

Open Networks Project

WS4 P4 Final Report

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1 Introduction

1.1 About ENA

Energy Networks Association (ENA) represents the owners and operators of licenses for the transmission and/or distribution of energy in the UK and Ireland. Our members control and maintain the critical national infrastructure that delivers these vital services into customers' homes and businesses.

ENA's overriding goals are to promote UK and Ireland energy networks ensuring our networks are the safest, most reliable, most efficient and sustainable in the world. We influence decision-makers on issues that are important to our members. These include:

- Regulation and the wider representation in UK, Ireland and the rest of Europe
- Cost-efficient engineering services and related businesses for the benefit of members
- Safety, health and environment across the gas and electricity industries
- The development and deployment of smart technology
- Innovation strategy, reporting and collaboration in GB

As the voice of the energy networks sector, ENA acts as a strategic focus and channel of communication for the industry. We promote interests and good standing of the industry and provide a forum of discussion among company members.

1.2 Our members and associates

Membership of Energy Networks Association is open to all owners and operators of energy networks in the UK.

- ▶ Companies which operate smaller networks or are licence holders in the islands around the UK and Ireland can be associates of ENA too. This gives them access to the expertise and knowledge available through ENA.
- ▶ Companies and organisations with an interest in the UK transmission and distribution market are now able to directly benefit from the work of ENA through associate status.

1.2.1 ENA members



1.2.2 ENA associates

- [Chubu](#)
- [EEA](#)
- [Guernsey Electricity Ltd](#)
- [Heathrow Airport](#)
- [Jersey Electricity](#)
- [Manx Electricity Authority](#)
- [Network Rail](#)
- [TEPCO](#)

2 Work Stream 4 and Product 4 Overview

ENA Open Networks Work Stream 4 (“WS4”) is now in its third year of delivery in 2021. WS4 was created in response to stakeholder feedback in early 2019 to build on the work across the electricity Transmission and Distribution sectors to consider the whole energy system. Working closely with the Gas Networks as well as other industry reps including Energy UK, ADE and ESC, WS4 has made significant progress in building the foundations for whole system and for tackling whole system challenges.

This year, we have made the decision to facilitate WS4 as a joint workstream between Open Networks and ENA’s Gas Goes Green project that is looking at the future of gas and leading the transition. The focus of WS4 will continue to be on delivering tangible whole system change in the shorter term and this dual governance will help us better align the improvements that we deliver with the longer term vision for gas.

2.1 WS4 P4 Introduction

Investment Planning: Product 4 was approved to proceed by the Open Networks Steering Group on the 18 April 2019. The aim of the product is to identify and realise consumer benefits by applying a whole system approach within the investment planning processes.

Anticipated outcomes:

- Higher quality robust data;
- Lower stakeholder and network costs;
- Higher value solutions for customers and stakeholders;
- Optimised network utilisation;
- Delivering timely capacity;
- Improved more efficient relationships;
- More efficient decision making.

2.2 P4 2020 Deliverables

Regional stakeholders such as local authorities and other regional bodies are developing increasingly ambitious growth, environmental and decarbonisation ambitions requiring challenging enabling infrastructure plans. By providing a coordinated optioneering service, a more efficient response can be provided with new options identified for the LAs to meet their ambitions.

The 2020 product deliverables were designed to further assess the Whole System Optioneering opportunity and to understand any links with the ESC’s Local Areas Energy Planning (LAEP) project and LHEES (a Scottish Government initiative).

The agreed 2020 P4 deliverables are shown in the table below.

