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Please reply to:

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Dear HMT

Encouraging innovation in regulated utilities

Sustainability *First* is a small charity that works in the energy, water and waste sectors. We promote practical solutions to improve environmental, economic and social well-being. We have significant experience – as an organization and as a group of Associates - of consumer and public interest issues, regulation and the demand side (**www.sustainabilityfirst.org.uk).**

Background

1. Sustainability *First* has carried out significant work on innovation and regulated utilities. We bring a consumer, citizen and environmental perspective to innovation thinking that takes account not only of the need to innovate to solve today's problems but also to address future challenges in a fair way. The reports referred to below spell out in detail the pros and cons to some of the existing and historic approaches to innovation in the energy and water sectors.

2. In November 2017, we published a discussion paper on Innovation in energy & water: what is an appropriate role for Government & regulators in delivering desired long-term public interest outcomes? This paper was part of our New Energy and Water Public Interest Network ('New-Pin') project which over three years used deliberative engagement with key stakeholders to define what the long-term public interest in the energy and water sectors may be and how it might best be delivered. This work is summarized in our final February 2018 project report, Looking to the long term: hearing the public interest voice in energy & water - eight agendas for change. This paper provides a set of 10 New-Pin principles for government and regulators when considering transformative innovation and identifies four practical steps for government and regulators for innovation in energy and water.

3. In January 2018 we published a final report from our Project Inspire, Energy for All-Innovate for All. This summarises the significant project activity that we carried out over a two-year period on innovation and consumer vulnerability and how to improve service and quality of life for energy customers in vulnerable situations. The project, which involved a 'consumer dragons den,' set out: 18 recommendations for companies, regulators and policy makers; identified a 'Vulnerability Innovation Flight Path;' Provided for practical guides to standard, good and innovative practice around vulnerability; and shared 70 case studies.

4. Sustainability First's current Fair for the Future Project Framing a 'Sustainable Licence to Operate' for the water and energy sectors strawman report explores what more energy and water companies can do to be more proactive in addressing issues of fairness. A key part of this is getting them to embrace disruptive change and get on the front foot in terms of innovating to solve both todays and tomorrows problems. We are currently testing this thinking with stakeholders and against case studies from other sectors. Part of this project will also be considering what a 'forward compliance' approach from companies may mean for regulators and policy makers.

5. Drawing on the above work and our wider experience as Associates, this consultation response begins by making some general comments on innovation and regulated utilities. These are focused specifically on our areas of greatest familiarity; the energy and water sectors. They include: specific issues faced by innovation in utilities; outcomes and processes; consumer, citizen and public interest outcomes; sharing learning and dissemination; leadership and distributional issues; and institutional innovation. Our response then makes some brief comments on the specific questions raised in the consultation document.

General comments

Innovation in utilities

6. Innovation, by its very nature is multi-dimensional and dynamic. It is not always clear what will come out of it and like all experiments, it will not always succeed in its stated intention. It is important to define innovation at *a high level* to distinguish between what is novel and what may be seen just as 'business as usual' (BAU). A **taxonomy of innovation** in utilities may be helpful that recognises the different challenges that are posed by getting innovation in different sectors and across **different parts of the value chain** (competitive and non-contestable), the fact a **'one size fits all' approach won't work** and which examines the differences between:

- **Disruptive or transformative innovation** – 'doing things differently'. Can significantly lower costs and / or develop new functionality in a way that reshapes existing markets and creates new ones. In energy and water, some of the most valuable changes from a public interest perspective may be the 'boring' and dull ones that to some extent take place 'behind the scenes;'
- **Incremental innovation** – 'doing things better.' Can lead to marginal increases in productivity and / or fringe developments for existing activities, often enabling the 'over serving' of higher paying customers. Most would agree that incremental innovation is desirable and necessary for a well-run business to meet the evolving expectations of its stakeholders;
- **Enabling innovation** – 'paving the way.' It is important to recognize that the difference between disruptive and incremental innovation isn't black and white. One can lead to and **enable** the other.

7. These three categories can be further subdivided into: technical; consumer facing; commercial (process and business model); institutional; and financial innovation.

