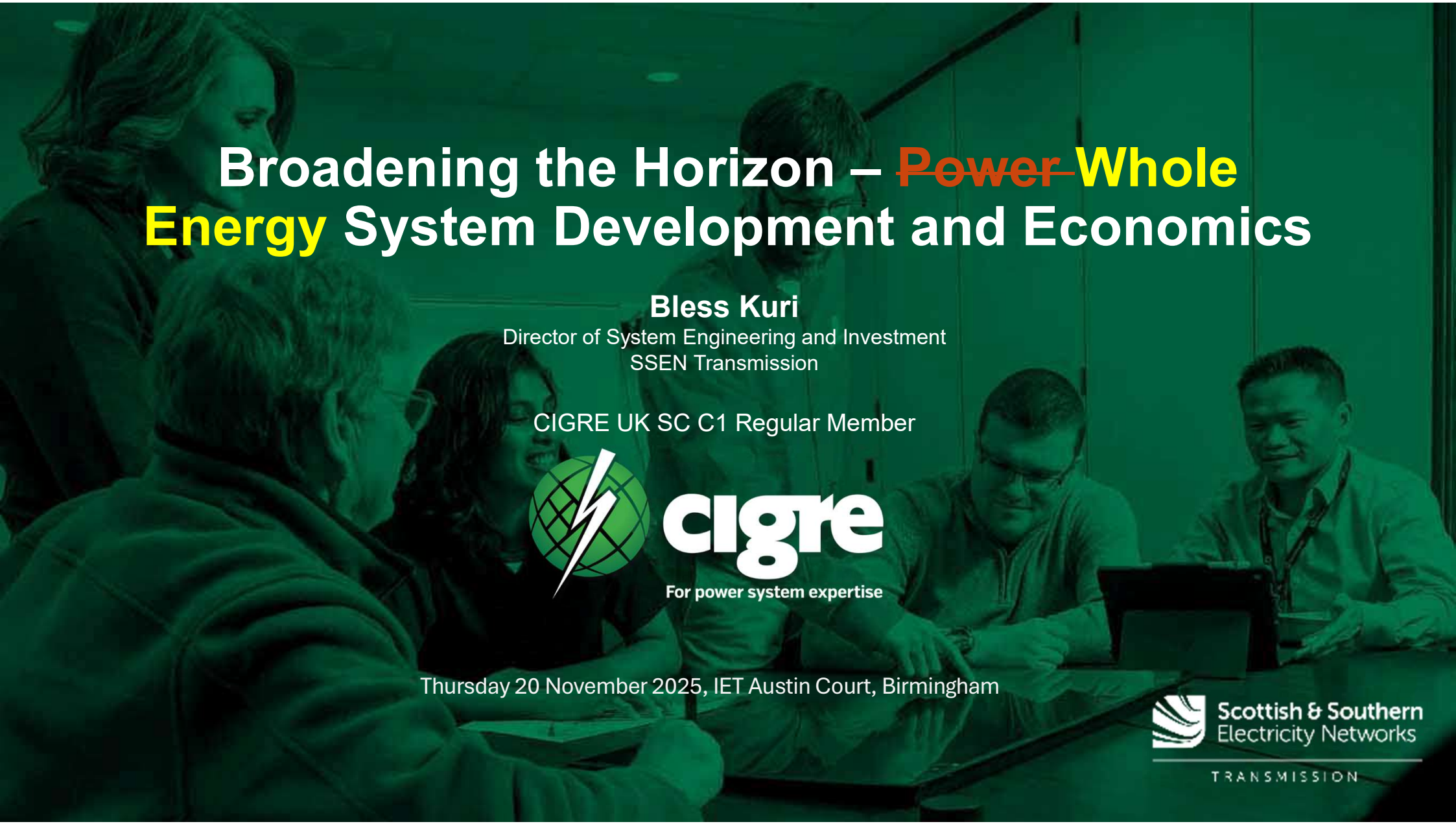

Broadening the Horizon – ~~Power~~ Whole Energy System Development and Economics

Bless Kuri
Director of System Engineering and Investment
SSEN Transmission

CIGRE UK SC C1 Regular Member

cigre
For power system expertise

Thursday 20 November 2025, IET Austin Court, Birmingham

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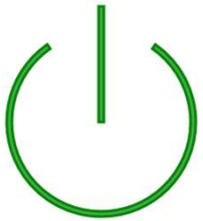
Overview



- About Study Committee C1
- Climate change & response
- Focus on whole energy system development

“What do we need to do today to keep the lights on tomorrow, next year, in 20 years…?