Ref	Product Element	Activities	Duration	Timeline	Deliverables	Stakeholder Engagement	Approval
4A	<p>Further assess and develop proposal for Whole System Optioneering.</p> <p>Assess and further develop opportunity identified in 2019 on Whole System Optioneering. Understand interaction with LAEP work led by ESC. Develop an outline proposal to progress (highlighting scope, potential cost, benefits, scale of change etc.) and seek approval.</p>	<p>Undertake further assessment of Whole System Optioneering opportunity identified in 2019.</p> <p>Undertake further engagement with LAEP project to understand any overlaps, dependencies or linkages.</p> <p>Identify at least 3 areas to trial a joint electricity and gas optioneering service with a local authority</p> <p>Run trials to identify whole system solutions that meet LA ambitions and objectives</p> <p>Collate feedback from all completed trials and workshop to identify a GB process/service/procedure and understand benefits and added value</p> <p>Document findings and proposal for approval from the Steering Group and GFG, highlighting scale of impact.</p>	11 months	Jan 20 – Nov 20	<p>Outline proposal to progress Whole System Optioneering, indicating scope, potential cost, scale of change and clarifying linkages with LAEP</p> <p>(Nov 20)</p>	Advisory Group	<p>Steering Group</p> <p>Gas Futures Group</p>
4B	<p>Detailed process development</p> <p>Undertake detailed process development for agreed approach.</p>	<p>Develop detailed processes, template etc. to take further develop and implement the Whole System Optioneering approach.</p>	2 months	Nov 20 – Dec 20	<p>Report outlining detailed processes and supporting templates and committed timescales for implementation.</p> <p>(Dec 20)</p>	Advisory Group	<p>Steering Group</p> <p>Gas Futures Group</p>

2.3 2020 Delivery

The initial focus for 2020 was the establishment of at least 3 trial areas, where the electricity and gas networks would work with a Local Authority to explore and confirm the benefits of applying a whole energy system approach.

An initial long list of 7 potential trial areas was identified:

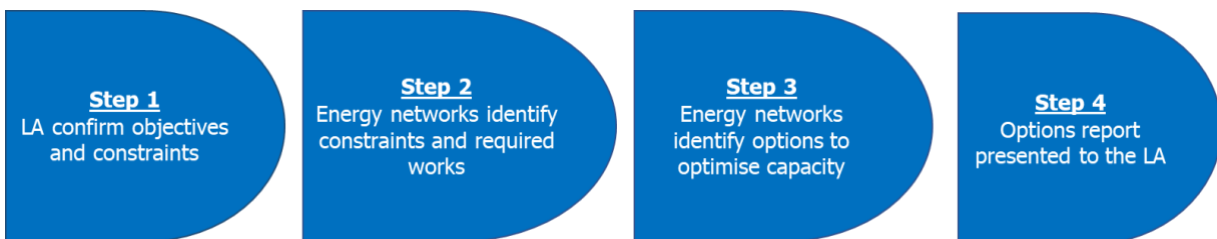
Area	Networks
Cheshire and Warrington	<ul style="list-style-type: none">• SP Manweb• Cadent
Isle of Dogs	<ul style="list-style-type: none">• UKPN• Cadent
Coventry and Warwickshire	<ul style="list-style-type: none">• WPD• Cadent
Oxford	<ul style="list-style-type: none">• SEPD• SGN
Dundee	<ul style="list-style-type: none">• SHEPD• SGN
Fife	<ul style="list-style-type: none">• SPM• SGN
NW	<ul style="list-style-type: none">• ENW• Cadent

This long list was then filtered by considering those initiatives where conclusions could be reached within the required 6 month timescales. This was necessary to allow the trial's findings, including the feedback from the Local Authorities, to inform the next stage of the Products development at the end of 2020.

A final short list of 3 trial areas was then confirmed and taken forward with the aim for completion in the Autumn.

Area	Networks	Regional Body	Additional Information
Isle of Dogs	<ul style="list-style-type: none"> • UKPN • Cadent 	<ul style="list-style-type: none"> • GLA • Tower Hamlets 	<ul style="list-style-type: none"> • Plans for 30,000 homes and ancillaries • Plan to accommodate growth and to also consider net-zero options
Coventry and Warwickshire	<ul style="list-style-type: none"> • WPD • Cadent 	<ul style="list-style-type: none"> • Coventry and Warwickshire LEP • Coventry City Council 	<ul style="list-style-type: none"> • Primary focus on infrastructure to support growth plans
Oxford	<ul style="list-style-type: none"> • SEPD • SGN 	<ul style="list-style-type: none"> • Oxford City Council • Oxford County Council 	<ul style="list-style-type: none"> • InnovateUK funded project to develop Smart Local Energy System to support decarbonisation, clean air and lower prices.