8. Regulated utilities such as energy and water provide essential services that are universally used on an on-going basis. They are key parts of critical national infrastructure and have frequently long-term assets that are vital for social, economic and environmental wellbeing, short and long-term. This can make regulators – and utility companies – **risk averse and less willing to experiment**. There are also significant interdependencies between regulated utilities and they are often subject to systemic risks. These points can make the outcomes of any innovations possibly more unpredictable and difficult to evaluate.

9. The fact that regulated utilities often include significant elements of **monopoly activity** poses further issues. Regulators need to get incumbent monopolies to understand that to meet their licence conditions and prepare for the future, they need to innovate. However, in regulating monopoly prices, regulators can inadvertently drive down R&D spend and thus exacerbate the market failures around low levels of monopoly innovation further. Direct innovation incentives may be needed to counter this; sometimes these will be financial, sometimes reputational and sometimes driven by the desire to ensure the survival of the executive team. Regulatory frameworks need to consider how, when necessary: to force the pace of change; how to prevent incumbents from stifling innovation by third parties; how to ensure innovation benefits all consumers (not just active early adopters of smart technologies that can often be more affluent); and crucially, how to ensure innovation for the long-term – including in terms of potential to compete in global markets.

10. Even in **competitive activities**, such as the energy supply market, innovation will not always happen on its own and may need specific regulatory incentives. Markets may not deliver innovation around fairness outcomes, long-term resilience and place-based well-being, for example. Sustainability First's Project Inspire highlights what works and what doesn't from reputational regulation, financial incentives, requirements etc in terms of innovation around vulnerability.

11. The demand side in the utilities sectors is also becoming increasingly important, to keep up with changing consumer expectations in the digital world but also vitally to help reduce peak network usage and costs and to adapt and mange increasingly extreme and unpredictable weather. **Active consumer / citizens and communities may want to have a voice in the future of the sectors and play their part in innovation**, particularly in the face of a real or perceived democratic deficit, through co-design, co-production etc.

12. All these issues need to be understood and acknowledged when considering regulatory approaches to innovation in utilities. This is **not** to argue for 'special pleading' or equate to 'picking winners.' It is clearly important that regulated **companies and regulators need to look outwards not inwards** – whilst recognising these specific features.

Outcomes and processes

13. We are pleased to see that the consultation talks in terms of innovation to improve '**customer outcomes**.' It is important to continue to 'frame' innovation discussions in terms of outcomes and ensure that innovation in these sectors is not seen as an end in itself or a process issue.

14. In places, however, the consultation document does take a somewhat **process driven** approach to innovation. This is counter to most commercial approaches to innovation – particularly in dynamic competitive markets. It is also important given the rapid pace of change in the sectors.

15. For **monopolistic and asset heavy parts of the value chain** which are regulated by 5 or 8 year price controls, **processes to incentivize innovation are important**. Without these, and at times when affordability and cost reduction can be seen as paramount, R&D is likely to suffer.[1] High gearing, as is the case in some water companies, may also lead to short term cost drivers that may deter innovation spend.

16. However, it is vital that the **right balance is struck** between providing incentives to enable innovation where it can deliver better outcomes / setting out processes to aid delivery and being overly prescriptive in terms of the types of innovation required and the processes surrounding this. Funding criteria which are narrowly focused, tight restrictions on eligibility and bureaucratic reporting processes can all lead to greater rigidity and make the 'agility principle' identified by the Secretary of State for Business, Energy and Industrial Strategy in his speech on 15th November[2] more difficult to achieve.

17. Although, as always, there is still room for improvement, the **Ofgem** approach to innovation (with funding through the Low Carbon Network Fund and subsequent Network Innovation Competitions) has helped to attract and enable low carbon innovation in energy networks, particularly that which is high risk (whether this is financially or in terms of safety, customer impacts etc) and / or which may not yield rewards into the medium to longer term.

18. **Ofwat's** approach of stretch targets on things like leakage and putting a downward pressure on prices so that 'necessity is the mother of invention' may lead to short to medium process innovation, where returns can be generated within the price control period, but may be less successful in driving innovation that requires significant up-front investment, riskier change or that which straddles price control periods or different 'systems' (where collaboration may be needed).

