Centre for the Evaluation of Complexity Across the Nexus

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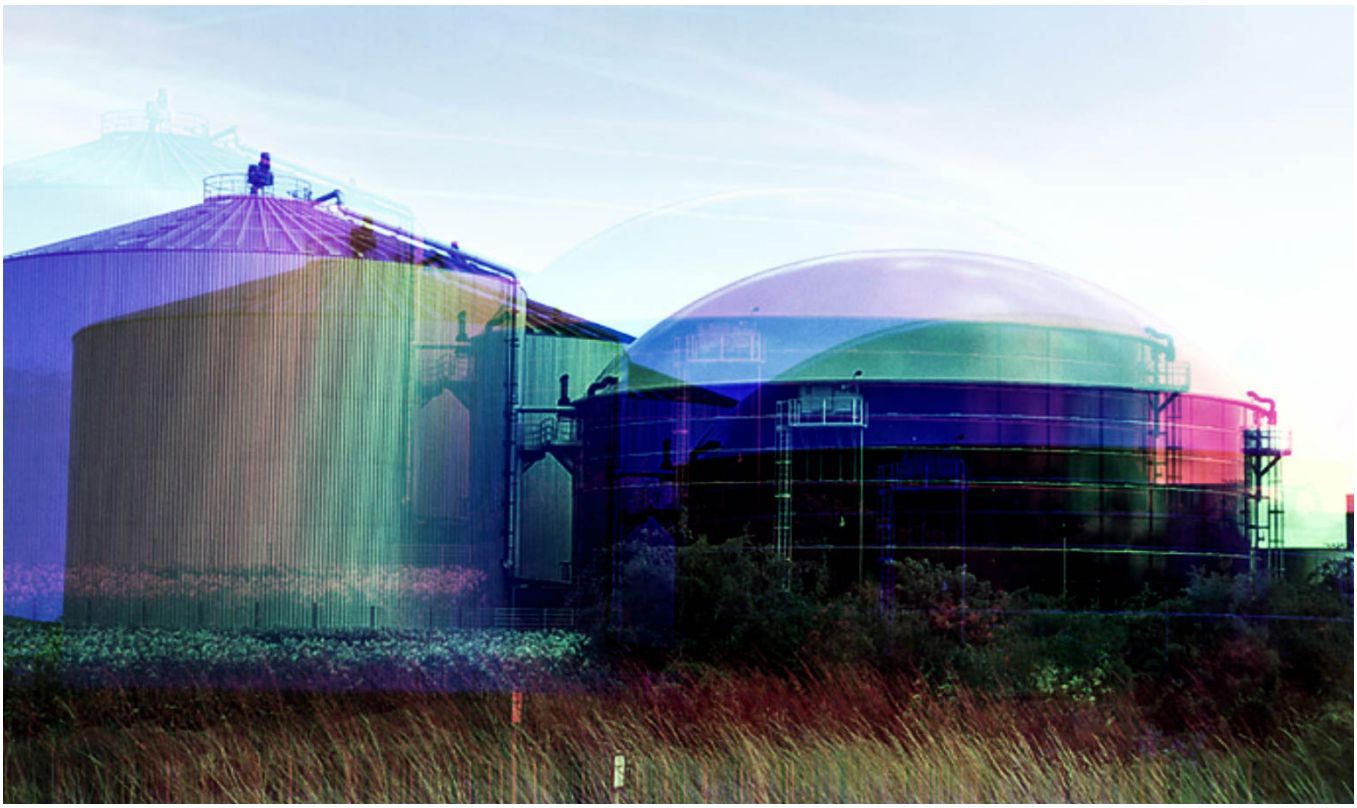
Participatory Systems Mapping in action —Supporting the evaluation of the Renewable Heat Incentive

A CECAN case study Evaluation Policy and Practice Note for policy analysts and evaluators



The Renewable Heat Incentive (RHI) is a UK government scheme delivered by the Department for Business, Energy and Industrial Strategy (BEIS). It implements a payment system for the generation of heat from renewable sources. It is designed to support households, businesses, public bodies and charities in transitioning from conventional forms of heating to renewable alternatives, and covered an annual spend of £545m to £818m each year between 2016 and 2019. An evaluation of the RHI is currently underway, led by CAG Consultants.

