iPTiF

Oorja Grand Challenge

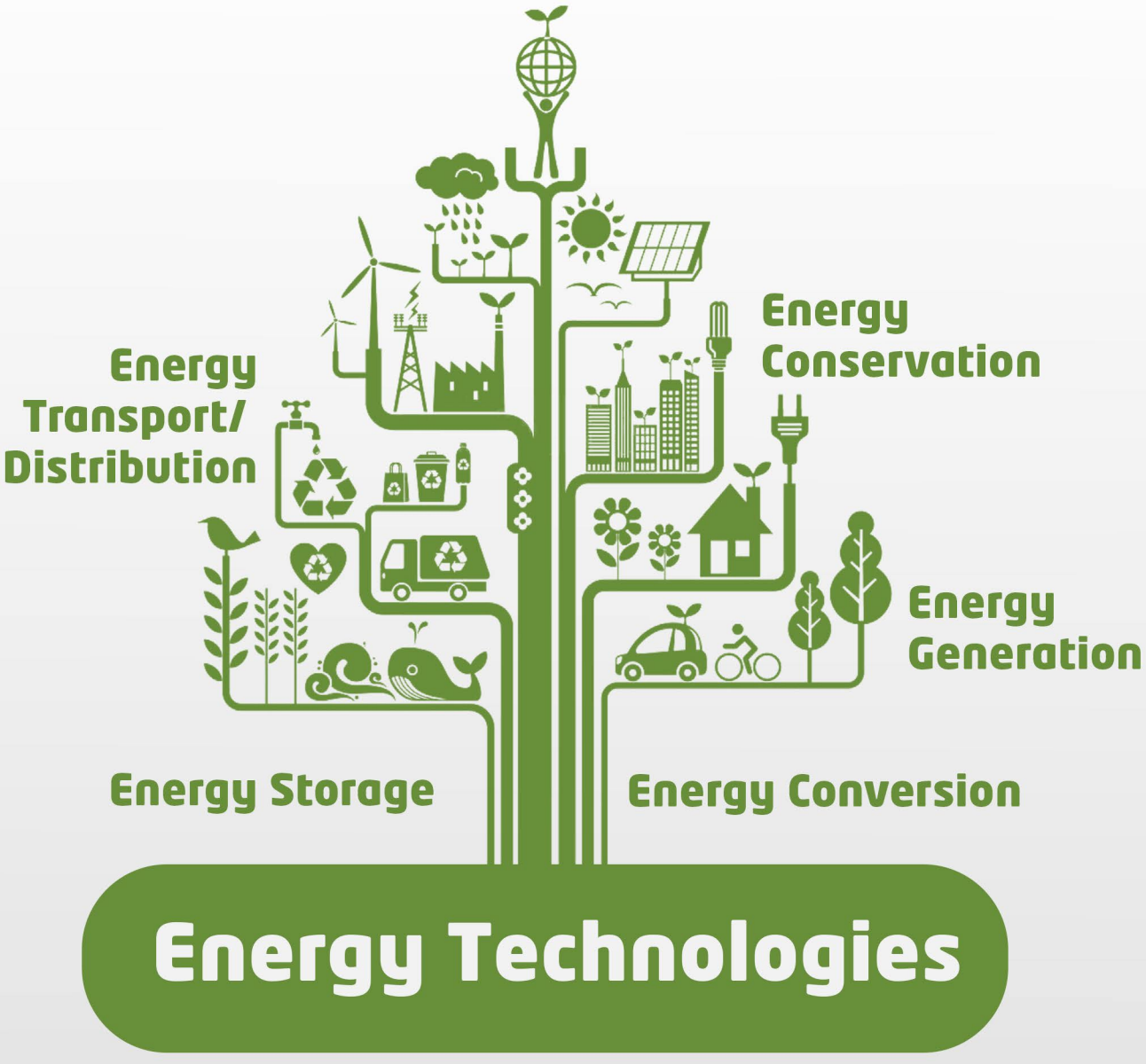
IIT Palakkad
Technology IHub Foundation
Driving automation for energy and safety

EDUCATE . INNOVATE . IMPACT

As the world is heading towards lesser carbon emission goals, India still relies on fossil fuels for its energy needs. In times of these depleting resources and climate crises, the best way forward is to take the dual path of energy efficiency and renewable resources for energy generation. There is a need to discover and nurture innovative and sustainable solutions for significant Energy challenges faced by our country and make India a forerunner in technology solutions to mitigate climate change.

