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**Accelerating the development and diffusion of low-emissions innovations**

Summary of the 37th Round Table on Sustainable Development[[1]](#footnote-2)
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**Connie Hedegaard**
Chair, Round Table on Sustainable Development

Nearly all countries committed to the Paris Agreement and SDGs, but three years on we are nowhere near reaching these commitments. The latest report of the International Panel on Climate Change warns that not only must global emissions peak by 2020 – they need to be reduced by 45% from 2010 levels by 2030. This is staggering when one realises that it means halving global emissions every decade from now on, especially with emissions increasing last year.

More and more countries are talking about “net zero” carbon emissions, which cannot be achieved without widespread adoption of disruptive innovations to mitigate and adapt to climate change. While many of these technologies exist, they are not scaling up fast enough, and many current low-emissions innovations are too incremental. We need a more holistic approach to innovation, and to re-think the way policies and regulations are made, while empowering people to engage and accept.

The 37th Round Table on Sustainable Development gathered a group of high-level experts and influencers from the private and public sectors to discuss how to accelerate low-emissions innovations, with practical solutions for how to:

1. improve existing frameworks;
2. accelerate development without misallocating capital;
3. create markets without hindering competition; and
4. achieve real transformation.

A background paper that supported the discussion is available [here](http://www.oecd.org/sd-roundtable/papersandpublications/Accelerating%20the%20development%20and%20diffusion%20of%20low-emissions%20innovations.pdf).

