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The 27th INTERNATIONAL ELECTRIC VEHICLE SYMPOSIUM & EXHIBITION
BARCELONA
17th-20th November 2013

ENEVATE
European Network of Electric Vehicles and Transferring Expertise
Accelerating E-Mobility

Accelerated Introduction of Electric Vehicles in North-West Europe

ENEVATE: Project Lay-Out and Results

Dr. Kord Pannkoke
Matthew Lumsden
Huw Davies
Edwin Bestebreurtje
Harm Weken

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• Introduction of ENEVATE	
• Electric Vehicle Supply Chain Management	dr. Kord Pannkoke - Bayern Innovativ
• Sustainable Energy Supply Infrastructure	Matthew Lumsden - FTS
• Market Drivers & Mobility Concepts	Huw Davies - Cardiff University
• Pilot experiences	
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Why a NW-European Networking Project on E-Mobility?

- Most regions spend large public funds on EV & E-Mobility programs, pilots & stimulation ➔ with no learning effects over the regional borders
- Europe is scattered in strategy, programs and implementation.
  - ✓The competition comes from China, Japan and even US
  - ✓With a much more coherent approach
- Integral approach is absent. On national, regional and city level
- User acceptance is the question mark. Should be driver for mobility concepts and industry development
- The many promising SME companies working on EV, are not to be found by the Vehicle Manufacturers
- Electric energy / infrastructure & automotive are historically isolated from each other

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ENEVATE aims to

facilitate and support an accelerated and well informed introduction of electric mobility in North-West Europe through structured trans-national co-operation between public authorities and business representatives.

And at same time to boost innovation and competitiveness of the rapidly developing electric vehicle sector in NW Europe.

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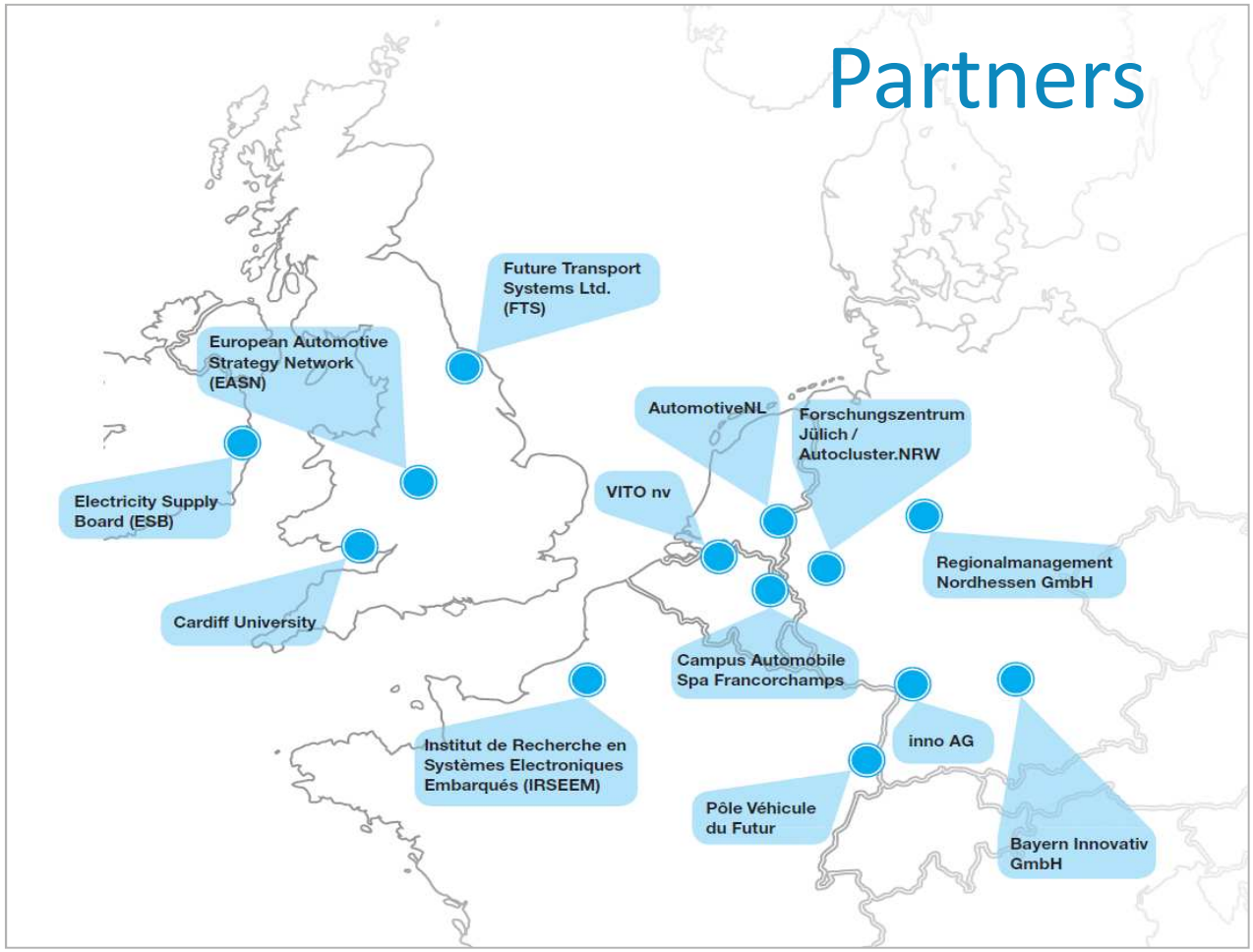
Partners