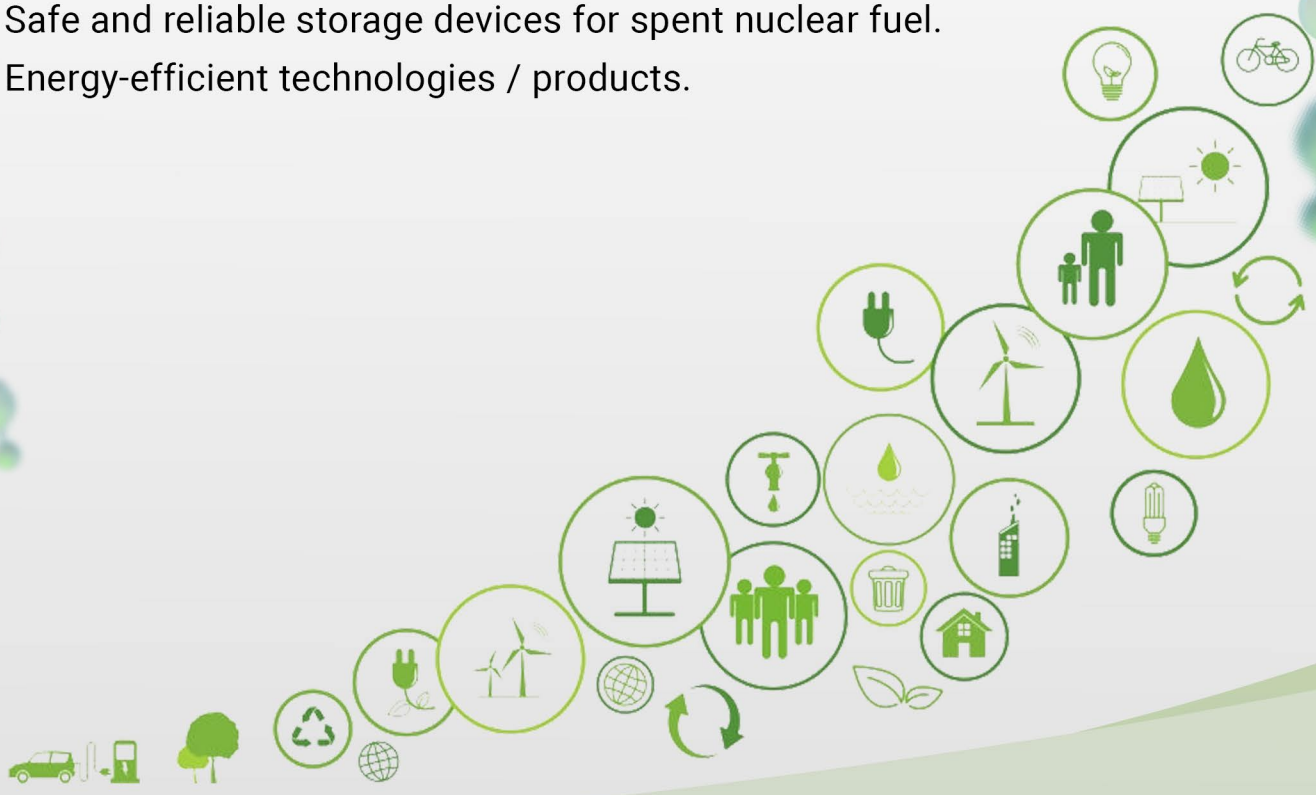
IIT Palakkad Technology IHub Foundation (IPTIF) is conducting the Oorja Grand Challenge to boost Cyber-physical technology innovations in the energy domain. This grand challenge will mold teams to generate employment for the Indian and global energy industries by undertaking fundamental research and product development. Verticals of interest in this grand challenge include but are not limited to:

- Energy storage technologies
- Energy generation technologies
- Energy conversion technologies
- Energy transportation/distribution technologies
- Energy conservation



A few problems of interest in the above verticals:

- Switched reluctance or induction motor with more than 2 Kilowatt/Kilogram power density and high efficiency.
- Lithium Polymer battery charger and battery management system. Low weight for onboard charging systems, medium weight for external chargers.
- Hydrogen extraction from seawater using solar energy with focus on improved product design, large lifetime and reliable operation.
- Battery pack design using Lithium, Aluminum and Iron chemistries.
- Small size high-efficiency solar thermal systems for electricity generation.
- Battery pack designs for simplest battery swapping standard. This standard should be adoptable by all 4 wheeler vehicle manufacturers.
- Battery swapping automation systems design such as robotic manipulators for swapping batteries in cars, swapping grid level storage in the battery station.
- Grid level battery charging (100s of Kilowatts to several Megawatts).
- Battery life monitoring systems, predictive failure estimation, charging methodologies for battery life maximization.
- Automated assembly systems for large windmills.
- Large megawatts high power density generators for lighter windmills.
  Smaller and safer nuclear reactor designs.
- Safe and energy efficient extraction of fissionable materials from mineral ores.
- Safe and reliable storage devices for spent nuclear fuel.
- Energy-efficient technologies / products.