19. In all utility sectors, processes and incentives can be important to encourage innovation in areas where there is unlikely to be a commercial pull for this to take place. Sustainability First's Project Inspire found that **innovations to improve services and support for customers in vulnerable situations** were less likely to happen in energy

[1] https://www.ofgem.gov.uk/sites/default/files/docs/2003/07/4034-innovation-and-rpz-discussion_paper.pdf)
[2] https://www.gov.uk/government/speeches/after-the-trilemma-4-principles-for-the-power-sector

retail compared to energy networks, in large part due to the absence of explicit incentives to support these customers in the retail market.

20. Setting clear strategic outcomes and **signalling** these as widely and loudly as possible to all potentially interested actors and then measuring the impacts of the approach for all relevant stakeholders are important to ensure that innovation delivers public interest outcomes.

21. A **new regulatory duty to promote innovation** may get in the way of focusing on outcomes and could make innovation more bureaucratic. We would note that regulators already have quite a large degree of discretion as to how they interpret their duties. However, providing the primary focus of regulatory duties was on consumer and public interest outcomes and delivering this "only where appropriate by promoting competition and innovation" was secondary, a new duty along these lines could arguably be beneficial in promoting culture change within the regulators.

22. In an optimistic world, a focus on innovation in regulatory duties could be used to encourage regulators to: a) be more innovative themselves and 'practice what they preach'; b) be more embedded in the wider world - anticipating and understanding likely future trends in all of their teams; c) recruit people with more diverse perspectives to facilitate the latter; d) potentially reward more creative approaches in their staff appraisal approaches and become more flexible and less process orientated in how they assess what good looks like in terms of internal performance. **Providing there is a clear focus on outcomes – this could potentially be an opportunity to strengthen the focus on the consumer and public interest while making explicit that innovation and competition are only worthwhile if they deliver benefits for the latter and are not ends in themselves.** However, it is worth noting that over time, our experience of the interpretation of regulatory duties in terms of competition has not always been encouraging in this regard.

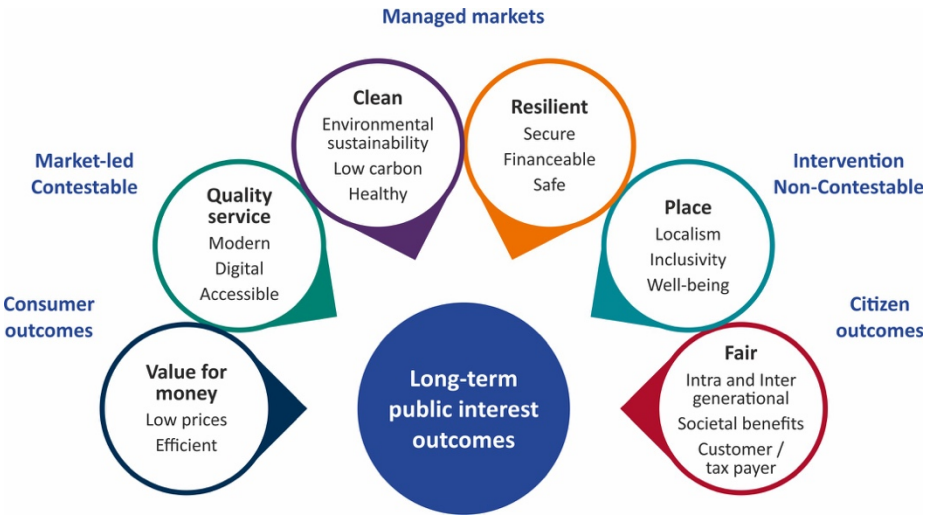
23. **Catapults** are clearly now also an important part of the innovation picture. Ensuring that funding streams are joined up is important not only to make it easier for innovators and investors to come in but also to ensure that activity isn't wastefully duplicated. The Catapults, working closely with government and regulators, can play a key role in terms of innovation to address **major uncertainties and systemic risks** and the public interest challenges faced in specific **places**. However, Catapults tend to focus on **longer-term and less close to market research** than may be needed to address the sorts of medium term challenges that monopoly companies need to address in price control business plans.

24. It is worth noting that there isn't a water catapult. The High-Tech Manufacturing Catapult has sought to fill this gap, and has some excellent offerings on laser welding, robotic inspection, 3d printing etc. but very few water companies are working with it and it is inevitably only looking at part of the gap: notable absences from its portfolio are satellite imagery (covered by the space catapult at Harvard) and blockchain/AI. For all Catapults, there can be a potential question of the degree of sector knowledge compared to sector specific regulators.

