October 2018

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Isles of Scilly, UK - Smart Energy Islands

European Union
European Regional Development Fund

Hitachi – a brief introduction

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Founded 1910, incorporated 1920, now 1,000 companies but with one mission:
Contribute to society through development of superior, original technology & products

■Others

■Smart Life & Ecofriendly Systems

■ Information & Telecommunication Systems

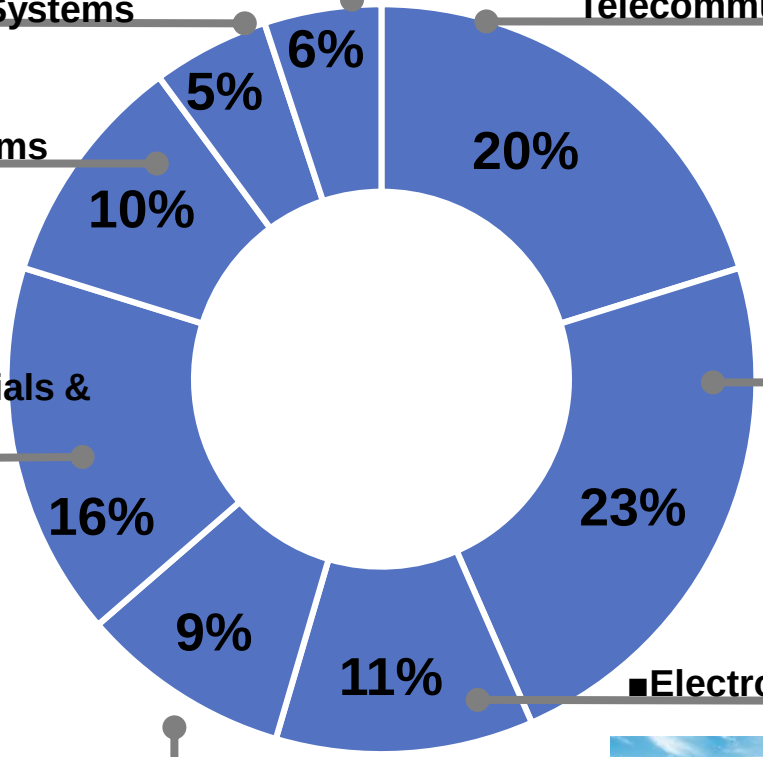
■ Social Infrastructure & Industrial Systems

■Electronic Systems & Equipment

■Construction Machinery

■Automotive Systems

■High Functional Materials & Components



The Isles of Scilly – a unique environment

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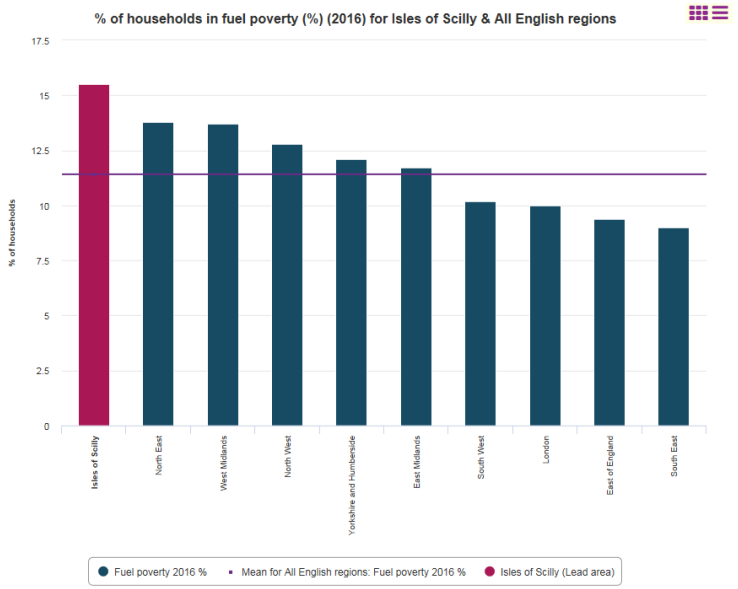
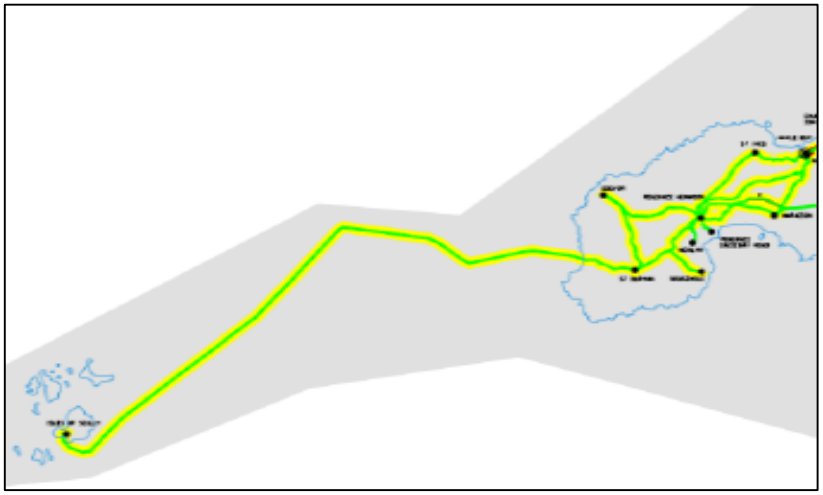
- 5 inhabited islands, of 200 rocks/islets, located 28 miles off the coast of Cornwall
- 16 square miles, 9 miles of main road, 2250 permanent population, 100,000+ tourists/yr
- Highly protected AONB, SSSI, MCZ, historic/scheduled monuments, etc.
- 95% owned by the Duchy of Cornwall
- Smallest unitary authority in UK

