDG 7 theme is 'leave no one behind'
- the UN estimates that a tripling of clean energy investment to US\$5 trillion per year will need to be achieved by 2030



Universal access

SDG 7.1.1 aims for 100 percent access to electricity by 2030.

Between 2010 and 2018 the number of people without access to electricity fell from about 1.2 billion to 789 million

The latest projection shows that about 620 million people would still lack access to electricity in 2030

- by 2018, about 35 million people had access to off-grid sources of electricity at Tier 1 and above; close to 136 million people had access to solutions below Tier 1
- sources above Tier 1 were mostly standalone home systems and solar lighting, with mini grids becoming a growing source. By 2018, the adoption of off-grid energy sources had tripled worldwide from 2010 levels
- the two major access-deficit regions (Sub-Saharan Africa and Central Asia and Southern Asia) are embracing off-grid technologies as least-cost alternatives to the grid

Tier 1 households with access below Tier 1 have electricity for less than 4 hours per day supplemented by off-grid solar devices or rechargeable batteries



Policy insights

Whilst universal access primarily focuses on communities without access, the insights are relevant to developed jurisdictions and the development of consumer energy networks

The UN's 2020 progress report on SDG 7 outcomes provides these insights

- the most successful national strategies integrate grid improvements, mini grids, and off-grid technologies
- policy frameworks, workable regulations and strong institutional arrangements create enabling environments
- encouraging rapid development of markets and promoting private sector participation is essential
- clean technologies like renewable energy mini grids and off-grid electrification remains underfunded
- leveraged public and private sector funding is needed



Global movers and shakers



The UN is expecting bold commitments put forward as Energy Compacts as well as large financial commitments from partner institutions

....who/where are the NZ movers and shakers?

- the IKEA Foundation, the charitable arm of the Scandinavian homeware store, has teamed up with the Rockefeller Foundation to set up a \$1bn (£700m) fund to fight climate change and energy poverty
- the platform aims to reduce one billion tons of greenhouse gas emissions and give one billion people access to distributed renewable energy
- each foundation will provide \$500m of risk capital for the venture, but they also hope to attract additional funds of \$10bn this year from international development agencies before opening to institutional investors



Case study

Marine power

Orbital Marine Power

2MW floating tidal generator to power the Orkney Islands community.

Marine Power Systems

Combined wind and wave floating offshore technologies. Projects being developed for Scotland and Spain.

Breaking news

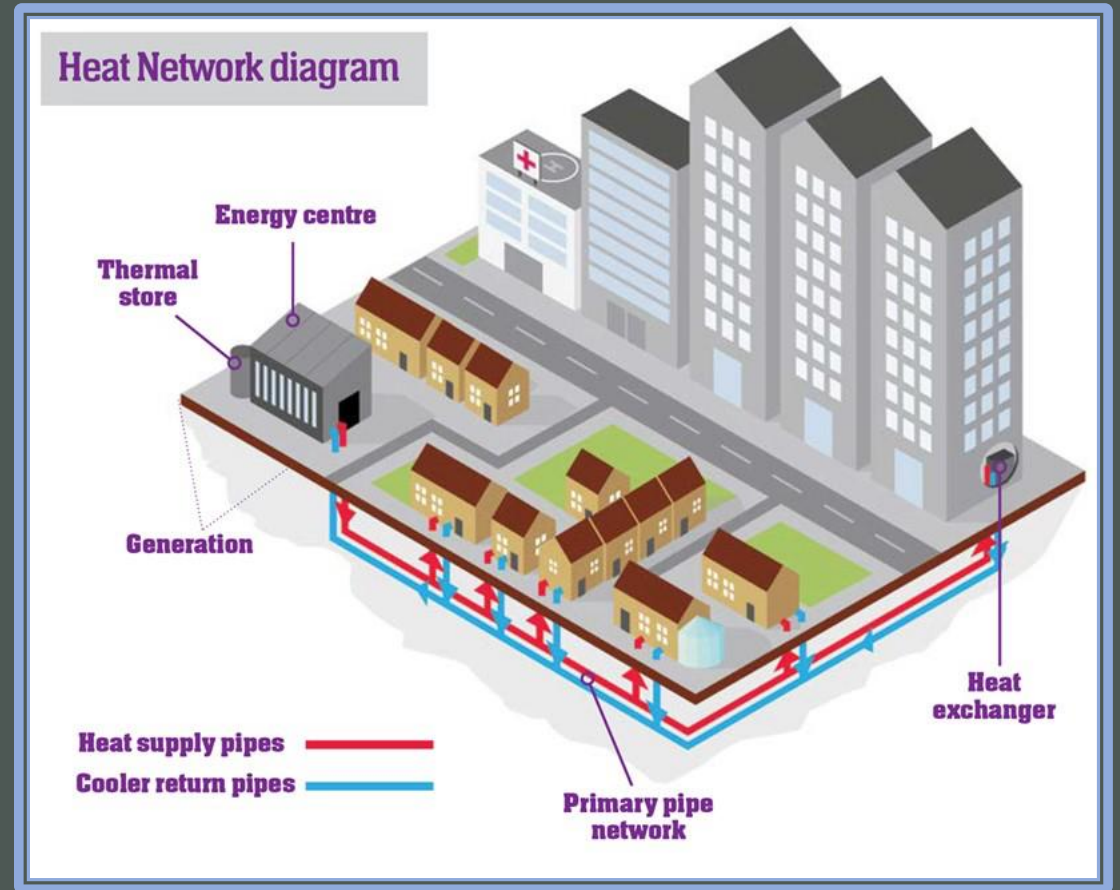
UK Government just announced that it will provide 'Contracts for Difference' funding for emerging technologies such as tidal power and floating offshore wind.



Case study

District Energy

- UK clean heating technologies need to reach at least 50 per cent of sales by 2030 to hit UN sustainable development goals
- district heating is becoming a viable low carbon option for urban environments
- Scandinavians have done this for ages
- how could it work in NZ?
- many industries and commercial buildings pay to throw heat away



Case Study

Community solar

- 25kW Rooftop solar installed in 2016 at the Evercreech Junction Industrial estate near Shepton Mallet UK
- generates approx. 25 MWh/year; - is Shepton Mallet likely to have more sun than New Zealand?
- saves around 12 tonnes of CO2 each year
- 25% of the electricity is used by the business, the rest is exported to the grid
- could this be a great model for NZ community energy? think of Hastings' cold store roofs, sports centres etc.



Case study

Agrivoltaics

- a study by Oregon State University researchers found that agrivoltaics installed on approximately 1% of US farmland (13,000 square miles) would meet 20% of US electricity generation needs
- the capital cost was estimated at US\$1.12tn. With an expected asset life of 35 years payback on capital was expected to be 17 years
- in addition, 117,000 jobs would be created to operate and maintain the installation



- whilst pasture growth may be lower, solar panels also provide shade and shelter for stock
- solar arrays could also be matched with crops, including crops for carbon sequestration.



My summary on emerging international trends

- the challenge we are facing is epic
- UK and EU are leading the charge – let's keep a close eye on them – stay plugged into the international community and draw on its innovation and experience
- technology development is diverse and accelerating but the game changers have not yet emerged
- technology developments and implemented projects indicate that community renewable energy resources are significant
- currently, the focus appears to be weighted towards delivering solutions to communities rather than empowering communities to implement their own solutions
- who will be NZ's corporate movers and shakers standing up to support and fund community energy initiatives?



Te mutunga Mauruuru mo te whakarongo

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