

Ofgem Strategic Innovation Fund Alpha End of Phase Report Template

Completion Information

In accordance with the [SIF Governance Document](#), the End of Phase Report (EOPR) is designed to facilitate learning and knowledge dissemination and demonstrate that a project satisfies the SIF Eligibility Criteria.

The continuation of your project into the next phase dictates whether or not an End of Phase Report is required, and when it needs to be provided.

- If you are not applying to the next phase, your EOPR must be submitted **within one month of project completion** to your Internal Monitoring Officer (IMO) by email or link to a file sharing site and must be published on the [Smarter Networks Portal](#).
- If you are applying to the next phase, but are unsuccessful, you are required to retrospectively complete and submit your EOPR **within one month of receiving your unsuccessful notification** to your IMO and upload it to the [Smarter Networks Portal](#).
- If you are applying to the next phase and are successful, you are not required to submit an EOPR at this stage.

All projects, regardless of whether applying to the next phase must present findings at a public Show and Tell webinar arranged by Innovate UK. A copy of the Show and Tell presentation must be submitted to the [SIF mailbox two days prior](#) to your allocated Show and Tell slot. Any other publishable project outputs must also be provided to your IMO and published on the [Smarter Networks Portal](#) **within one month of project completion**.

The EOPR template is broken into 7 sections that all require completion. The **responses** can be up to **400 words long per section** and should only provide information that focuses on the key elements of the project, in a manner that is easily reviewed and accessible to a range of stakeholders. **You may include diagrams, hyperlinks and appendices to support this document.**

The EOPR template has been designed to correlate with the application questions as much as possible, to help support easy completion for those who are not successful.

Project Number 10084666	Project Title RetroMeter
Date Oct '23 – Apr '24	Author and Contact Details ENWL InnovationTeam@enwl.co.uk

Section 1 -	Alpha Phase – Project Summary
Please provide a summary of the key findings from your Alpha Phase Project. Describe the innovative aspects of the work including any new findings or techniques. Please provide a short factual summary of the most significant outcomes of your work.	
You should describe: <ul style="list-style-type: none"> • how your Project has met the aims of the specific SIF Innovation Challenge • how your perception of the problem and opportunity has evolved • why the problem relates to energy network functions, and the potential role of energy networks to realise future opportunities • the innovative, novel and risky aspects of the work, including any new findings or techniques. 	

RetroMeter aimed to provide and demonstrate a new, consistent methodology to accurately meter the energy and cost savings of retrofit energy efficiency measures, unlocking pay-for-performance financing, increasing uptake and leading to reduced costs for consumers and additional flexible services for the DNO.

Our project addressed Innovation Challenge 4 “Accelerating decarbonisation of major energy demands: Improving efficiency at different levels in the energy system”.

The challenge statement specifically mentions integrating diverse energy system activities to meet Net Zero challenges and RetroMeter brings together a number of these: use of data, IT systems and methodologies, domestic retrofit, heat pump adoption and local flexibility systems.

During Alpha phase significant progress was made in developing the “Metered Energy Savings” (MES) methodology, the RetroMeter value stack and the business model proposal. The project team engaged, and tested ideas, with industry experts and a social housing scheme. Feedback from this improved understanding of the challenge and informed proposals for a trial and eventual roll out of RetroMeter.

Our understanding of the problem and opportunity has evolved through the Alpha phase:

- RetroMeter was successful in building on the OpenEEmeter methodologies to account for behavioural and price changes.
- Ongoing availability, quality, and access to smart meter data is essential for RetroMeter to reach its full potential and we have proposed a process for this.
- MES benefits accrue across the whole system; for a DNO it is difficult to quantify network benefits when energy efficiency retrofit is installed before consumers transition from gas to electric heating.
- Early engagement with retrofit and housing providers is vital to ensure success due to the complexity of projects with many parties and layers of approval involved.

RetroMeter provides benefits to DNOs through improved demand profiles which can feed into forecasting. Domestic demand reduction has multiple energy system benefits, from reduced generation needs to lower distribution system costs.

