Energy Systems Innovation: whole systems and multi-vector integration

David Richardson: Innovation Lead for Energy Systems
David.Richardson@innovateuk.ukri.org
@David_AB_Rich

UK Research and Innovation
Prospering from the Energy Revolution

Practical Demonstrators

Future Energy Model Proving

Future Designs

Innovation Development

Research Programme (Academia) & Programme Integration Service (ESC)
Timeline of programme activities

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Concepts and Designs projects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demonstrator Projects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Detailed Designs projects</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Energy Revolution Integration Service (ERIS)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Energy Revolution Research Consortium (ERRC)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
What are we looking for?

World-leading smart energy systems designs which focus on a specific UK location. These designs must encompass new business models and market structures that intelligently link supply, distribution, storage and demand patterns across power, heating and transport.
Detailed Designs competition

An initial overview:

• Up to £30M to fund detailed designs for future local energy systems

• Competition to open in summer 2019

• Project duration of 24 months, starting early 2020

• Around 10 projects to be funded

• Open to all eligible applicants (not just winners of the concepts and designs competition).

• Proposed briefing/brokering events in Belfast, Cardiff, Edinburgh, London and Manchester in early May

An initial briefing webinar available at: https://vimeo.com/314817360/f690aef0ce
Description

The Enterprise Europe Network is organising a fully funded visit to Boston, USA targeted at innovative and ambitious businesses in the Energy Sector. The visit is funded by UK Research and Innovation through the Industrial Strategy Challenge Fund (ISCF) and forms part of the Global Business Innovation Programme.

To express your interest in participating, please complete all of the questions below.

The closing date for applications is **Sunday 10th February 2019 at midnight**.

Apply online here:

[https://www.eventbrite.co.uk/e/apply-for-the-global-business-innovation-funded-visit-to-usa-focus-on-energy-systems-tickets-54844750124](https://www.eventbrite.co.uk/e/apply-for-the-global-business-innovation-funded-visit-to-usa-focus-on-energy-systems-tickets-54844750124)

Google, “energy systems visit to USA Eventbrite”
Transforming Construction

What is it?

This ISCF challenge will bring together the construction, manufacturing, energy and digital sectors to revolutionise how we deliver the buildings the UK needs.

Concentrating on:

• How we manufacture buildings
• How we digitally design & manage buildings
• How we power buildings
Innovation: Disruptive Technologies

“A lot of times, people don’t know what they want until you show it to them.”

Steve Jobs
entrepreneur & inventor who revolutionized 6 industries
A National Centre to accelerate market adoption and nucleate a revolution in smart active buildings
Working Definition of Active Buildings

• “a building which integrates solar generation and storage technologies for both electricity and heat within its construction, rather than being heated by gas, and which is controlled by an intelligent system to optimise energy management and comfort for inhabitants. Active Buildings aim to be net energy generators, and have the potential to utilise the surplus energy to trade”

• Industrial Strategy Challenge Fund, Transforming Construction, March 2018
Active Homes Neath - £3.3m development of 16 homes

- Technology pioneered by SPECIFIC & demonstrated on the Active Classroom on a real housing development

- Flagship project for The Swansea City Deal “homes as power stations” activity (£517,050,000) as part of Swansea City Deal investment of £1.3 billion generating an estimated 4,512 new jobs

- Policy and Influence - Developed SPECIFIC’s position ‘A Thought Leader’

  - WG Housing Strategy and Innovative Housing Prog. (£1.5m Neath)
  - Building for 2050 a £1.4m BEIS funded research project
  - UK Government’s Clean Growth Strategy: The Transforming Construction ISCF (£170m) - ABC

The proposed development will provide 16 new, warm, healthy homes with lower energy bills and no reliance on gas.

Heat recover ventilation (HRV) recycles heat in the building to keep bills down.

Battery storage in a shared energy centre allows stored solar electricity to be used later in the day.

Integrated solar roof with almost invisible solar PV. These panels will meet the electricity requirements of the home instead of relying on gas or the grid.

Perforated cladding draws in warm air and is connected to the heat pump for hot water, which is available on demand like any ‘regular’ home.

Potential for electric vehicle charging point to reduce costs and environmental impact of travel.
Active Homes Neath: No Gas heating
Keep in Touch

Gill.kelleher@swansea.ac.uk
Gill@activebuildingcentre.com

T: @ActiveBuildingC
   @info_specific
EnSiX competition introduction

Energy Systems Technical Challenges

- OEMs and utility companies have:
  - Confidential engineering challenges to solve with no time to explore markets
  - Low exposure to companies outside the nuclear industry supply chain

Technical solutions from other sectors

Solution providers find it difficult to:
- Find the right person within a target customer’s organisation
- Prove the value proposition of products
- Understand customer’s time constraints
EnSiX process: High level overview

1. **Challenge translation**
   - Identify and translate innovation challenges with KTN

2. **Competition**
   - Prepare and release competition to extended KTN and innovation networks

3. **Solution selection**
   - Filter and select responses by Solution Providers to the call

4. **Relationship building**
   - Engage with chosen companies and identify routes for technology development

5. **Feedback**
   - Provide feedback on the process and identify new challenges for next round

- Workshop ➔ Public competition ➔ Selection and pitching ➔ Technology development ➔ Feedback
Thanks for listening

David Richardson: Innovation Lead for Energy Systems
David.Richardson@innovateuk.ukri.org
@David_AB_Rich

UK Research and Innovation