SMART LOCAL ENERGY SYSTEMS

Key insights from the LEMA Summit 2024, reflecting on the first 6 months of progress.

A report produced by The Traxis Group and Gemserv, representing The Local Energy Markets Alliance (LEMA).

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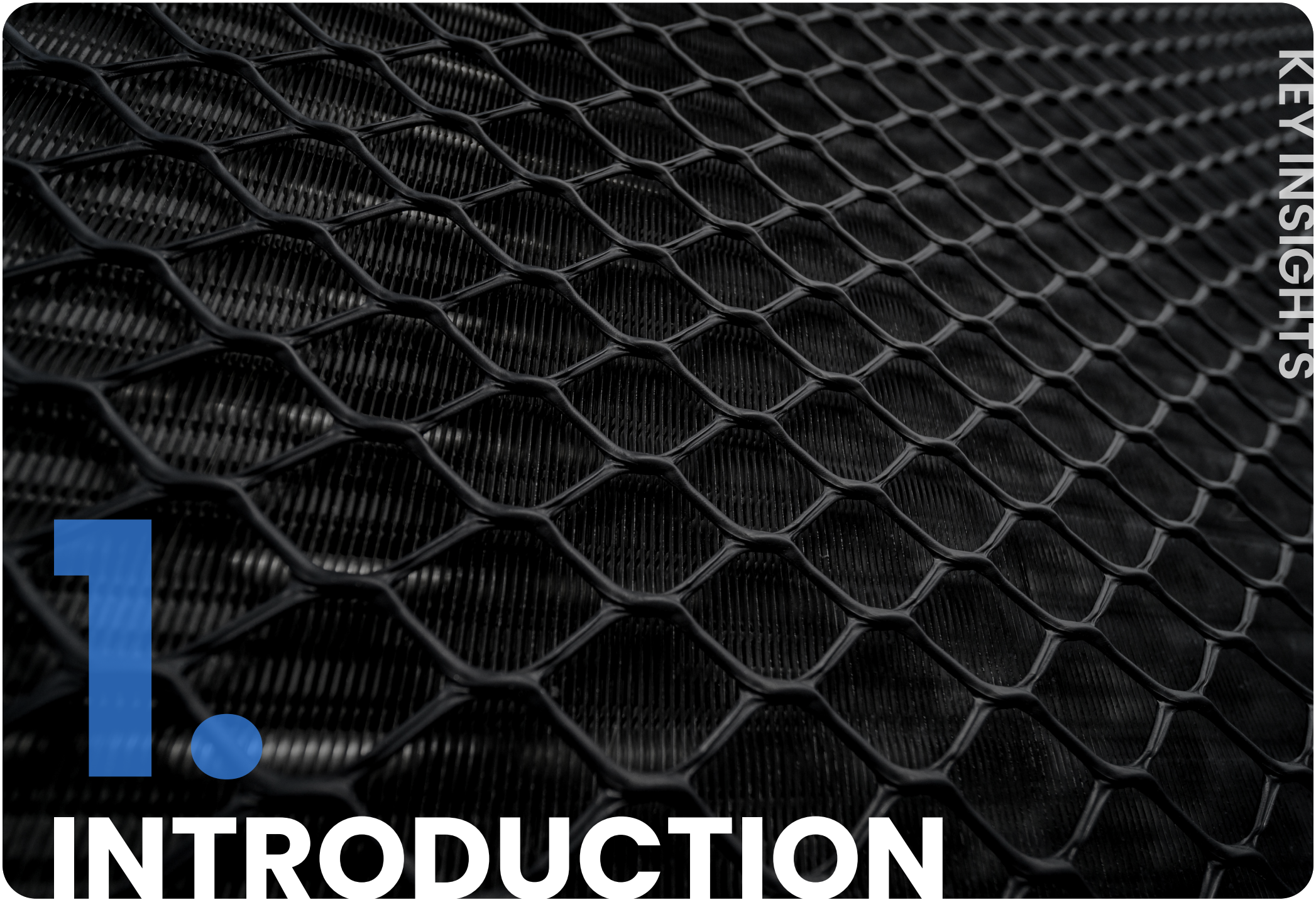


1. INTRODUCTION

This Summit far exceeded my expectations. Not only was it unique in its approach but I was incredibly impressed by the energy, enthusiasm and the can-do attitude that permeated throughout.

The Summit was unique in several ways. Firstly, it brought together a wide cross-section of stakeholders who rarely if ever meet even although they all share part of the "local energy burden". Secondly, this was about having genuine in-depth conversations with the time to have them - and without competing distractions! Thirdly, it was about genuine problem solving – today's problems with what we have now.

Bringing in the European perspective was fascinating too. It is good to understand how these issues are being dealt with elsewhere and learn from experiences there. The all too brief comparison of experience across networks, government initiatives and local implementation demonstrated the commonality of thinking and the value of working with each other.

At its heart LEMA is about the idea of "crossing the chasm" – developing a whole product solution for the mass market - and how collaboration is key to this. There is no mass market for smart local energy systems: it has to be created, and I am convinced collaboration is the first step.

I am hugely impressed by the way, through LEMA, this industry is starting to do this. It was heartening to see how LEMA sees government to be just one of the many stakeholders and that our input was being encouraged. Listening to how an Enterprise Market could facilitate the transfer and exploitation of innovation into the market at a time where growth is such a major focus was both timely and thought provoking.

I encourage you to read this report and to think seriously of joining the movement that LEMA represents. There are significant opportunities for your organisation and to help the country reach net zero more efficiently.

Patrick Allcorn - Head of Local Net Zero at DESNZ

1.1 EXECUTIVE SUMMARY

"Making the last mile the first mile".

This Summit theme was prompted by a comment made by Peter Hermans, ex-CTO of Stedin, a Dutch Utility. Whilst Peter was unable to attend the Summit, Huub Saris from Energie Nederlands showed why he made the comment, with over 60% of the Dutch grid at maximum capacity, severely limiting connections and economic growth.

The importance of tackling the causes of congestion early was made by Andrew Roper, Director DSO for SSEN. He showed that while demand is still falling in the UK, connection queues are starting to build. Consequently, SSEN is investing heavily, although building infrastructure takes time. Which is why LEMA's purpose of controlling residential and small business peak demand from the bottom up is of great interest. The opportunity to tackle the last mile first to buy time to enable full grid strengthening to be achieved without the economic impact being felt in The Netherlands is highly relevant.

The Prospering from the Energy Revolution Programme (2018-2023) demonstrated how the technology and the operational benefits of Smart Local Energy Systems could do this. LEMA is developing the business models, market mechanisms and early stage developments needed to create an Enterprise Market that accelerates their roll-out.

This involves tackling multiple non-technical challenges, sometimes termed the 'Local Energy Burden". Such challenges were raised several times, but there was enthusiasm for the direct approach being considered to cut through and "not boil the ocean". The interest, can-do attitude and desire to make things happen was tangible. As was the recognition that collaboration between the multiple stakeholders that share responsibility is the way for industry to rapidly build an 'Enterprise Market'.

The clear take away messages were that commercialising smart local energy systems is viable, there is a need to do so, and that LEMA and its members need to now focus on doing it.

Simon Anderson, CEO LEMA

1.2 SCENE SETTING

'Local energy' is short for Smart Local Energy Systems (SLES), a way to manage non-firm connection agreements, enable local decarbonisation and provide significant consumer benefits.

The term came from the UKRI Prospering from the Energy Revolution Programme (PfER), a £104m Challenge Fund that ran from 2018 – 2023 with over 80 business-led projects involving ~ £500m industry investment.

