Innovate UK @ eViz: Energy Visualisation for Carbon Reduction

Preparing for an uncertain future

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Interesting Times

WHAT'S YOUR PLAN?
Thinking about the future
Ruth McKernan, Chief Executive
UK R&D spending

Research Councils
£2.7bn

Innovate UK
£440m

Business
£17bn +
5-point plan for future growth

1. **Accelerating UK economic growth**, nurturing small, high-growth companies, helping them to become high-growth mid-sized companies with strong productivity and export success.

2. **Building on innovation excellence throughout the UK**, investing locally in areas of strength.

3. **Developing Catapults within a national innovation network**, to provide access to cutting edge technologies, encourage inward investment and enable technical advances in existing businesses.

4. **Working with the research community and across government** to turn scientific excellence into economic impact, and improve efficiency.

5. **Evolving our funding models**; exploring ways to help public funding go further.
1. Accelerating innovation; growing businesses

We have increased our focus on small, high-growth companies.
With headquarters in Cambridge, the Precision Medicine Catapult will have regional centres in the north of England, Northern Ireland, Scotland, Wales & southern England.
3. Building on regional and local excellence

Launchpads:
Driving SME innovation in clusters

- 2011  Tech City, London
- 2013  Space, Harwell
- 2013  Digital & creative, Glasgow
- 2013  Materials & manufacturing, NW
- 2013  Cybersecurity, Severn Valley
- 2014  Medical technology, Wales
- 2014  Tech City, London
- 2014  Motorsport, Midlands
- 2014  Process industries, NE
- 2015  Digital media, Edinburgh

Grant commitment by region, 2014-15
(compared to previous year)
4. Working with the research community

Targeting cancer with sound
- Spin-out from University of Oxford
- Commercialising research funded by EPSRC, NIHR and the Wellcome Trust
- Won Biomedical Catalyst funding to create a low-cost ultrasound device which targets drugs directly at tumours
5. Evolving our funding models

- **Vouchers**
- **Grants**
- **Contracts**

2014-15 - types of funding

**FIND**
- Research-led opportunities
- Government-led opportunities
- Business-led opportunities

**GROW**
- Creating high growth potential SMEs
- **CATAPULT**-centred scaling

**SCALE**
- SME to mid-size, allowing new supply chains to form in UK
- Delivery capability for industry and digital scale-up
What will the next five years look like?

Consolidated Catapult networks, bridging innovation to business

More globally-competitive medium sized science-based companies in strong clusters across the United Kingdom

Excellence in science being translated enthusiastically and across disciplines
Energy Visualisation

Past programme – Building Performance Evaluation

Supported product – Demand Logic

Future gazing
Building Performance Evaluation

£8m Innovate UK funding - 2010 to 2014

Projects are case study investigations of individual buildings or developments to:

- identify design and in-use factors that encourage good performance
- expose activities that contribute to poor performance
- explore lessons learnt by the domestic and non-domestic projects

https://connect.innovateuk.org/web/building-performance-evaluation
Domestic:
53 projects
(350 dwellings)

Non-domestic:
48 projects
(55 study buildings)

We will be disseminating outcomes of the Building Performance Evaluation programme throughout 2015.
4 principle emerging themes

1. Energy consumption is often much higher than design calculations suggest

2. Lack of client engagement

3. Challenges to occupants and building users

4. Low energy aspirations can influence system complexity
Tools and resources

[Logos and links]

- busmethodology.org.uk
- DomEARM
- CarbonBuzz
- connect.innovateuk.org/web/modernbuiltkttn
- embed
- or search for Building Performance Evaluation
Energy perception and the performance gap

EPC’s are only currently suitable for compliance checks and property valuations
● Building management collaboration
● Comfort & well-being
● Condition-based maintenance productivity
● Energy savings
● Smart commissioning and witnessing
Energy Systems
Vision Mapping Project

The contribution visualization could make

Innovate UK
“Vision Mapping” project

• Develop a vision for the energy system experience of
  – What value add **functionality** might users value and be motivated by?
  – To stimulate the sector and inform funding strategy

• Blue sky....creative value add functionality - harness all personal motivators types....to REALLY engaging end users

• Workshops Dec/Jan - first theme
  – Energy functionality in commercial/public buildings
Energy Systems Definition

Combinations of **ingredients and capabilities** that provide system **beneficiaries** with dynamic **functional**
energy value propositions, that......

1. Maximize the adoption of energy and carbon efficiency of solutions and methods at point of use
2. Manage uncertainty and balancing of energy need with energy availability
3. **Engage users and other beneficiaries in more energy or carbon efficient participation in their use of energy**
Energy systems opportunity pot for visualization

Personal motivators
• Comfort
• Emotional
• Financial
• Risk minimization/peace of mind
• Care for others
• Carbon & resource efficiency
• Minimal hassle/simplicity
• Fun

End users actual needs
1. Heat or cold
2. Light
3. Motive power
4. Energize electronics
5. Data/information
6. Control
7. £ ROI

Visualization potential..
What's it doing?
What's it about to do?
What's the trend?
What's the cost so far?
Is it on or off?
Is it working as it should? etc

Where are there problems to be solved....
• Lack of knowledge or information
• Lack of control
• Inability to predict
• Wastage
• Silly bad habits
• Hassle/frustration
• Current crude solutions
• Poorly addressed issues of comfort

Its not just about end users!
• Energy managers
• Building services/maintenance
• Housing associations
• Security staff
• Cleaners
• Employees
• Even kids!

All could play a role in managing building energy better with the right visual tools
Drawing these ingredients together

Different user and stakeholder types
Different types of functional needs
Different motivators

A pot of user & stakeholder frustrations, problems and unmet needs

Functional opportunity
• A method of...
• A means of...
• A way of.....

An opportunity for visualization to deliver that functionality

Vision mapping project designed to reveal these functional opportunities
Functionality that visualization could play a role in

1. **A way** of knowing when you flick switch how much cost/hour will then be incurred, (and vice versa)

2. **A way** of knowing how much energy cost/hour is being consumed in a room when you walk into it

3. **A way** of knowing how much it just cost you to boil the kettle

4. **A way** of knowing how hot a a radiator is by looking at it (e.g. it glows red when hot)

5. **A means** of mapping the personal comfort preferences of people that work in my companies office block so I can bespoke program our building system

6. **A way** of visualizing waste heat in a production process

7. **A way** of seeing high quality granular peer energy use, say in my village, maybe broken down by energy use type (e.g. lighting/heating/cooking/hot water), as a way of engaging real change
Vision Mapping - Summary

• Visualization could make a significant contribution to the energy systems agenda
  – Both for end user engagement, AND
  – Benefit of other parties

• Vision mapping workshop Dec/Jan
  (+mini workshop at TEDDINET event 12 Oct)

• For further info on Vision Mapping project
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