Future Transport Systems Ltd. (FTS)
European Automotive Strategy Network (EASN)
Electricity Supply Board (ESB)
Cardiff University
AutomotiveNL
Forschungszentrum Jülich / Autocluster.NRW
VITO nv
Regionalmanagement Nordhessen GmbH
Campus Automobile Spa Francorchamps
Institut de Recherche en Systèmes Electroniques Embarqués (IRSEEM)
inno AG
Pôle Véhicule du Futur
Bayern Innovativ GmbH

Work Packages

Electric Vehicle Supply Chain Development
Lead: AutoCluster.NRW, GER

Sustainable Energy supply infrastructure
Lead: Future Transport Systems, UK

Market drivers and mobility concepts
Lead: Cardiff University, UK

Pilots
Lead: Automotive NL

Enabling / Innovation Accelerator
Lead: Bayern Innovativ, Regionalmanagement Nordhessen, GER

Work Packages and Results

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Electric Vehicle Supply Chain Development

WP1

Lead: AutoCluster.NRW, Germany

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Methodological approach with following steps

WP1.1	Analysis of the conventional supply chain
WP1.2	Technical analysis of electric vehicles
WP1.3	Conception of a supply chain for electric vehicles
WP1.4	Comparison of ICE and BEV supply chain
WP1.5	Validation of findings
WP1.6	Database generation and analysis of the European BEV competencies map
WP1.7	International benchmark to leading regions

Analysis report

Online portal for the EV industry and related sectors

Training sets for target audiences on EV technology and supply chain

Information packages for target audiences on EV technology and supply chain

The BEV and ICE value chain differ significantly and will change in future…

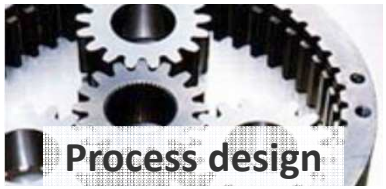
Upstream Value Creation Process

The valued added distribution will change significantly and makes a change in the minds of OEMs and suppliers mandatory:

- A BEV comes along with ~63 % more value added. Especially suppliers of battery cells and systems profit.
- Around 75 % of the ICE drivetrain production value is falling away.
- The product portfolio of suppliers may be endangered and makes a deeper analysis of the future compliance with the electrified drive trains necessary.

A make or buy analysis for all BEV components gives an insight on the future task sharing – but multiple strategies will be seen in the next years:

- OEMs will most likely focus on brand shaping and strategic relevant components.
- Attractive chances for suppliers are shown in interchangeable components and systems.



Often, xEV & ICE vehicles will be produced on the same flexible production lines.:

- Therefore the same process structure will be applied, but experience in the supply relations needs to be build up especially within the electronics industry.
- Sophisticated know-how in production technology is therefore a strategic asset for OEMs.

There are competencies all over Europe as basis for a strong EV supply chain.

ENEVATE Approach

North West Europe (NWE)

- Comp. A / UK
- Comp. B / Ireland
- Comp. C / France
- …

In whole North West Europe more than 900 companies are active in the automotive industry, but distributed over many locations.

