

A ROAD MAP FOR THE FURTHER DEPLOYMENT OF THE HYDROGEN ECONOMY

MARK NELLER
DIRECTOR ARUP

#h2nw



DELIVERING THE
HYDROGEN
ECONOMY

North West

Delivering the Hydrogen Economy North West :

A Road Map for the Further Deployment of the Hydrogen Economy

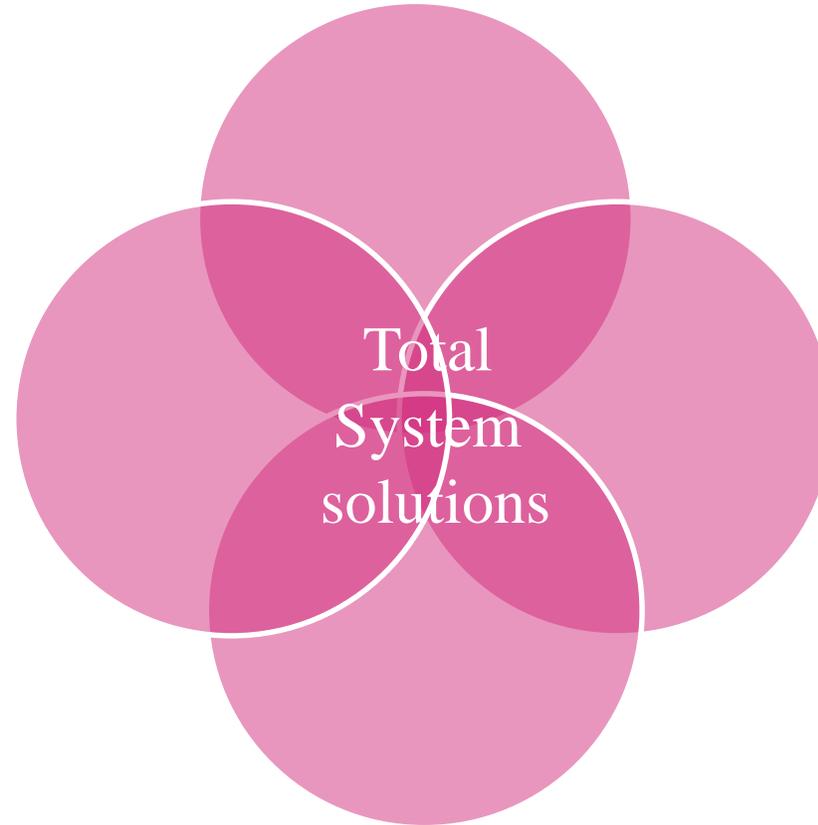
Mark Neller
Energy Advisory Director

May 2019



Engineering

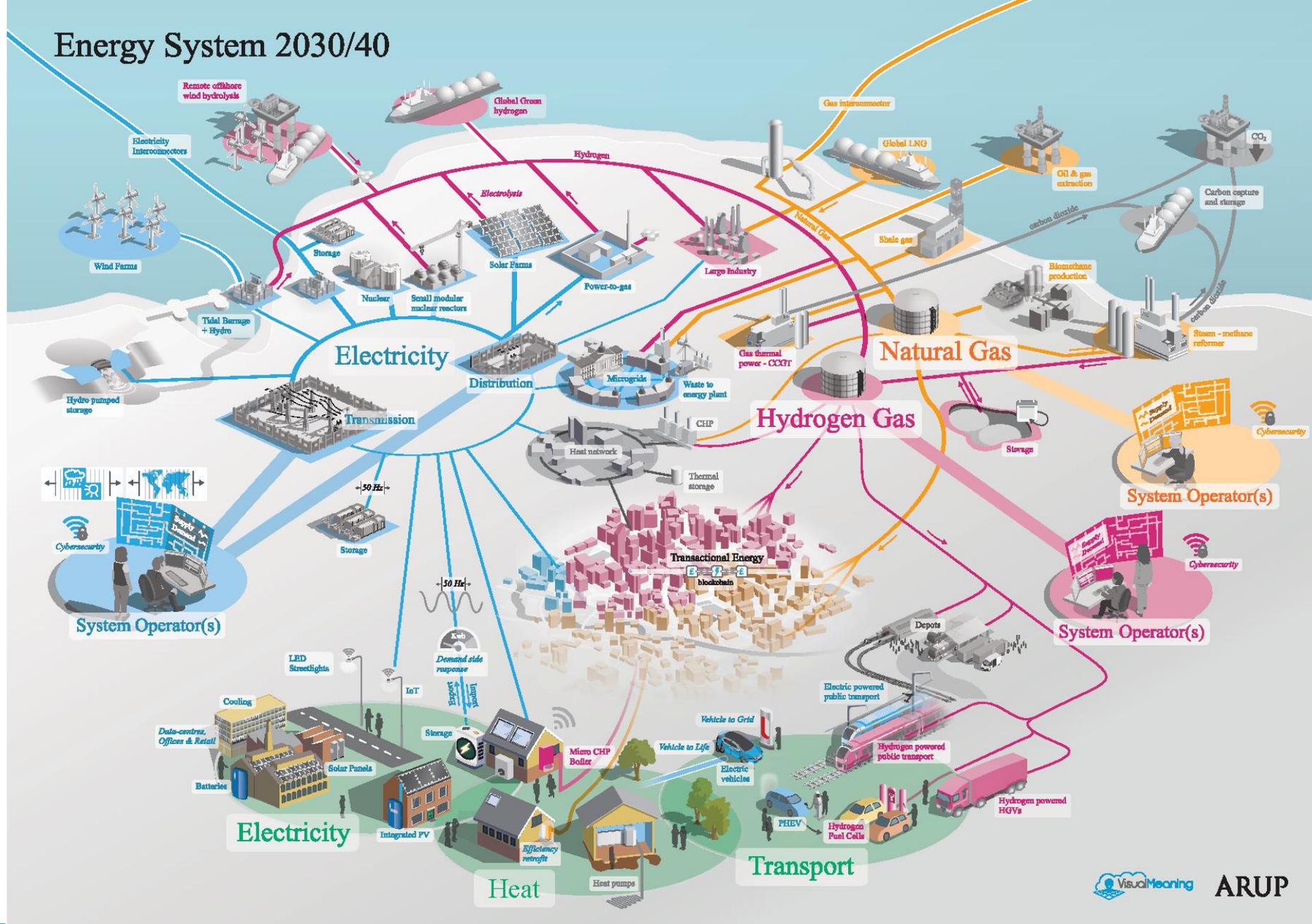