The PfER programme generated multiple reports that, in summary, demonstrated both the technical solutions and operational benefits of SLES and concluded by saying that:

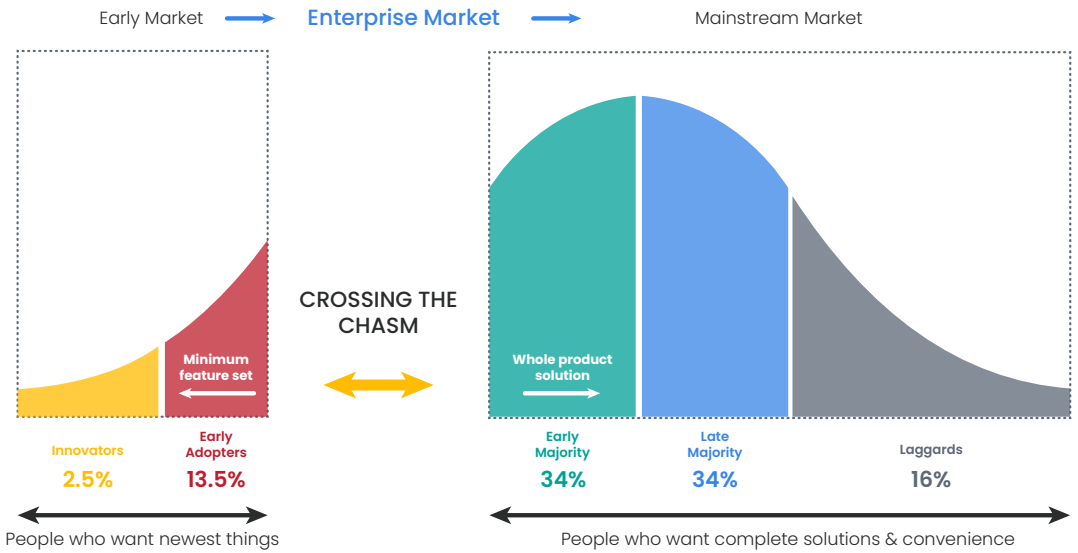
> *The best legacy for the Prospering from the Energy Revolution programme will be the nationwide rollout of successful smart local energy systems as a key part of the journey to net zero. National policymakers, regulators, local authorities, businesses and citizens all have a part to play in meeting the challenge of creating energy-smart places across the UK.*

Creating energy-smart places – The Traxis Group and Gemserv, founders of the Local Energy Markets Alliance, accepted this challenge on behalf of our Industry. We see the next step is to create an 'Enterprise Market' for smart local energy systems to address the 'chasm' between early and mainstream markets illustrated here:

Creating an Enterprise Market – This gap is caused by the challenge of creating a *whole product solution* covering the complete consumer journey, something that is generally well beyond most businesses' ability to do on their own or in competition. An Enterprise Market requires collaboration: hence LEMA.

The first step is to create the business models and market mechanisms needed to do this: i.e. commonly accepted approaches that streamline adoption and delivery.

ENTERPRISE MARKETS – transition from early to mainstream markets



MARKET	INNOVATION	ENTERPRISE	ESTABLISHED
BUSINESS MODEL	EXPERIMENTAL	CO-DEVELOPMENT	RECOGNISED
CAPABILITIES	LIMITED	COLLABORATIVE	MARKET-WIDE
INVESTMENT	VC	CO-ORDINATED	INSTITUTIONAL

Here LEMA's role is to define *what* to deliver, leaving individual businesses to determine their own proprietary ways of *how* to deliver. In this process LEMA remains neutral, operates on a 'not for profit' basis and is open to any organisation to join.

Three Common Interest Groups (CIGs) have been established to debate the common commercial barriers to developing a market. A work plan Is established to propose practical solutions that operate within current regulations and therefore can be implemented straight away. The solutions are reviewed and endorsed by the CIG creating industry led best practice from the ground up.

Collaborative projects to deliver these solutions are built between members, for example through building relationships by working together on solutions. Emphasis is also placed on generating additional revenue streams that funders can invest in and that can deliver significant benefits to consumers.

A wide range of stakeholders are involved: e.g. property, finance, local authorities, digital and equipment providers, as well as energy. However, they rarely meet together to take a whole system perspective, which they can as LEMA members.

The Summit was an opportunity to put all these elements together. Leeds Castle offered a unique benefit in being relatively remote, private and in surroundings conducive to talking.

The scene was thus set for an engaging, successful and unique business event.

1.3 MESSAGES FROM SUMMIT SPONSORS

Platinum Sponsor

Tom Woolley, Smart Product and Strategy Director, Metis by SMS

"SMS has established Metis, an Energy Transition Product that takes consumers and businesses on a journey to understand the best low carbon tech solution, mainly PV, Battery and ASHPs. Data driven propositions that consider building and energy consumption profile as well as tariffs, HEMS optimisation and flexibility services to value stack benefits to reduce cost and carbon. Metis deploys Innovative fully funded commercial models and utilises SMS's national workforce and partners to create win-win scenarios for all. We create customer journey for our partners, such as business and social landlords, housing associations and local authorities.

The Energy Saver App (www.energysaverapp.com) developed for Oxfordshire County Council is a partnership proposition that builds a marketplace of educated and engaged energy users that are then marketed with tailored propositions for fully funded retrofit solutions.

To find out more, visit us: https://www.metis.co.uk/ and get in touch.

Engaging with consumers on a local level has always proven to be successful, which is why we have committed to LEMA and look to build on our capabilities to enable successful business models to complement our propositions and deploy local energy systems".

Gold Sponsor

Capgemini

Carl Haigney, Vice President, Capgemini

“We are at a critical juncture in the evolution of the UK energy system, with solid sustainability targets, growing customer engagement, clear technical enablement and capability yet constrained budgets and concerns over major asset investments. Capgemini, as a core technology and consulting partner to the industry, feels that the time is now right for smart local energy systems (SLES) to drive the acceleration towards net zero and wider customer engagement in the market.

Deferment of major grid investment is clearly an early win from the implementation of SLES, and the ability to optimise the energy usage and storage at a local level does open up the potential for a distributed VPP which could enable the wider re-think of strategic asset investment. We do face challenges, though, in the implementations – mostly around the core industry and local planning processes which need to be followed. Time is of the essence and action is needed now to enable SLES to deliver benefits rapidly and to spark the innovative re-think of our investments in energy.

We at Capgemini contend that the technology and knowledge pieces of this complex jigsaw are there and ready. The overall picture we want to see is also there – and there is a willingness in the industry and the public to do something….let’s rally round now to drive SLES forward and delivery for the UK.”

2. LEMA'S PROGRESS REPORT

2.1 INTRODUCTION

LEMA is motivated to achieve tangible results through its workplan. In its first 6 months LEMA has:

- Shaped an innovate ***Dynamic Load Averaging (DLA)*** approach for Low Carbon Technologies (LCTs) within a Smart Local Energy Systems.

- Undertaken ***counterfactual modelling*** to define the core objectives, demand and diversity limits against Distribution Network parameters.

- Advanced the establishment of ***baseline requirements for data & platforms*** that would enable Dynamic Load Averaging (DLA) and Smart Local Energy Systems (SLES) at scale.

- ***Built momentum*** in engaging with Local Authorities & Developers in the identification of real-world housing projects subject to connection constraints.

More details, as described by the Chairs of the Common Interest Groups, are as follows, starting with the Systems CIG that addresses, Networks, Data and Platforms. This CIG has been in place for a year and so has made the most progress.

2.2 **NETWORKS –** LAURENCE CARPANINI & PETTER ALLISON

Networks sit at the LEMA nexus of the Building Developer and the Distribution System Operator (DSO) – enabling properties with their distributed low carbon technologies to be connected to the local grid, especially in congested areas, through a new form of DSO flexibility service we have termed ***Dynamic Load Averaging***.

Dynamic Load Averaging (DLA) is key to enabling Smart Local Energy Systems. The DLA is an innovative new contracting model to alleviate congestion by providing flexibility where the DSO knows it is needed but where it has not actually been built yet. It is in effect a medium term 'non-wires alternative' to grid strengthening that enables Low Carbon Technologies to be connected behind a substation in advance of upstream power grid infrastructure improvements.

The DLA differs from traditional flexibility, in that its intention is to forestall rather than mitigate existing congestion problems.

Since its formation, the Networks Common Interest Group (CIG) has focused on the design and development of the core fundamentals of a DLA service. The Traxis Group, Gemserv, SSEN and ElectraLink conducted the work package with ongoing input and confirmation sought from the LEMA community via Networks CIG meetings.