Source: Database - www.enevate.eu

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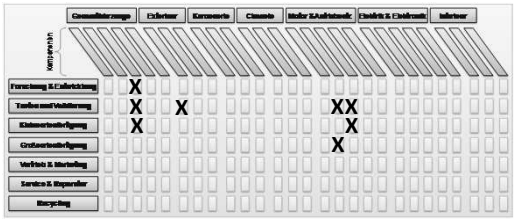
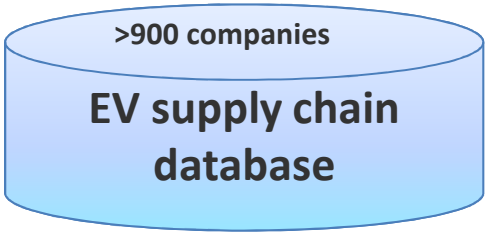
Systematic Determination



The competencies of all identified companies have been systematically determined for each field (electric motor, suspension …)

Database Analysis



The EV supply chain database allows a 'white spot analysis' for competencies in each region

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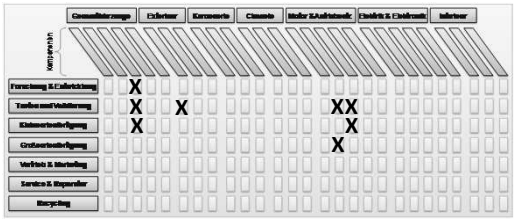

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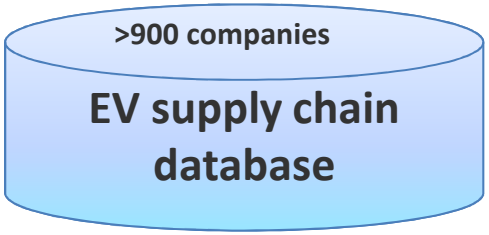

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Evaluation

Each separate region doesn't cover all competencies required to build a BEV. **The white spot analysis shows the lack of competencies and capacities in the regions.**

Research and Development	●	Fully covered
Testing and validation	●	Fully covered
Manufacturing (Low / High volume)	◕	Nearly all important BEV components are available within NWE
Reuse & Recycling	◔	Recycling for electric components is a white spot

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All actors need to set the right course to establish a strong electric mobility value chain.

Exemplary recommendations for action:

Policy Makers

- **Improve networking** of industry across all sectors
- **Support of know-how transfer** from research and development to market ready products

Vehicle Manufacturers

- Develop the fitting vehicle for the **current and future customer requirements**:
  - ✓ **BEV** are especially suitable for **vehicle fleets** driven in inner cities. This includes light commercial vehicles.
  - ✓ **PHEV** are the fitting technology solutions for customers with an additional demand for **long distance drives**.

Vehicle Suppliers

- Orientation towards **the right strategic business partner**, since the supply chain structure will change over the next years with increasing volumes.

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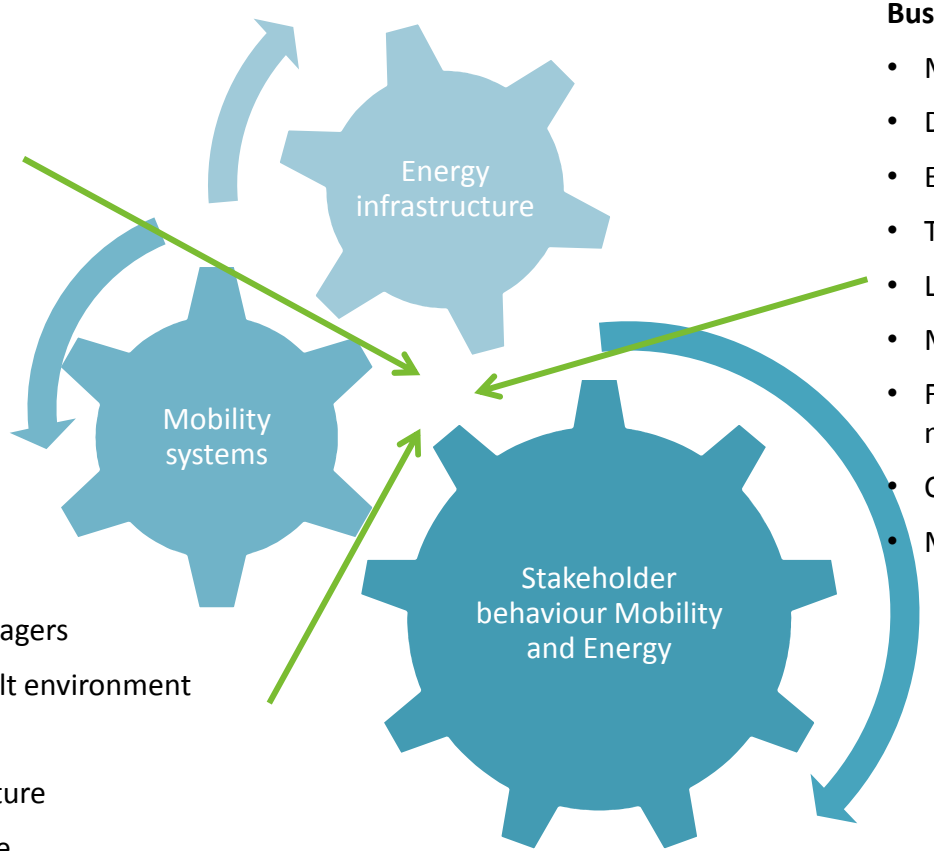
Future Transport Systems

