SIF Alpha Round 3 Project Registration

Date of Submission

Oct 2024

Project Reference Number

10131749

Initial Project Details

Project Title

Electric Thames

Project Contact

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Challenge Area

Whole system network planning and utilisation to facilitate faster and cheaper network transformation and asset rollout

Strategy Theme

Flexibility and market evolution

Lead Sector

Electricity Distribution

Project Start Date

01/10/2024

Project Duration (Months)

6

Lead Funding Licensee

UKPN - London Power Networks Plc

Funding Licensee(s)

UKPN - London Power Networks Plc

Funding Mechanism

SIF Alpha - Round 3

Collaborating Networks

UK Power Networks

Technology Areas

Demand Response

Electric Vehicles

Stakeholder Engagement

Project Summary

Today, the vessels, docks, and ports operating on the Thames run mostly on fossil fuels, but this is changing as the river's economy decarbonises. There is limited understanding how this shift will affect the electricity network.
Working together with stakeholders across marine and energy industry, we will map out the future of maritime transport in the central Thames area and explore the potential benefits of Boat to Grid (B2G) charging. The outcomes will shape a whole system planning framework for our waterways, offering insights for decarbonisation and electrification that can be replicated across Great Britain.

Add Preceding Project(s)

10061360 - Electric Thames

Add Third Party Collaborator(s)

LCP Delta

Marine Zero

Port of London Authority

ev.energy

Project Budget

£556,338.00

SIF Funding

£499,643.00

Project Approaches and Desired Outcomes

Animal testing (not scored)

- ○ Yes
- ◉ No

Problem statement

The Thames will undergo substantial change as the river's economy decarbonises in support of Net Zero. New technologies such as battery and hydrogen powered vessels will emerge, and shipping routes will adjust to allow for in service charging or to accommodate new hydrogen fuelling points.
The Port of London Authority (PLA) has committed to achieving Net Zero carbon emissions from its operations by 2040. Main sources of carbon emissions in the PLA include: port operations such as on board generators for moored vessels, and maritime transport. Both operations rely heavily on fossil fuels and have been outlined as key areas to be decarbonised through electrification.
To deliver pathways for electrification, suitable charging infrastructure will need to be developed to support electric vessels and facilitate B2G flexibility services. This includes rapid charging at key locations during the working day and overnight charging when moored. There is a risk that the extensive increases in energy demand along the Thames will lead to a considerable increase in decarbonisation costs. Previous decarbonisation planning has considered marine requirements and network requirements in isolation. A coordinated effort is required between UK Power Networks, PLA, vessel operators and wider stakeholders to develop a whole energy system planning approach to identify the most effective route to decarbonise.
During Discovery, the partners engaged extensively with river users to develop an understanding of the overall power requirements for new infrastructure on the Thames. We now have a deeper understanding of the challenges in decarbonising the vessels on the Thames, as well as the decarbonisation technologies, including vessel batteries, hydrogen, and static batteries. Our learnings informed the objective for Alpha and Beta which is the facilitation of a 'Green Corridor'. This will consider different electricity load requirements at multiple locations to find the optimal solution that minimises network reinforcement and meets planning requirements without disrupting vessel operation. The project will also create a decarbonisation framework for the Thames that considers the needs of multiple users. We will improve whole system coordination, modelling and planning capability across sectors to support holistic and timely system development.
The project addresses Challenge 1 by developing a whole system planning approach to decarbonising the central Thames area. Considerable charging and hydrogen storage infrastructure will have to be installed to facilitate a 'Green Corridor'. Electric Thames will also investigate the infrastructure requirements and network impact for B2G flexibility services from electric vessels operating on the Thames. This will facilitate decarbonisation through use of demand and supply side flexibility, addressing theme 3.
Users:

- The PLA: require a feasible and economic decarbonisation plan for the Thames.
- Quay owners and vessel operators: require an understanding of the opportunities for investing in electrification and a route to revenue.
- Local Authorities (LA): require guidance on the necessary planning requirements for clean maritime solutions.
- UK Power Networks: require understanding of the potential network impact and the potential for B2G to enable the efficient decarbonisation of the Thames.