People
& behaviours



Management
& Delivery

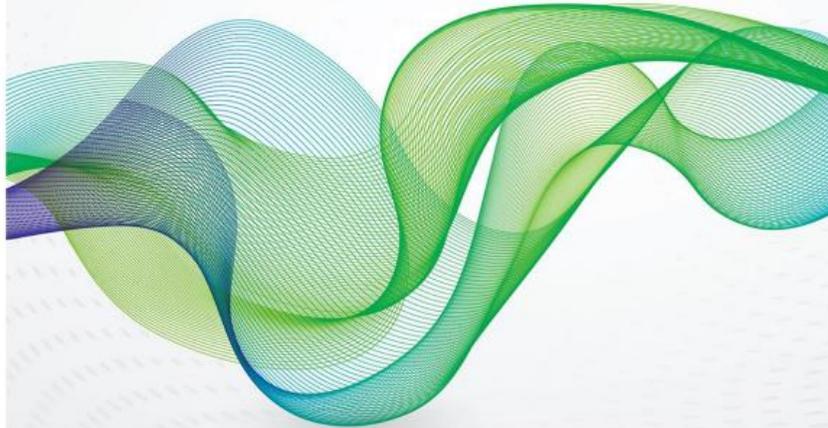
Economics,
Regulation &
Investment

Energy System 2030/40



May 2018

Decarbonisation of heat and the role of 'green gas' in the United Kingdom



OIES PAPER: EL 29

Malcolm Keay

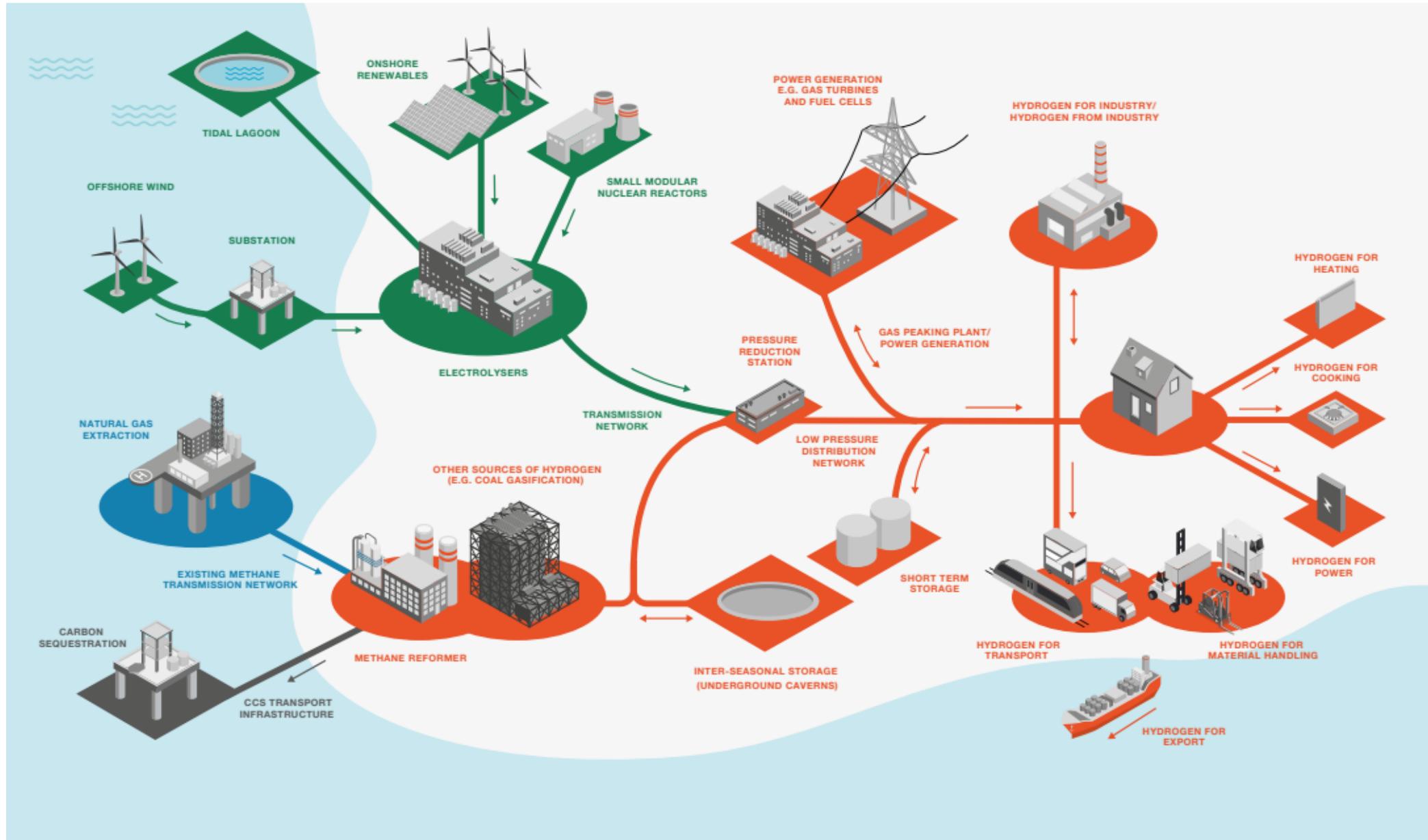
Conclusion

.....the figures quoted above suggest that the hydrogen route might well be **cheaper than the electricity route**.....

.... could only be delivered on the basis of a **major strategic decision by the Government** and a clear vision of the future low-carbon energy system

.....require a very clear and determined government strategy; it is likely that it would only make sense if there was an **overall vision of a hydrogen- based energy economy**.....