But with its own challenges

- Local authority area ranks 8th highest in England for fuel poverty.
- Highest home energy use in UK 6,610 KWh per house in 2014.
- High cost of imported fossil fuels.
- Local renewable generation less than 2% of annual demand.
- Ageing energy supply cable and constrained grid



Source:
Department for Business, Energy & Industrial Strategy



The Partnership

Aim: to enable the transition to a low-carbon, sustainable and resilient community on the Isles of Scilly.

Council of the ISLES OF SCILLY

DUCHY of CORNWALL

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islands partnership

TRESCO ISLAND

Aims, by 2025:

- 40% Lower electricity bills
- 40% Renewable supply
- 40% Electric/low-carbon vehicles

The Energy demonstration project

- £10m project, 80% EU funded, Smart Islands “foundation stone”
- Test multi-utility innovation; initial 0.5 MW gen and 0.3 MW storage
- Hitachi focus:
  - Cloud-based IoT platform connected to and aggregating in-home technologies
  - Mitigating curtailment of local renewables due to a constrained grid
  - Optimised energy use for heating, hot water, EV transport and storage
  - Social Innovation, through shared community benefit

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moixa

passivSYSTEMS

The (EV) Transport demonstration project

- Establishing a Grid-optimised Community Car-share system
- 10 vehicles, 10 solar canopies 25 Chargers (with V2G capability)
- Hitachi focus:
  - Electric Vehicles as part of the optimised islands energy system
  - Renewables optimised charging, with vehicle to grid (V2G)
  - Supporting the shift from owned fossil fuel, to shared low carbon
  - Social Innovation, through shared community benefit