Study Committee C1

Power System Development and Economics

Mission

- To support energy system planners, asset managers and decision makers in anticipating and successfully managing the system changes raised by the Energy Transition

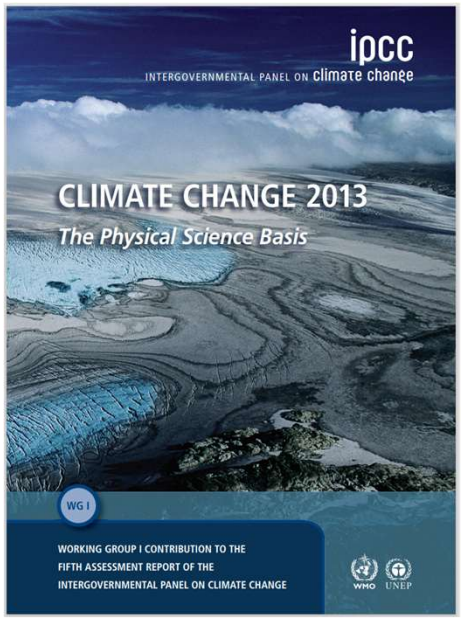
- To address emerging needs, seize opportunities and tackle growing uncertainties, while respecting multiple constraints: security of operations, adequacy, resilience, affordability and sustainability.

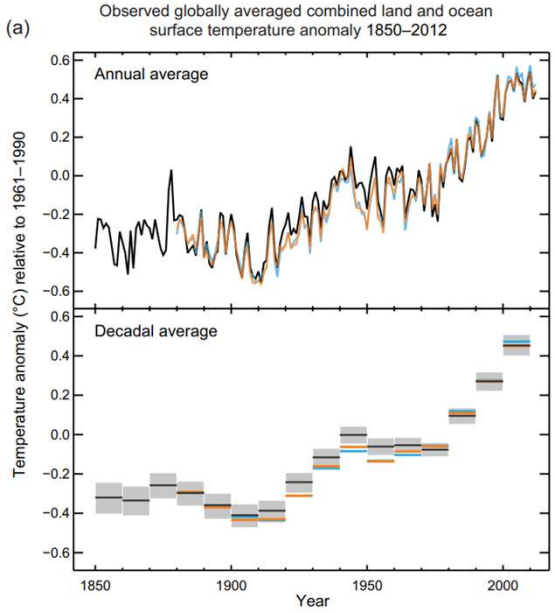
- To facilitate and promote the progress of engineering and planning methods, to share state-of-the-art, best practices and recommendations.

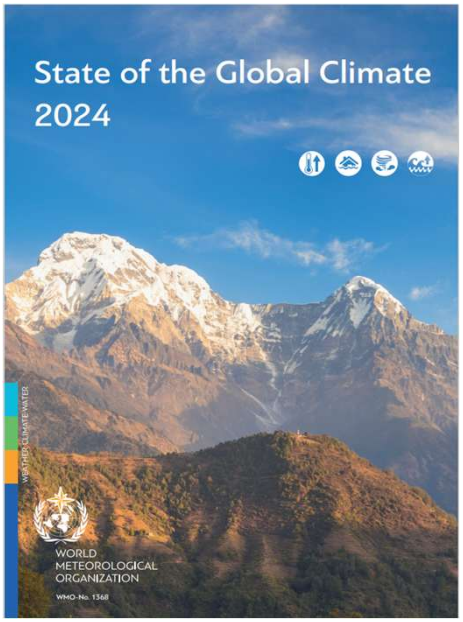
Areas of attention include

System planning | Asset management | Business planning | Interconnectors

Warming of the climate system is unequivocal







- The atmosphere and ocean are warming up
- The amounts of snow and ice are diminishing, the sea level is rising
- Concentrations of greenhouse gases are increasing

- Warming of the climate system is unequivocal
- Since the 1950s, many of the observed changes are unprecedented over decades to millennia

- The goal of the Paris Agreement is to hold “the increase in the global average temperature to well below 2°C above pre-industrial levels” and
- pursue efforts “to limit the temperature increase to 1.5°C above pre-industrial levels.”