From a whole systems perspective, where gas and electricity consumption are accounted for, RetroMeter could provide an estimated £33,000 in benefits per household shared between the householder, health service and network operator.

Using OpenEEmeter as a base methodology RetroMeter developed two additional innovative methodologies:

- The comparator method, which accounts for external changes such as energy price changes or Covid, greatly improved the accuracy of MES especially when consumption profiles matched. Grouping 5 homes brought the accuracy within industry guidelines.
- The physics-based method which estimated comfort take-back showed some promise but needs further work.

Section 2 -	Alpha Phase – User Needs
--------------------	---------------------------------

Please summarise who your prioritised users are and their specific needs relating to your project. Please include how you have translated these into your project design and requirements.
--

You may want to describe:

- | |
|--|
| <ul style="list-style-type: none">• how you have defined and justified your scope boundaries |
|--|

- what would need to happen to make the user journey as a whole work as well as possible (in particular, you are able to talk about other services that are part of the same journey, and the opportunities and challenges involved in making changes to those services)
- how you have tested your own assumptions against the needs of your users
- how the approach you have taken will minimise the burden on your future users and avoid duplication of effort through user journeys
- how you have considered the wider interactions of your outputs with the energy sector and other sectors. Please include a description of the product's user journey, processes, or wider services

The value stack and business modelling identified and analysed the needs of MES users to give a clear understanding of their needs and role in the market. This work is described in detail in the value stack report, business model proposal and scale up plan. Six key stakeholder groups were identified: policy makers, investors, retrofit providers, householders, electricity network operators and energy suppliers.

The RetroMeter user journeys informed the project scale up plan, which proposes an aggregator acts as a manager for a MES fund and a data warehouse. They would store data on MES-enabled retrofit projects alongside the financial and technical performance. Bringing these together de-risks the financial assessment of a retrofit scheme, opening a way forward to bringing MES to the market.

During Alpha the project worked with Carbon Co-op's area based retrofit scheme (ABS) and Manchester City Council Social Housing Development Fund (SHDF) boiler replacement project to understand these stakeholder needs and inform development of the engagement strategy and materials.

The learning from the piloting approach is captured in the WP4 outputs and is available to inform any future user journeys. This work showed that it is vital to engage retrofit providers as early as possible so that MES requirements can be integrated into project planning.

The project team engaged with representatives from across the MES value chain to understand RetroMeter from the perspectives of key stakeholders. From this engagement briefing notes have been prepared and disseminated for

- Policy makers
- Investors
- Retrofit providers
- Householders
- Electricity network operators
- Energy suppliers

The engagement and recruitment piloting has benefitted from close ties with the ABS enabling access to smart meter data.

Partnering with the SHDF boiler replacement scheme provided further engagement opportunities with 550 homes. The time taken to get approval to share data sharing across multiple parties meant that the opportunity to gather metering data for winter 23/24 was missed. As these schemes are complex with multiple stakeholders involved, early engagement is vital to feed MES access and data requirements into the planning phase.

Section 3 - Alpha Phase – Impacts and Benefits

Describe your expected net benefits to consumers and justify any changes in proposed impacts since the Application stage. Please provide details of any changes that have been made to the Project and why these were necessary.

If an application for Beta **has** been submitted for this Project, please provide the full Cost Benefit Analysis submitted as part of the Beta application.

You may want to describe:

- if the project should be pursued outside the SIF, and if so, why is it cost effective to pursue and how you plan to take it forward?
- how the Project has progressed towards the benefits outlined in your Alpha application
- an indication on quantitative measurements for associated benefits. These could be related to the:
 - end consumer
 - economic benefits resulting from the project to your users and any other parts of the supply chain, broader industry, and the UK economy, such as productivity increases and import substitution
 - impact on government priorities and any associated benefits
 - environmental impacts, either positive or negative
 - any expected regional or wider energy supply resilience benefits
 - impact on consumers of the whole energy system (both individuals, and collectively), including those with any vulnerabilities or experiencing fuel poverty

The lack of an accurate methodology to quantify the savings is stifling uptake of domestic retrofit energy efficiency measures at scale. It also makes it difficult for network operators to forecast demand changes and constraints across the network.

