



Decarbonising Transport through Electrification (DTE), A whole system approach

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Prof. Patrick Luk

Prof. Xibo Yuan

Prof. John Preston

Prof. Omer Rana

Dr. Dimitrios Potoglou

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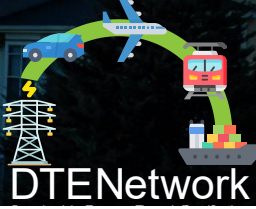
Prof. Phil Morgan

**UNIVERSITY OF
Southampton**

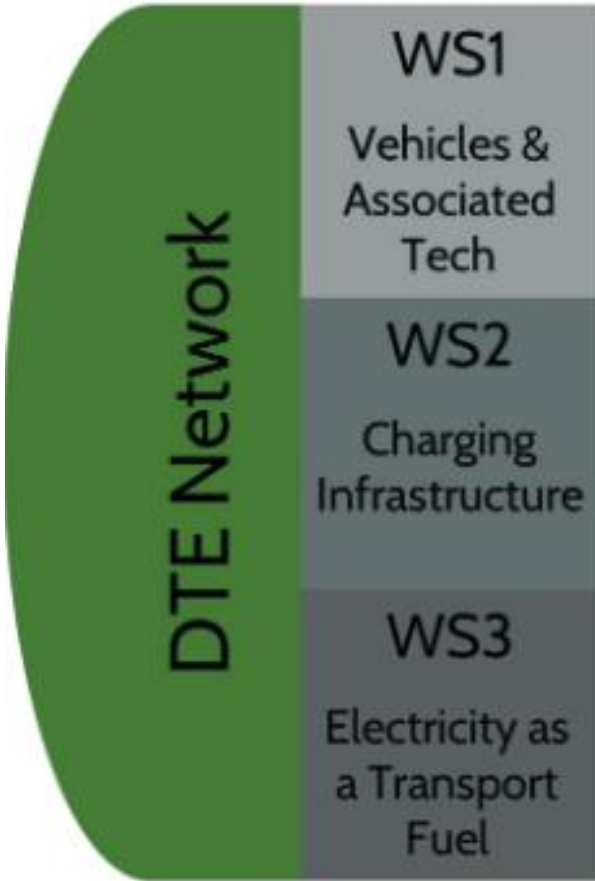


**University of
BRISTOL**

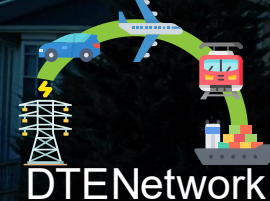
DTE Network+ Message



Identify and address challenges for electrification of transport.



DTE Network+ Message

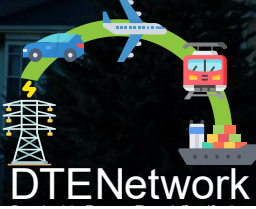


Identify and address challenges for electrification of transport.

DTE Network	WS1	Electric Powertrains
	Vehicles & Associated Tech	Connected Autonomous Vehicles
		Green Taxiing
	WS2	Building & Charging Solutions
	Charging Infrastructure	Wireless Charging
		Railway Feeder Stations
	WS3	Spatial Distribution
	Electricity as a Transport Fuel	Use of Renewable Energy
		Network Resilience & Efficiency