Our understanding of quay and vessel operators' needs developed during Discovery, and includes:

- Intentions to decarbonise through electrification and hydrogen in the central Thames area, with alternative fuels towards the estuary.
- Operating regimes and ability to support DNO needs on a daily and seasonal basis.
- Need for an investable business model that can alleviate capital expenditure concerns.

The project will help develop local area energy planning frameworks for waterways, meeting the needs of Local Authorities (LAs). This can be scaled across the UK, where canals, rivers and quays require decarbonisation and electrification. This will have an

impact and opportunity on the network and charging infrastructure in the local and regional surrounding areas.

Innovation justification

The project creates an innovative, integrated energy system and a business case which accounts for the impacts of decarbonising vessels, docks and quays.
Our approach is innovative as it is the first clean maritime planning framework that considers network requirements in parallel with the requirements of marine users, LAs and other key stakeholders. Alternative approaches to decarbonising waterways would involve significant build out of energy infrastructure at many exit points. Maritime, LA and DNO planning is usually conducted in isolation, potentially delaying decarbonisation. By working in isolation, marine users are unlikely to invest in assets that can enable clean operation, thus delaying the 2040 decarbonisation target for the Thames.

Our approach will demonstrate ambitious innovation through:

- Identifying the optimal route to decarbonise Thames traffic and operations through electrification and potential use of hydrogen.
- Investigating use of 'floating batteries', charging and discharging at different times and locations to manage network constraints.
- Exploring grid-scale batteries to offer flexible, high-speed charging for vessels to ensure resilient operation.
- Conducting a detailed engineering design of the vessel requirements and charging infrastructure needed for electrification and by-directional charging.

During Discovery, we worked closely with vessel operators, quay owners and the PLA to understand their needs and incorporate it into our approach. We learnt that:

- There is strong support among marine users for the project, particularly in B2G as this can potentially offset capital costs required for new infrastructure.
- The absence of a joined-up approach to electrification is seen as a key challenge.
- There are challenges associated with infrastructure development around the quays, as many sites are in protected areas of cultural significance.

At Alpha we seek to address these learnings by developing a detailed engineering design of the required infrastructure for bi-directional charging and the vessel requirements needed for electrification. In the current market, there are some examples of B2G charging for small vessels, this project will investigate the feasibility of bidirectional charging at the MegaWatt level. We will also develop closer working relationships with LAs to understand the barriers to infrastructure development around the quays, we will incorporate this into our implementation approach for a 'Green Corridor', see appendix A. And we will modify our business model to account for the needs of the key users we have identified, drawing on the expertise of the PLA and ev.energy.
Considerable investment, engagement and innovation is required to develop a solution to decarbonise Britain's waterways in a secure and economic manner. This would not be achievable as part of BAU activity, due to the complexity and high-risk nature of whole system planning across multiple sectors. Participation in SIF will enhance opportunities for stakeholders across multiple sectors in engaging with the project. Significant groundwork, such as feasibility studies and limited scale trials, must be undertaken before any scalable or widespread deployment is carried out, which is suited to the structure of SIF phases.
The project addresses challenge theme 3 by investigating the infrastructural requirement and network impact of B2G flexibility services. Alpha includes conducting a detailed engineering design of the vessel requirements and the charging infrastructure needed to facilitate by-directional charging. The whole system planning approach will be dependent on the results of this study.
B2G technologies are IRL3 as there are some examples of bidirectional charging infrastructure for maritime and many for land-based use. However, none of these operate at the MegaWatt level that we wish to explore in Alpha.

At the start of discovery, we identified TRL3 and CRL4. Following our research, our thinking remains the same. Although, we anticipate that a trial at Beta would increase B2G to TRL7-8.

