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# Innovation in Energy Transition in Wales: The Challenges and Priorities

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# Wales is an excellent context for discussing these issues:

- ▶ The site of energy-related innovations since the industrial revolution
- ▶ Lengthy period of transition away from coal



Penydarren steam locomotive, 1804

## The major issue of **alignment**:

how can economic/social transition of coalfield **regions**, be integrated with creation of more sustainable, affordable and decarbonised energy **systems**

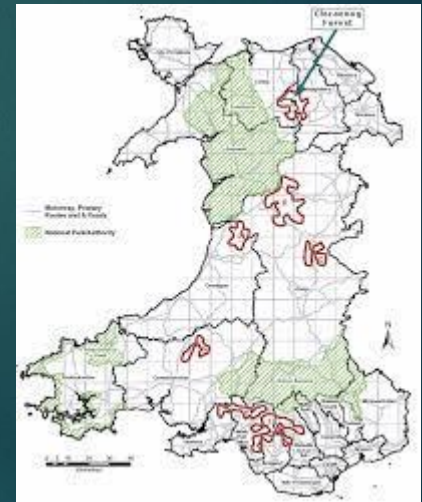
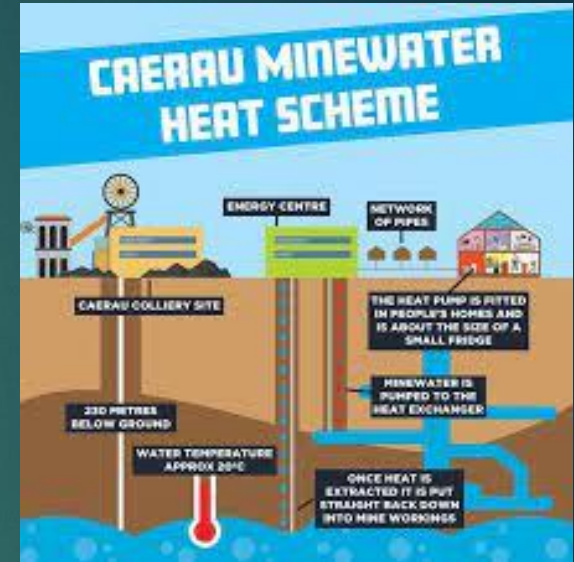


# 1. Challenges of spatial and social alignment

‘Positive’ legacies – exploiting mine water for heating (Caerau, Bridgend);

Extensive inherited grid capacity for hosting new renewables like onshore wind

***But spatial alignment ≠ social alignment***



# 1. Challenges of spatial and social alignment

Welsh initiatives:

- ▶ Some positive outcomes for extracting community benefits from wind farms
- ▶ Trickier for community-owned renewable energy schemes, where limited social capital and local capital are issues
- ▶ So, too, local resistance to social/ technological 'novelties'



Pen y Cymoedd wind farm, S. Wales, 228MW dnc



Awel Aman Tawe Community wind farm, 4.6MW

## 2. Attitudinal alignment

Turning spaces of extractive energy activity into centres of new energy systems:

- ▶ Tendency to view energy technology as just another form of inward investment, neglecting how it fits into a wider system e.g. nuclear
- ▶ Not helped by inherited infrastructures, that reflect extractive logics rather than regional, energy integration



Wylfa Newydd, nuclear plant 2.9GW - abandoned?



Electricity  
and gas  
grids in  
Britain

## 2. Attitudinal alignment

At local level, beliefs about whether the past can be maintained:

- ▶ Laura Norris's PhD research showed marine energy getting more cohesive support in Pembrokeshire, where the need to look beyond hydrocarbons was accepted
- ▶ ... Than in Anglesey, where local elites saw the economic future lying in another major nuclear power station



# 3. Governance alignment

Moving beyond instruments of economic development, to steering energy system change:

- ▶ In Wales, this is very linked to devolution, which has scored some energy 'wins' – power station consenting, hydrocarbon licensing, building regulations
- ▶ However, which powers matter is integrally connected to what energy/economic pathway you pursue. Getting involved in electricity production inevitably links local action to wider systems for market support, grid regulation etc
- ▶ Action on energy conservation and heat is inherently much more localised = more local powers

## 4. The objects that matter

Are the most relevant economic options always big, 'smart', innovative energy production technologies?

Investments which best align quality of life for coalfield residents with energy transition lie in energy consumption, heat and housing/buildings:

- ▶ Wales has hosted important innovations: the SOLCER House, by the Welsh School of Architecture; ARBED scheme for energy efficiency retrofit
- ▶ Innovation lies as much in social spheres of democracy, collaboration and delivery
- ▶ Vital, too, for tightening 'net zero' targets



SOLCER – Affordable, energy-positive house



ARBED energy-saving retrofit scheme

# Conclusions



Linking coalfield regeneration with energy transitions is a multi-faceted challenge of alignment – spatial, social, attitudinal and in terms of governance

Thank you