Consumer, citizen and public interest outcomes

25. Sustainability First's recently concluded 'New-Pin' project identified that in the energy and water sectors the 'desirable' long-term public interest outcomes were those listed in Figure 1. We consider that it is vital that innovation activity in these sectors should seek to address all of these outcomes.

Figure 1: Dashboard of desired long-term public interest outcomes in the energy and water sectors



26. It is important to note that some of the outcomes in Figure 1 are traditional 'consumer' outcomes and some are 'citizen' outcomes. This has **implications for how far markets on their own can deliver innovation so that all needs – including people in vulnerable circumstances, those who struggle to engage in markets, future generations, the environment etc – are met.**

27. Policy frameworks need to make it clear to regulators how far they expect them to facilitate / enable innovation to meet citizen outcomes. **Strategic Policy Statements** can help do this. In some cases, policy interventions may be needed to deliver the desired outcomes. Ensuring that the **signals sent by policy makers are aligned with those of all regulators** (economic, quality, safety etc) is important to maximise the effectiveness of innovation initiatives.

28. Given Ofgem's and Ofwat's *current* statutory duties, the consultation document makes few references to the need for innovation to also meet the needs of citizens in the energy and water sectors. Further work is needed in terms of **framing what innovation can potentially do for people in vulnerable circumstances, future consumers, citizens and the environment in the energy and water sectors** – rather than starting from where 'the sectors' themselves are. This bottom up approach is likely to reveal new barriers – and opportunities – to innovation.

29. Ofcom currently has duties towards citizens and we note that legal service regulators have public interest duties. If there is going to be an **alignment of regulatory duties**, it

would seem important to update them appropriately. Given that data and digitisation will be one of the driving forces of innovation in utilities, and that this breaks down boundaries between sectors, a consistent and coherent approach to duties would seem important. If there are good reasons for a different approach between sectors, these need to be clearly explained to build public confidence in the resulting decisions.

30. **Customer challenge and engagement groups** offer a new regulatory tool that can help in terms of innovations to deliver consumer and public interest outcomes. Policy makers need to recognise and more clearly articulate the role these groups can play in this area. CCGs and CEGs can help companies look beyond their own horizons, get under the sales pitches around what is 'new' and embed innovation in the business. Being close to the companies but at arms-length, these groups are able to catalyse the culture change that is needed by challenging companies, raising expectations, sharing the art of the possible, providing external perspectives, and raising the bar. They are able to encourage and support innovative individuals within the companies who are fighting against staid company cultures where it is in customers interests.

Sharing and disseminating learning

31. Given the seismic technological, environmental and social challenges that the energy and water sectors face, to ensure that both short and long-term public interest outcomes are met, the way these services are delivered needs to change (most noticeably on the energy side). This will require significant technological, commercial and institutional innovation. However, it is important to note that there is much that some companies in the sectors can do to meet these challenges that may not necessarily be truly 'novel'.

32. **Regulators have a key role to play** in sharing and disseminating learning within the sectors and to potential disruptors – identifying, understanding and showcasing the art of the possible - and critically monitoring progress and constantly reviewing and raising the bar on what good looks like. This is a key part of promoting the benefits of innovation. Policy makers and regulators also have a role in terms of developing a more coherent and joined up approach to innovation funding and incentives. A '**theories of change'** approach to which organisations may be best suited to carrying out what dissemination activity and ensuring that they are involved at the right stages, appropriately resourced etc, would be helpful. The Catapults also clearly have a part to play here.

33. **There is enormous scope for some to take-up existing good practice, and embed this into BAU, by learning from each other, from utility providers in other jurisdictions and crucially from other sectors.** In our experience, there has been far too much repetition between projects and insufficient emphasis on embedding results, both positive and negative, into learning and BAU. There needs to be much more focus on ensuring projects are really innovative. For example, the gas industry has developed in pipe robotic inspection which could be invaluable in the water industry for trunk mains. And the rail industry has developed laser techniques for extending life spans of key kit which again has wider applicability.

34. Leveraging learning between utility sectors and from further afield (including what works and what doesn't) can help **reduce risk and costs (by reducing duplication) and speed up deployment**. These points are important if the 12-year timescale identified by the IPCC is to be met and if the UN Sustainable Development Goals are to be delivered. Concerns around UK inequality also make the need to address innovation around vulnerability pressing.

