

## **Session V: Promoting Technological Innovation to Address Climate Change**

### **Krzysztof Michalak, OECD**

Thank you for inviting me, and the OECD, to contribute to the discussion on the role of innovation in promoting sustainable development, and specifically addressing climate change. This is my first visit to the OSCE but I understand the OECD has already been invited to the discussions before, most recently on water management.

For this reason I will assume that the OECD is known to most of you and more so as our two organisations are often confused due to a similar pronunciation of our respective abbreviations.

I would like to pre-empt my presentation making three points:

- Innovation has been an extremely important engine of growth. The first and second industrial revolutions, which were based on the use of innovation such as steam power and iron making, are vivid examples of how the innovation can lift significantly the wealth of the nations. But it also shows that innovation can have negative effects on the environment which we still have to deal with today. As it was then, as it is now humanity has been at risk from a series of dangers of our own making. A few days ago, Prof Stephen Hawking warned that further progress in science and technology will create "new ways things can go wrong".
- In this context, innovation, even green, may just transfer pollution from one form to another the processes that we may not appreciate now.
- Green innovation may indeed lead to emission reductions but this may be offset by an increased use of new products and thus more emissions.

There is a great deal of examples that innovation can help to stabilize and reduce CO2 emissions. For example:

- transport CO2 emissions have been declining due to the combined action of several measures that include vehicle and fuel economy improvements;
- another example comes from innovations in packaging which reduced the amount of plastic needed for the job. For example, today's plastic bottles are 30% lighter than they were in the 1970s, which means lighter loads and fewer trucks on our the roads, helping to reduce transportation fuel and greenhouse gas emissions.
- advanced lighting solutions with longer lifetimes and greater luminous efficacy replaced incandescent bulbs saving significant energy.

The third and the fourth industrial revolutions, and related technological change, should ensure that climate change is addressed without compromising economic growth.

We are very lucky that we can discuss the contribution of innovation to address the climate change challenges just after a historic agreement that was reached at COP 21 in Paris. It brought countries together to agree on an ambitious target for limiting the global temperature rise. The deal is a very important defining element of the system innovation approach as it sets credible and sufficiently ambitious objectives and visions in government, in firms as well as intellectual and opinion leaders in civil society.

However, the Intended Nationally Determined Contributions to cut emissions submitted by 160 countries – even if fully implemented – do not add up to the level of emission reduction needed to keep the global average temperature rises below 2 degrees. So how can we close this emissions gap?

As negotiators recognised, green technology is going to be an important component of this. Article 7 of the COP21 Agreement is dedicated to technology development and transfer for mitigation and adaptation actions. It highlights that ‘accelerating, encouraging and enabling innovation is critical for an effective, long-term global response to climate change and promoting economic growth and sustainable development’. All the details still need to be figured out but some early initiatives are already there. In Paris we saw the announcement of “Mission Innovation” through which twenty countries – including China, India and the United States, as well as some large fossil fuel-producing countries, such as Canada or Saudi Arabia - committed to accelerate clean energy innovation by doubling their clean energy R&D investment over five years. And at the same time, 28 investors from 10 countries have joined the Breakthrough Energy Coalition to make an unprecedented commitment to invest capital in early-stage technology development coming out of Mission Innovation countries.

This renewed focus on green innovation marks a significant leap forwards and one thing is clear. Going forward cannot be limited to focusing green innovation to the ‘green sector’ alone. Rather, we need to make sure that we are talking about making all innovation green! To do that there is a need to take a systematic approach to policy to ensure that green considerations are incorporated into general innovation policy settings at the outset.

This requires a focus not only on the pace of innovation, but on the direction of innovation policies.

Systems innovation is also not just the replacement of one technology or innovation with another, like upgrading a gasoline engine with an electric one. It is about transforming an entire system – in this case the car – but also developing mobility solutions across the board.

A well-crafted strategic vision or plan needs to be supported through a mix of policy instruments based on the objectives that have been set. Design and implementation issues are also important, this includes instrument co-ordination, timing and sequencing, adequate balancing and the interplay of policy instruments, technology-neutrality and the impact on “incremental” and “radical” innovation, amongst others.