Impact and benefits (not scored)

Financial - future reductions in the cost of operating the network

Financial - cost savings per annum on energy bills for consumers

Environmental - carbon reduction – direct CO2 savings per annum

Environmental - carbon reduction – indirect CO2 savings per annum

Revenues - creation of new revenue streams

New to market – processes

Impacts and benefits description

Pre-innovation baseline considers vessels, docks and quays extensively using fossil fuels and suboptimal electrification or transition to hydrogen of some operations. Our Discovery phase analysis estimates that 166 vessels will need to decarbonise to reach the PLA's net zero targets. If these vessels install chargers in isolation and do not participate in flexibility markets, then the expected peak demand would be 226MW, based on Discovery estimations.
Our Discovery high level analysis estimates a peak demand of 140MW with B2G charging and managed hydrogen generation. The whole life NPV of our option is £94m. This and all benefits are the net present values, considered from 2025 to 2050.
Further benefits can be expected from providing shore power for cruise vessels and by optimal location of charging infrastructure to avoid particularly expensive locations. These benefits have not been assessed in Discovery but will be considered in Alpha.
Financial - future reductions in the cost of operating the network
Reducing peak demand from electrification of the Thames waterway through flexibility services will unlock network capacity. During peak demand periods, electric vessels can supply electricity to the distribution network, helping to balance the load.
Metric: £12m in reduced network reinforcement to accommodate additional peak capacity, assuming average reinforcement costs for London Power Networks. River-based peak capacity is conservatively estimated to be entirely additional to land-based peak capacity but there may be some overlap, reducing the reinforcement need. This is achieved by managing local hydrogen generation within the peak capacity of vessel charging peak demand.
Financial - cost savings per annum on energy bills for consumers
Lower costs of decarbonising the marine sector will reduce the network cost element of consumer bills for all consumers.
Metric: Annual customer bill savings
Environmental – carbon reduction – direct CO2 savings per annum

Optimising investment for decarbonisation of the Thames can enable a more efficient roll-out of low carbon river operations. This will displace the existing fossil fuel-based fleet, achieving an immediate reduction in direct CO2 emissions.
Metrics: Accelerating the decarbonisation of vessels, assuming the project increases electrification from 5% to 10% by 2030, and moves forward Net Zero achievement six years from 2046 to 2040, giving rise to:

- 185,000 tCO2e reduced emissions and,
- £70m in fuel savings (difference between marine fuel and electricity costs)

Environmental – carbon reduction – indirect CO2 savings per annum
Battery and green hydrogen are expected to be the biggest means of decarbonisation of the central Thames in the long-term. Incorporating the flexible aspect of both technologies and coordinating the roll-out with the local development plans will release additional capacity for renewable generation on the distribution network, therefore achieving indirect reduction in CO2 emissions.
Metric: Tonnes CO2 reduction per annum
Revenues - improved access to revenues for users of network services
Electric Thames enables vessel owners and dock operators to benefit financially by participating in flexibility services, such as participating in demand response programs. This can potentially generate revenue for vessel owners, incentivising their participation in B2G programs to support the grid.
Metrics: Revenue gained from participating in flexibility markets from 2029.

- £16.1m from intra-day energy trading, assuming 20% of the battery capacity can earn 8p/kWh daily.

New to market – processes
Electric Thames will accelerate the technical, integration and commercial readiness of B2G solutions that make decarbonising river traffic more economic whilst also supporting economic infrastructure upgrades to support decarbonisation on the Thames.
Metric: Replication across GB to unlock wider benefits beyond UK Power Networks area.