Key issues addressed have included:

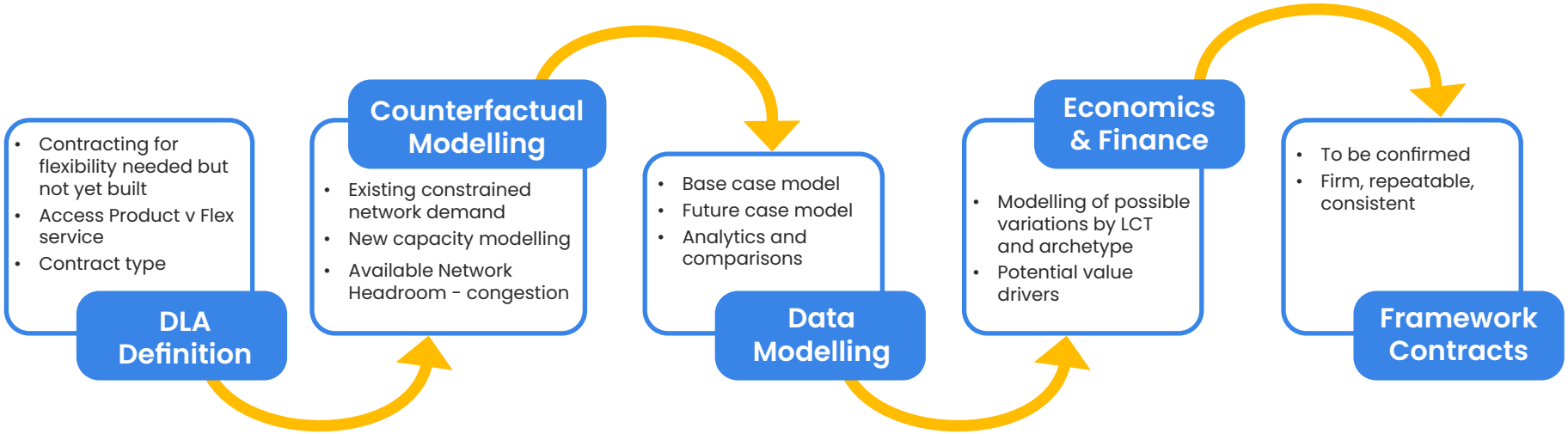
- The core design of the new DLA service to agree and enable coordinated LCT operation necessary for connection in congested areas. This is the process to link “data” and “requirements” into “operations” – i.e. what the DLA Service should look like defining the broad principles underpinning the DLA Contract.

- Assessment of outline results from a first-pass counterfactual modelling exercise (in conjunction with the Platforms Group) to define the core objectives, demand and diversity limits – defining the essential data requirements.

- Investigating where a DLA service could effectively be applied geographically in the SSEN network, considering capacity and design constraints.

- Developing a contract model - setting the parameters for a workstream to define a firm, workable, repeatable DLA contracting framework.

This is described in the diagram below.



2.3 DATA & PLATFORMS – LAURENCE CARPANINI & PETTER ALLISON

The Data Platform CIG discussed the high-level principles of the data exchange environment to be established to enable Smart Local Energy Systems.

We started by introducing the concept of federated dataspace architectures allowing each LEMA partner to contribute to SLES projects with their own data platform environment while enabling near real-time data exchanges between them.

We discussed the need to define a proper governance framework for data exchanges as well as the need to select proper interoperability standards. Some participants highlighted the need to align with current DESNZ initiatives for data sharing and automatic asset registration as well as key standards as defined through the PAS1878 for Energy Smart Appliance interactions with Demand Response Service Providers. Key standards such as OpenADR4.0 as well as Matter 1.4 seem relevant for the UK market.

Interoperability standards should be able to evolve with time to avoid any lock in effect through the definition of future flexibility services such as the Dynamic Load Averaging. They should be able to incorporate needed data exchanges to validate the conformity of these services (baselines, measurements, etc…).

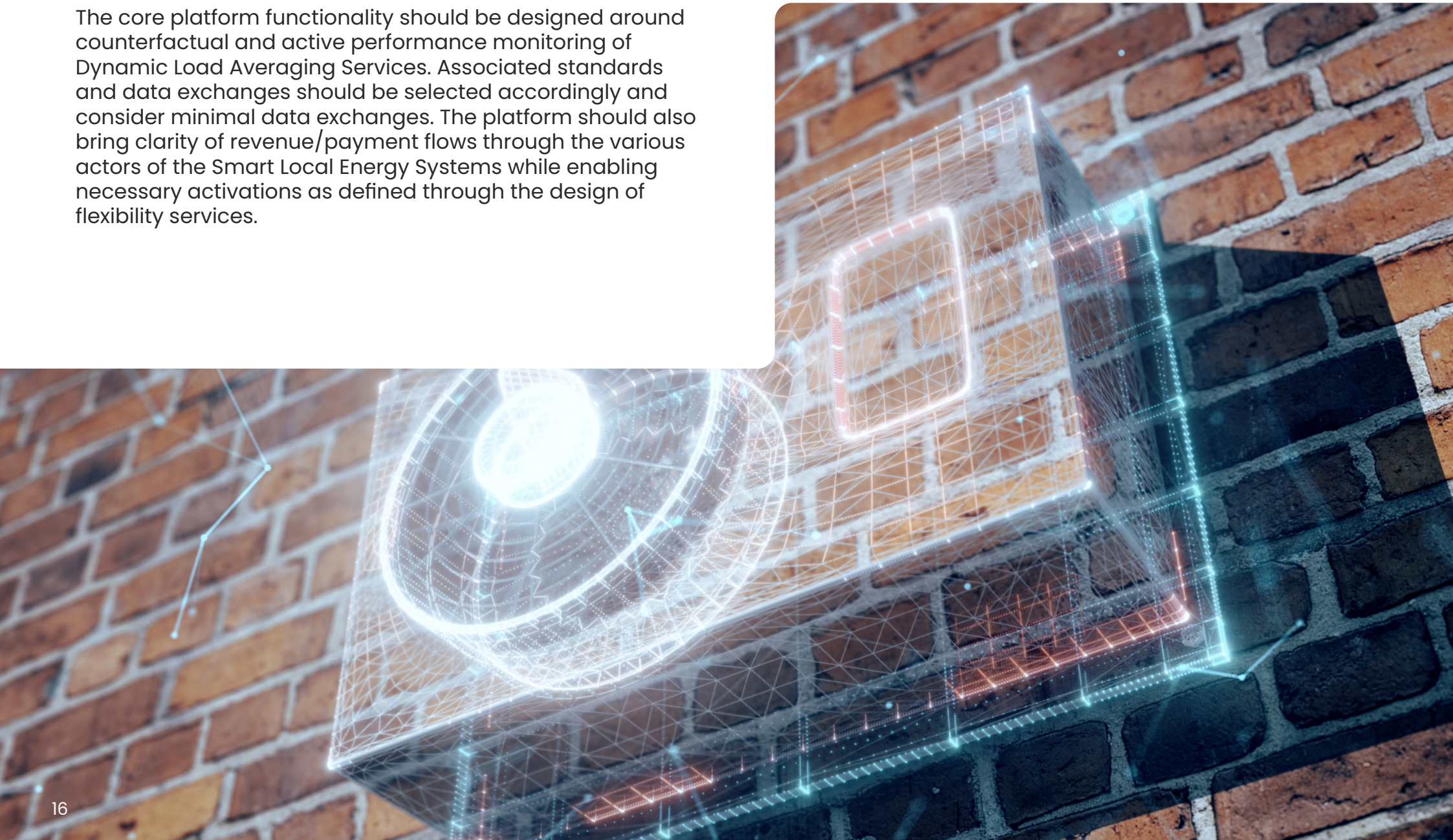
It is important to remain in an Agile development mode starting first Smart Local Energy System deployments with a Proof of Concept Minimum Viable platform and focus in particular on data exchange needs related to new services such as the Dynamic Load Averaging or Virtual Lead Parties as defined through the new Ofgem P415 regulation favouring independent aggregator through the Uk balancing mechanism.

Consumer consent should be central to the architecture to ensure consumer trust through the Smart Energy System ecosystem and respect all needed GDPR regulations and associated data governance. The Local operating company should be in charge to ensure needed permissions for data access through the various interconnected platforms.

All technology stacks should be cloud native, favouring real-time cloud to cloud interactions through interoperable APIs. Data security should be considered end to end from Energy Smart appliance producing data through customers and the various service providers to the Smart Local Energy system.

The platform should provide clear definitions of underlying operating asset data, keeping the option to appoint different Virtual Lead Parties to different assets. While the local operating companies will package Low Carbon technology offering to clients of the Smart Local Energy system, there should not be any consumer technology lock-in and so the platform should also be able to integrate other devices.

The core platform functionality should be designed around counterfactual and active performance monitoring of Dynamic Load Averaging Services. Associated standards and data exchanges should be selected accordingly and consider minimal data exchanges. The platform should also bring clarity of revenue/payment flows through the various actors of the Smart Local Energy Systems while enabling necessary activations as defined through the design of flexibility services.



2.4 **CONSUMER FIRST –** PHILIP LEWIS

"Consumer first" is a fundamental LEMA philosophy. Decarbonising residential and small business energy demand is different to decarbonising supply, and harder. Whilst the electrification of heating and transport along with maximising self-consumption of roof top solar are key government initiatives designed to tackle this issue, the adoption and implementation of these strategies is down to individual consumers. It is us who have to find ways to fund the LCTs required, to understand how to use them and worry about how to integrate, maintain and get the best out of them – and this is not simple.

