TECHFEST 2020-21

Energy Resources in India

It is rightly said that a nation's progress lies in the ease by which it can procure as well exploit its own energy resources. Today India stands as one of the fastest growing economies of the world with a nominal GDP of around 3 trillion dollars.

India also has one of the highest potentials for harnessing the renewable energy as it is bestowed with such natural resources and geographical and climatic conditions that support the promotion of renewable energy technologies like solar, wind, biomass and small hydro.

Energy Sector has mainly 3 steps where we should improve it:

- Conversion of energy, from one type to another usable form
- Transmission of energy from one place to another
- Using energy efficiently

The following are some points are just some suggestions for participants to concentrate on. They can be creative and solve different problems, or solve problems differently.

GENERATION

PROBLEM STATEMENT:

Keeping the above points in mind, you have to set up a tidal energy plant in line with the Prime Minister's vision of "Aatmanirbhar Bharat". Considering the fact that there are only 5 tidal power plants in the world, this is a problem with countable challenges, but these are pretty huge ones.

- Think of different ways you could set up machineries to produce tidal energy and identify the areas they could be installed.
- Your plan should ensure that the local ecosystem must not be affected.
- Your model should be low maintenance
- Emphasize on how the plants could reduce our reliance on oil imports from the Middle east.
- Try to make the plant as versatile as possible trying to help many industries and sectors in innovative ways

OR

"We are like tenant farmers chopping down the fence around our house for fuel when we should be using Nature's inexhaustible sources of energy – sun, wind and tide. … I'd put my money on the sun and solar energy. What a source of power! I hope we don't have to wait until oil and coal run out before we tackle that."

Thomas Edison

PROBLEM STATEMENT

As a part of the National Solar Mission, you are given the task to set up a solar power plant in the Thar Desert of western Rajasthan which is under the direct supervision of the PMO. Keep in mind the following points in your proposal:

- Identify areas in the desert suitable for setting up such a solar farm.
- Identify geographical conditions that can be a hindrance for the same.
- **Ensure that the material used is tolerant to the extreme variation of temperature during the day.**
- Do contemplate on how this plant can be a boon to the salt production in the nearby Gulf of Kutch region, Sambhar Lake and various other small-scale industries that require energy on a consistent basis.
- The plant must be self-reliant i.e. it must be sustainable in the long run.

TRANSMISSION

ELECTRICITY TRANSMISSION

Electricity transportation has 2 major problems
Transportation to far areas and difficult terrains

- Transportation to far off areas, mainly rural and hilly areas is expensive, approximately 20-25 rupees per unit.
- Setting up a Grid near a village for such a small population is not feasible. These two problems result in expensive electricity and discourages villagers from using electricity.
- Overhead wires are another problem that is a cheap solution but has many problems. Overhead wires are weak, vulnerable, and are prone to theft. You can think of another cheap idea to distribute energy.

EFFICIENCY

Electricity

The urgency of addressing climate change and the changing electric grid require a “next level of energy efficiency” to mobilize energy savings that go beyond historical practice and integrate with a grid characterized by high levels of intermittent resources and variable load.

In what ways we might increase energy efficiency in Industry / Commercial / Residential establishments using current & future technologies.

The solution can be to increase efficiency of any of the above said sectors, but it must satisfy the following points

The magnitude of energy efficiency savings must increase dramatically;

- The sources of energy efficiency savings must diversify;
- The solution must allow the user to know energy saved and used over a period of time.
- Energy efficiency outcomes must be integrated with a carbon reduction framework, i.e. and
- The solution should be broadly applicable for a wide range of power consumption demands(for eg, the solution to should work on a user with usage of 20MW/Year and a user with 50MW/year)

REPORT FORMAT

- Title
- Abstract
  1. Objectives
  2. Beneficiaries (For whom)
  3. Value of results (Usage)
- Background
- Statement of Problem
  1. Succinct definition of problem addressed (follows from material in the background section)
- Research
  1. Present methods of tackling the problem (if any)
  2. Proposed Solution
  3. Alternate solutions/approaches
  4. Novelty of Approach: How is/will your solution be better than the existing products that address the same problem?
- Technical Report
  1. Description of concepts, theories and/or approach involved in the proposed solution
  2. Technical aspect of the proposed solution
  3. Detailed technical specifications and pictorial representations (block diagrams/ flow chart)
  4. Description of the flow of operations demonstrating key features and functionality
  5. Performance estimate of the solution
  6. Experimentation/Verification done to establish the workability of the above
  7. A link to the video of the working model/ prototype
- Results
  1. Actual findings, significant output of tests and analysis (Must be readable)
  2. Include problems encountered, credibility of results, accuracy estimates
  3. Pros and cons of your solution
  4. Utility of results
- A link of the Google Drive Folder which contains Pictures and Video of the working model/ prototype.
- Application
  1. Your idea as a solution to the problem
  2. Additional applications
  3. Benefits to the users
- Future prospects, research in it and further development (in brief)
- Any other details: (Patent/Business plan etc.)