Teams and resources

The PLA was included as a partner for Alpha to ensure that the project continued to meet their needs as a key user. Additionally,

ev.energy have also joined as a partner to offer their expertise in charging infrastructure, understanding customer behaviours, and utilising flexibility. The consortium of partners for this project will ensure that our approach considers the needs of multiple stakeholders at every stage, which is integral to delivering an effective whole system planning framework.
Partners:
UK Power Networks are the UK's largest electricity distributor delivering power to 8.5 million homes and businesses across London, the South East and East of England, and are responsible for owning and maintaining the cables and assets in their licence area.
Role: Responsible for overall project management and dissemination of information across the industry. They will also provide the high level assessment for the 'Green Corridor' implementation approach, utilising insight into connection process, engineering solutions and costs.
LCP Delta is a leading consultancy working with energy suppliers, network operators and others to address challenges presented by the transition to a sustainable energy system. Previous work explores mitigating the impact of electrification on distribution networks. They have strong relations with energy communities, solution providers and network operators.
Role: LCP Delta will be responsible for defining the locations of chargers and hydrogen needed to make decarbonising the Thames feasible. They will lead on engagement with the non-marine sector (e.g. local authority planning). They are undertaking the CBA and financial analysis, investigating scale-up potential, and developing investable business models to accelerate the benefits from decarbonisation.
Marine Zero is a specialist in port and vessel engineering design and strategy for cleaner, sustainable, rivers and oceans. They bring a wealth of experience which includes a deep understanding of the current and future clean maritime technologies available and the regulatory framework governing their adoption.
Role: Marine Zero will provide the required maritime expertise to determine the power requirements for maritime operators on the Thames. They will also investigate the opportunities for B2G services and the use of energy storage on land to enable rapid charging. Hydrogen production and storage for maritime will also be investigated including identifying planning constraints and opportunities.
Marine Zero will sub-contract out a portion of work to Solis Marine Engineering, a team of naval architects and engineers who can provide the data to assess the power requirements for key vessels.
The Port of London Authority (PLA) is a self-funding trust port that operates for the benefit of customers and stakeholders. They work to keep commercial and leisure users safe, protect and enhance the environment, and promote the use of the river for trade and travel. Role: Provide geographic information system (GIS) data for the engineering design and validate the projects approach, ensuring it aligns with their decarbonisation strategy. They will also assist in the development of the stakeholder engagement strategy and business case.

ev.energy are a flexibility aggregator and have developed a smart, cloud-based platform that automatically optimises EV charging, for greener, cheaper and simpler charging.
Role: To assist in development of the business model and commercial frameworks to enable cost-effective charging and B2G flexibility services. They will also offer expertise on the necessary charging infrastructure to facilitate B2G.
In Discovery, we identified the 14 Local authorities that sit within the central Thames area we are focused on. We have included a stakeholder engagement strategy as part of WP5 to ensure that we engage with these key stakeholders and work collaboratively to achieve our desired outcomes.
For Alpha, there are no additional resources, equipment or facilities required.

Project Plans and Milestones

Project management and delivery

Project management will be led by UK Power Networks using standard best practice methods and tools, including regular management meetings and status reporting. UK Power Networks has an effective innovation governance procedure with robust financial and project controls in place. This approach provides transparency, facilitates cohesion and collaboration amongst the partners, and avoids duplication of work.
The project is made up of 5 work packages (WP):
WP1: Project Management (UK Power Networks)
Aims: Deliver the project on time, to budget, ensuring that project objectives and learnings are successfully achieved.
WP2: Vessel and Charging Infrastructure Engineering Design (Marine Zero)

