Crowd Sourcing Energy System Innovation Needs

Using the crowd to source and prioritise innovation ideas

Executive Summary - 07.08.2017

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Decision makers in charge of energy innovation are faced with a wealth of analysis and potential pathways to a low-carbon energy sector. Nevertheless, it is generally understood that recommendations from the expert community and the key messages from transition pathways agree on the main innovations that need to take place if the UK is to meet its long-term decarbonisation targets. Identifying and highlighting these innovation areas therefore has the potential to improve communication between experts and policy makers and help inform decision making.

In this project we explored the potential for collaborative crowd sourcing platforms to identify and prioritise these energy innovation needs for the UK. The central activity in this project was a year long trial of Percypt, a crowd sourcing platform developed by Dysrupt Labs[1], a company specialising in collective forecasting. The immediate goals of the project were to:

- Conduct a trial of the Percypt platform to identify energy innovation needs and priorities for the UK.
- Seek to identify areas of consensus among the energy systems community in this regard.

The more strategic goals of the project were to:

- Critically assess the trial run in relation to the above goals, identifying requirements for a potential second phase in terms of platform functionality and process design.
- Reflect more generally on the potential for crowdsourcing platforms to support the identification of innovation needs for the UK's energy transition.

The project ran in two phases. Phase I, running from October – December 2016, entailed developing the platform, creating conceptual clarity on goals, creating a user environment and establishing an initial user base. For the initial user base the project team convened an expert group consisting of 20 members from across the UK energy sector, including public and private organisations, all of whom contributed different expertise across a range of backgrounds and technologies. The expert group met in October 2016 to discuss the use of a collaborative innovation platform in the UK energy sector, potential benefits and drawbacks, and to discuss the first ideas to be published on the platform.

Phase II consisted of an additional round of recruitment which resulted in a total of 49 registered users. The additional users were predominantly recruited from the Energy Systems Catapult (ESC) and the Energy Technologies Institute (ETI). This phase ran from January – June 2017 and consisted of introductory bilateral and group sessions with users as well as bi-weekly user bulletins to update on platform activity and other news.

At the end of the project the platform had produced the following key statistics:

- A total of 40 ideas suggested by the user community covering a broad range of technical, political and institutional innovation needed for decarbonisation. These ideas had been traded 183 times by the community.

[1] Dysrupt Labs

- A total of 127 comments had been made as part of a wider discussion around the suggested ideas.

The top ranked ideas were the following:

Top five ideas

1. Develop a long-term coherent CCS strategy and process aimed at derisking infrastructure investment (storage, pipeline) as well as business model and finance
2. Create a mandate for energy suppliers to offer dynamic pricing tariffs to domestic customers
3. Develop our understanding of peak management as peak demands ultimately set the scale and cost of the required system
4. Establish an energy systems body responsible for coordinating the low-carbon transition
5. Develop a better understanding of how policy costs and benefits can be linked up between government departments and sectors

The Percypt experiment yielded valuable insights and lessons to the potential uses of crowd sourcing platforms in the UK energy sector

As a first of a kind in the energy innovation space, the Percypt experiment took a step towards improving the way by which innovation ideas are sourced and prioritised. By asking for innovation ideas and applying a trading mechanism for prioritisation of those ideas, it identified ideas which the user community (consisting of whole-system experts) believes have significant potential for contributing towards long-term decarbonisation. However, for the prioritisation of these ideas to be credible stand-alone analytical outputs the platform and process design need to be highly customised to the problem framing. The trial run also provided valuable lessons as to process, management and technical requirements of future platforms. The user interviews also revealed an overall support for the use of crowd sourcing platforms to support innovation and policy making. To that end, the ESC are keen to support organisations following up on the progress made in this project.

Platform and process design needs to be given careful consideration before engaging with any third parties

Despite the potential of using crowd sourcing for complex cross-sectoral ideas it is crucial for the administrator to think carefully about the intended project goals and platform design. Based on the experiment and the literature review we can identify basic design features for any crowdsourcing application, including:

- Concise problem definition
- Clear end goals and concise time frames
- An analytical structure that allows reasonable comparison of all ideas on the platform (this structure can potentially be provided offline by an expert panel)
- Clear outcomes and incentives for participation

- Appropriate platform design in regards to problem definition and end goals (including relevant voting mechanism and functionality for user collaboration)
- User friendly and understandable process for tackling the problem

Due to the broad and interconnected nature of whole-system analysis, further work is required to understand how crowd sourcing might add value.

Whole system analysis accounts for economic, environmental, social, political, technological and institutional factors in explaining energy transition pathways. In addition, these factors often have a spatial and temporal dimension. Due to the number of competing actors, technologies and sectors involved, a whole systems approach poses problems for a crowd sourcing platform that depends on a narrowly defined goal and purpose. Crowd sourcing platforms do not currently appear to provide any meaningful way of synthesising cross-sectoral innovation ideas in to a whole. While a platform may have a hierarchy of themes that represent the whole energy system e.g. 'technological' or 'social' at the highest level, some of the most important innovation ideas will be multi-layered, with aspects of technological *and* social innovation etc. Further work is therefore required to understand how crowd sourcing platforms can support the multi-layered representation of innovation when viewed from whole-systems perspective. One option is to use platforms as part of a wider research programme or process in which experts synthesise the results and provide the whole-systems lens.

Overall, there is a need to improve communication between the expert community and policy makers. This experiment identified several processes in which a crowd sourcing platform can add value by effectively aggregating input from a large group of experts over time to help policy makers identify and prioritise innovation spending. However, the platform used must be highly customised and specific to the problem framing in order to produce meaningful innovation ideas that can be compared and contrasted on a like-for-like basis.