VOLTSMART®

Managing Energy Efficiency

March 2026

Voltsmart's submission to Ofgem Consultation:

DNOs' Future Role in Supporting the Rollout of Low Carbon Technologies

Contents

Introduction – Summary of Key Issues Identified in the Consultation

Voltsmart welcomes Ofgem's consultation on the future role of Distribution Network Operators (DNOs) in supporting the rollout of low carbon technologies (LCTs). We note that the consultation forms part of Ofgem's wider work to define the RIIO-ED3 framework and considers how DNOs can support the large-scale deployment of LCTs and energy efficiency measures.

Voltsmart is a patent protected energy-efficient fuse board which incorporates auto transformer technology, advanced fire safety features and is manufactured in the UK.

This document outlines the capabilities of Voltsmart technology in further detail, together with our response to the critical system challenges that have been identified, namely:

- **Rapid electrification is increasing demand and complexity**
  The transition to electric heating, transport and domestic energy use is driving significant increases in electricity demand, while the uptake of LCTs such as EVs, heat pumps, solar PV and battery storage is fundamentally changing demand patterns.
  Voltsmart response: Voltsmart reduces demand at source by lowering voltage and current within the home, helping manage increased electrification without proportionally increasing system load.

- **Local electricity networks are under increasing strain**
  Existing low voltage networks were not designed for high levels of coincident demand, leading to growing constraints that risk delaying or limiting the rollout of LCTs.
  Voltsmart response: By reducing peak current and instantaneous demand at the property level, Voltsmart alleviates pressure on constrained low-voltage networks and helps create additional connection headroom for LCTs.

- **The current DNO model is too reactive**
  Traditional, connection-led approaches are insufficient to deliver net zero at pace. Ofgem is therefore exploring a shift toward more proactive, coordinated network planning and delivery.
  Voltsmart response: Voltsmart supports a more proactive system approach by delivering continuous, passive demand reduction that reduces reliance on reactive network upgrades.

- **Deployment of LCTs is fragmented and uncoordinated**
  Current rollout is largely consumer- and installer-led, resulting in a "patchwork" of current rollout is largely consumer- and installer-led, resulting in a "patchwork" of deployment that can increase costs and reduce system efficiency.
  Voltsmart response: Voltsmart can be deployed alongside LCTs as a standardised, property-level network measure, improving consistency and efficiency across fragmented rollout.

- **Significant infrastructure investment is expected**
  Without improved coordination and demand management, network reinforcement requirements are expected to increase substantially, with costs ultimately borne by consumers.
  Voltsmart response: By improving utilisation of existing infrastructure and reducing peak demand, Voltsmart provides a low-cost solution which can defer or reduce the scale and significant cost associated with network reinforcements.

- **Greater use of demand-side solutions and flexibility is required**
  Ofgem highlights the need to better utilise demand-side measures to improve system efficiency and reduce reliance on capital-intensive upgrades.
  Voltsmart response: Voltsmart complements flexibility by delivering continuous demand reduction at source, reducing overall system load rather than shifting it in time.

- **The future role of DNOs is unclear**
  The consultation seeks views on whether DNOs should move beyond their traditional role toward an enhanced co-ordination role (planning, data, facilitation), and/or an expanded role (potentially including more active involvement in delivery)
  Voltsmart response: Voltsmart enables DNOs to support system outcomes through coordination and facilitation without requiring direct involvement in installation or ownership of in-home technologies.

- **Ensuring affordability and fairness is critical**
  The transition must be cost-effective and inclusive, particularly for vulnerable and low-income households.
  Voltsmart response: Voltsmart provides passive energy savings and system benefits without requiring behavioural change, making it an inclusive solution that supports all households, including those in fuel poverty.

In summary, the consultation is focused on how to enable rapid electrification while minimisin system cost, avoiding inefficiencies and ensuring a fair and coordinate transition.

Voltsmart's response addresses these challenges and highlights the role our energy- efficient fuse board can play as a property-level efficiency measure. This is a currently unrecognised but essential component of an efficient and scalable energy system. Installed as a replacement for a standard fuse board, Voltsmart uses integrated autotransformer technology to reduce incoming voltage at the point it enters the home, before it is distributed across the property. This creates a more stable and appropriate electrical environment while reducing avoidable demand, improving system efficiency and supporting electrification without requiring behavioural change.

The key questions Voltsmart has identified to answer are numbers: 1, 2, 9, 10 and 11.

Q1. Should DNOs play a role in coordinating and supporting a cost-effective energy transition?

Voltsmart supports a stronger role for DNOs in coordinating and enabling a cost-effective energy transition, particularly through improved planning, system visibility and alignment with local delivery.