Aims: Engage with the identified operators to discuss the duty cycle of required operations and review alternatives to reduce, where possible, power demand and energy storage requirements.
Design the technical solutions for vessel charging, shore power and flexibility services.
WP3: Define implementation approach for a 'Green Corridor' (LCP Delta)
Aims: Identifying potential locations that will enable clean operation of the Thames. Validate the approach with the PLA to ensure that it aligns with their decarbonisation strategy. This WP will identify three scenarios which will provide the framework for the project business case in WP4.
WP4: Develop Business Case (LCP Delta)
Aims: Agreeing business models that are investment ready and meet user needs, incorporating the expertise of project partners and key stakeholders
Developing a Cost Benefit Assessment based on the preferred business model(s) and performing financial analysis in preparation for Beta.
WP5: Stakeholder Engagement and Scaling opportunities (LCP Delta and Marine Zero)
Aims: Detailed discussions with key users to ensure engagement at trial stage. The business case and ‘Green Corridor’ approach will be refined through dissemination and validation with stakeholders. Develop a roadmap for widespread adoption of clean maritime solutions, incorporating the needs of other users.
The development of the business case in WP4 is dependent on the findings of WP2 and WP3. The engineering design WP will include high level costing estimates for vessel and charging infrastructure, which will affect the implementation scenarios outlined in WP3. The implementation approach for a ‘Green Corridor’ in WP3 will provide 3 scenarios from which to build a business case around. By comparing the forecasted benefits of each scenario, the project team will decide which to take through to a trial.
All interdependencies between work packages and milestones are detailed in the attached Project Management Book and Gantt Chart.
Due to the scope of Alpha, no Stage Gates were considered appropriate.
The project will use a standard risk management approach where the Risk Register generated will be regularly maintained and reviewed by the project partners. The project has identified several risks as well as associated mitigations (see PMT template).
Key risks and mitigations include:

Risk: The cost of building charging infrastructure and electrifying vessels far outweighs the benefits outlined in the project. Operators are not incentivised to participate in any future work.
Mitigation: As part of WP4, the business model will develop a framework that seeks to share costs between users and ensure that any benefits are equally distributed.
Risk: Lack of engagement from key stakeholders prevents the project from building a credible whole system approach.
Mitigation: As part of WP5, a stakeholder engagement plan and schedule will be outlined to ensure that all users are well represented. The project team will utilise their individual networks to ensure that a variety of stakeholders are consulted.
We do not anticipate any planned or potential unplanned supply interruptions for consumers given the nature of the project. We do not anticipate any negative impact on energy consumers or their premises, either now or in future phases.

Key outputs and dissemination

The objectives of Electric Thames are to:
•
Enable the decarbonisation of vessels and operations on the Thames, providing a template for all riverways.
•

Enable B2G flexibility services; and
•
Minimise the whole system impact of decarbonising the Thames and maintain economic operation of all river users.
The proposed outputs and owners across the workstreams are:
WP1: Project Management:
Key outputs will include presentation to UKRI regular reviewing of the project plan, risk register and action list. UK Power Networks will be responsible for this WP.
WP2: Vessel and Charging Infrastructure Engineering Design:
Reports defining the charging infrastructure and the specific vessel power requirements for the key vessel archetypes. Marine Zero will lead the delivery of these reports, with input from ev.energy and the PLA.

WP3: Define implementation approach for a 'Green Corridor':
A report providing the vision for infrastructure locations including charging, shore power, B2G, and hydrogen capabilities, baseline and scenario power demands. Initial outline of a connection and flexibility framework to facilitate a 'Green Corridor' along the Thames. LCP Delta will be responsible for this deliverable, with input from UK Power Network and PLA.
WP4: Develop Business Case:
Findings and recommendations iterated with key stakeholders. Development of business models that enable investment and exploitation for more waterways. LCP Delta will lead on this work package, with input from all other partners.
WP5: Stakeholder Engagement and Scaling Opportunities:
Key outputs will include the development of a stakeholder engagement plan and schedule, Assessment of other clean maritime solutions across GB and the additional users that could benefit from the proposed charging infrastructure. LCP Delta and Marine Zero will lead, with contributions from all partners.
Knowledge Dissemination
The Electric Thames team will collaborate to deliver the dissemination activities. We intend to leverage the connections of our consortium to effectively disseminate our learnings.
Website:
• All SIF Round 3 Alpha projects will be disseminated on UK Power Networks' Innovation website.
• UK Power Networks will make an announcement press release summarising the total funding received for all Round 3 alpha projects. And will look for opportunities to share project announcements and updates in the way of press releases to help increase industry engagement. Social media
• Where appropriate, UK Power Networks will look to share project updates and milestones via its official LinkedIn page. This will leverage the strong audience of more than 50,000 followers, with updates also shared by project partners.
• Marine Zero's and LCP Delta's networks: will leverage their networks and contacts to disseminate the outcomes ensuring wide reach and impact, including Zestas (Zero Emissions Ship Technology Association), Future Fuels working group for National Maritime, Cornwall Marine Network (providing access to the wider Maritime UK network). Events
• At last year's Energy Innovation Summit 2023, UK Power Networks shared updates for 19 projects, with over half of them being SIF round two projects. This will be replicated at this year's event, be it at specific seminars/round tables or on its own conference floor stand.