The hydrogen economy





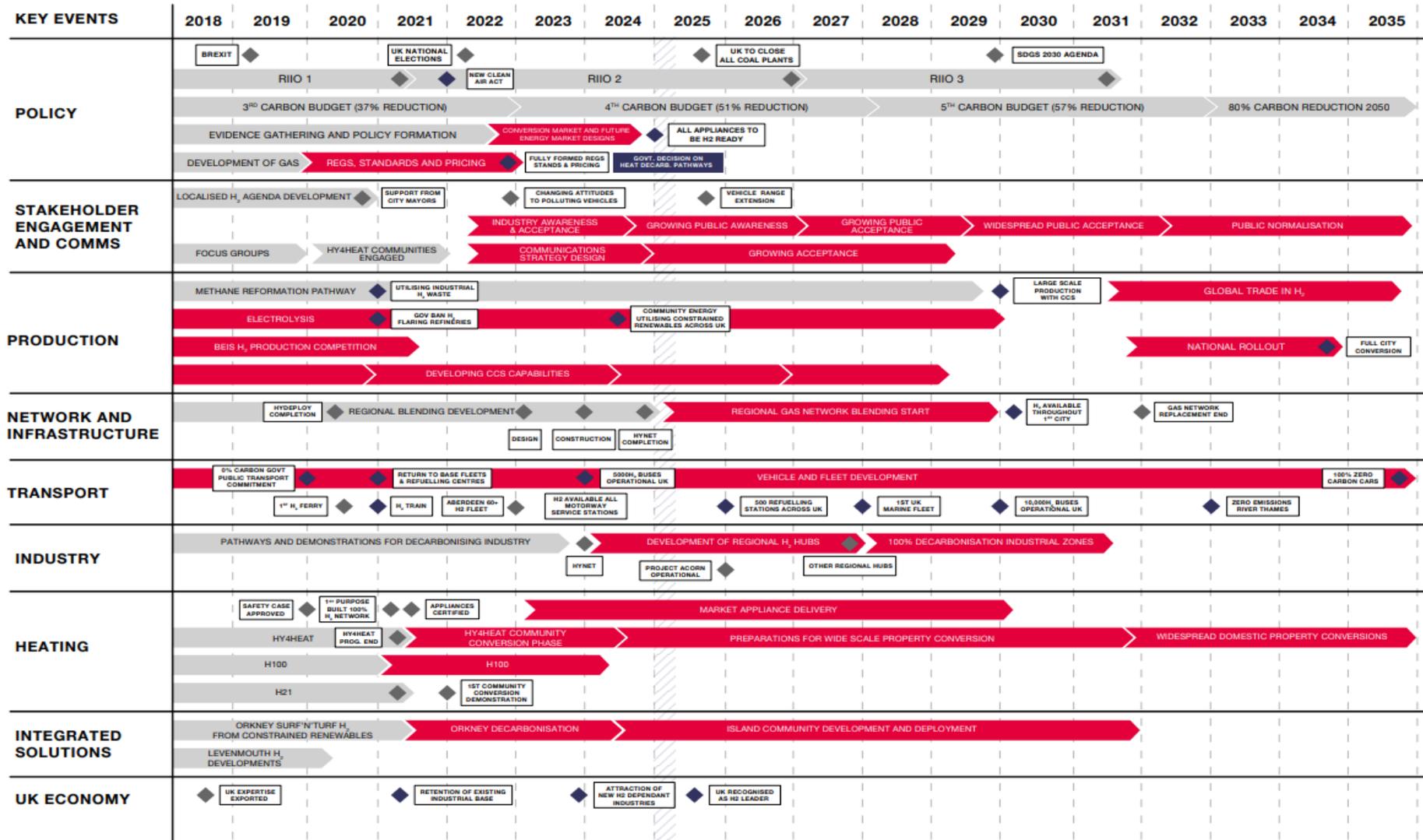
The Workshops Activities

Activities hosted throughout the sessions included:

- Challenges, barriers, risks and opportunity mapping
- Sub-group business models (production, transportation and retail)
- Business plans (Dragons Den style pitch)
- Group Road-mapping
- Briefing note to Claire Perry, responsible politician
- Conclusion sharing and cross-collaboration