However, the transition challenge is not solely one of increasing capacity, but of managing how electricity is used at the point of consumption. Electrification of heat, transport and domestic energy use is increasing both the scale and simultaneity of demand, placing pressure on networks that were designed around significantly lower and more diverse usage patterns.

There is therefore a clear need for solutions that:

- reduce peak electrical demand at source
- improve utilisation of existing network infrastructure
- support faster and more coordinated deployment of LCTs
- lower overall system costs for consumers

Ofgem's consultation highlights the importance of reducing peak demand and improving system efficiency. Property-level demand reduction technologies align directly with these objectives by reducing instantaneous current draw across voltage-dependent loads, thereby lowering peak demand at the household level.

Critically, the primary constraint on many low-voltage networks is increasingly peak demand rather than total annual consumption. High coincident loads from electrified heating, EV charging and domestic electrical usage are accelerating network saturation and reinforcement requirements.

Demand reduction at source should therefore be considered alongside flexibility and infrastructure investment as a complementary mechanism for managing network constraints.

Voltsmart energy-efficient fuse boards address this directly. By reducing voltage at the point of entry to the property, helping to lower peak demand and network loading across the household electrical system without requiring behavioural change.

Early modelling and testing indicate that this technology can reduce peak current in typical residential settings, depending on load composition. The underlying operation of this approach is grounded in established electrical principles. However, its relevance to Ofgem's objectives lies in system outcomes: reduced peak demand, lower thermal loading on network assets, and improved connection headroom.

Importantly, this approach is inherently equitable. Passive demand reduction benefits all households, including those least able to actively participate in flexibility markets or invest in complex energy systems/LCTs.

Q2. Do you agree with the overall rationale and scope of 'Enhanced Co-ordination'?

Voltsmart agrees with the rationale for enhanced co-ordination and supports Ofgem's focus on improved planning, data sharing and area-based delivery.

A more coordinated approach is essential to avoid fragmented deployment of LCTs and inefficient network investment. Aligning DNO activity with local authorities, housing providers and delivery bodies will improve outcomes and reduce duplication.

However, while the proposed scope focuses on where and how technologies are deployed, it places less emphasis on how efficiently electricity is used within individual properties.

This represents a potential gap in the framework. The consultation recognises the importance of demand reduction and flexibility, but primarily considers these in terms of system coordination and time-shifting of demand. There is an opportunity to also consider continuous, passive demand reduction at the point of use.

At present, enhanced co-ordination focuses on:

- where infrastructure is upgraded
- where LCTs are deployed
- how delivery is aligned geographically

To maximise system efficiency, this could be complemented by greater consideration of how demand is managed within properties, particularly in relation to peak demand and instantaneous load.

Property-level demand reduction technologies provide one example of this approach. By reducing voltage supplied within a property, these technologies can reduce current draw across voltage-dependent loads, contributing to lower peak demand without requiring behavioural change.

This type of intervention operates independently within each property and does not rely on feeder-wide adjustments, making it compatible with area-based delivery while allowing for variation in local network conditions.

Incorporating demand optimisation at the point of use alongside enhanced co-ordination could strengthen outcomes by ensuring that demand growth is not only managed geographically, but also reduced at source.

This is particularly important because voltage conditions are not uniform across a feeder. They vary by location, cable characteristics, phase allocation, demand profile and distributed generation. A single upstream adjustment cannot deliver the optimal voltage for every property. Property-level approaches therefore provide a more granular and scalable complement to network-level interventions.

Enhanced co-ordination will be more effective if it incorporates both coordinated deployment of LCTs and improved efficiency of electricity use within each property.

Q9. Should DNOs adopt an Expanded Role, and could this deliver system benefits?

Voltsmart supports a carefully defined expanded role for DNOs where it enhances system efficiency, reduces costs and accelerates the rollout of LCTs. However, this role should remain focused on enabling and coordinating delivery, rather than direct ownership or installation of in-home technologies.

The consultation highlights the importance of maintaining effective competition an avoiding market distortion, particularly where DNOs may otherwise take on roles already fulfilled by suppliers, installers and other market participants.

Voltsmart considers that DNOs are well placed to:

- identify areas of network constraint
- provide visibility of network capacity and future demand
- support coordination of area-based delivery
- enable deployment of solutions that deliver system and network benefits

This enabling role aligns with Ofgem's objective of improving coordination while preserving the role of competitive markets in delivering technologies to consumers.

With regard to the importance of market-led delivery, Voltsmart does not consider it necessary for DNOs to become installers, operators or owners of technologies within the home in order to deliver system benefits. Maintaining a market-led delivery model will:

- support innovation
- enable consumer choice
- avoid duplication of existing delivery channels
- reduce the risk of inefficient or centralised deployment

DNO involvement should therefore focus on facilitating and targeting deployment, rather than direct intervention in competitive markets.