35. The lack of learning in some companies from customer and citizen facing innovation elsewhere, particularly around vulnerability but also some basic aspects of customer service and information provision when there are disruptions, although improving, still has further to go. On the energy network side, improvements have been prompted by the financial incentives and league tables. On the energy supply side, by the regulator clearly setting out its expectations. In water, there's a desire to differentiate and seen to be 'frontier shifting'. On the supply side, many just don't think they need to innovate in the vulnerability area so either a stick or a carrot is needed plus enabling customers to more easily compare companies' vulnerability credentials so that competition can work in this space more effectively. We would note that a number of water and energy companies (supply and networks) seem more comfortable sharing across sectors, especially when there is a competitive element to the regulatory framework in their own sector.

36. Sharing learning between sectors is particularly important if **community and cross-sector solutions** are to be developed. These are important if future business models are to be social, integrated, circular and lean – as recommended by the UN Compact and Volans.

37. In **competitive markets**, it may be more difficult to get companies to share innovation. The need to get investors to see the rewards for their funds at risk, the desire to grow market share, and concerns about anti-competitive effects (even in monopolies if comparative competition is prioritised) can work against this. A more **collaborative culture** is needed where learning is shared in a timely, transparent and often more granular (and hence useful) way. This may need to be backed up by explicit incentives (reputational and financial).

38. Groups like Water Resources East / Water Resources South East can help promote cross company innovation on issues like resilience but unless these structures are fully recognised in Water Resource Management Plans etc their ability to undertake significant innovative work is likely to be limited.

39. Getting companies in a place where they feel comfortable sharing the **lessons of failures** arising from genuine innovation (as opposed to lack of competence, poor management etc) requires a **no-blame culture**. The consultation is silent on the issue of culture.

Leadership and distributional issues of principle and purpose

40. Innovation in regulated utilities can give rise to significant **questions of principle**. Innovation can clearly have **distributional impacts and unintended consequences** that are not always understood at the outset. These are not only relevant for today but can

also give rise to questions of inter-generational fairness. Given that energy and water companies face some specific issues, there are real **risks around encouraging 'change for changes sake' or 'disruption at all costs'**.

41. Strong **leadership** is needed in companies, regulators and policy makers to make the judgement calls that are needed to meet future challenges. Each group need to be clear about their future role and purpose in facilitating and delivering innovation. The beliefs and values of the board members of all these actors are also vital if innovation really is going to deliver public interest outcomes. Board diversity, customer and stakeholder engagement and immersion and empowering staff to share experiences can all help leaders focus on the outcomes that their innovations should be seeking.

42. 'Safe spaces' and robust **governance processes** are important for discussions of this nature to take place in. Clarity is needed as to where it is appropriate to take decisions about innovation that give rise to distributional issues.

43. The consultation document does not cover the potential distributional impacts of innovation. It focuses on tools and expertise of regulators and is silent on leadership; **the right leaders will get the right tools in place.**

Institutional innovation

44. The consultation does not cover this important issue. **Digitisation and big data** are making this an increasingly important area for innovative thinking. Policy and regulatory frameworks and policy, regulatory and corporate governance processes need to change if new collaborations, partnerships and business models are going to emerge to deal with digital and other pressing social and environmental challenges.

45. Meeting the challenges in the IPCCs report is likely to require a **systems approach** to innovation which extends beyond the whole-energy system into other utilities. This will require institutional innovation. Sustainability First is currently drafting a discussion paper on what this may mean for utilities regulation.

<u>Comments on specific questions in the consultation</u>

Understanding the barriers and opportunities for greater innovation

46. What barriers, if any, are there to the development and implementation of innovative technologies and methods in the utilities sectors?

- Lack of clear policy signals – Strategic Policy Statements should help. But these need to reach to a wider group of actors than those just currently involved in the delivery of utility services and be translated in a way so that these actors understand what the potential opportunities for innovation in the sectors are.
- Lack of mechanisms to understand some of the key issues that innovation needs to address (eg vulnerability and climate and environmental change).
- Confused decision-making pathways for ideas in 'difficult' areas such as vulnerability.