At least three major barriers are:

- How to afford them, especially the up-front costs, but also the cost of maintenance and repair.
- How to understand and use them: LCTs are new, more complex and do not work together 'out of the box'.
- A lack of confidence in local supply chains: their competence, reliability and longevity. There are a growing number of scare stories emerging about 'rogue traders' which can put off many people from what they see as taking a risk.

This is typical for a new market, it requires building a whole product solution and this is at the heart of an Enterprise Market: hence 'consumer first'. For LEMA to be successful we must start from a consumer perspective and understand how we can address these 3 main issues from the ground up. Loading more costs onto consumers and expecting them to pay for the major investment in energy generation and infrastructure with ever higher bills is increasingly unrealistic. We must take consumers with us – and shared local energy systems is one way of achieving this.

The Consumer First CIG has consequently started to consider just how to do this by generating a new integrated consumer proposition where a Local Operating Company takes on much of the 'energy burden' on the behalf of consumers. We will start by researching attitudes to an inclusive subscription service proposition. In parallel we will consider how to build trust and governance in such a model. How we can educate consumers, build their understanding and support will also be a central component possibly by providing transparency and a guarantee of performance through an Active Building Performance Management process.

The Consumer First CIG is just starting to identify these core components of a LEMA consumer proposition framework. The Hub discussion further explored this space, and the next meeting of the Consumer First Common Interest Group will establish the first work packages to be tackled.

2.5 **PLACE BASED –** CHERYL HILES

The Place-based CIG, the third LEMA CIG, has begun by trying to define the scope and importance of 'Place' in local energy. One of the reasons West Midlands Energy Capital became a Founding Member of LEMA is because we see it embodying our values and providing a route to bring the right people around the table to tackle many of the delivery challenges we are facing.

The West Midlands plans to become a net zero carbon economy by 2041. To achieve this we must completely decarbonise our built environment, transport systems and industry. As a major demand centre, local energy system projects will play a major part in enabling this transition. To this end the region will shortly launch an ambitious new strategy focused on enabling the UKs transition to a smarter, more flexible energy system.

We are committed to enabling a just transition, leaving no-one behind on this journey. Embedding energy assets within our communities is a key enabler of this. The public, private and third sectors come together in the West Midlands through the Energy Capital partnership to work to achieve this. We truly value the power of partnership and see LEMA as an important route to helping the market overcome the barriers we still face.

As a representative of place, we are particularly interested in ensuring the role of place in delivering the strategic vision is not overlooked: it is where problems are felt and people come together to implement solutions.

A clear area where businesses need to come together to offer one another solutions is energy and housing. We cannot continue to build new houses that will need to be retrofitted in addition to the huge challenge we already face in decarbonising our existing housing stock. How to bring these parts of the market together economically and deliver sustainable communities is a huge challenge. This is a key area that we will be seeking to address in developing the Place-based Common Interest Group work package over the coming year.

KEY INSIGHTS

3.

THE LEMA SUMMIT REPORT

3.1 INTRODUCTION

Decarbonising supply is one aspect of the energy transition; a second is decarbonising demand; a third is the growth in data centre demand. All three have an impact at the grid edge, the first through local generation, the second through the electrification of heating and transport, the third through the hyper-local concentration of demand. Whereas decarbonising supply is mostly in hand, the ***grid edge challenge*** is not and needs to become the primary focus of attention.

This is not just a grid problem: it also depends on consumer participation. The assets needed to decarbonise demand, and provide the flexibility needed to resolve it, will be largely owned by consumers, not large businesses. This brings a combination of challenges: financial, complexity, trust, maintenance, reliability. Success will depend on ***putting the consumer perspective first***, a driving philosophy behind LEMA.

LEMA is ***an industry initiative***. The operational benefits of SLES have been demonstrated several times, but not their commerciality. This is a business challenge best tackled by industry itself through collaboration to develop the market and build their revenues. LEMA is thus not about lobbying: it is about collectively identifying pragmatic commercial 'minimum viable propositions' capable of operating now in the current environment.

LEMA is therefore unique in that it aims to combine multiple perspectives on a collaborative business basis. This first Summit aimed to demonstrate how.

> *"The last mile is becoming the first mile[1]."*

[1]First used by Peter Hermans, CTO Stedin 2015 – 2020, now DGA at VALCRE BV.

3.2 REFLECTIONS ON THE KEYNOTE SPEECHES

Patrick Allcorn, Head of Local Net Zero at DESNZ

Patrick opened with an honest and genuine stance: ***"government doesn't always have the answer"***. The Summit therefore seems the perfect place to listen to industry experts share their challenges and discuss potential cross-sector solutions.

The current situation with individual projects and individual capital is not viable. It doesn't mirror what investors want to see, nor responds to what is needed to achieve net zero. Labour's manifesto has put ***an emphasis on local plans*** and made clear that it recognises the importance of designing and developing strategic investment opportunities. It also believes integration between housing, transport and energy systems is needed.

For a flexible market to work efficiently, a ***whole system approach*** is needed to effectively balance demand and supply, its golden thread enabling both communities and places to get to net zero. To thrive, LEMA needs to find the right narrative: there is not one universal fairness. LEMA needs to be disruptive, be clear on the different ownerships involved and develop an evidence-based approach.

With the many challenges the UK model faces – for example, communities lacking capability and capacity, Patrick recommended learning from different models in the EU.

Nigel Bessant, Head of Network Operations, SSEN

Nigel highlighted the role the DNO must play in smart local energy systems. To decarbonise the network a DSO must be linked to wider business and coordinate with other energy groups. Only then would multiple organisations be able to provide services to local communities. This requires investment, such as in developing very specific skill sets, such as power system analysts and electrical engineers trained in networks.

SSEN believes that delaying investment would not only delay the transition but also cost a significant amount of money: they estimate that the social cost of delaying the connection of a house for a year can be as high as £400,000/MW, in addition to the costs of delay incurred by the property developer. They are therefore bringing forward their investment plans at their own risk.

Part of this is gaining a better understanding of the data needed to build a network and to find ways for communities to participate in the networks. Thus, their role aligns with LEMA's aims to add social benefits, ROI, capability building, and deliverability.

3.3 EUROPEAN PERSPECTIVES

Grid viewpoints - Huub Saris, from Energie Nederland[2] set the scene with a disturbing perspective on the Dutch electricity grid illustrated by maps showing the level of grid constraints across the country.