In this case study, CECAN, BEIS and CAG Consultants applied CECAN's approach to Participatory Systems Mapping to support the evaluation of the RHI.

What were the aims of the case study?

The aim was to apply Participatory Systems Mapping to support the current evaluation, and specifically to understand the causal and stakeholder relationships underpinning applications to the RHI to install biomethane and biogas plants, and their outcomes. BEIS and CAG Consultants believed that the approach would be particularly useful in this context as biomethane and biogas plants typically operate within a wide network of actors, stakeholders and beneficiaries. The mapping project allowed BEIS to understand better the relationships between organisations, resources and other government schemes that drive decision making within these technologies. The case study also allowed us to further test and refine our emerging approach to Participatory Systems Mapping in evaluation.

Our approach to participatory systems mapping

Our approach builds on existing methods (e.g. fuzzy cognitive mapping, dependency modelling, theory of change maps) with a strong emphasis on: (i) a participatory approach, and (ii) a bespoke approach to analysis, using formal network analysis in combination with stakeholders' views of the system. In practice our system maps are:

- Always built by as diverse a range of stakeholders as possible.
- Designed to capture complexity rather than simplify it away.
- Analysed using a bespoke approach, led by users and firmly rooted in combining network analysis and stakeholders' beliefs about important, changeable, and controllable factors in a system. This means using stakeholders' beliefs as key starting and reflection points for the formal network analysis.

You can read more about the approach via www.cecan.ac.uk/resources.

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How is the map produced?

The approach involves teams of ideally no more than twelve people collaboratively constructing a causal map of the system. The map:

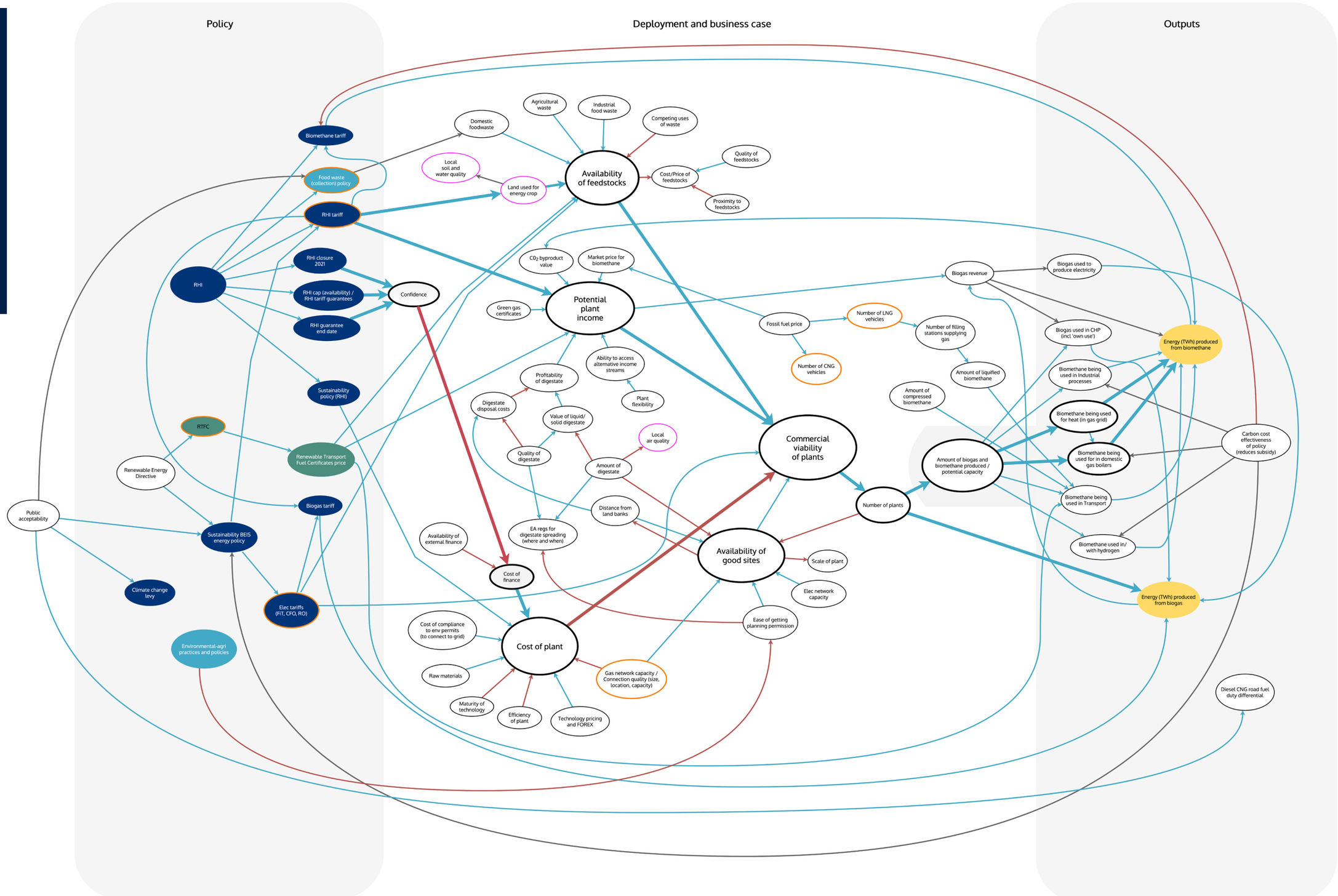
- Is made up of 'factors' and their causal connections. Factors can represent anything as long as they are variables (i.e. they can go up and down).
- Shows connections. These represent causal relationships, either positive, negative, or unclear/complex.
- Reflects the expertise and perspectives of the group of people that built it and so should not be assumed to be objective or comprehensive.
- Has value by virtue of the mapping process - the act of building a map can lead to important conversations, developing shared understandings and consensus.
- Can be analysed and presented to a wider audience following completion, although this needs to be carefully considered when the maps are large and complex.

A mapping workshop was held to create the map, with a selection of stakeholders from within BEIS, other departments, and industry. The key outcomes, 'energy from biogas' and 'energy from biomethane', were used as the focal factors. The map was then refined with the RHI evaluation team and shared with the wider stakeholders again for comment. During the refining process, it was decided to shift the layout of the map from that developed in the first workshop (which was unplanned, being the result of starting with the focal factors in the centre, and then making many small choices as people wrote on post-its and placed them on the map) to a more traditional, left-to-right, policy activities to outputs layout. Those using the map felt this made it more readable and usable. Rearranging the map like this is quite common and can help make it more accessible to new readers, but can mean it makes less sense to those involved in the workshops.

The Map

Figure 1 shows the full RHI map.

Emboldened lines represent particularly strong or important causal connections, and emboldened factors are core concepts or centres of clusters of factors.



Legend

- BEIS Policy
- DfT Policy
- Defra Policy
- Focal factor
- orange border: Potentially volatile factor
- pink border: Risk
- Positive causal relationship: increase in A leads to increase in B, or decrease in A leads to decrease in B
- Unclear or complex causal relationship (e.g. not sure, depends on other things, tipping points)
- Negative causal relationship: increase in A leads to decrease in B, decrease in A leads to increase in B

How is the map being used in the evaluation?