As these were trials to maximise lessons learnt, it was important to accommodate different approaches. Therefore a high level 4 Step framework was applied, as outlined below.



Step 1	Step 2	Step 3	Step 4
<p>LA confirms the objective to be met, which could include clean air, decarbonisation, housing, business and industrial growth, renewable energy projects or waste to energy production. Constraints could include timescales to provide energy network capacity or to reduce emissions, and land or other physical constraints.</p> <p>The LA may include options/scenarios such as different low/zero carbon transport or heating solutions.</p>	<p>The energy networks independently identify the efficient sector specific investments required to their networks to provide the incremental capacity, including indicative timescales and delivery risks.</p>	<p>Where network reinforcements are required or where significant delivery risks are identified, the networks will work together to produce alternative options using available capacity on the other network. The networks can also consider conversion of existing customers to the other vector as a tool to derive a full range of options. Examples could be conversion of electric heating on to a district heating scheme, or switching a multiple occupancy building from individual gas supplies to electric heating (or a local CHP).</p>	<p>The networks present the options to the LA and responds to any supplementary questions</p>
<p>Some aspects of Steps 2 and 3 could be combined</p>			

All three trial areas have successfully progressed through the first stages, with separate energy network assessments completed. The final steps are expected to be completed by the end of December 2020.

A summary of progress and key findings from the Isle of Dogs and Coventry trials to date is shown in the following table.

Isle of Dogs	Coventry
<p>GLA/Tower Hamlets have ambitious plans for 50,000 new homes on the Isle of Dogs, and have engaged with Cadent and UKPN to assess the energy infrastructure impact.</p>	<p>Coventry City Council are developing their growth plans and want to work with WPD and Cadent to understand their options and implications for new housing and business development around the City.</p>
<p>Step 1 and 2 are underway with the gas network assessment completed showing there are no reinforcements required to accommodate the new housing. An initial high level feasibility of supplying the area with a 100% hydrogen supply has also been completed.</p>	<p>Step 1 and 2 have been completed for both the electricity and gas networks. No electricity network constraints were identified for the phased development, although this was based on the low the vehicle charging requirements indicated in the new developments. Higher EV loads could trigger reinforcements.</p>
<p>UKPN’s assessment of the impact on their network will inform the scope of Step 3 with the identification of whole system options, such as the potential opportunities of moving peak electrical demand onto the gas network.</p>	<p>Significant gas network reinforcements were identified with the phases connecting to the adjacent gas mains.</p>
<p>Once this optioneering work is completed, the conclusions will be shared with the local authorities.</p>	<p>Gas network reinforcements could be avoided with a connection point further away. Reduced reinforcement costs would be offset by higher connection costs.</p>
	<p>Step 3 is underway with studies to explore options to avoid gas network reinforcements by moving some heating demand off the gas network. This is looking at what and where there is capacity on the WPD’s network.</p>
	<p>Once the Step 3 Whole System optioneering work is completed, the findings will be presented to the Local Authority for comment and review.</p>

Progress against the 6 components of Product 4A is shown below.

1	Undertake further assessment of Whole System Optioneering opportunity identified in 2019	Complete
2	Undertake further engagement with LAEP project to understand any overlaps, dependencies or linkages	Complete
3	Identify at least 3 areas to trial a joint electricity and gas optioneering service with a local authority	Complete
4	Run trials to identify whole system solutions that meet LA ambitions and objectives	Ongoing
5	Collate feedback from all completed trials and workshop to identify a GB process/service/procedure and understand benefits and added value	
6	Document findings and proposal for approval from the Steering Group and GFG, highlighting scale of impact.	

2.4 Dealing with the Trials delay

As a result of the delay in the completion of the trials, feedback from the LAs on the whole energy system approach is not yet available (Step 4). Only having 3 trial areas also impacts the breadth of the feedback from LAs.

With limited stakeholder feedback, in order to progress the development of specific proposals (Deliverable 4B), a range of Strawmen have been produced which could deliver an enduring mechanism that offers a LA a coordinated value adding service to support their regional objectives and infrastructure plans.