Road, Rail & Aerospace

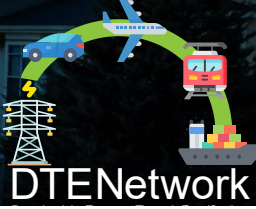
DTE Network+ Message



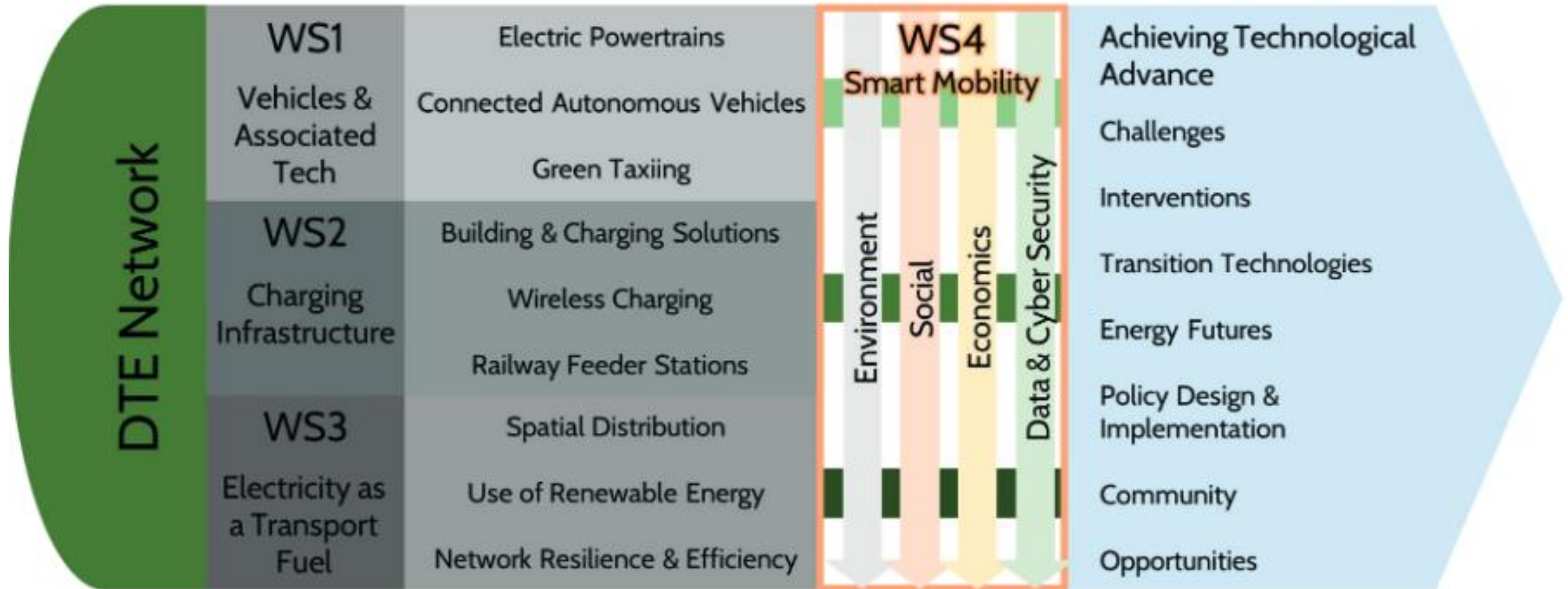
Identify and address challenges for electrification of transport.



DTE Network+ Message



Identify and address challenges for electrification of transport.

