

***tpgroup***



Developing and  
delivering innovation  
as a partner to the rail  
sector

21<sup>st</sup> May 2020

# / Introductions



**James Thomas**

Chief Engineer –  
Technology & Engineering

Providing technical direction and governance

Leading technology and engineering innovation for tpgroup

Experienced at working across many sectors including, automotive, strategy and consulting, motorsport, and defence.

***tpgroup***

Decarbonisation is essential and will be best achieved by a combination of Hydrogen trains and optimisation



# / Introduction to tpgroup

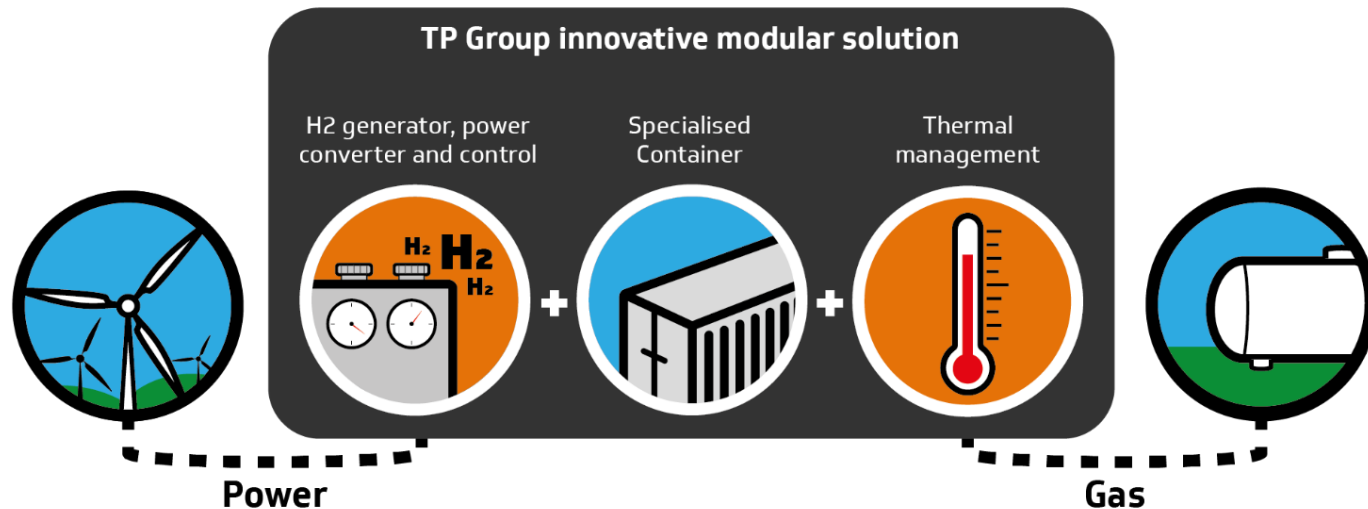
- tpgroup is a publicly listed company, and we operate globally, we are currently around 450 individuals and growing.
- Within the group have a wealth of proven technology, this includes years' of solutions related to decarbonisation.
- Hydrogen and Oxygen generation technology, with a focus on ultra-high reliability and class-leading safety.
- Carbon capture technology, scalable from small disaster relief systems to large scale infrastructure projects.