The Strawmen have been designed to enable initial network appraisal of the credible options, and potentially identifying a short-list of preferred options. This short-list can then be used for wider stakeholder consultation.

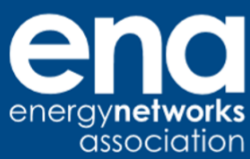
<p>Strawman 1</p> <p>Integrated Regional Joint Planning Teams</p> <p>Regional Joint Planning organisations/teams are established and co-located. Engineers are seconded from the relevant networks.</p> <p>One stop shop for Local Authorities to submit enquiries that are then progressed by the JPT within defined timescales, and predetermined reporting structure and format.</p>	<p>Strawman 2</p> <p>Coordinated Joint Planning Service</p> <p>Central Application process established to receive, validate and dispatch Local Authorities enquiries and manage the LA interface. Some engineering knowledge required. Central Team complete Step 1. Application is then passed to the relevant networks.</p> <p>Each network completes Step 2 where constraints on own networks are identified by modelling in BAU teams.</p> <p>Central Team lead coordinates Step 3 (if necessary) via ad-hoc meetings between gas and electricity networks and documents new options.</p> <p>Central Team produce final report with whole system options, for internal sign off by the networks before issuing to the LA.</p>
<p>Strawman 3</p> <p>Lead Network Joint Planning Service</p> <p>A Local Authority can apply to any network with a whole system optioneering enquiry.</p> <p>The receiving network then manages the response, liaising with the other energy network as required.</p> <p>The receiving network effectively performs the duty of the Central Team under Strawman 2, as well as undertaking their own assessment for the impact on their network.</p> <p>A variation to this approach could involve an LA led sequential approach, with the LA applying to the first network, and then submitting their output and conclusions to the second network for their appraisal and the whole system optioneering.</p>	<p>Strawman 4</p> <p>Whole System Review</p> <p>A Central Team is established with Gas and Electric expertise.</p> <p>Any LA can progress a separate gas and electric enquiry under the current arrangements, but can then submit these individual conclusions to the Central Team to consider new whole system alternatives: A Whole System Review</p> <p>Central Team would need access to data underpinning the individual studies.</p>

2.5 2021 Deliverables including revised 2020 activities

To accommodate the limitations in the output from the trials, the 2021 deliverables now include an enhanced network review process to identify a short-list of options for a new service, and additional consultation process with Local Authorities to ensure we have high quality feedback to support any proposals we bring forward for implementation.

Ref	Product Element	Activities	Duration	Timeline	Deliverables	Stakeholder Engagement	Approval
4A.2	<p>Develop proposal for Whole System Optioneering.</p> <p>Develop an outline proposal to progress (highlighting scope, potential cost, benefits, scale of change etc.) and seek approval.</p>	<p>Complete trials to identify whole system solutions that meet LA ambitions and objectives</p> <p>Collate feedback from all completed trials</p> <p>Energy Network workshop to review and agree short-list of options for an enduring whole energy system service for Local Authorities.</p> <p>Prepare a LA engagement plan, factoring in other relevant events and Comms.</p> <p>Consult UK Local Authorities on the short-list of options for a whole energy system optioneering service.</p> <p>Document findings and proposal for approval from the Steering Groups and, highlighting scale of impact.</p>	6 months	Nov 20 – April 21	Outline proposal to progress Whole System Optioneering, indicating scope, potential cost, scale of change and clarifying linkages with LAEP	<p>Advisory Group</p> <p>Bespoke Local Authority Consultation</p>	<p>Steering Group</p> <p>Gas Goes Green Steering Group</p>

4B.2	<p>Detailed process development</p> <p>Undertake detailed process development for agreed approach.</p>	Develop detailed processes, template etc. to take further develop and implement the Whole System Optioneering approach.	5 months	Jan 21 – May 21	Report outlining detailed processes and supporting templates and committed timescales for implementation.	Advisory Group	Steering Group Gas Futures Group
4C	<p>Implement new process</p> <p>Subject to company and Steering Groups approval</p>	Monitor progress		May 2021-	As set out in 4B.2	Advisory Group	Steering Group Gas Futures Group



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