**Key takeaways**

1. **Policies and regulations**
* **Regulatory sandboxes work.** By providing a safe space to test innovative products, services and business models under temporary regulatory authorisation, regulatory sandboxes reduce the time and cost of getting products to market and make it easier for young companies to secure financing. A successful example is the **UK Financial Conduct Authority’s Regulatory Sandbox,** whichhas been in operation since June 2016 and is now accepting its fifth cohort of firms. Around 90% of firms that completed testing in the first cohort are continuing towards a wider market launch.[[2]](#footnote-3)
* **Focus more on the “what” and less on the “how”.** Policymakers can learn from the approach of business to first ask “what” needs to be done to solve a problem (i.e. reduce emissions) and then come up with practical solutions for how to get there. **Norway’s first electric ferry** is an example of effective public procurement for low-carbon innovation where this has worked. In 2010, the Norwegian Ministry of Transport launched a competition for an environmentally friendly car ferry to link two villages on the Sognefjord. The Ministry did not specify a technology but rather a clear objective: a ferry at least 15-20% more energy efficient than the existing diesel-powered one. Four consortia, each comprising a ferry operator, a shipyard and an engineering company, competed for the contract, with the three unsuccessful bidders receiving compensation of NOK 3 million for their efforts. The result was the world’s first fully battery-powered car ferry, which has cut carbon emissions by 95% and operating costs by 80% compared to its traditional fuel-powered counterparts.[[3]](#footnote-4)
* **Applied research networks of industry, academics and governments foster co-operation between key investment actors across individual groups**. In 2012, the Scottish Funding Councilprovided GBP 120 million to establish **Scotland’s Innovation Centres Programme** with the aim of helping businesses increase the pace of innovation. Designed by industry for collaboration with academia and the country’s enterprise agencies, eight Innovation Centres address specific market and sub-sector opportunities, some targeting the environment (e.g. The Industrial Biotechnology Innovation Centre focuses on areas such as sustainable feedstocks and downstream processing).[[4]](#footnote-5) Germany’s **Fraunhofer-Gesellschaft** network of applied research institutes includes the Fraunhofer Institute for Solar Energy Systems, which performs scientific and engineering R&D to support innovation for the solar PV industry.[[5]](#footnote-6)
1. **Capital (mis)allocation**
* **The public sector could play a bigger role when it comes to risk**. First, by helping the private sector to better understand risks and risk-mitigation strategies; and second, by being willing to finance riskier projects. **The European Investment Council (EIC) pilot** is an example of a public sector initiative focussed on supporting high-risk/high-return disruptive and market‑creating innovations. To be launched in 2019 under the European Commission’s Horizon2020 research and innovation programme, the EIC pilot will bring together EUR 2.7 billion in funding for the period 2018‑2020, opportunities for networking, mentoring and coaching, and strategic advice to upgrade the innovation ecosystem in Europe.[[6]](#footnote-7)
* **A systems-based approach to innovation policy can help to ensure consistency and stability.** Recent work by the OECD shows that policies aimed at transitioning sociotechnical systems to more environmentally sustainable configurations requires that policymakers develop a forward-looking vision of the entire system – including technologies, infrastructure, business models and behaviours. Countries such as **Belgium,** the **Netherlands, Finland, Sweden,** the **United Kingdom, Korea** and **Japan** are experimenting with a “system innovation”[[7]](#footnote-8) approach, using systemic policy instruments such as longer-term (five to ten‑year) innovation funding programmes; road mapping; cluster policy; smart regulation and demonstrators. The major challenge is convincing policymakers trained in the old innovation framing to adopt the new framework. “Policy labs” can help to test new approaches in policy design.
* **Better and more data is needed on public and private R&D investment,** particularly on the break-even point at which public money stops crowding in private investment and starts crowding it out – i.e. the optimal point at which public money should pull out of innovations. **The** **IEA’s Tracking Clean Energy Progress** provides a comprehensive assessment of a full range of energy technologies, including up-to-date information on where technologies are today and where they need to be according to the IEA’s Sustainable Development Scenario.[[8]](#footnote-9)
1. **Market creation**
* **Don’t pick winners – dismiss losers.** Too much public and private money is being spent on incremental innovations that will not drive truly transformative change. Sectoral roadmaps can help to implement low-emissions strategies and establish technical and strategic guidelines to articulate a common vision to optimise business value and reduce risk.
* **Governments can do more to take on risk and uncertainty.** Current initiatives are limited by the mindset that innovation policy is about fixing market or systemic failures. Instead, mission-orientated initiatives and public procurement could enable testing of low-emissions solutions, creating markets from the bottom up. Ambitious governments with long-term vision can help carry innovations across the “valley of death”.
* **Sharing risk can unlock some of the hardest climate-mitigation investments** (i.e. disruptive innovations).For example, in October 2018 the European Commission and the Bill Gates-led Breakthrough Energy Coalition announced a new venture fund to provide very early stage financing in five key areas critical to deep decarbonisation (electricity, transportation, agriculture, manufacturing and buildings), with the criteria of 0.5 gigatonnes of CO2 for any investment made. Half of the equity for **Breakthrough Energy Europe** will come from the [Breakthrough Energy](http://www.b-t.energy/) Coalition and the other half from [InnovFin](http://www.eib.org/en/products/blending/innovfin/index.htm) (risk-sharing financial instruments funded through [Horizon 2020](https://ec.europa.eu/programmes/horizon2020/en/)).
1. **Real transformation**
* **Messaging around decarbonisation needs to be more positive**. Better understanding of how to inspire change is vital to nudging climate-friendly behaviour. People are a “pull factor”; ultimately, the uptake of low-emissions innovations depends on end-users. The language used to communicate the climate challenge, and the responsibility of each actor in tackling it, is critical. Rather than projecting fear, doom and gloom (which has led to apathy) messaging should convey bright opportunities for the future.
* **Focussing on the multiple benefits of decarbonisation and digitalisation, aligned with the SDGs, will make them more politically and socially acceptable**. The narrative around decarbonisation and digitalisation needs to shift from one about “losing jobs” to their benefits. Latest research finds that tackling climate change, air pollution and energy security separately could cost USD 1.7 trillion per year globally, while addressing all of three together would cost about two-thirds less.[[9]](#footnote-10) However, while the SDGs are an important framework, one must be wary of “shoehorning” existing business models into the SDG framework, which is not a recipe for truly transformative change.
* **Market incentives matter, but there is a huge need to restructure the tax incentive system.** Structural change is needed and markets must be created. Tax systems, carbon pricing and shadow carbon pricing are important, but will not be enough if money keeps pouring in to support fossil fuels. “Policy innovation” is needed to unclench the vested interests of incumbent actors in maintaining a high-emissions economy. Initiating a constructive policy dialogue on climate is difficult when immediate budgetary, economic and financial interests work against decisive climate change action that will drive investment away from GHG‑intensive activities. One solution is to make pension funds aware of the risk associated with policies that directly target the revenues of fossil fuel-reliant companies. For example, in 2015 France introduced legislation requiring institutional investors to evaluate and report on their exposure to risks related to climate change.[[10]](#footnote-11) Similarly, Norway manages its oil wealth through a sovereign wealth fund of which the government can spend no more than 3% a year.[[11]](#footnote-12) This has helped Norway to achieve high living standards while reducing exposure to risks related to oil prices.