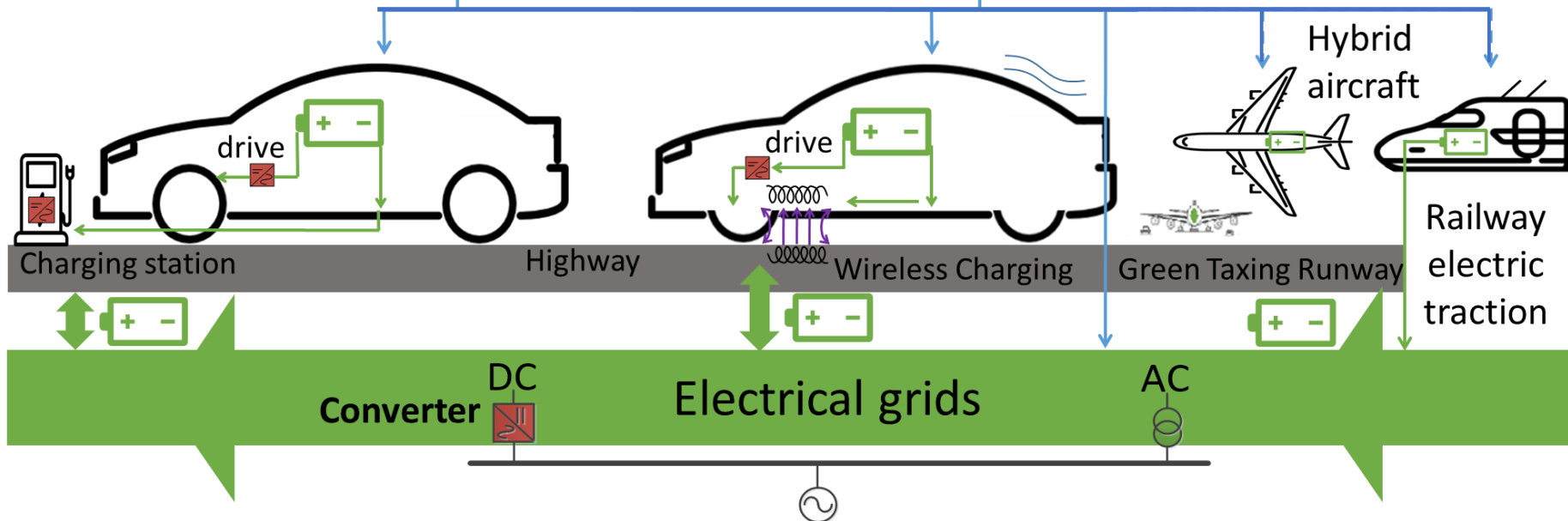


Vision of Whole System Approach

Addressing low-carbon transport modes as an integrated system embedded within the electricity energy vector

Analytics & cyber security

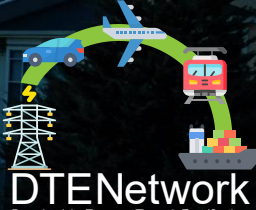
AC & DC electrical energy networks



Batteries are the heart of Decarbonisation

- Testing, Modeling, Sizing, Aging
- Development of Standards
- Right chemistry to the Right application
- Asset Management
- Maintenance procedures and health indexes
- Reusing & Recycling