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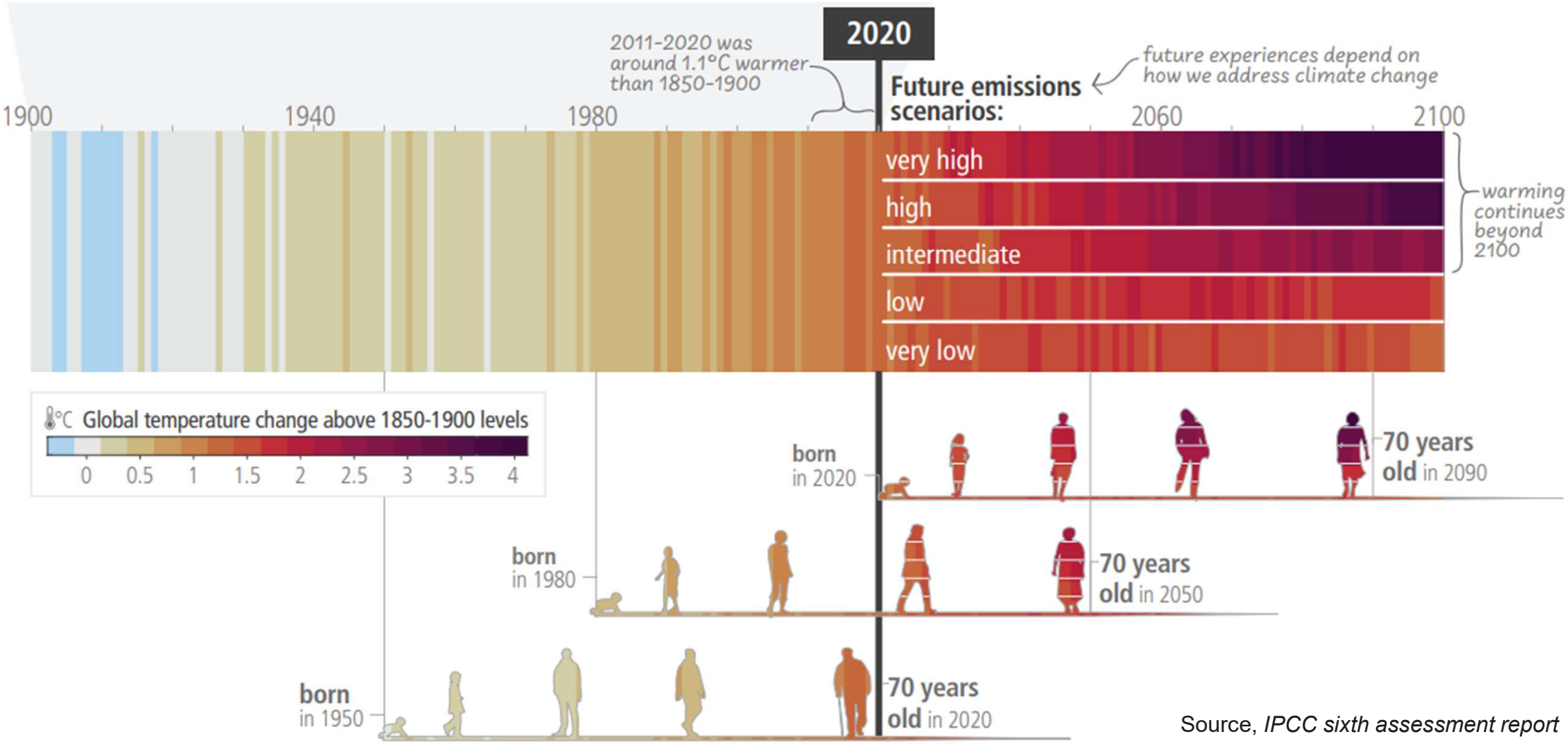
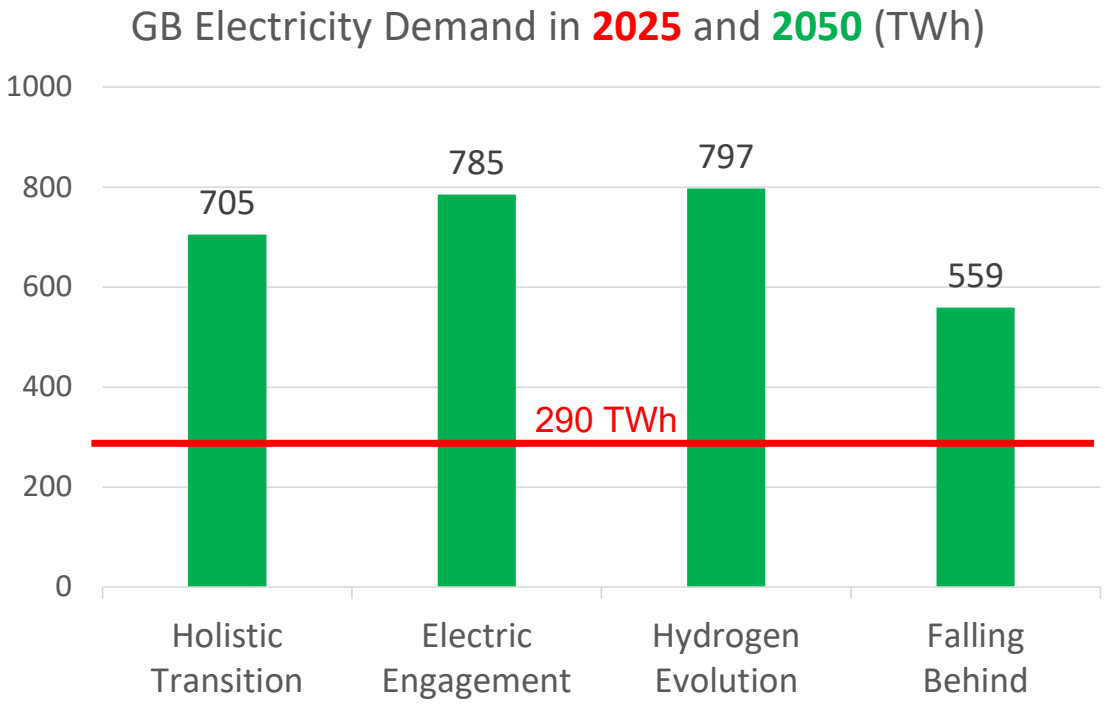
What will be our Legacy?