Connecting systems

- EV charging
- Vehicle 2 Grid (mobile storage)
- Energy storage (static storage)
- Energy management system integration
- Grid support – micro & macro
- Intelligent, integrated mobility management



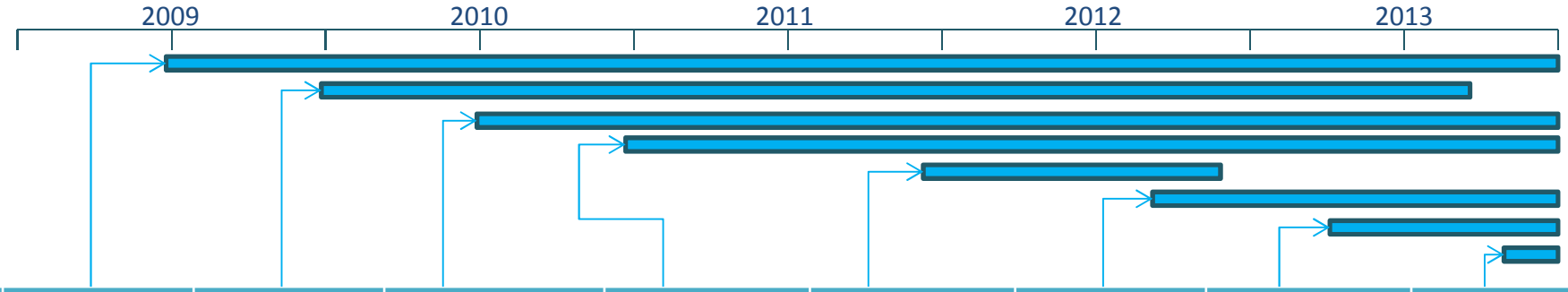
Business models

- Managed charging
- Demand response
- Electricity trading
- Time of Use tariffs
- Local network management
- Multi-stakeholder value streams
- Fleet management – facilities management
- Car clubs
- Multi-modal mobility

Behavioural influence

- Vehicle purchasers
- Drivers and fleet managers
- Inhabitants of the built environment
- Facilities managers
- The role of infrastructure
- The role of experience
- Interaction, knowledge, communication

Typical projects



Name	Regional strategies	SWITCH EV (TSB)	ENEVATE (EU Interreg)	EVALU8 (OLEV – PiP)	Infras'ture partnership	V2G	Managed Charging	Everest (DECC)
Partners/ clients	Various UK regions	Nissan, SEV, Peugeot, Newcastle Uni, AVID	Partners in UK, NL, GR, B, IR, F	Herts Uni	Major Industrial Blue Chip	4 UK Distribution network operators	Major global energy company	Automotive supply chain
Value	£250k	£10m	€5m	£7.5m	£100k	£2.5m	Confidential	£3.6m
Objective	Develop EV charging network & e-mobility strategies	Flagship TSB vehicle trial 43 vehicles, 24 months	Researching EU EV infrastructure landscape, developing tool kit	East of England Plugged in places EV charging network	Commercial partnership to develop and operate EV charging network	Develop V2G conversion feasibility and trial	Create sophisticated managed charging trial within UK, US and Germany	Develop and trial unique energy storage concept

Why develop the ENEVATE Tool Kit?