# / So how are we developing and delivering innovation?

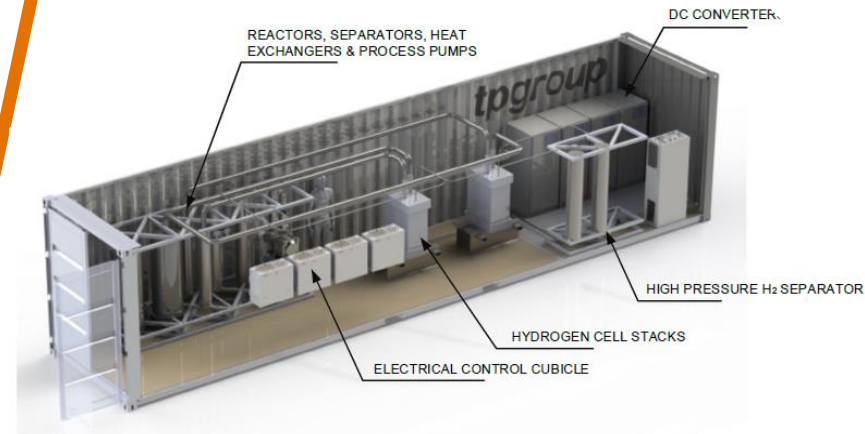
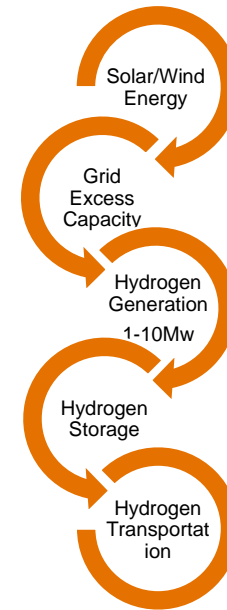
- Innovation is key to decarbonisation, for us that is both taking existing technologies and finding new ways to deploy them and looking into the development of new technologies
- Within tpgroup I run 4 events per year assembling mixed stakeholders from across the group
- Partnerships with other exciting companies



# Rail specific hydrogen generators

- providing fast filling at high pressure

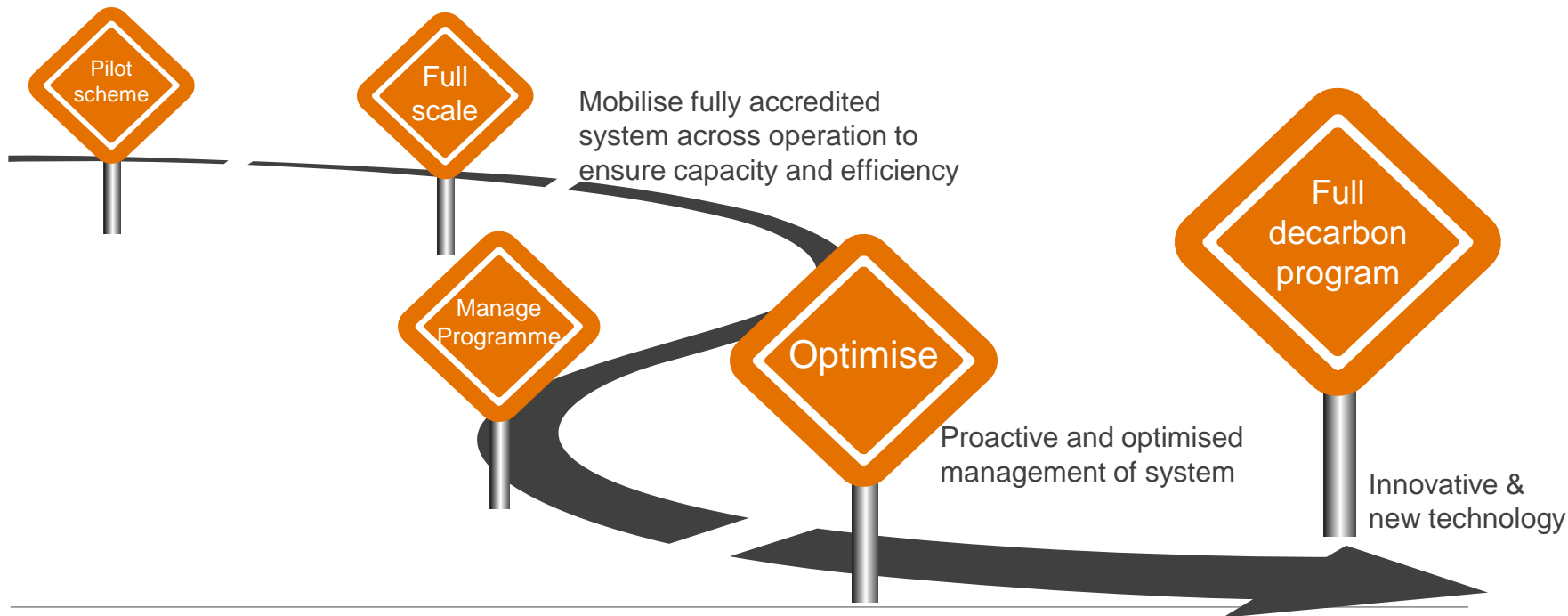
- Scalable rail side containerised solutions to fit standard 20-40ft containers
- Hydrogen storage available enabling fast refilling via high pressure tanks, enabling generation overnight using surplus green energy
- Storage available at high pressure and in tanks depending on requirement
- Remote generation ability, requires only a source of water and electricity to run, enabling branch line/remote town info structure solution
- Saltwater through to portable water capability, enabling remote off grid locations