Organisations have not been able to ascertain a “high-quality” installation without improved modelling methods, minimising access to flexibility revenues for consumers/aggregators and performance-related revenues for contractor.

RetroMeter developed methodologies to provide savings quantification which could open the way for Pay for Performance domestic retrofit services to operate in the UK.

Making the solution open-source and accessible to a range of UK actors would unlock considerable benefits across the market, including access to new revenue streams, and accelerate carbon emissions reductions.

In the Alpha phase, RetroMeter demonstrated it can provide value to the market across a number of areas, with the following benefits realised through whole house retrofit:

- Health improvements £5,100
- Energy Performance Certificate uplift £4,720
- Increase in real estate/ rental value £1,970
- Household load reduction £13,890
- Explicit Flexibility £990
- Implicit Flexibility £2,330
- Peak capacity uplift/ Load shaping £3,860
- Deferred network reinforcement £260

Totalling around £33,000 of benefits per home

There is clear benefit for decarbonisation however most of the value sits with other actors,

rather than DNOs.

Section 4 - Alpha Phase – Risks, issues, and constraints

Please provide a copy of the final updated project risk register outlining the risks and issues you are currently aware of, including a likelihood and impact estimate, and mitigating actions.

If an application for Beta **has not** been submitted for this Project, what constraints (if any), such as technical, political, policy, commercial, managerial etc., have you encountered during your project that have hindered your ability to progress this project further?

You may want to describe:

- any actual or potential constraints in regulation, legislation, commercial contracts, or legacy technology that affect the innovation you are developing
- any barriers for innovations to be delivered into business as usual which could be relevant to future projects
- how you will create an innovation that meets user needs while working within these constraints
- if you have identified constraints that can be removed over the short or long term, how have you overcome them and what is your plan for mitigating future risks? (if there is an intention to carry on with some or all aspects of your project via a different route)

The project Risk and Issues register logged mitigating actions taken to manage risks and issues identified during the Alpha phase.

Risks managed and closed during alpha phase include:

- The availability, and quality, of data to inform the methodology development including smart meter data and data on network constraints.
- Suitability of the methodology to give the required accuracy and confidence.
- Ensuing industry experts engage with the advisory group.
- Delays in the delivery of the SHDF retrofit scheme.

Risks that may impact future work that are still recorded as 'open' include:

- Regulatory barriers may mean that the metered savings protocol is not accepted,
- Variance in customer behaviour following retrofit may affect energy performance guarantees during future work
- A suitable data set to enable use of the comparison methodology may not be available.

When changing from gas to electric heating, it is considered best practise to adopt a fabric first approach, for example, fitting insulation to reduce the size of the heat pump. This means that the DNO sees an increase in electricity consumption albeit smaller than without the energy efficiency measures but is unable to quantify the benefit associated with the retrofit. Additionally, as stated previously, the majority of benefits lie beyond the DNOs.

Therefore, although the RetroMeter project team strongly believe the methodology has value, it was felt that additional network innovation funding is not the best route to further the development and an application for a Beta phase project has not been submitted.

Section 5 - Alpha Phase - Working in the open

How have you worked openly during the Alpha phase and engaged stakeholders in a transparent and constructive manner? What have you learnt from the approach you have taken?

You might want to describe:

- ways in which you have talked publicly about the project
- how you have invited challenge and external input of your approach to the project
- how have you shared learning, to avoid duplication of work by others and accelerate industry progress on related initiatives
- how your team has been working openly and have started building relationships with organisations and teams responsible for other parts of the user journey. These could include infrastructure/data owners, regulators, policy makers, investors, and others
- any learnings from engaging with stakeholders that would be relevant for future projects
- a description of any data or insights that you have produced/published from the project, and where they may be found or requested (other than documents to be hosted on the Smarter Network Portal)

All reports on the work completed are publicly available on the Smarter Networks Portal and the Electricity North West [website](#)¹.

This demonstrates the progress made during both the Discovery and Alpha phases and provides learnings for stakeholders interested in this area. If further information is needed, stakeholders can contact the Electricity North West team directly.