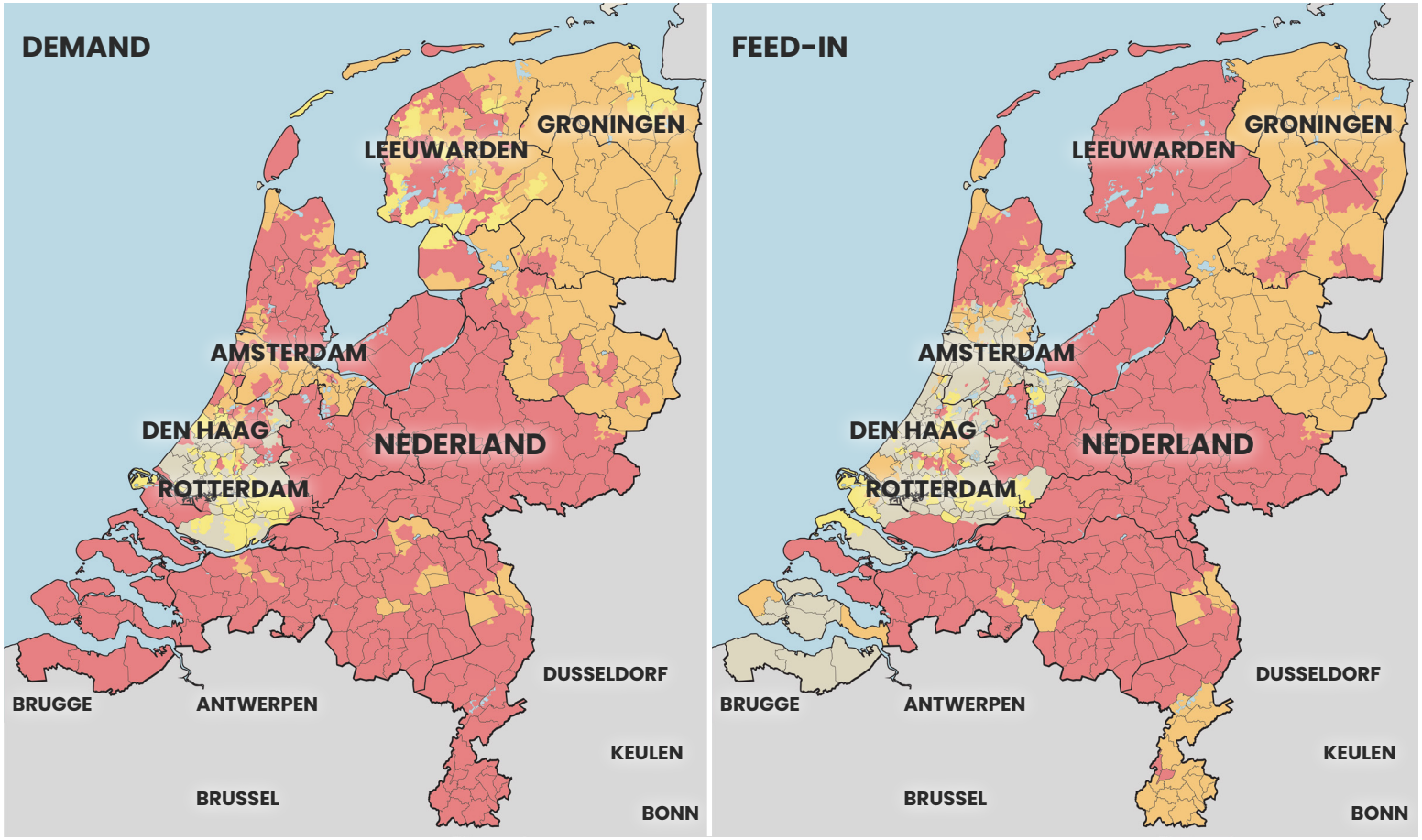


Figure 1: Dutch Electricity Grid Constraints - Energie Nederland presentation for the LEMA Summit 2024

[2]Energie-Nederland is the trade association for parties that produce, supply and trade electricity, gas and heat

In the residential sphere The Netherlands currently has ***9,500 houses waiting to be connected to the grid***, whilst ***7,500 want to feed into the grid*** with a total of 3.6 MW.

Grid congestion is a great burden on the energy transition making the economy static as new companies can't expand and might even lose contracts as they can't promise on net zero nor carbon neutral plans. All of it costs between ***2.5 to 15,000 euros per MWh*** which makes a total of ***40 billion euros of lost value annually***.

The production of wind and solar in a system that wasn't ready for these renewables due to inadequate investment has contributed to the congestion problem. Congestion concerns high and mid voltage but also domestic. It is now very difficult for businesses to be flexible, and consumers are asked to act paradoxically and turn off their solar panel when there's a lot of sun so as to not add to the congestion problem!

The lesson was clear: the economic consequences of not leading the challenge with timely investment is very significant.

Andrew Roper DSO Director, SSEN

On day 2, following on from Nigel Bessant's comments on Day 1, Andrew Roper responded to the Dutch experience by first showing how SSEN is responding to the congestion challenge.

He also noted that their role in local growth fits with LEMA's aims to add social benefits, ROI, capability building, and deliverability.

SSEN is promoting to Ofgem the value in reinforcing the need for strategic investment for the long term as well as flexibility. NERA recently reported:

> To provide a sense of the possible economic benefit of avoiding these delays, our (NERA) preliminary estimates suggest that if strategic investment could prevent delays as a result of insufficient network capacity and reduce the time to connect for 10 per cent of new connections by as little as one year this would create a societal benefit to SSEN's customers on the order of £568 million by 2030 and £1.1 billion by 2050.

The dilemma is getting the timing right. Energy demand is still falling, as shown below:

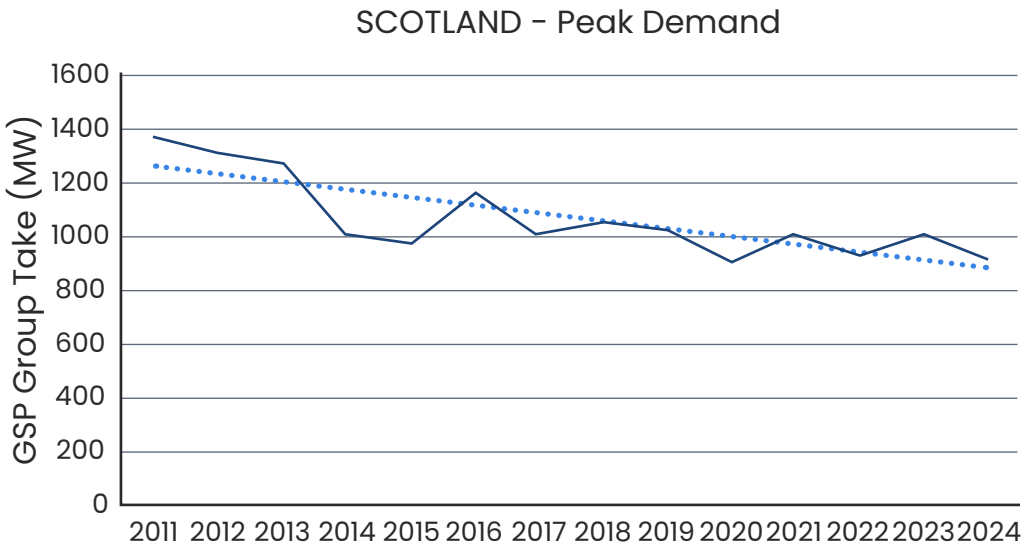


Figure 2: Scotland Peak Demand - SSEN DSO In Action presentation for the LEMA Summit 2024

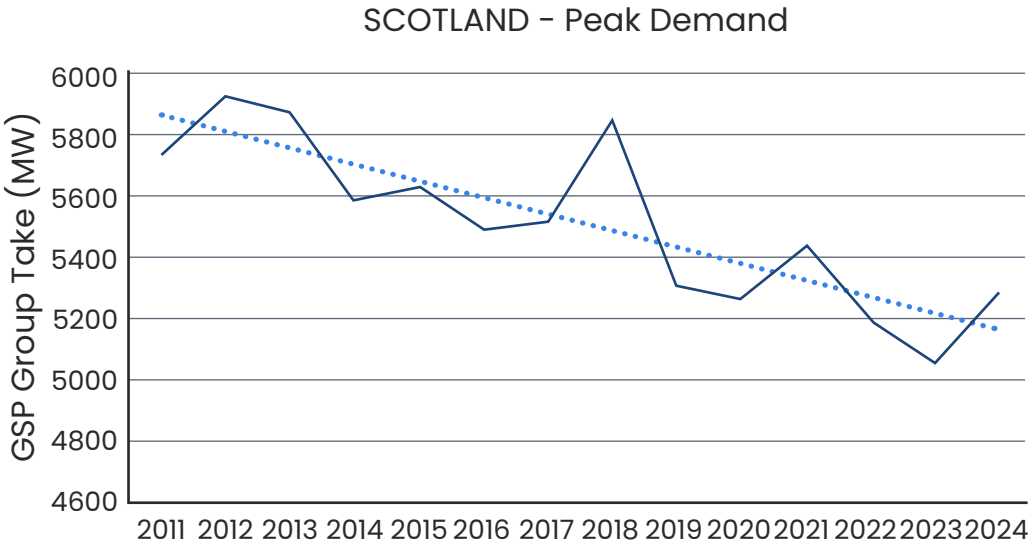


Figure 3: South Peak Demand - SSEN DSO In Action presentation for the LEMA Summit 2024

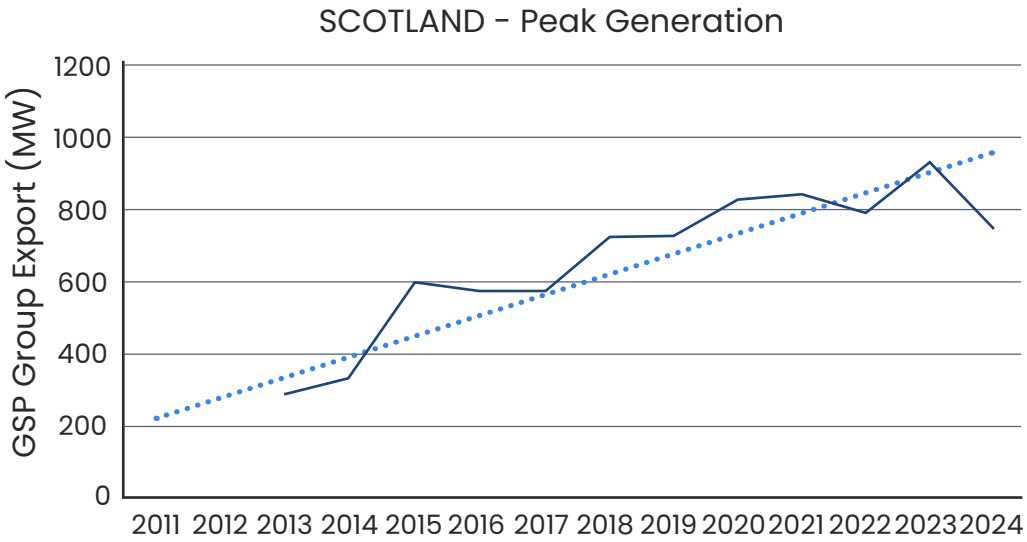


Figure 4: Scotland Peak Generation - SSEN DSO In Action presentation for the LEMA Summit 2024

However, as the Netherlands has shown consumer demand can build far more quickly than the infrastructure required can be built. SSEN is developing plans now for delivering in an uncertain environment. Hence the value in what LEMA is proposing with the Dynamic Load Averaging Contract to get ahead of the problem and buy time for strengthening.

