Sustainability *First*
New Energy and Water Public Interest Network – New-Pin briefing paper

Innovation in energy and water: What is an appropriate role for Government and regulators in delivering desired long-term public interest outcomes?

DEFINITIONS

Innovation is not an end in itself. It is not always clear what will happen as a result and like all experiments, it will not always succeed in its stated intention. There are several different types:

Disruptive or transformative innovation ('doing things differently') can significantly lower costs and / or develop new functionality in a way that reshapes existing markets, creates new ones & may lead to disintermediation. The goal and outcomes of disruptive innovation are less clear. It is often driven by **external threats from** across the wider economy / globe.

Incremental innovation ('doing the same things better') can lead to marginal increases in productivity and / or fringe developments for existing activities. Most would agree that incremental innovation is desirable and necessary for a well-run business to meet the evolving expectations of its stakeholders. Incremental change may be particularly important for innovation around **vulnerability** where the risks are often higher (both in terms of cost and reputational risk from failure).

Enabling innovation ('paving the way') can lead to and enable other types of innovation, often blurring the lines between what is disruptive and what is incremental change. This sometimes 'boring' innovation is important.

Innovation can also be: **technological,** including via digitisation (e.g. big data, robotics and AI), in materials (e.g. graphene) and in biological processes (e.g. around gas and waste); **consumer facing** (at an individual or community level); **commercial** (process and business model); **institutional** (particularly important in complex systems with social and environmental externalities); and **financial** (e.g. company structures, crowd sourcing, peer to peer etc).

Why Government / regulatory action may be needed in terms of innovation in energy & water

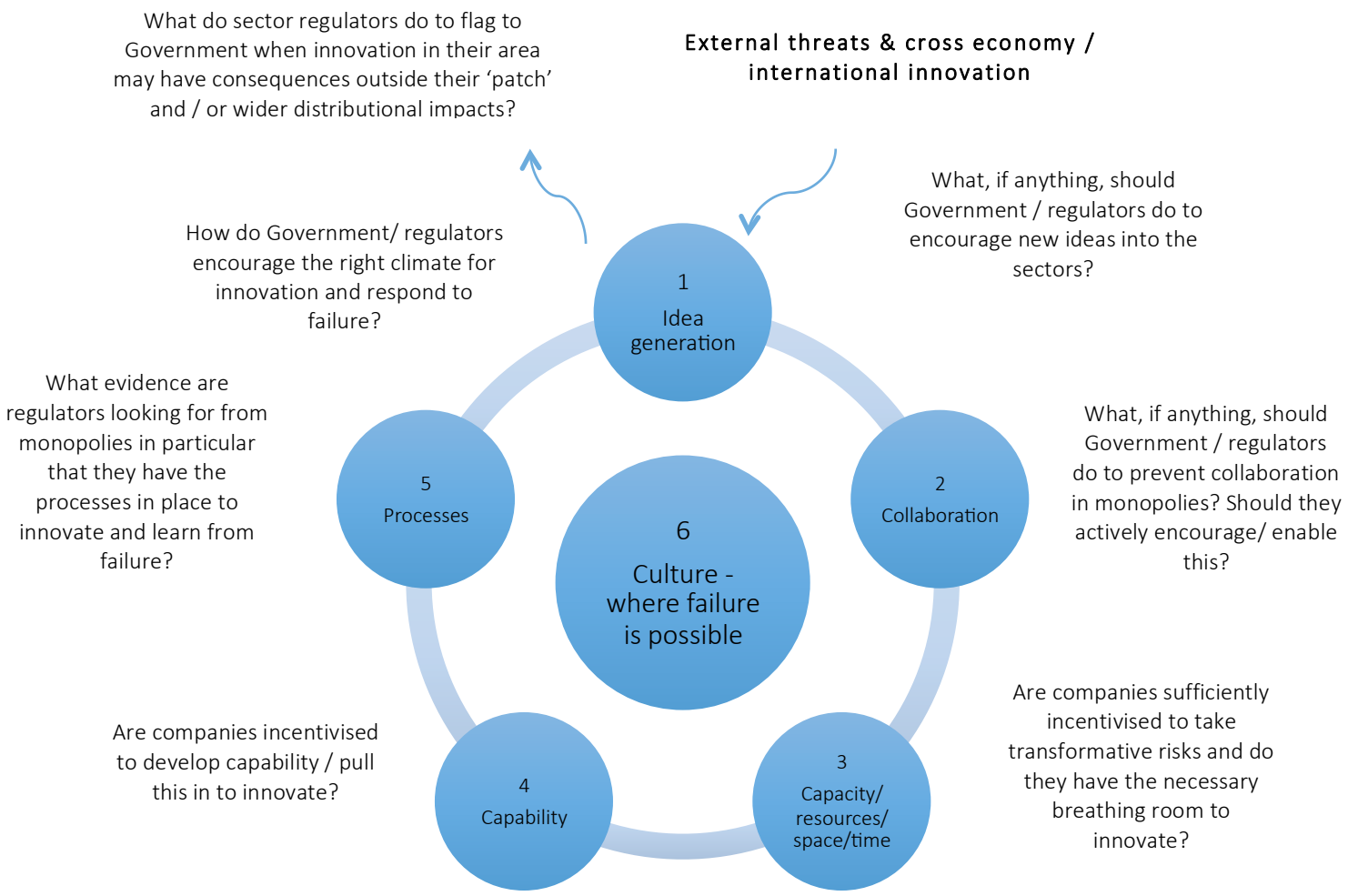
In **competitive markets**, companies routinely innovate to grow or maintain their market share, in the process delivering **efficient, value for money and quality services** that meet consumer needs. Even well-functioning markets, however, can struggle to innovate in some areas: where it is difficult to put a price on the outcome desired; where there are social and environmental externalities; or where the activity is part of a complex system. In energy and water, markets on their own are therefore unlikely to innovate to deliver public interest outcomes around **long-term resilience, fairness and place (well-being in communities)**. Change in these areas may also lead to **distributional impacts** for consumers and citizens that raise ethical questions for Government to address, particularly when many 'early adopters' of change may be more affluent. To get innovation to deliver the full range of desirable public interest outcomes, Government/regulatory action may be needed. And in situations of **imperfect competition** or where essential services are delivered by **monopolies**, as is often the case with energy/water, innovation is unlikely without some Government or regulatory activity.

