Investing in freight transport decarbonisation

Decision making and methods for evaluating opportunities and risks

Decarbonising
UK Freight Transport

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Pressure to invest in decarbonisation is growing rapidly. This is occurring domestically, with the launch of the UK's Transport Decarbonisation Plan this summer, and also internationally, with pressure mounting on all sectors to decarbonise at ever increasing speeds as another IPCC report is launched and COP 26 looms on the horizon.

However, the ingredients to clarify precisely where that investment should go, remain elusive. Technology pathways, detailed policy/incentives, customer readiness, infrastructure evolution are evolving but can sometimes be hard to disentangle and decipher.

In 2020 the Decarbonising UK Freight Transport (DUKFT) Network funded four small research projects that aimed to answer research questions investigating freight transport decarbonisation investment decisions. The projects explored the roles of decision makers, financiers, and the methods that characterise freight technology and fuel-based decarbonisation options.

This document provides a brief summary of the key findings of each of the research projects.

1 Understanding Freight Decarbonisation Investment Decisions

2 Transport Investment Decisions (TIDE): An exploration of climate alignment in freight related investment decisions

3 An Integrated System and Service Design Approach for Decarbonisation of UK Freight Transportation (INSTINCT)

4 Co-produced Route-mapping to Accelerate Freight Decarbonisation (CRAFTeD): A Transdisciplinary Learning and Decision Framework

1 Understanding Freight Decarbonisation Investment Decisions

Project team: Fraser McLeod (University of Southampton), Anthony Velazquez Abad (TRL), Marina Garyfalou (TRL)

This project aimed to undertake a wide scope analysis, including all stakeholders, of the factors influencing freight transport investment decisions. Specifically, it aimed to identify the key drivers and enablers or barriers associated with freight decarbonisation investment decisions, and the relative importance of these for each mode of transport. The project team carried out a literature review, conducted several focus groups and AHP interviews, their analysis of the data they collected led to the following results.

Whole life cost was ranked highly by each sector and was needed to justify investments in vehicle fleets. For road vehicles it was considered easy to calculate, as many low carbon options are commercially available, however for rail freight it was currently considered impossible to calculate due to the immaturity of the market. For maritime the whole life cost of low carbon fuels is not yet fully understood, and the cost of low carbon fuels compared with alternatives currently in use was considered a barrier to adoption.

The current **lack of recharging/refuelling infrastructure**, and uncertainty about future provision were considered barriers to adopting low carbon vehicles at this stage. However, where infrastructure is more widespread low carbon vehicles are becoming more commonplace, and local authority participants felt they had a responsibility to aid the deployment of infrastructure to support the uptake of low carbon vehicles.

Vehicle range, payload capacity and efficiency were identified as key factors for the road, rail and maritime sectors. Due to the current lack of infrastructure, range anxiety is an issue for all. For long haul road freight long downtimes reduces operational efficiency, and suitable options are not available at present. For rail freight Infrastructure would need to be upgraded to support heavy axle loads to allow heavier freight trains access across the whole rail network. For maritime the ability of a vessel to move freight at a speed, and capacity, that meets the time restrictions of the charterparty is vital and it is not clear which alternative fuel will meet the requirements.

Subsidies or incentives were identified by maritime freight operators as being necessary due to the cost differences between alternative fuels and the fuels currently in use. Road freight operators stated that subsidies or incentives would increase the uptake of low carbon vehicles but did not consider this as one of the most important key drivers.

Reliability was identified as the most important factor for the road freight group. Low carbon vehicles are currently considered less reliable than existing models, and there was concern that many service stations are not equipped to service alternatively fuelled vehicles.

Vehicle suitability/capability was considered a priority for the public sector and rail freight groups. For the public sector the variation in vehicles used, from small vans to refuse collection vehicles meant that there is currently no simple solution across different areas and fleets. The rail freight group noted that no viable solution had yet emerged with the same capability as diesel engines.

Vehicle emissions were given as a key driver only by the public sector group. Many local authorities have air quality targets and want to set a good example with their fleets. The private sector does not currently have the same pressures or priorities.

