Reflections from Voltage Matters

The Latest Voltage Matters Forum event focused on **Play 2: System Services and Flexibility** of our previously published Voltage Grand Slam. The goal of this play is to unlock billions of pounds in flexible capacity that already exists on the network but is currently trapped by regulation and data gaps.

Key Take-away: The Big Picture: Unlocking the "Hidden Battery"

To meet the UK's goal of a decarbonised power system by 2030, we need a 300% increase in demand-side flexibility. This means using the "hidden battery" already present in our homes and businesses and harness the ability for devices like electric vehicle (EV) chargers and solar panels to help balance the grid. While the technical tools to do this exist now, outdated regulations and data gaps act as barriers to using them at scale.

This event identified **3 Keys to a Modernised Grid**:

1. **Shifting from Trials to Daily Reality**

The forum highlighted a need to move away from "academic exercises" and into everyday operations.

- **Business as Usual:** Ofgem's DSO Performance Panel is now assessing energy networks on how well they move innovation into the real world.
- **Proven Success:** Projects like **CLASS** and **Smart Street** are already operational, demonstrating that manipulating voltage can provide grid services without customers noticing any change in their supply.
- **Call to Action:** Stakeholders have until 30 April 2026 to provide evidence to Ofgem to help shape these new regulatory outcomes.

2. **Solving the "Home Front" Data Gap**

Currently, a massive disconnect exists between the data held by manufacturers and the data seen by the people running the grid.

- **The Visibility Problem:** Network operators often only see 30-minute voltage averages after the event, while EV charger manufacturers have granular, second-by-second data.
- **Financial Impact:** This lack of visibility means between 28,000 and 61,500 EV owners experience "trip" events annually. Investigating these complaints costs bill-payers between £25 million and £65 million each year.
- **The SOLVE Solution:** Project SOLVE has proven that smart meters can be updated to send real-time voltage data to operators, allowing them to fix issues before a customer even notices a fault.

3. **Modernising the Rules**

The **Quest** project proved it is possible to optimise voltage across the entire system simultaneously, from 132kV transmission down to individual homes. However, this project identified a significant legal hurdle.

- **Running Out of Room:** The project found that we are reaching the limits of what voltage optimisation can achieve within the current legal statutory range.
- **Regulatory Change:** To fully unlock the flexibility the grid is capable of providing, the government must widen the statutory voltage limits.

The Takeaway: The technology to save millions of pounds and secure a green energy future is ready. The next step is for regulation and data access to catch up with the engineering.

Forum Presentations

1. The Regulatory Lever: Make Your Voice Heard

Gary Swandells (Smart Grid Consultancy) delivered a compelling keynote that challenged the audience to engage directly with policy. Drawing on his role on Ofgem's DSO Performance Panel, Gary issued a clear call to action. Because the current ED2 regime relies heavily on stakeholder surveys rather than hard metrics, industry feedback directly shapes outcomes. He strongly urged practitioners to submit their evidence before the formal deadline on 30 April 2026.

Crucially, Gary revealed the Panel's firm stance on innovation: projects still in the development phase receive no ambition scoring credit. The Panel's priority is seeing successful concepts transition into business as usual to deliver tangible benefits. Pointing to several successful live trials across the UK, he challenged the industry to overcome the "not invented here" culture. He stressed that DNOs and DSOs must be recognised for adopting proven best practices from across the sector, rather than leaving successful pilots stranded.

2. The National Picture: Voltage as the Last Frontier

Julian Leslie (Director of Strategic Energy Planning and Chief Engineer, NESO) provided a commanding overview of the path to a decarbonised power system. He shared the highly positive news that six of the seven major engineering challenges are now substantially resolved. Frequency management and grid stability have been transformed, and the system is now tantalisingly close to achieving 100% zero carbon operation.

However, voltage remains the final frontier. Julian detailed a fundamental shift in how voltage behaves on the modern grid. Historically, operators simply needed to maintain high voltage during winter peaks. Today, voltage swings dramatically within a single day, often reaching excessive highs overnight due to lightly loaded cables and inverter-connected devices. He explained that modern consumer habits and technologies, from widespread LED lighting to the proliferation of phone chargers, are driving this volatility and creating a new era of grid management challenges.

3. The Home Front: Hyper-Local Flexibility

James Harrow (Head of Flex and Innovation, Geo) and Olayinka Ayo (Lead Research Engineer, EDF Energy UK R&D) introduced Project SOLVE. This innovative Northern Powergrid project explores "hyper-local flexibility" to solve two major industry blind spots: a lack of real-time voltage visibility and the absence of standardised controls for household assets.

Currently, poor network visibility comes with a heavy price tag. Up to 61,500 EV owners experience voltage-related charging dropouts annually. These incidents trigger costly site investigations that add up to £65 million to consumer bills every year. Project SOLVE offers a clever workaround. By simply modifying smart meter firmware, the team successfully transmitted near real-time voltage data via standard home broadband, entirely bypassing the need for expensive national infrastructure upgrades.

4. The Whole-System Proof: Quest Delivers

Andy Howard (Innovation Programme Manager, SP Electricity North West) concluded the session with a compelling update on Quest. Backed by £7.95 million in Network Innovation Competition funding, this ambitious project has successfully demonstrated whole-system voltage optimisation across all network levels, providing a vital, comprehensive blueprint for managing the future grid.

The Hidden Battery Revealed

Today's session demonstrated that Play 2 of the Grand Slam is not a theoretical proposition. CLASS is already commercial. Quest has proven whole-system optimisation. Project SOLVE is pioneering the data pathways needed to orchestrate millions of behind-the-meter assets. And NESO has confirmed that the reactive power capability locked across distribution networks represents one of the most significant untapped resources available to the system.

But a critical constraint emerged. Quest's finding that the existing statutory voltage range is close to exhaustion underscores a message the Forum has been making since its inception: the tools exist, but the regulatory framework has not kept pace. Wider statutory limits, as proposed in the ENA consultation, are not a nice-to-have. They are the precondition for unlocking the value of the flexibility that networks have already proven they can deliver. But wider limits are proposed by ENA are just the start, and arguably too little too late.

The GB electricity system needs a 300% increase in demand-side flexibility by 2030. The hidden battery is there. The question, as ever, is whether we have the regulatory confidence and operational ambition to switch it on.

Next up: the Forum's in-person event on 2 July, with a further webinar on 16 October. Details to follow.

Roger Hey – 17 April 2026
Convenor – Voltage Matters Forum

Forum Update

Following EA Technology's acquisition of Fundamentals in January, EA Technology will take a leading role in the Forum going forward. Richard Parke and the Threepwood Consulting team have formally handed over the co-pilot seat, having helped build the Forum from a post-conference conversation to a community of over 400 members in just 18 months. Richard reflected on the four recurring themes that have defined the Forum's work: voltage as a constraint to LCT rollout, legacy planning assumptions designed for static systems, limited visibility below HV, and the evolving standards and regulatory landscape. The Forum remains committed to being an independent space for collaboration and knowledge exchange.

Background

The **Voltage Matters Forum (VMF)** is an independent, collaborative space where engineers, regulators, and energy experts work together to solve the technical and regulatory challenges of moving the UK to a carbon-free power grid.