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CIOS LEP

Smart Energy Islands project

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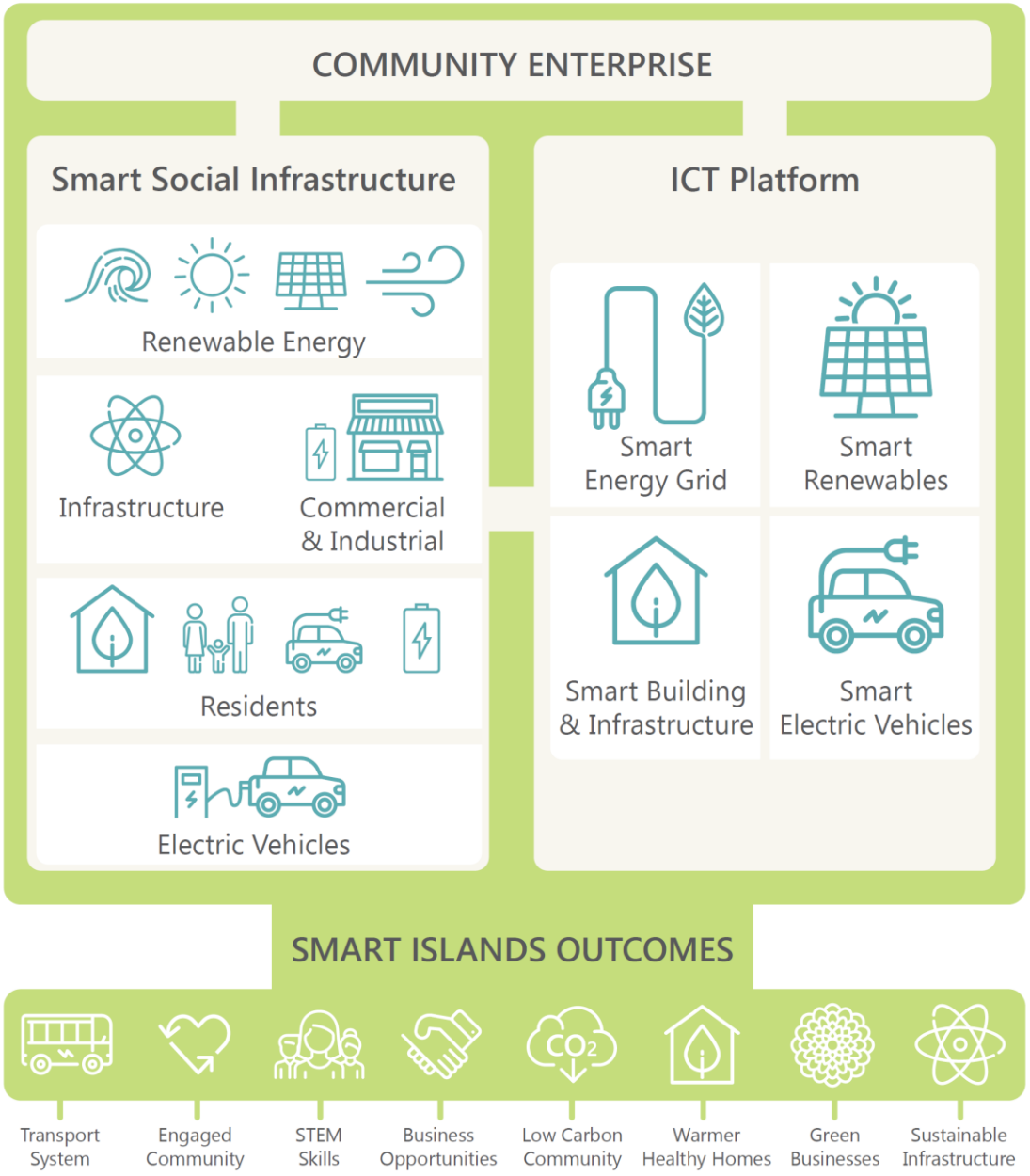

Smart Social Infrastructure

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- 100 homes with HEMS:
  - 71 PV, each ~3kW generation
  - 55 Hot water controls
  - 8 ASHP ~8kW rating
  - 5 Batteries, each ~2kWh
- 6 large sites:
  - 84kW Industrial Roof
  - 48kW Solar Garden
  - 4 Other roofs 10-22kW
  - 6 Batteries, each ~5kWh