2 Transport Investment Decisions (TIDE): An exploration of climate alignment in freight related investment decisions

Project team: Nadia Ameli (UCL), Nishatabbas Rehmatulla (UCL), Julian Allen (University of Westminster), Sophie Parker (UMAS), Marie Fricaudet (UCL).

This project aimed to undertake a narrow scope analysis of financiers, including banks, institutional investors and equity investors of the factors influencing freight transport investment decisions. Specifically, it aimed to provide a better understanding of the existing initiatives and tools available to financiers to measure the alignment of their investments and portfolio to a decarbonization trajectory, and how they compare to each other. It also aimed to provide some insights on the approaches financiers currently use to screen their investments against climate alignment, and the barriers they face in their implementations. The project team carried out a literature review and conducted several interviews to collect their data.

The project found that **awareness and use of such tools by financiers vary widely depending on the institution**. A few financiers use a wide variety of tools conjointly and are proactive in developing them. Many others are lagging and are found to use no climate alignment tool outside of high-level commitments and guidance. Many of the stakeholders that were interviewed were just starting the process of understanding the alignment of their portfolios and, currently, the emphasis is on first understanding their emissions and disclosing rather than on screening investment decisions and checking for future alignment. This explains why the project found the uptake of high-level guidance and commitments among freight financiers to be higher than the uptake of assessment tools, and as yet it is hard to see any concrete impact of this on investment decisions.

The increased interest in climate change in finance has resulted in a **large range of initiatives, often targeting different types of financiers, sectors and regions and therefore appear fragmented**. Shipping is an exception in this regards, as the Poseidon Principles provide a harmonized and coherent methodology to its signatories and managed to attract enough signatories to cover a large share of the sector's finance. In the other sectors however, this suggests that climate alignment methodologies might not be comparable across financiers, but also that methodologies are used for complementary activities.

Many financiers are lagging and are found to use no climate alignment tool outside of the high level commitments and guidance. The project found that sectoral methodology and the PCAF (Partnership for Climate Accounting Financials) in the US are increasingly popular for banks while asset managers are looking for portfolio alignment tools with increasing attention on forward looking pathways, typically the SBT-FI (Science Based Targets for Financial Institutions) tool. Moreover, some tools are better used to understand the present situation of the financier while others are forward-looking tools (e.g. PACTA, Paris Agreement Capital Transition Assessment). This explains why we found that in some cases a single freight financier can be using several tools conjointly.

Firms at the beginning of the process face **institutional/organizational barriers**, where change is difficult and a slow process. They also lack a clear view on which is the best climate alignment tool. On the other hand, the main barrier which more advanced financiers have noted is the **lack of comparability of results, resulting from a lack of comparability of the climate alignment methodologies** and the lack of comparability of the corporate data provided by external providers.

3 An Integrated System and Service Design Approach for Decarbonisation of UK Freight Transportation (INSTINCT)

Project team: Alok Choudhary (Loughborough University), Edward Sweeney (Aston University), Tracy Ross (Loughborough University), Fahham Qaiser (University of Huddersfield), Amritha Sasankan (Aston University), Sube Singh (Loughborough University).

This project aimed to characterise and benchmark logistics activity and its carbon footprint for decarbonisation of freight transportation and identify the key drivers and barriers, key decision points and key decision-makers in the supply chain for decarbonisation of freight transportation. To collect their data the project team organised a series of activities to engage with key stakeholders from 63 organisations across the UK and internationally.

The project identified the following **key barriers**, the logistics sector not prioritising the decarbonisation agenda, a lack of information flow creating uncertainty e.g. around which technologies to adopt, the high degree of fragmentation in the freight transport industry, green initiatives that are often only relevant and prominent among bigger organisations, and the imbalance of fleet technology developed to infrastructure implementation.