The OECD Project on Systems Innovation aims to re-think innovation policies in the context of green growth, to make mobility smarter and to make buildings and construction less resource intensive and less polluting. The OECD Innovation Strategy outlines three key strategies to transition to a systems-based approach:

- First, framework policies such as fiscal policies, Intellectual Property Rights, and product and labour market regulations, must be adapted to support the entry and growth of young, innovative firms. This requires “smarter regulations” to avoid stifling new firms and business models that could spur green innovation.
- Second, there is a need to reverse the decline in public funding of basic research and remove barriers to private R&D investment in green technology. In many countries, public R&D spending has stagnated or experienced significant fluctuations, averaging less than 0.7% of GDP in 2014 in the OECD area. Although private R&D spending has continued to increase, when it comes to longer term investments in R&D —such as those in renewable energies or energy storage -- significant barriers remain. This is due in part to the short-termism of financial markets and the lack of early stage financing for innovative start-ups.
- Third, there is a need for tools to help governments create “lead markets” for greener transport and sustainable buildings. Indeed, governments have often paved the way for new technologies where markets did not yet exist. Disruptive technologies that have originated in public research include nuclear power, personal computers, semiconductors, the development of the internet (CERN), the touch screen, GPS, and an estimated 75% of breakthrough drug developments. Even when governments were not directly part of the research that led to these new “general purpose technologies” (GPTs), often private enterprises benefited from grants and early stage government. Hence, it matters, which technological domain receives public support. This includes public and private funding for large-scale demonstration projects (e.g. bio refineries that turn waste into renewable energy), or carbon capture technologies. It will also require action on public procurement of technologies, such as low-carbon vehicles for public transport.

But above all, boosting green innovation requires clear and stable market signals, such as carbon pricing or other market instruments addressing the externalities associated with environmental challenges. Such signals will enhance the incentives for firms and households to adopt and develop green innovations. They enhance efficiency in allocating resources by establishing markets for green innovation. Pricing mechanisms tend to minimise the costs of achieving a given objective as they provide incentives for further efficiency gains and innovation. Such signals are very important as they indicate the commitment of governments to move towards greener growth.

- \* -

## **Eastern Europe, Caucasus and Central Asia**

Several economies in Eastern Europe, Caucasus and Central Asia have implemented measures to green their economies. For example, renewable energy production is high in Tajikistan and increasing in Georgia and the Kyrgyz Republic. Photovoltaic installations have improved access to energy in remote areas of Uzbekistan and Kazakhstan. Kazakhstan and Ukraine has set ambitious energy efficiency targets. Azerbaijan uses its sovereign wealth fund to finance green projects. Many of these actions are also contributing to job creation and poverty reduction.

However progress has been slow in this region. Steelmaking in Ukraine requires four times more energy per unit of output than in China. Central Asia's energy savings potential across all sectors through improved efficiency and conservation constitutes 50% of the current consumption.

In some (mostly resource rich) countries the persistence of command and control approaches, characterised by a strong position of central governments in the economic decision making, has limited the transition to more market-responsive legislation. In other countries, government pursued total deregulation rather than embarking on smart regulatory reforms. It resulted in an accelerated depletion of natural capital and w weakening of pollution prevention and control measures.

In all countries top political leaders, including presidents, clearly indicate the need to green countries' economies. However, Governments should avoid engaging in yet another wave of strategic papers and green growth promotion needs a reinforced focus on implementation, which includes the following key elements:

- The pricing of both natural resources and pollution must be brought up to a level that will promote environmental and resource efficiency. Though in place since the early 1990s, such instruments are still ineffective in the Eurasia region and require holistic reform. Existing data point to a strong presence of environmentally harmful subsidies. Six countries from the region are leading the global ranking of states that subsidise fossil fuel consumption. This makes the region particularly prone to wasteful resource consumption, budget pressures, and technological stagnation.
- The countries in the region should better manage the ways in which revenues from natural resources are collected and spent. Revenue from natural capital (including the appropriation, distribution and sound use of natural resource rents) has to be managed in a transparent way that enables its transformation into other forms of capital (foremost, human capital and productive capital) through innovation.
- Environmental regulations that set performance standards should be adjusted in line with green growth and smart regulations objectives to unleash the potential for increasing efficiency and innovation. This will allow to bring the private sector (big and small and including foreign direct investment,) on board by convincing entrepreneurs that green growth pays and or reduce costs of doing business. The small and medium-sized enterprise sector has particular needs. In this context, countries may need to look at the potential offered by supply chain pressure, green procurement and support that can be provided by the business associations and private sector management consultants.