Smart Buildings: Demand side response/storage

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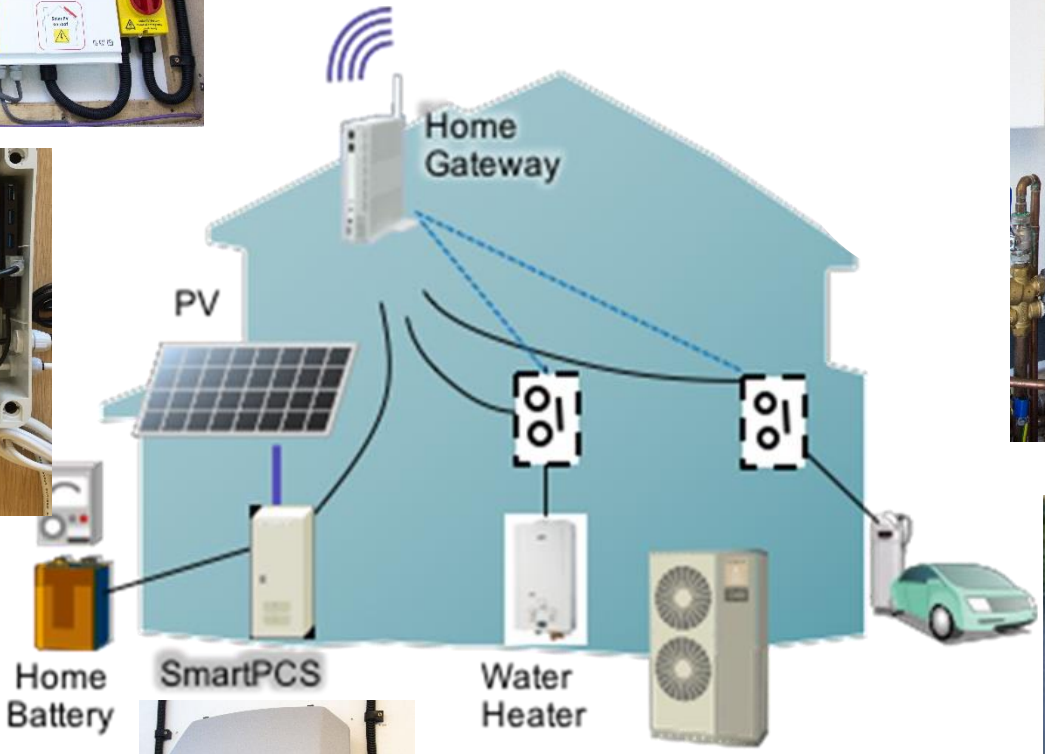
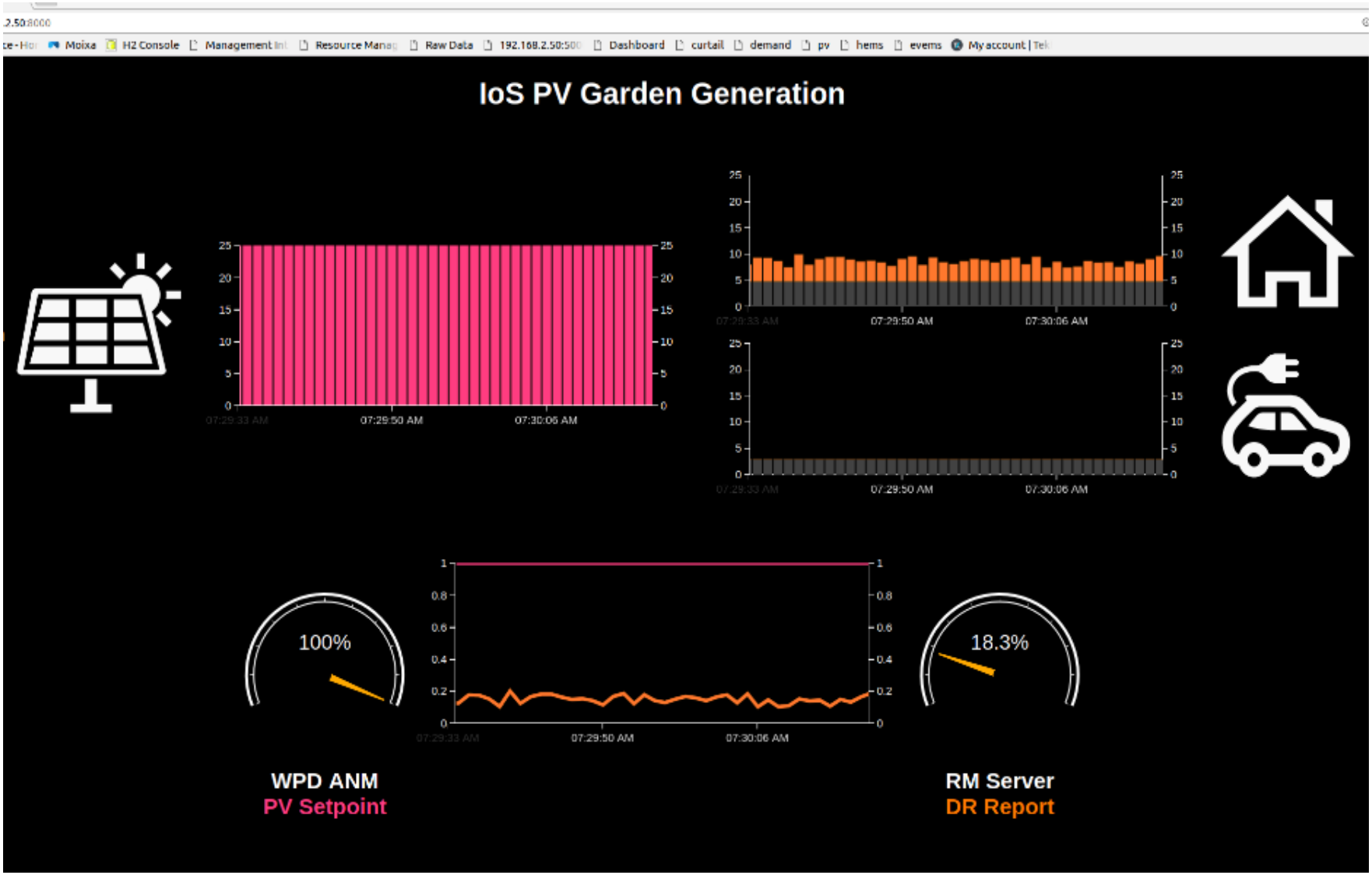