- Limited resources for innovation to address vulnerability and some climate and environmental outcomes.
- A fragmented funding picture – this can make it more difficult for new actors to identify and realise opportunities for innovation. The New Innovation Board in BEIS is a welcome development in this regard. However, it will important that this measures impact against outcomes.
- Limited commercial 'pull' for innovation for some customers (eg those in vulnerable situations) and in some areas (if benefits are only likely to be realised through 'value stacking' – eg energy / water efficiency).
- Regulatory price control periods – can make it difficult to get transformative innovation that spans / straddles review periods (with a ~10 year horizon) but isn't very early stage / TRL innovation (a ~15 year + horizon).
- Risk aversion in the regulation and delivery of essential services.
- Financing arrangements in some companies - a company which is securitised on a regulated only basis will be severely hamstrung in exploiting any IP. The water industry in particular have a poor record in international partnership/services, something which is important in the context of the Industrial Strategy (and climate and environmental change).
- A blame culture that discourages experimentation – particularly for long-term projects.
- Corporate cultures which can operate in silos making embedding new approaches across the business more challenging.

47. What are the best way(s) for utility regulators to further promote innovation in their sectors, while ensuring the interests of consumers (present and future) are protected?

- Regulators need to work with government (including the National Infrastructure Commission and the Committee on Climate Change) to frame the challenges, identify desired outcomes and signal high-level priorities. Signals need to meet the test of the "5 C's" – they need to be: culturally supportive; clear; consistent; co-ordinated; and collaborative.
- Develop enabling frameworks to facilitate change - pilots and initiatives like Ofgem's sandbox can help overcome risk aversion.
- Put appropriate incentives and funding mechanisms in place.
- Challenge companies as to why they have not adopted innovations which have been successfully trialled and piloted elsewhere into BAU.

48. What barriers, if any, are there to innovative sector specific and cross- sector business models?

- Complexity. Sector specific regulation is still often unduly detailed and prescriptive. The focus is still often on process rather than on outcomes and principles.
- Lack of joined up, consistent and - at times - coherent regulation.
- Lack of 'ownership' of systemic risks – although the National Infrastructure Commission's work is starting to highlight some of these issues.

Policy and implementation

49. How have utility regulators most successfully encouraged innovation in their sectors?

- Encouraging companies to manage their own forward risks and to enter into dialogue with their stakeholders through CGs / CEGs so they better understand their current and future requirements and how to embed these in their business.
- Understanding wider stakeholder and market actor concerns.
- Learning the lessons from successful innovation and failures in their sectors and beyond.
- Facilitating process, commercial and institutional innovation – as well as technical.
- Using incentives that are focused on outcomes rather than processes (eg challenge prizes).

50. What additional tools and expertise, if any, do utility regulators need to respond to technological change and promote innovation in their industries?

- Strong regulatory leaders, who are brave enough to accept that innovation takes time and will not always work, will be able to identify the right tools and expertise that they need in their teams.
- Regulators need to have the flexibility to try different approaches without fear of government sanction.

Regulators statutory duties

51. To what extent would a statutory duty to promote innovation help regulators focus further on encouraging greater development and adoption of innovation in their sectors?

- We do not consider that it is necessary to give regulators a statutory duty to promote innovation. This may lead to the adoption of the new and novel for its own sake at the expense of existing good practice that can be leveraged from elsewhere. However, there are some arguments that this duty could lead to a beneficial cultural change within regulators.
- If such a duty was introduced, it would need to be very firmly secondary to the delivery of public interest outcomes.

52. What other measures might support an innovation duty in helping regulators to focus on encouraging innovation in their sectors?

    - Having a clear set of principles for government / regulators when considering transformative innovation. New-Pin identified the following principles as relevant to the energy and water sectors:
        - Regulatory incentives around innovation need to align with public interest outcomes.
        - Incentives should consider when collaboration may be necessary (eg innovation across and between systems or to support customers in vulnerable situations).

- Access to innovation support, incentives and funding needs to be transparent, simple, clear and co-ordinated.
- The timing, form and durability of any innovation interventions need to be clear. Any interventions should be time limited.
- 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).
- The potential distributional impacts of any innovation interventions need to be recognised and taken into account by Government and regulators.
- 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.
- Government and regulators need to be able to articulate what success and failure look like in terms of innovation in the sectors / systems.