Advisory Board



Aerospace  SAFRAN  cardiff airport maes awyr caerdydd  AEROSPACE WALES  AIRBUS

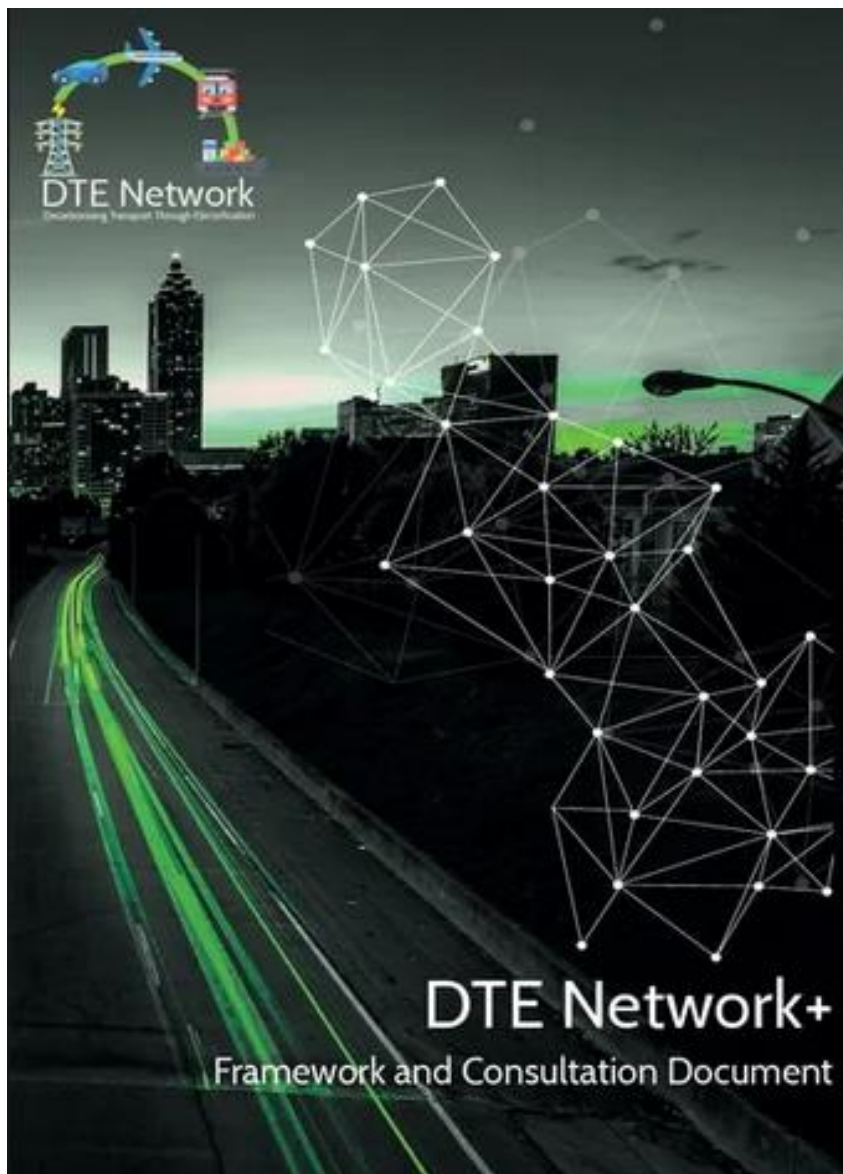
Rail  RSSB | A Better, Safer Railway  KEOLIS  tps TURBO POWER SYSTEMS  Battery  FZSoNick

Transport Road  Transport for London  TRAFNIDIAETH CYMRU
TRANSPORT FOR WALES  Welsh Automotive Forum
Fforwm Modurol Cymru  CATAPULT
Connected Places

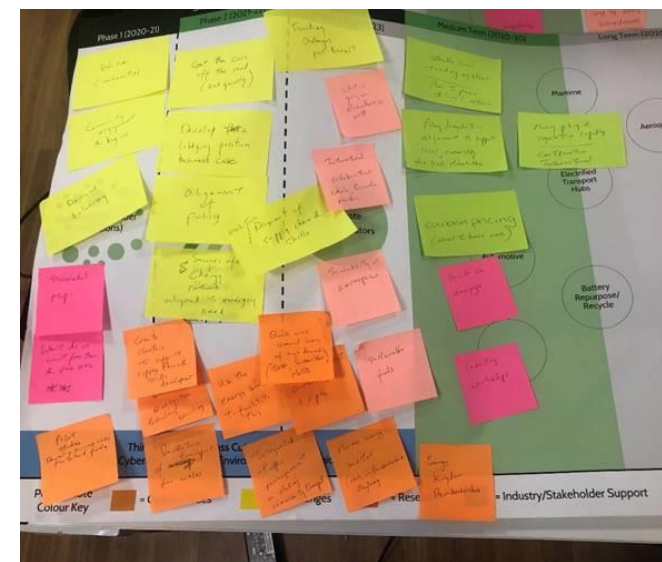
Electricity Infrastructure  nationalgrid  SP ENERGY NETWORKS  COSTAIN  CONNECTED KERB

Industry Consultancy  FTI CONSULTING  wsp  XP XP Power  SciFlair  NR

Government Investment  Department for Transport  Llywodraeth Cymru
Welsh Government  QUERCUS
INVESTMENT PARTNERS  UKRI UK Research and Innovation  Innovate UK  WISE-ACT
COST ACTION CA16222  cost