**Ideas for future work**

* **Big data and artificial intelligence: a game changer for climate change.** What policies and regulations are needed to materialise the benefits of the digital transformation? How to manage related risks (from performance, security and control risks to economic, social and ethical risks)? Big data, AI, the Internet of Things, blockchains and other digital technologies hold great potential – from urban and sectoral applications in energy, water, transport and agriculture to regional and national policy uses for climate change mitigation and adaptation. For example, AI and the IoT can incorporate data from smart meters, manage and repair renewable grids, store energy and forecast energy demand without human involvement. Big data and deep learning can help to improve the accuracy of climate change projections, forecast and track air pollution, simulate zoning laws and devise flood plains to assist with disaster preparedness.
* **Lobbying for climate change away from the public eye - the political economy of tensions between incumbents and newcomers**. What social factors make it easier or more difficult for governments to implement an effective climate response? How can internationally co-ordinated policies, standards and enforcement of legislation help to manage tensions among those affected by the low-emissions transformation – from incumbents to newcomers?Lobby groups can influence the politics of climate change. For example, the majority of climate lobbying expenditure comes from sectors that would be affected by climate-stringent legislation; the fossil fuel industry and transportation stand to lose out. By contrast, the lobbying efforts of environmental groups, sustainable transport and renewable energy sectors pale in comparison to fossil fuel-driven incumbents.
* **New approaches to corporate governance for socially-inclusive climate strategies**. What is the impact of social and environmental considerations on business performance along the supply chain? How to track and adjust corporate strategies by establishing the true value of corporations in terms of financial, social and natural capital? More and more companies are publishing environmental and social governance disclosures, but further effort is needed to better understand the material implications of social inequality and environmental sustainability risks in doing business.
1. The Chair’s Summary reflects views heard at the Round Table, which was held under the Chatham House rule. It does not reflect the views of the OECD Secretariat or its member countries. The RTSD is grateful to i24c, an initiative of the European Climate Foundation, for their financial support. [↑](#footnote-ref-2)
2. UK Financial Conduct Authority (2017), Regulatory sandbox lessons learned report. <https://www.fca.org.uk/publication/research-and-data/regulatory-sandbox-lessons-learned-report.pdf>. [↑](#footnote-ref-3)
3. <https://www.oecd.org/sd-roundtable/papersandpublications/The%20Role%20of%20Public%20Procurement%20in%20Low-carbon%20Innovation.pdf>; <https://maritimecleantech.no/2018/03/21/electric-revolution-norwegian-fjords/>. [↑](#footnote-ref-4)
4. [www.sfc.ac.uk/web/FILES/InnovationCentres/Scotlands\_Innovation\_Centres.pdf](http://www.sfc.ac.uk/web/FILES/InnovationCentres/Scotlands_Innovation_Centres.pdf). [↑](#footnote-ref-5)
5. The Fraunhofer-Gesellschaft network clusters advanced scientific and engineering expertise in different technological fields with strong industry-government links, enabling funding and policy advice on the technological landscape and commercially viable technologies. [www.lse.ac.uk/GranthamInstitute/wp-content/uploads/2016/01/Dechezlepretre-et-al-policy-brief-Jan-2016.pdf](http://www.lse.ac.uk/GranthamInstitute/wp-content/uploads/2016/01/Dechezlepretre-et-al-policy-brief-Jan-2016.pdf). [↑](#footnote-ref-6)
6. <https://ec.europa.eu/research/eic/index.cfm?pg=about>. [↑](#footnote-ref-7)
7. System innovation is a horizontal policy approach combining technologies and social innovations to tackle problems that are systemic in nature, such as sustainable housing, e-mobility and health care. It involves many actors outside of government (as well as different levels of government) and takes a longer-term view. [www.innovationpolicyplatform.org/system-innovation-oecd-project](http://www.innovationpolicyplatform.org/system-innovation-oecd-project). [↑](#footnote-ref-8)
8. International Energy Agency (2018), Tracking Clean Energy Progress. [www.iea.org/tcep/](http://www.iea.org/tcep/). [↑](#footnote-ref-9)
9. IIASA (2010), “Clean Energy – Multiple Benefits“. <http://www.iiasa.ac.at/web/home/resources/publications/options/CleanEnergy.en.html>. [↑](#footnote-ref-10)
10. Journal Officiel (2015), “Décret no 2015-1850 du 29 décembre 2015 pris en application de l’article L. 533- 22-1 du code monétaire et financier”, Direction de l’information légale et administrative, Paris. [www.legifrance.gouv.fr/eli/decret/2015/12/29/2015-1850/jo/texte](http://www.legifrance.gouv.fr/eli/decret/2015/12/29/2015-1850/jo/texte). [↑](#footnote-ref-11)
11. Norway Sovereign Wealth Fund. [www.nbim.no](http://www.nbim.no). [↑](#footnote-ref-12)