# / Accelerating decarbonisation to net zero

To meet the needs of the rapidly accelerating decarbonisation challenges, we are making use of cross sector experience.

We have mature systems in high performance, hazardous applications where we offer complete support solutions



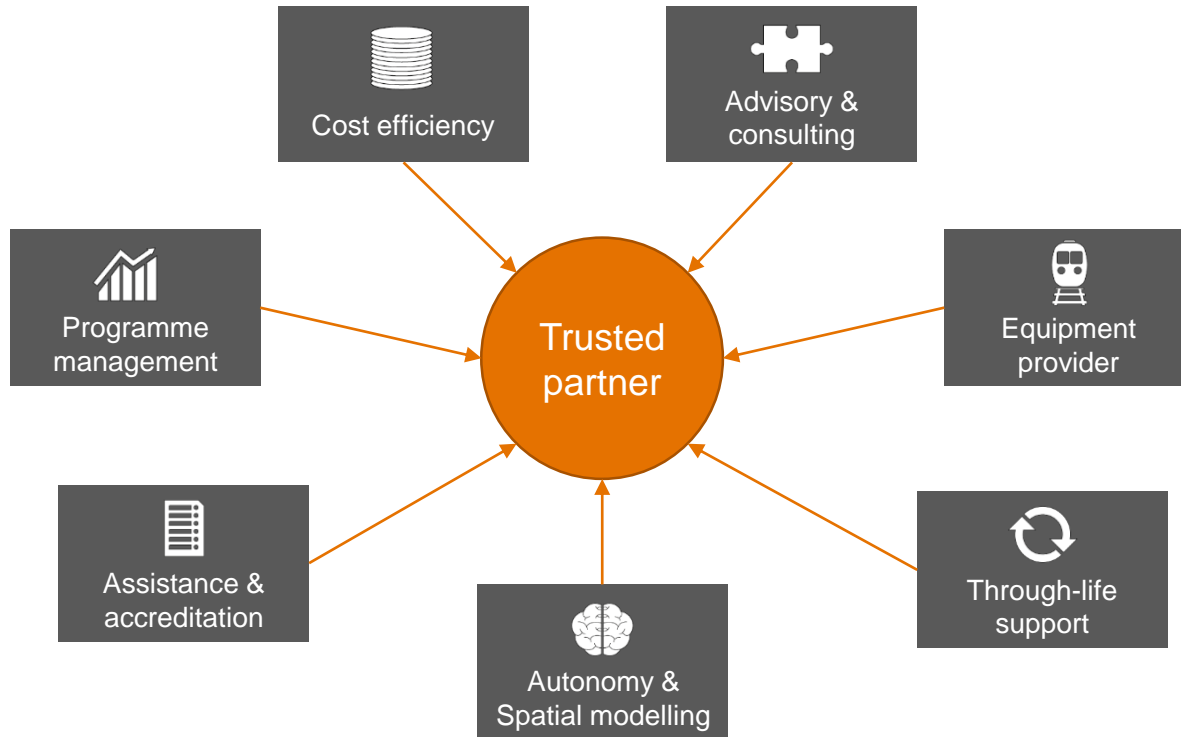
/ North\*

Using North\*, our digital technology suite, to solve complex world problems





# / Our decarbonisation multi threaded approach



# / Partnering with rail



Operate in highly regulated industries



Safety first  
ISO18001  
ISO45001



30 years optimising asset performance

H + O

40 years hydrogen & oxygen production



Global electrolyser manufacturer  
ISO9001 – UK base

*Mission and business critical solutions for a safer world*



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