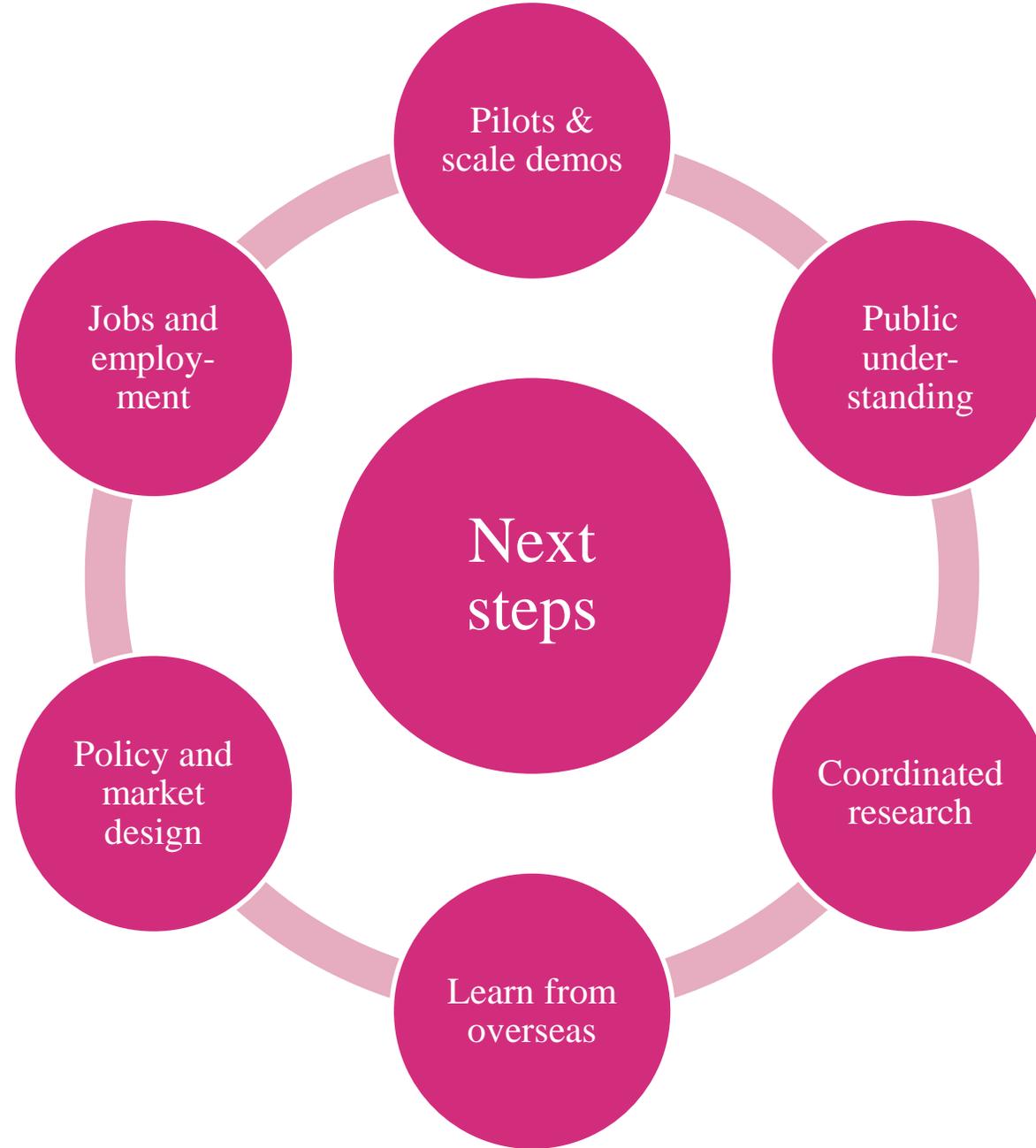
Hydrogen Roadmap to 2035



KEY: Enacted Process Enacted Milestone Recommended Process Recommended Milestone

Key Themes

- Incremental build up of demand and supply
- Public transport and return to base fleets as stage one
- Blending and industrial decarbonisation via establishment of regional hubs
- Hydrogen production from constrained renewables and methane reformation with CCS
- Gather evidence to support case for 100% conversion
- Reduce dependence on single big government decision
- Build consumer acceptance
- Develop regulatory and market models with large elements of competition and equitable socialisation costs
- Use next 5 years to implement demonstration and real projects.