ICT Platform: Aggregation and balancing



ICT Platform Benefits

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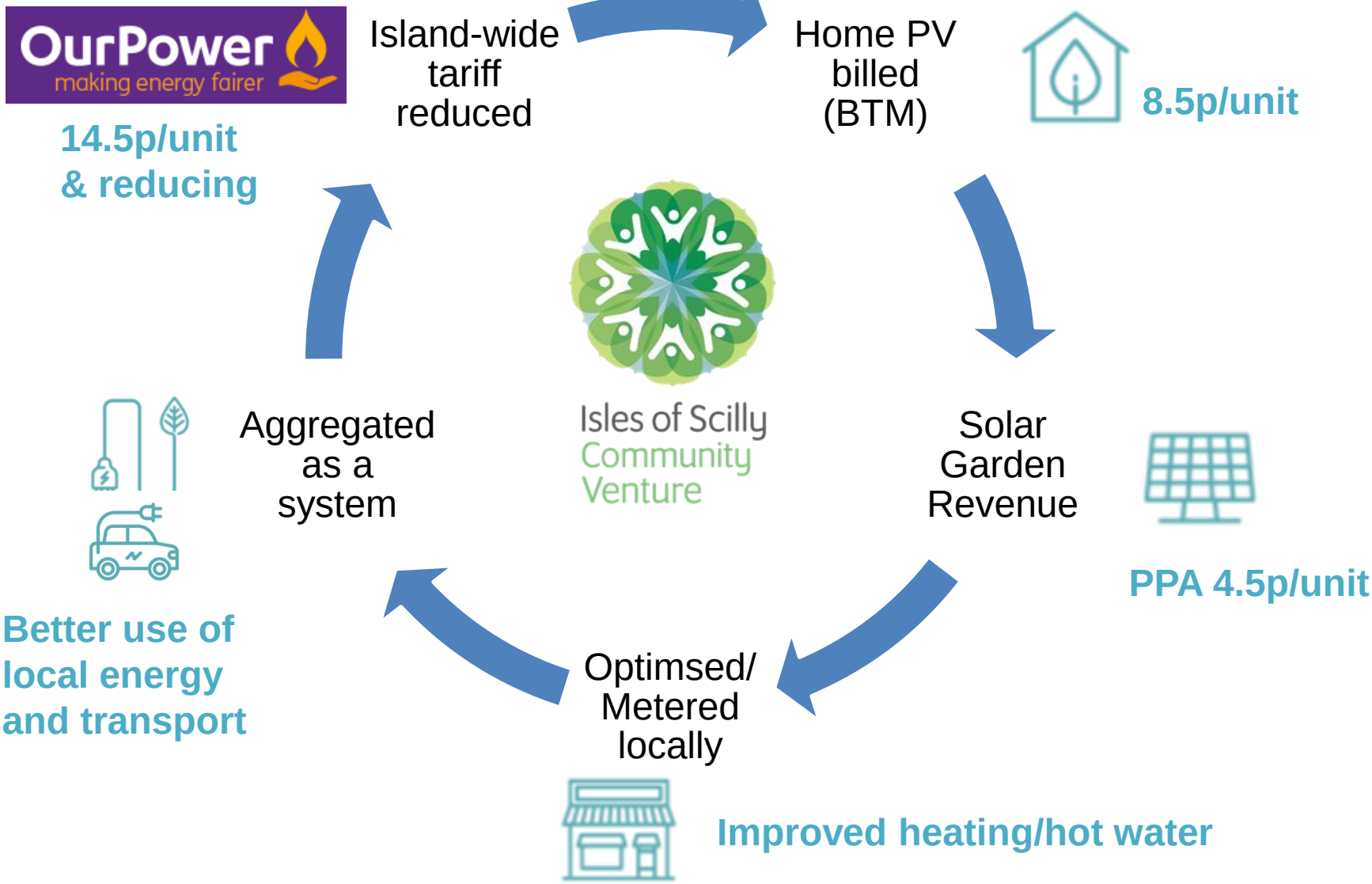