The project identified the following **key drivers**, the opportunity to make use of pandemic recovery funds for decarbonisation initiatives, customer expectations and demand for greener alternatives, employee level initiatives and the need to be seen to be working on decarbonisation in order to attract the best young talent, potential collaboration between leading organisations and smaller companies, and the use of technologies such as telematics for fleet management, vehicle tracking, maintenance, dynamic routing, and driver performance

The project identified the following **key decisions**, redesigning the existing supply chain and its operations, the development of fleet technology e.g. telematics, innovative vehicle design and new technology vehicle trials, infrastructure implementation e.g. smarter mode switch, smart motorways and electrification of road and rail networks, the positioning of warehouses and greater warehouse automation and storage density, long term partnerships and collaboration involving small companies and start-ups, and investment decisions that take into account vehicles and assets life cycle, the vehicle technology and infrastructure.

The project identified the following possibilities with regards to **decision makers**, the expansion of decision making to include shareholders and technology providers, and a growth in the role of consumers in decision making that impacts on decarbonisation of freight.

The project identified **25 KPIs to focus on investments to inform the benchmarking framework**. These were categorised into technology, behaviour and infrastructure, which focused on both private and public investment.

The project concludes that supply chain and logistics activities should be viewed as an integrated chain rather than a collection of subsystems. A collaborative effort including players from the entire value chain irrespective of the organisation size and maturity is essential for the decarbonisation of freight transportation pathway. More initiatives from government and policymakers are required to provide guidelines, create policies and regulations, and enable more investments in infrastructure, technology, and training to maximise the investments in the decarbonisation of freight transportation initiatives.

4 Co-produced Route-mapping to Accelerate Freight Decarbonisation (CRAFTeD): A Transdisciplinary Learning and Decision Framework

Project team: Graham Parkhurst (UWE), Daniela Paddeu (UWE), Ges Rosenberg (University of Bristol), Neil Carhart (University of Bristol), Colin Taylor (University of Bristol).

This project aimed to identify what kinds of methods and tools would most effectively support decisions that would contribute to the design of a pathway to decarbonise the future UK freight system, considering local, regional, and national scales and international implications. To collect their data the project team convened an expert panel and carried out a scoping workshop and several stakeholder workshops and small discussion groups.

Significant uncertainty is a major challenge for freight service operators and local government as they seek to plan a long-term investment strategy and develop net zero carbon policies. Principal areas of concern remain around i. the lack of transparency and clarity in terms of the direction and timeliness of national regulations and standards, ii. the feasibility of timelines for delivering the energy and transport infrastructure on which freight decarbonisation is dependent, iii. the maturity and roles for energy carriers such as battery, fuel cell, hydrogen and e-fuel technologies.

Behavioural change in consumers, producers and retailers is frequently overlooked when forming policy for the freight sector due to the widespread perception that decarbonisation as a purely technical challenge. Although consumers and organisations make decisions which contribute to freight sector emissions, they seldom take responsibility being either unaware of the impacts or seeing decarbonisation as 'outsourced' to freight providers.

The **regional level is a relevant one for stakeholder engagement around freight decarbonisation**, offering a viable scale for coproducing a route-map, coordinating and organising public and private action, including testbeds and living labs. Creating alignment with national guidance, fiscal and regulatory measures, was identified as vital for effective regional transition planning. Of concern, regional governance and leadership of freight decarbonisation in the largely absent. In this vacuum, the formation of other regionally oriented interest groups, such as the South West Infrastructure Partnership (SWIP), could be helpful to build future regional governance, leadership and citizen engagement.

Segmentation of the freight sector could present significant challenges in the drive to net zero, with conversations and planning of decarbonisation still taking place in sub-sector siloes. Whilst aviation and maritime subsectors are predominantly focused on global or national scales, the domain of road and rail subsectors has a distinctly local to regional focus. Notably, airport and **ports could play an important 'boundary spanning' role**, bringing global airfreight and shipping perspectives to regional infrastructure planning.

Stakeholders generally identified changes of regulation, governance, and organisation as more significant for successful decarbonisation than a particular 'breakthrough' technology. Hence, there was a **call for clear national policy guidance which is needed urgently from central government** to empower businesses and devolved administrations to take action to speed up freight decarbonisation. National targets, incentives and regulations will be essential if decarbonisation is to be prioritised above the other demands the organisations face in delivering their primary outputs efficiently in either a competitive business or public sector environment.