Committee for Climate Change: Net Zero report



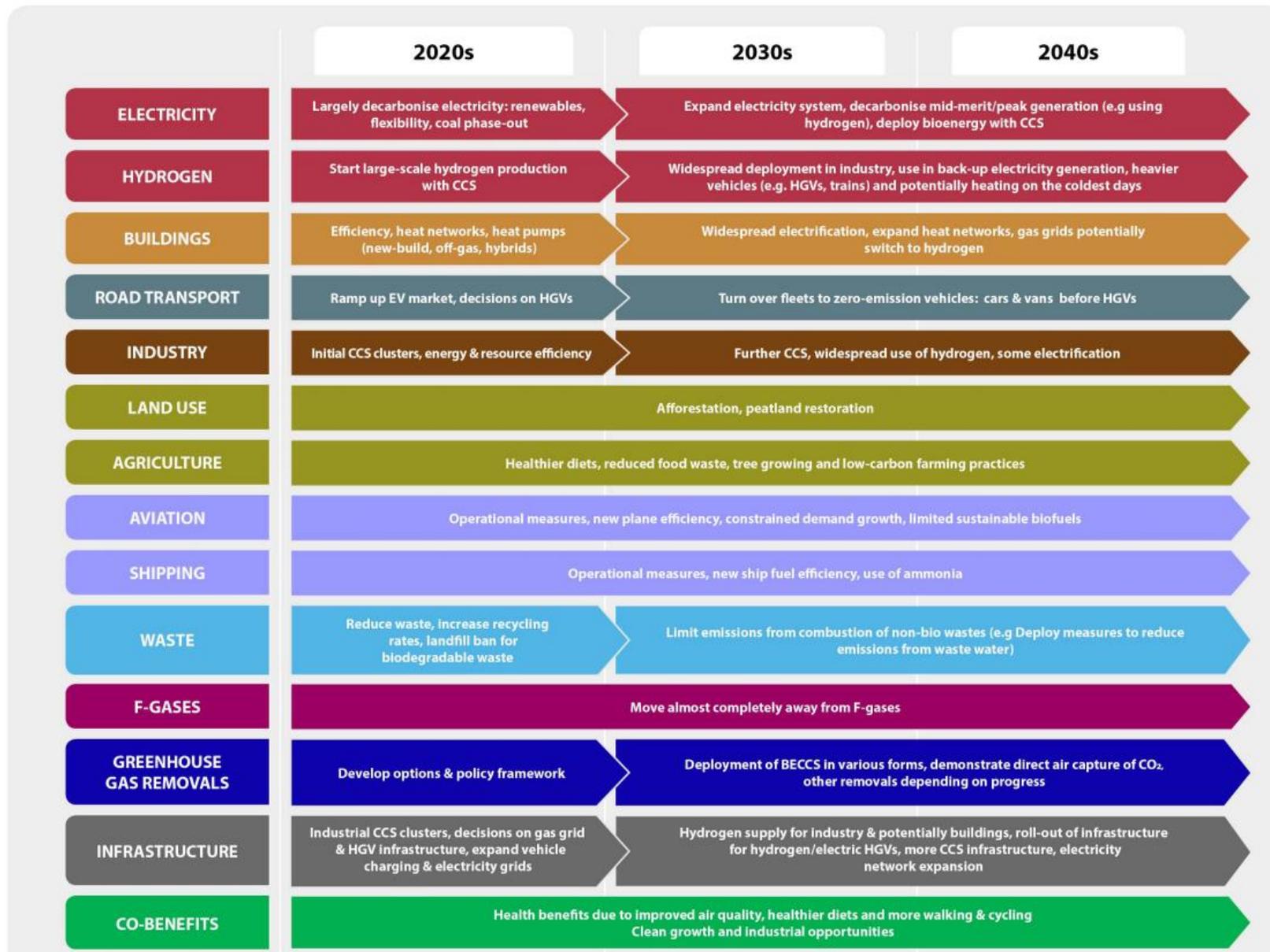
Delivery must progress with far greater urgency.

Many current plans are insufficiently ambitious; others are proceeding too slowly, even for the current 80% target:

- Over ten years after the Climate Change Act was passed, there is still no serious plan for decarbonising UK heating systems and no large-scale trials have begun for either heat pumps or hydrogen.

Development of a hydrogen economy to service demands for some industrial processes, for energy-dense applications in long-distance HGVs and ships, and for electricity and heating in peak periods. By 2050, a **new low-carbon industry is needed with UK hydrogen production capacity of comparable size to the UK's current fleet of gas-fired power stations.**

Figure 2. UK net-zero GHG scenario



Hy4Heat