Differences between energy and water in terms of innovation

The **energy and water sectors are at slightly different 'moments'** in terms of innovation. Both face external/cross economy threats from digitisation, the need to adapt to the uncertainties of climate and demographic change and the potential rising future costs of capital. However, energy also has a 'burning platform' in terms of the low carbon transition and the need to become more flexible to cope with intermittent renewables/distributed generation. In water, the 'burning platform', if it exists, may be due to resilience issues. In such circumstances, companies that fail to innovate may not survive.

*This briefing note summarises Sustainability First's **full paper** on Innovation. The paper is based on a literature review, interviews with 18 New-Pin Network members and others, case studies from the water, energy and banking sectors and a New-Pin workshop on 15th November 2017. It is complementary to earlier New-Pin work on market-led approaches to the public interest. Copies of all New-Pin papers can be found at: www.sustainabilityfirst.org.uk.*

Iterative innovation: what is an appropriate role for Government & regulators in energy & water?



Government and regulatory approaches to innovation in energy & water are rapidly evolving

Government and regulatory initiatives have done much to encourage **incremental innovation** in energy and water companies in the short term (~5 years and within price control periods / electoral cycles). Many of these initiatives were designed to support innovation in big tech / heavy assets and not necessarily for digital, materials or biological process innovation or for the consumer facing, commercial and institutional change that may be needed in a more uncertain and 'flexible' future. Government and regulatory approaches to innovation are now evolving. Considerable Government activity is taking place to develop a **high-level narrative and direction of travel, particularly in energy**, and the different pieces of the jigsaw are starting to come together through measures such as the **Industrial Strategy and the Clean Growth Plan. Regulators are reviewing their approaches** to innovation as part of the forthcoming price reviews (RIIO2, PR19 and SR21) and their work in retail markets (greater focus on principles based regulation and Ofgem's Innovation Link and Sandbox which help pilot and test new approaches). Significant innovation **funding** is now being allocated by Government for cross-sector clean tech, renewable power and electricity storage and by Ofgem (via the Network Innovation Competitions) for adapting networks for more low carbon, smarter systems.

