LCPDelta

Energy Hackathon
Project Scope

About LCP Delta

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Expertise in generation, networks and demand in a single integrated energy transition practice

Our mission is to enable a better, faster energy transition for all by supporting the energy sector to drive the transition.

Founded in 2004 and based across the UK, France, Germany, Norway, the Netherlands and beyond, LCP Delta provide data-driven research, consultancy, technology products and training services to companies investing in and navigating the energy transition.

We are a diverse team from a variety of backgrounds including engineers, data analysts, environmentalists and more.

LCP Delta is a mission driven organisation - all of us want to make a difference to the energy transition and accelerate the path to a low carbon future.

The energy market is becoming increasingly complex. As consumers become more empowered and as energy systems around the world decarbonise, there is a need to understand both the generation and demand side to effectively navigate the rapid changes occurring.

LCP Delta was formed through the merger of Delta-EE and LCP Energy to bring together deep generation and consumer-side expertise, to provide our clients with a single partner to help them on their journey and provide them with a 360° view across the energy spectrum.

LCP Delta provides the best advice, support and tools to enable the energy sector to drive the energy transition

Subscription research services

Our portfolio of subscription research services offer in-depth insights across the energy transition landscape. We have been undertaking primary research with organisations active in the energy transition since 2004 – we have an unparalleled international network of contacts we can draw on. Each service focuses on a particular aspect of the energy transition.

Market and strategic advisory consulting

We provide support across the full energy value chain with bespoke research, insight, forecasts and advice tailored to them. Our consultancy offerings draws on expertise and data from across LCP Delta, from strategic market entry analysis through to detailed half-hourly revenue forecasting.

We support our clients in four ways

Technology & data

Data integration and analysis is at the heart of the energy transition. However, sourcing and navigating complex, wide-ranging datasets is challenging. At LCP Delta, we combine and curate proprietary and public datasets to provide you with a single source of truth across the energy spectrum, and make this data interactive using our cutting-edge technology.
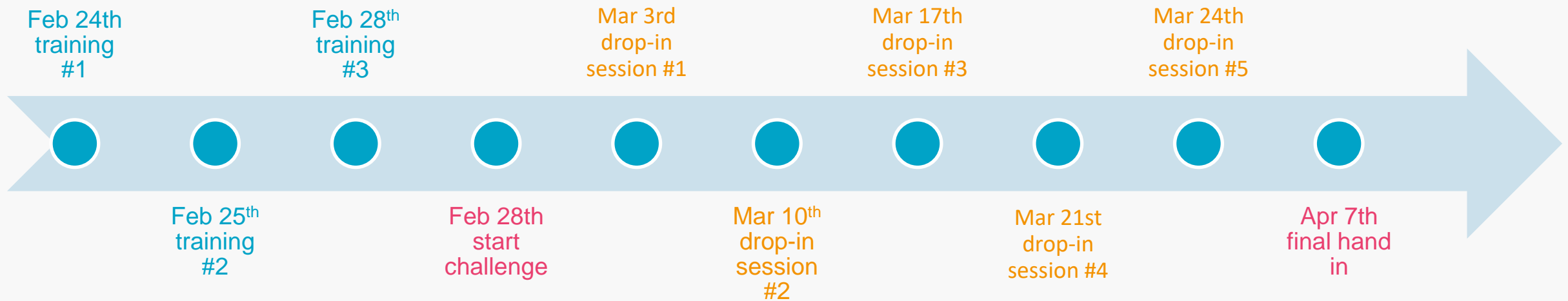
Training

Our training helps professionals quickly develop their new energy knowledge, accelerating their impact for organisations who want to capture opportunities. We provide meaningful, concise and easy to understand short courses.

Structure & Timeline

Project Timeline

Feb 24th training #1

Feb 25th training #2

Feb 28th training #3

Feb 28th start challenge

Mar 3rd drop-in session #1

Mar 10th drop-in session #2

Mar 17th drop-in session #3

Mar 21st drop-in session #4

Mar 24th drop-in session #5

Apr 7th final hand in

Training & Check-Ins

Training

- We will provide training in the first couple of weeks.

- **Training 1:** Intro to Energy Landscape

- **Training 2:** Intro to Energy Markets

- **Training 3:** Topic-specific, based on forecasting problem

- Online and recorded sessions.

Drop-Ins

- Weekly online drop-ins once projects begin.

- Q&A style sessions to help you overcome challenges and move forward.

- Guidance on the energy market, requests for extra data and approaches taken.

- Hosted by experts in our team whose experience aligns with your project topics.

