INTERSESSIONAL PANEL OF THE UNITED NATIONS COMMISSION ON SCIENCE AND TECHNOLOGY FOR DEVELOPMENT (CSTD)

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Contribution by India

to the CSTD 2022-2023 priority theme on "Technology and innovation for cleaner and more productive and competitive production"

Government of India's Inputs for Priority Theme 1: Technology and Innovation for Cleaner and more productive and competitive production

Department of Science & Technology (DST) works at the initial stages of value chain of the technology & innovation for cleaner and more productive and competitive production. DST supports Research & Development of technology concept, experimental proof & Technology demonstration projects in domain of Clean Energy. The Line Ministries/ Departments vis-a vis Heavy Industries, Power, New and Renewable Energy, Promotion of Industry and Internal trade carry out the major work for policy for production and competitive production of green technologies in India.

1. What are some specific examples (from the public and private sectors) of green technology and innovation for cleaner and more productive and competitive production in your country? Please include contact, website, link to reports and any other relevant information concerning these projects and initiatives?

The Production-Linked Incentive (PLI) Schemes have come out in few sectors for enhancing India's Manufacturing Capabilities contributing to cleaner production and competitive production. These are being is administered by Line Ministries /Department as under :

S. No.	Sectors	Ministry/Department
1.	Advance Chemistry Cell (ACC) Battery	NITI Aayog and Department of Heavy Industries
2.	Electronic/Technology Products	Ministry of Electronics and Information Technology
3.	Automobiles & Auto Components	Department of Heavy Industries
4.	High Efficiency Solar PV Modules	Ministry of New and Renewable Energy
5.	White Goods (ACs & LED)	Department for Promotion of Industry and Internal Trade

2. What are the national strategies, policies, and laws concerning green technology and innovation for cleaner and more productive and competitive production in your country?

Following Act and Policies are few enablers to promote cleaner and more productive and competitive production in country:

(a) Energy Conservation Act 2001

(b) Energy Conservation Building Code (ECBC)

(c) Electricity Act, 2003

(d) India Cooling Action Plan

(e) Green Hydrogen/ Green Ammonia Policy

(f) National Clean Air Programme (NCAP)

3. What are the key industries that are pioneering green innovation in the country? List the key actors in the national ecosystem of innovation related to green innovation in your country (firms, universities, financial institutions, regulators)? What are the key networks of the ecosystem in your country (including online networks, innovation hubs, forums, etc.)?

Electric Vehicle, Energy Efficient buildings, Renewable energy including Solar, Batteries etc are the some of the key industries pioneering green innovation in the country. Few of the key organizations working in area of clean energy innovation domain are as under:

1. Bharat Heavy Electricals Ltd. (BHEL) - www.bhel.com
2. Energy Efficiency Services Ltd. (EESL) - https://eeslindia.org/
3. NTPC Energy Technology Research Alliance (NETRA) - https://www.ntpc.co.in/en/services-and-initiatives/netra/about-netra
4. Tata Power, New Delhi - https://www.tatapower.com/
5. Aartech Solonics Ltd., Bhopal, Madhya Pradesh - https://aartechsolonics.com/
6. Aspiration Energy Pvt. Ltd., Chennai - https://aspirationenergy.com/
7. CATS Eco Systems Pvt. Ltd., Nashik, Maharashtra - http://www.cats-global.com/
8. Indira Gandhi Centre for Atomic Research, Kalapakkam, Tamil Nadu – http://www.igcar.gov.in
9. National Thermal Power Corporation Limited, New Delhi – https://www.ntpc.co.in
10. The Singareni Colleries Company Limited, Kothagudem, Telangana – https://scclmines.com/
11. L&T India, Odisha - https://www.larsentoubro.com/
12. ISHRAE, New Delhi - https://ishrae.in/

13. Thermax Limited, Pune - http://www.thermaxglobal.com/

14. Lab Concern (India), Kanchipuram, Tamil Nadu

15. Seth Automobiles (p) Ltd, Kolkata, West Bengal – www.sethautomobile.com

16. SELCO Solar Light Private Limited- https://selco-india.com

17. TERI -https://www.teriin.org/

4. What are the challenges that your government have faced or may face in promoting green technology and innovation in your country to contribute to national development priorities and accelerate the progress towards the SDGs?

Good innovative performance is a necessary condition for economic performance in the future. The challenges of the promoting green technology and innovation system in India is weak bonding between science/higher education and industry due to skewed spending on Research & Development activities by private organization in terms of their revenues. Few of the challenges are

• Improving the institutional frameworks for co-operation between public and private actors of innovation.

•Improving the attractiveness of India as a top location for researchers as well as R&D and other innovative activities.

•Streamlining of complex innovation governance system existing in private and public organization

• Improving interdepartmental co-ordination.

Public-Private Partnerships (PPP) for innovation is an important part of the answer to such challenges. Different models of PPP are already the key components of innovation policy tool and much more is needed in terms of the cultural diversity exists in different states of India.

5. What should governments, the private sector, organized civil society, and other stakeholders do so that developing countries can benefit from these technologies?

The Government, Private Sector & Stakeholders must work in close coordination to raise the awareness of the technological development happening in the space of green technologies. Suitable actions are to be contemplated which could complement PPP in identification and phase wise adaptation of green technologies.

It is important that the best practices are taken into account from practical experience gained in the management of existing PPP projects. When streamlining the numerous schemes to promote innovation, the balance between competitive and unconditional grants, as well as between project-based and programme-based support are worth to consider.

For university research to be more responsive to innovation-driven demand for scientific and technological knowledge, the funding system should encourage more research of public private partnerships. Greater priority should also be given to measures that encourage spin-offs from public research, creation and operation of incubators and a more efficient management of IPRs by universities and public research institutes.

6. What are some examples of international cooperation mechanisms, projects, programmes or strategies, including triangular and South-South cooperation, in green technology and innovation that your country is part of?

Clean Energy Ministerial and Mission Innovation are some of the leading international cooperation mechanism in clean energy.

7. What actions can the international community, including the CSTD, take to help your country take advantage of green technology and innovation for cleaner and more productive and competitive production?

India expects developed countries to provide climate finance of $1 trillion at the earliest. Further Technical and financial cooperation, provision of technology and know-how that would increase efficiency, resilience, reliability and flexibility of energy production, storage and consumption.

8. Could you suggest some contact persons of the nodal agency responsible for projects/policies and international collaboration in this context as well as any experts (from academia, private sector, civil society or government) dealing with projects in this area? We might contact them directly for further input or invite some of them as speakers for the CSTD inter-sessional panel and annual session.

Nodal Agency	Contact Person
Department of Science & Technology (DST)	Dr. Vineet Saini, Sc-F (R&D in Solar Energy & Renewable Energy System)
	Dr. Ranjith Krishna Pai, Sc-E (R&D in Hydrogen & Fuel Cell)
Bureau of Energy Efficiency (BEE)	Mr. Abhay Bakre, Director General
Ministry of New & Renewable Energy (MNRE)	Dr. Arun K Tripathi, Sc-G
National Chemical Laboratory, Pune	Mr. Ashish Lele, Director
International Advanced Research Centre for Power Metallurgy and New Materials (ARCI), Hyderabad	Dr. Tata Narasinga Rao, Director

9. Do you have any documentation, references, technological assessments, future studies or reports on the priority theme in your country or region?

https://www.tifac.org.in/index.php/programmes/activities/technology-vision-2035

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