Stakeholder and Market Analyses

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Method

Stakeholder Analysis:

- Semi-structured interviews
- Analysis of official communications
- Notes and summary from workshop

Market Analysis:

- SWOT
- PESTLE
- Porter’s Five Forces

Stakeholder Analysis of Driving Forces for ERS Adoption

- Hauliers (Åkerier)
- Port Operators
- Transport Buyers
- Grid Operators
- Other Stakeholders
  (OEMs, ERS developers, construction companies)

Hauliers (Åkerier)

Reducing fuel costs

Meeting environmental targets

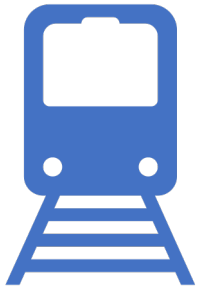
Comfortable, attractive working environment

Policy uncertainty

Lack of experience with electric vehicles

Port Operators

Competitive advantage for attracting large industrial customers



Flexible alternative to rail

Direct routes from ports to industrial facilities

Transport Buyers

Meeting environmental targets

Positive experiences with EVs

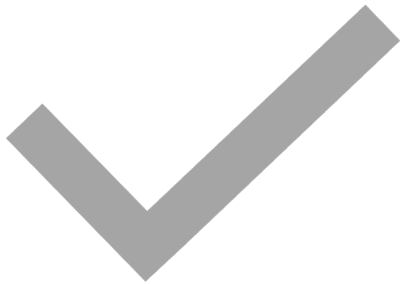
Increase carrying capacity

Direct routes more interesting

Limited availability of electric vehicle classes

Grid Operators

Grid investment opportunity,
or deferral



Preference for mature
technology, reliability

Other Stakeholders

OEMS:

ERS can enable transition to electric drive in some segments, specific use cases.

Significant investment, complexity and multi-stakeholder coordination required for ERS.

ERS developers & construction companies:

Business opportunity.

Market Analysis: Overarching Conclusions

Government support and ownership is fundamental to any ERS business model

OEM support is crucial but currently limited

New technology risk needs to be considered and managed

Technology choice and standardisation can reduce uncertainties and increase stakeholder confidence and engagement

Legal frameworks for ERS implementation and gap analysis still required

Government support and ownership is fundamental to any ERS business model

Almost all stakeholders presume ERS implementation on large scale only feasible with government playing a strong leading role.

- Standardising the technology
- Establishing a legal framework
- Coordinating support from OEMs and the logistics sector
- Financing and owning the infrastructure

Only limited government engagement within EU (27+1) to date

- Sweden, Germany appear most ambitious
- UK feasibility study
- Most countries not yet engaging in official capacity

OEM support is crucial but currently limited

Current OEM engagement and support for ERS

- Volkswagen's Traton Group (which includes Scania) currently only European OEM to publicly support ERS as a large-scale charging solution
- Volvo only sees ERS in niche applications

Other OEMs likely waiting for stronger government signals before committing to supporting the technology themselves.

Lack of broader OEM support represents a market risk to stakeholders

- Uncertainty around if a competitive market for ERS compatible vehicles will exist? (lock-in risk)
- Suitability of ERS for business difficult to assess
  - Performance characteristics of potential vehicles on and off ERS?
  - What vehicle models, types, brands will be made available for use with ERS?
  - What price points?
  - These questions unlikely to be addressed until broader OEM support for ERS is secured.

New technology risk needs to be considered and managed

As with any new technology, the transition to ERS will entail risk

The nature and magnitude of the risk varies between the different stakeholders

- Government: financial risk in the significant capital investment required to deliver a minimum viable ERS network, risk in OEM and fleet owners not supporting the technology, political risk.
- Haulers and transporter buyers: capital risk associated with investing in ERS compatible vehicles, risk of limited competition, technology reliability risk, TCOO risk.

Underlying risk for all parties is the threat of substitution from competing technology pathways

- Namely pure electric vehicles (and static charging infrastructure), hydrogen fuel cells and biofuels.

However, there is a lack of understanding and consensus about the degree to which these various technology pathways could either rival or complement each other.

- Rapid BEV adoption may aid adoption of ERS as vehicle fleet can be made compatible with ERS relatively easily
- BEV adoption may also mean sunk investment in vehicle fleet that do not rely on opportunity charging, marginal benefits from ERS would be reduced.

Technology choice and standardisation can reduce uncertainties and increase stakeholder confidence and engagement

The lack of technology choice and standardisation is a key source of uncertainty and signal to stakeholders that ERS is far from market readiness.

- Often cited as reason for lack of serious engagement with ERS
- Choice of technology has important implications for what type of vehicles can use ERS and therefore its relevancy to different stakeholders

Does it matter what Sweden chooses?

- Germany has not officially committed to an ERS technology type, but Siemen's overhead line technology has been exclusively used in all government funded trials to date.
- Sweden publicly remains open to full range of ERS technologies, with 4 different types of technologies featured in government funded trials to date.
- Sweden may be a technology-taker as Traton Group (owned by VW) is only OEM committed to ERS.

Proprietary technology may present issues for public procurement

- Proprietary technologies dominate the ERS space
- But large infrastructure investments generally rely on open standards to ensure competition and value for money in public procurement processes

Legal frameworks for ERS implementation and gap analysis still required

Thorough legal gap assessments enabling the implementation of ERS at scale still need to be undertaken

Priority legal areas already identified are the need for:

- in-depth assessment of the tasks, rights and obligations of those involved in the planning, construction and operation of the ERS infrastructure
- a framework for binding agreements between vehicle manufacturers, ERS system providers and the state to ensure long-term support for the system

Other areas include:

- the ownership structure and implications on management responsibilities (e.g. road safety, environmental protection, operational reliability and accessibility)
- the interface between the party responsible for operation and maintenance of ERS infrastructure and the operator
- the interface between the ERS infrastructure and the electricity grid
- potential conflicts between the Swedish Transport Administration owning the ERS infrastructure while fulfilling its obligations to instructions from the government and the Electricity Act
- aspects of data protection law
- system interventions in driving operation