Regulatory perspectives - Michael Villa, Executive Director of smartEn outlined 3 main European challenges:

- ***Congestion*** as illustrated by Huub Saris.
- ***Delays*** in new grid connections.
- ***High fluctuations*** with renewables creating peak and negative prices. In Belgium, ***30%*** of negative prices happen during the weekend.

There are increasing systemic costs as well as high up-front costs despite some subsidies to help find solutions. However, only 3% of current assets are activated leaving ***200 GW of flexible assets not activated***. The cause of most congestion is that new renewables rarely take account of the impact on the system - nor how flexibility can help solve this. There is a need to at least activate what's already there.

There is an opportunity to demonstrate that SLES can contribute to addressing the three main challenges above. The UK and the Netherlands could be innovation hubs whose results could be used as a reference scenario for the EU.

For example, in the Netherlands, the use of communities to solve these challenges has brought positives:

- Energy communities are perceived as solutions.
- DSO and municipality are initiators of communities.
- Consumers are willing to engage in these communities as they receive reliable energy.

In response, **Dr Jeffrey Hardy, representing Ynni Cymru (Welsh Energy)** started by saying their objectives are to ***accelerate*** the transition; to have ***renewable*** ownership targets; and to ***optimise efficiency*** in a fair way.

One of the biggest challenges they face is to know how to establish LES in communities that have never engaged with energy.

Jeff also outlined 5 other problems that they face:

- ***Limitations*** in realising the value of distributed energy.
- ***Market rules and governance***: it is not in the suppliers' interest to work locally.
- ***Limitation in innovation***: there is no possibility of changing a plan once a project has been accepted
- ***Supply dominated*** *system.*
- ***No vision*** nor clear responsibilities for the future energy system.

Implementation perspectives - Luisa Matos, CEO Cleanwatts, explained how in Portugal they can enable community energy sharing. They engage with commercial end users to install solar panels and share surplus generation with local energy communities within a specific distance (within 2km for high voltage or 4km for medium voltage). Batteries are increasingly being used to help optimise the use of solar.

Benefits come first in their vision. Cleanwatts provides investment with stakeholders not obliged to invest. They provide clean, local and cheaper energy to consumers without inconvenience (flexible contracts, no paperwork with a 2-invoicing process). They're offering a "***win-win-win solution***": good for consumers, viable for investors and benefits in local communities.

The Cleanwatts solution is in demand. They have ***24 licensed projects*** with ***70MW backlog*** to deploy.

Cleanwatts is not creating a solution to replace the DSO, but to complement them. They are currently working on a project in the UK with NPG to manage their congestion problems.

Heather Steel, Finance Director, SMS & Metis then outlined how they are working to demonstrate how social balance can be achieved by flexibility.

She noted that 5% of social landlords are looking to deploy assets and this is their initial market focus.

On the consumer side, Metis is trying to find a workable solution. In Europe subscription models work: for example, Enpal in Germany is offering a 20-year subscription model. However, in the UK, consumer hire rules, originally set by the FDA to govern TV rental, states that after 18 months, the consumer can decide to leave, with the supplier having to pay the associated costs to remove the assets from the house. This is clearly inappropriate for low carbon technologies.

So, whilst there is an appetite from consumers and there is evidence that the subscription model works well, the main challenge in the UK is taking account of consumer hire laws.

Day 2 summing up - A fascinating set of observations starting with the salutary warning from the Dutch market, and how SSEN recognises this and is working to mitigate it. On the regulatory side there is a wide range of issues to be faced with much to learn between the EU and the UK: e.g. how energy sharing works in the EU. On the other hand, whilst several EU countries are slow to adopt new legislation the UK is much freer and therefore should be more able to make quick improvements.

Most importantly, it was encouraging to see how Cleanwatts and SMS are getting on with tackling the issues now.

3.4 ROUNDTABLE DISCUSSIONS

The LEMA Summit offered a unique opportunity to bring attendees together to take part in focused roundtable debates and discussions. Our delegates placed laptops and phones to one side, and across four marshalled discussions, faced each other in a round circle of senior figures and decisions makers across the value chain for Smart Local Energy Systems in a Net Zero Energy System.

In this section, we reflect on the discussions and outcomes of each of the four Roundtables:

Roundtable 1: Consumer First - Attendees first discussed how trust is important and should be thought of at different levels:

- At the start with decision makers and stakeholders.
- With the consumer, possibly with strong branding generating an aspiration to find such a home.
- Trust should be maintained throughout the consumer's journey by providing transparent evidence.

Good advocates, both top-down and bottom-up, will be needed to help build trust, for instance:

- Local authorities and Parish Councils (although they will require training);
- Examples of successful neighbourhood systems on the ground;
- By suppliers and local communities collaborating to advocate for the LEMA proposition;
- A trusted advocate sitting in the middle of these stakeholders;
- As trust is lacking in the energy sector in general, there may be a role for LEMA to establish a Code of Conduct with its members.

Also discussed:

- The importance of properly understanding customer needs and not assuming them.
- Ensuring proper governance of the energy hubs.
- Understand the motivation and drivers for people to move to new properties: e.g. is value more important than energy saving? (energy efficiency is not in Rightmove's annual green report's top 5 decision to buy a house. However, only 6% of people disagrees with the statement "I would be willing to pay more for more energy efficiency homes".). Main drivers to retrofit homes could be through remortgage and green products.
- Better awareness and trust with EPCs is needed.
- Developers seem to put less emphasis on consumer trust as they chose place over developer
- New assets don't necessarily mean new complications if offered as a subscription service. Consumers already use subscription services routinely because they enjoy the simplicity.

With regards to funding:

- Cost of mortgages has a vital impact on people's decisions to buy a house.
- Need to think about how the infrastructure is funded to help stakeholders deliver;
- Possible appetite to have green home guarantees for the DLA;
- Risk sharing should be part of the proposition. Housing associations could perhaps share the risks with the funders, if they see the added value to their portfolio.

Finally, it was recommended that the LEMA proposition should:

- Be simplified;
- Be co-beneficial;
- Have a sense of place;
- Build in AI;
- Have different narratives depending on each cohort;
- Add a social value to show its wider benefits (e.g. health and CO2).

Philip Lewis – LEMA Management Team (The Traxis Group)

Roundtable 2: DLA – In this roundtable, delegates discussed one of the unique solutions that LEMA is developing – Dynamic Load Averaging – to expedite new housing estate connections with Low Carbon Technologies (LCTs – solar, batteries, heat pumps, EV and EV charging) to congested power grids – Dynamic Load Averaging.

Petter Allison, Director Traxis, chaired this Roundtable, and recapped on the work done to date led by SSE Networks and supported by ElectraLink data, with input by LEMA Members at the Common Interest Group (CIG) meetings held at Gemserv. The CIGs identified the problem statement as how to contract with a DSO to control the load "behind the substation" for a new housing estate connection in a congested grid area, before the estate is built, by controlling load "behind the substation".

This novel contract approach would need to satisfy the DSO that the connection is viable and safe, provide certainty allowing the property developer to build, and provide for payment by the DSO to support the operation of the service (and indirectly the economics of the adoption of LCTs by households), in the years before DNOs can deploy capex is for power grid infrastructure improvements.

The Roundtable was then opened for discussion, with opening remarks delivered by Nigel Bessant, Head of Network Operations, SSE.

Nigel said that the DLA concept was seen by SSE Networks as an effective means of releasing network capacity. He described the work ahead as "how to take the DLA concept into effective, efficient, scalable reality", requiring:

- Proof that it works – initially by counterfactual modelling.
- Determination by DSO on the contract form and contractual approach.
- Agreement on valuation.

Dan Hopkinson, CEO ElectraLink, then spoke to say that they were working on an offering to be the "data-spine" for the DLA service, providing a "credentialled passport service" to access the required industry and other data. The data requirements would be for pre-build DLA modelling, and post-build DLA operations.