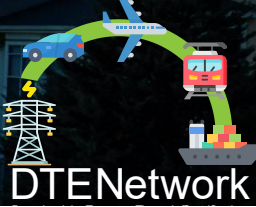


Road map round tables
Identified short-term,
mid-term and long term
challenges



<https://dte.network/reports>

Funded Projects



Optimisation of Intermittent Electrification of Rail Transport for the Near-Term

Dr. Will Midgley, Loughborough University, Hitachi Rail Europe

Published: [An investigation into intermittent electrification strategies and an analysis of resulting CO2 emissions using a high-fidelity train model](#)



The Renewable Powered Railway: Renewable Railway Power Network Design with Optimal Energy Management

Dr. Zhongbei Tian, University of Liverpool, Riding Sunbeams, Ricardo Energy & Environment

Data-Driven Approach for Optimal Distribution Network Operation with Rapid Charging Infrastructure and Large-Scale Battery Storage

Dr. Chun Sing Lai, Brunel University London, UK Power Networks

Published: [Operational Challenges to Accommodate High Penetration of Electric Vehicles: A Comparison between UK and China](#)



Optimal scheduling of electric vehicle-integrated multi-energy system with high renewable generation

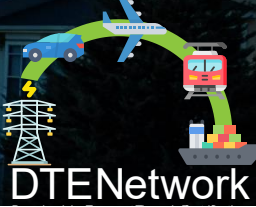
Dr. Mousa Marzband, Northumbria University, OtaskiES, RINA



Optimisation of Wireless Charging Infrastructure Deployment for Bus Services

Dr. Panagiotis Angeloudis, Imperial College London, Alan Turing Institute, Transport for London, Innovate UK, EPSRC IAA

Open calls



Equality, Diversity and Inclusion (EDI) funding call

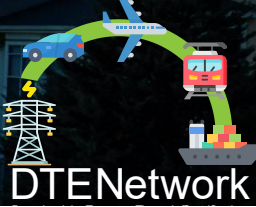
Funding available: Up to £20,000 of funding (at 80% Full Economic Costs) is available. We are planning to award 2 to 3 projects in this call.