Source, *IPCC sixth assessment report*

Need for energy



GB electricity demand is expected to more than double by 2050

- More low carbon energy resources are required to connect to the network
- These have different operational and technical characteristics to conventional technologies
- They are developing in different locations
- Both network and energy technologies are changing
- The energy system is changing

Source, NESO, FES 2025

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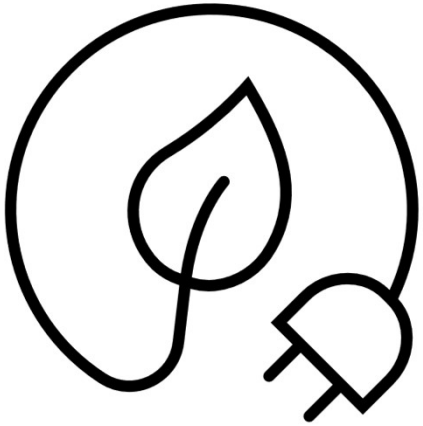
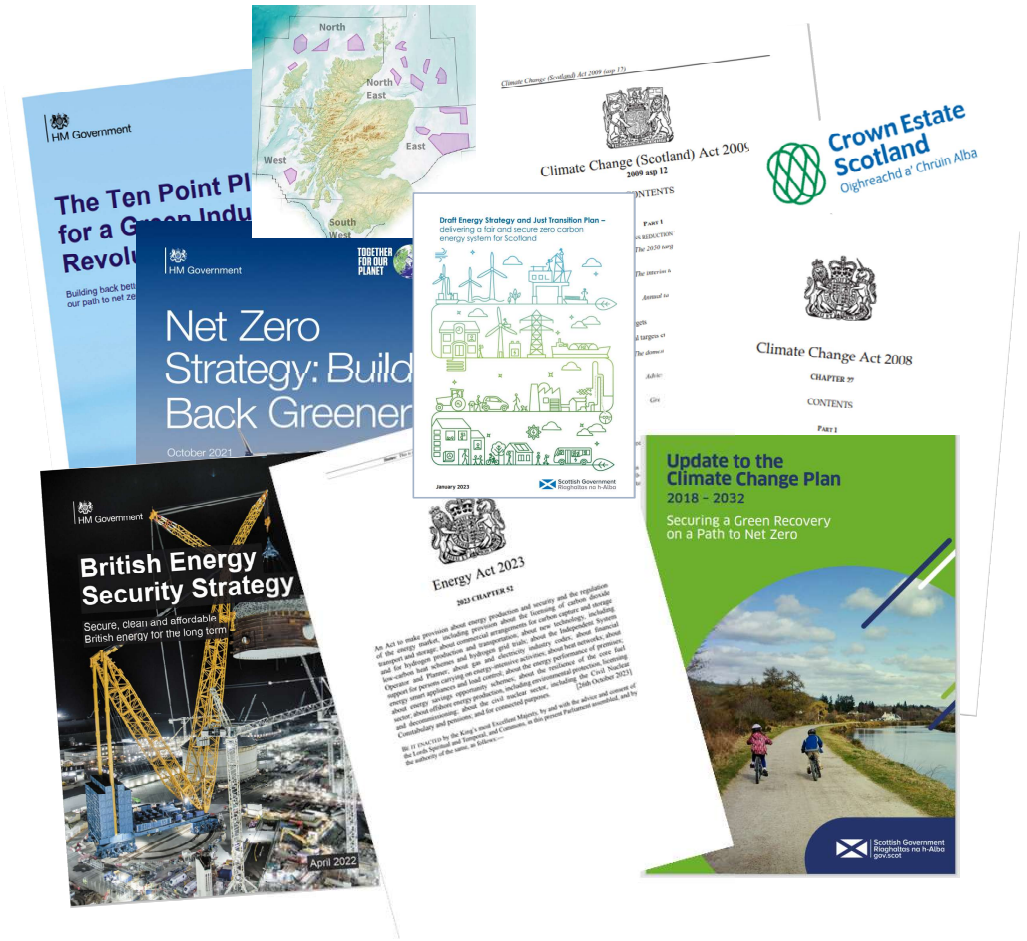
Why focus on energy?



*"Energy is a **driving force for growth**, productivity and innovation across the economy in closely related sectors such as transport, agriculture, construction, financial services, information technology, telecommunications, waste, and many more. The **transition** to a cleaner energy system creates a significant **opportunity** for job creation and investment in green skills."*

Energy 101, NESO, https://www.neso.energy/about/whole-system-challenge