Whilst Nigel Bessant was confident that the DLA could be developed as a generalised, scale business-as-usual solution, others raised questions around regulatory barriers and opportunities, in particular around the microgrid export cap, and the lack of a home-to-home electricity sharing model in the UK.

Luisa Matos, CEO & Founder of Cleanwatts, outlined the additional opportunities available in Portugal, where their 1MW export cap is mitigated by an ability to export up to 2km away on the LV network, and 4km on the MV network. This allows Cleanwatts to include in their local neighbourhood / village energy systems approach, nearby "anchor tenants" such as business parks and renewables generators.

There was general agreement that some form of energy sharing and export opportunities could improve the economics. When asked about the economics and value of a DLA, Nigel Bessant said that it is important to understand that there are sometimes "hyper-localised" features, so that the value of mitigating congestion could vary widely. The Roundtable discussion concluded that congestion is only likely to increase in the next years, with the Netherlands as an important "early-warning" of the consequences.

Petter Allison – LEMA Management Team (The Traxis Group)

Roundtable 3: Data & Platforms - The Hub discussed the high-level principles of the data exchange environment to be established to enable Smart Local Energy Systems. We introduced the concept of federated dataspace architectures allowing each LEMA partner to contribute to a SLES project with their own data platform environment while enabling near real-time data exchanges between them.

We discussed the need to define proper governance framework for data exchanges as well as the need to select proper interoperability standards. Some participants highlighted the need to align with current DESNZ initiatives for data sharing and automatic asset registration as well as key standards as defined through the PAS1878 for Energy Smart Appliance interactions with Demand Response Service Providers. Key standards such as OpenADR4.0 as well as Matter 1.4 seem relevant for the Uk market.

Key points arising were:

- Interoperability standards should be able to evolve with time to avoid any lock in effect.

- It is important to remain in an Agile development mode starting with a Proof of Concept Minimum Viable platform and new services such as the Dynamic Load Averaging or Virtual Lead Parties as defined through the new Ofgem P415 regulation.

- Consumer consent should be central to the architecture. The Local operating company should be in charge to ensure needed permissions for data access through the various interconnected platforms.

- All technology stacks should be cloud native, favoring real-time cloud to cloud interactions through interoperable APIs.

- The platform should provide clear definitions of underlying operating asset data, keeping the option to appoint different Virtual Lead Parties to different assets.

- The core platform functionality should be designed around counterfactual and active performance monitoring of Dynamic Load Averaging Services.

Laurent Schmidt – LEMA Management Team (The Traxis Group)

Roundtable 4: Deploying Smart Local Energy Systems on the ground – how to manage & govern local operating companies? - This roundtable tackled the challenges, strategies, and solutions essential for deploying Smart Local Energy Systems and the demands on local operating companies. Chaired by Gavin Beresford, COO of the Local Energy Markets Alliance, with leading insights from Tom Woolley of Metis by SMS and Luisa Matos of Cleanwatts, the discussion spanned key areas: skills for rollout and maintenance, customer engagement, lifecycle management, trust-building, and cost considerations.

Key Challenges and Focus Areas.

Exploring some of the challenges that might face SLES deployment and operating companies, the group circled upon these key points of focus:

1. **Navigating Customer Protection Laws:** Laws spanning housing, banking, and energy present complexities, particularly across regions like Great Britain and Europe. Understanding these differences is critical for smooth implementation.

2. **Ensuring Customer Choice:** A one-size-fits-all model won't work. Tailored propositions that address diverse customer needs and behaviours are essential but add delivery complexity.

3. **Demonstrating Benefits:** Customer buy-in relies on clear economic benefits. Since regulatory frameworks don't mandate tenant participation in SLES agreements, compelling value propositions are vital.

4. **Coordinating Stakeholders:** Effective stakeholder management requires simplified customer touchpoints, consistent governance structures, and clear quality and performance expectations across the supply chain.

5. **Mitigating Reputational Risks:** Sustained customer satisfaction within SLES developments is critical. Dissatisfied customers could undermine the broader viability of SLES and its associated concepts, such as Dynamic Load Averaging.

Essential Steps and Solutions.

With the key challenges in mind, the Roundtable turned to essential steps and mitigations in preparing for SLES deployment on the ground. Participants focused upon:

1. **Workforce Surveys & Upskilling:** Identifying skill gaps and training local authorities, councils, housing associations, and developers in energy and SLES expertise.

2. **Lifecycle Management:** Adopting a lifecycle approach to manage customer relationships. Cleanwatts highlighted their experience in community energy-sharing projects in Portugal as a model.

3. **Building Trust:** Early trust-building with both customers and investors is crucial. Cleanwatts' "Energy Ninja" ambassadors exemplify local engagement and customer flexibility within energy agreements.

4. **Performance Assurance:** Guaranteeing performance through active monitoring, real-time data insights, and ensuring freedom of choice for customers.

5. **Cost Reduction:** Reducing installation costs is key for scalable rollouts. New builds provide an ideal starting point, with retrofits following to address existing housing challenges.

6. **Governance:** Robust governance frameworks will ensure accountability among all SLES participants.

Next Steps

Insights from the roundtable will inform LEMA's Place-Based Common Interest Group, shaping critical workstreams and advancing the deployment of SLES.

Gavin Beresford – COO of LEMA (Gemserv)

3.5 SUMMATION

Overall, the Summit demonstrated:

1. A strong endorsement of LEMA's purpose, approach and leadership.

2. The validity of the solutions being developed by the LEMA IPTs.

3. A can-do attitude amongst delegates together with a desire to make things happen and turn this into tangible actions.

The new government's drive to accelerate the energy transition creates a welcome urgency and important opportunities, but also a significant risk, as demonstrated by the Dutch experience.

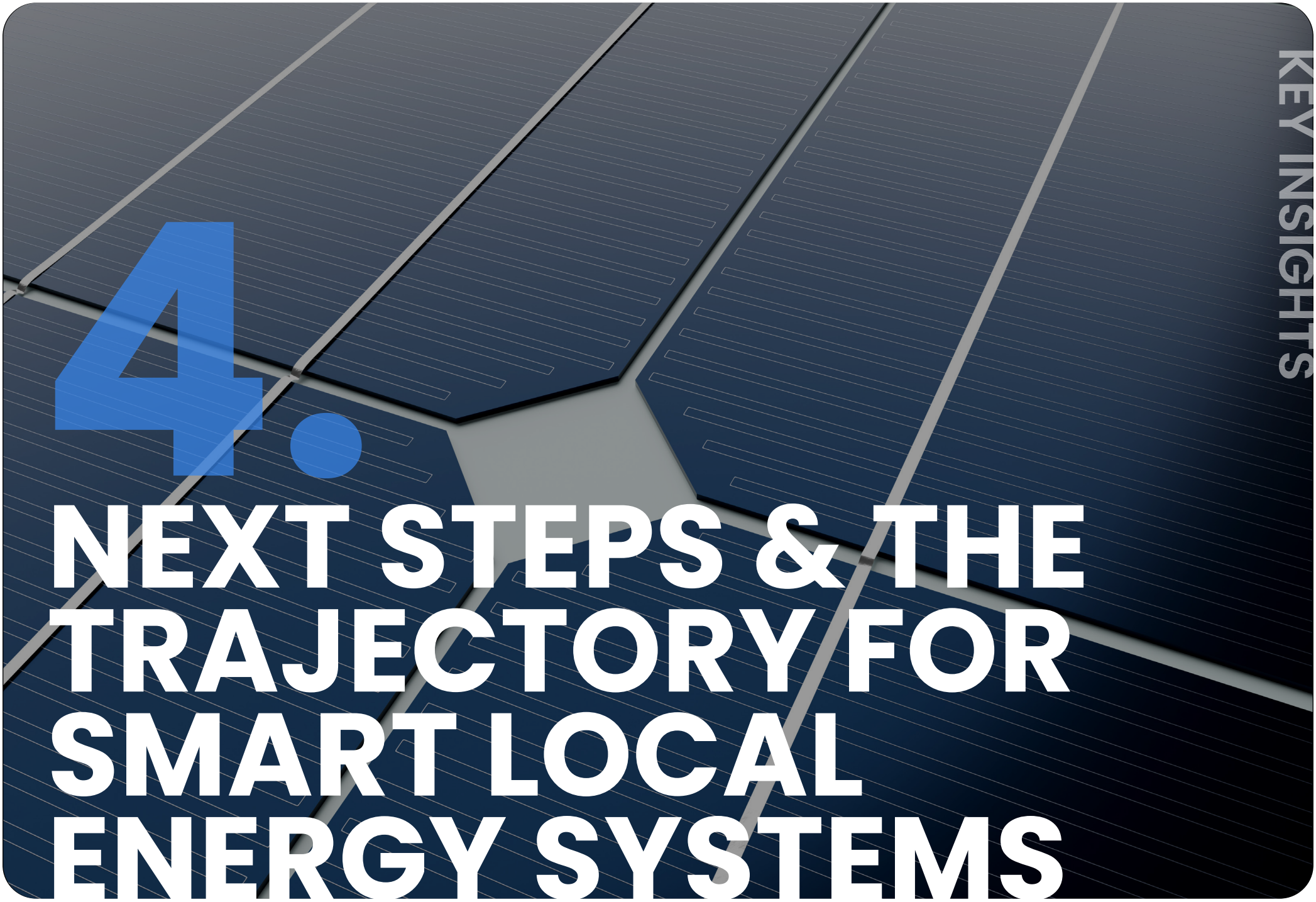
There is an absolute need for a whole system approach that encompasses the grid edge alongside achieving net zero supply. In the determination to concentrate on large scale top-down initiatives that are relatively straight forward to deliver, there is a substantial risk of overlooking the necessity and contribution that consumer focused, bottom-up measures can provide, particularly in buying time and leading the problem.

