## Conclusions

As The National Grid's Futures Energy Scenarios 2018 notes, "the more decentralised a system is, the more its supply and demand assets are linked to local networks and processes. Local energy solutions are developed to meet local requirements."

Recognition that each place has its own combination of energy assets, challenges, capabilities and purposes is key. What drives one area, may not drive another, and that purpose can only be determined locally. Clearly local authorities would play a key role be that as an enabler, an advisor or as an investor.

This requires a governance system that is designed from the bottom up, with a greater role in the system and its governance for local actors, be they increasingly prosumers, collective local groups, or local authorities acting strategically for their place.

Therefore, energy system governance must change, and place, and the representatives of place, must have a significant role in the design and use of the new energy governance.

We recommend BEIS now commission a programme of work that is led by local leaders, involving Ofgem that creates the necessary governance for a DE system.

To reinforce this energy transition, government funding and support must give greater priority to place based, rather than technology based, solutions, including an overt role in the transition for local authorities.

The government's Construction Sector Deal and Buildings Mission 2030 provide an opportunity to focus housing and construction on the benefits of building to the right standards so as to secure high energy efficiency, built-in energy harvesting capability, and support the prosuming households of the imminent future.

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# A Decentralised Energy Future for the UK

## Introduction

Here, we offer a new vision for the future of the UK's energy system. We look to create a bottom up, decentralised energy (DE) system that can provide the great majority of citizens with an economically positive, everyday energy experience. This pamphlet is drawn from an accompanying essay collection in which our authors seek to explore the challenges and opportunities of such a decentralised energy future.

## The vision

**– built on the systemic principles of:**

(A) Generating energy as close to its use as possible
(B) Maximizing the local benefit of energy infrastructure
(C) Efficient use of energy

Together they give us the concept of Near Net Neutral – be that a home, commercial building or collections of homes and buildings in places, large and small, that seek to minimise their energy demand, and maximise their 'own' energy production.

In support of this, the vision proposes that energy harvesting, capturing thermal, light, and kinetic energy, should be a key driver for the development of local energy infrastructure, particularly making the most of the harvesting potential of all forms of building.

## The challenge

**– our authors highlight some of the challenges to be addressed. These include:**

- Ensuring the future energy system is, as Nicolette Fox rightly says, "an everyday experience for everyone"
- The need to be led by customers and citizens
- Reflecting the experiences of users who have not been immediate beneficiaries of DE to date, yet must be included
- Acknowledging the inherent variety of the UK means locally-led approaches to realise the social and economic benefits
- Avoiding edict, i.e. Not a centralised approach to decentralisation
- Showing the societal and economic benefits to each and every community
- Taking the opportunity to design out fuel poverty

## The household and the home
**– the new driver of the energy system**

Hardy explores the future for consumers, be they an active or a passive participant in a system that will inherently be more local, while also prompting greater flexibility from consumers in their own energy use. Consumers could deal directly with others, trading to secure their best benefit. They could work collectively to form a local energy system, exchanging between members for mutual benefit; or they could decide others are better placed and opt for the support of an energy lifestyle services company, which handles everything. Trusted use of data will be a key part of realising the potential of this vision. The grid is a connector and an insurance policy (paid up) for times of need.

Kelleher shows the potential of our future homes as technology develops for buildings as harvesters, stores and sources of energy, taking an integrated approach to heat and power needed in the home. Built and improved to the right standards, of energy efficiency and harvesting, homes will come to offer people living in all tenures the opportunity to benefit with the potential to save and make a return, while reducing fuel poverty and transforming the construction sector.

## Local active energy
**– a greater role for local assets**

Skarvelis-Kazakos highlights the active balancing of the system in real time, over-time, with smart systems, sensors and meters that allow a much greater understanding of how the local energy system is operating; with local storage (including electric vehicles) to provide a 'sink', while managing energy generation to match demand over time. While some flexibility will be autonomous, incentives will guide customers in the timing of their energy use.

Adams and Gluyas explore how DE systems allow a more creative approach to sourcing heat to reflect local circumstances, eg using mine-water heat, or moving to lower temperature system ($40^{oc}$ not $80^{oc}$+) with the benefits of lower cost and fewer emissions.


## Building blocks
**– places, local government and governance, bottom up**

Roelich highlights how recognising the variety of places is key to success as in every place there are different opportunities, resources, skills, capability, and experience, as well as different local reasons for supporting a decentralised system. These require support that values different contexts, each for what they are and want to become.

That suggests an approach that supports places before technologies; helping places deliver for their needs and motivations, as well as new ways of valuing the impact of new energy provisions.

Tingey and Webb highlight the key role local authorities would play, having a long-term commitment to place and a set of unique place focused powers. They can enable by setting standards, support integration between heat and power and different parties, while their advice can provide direction and opportunities for targeted action. And they can invest through energy performance contracting; municipally owned energy organisations; special purpose vehicles; or working with community representatives and enterprises.

Britton et al explore the need for governance that is people-centred, flexible and coordinated in its operation. That would, inter alia, require a greater input from local actors, particularly local government which could also take advantage of local governance changes across the UK. A people-led system would be one that is optimised for the prosumer, that acts on demand management, energy efficiency, treats energy related data as a public good, and has an even more active role for the local 'network', as a local coordinator, a local market facilitator, coordinator and balancer.