• UK Power Networks Innovation Team will host a second edition of its Net Zero Networks conference in early 2025, with a focus on disseminating projects from the Strategic Innovation Fund Round 3 Alpha phase.
• UK Power Networks will also proactively share project updates on an ADHOC basis at other industry events where appropriate.
All outputs will be made available to all networks and therefore does not undermine competitive markets.

Commercials

Intellectual property rights, procurement and contracting (not scored)

The parties agree to adopt the default IPR arrangements for this project as set out in Section 9 of the SIF Governance document. The partners recognise that knowledge transfer is one of the key aims of the SIF, and that the benefits of this project will be maximised by the ability of other licensees to be able to learn from the Project so as to create improved outcomes or reduce costs for consumers. The partners do not anticipate that the Alpha Phase (or any potential subsequent phases) will result in the creation of IPR that cannot be freely disseminated and have no expectation of creating income streams or royalties from IPR outside of participation in a competitive marketplace for services that may be informed or stimulated via the outcomes of the project.
Marine Zero will need to sub-contract out a portion of the work to Solis Marine Engineering , who can provide the data to properly assess the power requirements for the key vessels that we will look at within WP2 In preparation for a trial, we will need to consider key enablers:
Charge points and related infrastructure – The trial will require installation of a small number of B2G enabled charge points. During Alpha, we will outline the best locations for this work and engage relevant contractors who could carry out the work.
Electrically powered vessels – Several vessels will need to be modified or built to participate in the trial. Through discovery, the project team have engaged many vessel operators who are interested in participating. Four vessel architypes were identified in Discovery, and we intend to model their duty cycle and operational profiles.

Commercialisation, route to market and business as usual

Business as Usual (BAU) adoption
To ensure whole system planning products are quickly adopted into BAU for the DNO, we will work with the relevant UK Power Networks' teams on design and testing throughout the project. This includes:

•
Network planners, to ensure new insight regarding maritime flexibility resources can be adopted into network development.

•
The connections teams, to co-develop services to be offered to installers of marine infrastructure.

•
The Distribution System Operators (DSO) team, to ensure any resulting incentives and/or commercial products are aligned with business practices and priorities.

If B2G services are found to be effective and increased confidence in delivering a return for customers and shareholders has been established, any new services to be provided by the DNO or DSO would be funded through BAU allowances. The teams will be involved in any trials to ensure they are aware of project outcomes as they occur and ready to adopt practices should they be proven effective.
Maintaining competitive markets
Electric Thames is not working to support any singular market participant in developing a proprietary approach or technology. As an owner of vessels, the PLA will gain learning as a project partner into the optimal ways to decarbonise their fleet. As a charging solution provider, ev.energy will gain learning and will develop their services alongside this project. All learnings and technologies, such as charging infrastructure will be treated fairly and analysed independent of partner bias, safeguarded via the neutral position of UK Power Networks.

To promote competitive markets, any propositions and business models developed through this project will be made available to all market participants as part of BAU. All data gathered and insights developed – either into technical solutions or potential market-side business models – will be made available through knowledge dissemination.
Customer adoption
The customers for BAU commercialisation of the flexibility proposition for B2G are:

•
Vessel owners: would need to retrofit their vessels or purchase a new build with a battery powered motor to participate in B2G. It is assumed that the benefits of B2G will incentivise them to cover the cost of decarbonising their fleet.

