

Co-Innovation of Clean Technologies: A Panacea for Climate Change

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Access to advanced technology is critical to achieving energy, environmental and climate mitigation goals for developing economies. However, lack of availability, access and adaptability to adequate technology domestically remains a critical obstacle. Interestingly access to technology from overseas players or developed economies end up in the costly purchase of finished products or transfer of technology that is not necessarily a game-changer. While a developing country is keen to have advanced and disruptive technology to make breakthrough progress in climate mitigation, the overseas counterparts give more importance to the profit they can make from such an engagement. Free flow of advanced technology is also limited owing to reasons such as legal issues, financial constraints and intellectual property rights.

How to overcome these hurdles and ensure better access to advanced technology for developing countries while also meeting the demand of the technology suppliers? This article discusses 'Co-innovation' as a model for technology collaboration between technology suppliers and recipients.

The growing dependence on fossil fuels and the inefficient energy usage in industrial, transportation and residential sectors coupled with emissions from coal-based power generation and manufacturing sectors have led to significant increase in greenhouse gas emissions in many countries. In order to address GHG emissions in developing countries, integration of better technologies across various energy producing as well as consuming sectors is critically important. The increasing air pollution in many cities across the world also require interventions of advanced technologies.

As the lack of availability of advanced technologies domestically has been a critical impediment, developing countries turn to overseas players for technological support.

Over the years, the perception of technology collaboration or technology transfer have reduced to the sale of finished products from developed world to developing world, as simply transferring technological knowhow is often unacceptable for the former. However,

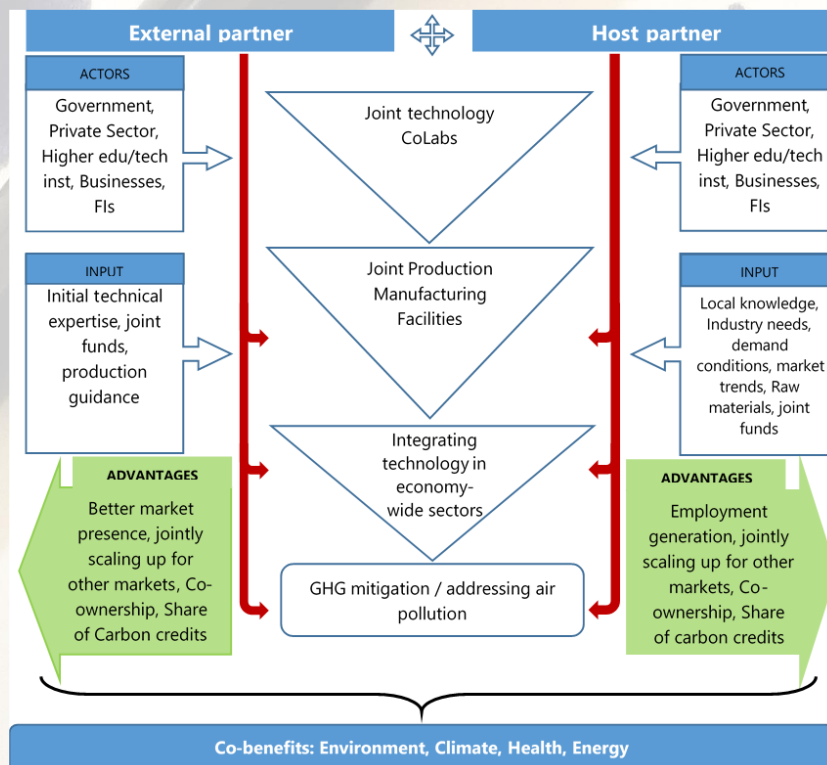
adapting to technologies from other countries also face a multitude of challenges in a recipient country especially because of various limitations such as lack of continuous support, lack of adequate capacity in operations, lack of adequate customisation to local conditions etc. Here, a sustainable approach is required in order to benefit both the players from the collaboration – the donors as well as recipients. The use of low carbon technologies in transportation, industry as well as other major energy consuming and producing sectors require ‘*co-innovation*’, where both host as well as external partners cooperate and contribute ideas to develop advanced technologies adaptive to local conditions.

Co-innovation of Climate Technologies

Co-innovation can be defined ‘as a shared work of generating innovative and exceptional design conducted by various actors from firms, customers, and collaborating partners’. In terms of climate mitigation and addressing greenhouse gas emissions or even

Co-innovation: Schematic Representation

minimising the air pollution of many countries, mostly developing, economies will need to depend on advanced technologies from external partners. While the original concept or the knowledge behind a specific technology itself may not be new, co-innovation provides opportunities for external partner (which probably holds the advantage of developing and using the same) to collaborate with internal partners (domestic partners in a host country which are in demand of the technology).