Deadline: 21st of February 2022

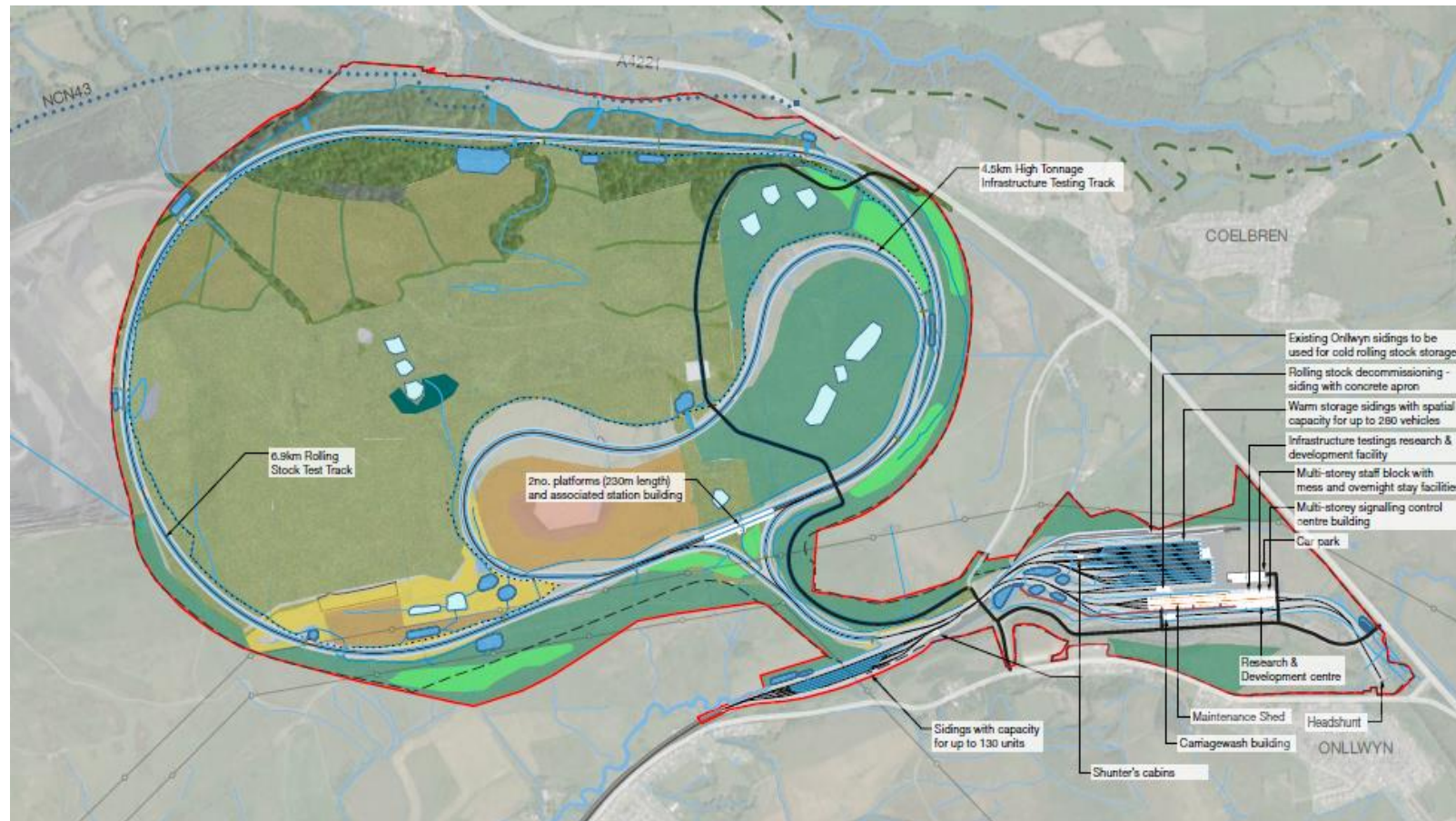
Expected start date: 1st of April 202

<https://dte.network/edi-call-1>

Global Centre of Rail Excellence (GCRE)

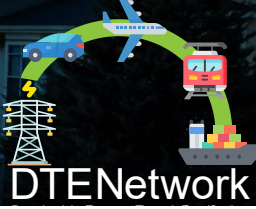


- Rail testing complex with 2 electrified oval tracks.
- Testing speeds of up to 110mph with a tunnel section and a full platform environment.



- 7.3km electrified oval track
- 3.1km electrified oval track
- Full station & platform environment
- Tunnel section
- Infrastructure testing
- Well equipped maintenance facility
- 500+ vehicle warm storage
- R&D & showcasing
- Decommissioning area
- Hydrogen fuelling station

Global Centre of Rail Excellence (GCRE)



The site is located at the Nant Helen surface mine and Onllwyn coal washery at the head of the Dulais and Tawe valleys.



Timetable

Public consultation: summer 2019 and autumn 2020

Planning application submission: spring 2021

Planning approval: summer 2021

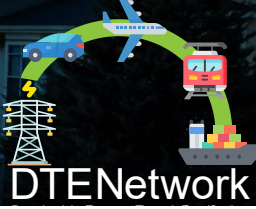
Site preparation / construction: 2022 to 2025

