

## MEDA — Open Energy Use Case — Local Authority v1.0

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<b>Overview</b>	<b>1</b>
<b>Local Authority Use Case</b>	<b>2</b>
Future development	8
Reference Data Sources	8
Glossary	9
Useful Links	9

### [Slide summary](#)

## Overview

To enable the production of the Open Energy Alpha Prototype the OE project has developed a Use Case which demonstrates the value which can be created by adopting an Open Energy Federated Ecosystem Model. The Use Case will be used in three key ways.

- By stakeholders in the four Open Energy Advisory Groups to inform discussion on user needs, policy, regulatory legal, operational and technical aspects.
- By the Open Energy Team to enable the development of the example product and service definitions, cost benefit analysis and business case.
- By the Open Energy technical partners who will produce the Knowledge Graph and the OE Governance Platform Prototype, as it provides confirmation of the discrete data items, required data providers, data locations/sources, data flows and directory roles.

## GOALS of the Use Case

1. Demonstrate, through example, how the Open Energy Governance Platform can enable a secure, trusted environment in which authorised participants can find and validate other authorised participants, to facilitate the sharing, access and control of energy data according to an Open Energy Standard.
2. Demonstrate the capability to discover the energy data required according to the specific requirements of the Use Case through a Knowledge Graph approach.
3. Demonstrate the status of the relevant data items identified:
  - a. Are the data items open?
  - b. Are the data items shared using a licensing agreement?
  - c. Are the data items machine readable?
  - d. Is access to the data restricted via requirements for;
    - the data recipient to authenticate their identity and authority to access the data? (the entity requesting data can prove that it is what it claims to be,

## MEDA — Open Energy Use Case — Local Authority v1.0

- is entitled to access the data and possesses the correct certificates to support a request for data);
    - the data provider(s) to apply a consent to share process (for example if they are holding data on behalf of another party) or otherwise agree to authorise access if specific conditions are met?
  - e. Is the process for accessing the data items common across data providers?
  - f. Is the data provided in a common standard?
- 4. Demonstrate the ability for an authorised participant to access the Shared Data where all conditions have been met.

### Local Authority Use Case

During Phase One of MEDA, the Open Energy team sought views from stakeholders on the most significant problems to be solved as the industry transitions to net zero.

It was recognised that a large number of municipal bodies such as Combined and Local Authorities in the UK have declared climate emergencies and launched ambitious climate emergency plans seeking to achieve carbon neutrality in the 2030's. A building block towards these goals is that of replacing fossil fuel emitting heating systems with new Low Carbon Technologies (LCTs). The forthcoming ban on the installation of fossil fuel boilers in new homes from 2024 in Scotland and 2025 in England and Wales may be extended to include “replacement” of fossil fuel heating systems.

This context is motivating municipal organisations to initiate Local Energy Plans (LEPs). LEPs will require organisations to identify housing developments where there is a requirement to retrofit energy efficiency measures and install new Low Carbon Technologies such as Air or Ground Source Heat Pumps, Electrical Storage Heater Systems, Solar PV, Electric or Phase Change Batteries and Electric Vehicle Charging Points into homes.

However, a common challenging issue for Local Authorities implementing their LEPs is to be able to understand whether or not plans to install these new Low Carbon Technologies would be achievable without Distribution Network reinforcement build being required. They need to be able to evaluate and understand the implications of a range of variables such as different planning approaches, LCT options, timelines or priorities, with minimum delay. This is essential to ensure that investment and resources are allocated effectively and achieve the intended outcomes. Any such evaluation therefore requires access to performance data for existing systems and new LCTs, spatial data (LSOA) and Distribution Network Operator (DNO) data on “Headroom” (available capacity) and transmission constraints. For example, the implications of installing a Solar PV array may increase DNO Headroom overall, while the demands of new EV charging points may decrease DNO Headroom. Lack of accurate data on the impact of such projects on DNO Headroom can delay projects significantly, thereby slowing the uptake of LCTs.

## MEDA — Open Energy Use Case — Local Authority v1.0

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The feedback from stakeholders universally supported the view that data, although high value, is considered to be challenging and time consuming to obtain on an automated basis. Further engagement and analysis has been undertaken at the start of the Alpha Phase to confirm that this issue should be adopted as the example Use Case for Open Energy. This engagement process has refined the Use Case and helped to crystallise the required data and the roles and responsibilities associated with it.

