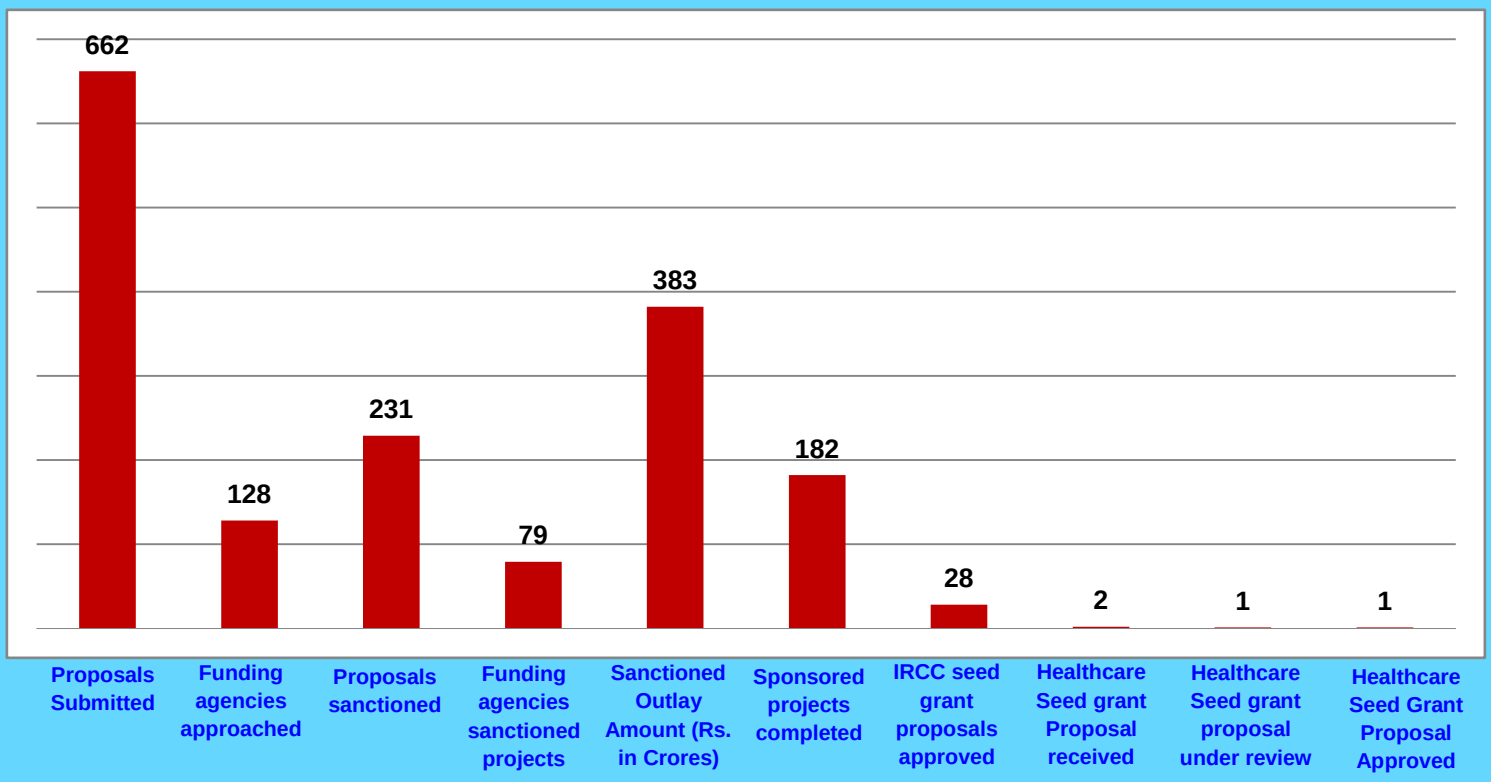
R&D Update

1st July 2016 to 31st March 2017

INDUSTRIAL RESEARCH & CONSULTANCY CENTRE

INDIAN INSTITUTE OF TECHNOLOGY BOMBAY

Sponsored projects:



Few major sponsored projects undertaken

Project Title: Centre of Propulsion Technologies

Description:

This centre aims to spearhead fundamental and applied research in design of components of aero propulsion.