Within this framework, the role of property-level demand optimisation technologies, including Voltsmart energy-efficient fuse boards, can deliver measurable system benefits without requiring DNO ownership or direct installation.

Installed by qualified electricians as part of standard fuse board replacements, Voltsmart energy-efficient fuse boards can be deployed through existing market channels while contributing to reduced peak demand and improved network utilisation. This allows DNOs to support outcomes such as increased connection headroom and reduced network strain without taking on additional delivery responsibilities.

Network and System Benefits

An expanded DNO role should prioritise solutions that deliver both local network and wider system benefits. This includes:

- reducing peak demand
- improving utilisation of existing infrastructure
- enabling faster connection of LCTs
- supporting efficient area-based delivery

Property-level demand reduction can contribute directly to these outcomes by lowering baseline demand across the network, complementing both infrastructure investment and flexibility.

Consideration of low-income households

Voltsmart supports the principle that an expanded DNO role should help ensure that the benefits of the energy transition are accessible to all households. Solutions that deliver passive benefits, without requiring behavioural change or complex consumer engagement, may be particularly valuable in supporting lower-income households and those less able to participate in flexibility markets.

Targeted, area-based deployment supported by DNO coordination could help ensure that these households benefit from both reduced costs and improved system performance.

In summary, Voltsmart supports an expanded role for DNOs where it is focused on coordination, targeting and enabling delivery. To be effective, this role should complement rather than replace competitive markets, ensuring that solutions are delivered efficiently through existing channels.

This approach enables technologies such as Voltsmart energy-efficient fuse boards to be deployed at scale, delivering system and network benefits without requiring DNO ownership or market intervention.

Q10. Should proposals be assessed using a network and wider system benefits approach?

Voltsmart strongly supports a framework that evaluates both network and wider system benefits. Many technologies deliver value across multiple layers of the energy system, and a whole-system assessment approach is essential to ensure these benefits are properly recognised.

As highlighted in the consultation, coordinated deployment of technologies can reduce peak demand, improve system efficiency and lower overall costs. A framework that captures both local network and wider system impacts is therefore critical.

Network benefits

Property-level demand reduction technologies, including Voltsmart energy-efficient fuse boards, can contribute to a range of network benefits, particularly where peak demand is the primary driver of constraint. These include:

- reduction in peak current at the household level
- reduced thermal loading on cables and transformers
- improved utilisation of existing infrastructure
- potential deferral or reduction of reinforcement requirements

System benefits

In addition to local network impacts, demand reduction at source can deliver wider system benefits. These include:

- reduction in overall system demand under given conditions
- increased capacity for LCT connections
- improved integration of distributed generation
- reduced reliance on peak generation and associated system costs

Consumer benefits

- lower energy bills through reduced avoidable consumption
- improved reliability of electrical systems operating within appropriate voltage ranges
- reduced electrical stress on household equipment

Environmental benefits

- reduced energy waste and associated emissions
- extended asset life and reduced material consumption

Importance of demand reduction at source

A key distinction within the assessment framework is between measures that shift demand in time and those that reduce demand itself.

While flexibility plays an important role in managing when electricity is used, reducing the magnitude of demand can directly lower network loading and system stress.

Property-level demand reduction, delivered through technologies such as Voltsmart energy-efficient fuse boards, contributes to this by reducing baseline demand across a proportion of household loads.

Whole-system evaluation

A whole-system assessment framework should therefore:

- capture both network and system-level impacts
- recognise interactions between demand reduction and flexibility
- consider cumulative benefits across large-scale deployment
- reflect both short-term and long-term cost impacts

This approach will ensure that solutions which reduce demand at source are evaluated alongside infrastructure and flexibility options on a consistent basis.

In summary Voltsmart supports the use of a network and wider system benefits approach to assess proposals. A whole-system framework is essential to capture the full value of different solution types, including demand-side measures such as Voltsmart energy-efficient fuse boards, which reduce baseline demand and complement both infrastructure investment and flexibility.

Q11. Views on technologies, delivery models and key components

A. Technologies and measures that should be supported

Voltsmart considers that a range of technologies and measures will be required to support an efficient and scalable energy transition, including both supply-side and demand-side solutions. In addition to LCTs such as heat pumps, EV charging, solar PV and battery storage, there is a role for technologies that improve how electricity is used within the home.

Voltsmart energy-efficient fuse boards represent one such technology, operating as a form of property-level demand reduction. Installed as a replacement for a standard fuse board, they reduce voltage supplied within the property, contributing to reduced current draw across voltage-dependent loads and improved electrical operating conditions.

The technology is grounded in established electrical principles and is designed to operate flexibly across different property types, without adversely affecting the efficacy or performance of connected voltage-dependent loads when appropriately configured.

