

3.3.1. Institution has created an ecosystem for innovations including Incubation centre and other initiatives for creation and transfer of knowledge

Describe available incubation centre and evidence of its usage (activity) within a maximum of 500 words

HBNI has under its academic umbrella eleven institutions of DAE as its constituent institutions (CIs)/off-campus centre (OCC). Out of these, seven are grant-in-aid institutes of DAE, most of which are engaged in fundamental research (eg. HRI, IMSc, IoP, SINP) or education programmes at MSc level (NISER, HRI) or medical research (TMC). Due to the mandates of these institutions, activities in these institutions are not oriented to technology development. In the DAE units under HBNI (BARC, IGCAR, VECC and RRCAT), although there is no emphasis on technology incubation, other initiatives for creation, transfer and exploitation of knowledge are pursued vigorously. One of the mandates of HBNI is to develop knowledge base and technology solutions for indigenous development of nuclear science and technology, and thus the results of research work of HBNI students in DAE units is often directly relevant to DAE's own programs. Such developments get converted into technologies and products / processes in the industrial units (eg. Nuclear Fuel Complex, Heavy Water Board), commercial unit (Board of Radiation and Isotope technology) and public sector companies (eg. NPCIL, ECIL) under DAE, which thus play the role of incubation as well as implementation centres. A part of the research programs of DAE units under the HBNI umbrella do deal with problems of wider interest, and the DAE has indeed created an ecosystem for incubating the innovation developed by the academic & research staff in such domains, with the help of the industry. An IPR cell at DAE provides guidance and assistance to the CIs/OCC in filing patents.

BARC, a CI of HBNI, has a Technology Transfer and Collaboration Division (TTCD) to assist in the transfer of the technologies developed in BARC as well as other DAE units for commercial exploitation. This division is presently headed by a senior professor of HBNI. In addition, some of the CIs, like BARC, IGCAR, RRCAT, VECC and IPR, have a technology transfer cell/committee which coordinates with TTCD and arranges the logistics for transferring technology developed in the Centre to the industry.

The technologies developed in BARC as well as other DAE for public utilization are available for transfer on non-exclusive basis, on the TTCD website (<http://www.barc.gov.in/technologies/technology.html>) under various areas: Agriculture and Bioscience, Radiation Technology, Advanced Instrumentation, Medical Equipments,

Engineering, Environment, Chemical and Water Technologies. In fact, BARC has entered into MoUs with several Agricultural Universities for incubation of technologies for new varieties of seeds. The list of technologies transferred in the last five years is in the supporting document. A technology developed by BARC, "A plant lectin based formulation for prophylactic protection against oxidative stress-induced toxicity, morbidity and mortality" is presently available for incubation to the industry (see <https://technologies.britatom.gov.in/>).

IPR has set up Facilitation Centre for Industrial Plasma Technologies (FCIPT) (<http://www.plasmaindia.com>) to promote the commercial exploitation of plasma technologies through development, incubation, demonstration, manufacturing and transfer. FCIPT has generated several advanced and non-conventional plasma based technologies for material processing and environmental remediation.