- Create knowledge database for areas related to gas turbines and other aero propulsion technologies.
- Train students (M.Tech. Ph.D. Post-docs) in areas related to aero engine and propulsion technology.
- IIT Bombay acts as a primary Research Node for this Centre along with IIT Madras.

Funding Agency: Defence Research and Development Organisation

Main PIs: Profs. A. M. Pradeep and B. Roy, Department of Aerospace Engineering

Project duration: 5 Years

Sanctioned outlay: Rs. 160 Crores

Project Title: Million Solar Urja Lamps (SoUL Program) Phase II. Distribution of 5 lakh lamps

Description:
Solar Urja Lamps (SoUL) Phase-II program (proposal for distributing 5 lakh units in the states of Rajasthan, Uttar Pradesh and Bihar) is in continuation with the Million Solar Urja Lamp (SoUL) Program.

- IIT Bombay coordinates planning and execution of the project.
- This project aims to localisation of solar energy through local assembly, sale and usage of Solar Urja Lamps.
- Cost of a lamp: Rs. 740. Contributions towards lamp cost: Rs. 240 from MNRE, Rs. 380 from CSR grants, Rs. 120 by the student beneficiary.

Funding Agency: Ministry of New and Renewable Energy, CSR partner: Idea Cellular Ltd.

Main PI: Prof. Chetan Singh Solanki, Department of Energy Science and Engineering

Project duration: 2 Years

Sanctioned outlay: Rs.37 Crores

Project Title: Implementation of 70 lakhs solar study lamps in the states of Assam, Bihar, Jharkhand, Uttar Pradesh and Odisha

Description:
Through this project Government aims to provide solar study lamps to school going children in rural India where household grid connectivity is less than 50% as per 2011 census and to eliminate the usage of kerosene wick lamps for study purpose.

- The number of beneficiaries under this program will be around 7 million in the five states of Assam, Bihar, Jharkhand, Uttar Pradesh and Odisha with a total budget of Rs.494.90 Crores.
- IIT Bombay and Energy Efficiency Services Limited (EESL), Noida will jointly implement this project.
- IIT Bombay involvement includes selection of zonal executing agencies, coordination and assembling of lamps, communicating demand plan to EESL, and ensuring orderly distribution of lamps among others.
- Cost of a lamp: Rs. 700 of which Rs. 600 is contributed by the MNRE and the student beneficiary pays Rs. 100.

Funding Agency: Ministry of New and Renewable Energy

Main PI: Prof. Chetan Singh Solanki, Department of Energy Science and Engineering

Project duration: 2 Years **Sanctioned outlay:** Rs.27.73 Crores

Project Title: Teaching Learning Centre for Information and Communication Technologies

Description:
This projects aims to raise the levels of teaching/learning in educational institutions through ICT based pedagogic tools. Some of the objectives of this project are as follows:

- Mapping popular open source ICT tools such as Scilab, LaTeX and OpenFOAM to the course curriculum of colleges and LibreOffice, Geogebra, Jmol, GChempaint, Avagadro and GIMP to the course curricuum of schools.
- Develop pedagogic methods to integrate such tools in teaching.
- Introduce college and school teachers to some of the effective and popular education technology tools (e.g., flipped method, clicker, Moodle).
- To train approximately 6000 teachers.

Funding Agency: Ministry of Human Resource Development

Main PI: Prof. K. Moudgalya, Department of Chemical Engineering and Interdisciplinary Programme on Educational Technology

Project duration: 4 Years **Sanctioned outlay:** Rs.9.75 Crores

Project Title: High Resolution Mass Spectrometry based Proteomics Research and Training Facility

Description:
This projects aims to establish Mass Spectrometry (MS) facility to support proteomics research in IIT Bombay and provide service and training to external users.

