Imperial College London

Grantham Institute

June 2017

Society-led low carbon transformation

About the research

Our energy system – vital for keeping us warm, fed, entertained, mobile and productive – is changing. It is becoming cleaner and smarter, driven by environmental law, an explosion of data and rapid technological development. In the future, peoples' role as relatively passive consumers may end. This is because a future low-carbon energy system is more efficient and affordable if people consume energy when it is available, for instance, when the sun is shining and the wind blowing. There are also increasing opportunities for people and communities to take more control over energy, driven by the falling costs of technologies, like solar photovoltaic panels.

The cheapest future energy system is a smart and efficient one – the National Infrastructure Commission thinks a smart power system, where demand follows available supply, could save consumers up to £8 billion a year by 2030. This is a business opportunity for existing and new energy companies.

This study has centred on two potential future energy business models that put people or communities in control of energy. One model, 3rd Party Control, is where a company engages on your behalf in the energy system. The other model, Shared Economy, is where communities have come together to own and operate their local energy system.

During the research, energy stakeholders examined two futures, in which one or the other business models has dominated the market. They were asked "what would have to happen for this to be true?" Their answers give insight into: what is driving new business models; the issues they could face; and insight into the decisions that can be taken to enable new businesses to thrive. This graphic is a summary of the findings.

About the researcher

The study was undertaken by Dr Jeff Hardy, a Senior Research Fellow at the Grantham Institute – Climate Change and the Environment, Imperial College London. Jeff's research interests are around future low carbon energy systems, particularly how people will engage and what businesses will operate. Previously he was Head of Sustainable Energy Futures at the GB energy regulator, Ofgem, and Head of Science for Work Group III of the Intergovernmental Panel on Climate Change. He's also worked at the UK Energy Research Centre, the Royal Society of Chemistry, the Green Chemistry Group at the University of York and at Sellafield as research chemist in a nuclear laboratory.

About the Grantham Institute – Climate Change and the Environment
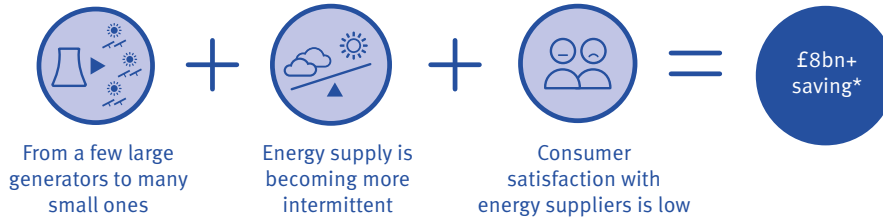
The Grantham Institute is committed to driving research on climate change and the environment, and translating it into real world impact. Established in February 2007 with a £12.8 million donation over ten years from the Grantham Foundation for the Protection of the Environment, the Institute's researchers are developing both the fundamental scientific understanding of climate and environmental change, and the mitigation and adaptation responses to it. The research, policy and outreach work that the Institute carries out is based on, and backed up by, the worldleading research by academic staff at Imperial.

www.imperial.ac.uk/grantham

Grantham Institute
Climate Change and the Environment
An institute of Imperial College London

You and your energy company in the low-carbon future

The UK's energy system is changing

From a few large generators to many small ones

+

Energy supply is becoming more intermittent

+

Consumer satisfaction with energy suppliers is low

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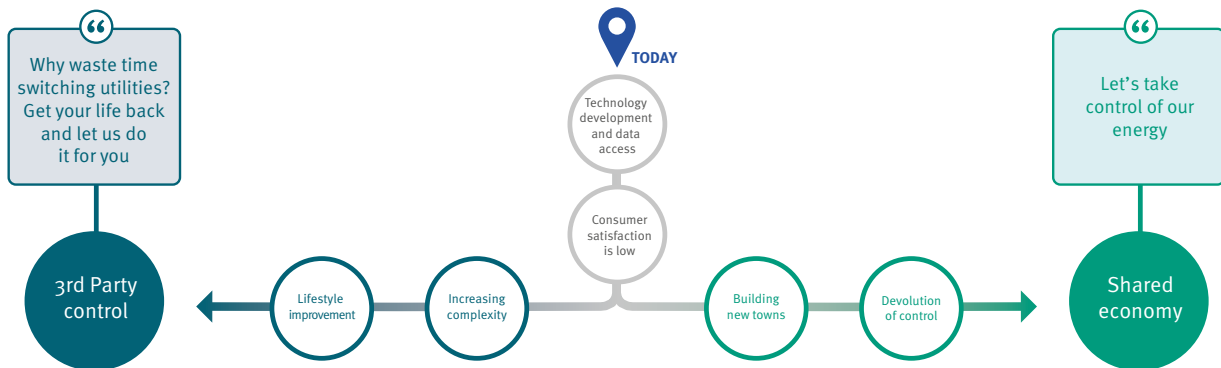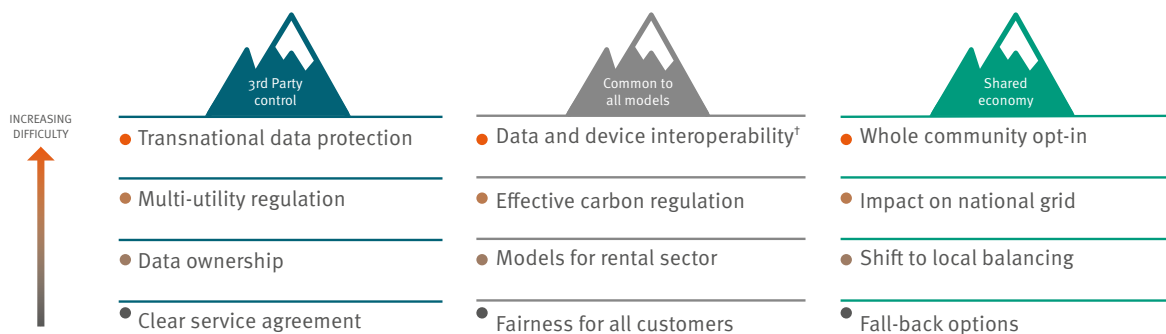£8bn+ saving*

This study examined two new future energy businesses that could address these issues

It uncovered common and specific drivers for these new energy businesses

"Why waste time switching utilities? Get your life back and let us do it for you"

3rd Party control

← Lifestyle improvement ← Increasing complexity

TODAY

Technology development and data access

Consumer satisfaction is low

Building new towns → Devolution of control →

Shared economy

"Let's take control of our energy"

Requirements for these businesses to succeed

INCREASING DIFFICULTY

3rd Party control
- Transnational data protection
- Multi-utility regulation
- Data ownership
- Clear service agreement

Common to all models
- Data and device interoperability†
- Effective carbon regulation
- Models for rental sector
- Fairness for all customers

Shared economy
- Whole community opt-in
- Impact on national grid
- Shift to local balancing
- Fall-back options

Take-home messages

Markets must enable business model innovation

Smart devices and data must be interoperable and secure

Service standards must be better

Solutions required for all consumer situations

Greenhouse gas emissions must be regulated

*For smart power alone, the National Infrastructure Commission estimate it could be worth up to £8bn a year by 2030
†Interoperability is the ability of computer systems or software to exchange and make use of information