Project Inputs & Outputs

Inputs

- We will provide CSVs with all the data you will need for the project.

- If cleared with us, you are also able to use other market data that you find.

Outputs

- A Python script containing an ML-model. This model should:

  - Prepare the data, including pre-processing, feature engineering and the creation of training/validation/test sets.
  - Train a model, using individual/ensemble/regime-based approaches, including hyperparameter tuning.
  - Evaluate performance of the model.
  - Be well documented.

- A short 5-page report, detailing:

  - Any background research.
  - Your approach.
  - Your results.

The mechanics

- **Team size of 1-3 people.**

- **You choose your own project from the below 3 suggestions.**

- **Prizes available for winners!**

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Project 1:

BESS Price Forecasting

BESS Frequency Response (DFR) Price Forecasting
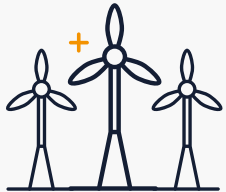
Why is price forecasting important?

Key objectives for this project

Optional extras you could choose to explore

Accurate DFR price forecasting…

+ Allows battery operators to **optimise their capacity** in different markets to **maximise revenue**

+ Helps the NESO **understand the drivers of DFR costs and allocate resources efficiently** at optimal costs

+ Helps **support the energy transition** by allowing battery operators and owners more accurately **forecast future revenues and encourage investment**

Your team should focus on…

+ **Developing a forecast model** for the day-ahead DFR service prices

+ Use historical wholesale electricity prices, balancing mechanism prices and DFR volume requirements, **to improve your model**

+ **Assessing your model's accuracy** using metrics and visualise the results effectively

If you have time, you could look at…

+ Exploring **battery operator strategies**, e.g. trading-specific dynamics, affect prices

+ Identifying and incorporating **additional factors**, such as generation mix, demand, system frequency, seasonality

+ **Incorporating confidence intervals** or other uncertainty measures to improve the reliability of your forecast

If you're interested in energy trading or optimisation in the future, this project is the type of thing you could be involved in.

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Project 2:

Electricity Demand Forecasting

Day and Week-Ahead Electricity Demand Forecasting
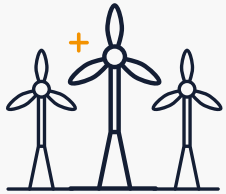
Why is demand forecasting important?

Key objectives for this project

Optional extras you could choose to explore

Accurate demand forecasting…

Your team should focus on…

If you have time, you could look at…

+ Is critical for maintaining a **reliable electricity supply** across the network

+ Enables **better resource planning,** and better use of renewables

+ **Improves reliability for consumers,** reducing outages whilst also lowering costs

+ **Developing a forecasting model** for day- and week-ahead demand on the transmission network across GB

+ Using historical electricity demand data and weather forecasts, **to improve your model**

+ **Assessing your model's accuracy** using metrics and visualise the results effectively

+ Exploring demand forecasting for **distribution level systems**

+ Identifying and incorporating **additional external factors**, such as social events

+ **Incorporating confidence intervals** or other uncertainty measures to improve the reliability of your forecast

If you're interested in energy trading or modelling in the future, this project is the type of thing you could be involved in.

Project 3:

Household Archetype-Specific ADMD Factors

Probabilistic Household Archetype-Specific ADMD Factors

Understanding After Diversity Maximum Demand (ADMD) factors are crucial for network planning
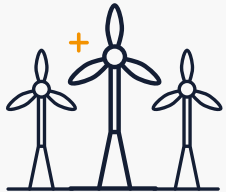
Why are archetype-specific ADMD Factors important?

Key objectives for this project

Optional extras you could choose to explore

Understanding ADMD factors…

Your team should focus on…

If you have time, you could look at…

+ Is critical for maintaining a **reliable electricity supply** across the network

+ Enables **better resource planning,** and better use of renewables

+ **Supports electrification** by enabling efficient grid planning as heat and transport sectors transition to electricity

+ **Developing day demand profiles** for different household archetypes (e.g. with/without EVs and HPs)

+ Develop probabilistic spread of ADMD factors by archetype, investigating **variance by population size**

+ **Assessing your model's accuracy** using metrics and visualise the results effectively

+ Examining how ADMD factors vary under **different electrification scenarios**

+ Exploring how **external variables** such as weather or socioeconomic factors influence ADMD

+ **Developing a network model** or suggesting methods to optimise network design based on your findings

If you're interested in working within networks in the future, this project is the type of thing you could be involved in.

Contact us

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