



FASTER TOGETHER: A SHARED RESPONSIBILITY TO ACCELERATE ENERGY INNOVATION

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Energy consumption and production make up two thirds of the world's greenhouse gas emissions, putting energy at the heart of global efforts to mitigate climate change. The urgency of this challenge requires an increase in the pace and scale of energy innovation.

The accelerated development and deployment of new technologies and business models will be pivotal not only to address climate change, but also to ensure universal access to reliable and sustainable energy at affordable prices.

The energy industry has an impressive track record of innovation – as technological developments over the past century demonstrate – and the landscape has shifted seismically over the past decade. More and more sustainable energy technologies are gaining maturity and cost competitiveness.

But the scale of the energy system and the “*need for speed*” in energy transition now requires innovation right across this landscape. Critical areas include power generation and energy extraction, carriers such as hydrogen, biofuels and energy storage, carbon abatement options such as CCUS, and deep-decarbonisation of hard-to-abate end-use sectors.

Yet according to the International Energy Agency, only four out of 38 energy technology areas are on track to meet long term climate, access and pollution goals.

Accelerating the energy transition requires breakthrough discoveries and extensive deployment of market-ready technologies to transform the landscape. This calls for more investment, a stable and enabling policy environment, and support for out-of-the-box ideas and business models that address financial, regulatory or institutional barriers.

Through the World Economic Forum's initiative “*Partnering to Accelerate Sustainable Energy Innovation*”, experts highlight three critical elements to ensure the rate of innovation keeps up with the need for a radical transformation of the world's energy systems.

Institutional approach to energy innovation

Policies, incentives and public funding are instrumental for energy innovation, especially in the early stages of technology development. However, the implementation of various support mechanisms remains fragmented in many countries and is spread across multiple ministries and departments. The lack of coordination among agencies creates inefficiencies and restricts the transfer of knowledge.

Establishing institutions that set the national energy innovation agenda, pursue technology roadmaps,

implement and evaluate innovation-friendly policies, and disburse public funding to potentially transformational technologies in the early stages can help streamline the innovation process.

Additionally, this approach can help innovators access timely support, by bridging the gap in private sector investments due to technical and financial uncertainties, and improving coordination among different stakeholders, such as investors, academics and the private sector. Institutionalising energy innovation under a centralised umbrella provides predictability to funding and regulatory mechanisms and minimises disruption from political cycles. The ARPA-E programme in the US is a notable example of an institutional approach to energy innovation.

Innovative financial instruments to mobilise private capital

Private sector investment in energy innovation, although increasing over the past decade, remains low relative to areas like healthcare, information technology and artificial intelligence. Public funding has been the main source for research, design and development in energy. Significant capital expenditure requirements, high technology risks, and longer maturity timelines act as deterrents to private investment in early stage innovative energy technologies and solutions. At the same time, public funding programmes tend to be bureaucratic, entail high transaction costs and face challenges in identifying target investees.

Co-investment instruments that pool public and private sources of capital can improve the efficiency of public funding and reduce risks for start-ups and private capital. One such instrument is the “*Sustainable Energy Innovation Fund*” (SEIF), an innovative funding concept developed by the World Economic Forum in collaboration with KPMG.

SEIF is designed to be a blended finance fund to attract public and private sources of capital, focusing on innovations with application in emerging economies, and mitigating risk by diversifying across technology areas and stages. This blending of funds helps mitigate macroeconomic, tax, currency, and political risks inherent in clean energy investments in developing countries.

The SEIF has been structured as a global fund, allowing participating countries to channel a portion of their energy innovation budget to co-invest in capital intensive areas with private sector investors, gain access to new markets,



Strategic public procurement can support technology innovation at all stages of the development cycle

and to nurture their domestic innovation ecosystem through knowledge exchange with global peers.

Strategic use of public procurement

Beyond investment and incentives, innovations struggle in securing first buyers in a market dominated by incumbents. The public sector is a sizable consumer of energy products and services, however public procurement is restricted to off-the-shelf, low cost, secure and proven technologies. Strategic public procurement can support innovation at all stages of the development cycle – from pre-commercial to later stages.

In the early stages, the public sector can push supply by scouring research and development capabilities for design and prototyping solutions that currently do not exist in the market, thereby helping to explore new solutions. Public procurement can also pull demand by driving the commercialisation of late-stage solutions, helping them to achieve cost efficiency and economies of scale.

Strategic public procurement combines these two

mechanisms, allowing the public sector to fast-track innovations at different stages of maturity. For public procurement to play a stronger role in accelerating innovation and deployment, the legal framework needs to evolve to ensure transparency, accountability, and to address intellectual property concerns. The Small Business Research Initiative (SBRI) in the UK and mass procurement of LED bulbs by Energy Efficiency Services Limited (EESL) in India are good examples of the use of public procurement in accelerating innovation.

These elements show how the acceleration of innovation must come from several sources, working in parallel. It cannot be overcome unilaterally by governments, industry, researchers or entrepreneurs working in isolation. The use of energy is deeply embedded in modern economies and societies. To fast-track development and diffuse innovative technologies successfully, the interplay of effective collaboration across all stakeholder groups, together with the creation of a value proposition for both business and society, is essential. ■