Multiple inherent limitations lead both the partners towards co-innovation. An external partner with the technological knowhow can be often ill equipped to understand the demand conditions as well as various factors such as cost sensitivities, climatic conditions under which the equipment needs to operate, design needs of the consumers etc. in a specific market. On the other hand, the internal partner or the host country partner will have adequate knowledge of the demand conditions, consumer expectations, knowledge of policy and legal mechanisms as well as legal requirements that govern technology development. The collaboration of internal and external partners by jointly pooling in resources and focusing on fine-tuning the innovation is likely to have a far better output than a finished product or equipment imported from overseas countries. The co-innovation typically benefits from the technological expertise of the external partner and demand and market conditions and local knowledge of internal partner.

Widespread use of low carbon technologies is a key step to meet the climate mitigation goals. Developing countries also seek technological assistance in controlling carbon emission and environmental damage, using the climate negotiation platforms too. Though there have been existing technologies for electric mobility in many countries, the exorbitant cost of the same has been adversely affecting the popularization in developing economies. In addition, efficient technologies for battery storage, charging facilities and vehicular designs that suit the needs of the developing country are also limiting the popularization of existing electric vehicles technologies.

Operationalising Co-innovation

‘Co-innovation’ has a significant role to play in promoting technology collaboration between countries. In order to enhance the understanding of co-innovation three key steps relevant to the same are indicated below.

1) Developing conceptual understanding:

While climate change is widely recognized as a critical challenge to humanity, exploring opportunities for co-innovation of specific technologies, under specific governance and legal framework is relatively a newer aspect. It is important to explore the possible framework for co-innovation where an advanced economy or an external partner can collaborate with a recipient country or a host partner. This has great relevance in terms political interaction between governments, business interactions, and furthering academic knowledge on newer frameworks of technology collaboration in a wider developing country context. While the article specifically looks at co-innovation in addressing the technology gaps towards enabling a host country meet its long-term climate needs, this model has wider applications in all sectors.

2) Mapping the importance of Co-innovation:

It is widely recognised that the advanced low carbon technologies can help meet climate mitigation and clean energy development targets and help fight air pollution remarkably. Unlike the conventional understanding of technology transfer, where technologies from one country to another is facilitated through business-to-business (B2B) interactions, it is important to find options for a more sustainable approach. The issues pertaining to climate mitigation and air pollution are dynamic and continue to evolve based on the changing economic activities, emissions trends etc. Hence, it is important to continuously upgrade and integrate the local concerns in fine-tuning the technological solution. Co-innovation typically helps in achieving the desired targets in a specific local context and help make the solutions economically viable even to a larger market.

3) Shaping Co-innovation:

Understanding ways to shape co-innovation as a strategy towards the development of locally adaptive technologies is important. Identifying the key stakeholders and components that are critical to encouraging co-innovation is also relevant in this context. While the host partner possesses huge repository of knowledge about the local condition, demand trends, political and economic dynamics, an external partner on the other hand already has experience in the use of a mature technology that can contribute conceptual knowledge, investment needs and specific expertise with regard to operationalization. In order to shape co-innovation as an important process for addressing air pollution issues or developing climate technologies the host partner and external partner may need to develop customized institutional setup to engage in co-innovation including adequate governance mechanisms, legal, financial and policy elements.

Conclusion



Technology collaboration or transfer of technology from one country to another is not a new phenomenon. Hence, the objective of this article is not to reinvent the wheel, but to examine the feasibility of technology collaboration in a manner, which enhances long-term partnership, and benefit all players under the framework of Co-innovation. Co-innovation is also an effective model for promoting advanced technology in addressing climate mitigation and air pollution in developing countries. While highlighting the importance of co-innovation the article does not undermine the potential challenges in operationalising the same. The capacity of host countries in manufacturing and production, availability of raw materials for production, gathering technical knowhow, setting up adequate institutional mechanisms, securing financial resources etc. will be key challenges for operationalising co-innovation. The article is also aimed generating debate on the pros and cons related to co-innovation as a potential platform to replace the existing models of developed-developing country technology collaborations.

(Note: This article is based on an ongoing research by the author using extensive field study and expert interviews. For citation please use: Janardhanan, N. (2019), *Co-innovation of Clean Technologies: A Panacea for Climate Mitigation?*, *Energy Review*. Vol. 1, Issue 9.) Author, Dr. Janardhanan can be reached at nanduj123@gmail.com. ■■■



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