



Project area: Low Emission Energy Technologies

Objective

The objective is to overcome the technological barriers for a secure, clean and renewable energy. Wind, solar, tidal power have to be made even more efficient and new materials and concepts have to be developed. The grid stability problems, generated by the intermittent nature of renewable sources, need the development of energy storage technologies and new concepts for the efficient and low emissions energy conversion and for the management and control of the energy fluxes in a complex hybrid grid. Conventional power plants must be adapted for intermittent use and so emission control and CO2 capture processes. Other main objectives are digitization, energy harvesting, energy from wastes, energy savings in cooling and heating, production and efficient utilization of biofuels, high efficient micro cogeneration, integrated-hybrid solutions for energy and chemicals/materials production.

Approach

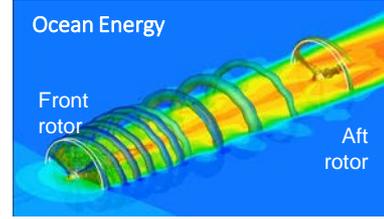
The research at DIITET follows an integrated approach to power, thermal, chemical and materials production, combining expertise in combustion, chemical and mechanical engineering, chemistry, physics, materials science, biotechnology, IT, geology, social science, and economics. Research spans from theoretical and fundamental studies to lab scale experiments, up to prototype and demonstration units.



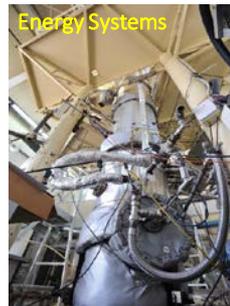
Wind Energy



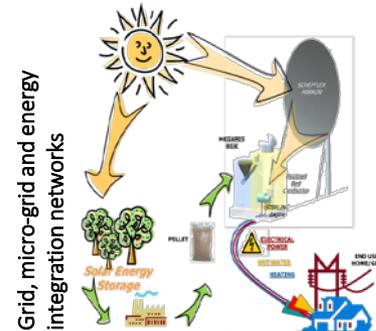
solar energy storage



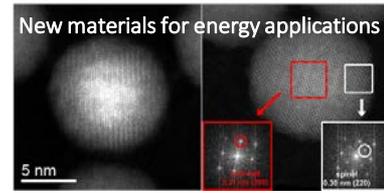
Ocean Energy



Energy Systems



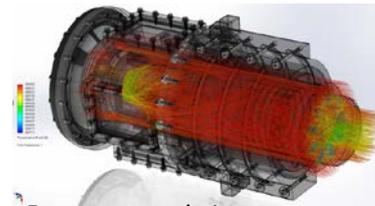
Grid, micro-grid and energy integration networks



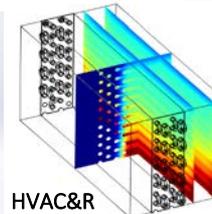
New materials for energy applications



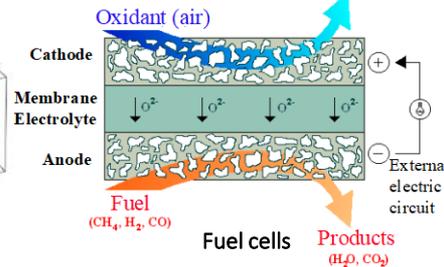
Biofuels in the space



Energy systems design



HVAC&R systems



Fuel cells

Results

- Wind energy, Ocean Energy, Solar energy
- Revamping of conventional plants, Emission control, Energy storage and carriers, Fuel cells, Integrated Systems, Energy harvesting, Power grids, Micro-cogeneration
- Bio and alternative fuels
- CO2 capture and use
- HVAC&R, energy saving in buildings
- Solar cooling and heating