•
Quay owners: it is anticipated that a B2G charger would need to be integrated with the operations at different quays, such as the mooring times and maintenance schedules.

•

Charging solution providers: companies such as OVO energy, Octopus and ev.energy will be able to sell the solution to quay owners, enabling the deployment of B2G at their site.
Roll-out of technical solutions and services to Quay owners would be funded by solution providers through business models informed by this project. The end user value proposition lies in the financial rewards from flexibility (lower fuel costs, reduced mooring costs, free charging)
The focus of Electric Thames is on designing a new commercial framework for clean maritime adoption. At this stage all key partners can design the framework for deployment, but additional partners will need to be recruited in order to deliver the trial. At Beta, the project team will recruit vessel operators, quay owner and charging solution providers.
Due to the strategic importance of this project, senior sponsors from all partners have been involved to date. The engagement has been focused on understanding the learnings from Discovery and shaping the subsequent phases of Electric Thames. Senior sponsor engagement included:

- Executive management sign off at UK Power Networks
- Engagement from the UK Power Networks DSO senior management team.
- The executive management team at the PLA
- LCP Delta Director level
- Marine Zero Managing Director
- ev.energy Director

Policy, standards and regulations (not scored)

At this stage we are not aware of any specific derogations that would be required to proceed with a demonstration or trial of the technologies within the scope of this proposal. All relevant market access requirements are possible under current arrangements.
During the Discovery phase, a detailed assessment of the regulatory barriers was carried out. Marine Zero identified projects which have progressed in other countries where the relationship between the vessel operators, classification society, and the regulatory authority is much closer than in the UK.
There are no marine standards for vessel charging in the UK or beyond. It is clear that standard EV charging solutions are not fit for purpose in a marine environment where corrosion protection and saltwater ingress protection is vital.
Marine Zero will engage with classification societies i.e. Lloyds Register and the Maritime and Coastguard Agency (MCA) to ensure that all planned developments are compliant and that future regulatory changes are considered within the planning phase for Beta.
Marine Zero has positive links into both the MCA and relevant classification societies and will use these to accelerate the delivery of solutions.
Several regulatory enablers could support the accelerated delivery of flexible technologies in the future:

- Reducing barriers to entry: Policymakers could explore whether a proportionate and flexible certification framework is needed for organisations providing services to quay operators to facilitate flexibility service provision on their behalf.
- Flexibility and access products and services: Products and services must be launched that enable the procurement of flexibility from quays. To maximise participation these should be consistent across DSOs, available for the widest possible range of technology, and provide access for B2G flexibility to deliver against the widest possible range of products. They should also enable greater incentives on technology types and propositions that can be most useful to the system.
- Market access: Flexibility providers need to choose which flexibility value streams they wish to access. They need to understand potential conflicts, and access these value streams via different routes, with different platforms, contracts and eligibility criteria. Product designs themselves can create complexities and barriers to participation or inhibit the full value of flexibility being realised.

Further enablers through standards may also be required to accelerate the uptake of demand side response from B2G assets in future:

- Technology readiness: Appropriate technologies and reliability, including availability of B2G capable vessels, will need to be demonstrated to prove the ability for cost-effective flexibility provision from quays, and appropriate standards put in place to allow

their connection and operation for service provision.

- Route to market: Ownership models of quays may introduce complexities regarding how entities can mobilise investment in B2G charger infrastructure and control services and share in the benefits of flexibility service revenues. Publicly owned quays may require policy decisions to enable investment.
- Cyber security: Minimum cyber security regulations must be met before widespread use of flexibility is introduced to the maritime market. Primarily, the hurdle relates to ensuring that B2G solutions can meet the existing regulations, but the regulations themselves may need to be reviewed to ensure that they remain appropriate.