Phase 1 operational: 2023

Fully operational: 2025

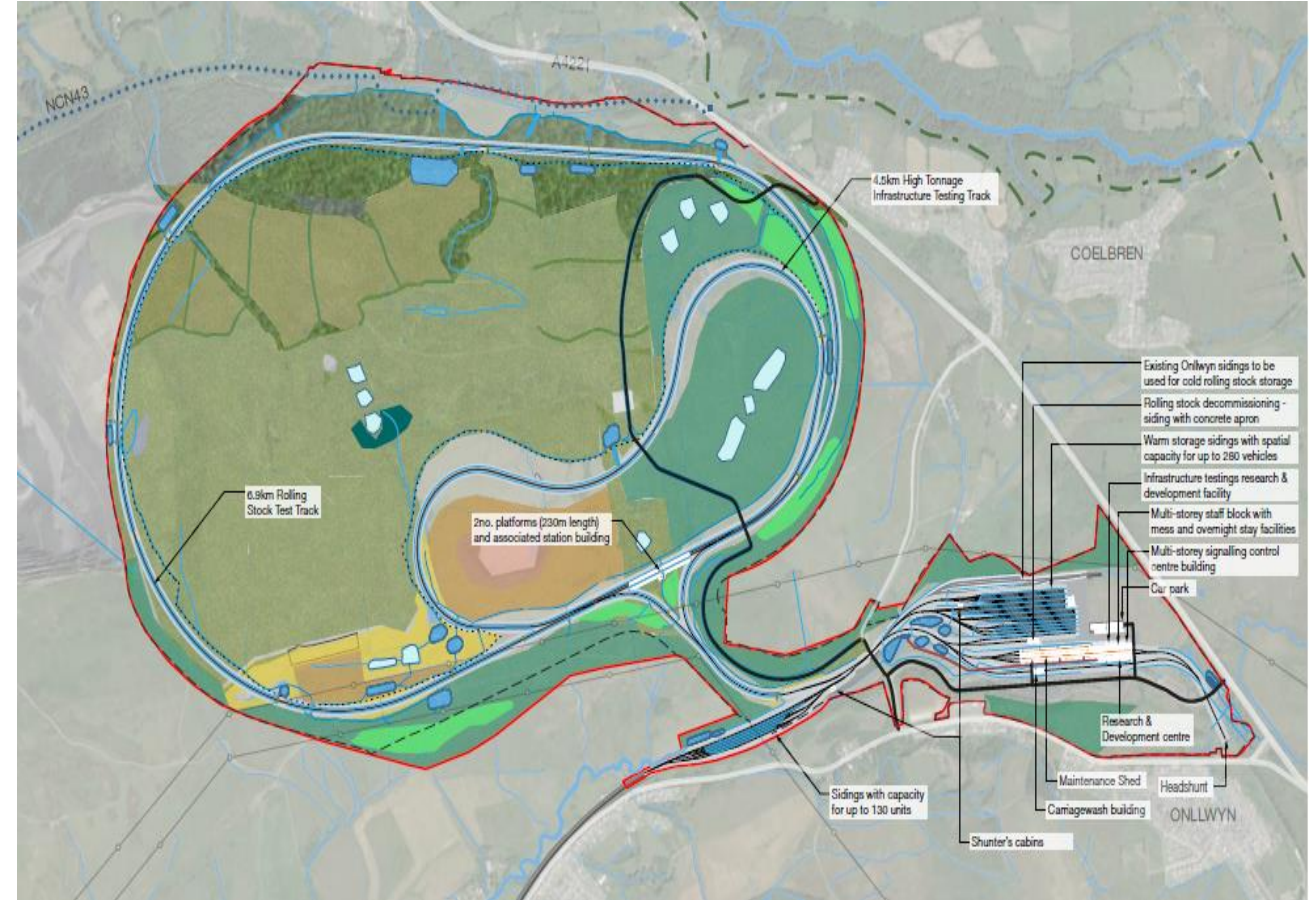
Earthworks will begin on site in spring 2022 to prepare the land for rail infrastructure.