Tool kit for Government and regulators to use to identify appropriate approaches to innovation

To help Government/regulators decide when 'to get out of the way' in terms of innovation and when action may be necessary, particularly around disruptive change, Sustainability First has developed the following **Tool kit** for use specifically in the energy and water sectors. The Tool kit should help all sides **view innovation 'in the round,'** avoiding potential duplication or confused / contradictory signals.

1. Government to frame the challenge(s), identify desired outcomes and signal priorities

There is still much work for Government to do in terms of signalling where change is needed, priority areas for action and integrating different innovation initiatives. It is important to acknowledge that the business of innovation entails 'learning by doing' and going on a journey where the destination is not always known. However, to help ensure that innovation in energy and water delivers public interest outcomes, Government signals need to meet the test of **Sustainability First's '5 Cs'**:

- **Culture** of innovation supported that 'gives permission' to companies to think creatively, accepting that things will not always work and an iterative approach is important that allows **space and time** for experimentation;
- **Clear high level challenges and priorities** flagged for short, medium and long-term. Strategic clarity is needed to give investors a 'firmer footing' and line of sight for their plans on which to undertake riskier novel activities – both in / outside their regulated asset base. This is outcome focused - not the same as picking winners;
- **Co-ordinated** and joined up between Government and regulators, particularly on wider social and environmental outcomes that require **cross sector**, and even **cross economy**, focus;
- **Collaboration** enabled to pull in new, and more diverse, ideas and approaches. Clarity is needed as to **when this can and can't be done** within competition law constraints; and
- **Consistent** over time. To enable this is in a fast moving environment, an **adaptive approach** can help ensure any interventions are more **'predictable.'**

2. Government & regulators to create enabling frameworks to facilitate transformational change

Simplifying, clarifying and better communicating the **basic rules of the game** can help both existing players and new entrants innovate. Principles based regulation is starting to address the need to reduce prescriptive regulation and remove regulatory barriers, in areas such as access arrangements to core systems, which may often largely be down to 'custom and practice.' For transformative innovation to happen, there may also need to be a rethink of **consumer protection arrangements** to ensure that these are fit for purpose in a dynamic world. A review is needed of: the minimum levels of consumer protection that may be needed on a sector-by-sector basis for *all* consumers; the consumer safeguards that are needed in both sectors specifically for customers in vulnerable circumstances; where general consumer protection legislation may be sufficient; and how regulators and other partners could work together to ensure consumer redress arrangements are as simple as possible, yet work across the complex and fuzzy chains of liability that are now emerging. For consumer confidence to be maintained, regulators also need to grapple with questions of **data protection and ownership** as digitisation continues at an exponential rate. Helping consumers understand what to expect regarding their data is an issue that has relevance across the economy.

3. Incentives and funding mechanisms that can support disruptive change

Government recognise the need to fund long-term R&D (~15 years +) and 'blue skies' tech innovation. A high level overview and greater **co-ordination** of different funding mechanisms is needed, with a stronger focus on long-term public interest, as well as commercial, outcomes. The really challenging area for **transformative innovation** is how to get this in the **medium term (~ 10 years) in monopolies**, where innovation straddles price control periods / electoral cycles but isn't quite 'blue sky.' This difficulty is greatest where the innovation involves a **mix of technological, commercial and consumer facing change**. To get a range of often disparate actors to act in concert to take risks and change their practices can require a determined, pro-longed effort – and hence the need for a worthwhile reward / adequate resource - plus, potentially, specific incentives to collaborate. **'Place' based decision-making** can help address this challenge.