ELIGIBILITY

- Individuals or teams from the following categories are allowed:
  1. Students/research scholars of authorized institutions (students have to show their Valid College/School ID)
  2. Upto 3 years old college pass-outs.
- A team is allowed to have a maximum of 4 members.
- If the participating team feels that their idea requires more participants in their team, they can forward their request, with suitable reasons, to Ujjwalbharat@techfest.org with the subject "Ideate XXX: Team number increase request".

REGISTRATION AND SUBMISSION

The Participants have to register on the official Techfest Website and fill all the necessary details. www.techfest.org ->(Hover on) Competitions-> Ideates -> Ujjwal_Bharat -> Explore More -> Register -> Fill all your details - > Now you must create/Join a team

PROJECT REPORT SUBMISSION

The project report should be mailed to with the subject ‘Ideate: ‘’Ujjwal_Bharat’’ Project Report: ’ (for eg. Ideate: ‘’Ujjwal_Bharat’’ Project Report: UB-191234). The report must be submitted in PDF format only mailed to Ujjwalbharat@techfest.org.

TIMELINE

Last date of Registration	24 October
Abstract Submission	24 October
Final Rounds	11/12 December

EVALUATION

Ujjwal_Bharat abstracts will be judged by a panel of experts. Following are the broad guidelines for judging:

1. Creativity and Novelty: How novel is the idea? How different is it from the current solutions available? The innovation must be ingenious and novel in its area of application and should have a high potential for leaving an impact on the society.

2. Originality: The innovation should not, by any means, include copied or stolen work. Such applications will be disqualified immediately.
3. Performance
4. Cost/Market Value and Acceptance
5. Durability and Usability: Durability of the prototype/method proposed.
6. Implementation ability: Is the solution implementable as described? Is it repeatable? Is the solution feasible for diverse and changing conditions?
7. Scalability: Is the solution scalable to a higher level, how easy is it to scale up and what are the factors affecting it?
8. Potential of Impact: How does it benefit the society? The scale of problem that it solves, intensity of the solution and number of people catered from the solution directly and indirectly.
9. Design: Has the design been taken into consideration? How optimized is the product?
10. Ergonomics (if the team decides to make a well-designed product) In case of any discrepancies, the decision of the Organizers or Judges will be final and binding on all.

SHORTLISTING

Top 15 teams will be selected and will get the chance to present their model/idea in the Final Round of Ujjwal_Bharat, Techfest, IIT Bombay. Participants will get a slot for presenting their model/idea to the Judges based on which they will be evaluated. These teams will be selected by a panel of judges.

GENERAL RULES

1. Every team has to register online on our website for the competition. A Team ID will be allocated to the team on registration which shall be used for future references.
2. A team can register at any point of time before 24th October 2020 and submit the final abstract and video (as mentioned in the structure).
3. The decision of the organizers or judges shall be treated as final and binding on all. Techfest has all the rights to verify the identity and accuracy of the details provided by the participants.
4. No responsibility will be held by Techfest, IIT Bombay for any late, lost or misdirected entries.
5. The idea presented by the teams should be original (not protected by means of patent/copyright/technical publication by anyone else).
6. Note that at any point of time the latest information will be that which is on the website. However, registered participants will be informed through mail about any changes on the website.

7. All modes of official communication will be through the Techfest e-mail.

CERTIFICATE POLICY

Only those teams that are shortlisted for the finals and also give a final presentation about their work during Techfest 2020-21 would be awarded an e-Certificate of Participation. The top 5 entries from this event would be provided with a Certificate of Excellence.

PRIZES

The prize money will be awarded to top 3 winners via NEFT and will be processed within 30 working days after receiving the prize money from sponsors. Winners have to mail the following information (immediately after the announcement of results) to shubhamgautam@techfest.org

FORMAT OF MAIL :

Subject: Ujjwal_Bharat, Team_ID - Position - (example- Ujjwal_Bharat, UB191003 - 3 rd Position)

Body of mail:

1. Account Holder's Name
2. Account Number
3. Bank name and Branch name.
4. IFSC Code
5. Photograph of Bank Passbook as a proof