Objectives of Oorja Grand Challenge

- Discover and nurture new, innovative, viable, and sustainable Cyber-physical technology solutions for significant Energy challenges that are faced by our country.
- Encourage ideas from latent sources and convert them into start-ups.
- Generate better awareness about entrepreneurship amongst India's masses and lend a helping hand to aspiring and existing entrepreneurs through active media outreach.
- Expand the pipeline of potential incubates.
- Provide structured mentoring, guidance, prototyping grants, and seed-funding for innovative ideas applying for such programmes.
- Establish a network between academia, financial institutions, industries, and other institutions thereby, building a vibrant start-up ecosystem.

Phases of Oorja Grand Challenge

The challenge will have three evaluations with sequential filtering of teams in each stage.

Preliminary evaluation - Teams will have to register for the grand challenge and submit their proposal online. Shortlisted teams will be given a grant of upto to **1.5 Lakhs** for perfecting their designs.

Intermediate evaluation - Teams that are shortlisted based on their designs will be granted a grant of upto **10 Lakhs** for prototyping their designs.

Final evaluation - After prototype review, the best teams will be awarded a grant of upto **25 Lakhs** towards incubation and business support.

Eligibility Criteria

- A team of minimum 5 members with at least one subject-matter expertise from industry/academia.
- At least half of the team members (including the team lead) should be Indian citizens.

Preferred Applicants

- Entrepreneurs with a business plan that can result in technology/manufacturing jobs.
- Recent graduates and innovators who have:
  - Energy focused business ideas with bigger technology uncertainties and/or long gestation periods.
  - Energy focused business ideas leveraging technology or IP from publicly funded research or academic organizations.
  - Technology business ideas with considerable potential for social impact.

Evaluation Criteria

Applications will be evaluated based on:

- Technology innovation
- Business model innovation
- Market addressed
- Customer feedback
- Scalability & potential
- Competitor evaluation & pricing

Selection Process

- Applicants will be shortlisted based on the evaluation criteria.
- The selected teams will receive adequate feedback from expert review panels to enhance their learnings in design, documentation, and business plans.

About NM-ICPS and TIH-ICS

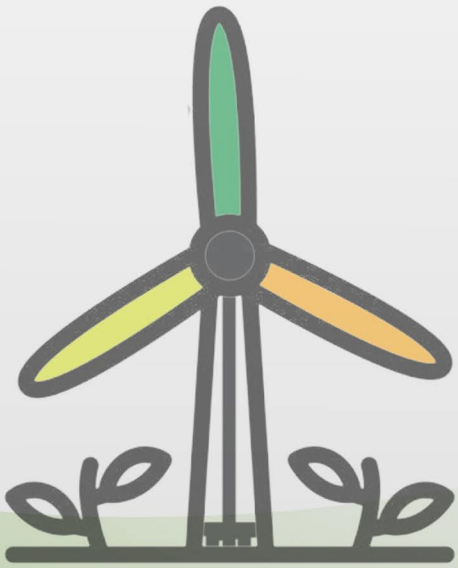
The Union Cabinet approved the National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS) to be implemented by DST with a total outlay of Rs.3660 crore for a period of five years. The Mission aims to create a strong foundation and a seamless ecosystem for CPS technologies by coordinating and integrating nation wide efforts encompassing knowledge generation, translation research, technology and product development, human resource development, innovation & commercialization standards and international collaborations. To this end, a TIH on Intelligent Collaborative System (TIH-ICS) has been established at Indian Institute of Technology Palakkad.

About IIT Palakkad

Indian Institutes of Technology (IITs) are autonomous public institutions of national importance for higher education in engineering, science and technology. IIT Palakkad was announced by the Government of India in 2014, and began with a headstart in the very next academic year, 2015-16, with the support of IIT Madras. The academic program was launched by admitting students to the B. Tech. course in the disciplines of Civil Engineering, Computer Science & Engineering, Electrical Engineering and Mechanical Engineering. IIT Palakkad can already boast of a vibrant student and faculty community drawn from different parts of the country; it has truly emerged as a microcosm of India.

About the company

IIT Palakkad has established IIT Palakkad Technology IHub Foundation (IPTIF) to facilitate the Technology Innovation Hub on Intelligent Collaborative Systems (TIH-ICS) setup at IIT Palakkad by NM-ICPS coordinated by the DST, Govt. of India. TIH-ICS, through IPTIF, plans to attract potential and harness expertise available nationwide, thus fostering research innovation, world-class technology and product development. IPTIF also plans to build linkages with research institutes and labs within and outside India. One of the primary goals of this company is to work in close collaboration with the industry to deliver commercial technology and products, and build a vibrant innovation ecosystem by providing a reliable platform for technology-based start-ups and entrepreneurs.



Important Dates

Apply from - **10th January 2022**

Apply by - **1st March 2022**

Application fee **- None**

Application Process
https://tinyurl.com/Oorja-Challenge-registration
Scan the code (QR Code image)

We will have a series of webinars in the months of **January and February** to give prospective applicants awareness about technology challenges in the energy domain and how they can be potentially tackled.

For any further enquiries

email **office@iptif.tech** or
call us on **+91 9188952064**
visit **www.iptif.tech**