Barriers and enablers were explored during the Discovery Phase and will be explored further in Alpha, and our intention is to inform future policy and regulation through Beta by:

- Assessing the value case, urgency, and any required enablers for accessing flexibility from quays, thus informing the priority for policymakers.
- Designing and trialling real-world flexibility products from quays, thus creating evidence to support any proposed policy changes and support market participants in investing in the required capabilities and propositions.

Value for money

The total project costs for Alpha amount to £556,338, with a total SIF funding request of £499,643. The Project Partners are contributing 10% of the total project costs through the provision of uncharged time, demonstrating their commitment to the project and providing value for money to customers.

The project partners and subcontractors are highly experienced in the subject matter, which enables them to deploy their knowledge efficiently in the project. Additionally, the project partners are contributing resources at competitive market rates. It is expected that the project findings will offset the opportunity costs of the project participants who would otherwise use resources on other core business opportunities that enhance value.

There is a requirement for the project partners to travel to multiple quays and vessel operator sites as part of the project. LCP Delta have offered to cover this travel cost outside of their SIF funding request, Marine Zero have also contributed a proportion of their travelling costs. By partnering with the PLA, the project team will build a schedule of visits to key users, minimising travel and saving on project costs.

Breakdown of costs and SIF funding per partner:

UK Power Networks:
Total Cost: £71,535
Total Contribution: £9,120 (13% of total costs)
Total SIF funding: £62,415
LCP Delta:
Total Cost: £255,803
Total Contribution: £25,585 (10% of total costs)
Total SIF funding: £230,218
Marine Zero:
Total Cost: £193,300
Total Contribution: £20,480 (11% of total costs)
Total SIF funding: £172,820
Marine Zero will sub-contract out a portion of the work to Solis Marine Engineering. A naval specialist who can provide the data to properly assess the vessel power requirements within WP2.
Cost: £29,000
Port of London Authority:
Total Cost: £15,100
Total Contribution: £1,510 (10% of total costs)
Total SIF funding: £13,590
ev.energy:
Total Cost: £20,600
Total Contribution: £0
Total SIF funding: £20,600

Electric Thames represents good value for the SIF investment through:

- Effective market engagement: Through the partners connections to the energy and marine industries, substantial engagement with stakeholders and potential partners will be considerably easier and cheaper than partners less engaged in the industry. For example, securing time with potential partners for Beta may incur longer response times and potential fees. Higher whole system participation and engagement rate enables a more well-informed and developed solution for the cost. Some of this engagement has already commenced as part of Discovery.
- Energy transition expertise: LCP Delta is a leading energy transition consultancy, focusing on UK, Europe and Asia. Their energy and carbon asset modelling is trusted by the Department for Energy Security and Net Zero, Ofgem, National Grid and the Climate Change Committee. This expertise and understanding of the energy system and transition, and modelling capabilities bring efficiencies to the project.
- Marine decarbonisation expertise: Marine Zero is a specialist in port and shore engineering design and strategy for cleaner, sustainable, rivers and oceans. Their expertise in marine decarbonisation and relationships with key stakeholders brings prior knowledge in vessel archetypes and efficiencies in marine stakeholder engagement.
- Wider stakeholder involvement: The PLA are a key stakeholder for this project and were heavily involved at Discovery. They have joined as a project partner for Alpha, on the basis that the project will help meet their stated aims of decarbonisation – for which there currently is no clear view of the impacts of electrification or the ability to meet their objective.

There is no funding from other innovation funds. Partners will leverage their own facilities (offices and IT).

Associated Innovation Projects

- (●) Yes (Please remember to upload all required documentation)
- ( ) No (please upload your approved ANIP form as an appendix)

Supporting documents

File Upload

Electric Thames End of Phase Report- ENA.pdf - 2.7 MB
Electric Thames Midpoint - ENA.pdf - 1.8 MB
SIF Alpha Round 3 Project Registration 2024-10-14 11_17 - 83.9 KB

Documents uploaded where applicable?

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