Smart Energy Islands – Stakeholder Engagement

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Close engagement with local stakeholders to capture requirements, specify use-cases, resolve issues and ensure collaborative project development

Warming up session

Use case brain storming

> Support from Jeanne Skog and lessons learned from Maui!

Smart Energy Islands – Support

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Technology demonstration

Attendance at a Smart Islands Partnership meeting

Smart Energy Islands – Replication

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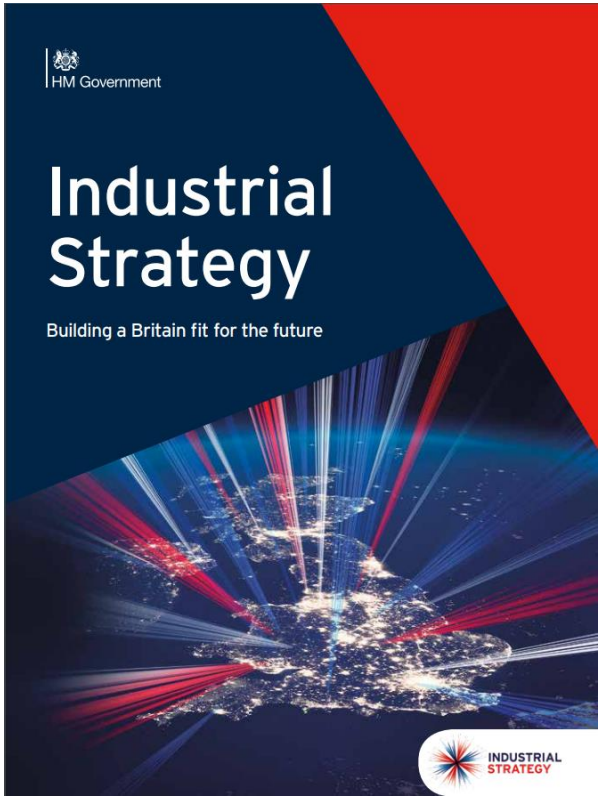
The Smart Islands programme was featured in the UK Government's Industrial Strategy as one of twelve best-practice case studies



Case Study: Smart Islands programme on the Isles of Scilly

Located in the Atlantic Ocean, 28 miles from the mainland, the Isles of Scilly face challenges in installing new infrastructure, with high costs shared among a population of only 2,500 people. Taking on these challenges, a new Smart Islands programme will use smart grid technology to improve energy provision, reduce costs and support local growth.

The Smart Islands programme will aim to transform the islands' infrastructure, with its goals to provide 40 per cent of electricity using renewables, to cut electricity bills by 40 per cent, and for 40 per cent of vehicles on the islands to be electric or low carbon – all by 2025.

The programme will pilot an integrated smart energy system to improve energy efficiency and manage energy demand, incorporating new low carbon and smart technologies, such as electric vehicles. It will be operated by a local community energy services company and monitored through an 'internet of things' platform. Energy audits, monitoring and training will be provided for free, young people will have the opportunity to undertake internships and develop STEM skills, and support will be provided to 10 supply chain businesses in the region to develop new products and services for the programme. As one of the first of its kind, and a model that will be scalable to other rural communities and cities across the world, the programme offers the potential to build and export UK expertise.

The programme is a partnership between the public and private sectors, including the council, Hitachi, Moixa, PassivSystems, and other local partners. The Cornwall and Isles of Scilly Local Enterprise Partnership has agreed in principle to provide up to £2.95m to support the programme, funded through our Local Growth Fund.

Smart Energy Islands - Legacy

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- Providing a long-term legacy for funded projects on Scilly.
- Developing sustainable products and services and sharing the benefits with the local community.
- Bespoke energy tariff and reduced energy bills for customers on the new energy deal.

Isles of Scilly
Community
Venture


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