As a UK-developed, patent-protected innovation with global relevance and protection across 74 international markets, Voltsmart energy-efficient fuse boards represent a scalable solution that can support more efficient electricity use both within the UK and internationally.

Great London Authority case study

If Voltsmart was adopted across the 3.8 million homes within the Greater London Authority and by utilising the LOWEST energy saving setting, the possible annual savings are:

- **kWh savings p.a. = 563,160,000 kWhs**
- **This could power 258,000 homes a year (the size of Edinburgh)**
- **Carbon savings p.a. = 99,679 tCO2e**
- **Consumer savings = £140.7 million (based on 25p pkWh)**

B. Relative costs and benefits
Infrastructure investment is increasingly driven by peak demand and network constraints.

Technologies that reduce peak demand can therefore play an important role in improving system efficiency and reducing the need for reinforcement.

By lowering current draw across a proportion of household loads, Voltsmart energy- efficient fuse boards can contribute to:

- reduced instantaneous demand
- lower thermal loading on network assets
- improved utilisation of existing infrastructure

This positions demand reduction at source as a complementary, relatively low-cost measure alongside capital investment in network infrastructure.

A balanced approach that includes both infrastructure and demand-side solutions is likely to deliver the most cost-effective outcome for consumers. This combination of system benefit and demand reduction achieved without compromising the performance or efficacy of connected voltage-dependent loads positions such technologies as a credible, low-cost complement to network investment.

C. Supporting heat pumps and wider electrification
Heat pumps and other LCTs are sensitive to supply conditions and contribute to increased household demand. Maintaining appropriate and consistent voltage conditions can support the effective and consistent operation of these technologies within their intended design parameters.

Voltsmart energy-efficient fuse boards contribute to this by helping maintain voltage within optimal operating ranges, reducing electrical stress on components and supporting more consistent performance of connected technologies. This enables electrification to scale while helping to manage the associated increase in demand.

D. Identification of suitable properties and engagement
DNOs can help identify areas of network constraint, but delivery should be coordinated with local authorities, housing providers, installers and retrofit programmes.

Voltsmart energy-efficient fuse boards are well suited to coordinated, area-based delivery as they can be deployed independently within individual properties without requiring feeder-wide adjustments or behavioural change.

Voltsmart energy-efficient fuse boards are well suited to coordinated, area-based delivery as they can be deployed independently within individual properties without requiring feeder-wide adjustments or behavioural change.

This makes them compatible with broader programmes such as unlooping, service upgrades and LCT deployment, allowing multiple interventions to be delivered efficiently within the same geography.

E. Funding approaches
The benefits of property-level reduction are shared across:

- consumers (lower bills)
- networks (reduced load)
- the wider system (improved efficiency and reduced costs)

This supports consideration of such technologies within:

- area-based delivery programmes
- electrification support schemes
- and network support mechanisms

Voltsmart energy-efficient fuse boards should be viewed as a complementary measure that enhances the effectiveness of infrastructure investment, rather than as an alternative to it.

F. Responsibility for installation

Installation should remain with qualified electricians. Voltsmart energy-efficient fuse boards are designed as compliant fuse board replacements, enabling standardised installation through existing electrical supply chains without requiring DNO involvement. This supports a market-led delivery model while ensuring safe and consistent deployment.

G. Ownership and control

Network and system benefits can be achieved without requiring DNO ownership of in-home technologies. Maintaining consumer ownership and market-based delivery helps preserve competition, supports innovation and reduces the risk of market distortion. This aligns with an enabling role for DNOs, where they support deployment and system outcomes without directly controlling domestic assets.

Conclusion and recommendations

Voltsmart supports Ofgem's direction in support of a more coordinated and efficient energy system. However, the current framework does not fully address a critical opportunity to reducing demand at the point of use through property-level demand reduction.

By reducing voltage and current within the home, Voltsmart:

- lowers peak demand
- improves system efficiency
- can improve effective network capacity
- supports reliable operation of LCTs
- reduces costs for both consumers and the system

As electrification accelerates, this capability becomes increasingly important. Voltsmart also supports national energy security by improving the efficiency with which electricity is used at the point of consumption, lowering peak demand, reducing stress on the network and enabling greater utilisation of domestic renewable generation. As electrification and renewable penetration increase, property-level optimisation will become increasingly important to ensuring that the system can absorb and use electricity efficiently as well as generate it.

Voltsmart should be recognised as a relevant category of solution within Ofgem's framework as enabling infrastructure, as a demand-reduction technology operating at source and as a valid network support intervention within ED3. We further recommend that it is considered for inclusion within area-based rollout models, electrification programmes and coordinated deployment alongside technologies such as solar PV, battery storage, EV charging and heat pumps.