### Service Required to Deliver the Use Case

New services will therefore be required using energy data to inform decision making and management. It is envisaged that these services will be enabled by third party providers (TPPs) such as construction consultancies, community energy groups and innovative new entrants, and will be used by municipal bodies to both produce and then assist with the implementation of the LEPs. These TPPs will coordinate the required research into the existing housing stock, the number and suitability of the LCTs predicted to be installed (and associated carbon savings and improvements to EPC ratings) and will need to produce insight into the “Headroom” available from the Distribution Network across the relevant geographical area e.g. the Lower Super Output Layer (in England and Wales) and Data Zone (in Scotland) which equates to 1,000 people or 400 households. This Headroom data will be used to assess the viability and timing of LCT Retrofit Projects.

Currently in order to provide the municipal body with the required “Headroom” data it will be necessary for the TPP to engage with the relevant DNO and Transmission System Operator (TSO) and to follow a process to request the data. The process operated by DNO/TSOs is not currently standardised (The ENA Data Working Group are developing a common approach to Access Control) and can involve;

- The requirement to register as a partner with the DNO/TSO and to submit a request to access the data which is then processed and authorised
- The requirement to agree to T’s and C’s
- A download of a CSV file directly from the DNO website without the requirement to perform a registration activity

However, these factors can introduce delays and consume scarce resources. Critical success factors cited by stakeholders for this type of service, and that should be considered in the design principles are:

- Speed of implementation
- Ease of use

## MEDA — Open Energy Use Case — Local Authority v1.0

- Clear traceability of decision making
- Low relative cost
- Ease of technical integration

### Data Items Required to Deliver the Use Case

Item	Data Provider	Access Mechanism Definition	Rationale For Definition	Current Access Mechanism	Purpose of Data Item
Aggregated Smart Meter Data (e.g. for an apartment block)	TBC - possibilities are n3rgy or Electralink	Shared. Currently requires a bilateral contract. (TBC)	Aggregated to social housing estate level - derived from individual households	Registration/authentication process (TBC)	Baseline current energy usage and carbon emission
Installed LCT performance data at communal level (e.g solar panels on an apartment block)	PassivSystems	Shared. Currently requires a bilateral contract.	Aggregated to social housing estate level - derived from a number of defined PV arrays in a local area	Registration/authentication process	Potential for mitigating DNO headroom and constraint problems, and understand potential and actual performance improvement
Public EV charging points performance profiles for typical users (profile/demographics tbc)	TBC - possibilities are EB Charging or PlugIn Power	Shared. Currently requires a bilateral contract. (TBC)	Data may be commercially sensitive/valuable (e.g. competitor would know where to invest)	Registration/authentication process (TBC)	Understand the impact on the power usage and DNO headroom
Domestic Low Carbon Technology Air or Ground Source Heat Pump Capacity e.g. 9kW, 12kW	3rd Party Organisation e.g. Engineering Consultancy	Shared (e.g. a pre-emptive licensing mechanism is required) but N.B. aggregated data from open data	Net Zero SP will require authentication that 3rd Party has the Local Authority permission to make data available	Will require a log onto a secure portal held by the data aggregator	Identify required capacity for retrofit project
Domestic Low Carbon Technology Off Street Electric Vehicle Charge Point Capacity e.g. 7kW	3rd Party Organisation e.g. Engineering Consultancy	Shared (e.g. a pre-emptive licensing mechanism is required) N.B. aggregated data from open data	Net Zero SP will require authentication that 3rd Party has the Local Authority permission to make data available	Will require a log onto a secure portal held by the data aggregator	Identify required capacity for retrofit project
Public Low Carbon	3rd Party Organisation e.g. Engineering	Shared (e.g. a pre-emptive	Net Zero SP will require	Will require a log onto a	Identify required