- Many EV infrastructure and e-mobility pilot projects
- Little sharing of knowledge
- E-mobility is still in the R&D phase we need to work together
- A big knowledge differential

The development process

- Insights from parties climbing the learning curve
- Borrowed their tools
- Combined their experience
- Created a Tool Kit guidance document
- Passed it on
- Trialled on several projects

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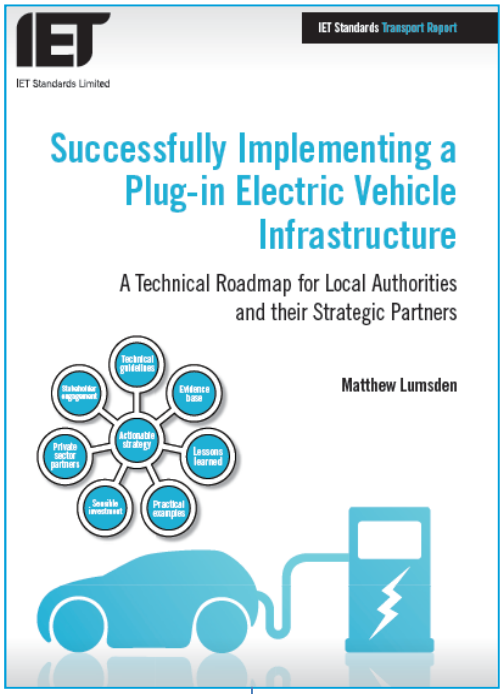
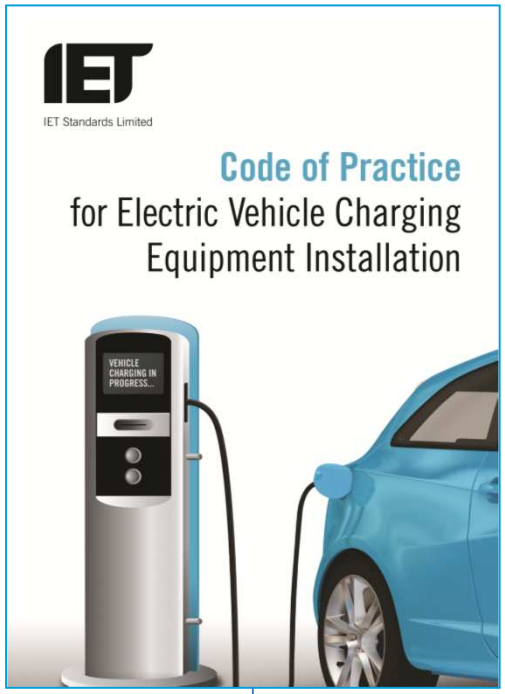
Part of a set of documents

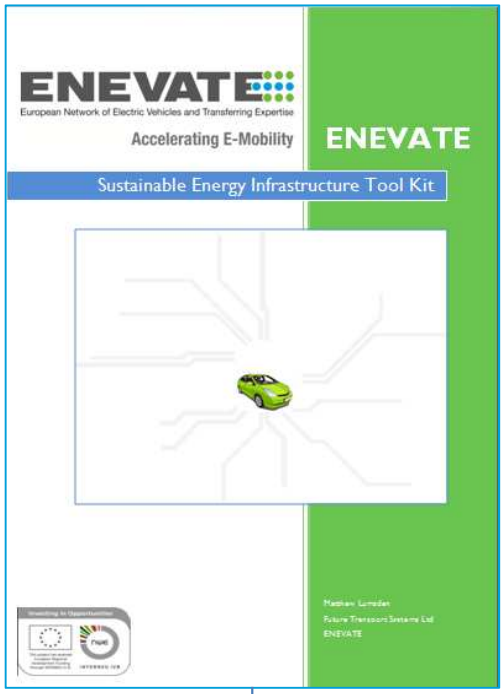
Technical & strategic background information



Detailed technical guidance on charge point installation



Key components of the development and implementation process



Bespoke workshops

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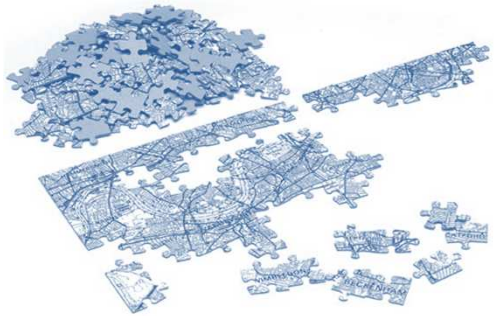
Structure