- MS based proteomics technology will be used to analyze the biological samples to study the disease pathogenesis and identification of clinical biomarkers and potential drug/ vaccine targets.

Funding Agency: Department of Biotechnology

Main PI: Prof. Sanjeeva Srivastava, Department of Biosciences and Bioengineering

Project duration: 5 Years

Sanctioned outlay: Rs.9.67 Crores

Project Title: Development of Lab-on-chip platforms for efficient and automated farming (LEAF) Agricultural Sensors

Description:
The project seeks to develop sensor platforms relevant for agricultural requirements of the country.

- It aims to develop prototypes, nano-mechanical cantilever-based electronic-nose platform for detection of ethylene (as fruit-freshness indicator), methane and H2S (for paddy fields), soil micro-nutrients (B, Zn, S, Mn) based on host-guest binding, Nano-material based electrochemical sensor system for detection of soil macro nutrients (N. K. P), soil moisture and pH and metal waveguides based metal oxide nanoparticle coated sensors for pathogen detection among others.

Funding Agency: Department of Science & Technology

Main PIs: Profs. Subramaniam Chandramouli, Department of Chemistry and T. Kundu, Department of Physics

Project duration: 3 Years

Sanctioned outlay: Rs.9.5 Crores

Project Title: Centre for Computational Engineering and Science

Description:
The Centre for Computational Engineering and Science will support development, maintenance and up-gradation of computational mechanics software packages and provide human resource development and education on a continuing basis.

- The centre aims to bring voluminous research work done in the areas of computational mechanics and analysis of nuclear structures under one roof and develop software packages to cater to the future needs.
- The activities of the Centre will be modulated through projects to be undertaken by faculty of the Institute and funded separately by the Board of Research in Nuclear Sciences.

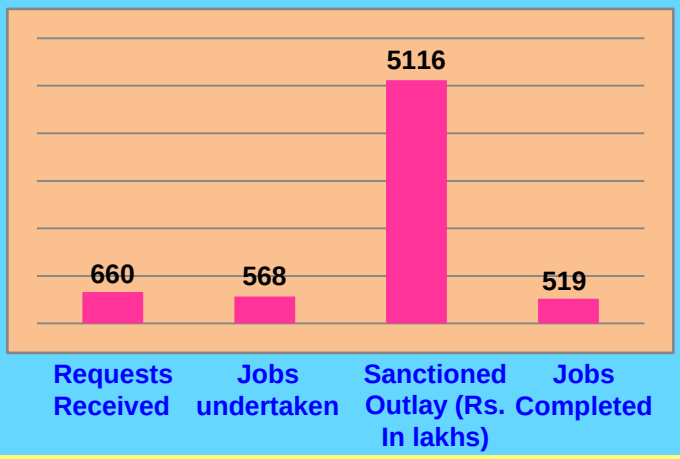
Funding Agency: Board of Research In Nuclear Sciences

Main PI: Prof. Y.M. Desai, Department of Civil Engineering

Project duration: 3 Years

Sanctioned outlay: Rs.4.99 Crores

Consultancy projects:



Intellectual Property licensed for opening incubating company in SINE

- **Predication of body weight and disease risk based on a physiological mathematical model**
  - Name of the inventor(s): Prof. K.V. Venkatesh and Abhishek Koshta
  - Name of the person to whom license is given: Prof. K.V. Venkatesh
  - Name of the company: Swasthya Guru
- **Developing Web based Hybrid Expert System for Financial Analysis**
  - Name of the inventor: Prof. Rajendra M. Sonar
  - Name of the person to whom license is given: Prof. Rajendra M. Sonar
  - Name of the company: WKA Technologies Pvt. Ltd.