More than a Tests Centre (GCRE)



The GCRE will be

- Unique to Europe
- A Research and Innovation Hub, embedding university research
- Wider than rail
- Energy – innovation and generation
- Sustainable solutions for rail and beyond



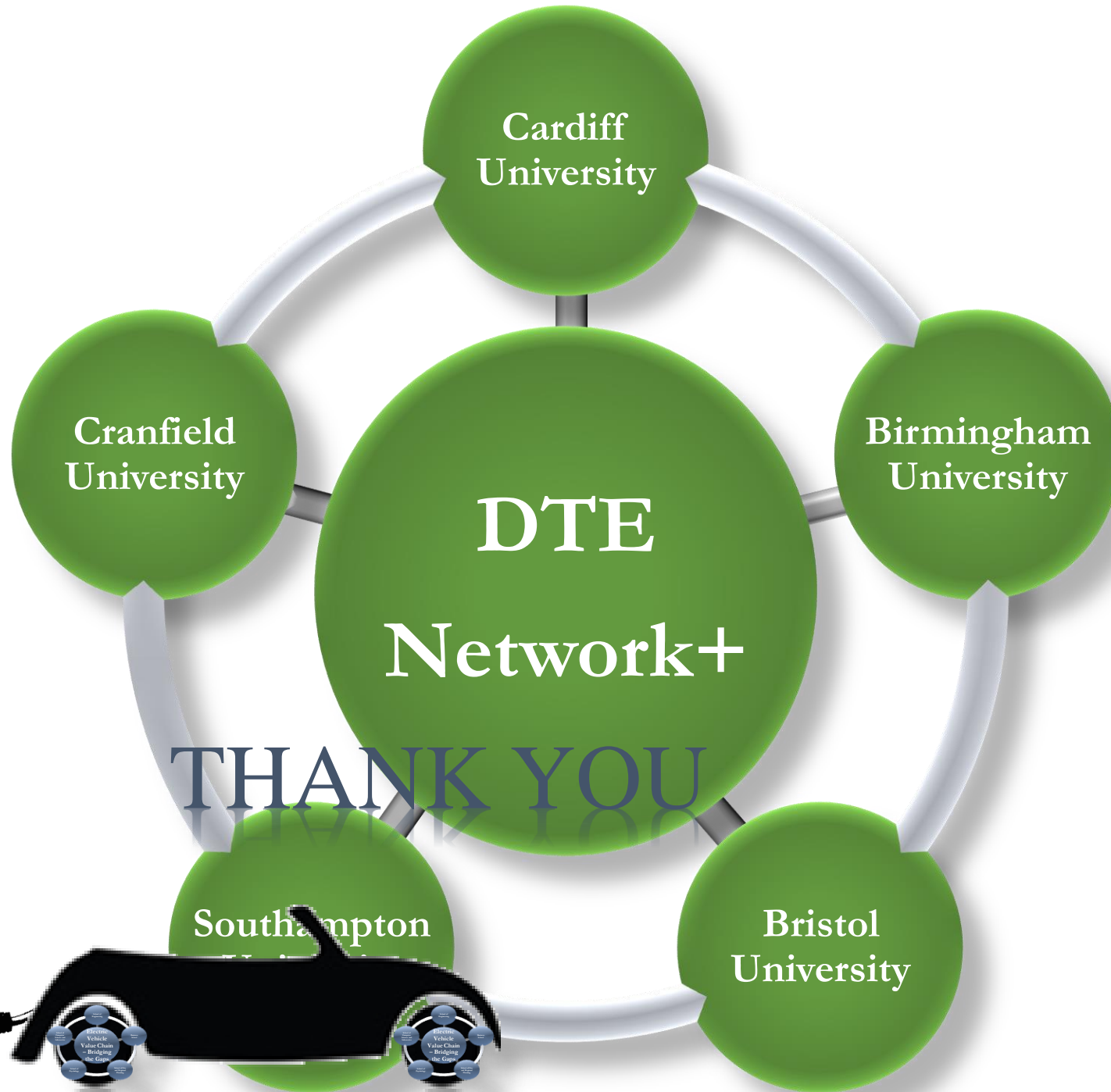
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<https://dte.network/>





THANK YOU