## MEDA — Open Energy Use Case — Local Authority v1.0

Transport Hub Capacity e.g. 3 x 50kW	Consultancy	licensing mechanism is required) N.B. aggregated data from open data	authentication that 3rd Party has the Local Authority permission to make data available	secure portal held by the data aggregator	capacity for retrofit project
Lower Super Output Layer ID (LSOA)	Local Authority	Open	Publicly Available Online	Publicly Available Online	Identify geographic area where retrofit will be delivered. Given LSOA, will be able to identify DNO Primary Sub-station area and Transmission area.
Primary Substation Head Room Available	Distribution Network Operator (DNO)	Presumed Open e.g. post RIIO ED 2 Special Licence Condition CS 37 (belief is it will become shared)	There is a requirement for a user to agree to the T's and C's of using the data and an access control mechanism.	Varies between DNO's Requirement to Register as a Partner of User to enable access for some DNO's. Downloadable .csv files for some DNO's.	Identify whether or not network reinforcement would be required to enable retrofit. Availability of technical equipment
Transmission Constraints	National Grid Electricity Transmission Scottish Power Transmission Scottish Hydro Electric Transmission NG ESO	Presumed Open e.g. post RIIO ED 2 Special Licence Condition CS 37 (belief is it will become shared)	There is a requirement for a user to agree to the T's and C's of using the data and an access control mechanism.	NGET Requires a Customer Log In to a Portal SP Transmission Requires a Customer Log In to a Portal Scottish Hydro Transmission requires acceptance of T's to access a Heat Map (TBC)	Identify whether or not upstream transmission constraints could delay retrofit

### Platform Required to Deliver the Use Case

This service will be enabled by the Open Energy Governance Platform (OEGP). This is an enabling technology that does not hold data, and does not provide end-customer (business or consumer) services in its own right, but enables a trusted environment within which an

## MEDA — Open Energy Use Case — Local Authority v1.0

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ecosystem of commercial and public data providers and energy data service providers (EDSPs) can operate.

The OEGP provides signposting to access identified data sets and enables secure, controllable access for accredited organisations. The OEGP actively monitors the ecosystem deployments, tests availability and compliance, and enables secure data sharing, thereby providing a trusted environment within a distributed network.

The OEGP performs a crucial role, in that it enables many users to access and use the data without data owners having to create a time consuming and expensive custom integration with each one. It automates the ‘presumed open’ ambition and augments it with preemptive licensing where shared data is needed, so that there is no need to negotiate and agree bilateral contracts for access to data. These factors remove the major barriers to data sharing.

This approach therefore provides an integrated, scalable solution. Rather than a ‘data hosting platform’ into which organisations must continuously send data, the assets themselves (or organisations which manage them) should ‘enable the discovery, access, collection and use’ of the information they hold. This enables third-parties to seek and collect the information needed when they need it. It enables the asset owner to retain control over access to the data and ensures data is never stale. To ensure interoperability, data sources’ compliance with existing and evolving standards will be instrumented.

### **Describing the proposition: “Net Zero” service for Local Authorities**

*To bring this service to life, we have imagined how this service might be described on a website or a brochure.*

#### Retrofitting Low Carbon Technologies under a Local Energy Plan

As a Local Authority with ambitious plans to rapidly achieve carbon neutrality, you’ll recognise the importance of information to guide your planning and decision making.

A significant requirement is to be able to understand the impact of Low Carbon Technologies, and whether retrofitting or new installations would be achievable without investment by the local Distribution Network Operator. With the rapid pace of change, understanding how a specific retrofit sits within an overall regional plan, or where investment will be required over time, is critical both for the Local Authority and the DNO. This lack of certainty can cause significant delays to the rollout of retrofitted LCTs.

## MEDA — Open Energy Use Case — Local Authority v1.0

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While the data to achieve this certainty exists, the process to access the data can be time consuming, expensive, and different for each data provider.

The Open Energy “Net Zero” service for Local Authorities is designed to address this challenge, making planning easier, providing certainty to the DNO, and enabling faster retrofitting with LCTs, hastening carbon reduction.

Delivered through the proven, secure, Open Energy Governance Platform, this service enables any Local Authority to:

- Search for and discover the energy data required
- Quickly and easily obtain access to this data - within days rather than months
- Use the data to model and understand the implications of:
  - Different planning approaches, timelines or priorities;
  - Different LCT options
  - DNO Headroom mitigating strategies
- Ensure complete transparency in the planning and decision-making progress
- Demonstrate the impact of LCT retrofitting to the specific community and constituents
- Provide robust data to the DNO that allows decisions to be made with confidence in their outcomes

Net-Zero achieves this by allowing the Local Authority to coordinate data on existing housing stock, the number and suitability of the LCT’s predicted to be installed (and associated carbon savings and improvements to EPC ratings). It then undertakes analysis against data drawn from primary substations and network transmission constraints to calculate the “Headroom” available from the Distribution Network across the relevant area. This Headroom data can then be used to assess the viability, timing and impact of LCT Retrofit Projects. Typically, this is done at the Lower Super Output Layer in England and Wales which equates to 1,000 people or 400 households.