There has been a high level of collaboration and cooperation between the partners throughout the project. In line with other Electricity North West projects, the team used a secure online workspace to share project documents promoting an open culture and ensuring that everyone had access to the latest relevant information.

Additionally, regular project update meetings were held to discuss updates on individual partner's progress.

In Alpha phase there was a dedicated work package for stakeholder engagement and dissemination of learning which facilitated:

- The production of six Briefing notes - for policy makers, investors, retrofit providers, households, DNOs and energy suppliers.
- 14 bilateral sector meetings and activities – including with UCL the lead author in SMETER and BSI/ PAS fulfilling the project special conditions (see section 7 below).
- 3 meetings of the RetroMeter Advisory Board made up of industry expert stakeholders who influenced the direction of the project.
- 4 blog posts
- 4 public webinars
- Input into relevant policy consultations.
- Providing updates to stakeholders signed up to the RetroMeter stakeholder mailing list.

1. <https://www.enwl.co.uk/future-energy/innovation/strategic-innovation-fund/retrometer/>

Section 6 - Alpha Phase – Costs and value for money

Please give a description of how funds were spent with reference to the original forecasted budget, explaining any significant variations and any additional contributions made over and

above that which was set out in the Project Direction. Explain how the project has delivered value for money to consumers.

Please complete the table below with the final project expenditure. Please indicate any figures that are yet to be confirmed as final (we will request confirmation of final amounts 6 weeks after the project has ended).

Project spend was in line with budget.

No variations or additional contributions were required over and above those set out in the Project Direction.

The project delivered value for money to consumers by:

- advancing learning on the methodologies for MES
- improving the technical and economic modelling of the value and business case for MES
- proposing a business model for a business as usual deployment of MES
- increasing understanding of the engagement requirements with retrofit providers and local authorities
- sharing our learning with industry stakeholders

All of the above pave the way for a full scale trial in the future.

Project partner name	SIF funding requested	Total actual project spend	Total project contribution made (incl. contributions in kind)
ENWL	£53,404.00	£60,686.00	£7,282.00
Carbon Co-op	£102,665.00	£114,090.00	£11,425.00
EP	£94,702	£105,224.00	£10,522.00
ESC	£222,958.00	£247,732.00	£24,774.00
MCC	£10,205.00	£10,205	-

Section 7 - Alpha Phase – Special Conditions

If applicable, please describe how you have met the requirements of any project specific conditions set out in the Project Direction.

There were two project specific conditions for RetroMeter in the Alpha phase:

1. Provide a summary of how it is incorporating GB-focused energy efficiency research into the Project to ensure the Project's proposed solution will be applicable to GB in addition to its focus area in the Alpha Phase. As part of this, it must include an explanation for how existing energy efficiency research in GB, such as that done under the Smart meter enabled thermal efficiency ratings (SMETER) competition and by the Smart Energy Research Lab (SERL), is being incorporated into the Project.
2. Engage with the British Standards Institute as a key stakeholder; provide a summary of the engagement, including consideration for how the Project may seek to incorporate its findings and proposed solution into a PAS standard.

Condition 1

Whilst developing the RetroMeter methodology existing GB energy research such as

SMETER and SERL was leveraged by:

- Including SMETER and SERL publications in the literature review.
- Seeking advice from people / organisations involved in SMETER and SERL.
- Holding discussions with SERL about enduring data provision.

From this, the HTC model used in the physics-based methodology was largely based on SMETER work. SERL was identified as a viable option to provide the counterfactual data for the comparator methodology.

Additionally, representatives from SMETER and SERL were included in the advisory group and other stakeholder engagement. For further detail refer to WP2 M4: Methodology report and WP5 M2: Industry Stakeholder Report.

Condition 2

Specific action was taken to engage with the British Standards Institute and two meetings took place during the project which are recorded in WP5 M2: Industry Stakeholder Report.

Following which members of the RetroMeter project team have been asked to attend, and present at, the next meeting of the PAS Retrofit Task Group to share learning and explore how to incorporate the findings into a standard. This supports the ongoing outcome of pursuing an industry-accepted MES standard.