Regulators are actively looking at this issue. But it is hard; the public don't want essential services, and monopolies in particular, to make profits nor to fail – either of which may happen if genuine transformative innovation is to be encouraged. Many consider that parts of the sectors are already 'overpaid' and therefore have no incentive to do anything differently. If asked, many consumers may just want 'a faster horse' and have a low appetite for anything beyond 'boring' / incremental change and may often under-value long-term innovation (present bias). Regulators and their vires are also not necessarily well set-up to deal with a multiplicity of decentralised and heterogeneous interests who may have innovative ideas but also multiple objectives of their own (e.g. on heat, local energy and water quality). To meet this challenge, **incentives and funds need to be aligned with the desired long-term public interest outcomes** and criteria for receiving support need to be framed appropriately (not too narrowly). To deliver the full range of public interest outcomes, additional incentives and funding may be required in certain areas (e.g. to support long-term resilience, fairness and place).

- **Incentives**: Need to be high-level and not prescriptive (real time data should help regulation from becoming too intrusive here). Incentives are also needed for collaboration. However, to be effective, it is vital incentives are strong enough and that they enable long-term experiments.
- **Funding**: Need to support consumer facing, commercial and institutional innovation – not just tech change. Public funding can be helpful in requiring the **dissemination of innovative learning** more widely (important in networks). Ex-ante funds, where money comes from consumers, can be helpful to stimulate innovation in monopolies, where companies may otherwise face limited incentives to take transformative risks. Ex- post funds / challenges and competitions, where the company bears the risk, may be more suitable for smaller scale or competitive activities. The rationale for the **quantum differences in funding between energy and water** needs further consideration if water really does face a 'burning platform' and incremental change is insufficient.

4. Direct interventions to enable transformative change

Existing licences and vires for both monopolies and retail activities can sometimes restrict innovation. This is often because existing licences were constructed for a time when the sectors were more 'predictable' and supply and demand were separate. As these increasingly come together and both sectors look to developments that will enable and facilitate more optionality and flexibility in terms of how services are delivered, changes to existing licence arrangements may well be necessary to enable transformative innovation. In energy, a fundamental re-think of the scope of licensing arrangements may be needed to: get rid of the brake that supply licences are having on innovation in the retail space; and to allow networks to enable transformational change – rather than just being passive recipients of change happening around them.

All this raises questions for the **roles and responsibilities that need to underpin any new licensing arrangements**. Greater clarity is needed in these areas so incumbent companies can seize the day and new entrants and capital come in. Given that the future is uncertain, a certain degree of agility is needed so that roles and responsibilities can evolve in response to change. **One size is unlikely to fit all**. Identifying what is the core, minimum level of licence responsibility needed by a given group of actors to unleash medium term innovation and agreeing what will / won't change would be a good starting point.

Principles for Government/regulators to consider when approaching innovation in energy/water

1. Innovation activity needs to be focused, inter al, on the desired long-term public interest outcomes.
2. Incentives for innovation need to align with these outcomes.
3. Interventions for innovation activity need to incentivise collaboration across and between systems.
4. The outcomes sought should be framed in terms of tomorrow's problems, not todays and focus on long-term objectives.
5. Access to innovation support, incentives and funding needs to be transparent, simple, clear and coordinated.
6. The timing, form & durability of any innovation interventions need to be clear. Any interventions should be time limited.
7. To enable evaluation, innovation activity needs to be measurable. It is important to be able to: identify the counterfactual (the world doesn't 'stand still'); and honestly assess the positive and negative quantitative and qualitative impacts of the innovation activity (including around cultural change / lessons from failure).
8. The potential distributional impacts of any innovation interventions need to be recognised and taken into account by Government and regulators.
9. Clear red lines are needed of where interventions for innovation do not serve the wider long-term public interest / are outside the public 'risk-appetite' for change.
10. Government/regulators need to be able to articulate what success/failure look like in terms of innovation in the sectors.

ABOUT SUSTAINABILITY FIRST AND NEW-PIN

Sustainability *First* is an environmental think-tank. The charity's New-Energy and Water Public Interest Network (New-Pin) project brings together public interest advocates (including consumer and environmental groups), companies, regulators and Government reps with an interest in energy and water to: develop clearer alignment between different stakeholders as to what the long-term public interest looks like in these sectors; develop capacity and expertise amongst public interest advocates to ensure a more level playing field in long-term company and regulatory decisions; and improve understanding amongst company and regulatory boards of the value of public engagement in these sectors and how this needs to shape strategy. Since it was established in 2015, New-Pin has been using deliberative engagement to systematically unpack difficult long-term public interest issues.