Policy and Regulatory Response



- UK and Scottish Governments' Net Zero targets by 2050 and 2045 respectively
- Scottish Government's 11GW offshore wind and 20GW onshore wind by 2030 targets
- ScotWind offshore leasing round (Jan '22) - 28GW
- UK Government British Energy Security Strategy (Apr '22) - 50GW offshore wind by 2030 target
- Ofgem approval of need for Holistic Network Design 'Pathway to 2030' projects (Jan '23)
- NESO's 'Beyond 2030' network design (Mar '24)
- UK Government's Clean Power 2030 Plan (Dec '24)
- Connections Reform

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The planning frameworks are changing

Pre-2022 | 2022 | 2023 | 2024 | 2027 onwards

January

January

March (Beyond 2030)

Central Strategic Network Plan (CSNP)

July (NOA7 Refresh)

July (Pathway to 2030)

tCSNP1

Coordinated Offshore Network Design Recommendation

transitional Central Strategic Network Plan 2 (tCSNP2)

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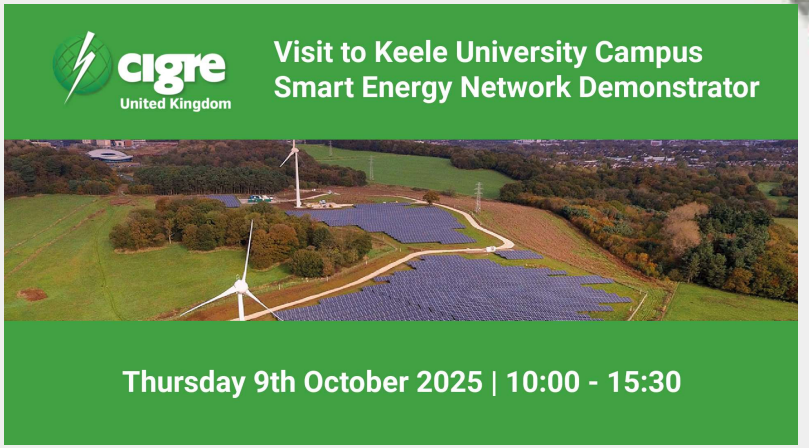
Planning energy and energy transportation infrastructure systems