Encouraging shared community energy systems that maximise the self-consumption of local renewable generation and storage is an important part of a successful net zero grid programme. It increases the level of renewables, reduces the scale of infrastructure required and could generate increased consumer backing.

Delegates saw that LEMA could provide the required leadership and collaboration needed to address the complexity of such an undertaking through local authorities and industry working together to take on and simplify the 'local energy burden'.

In doing so, LEMA could help translate Local Area Energy Plans (LAEPs), which primarily address the technicalities of energy systems, into **Neighbourhood Energy Action Plans** that deliver on the ground by including consumer, place and commercial considerations.

A final thought was that the neighbourhood approach LEMA is championing is perhaps a better description of a SLES: i.e. a **Neighbourhood Energy System**. The term 'smart' can too often be seen as an oxymoron.



4. NEXT STEPS & THE TRAJECTORY FOR SMART LOCAL ENERGY SYSTEMS

4.1 A THREE PHASE PROGRAMME

LEMA's purpose is to create an Enterprise or Transition Market as a route to a mass market for smart local energy systems. We see this as a three stage process: this first year is about establishing LEMA, the next 2 are about transitioning to the mass market through a programme of development and delivery projects that stimulate the market and build the initial grid-edge energy infrastructures. The third stage is about consolidation, refinement and replication.

By Year 5 (2028) we expect the early-stage mass market to be developing and our work to be overtaken by the market itself. By 2030 Neighbourhood Energy Systems should be a standard element of the grid contributing significantly to both the Net Zero Grid and the new homes building (and connection) ambitions.

4.2 MEMBERSHIP

Today LEMA has 15 members including Traxis and Gemserv with, following the Summit, at least another 15 in the pipeline. the benefits of joining LEMA are primarily accelerating your time to market, exposure to new business opportunities and building new business relationships.

LEMA is also looking at ways to co-ordinate access to funding and investment opportunities designed to fit members' needs.

To become a member get in touch at: www.lema.energy

4.3 EUROPE

LEMA was established as a Europe-wide proposition. As local relationships are fundamental to the collaboration, each country or region will need to have its own arm of LEMA. We chose to start in the UK and if this works to look towards establishing the next 'arm'.

A number of European businesses have expressed interest in helping us to do this and over the next 6 months we will be talking to interested parties and considering how this should be tackled. In the meantime, we are establishing an informal "Support Partner" status with smartEn where we will support each other's work and share knowledge and information.

4.4 SHARED ENERGY

Consumers are at the heart of our vision, and it feels that we need to not repeat the mistakes of smart meter programmes around the world in how they addressed consumers – and oversold the 'smart' concept devaluing the word in the process.

Instead, the concept of 'shared' energy seems much more powerful, consumer focused and relevant to the collaboration we believe is essential to this market.

5. ABOUT LEMA

5.1 FOUNDATION MEMBERS 2024

5.1 REGULAR MEMBERS 2024

Capgemini

UrbanChain

CARBONLACES

GREATER LONDON AUTHORITY

west sussex county council

5.2 ABOUT THE LOCAL ENERGY MARKETS ALLIANCE LTD

The Local Energy Markets Alliance (LEMA), founded by The Traxis Group and Gemserv, is a business-led initiative to develop commercial market solutions and scale the delivery of consumer-facing local energy systems.

There are multiple local energy system pilots and demonstrators but few fully commercial developments. Our aim is to get beyond this stage. It is mainly a commercial rather than a technical challenge and is for businesses that want to take the initiative.

LEMA's comprises of members hailing from diverse backgrounds within the energy industry including consultants, housing developers, suppliers, law firms, local councils and more. Together we will navigate the complexities of the Local energy Markets and create impactful and sustainable solutions for Smart Local Energy Systems.

With like-minded businesses focused on commercialising Local Energy Markets across Europe, the Alliance is a unique opportunity for businesses to commercialise their innovation through engaging, connecting and collaborating with organisations that have complementary capabilities and parallel interests, to build a commercial marketplace.

The Alliance spans the entire Smart Local Energy System market value chain. It offers different tiers of membership based on size of organisation and level of involvement. It includes members from across Europe responding to development opportunities. To find out more about the benefits of joining LEMA, visit us a lema.energy.

THE TRAXIS GROUP

LEMA
Local Energy Markets Alliance

Our Purpose is to accelerate the adoption of efficient low carbon developments at scale on constrained grids. In doing so we expect to be able to:

- Make low carbon homes attractive for households and investors.
- Alleviate the impact of grid congestion by pooling local flexibility.
- Create a market place for Shared Local Energy Systems and associated financing.

We offer to:

- Create new consumer focused revenue models for the installation and operation of shared local energy systems.
- Conduct grid planning and impact analysis to help specify and optimise energy assets in and around new developments.
- Provide an AI enabled federated environment for Dynamic Load Averaging service operations and interactions with Virtual Lead Parties/Flexibility Service Providers.
- Assist in tackling the place-based energy burden of financing and planning of net zero and accelerated development targets.
- Provide Active Business Performance Management maximising, proving and communicating the energy efficiency and carbon accounting of Shared Local Energy Systems.
- Support the development of financial structures to attract private capital by providing expert commercial energy advice to investment funds.

We are developing a range of tools to support these activities including:

- DLA Planning & Baseline Modelling (Grid Impact analysis).
- DLA Real-time Management (Grid Congestion visibility & remedial activation).
- Active Business performance and emissions tracking of the LEMA market framework.
- A data exchange environment.

You can contact us by emailing:
simon.anderson@traxisgroup.com

Gemserv provides professional services and solutions to some of the world's leading organisations and public authorities. As part of the Talan Group and a dynamic global business network, we offer combined capabilities in Consultancy Services, Governance and Compliance, Cybersecurity, Data, Digital Transformation, Energy Sector Services, Project and Programme Management.

Experts in managing complex market arrangements and regulatory compliance within the energy sector, Gemserv manage regulatory and industry codes, such as the Smart Energy Code (SEC) and the Retail Energy Code (REC), to ensure compliance and efficient operations. Additionally, Gemserv manages the implementation and governance of Smart Meter Systems to improve energy efficiency and consumer experience.

Gemserv pioneers Net Zero solutions through expert design with expertise in emerging technologies such as hydrogen and electric vehicles.

As part of the Talan Group, Gemserv has enhanced services with additional digital, data, and programme management capabilities, ensuring a comprehensive approach to addressing client needs.

www.gemserv.com


KEY INSIGHTS
6.
SUMMIT
CONTRIBUTORS
Compressor
37%
Maintenance Periods
Alarm history
Cooling tower
22%
Maintenance Periods
Alarm history
Expasion device
59%
Maintenance Periods
Alarm history
Brine level
75%
Maintenance Periods
Alarm history
Water level
81%
Maintenance Periods
Alarm history
System monitoring
B01-224
A01-223
BZ04-875
A01-225

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CEO LEMA

Dr Jeff Hardy –
Director of Sustainable Energy Futures Ltd

Francine Peyroux-Sissoko –
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Miriam Atkin –
Co-Founder of LEMA (Executive Director at Gemserv)

Philip Lewis –
LEMA Management Team (The Traxis Group)

Cheryl Hiles –
Director, West Midlands Energy Capital

Gavin Beresford –
COO of LEMA (Gemserv)

Laurence Carpanini –
LEMA Management Team (The Traxis Group)

Tom Woolley -
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Executive Director at smartEn

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Patrick Allcorn –
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LEMA
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GET IN TOUCH??
lema.energy