The final map is supporting an exploration of the impact that the RHI scheme has had on enabling installations (for whom and under what circumstances), and on the biogas and biomethane supply chains. Discussions with the evaluation team identified six ways in which the map has been used:

1. Being present during the map building process was helpful in enriching the evaluators' knowledge of the policy and this specific element of it (i.e. biogas and biomethane plants). Connections with other sectors (e.g. transport), the breadth of considerations that go into a business plan for renewable heat, and the importance of availability of good sites for installations, were specific examples of this. The mapping process helped the evaluators orient themselves to the area quickly, something which is often valuable where evaluators are under tight time pressures and face steep learning curves.
2. The map is supporting the refinement of the theoretical framework for evaluating the policy. The theoretical framework is defined in realist terms, and sets out hypotheses about for whom, and in what circumstances (i.e. in what 'contexts'), the policy is expected to lead to particular reasoning or choices (i.e. causal 'mechanisms'), leading to desired or undesired policy outcomes. These realist hypotheses are generally known as context-mechanism-outcome configurations, or 'C-M-Os'. The evaluation team had already identified many of these, so the map helped sense-check and refine them. The team used the map to ask whether the C-M-Os they had were accurate and 'deep' enough. They also noted the map tended to contain many contexts, but fewer mechanisms and outcomes. Finally, the team used the map to help generate the qualitative description of C-M-Os.
3. The team also used the map and mapping process to inform the evaluation scope. They noted the system boundary question was similar to the evaluation boundary question, but that because the map is not solely focussed on assessing the impact of the policy, it helped them to avoid an overly narrow focus that ignored the context. They also noted that the map helped them avoid confirmation bias on a few issues (i.e. overemphasising an impact they repeatedly learn about), making them realise a particular element of the evaluation was more complex than they had understood previously.
4. Topic guides for interviews in the evaluation were updated to reflect some of the concepts and factors that appear in the map.
5. The map helped convince the team to conduct a wider stakeholder mapping exercise and informed their sampling approach, particularly in sampling beyond applicants to the RHI.
6. Finally, the team explained how the map helped give them prompts for concepts and themes to look for when analysing qualitative data collected during the evaluation.

Overarching all of these uses of the map, the team felt the map gave them a quick visual orientation to the policy area and made them understand the system better. They felt this made them better evaluators and better 'realist theory makers'. They noted they might have developed this understanding in other ways, but that the mapping process was a particularly quick way to do it.

What are the implications for future policy evaluation?

We hope this example proves useful for those wishing to demonstrate how Participatory Systems Mapping can be used in an evaluation. Deeper reflections on this case study, and the related CECAN case study on the energy trilemma will be presented in a forthcoming journal paper.

Further information

- Penn, A. & Barbrook-Johnson (2019) Participatory Systems Mapping: a practical guide. CECAN report available at www.cecan.ac.uk/resources
- Barbrook-Johnson, P. (2019) Negotiating complexity in evaluation planning: a participatory systems map of the energy trilemma. CECAN EPPN 12 available at www.cecan.ac.uk/resources.

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The Centre for the Evaluation of Complexity Across the Nexus (CECAN) is a £3m national research centre hosted by the University of Surrey, which brings together a unique coalition of experts to address some of the greatest issues in policy making and evaluation.

This Evaluation Case Study Policy and Practice was written by Dr. Pete Barbrook-Johnson. The core team working on the case study also included Dr. Alex Penn (CECAN), Mary Anderson, Denny Gray, and Tim Maiden (CAG Consultants), and Mike Gentry (BEIS).

CECAN has developed a set of co-produced case studies, working with government departments and agencies to tackle their intractable evaluation challenges in complex policy area. These case studies have involved sustained dialogue and an orchestrated succession of activities and relationship building. They are providing experiments in bringing together the expertise of evaluation practitioners, methods and domain specialists, social and natural scientists and policy analysts to develop shared understandings of evaluation challenges and to identify evaluation needs and solutions.

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