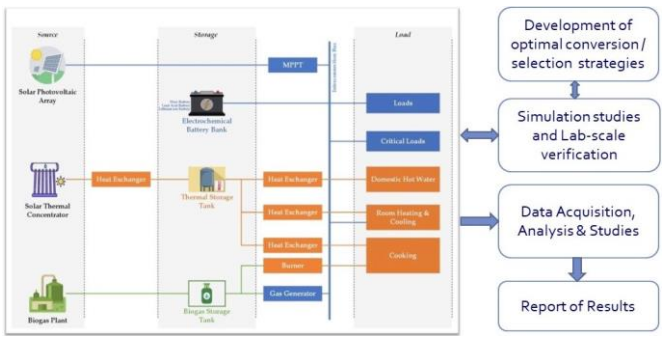
DEVISE

Diverse Energy Vectors Integration for Storage of Energy

> *DEVISE is scalable, reproducible and replicable for any rural or semi-urban community with availability of bio-waste and Sun light*

The existing microgrids integrate various renewable energy sources with the grids. However, such microgrids are heavily biased towards electrical energy. Other forms of renewable energy are converted into electrical energy for integration with the grid. At present the storage of energy is also predominantly electrical but this strategy prevents the efficient and rational end-use of diverse sources of energy, especially where the energy is available as heat and is supposed to be used in the same form. Therefore, there is a need for development of a more holistic definition and design of renewable energy microgrid, which ensures efficient integration/transformation of different forms of energy for rational end-use and storage of all forms of renewable energy to facilitate the optimal interchange of energy from one form to other.

DEVISE propose to attempt above through an integrated energy bank for the storage of diverse vectors of energy. Investigations will be made to determine the optimal combinations of different energy vectors matched to various demand vectors in order to achieve best solutions for a range of supply and demand scenarios. The computer models will be developed to assess a wide range supply demand scenarios and different geographical conditions of the partner countries.



ERA-Net Smart Energy Systems

This project has received funding in the framework of the joint programming initiative ERA-Net Smart Energy Systems. The initiative has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreements no. 646039 and no. 755970.

Project Duration

30.12.2020 - 29.12.2023

Project Budget

Total Budget: € 1,262,456.-
Funding: € 727,000.-

Project Coordinator

Indian Institute of Technology Roorkee
Dr. Vishal Kumar (India)

Project Partners

- DEI (India)
- IIT Delhi (India)
- UiT (Norway)
- FBK (Italy)
- UMEA (Sweden)

Project Website

www.iitr.ac.in/devise/

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ERA-Net Smart Energy Systems Joint Call 2019 (MICall19)

This project has been awarded funding within the ERA-Net SES Joint Call 2019 for transnational research, development and demonstration projects. EUR 16.5 Mio of funding have been granted to 14 projects active in 15 regions and countries.

Main Objectives

The **Goal** of DEVISE is to design and implement a hybrid micro grid of electric and thermal energy with heterogeneous storage and relevant energy conversion inter-linkages. Further, to demonstrate the pilot for emphasizing its utility as solution to energy needs in general and particularly in village setup to give necessary impetus to rural development.

Main objectives of the project include –

1. Developing Mathematical models of the sources, energy storage devices and loads.
2. Design and development of hybrid battery system
3. Design and development of Thermal Capsules and thermal charging station
4. Development of an optimal energy conversion/selection strategy with consideration of cost/reliability, and characteristic constraints of load and storage system
5. Development of a lab-scale demonstration to evaluate the energy conversion and catering loads optimally
6. Carryout Techno-economical analysis of the proposed system
7. Develop the project as a demonstration for future investors/ entrepreneurs
8. Carryout investigations on PCMs as thermal storage for energy savings and improved thermal comfort in buildings

Expected Key Results

Technology

- Hybrid Electric Energy Storage System
- Portable Thermal capsules and thermal charging station
- Hydrogen storage integration to microgrid
- Heterogeneous energy storage system

Market

- Green Villages / Communities
- Institutions
- Utilities
- Local District Administration
- Other Government Organizations
- Builders / Developers

Adoption

- Thermal Storage technologies
- Hybrid Battery Bank
- Inverter Technologies

Joint Programming for Flourishing Innovation – from Local and Regional Trials towards a Transnational Knowledge Community

www.eranet-smartenergysystems.eu