Enabling the decarbonisation of the energy system

Whole energy system planning

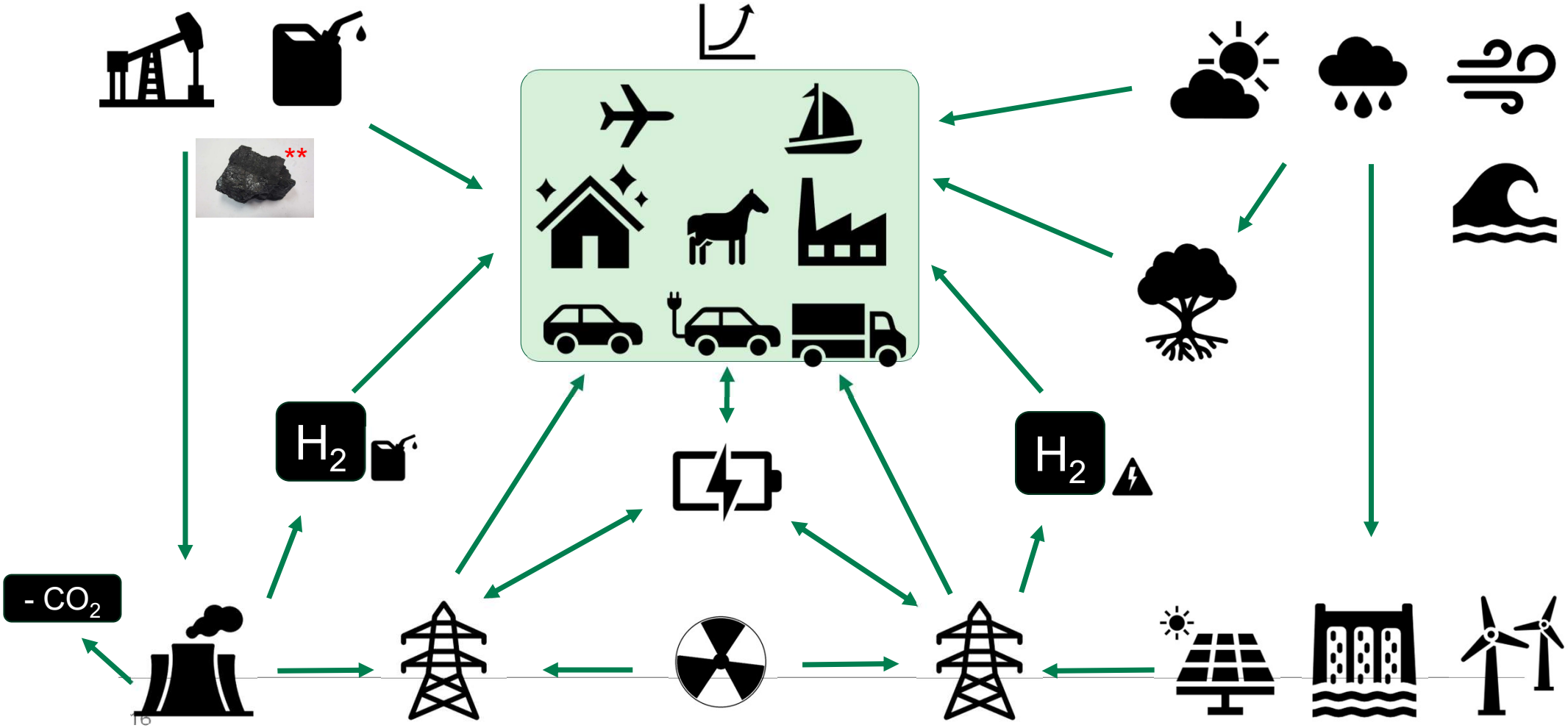
- We need to think beyond single energy vectors
- Understanding interdependencies between energy vectors and cross-vector modelling
- A lot of work has been done on the energy system building blocks and it is now time to take the next step
- Open up whole energy system planning to unlock the full benefits of integrated energy systems
- How do we get rid of silos?

Even within CIGRE we have many parallel efforts



Could there be value in establishing a whole energy system framework?

Whole energy system – Building blocks



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