No. of IP licensed/royalty received (fresh/renewed): 7

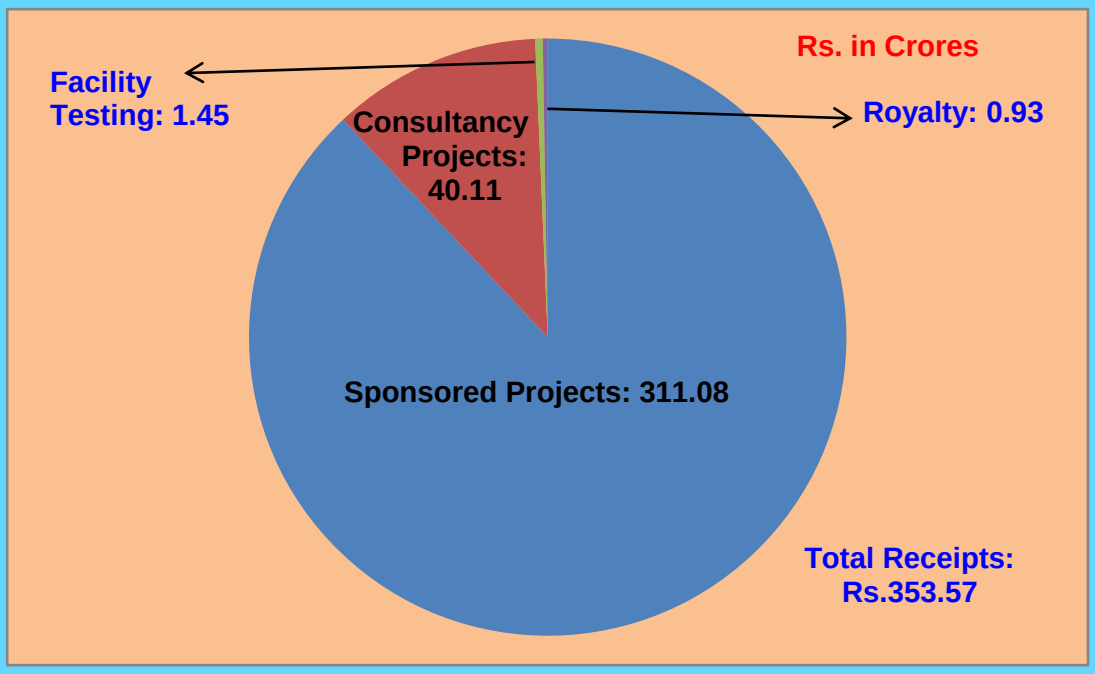
- Board Games design
- Fuel Additives for improving efficiency
- Multi Utility Heat Pump
- Software for bid matching in power exchange
- Software for computation of sharing of inter-state transmission charges and losses
- Tube Tube heat exchangers
- Web based software for transmission usage cost and loss allocation (WebNetUse)

Intellectual Property (IP) Rights:

Patent		
Patent Details	***Applications filed (No.)***	***Granted (No.)***
Indian Patent	56	11
Patent Cooperation Treaty (PCT)	8	-
US Patent	6	1
Other IPs		
IP Details	***Applications filed (No.)***	***Registered (No.)***
Trademark	4	5
Design	2	1
Copyright	1	-

Please note that the patent granted are not those that were (applications) filed during this period

Receipts:



Industry Interactions:	
No. of industry requests received	171
No. of industry that visited Institute	42

Institute Ethics Committee (IEC):	
No. of proposals received for IEC review	19
No. of proposals approved by IEC	10
No of proposals under review	9

Project staff:	
No. of project staff joined	767
No. of project staff resigned	719
No. of project accommodation allotted	35
No. of project accommodation vacated	5

MOU/Agreements:	
No. of requests received	165
No. of agreements finalised & signed	93
No. of agreements abandoned	2
No. of agreements under discussion	70

Accounts Related:	
No. of Advance requests received	704
No. of Bills and Receipts processed	33893
No. of Honorarium request received	1868

Central Facility:

No. of Central facility installed and open to users : 1

- Bio Safety Level-2 Laboratory @ Department of Biosciences & Bioengineering

15th May, 2017