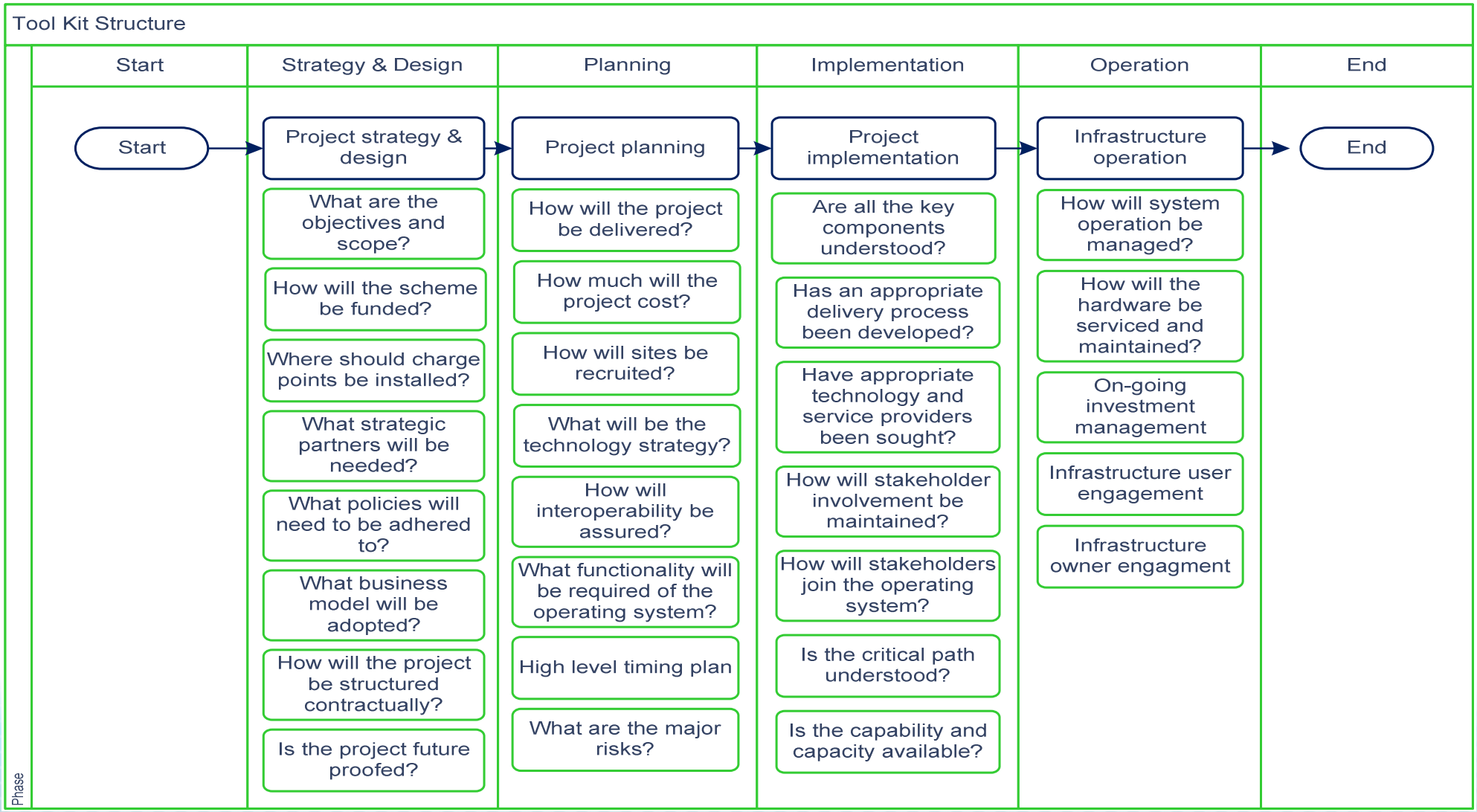
Strategy & design

Planning

Implementation

Operation

Tool Kit Structure



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Investing in Opportunities

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Sustainable Energy Infrastructure Tool Kit

Work Package 2 working document – UK version | ENEVATE

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Use of the Tool Kit