The Local Authority can use this insight to plan and prioritise, and to calculate the carbon reduction impact. This provides a sound basis for detailed, evidence-based Local Energy Plans that accelerate business cases, save money, align complementary investments and deliver net-zero.

- Decisions can be evidenced with real data for full transparency
- Integration with the DNO becomes easier and faster
- Retrofit lead-times substantially reduced
- Strong cost-benefit analysis
- Local Authorities can enable communities to understand the impact of retrofit choices on their carbon footprint
- Evidence progress against Local Energy Plan



## MEDA — Open Energy Use Case — Local Authority v1.0

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Net Zero is available as an online tool with a low-cost one-year licence, from as little as a single seat, is easy to set up and use, and does not require technical integration with data sources.

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### Future development

This service has been scoped for this phase of the project as a Minimum Viable Proposition (MVP). The service could be further enhanced in the future, for example through improved granularity, wider data sets and availability of time-series data. This could provide:

- Visual representation of the overall carbon reduction impact of retrofitting Domestic LCTs, so that these can be easily shared with communities;
- Provide further insight into specific issues such as addressing fuel poverty or where LCTs might bring the greatest economic benefits;
- Enable Local Authorities to provide public-facing information against the forecast carbon impact of specific LCTs, such as where public EV charging points or low carbon transport hubs are planned;
- Allow greater insight into usage of public EV charging points so that supply meets the demand profile and the DNO can plan effectively;
- Forecast and monitor the impact of LCTs and EV take-up on air quality;
- Allow understanding of how electricity and gas networks can be best aligned to maximise efficiency and reduce emissions at a whole system level;

### Reference Data Sources

- LSOA to Ward Mapping Tools
- <https://geoportal.statistics.gov.uk/datasets/local-planning-authorities-april-2020-uk-bfc>
- National Grid Electricity Transmission Connection Portal
- <https://customer.nationalgridet.com/s/login/?startURL=%2Fs%2F&ec=302>
- Scottish Power Transmission Connection Portal
- [https://www.spenergynetworks.co.uk/pages/customer\\_connections\\_portal.aspx](https://www.spenergynetworks.co.uk/pages/customer_connections_portal.aspx)
- Scottish Hydro Transmission Heat Maps
- <https://www.ssen.co.uk/GenerationAvailabilityMap/?mapareaid=2>
- Western Power Distribution
- <https://www.westernpower.co.uk/our-network/network-capacity-map/>
- Scottish Power Distribution
- [https://www.spenergynetworks.co.uk/pages/dg\\_spd\\_heat\\_maps\\_terms.aspx](https://www.spenergynetworks.co.uk/pages/dg_spd_heat_maps_terms.aspx)
- NRS Census Geography Comparison



## MEDA — Open Energy Use Case — Local Authority v1.0

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- <https://www.nrscotland.gov.uk/files/geography/2011-census/geography-bckground-info-comparison-of-thresholds.pdf>

## MEDA — Open Energy Use Case — Local Authority v1.0

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### Glossary

**EPC** Energy Performance Certificate

**LCT** Low Carbon Technology such as Air or Ground Source Heat Pumps, Electrical Storage Heater Systems, Solar PV, Electric or Phase Change Batteries and Electric Vehicle Charging Points.

**LSOA** Lower Super Output Layer equates to 1,000 people or 400 households (Lower Threshold)

**MSOA** Middle Layer Super Output Layer equates to 5,000 people or 2,000 households (Lower Threshold)

**MHCLG** Ministry of Housing, Communities and Local Government

**TPP** Third Party Provider

**EDSP** Energy Data Service Provider

### Useful Links

<https://geoportal.statistics.gov.uk/datasets/local-planning-authorities-april-2020-uk-bfc>

Oxford Consultants for Social Inclusion