Global energy consumption has reached a record high and worldwide demand for energy is increasing, although there will be a shift towards alternative sources of energy, the dependence on fossil fuels will still remain dominant. Therefore, the drive towards a low-carbon economy will require the development of novel approaches to better analyze how the complex energy system is managed. The Energy and Environmental Sustainability Engineering research track includes research which supports sustainable engineered systems that sustain human well-being and that are also compatible with sustaining environmental systems. Articles included cover different important research topics such as: smart grids, integration of renewable energy sources, control systems and environmental sustainability with applications in water and transportation systems.

- **Modeling and Analysis of Smart Grids** - Beck and Gohner, propose a model-based user-centric approach for automated energy analysis. The approach supports users in reducing their energy costs by automated generation of individual electrical energy optimization for their industrial automation systems. Mori and Fujita, propose a novel method for optimal allocation of Flexible AC Transmission System devices in smart grids. In their paper, a hybrid-coded Evolutionary Particle Swarm Optimization is developed to solve the nonlinear mixed integer problem. Mori and Kakuta, present a method for probabilistic reliability assessment in smart grids, they develop a new Multi-objective Meta-heuristic algorithm to evaluate reliability assessment that focuses on two objective functions of the occurrence probability of contingencies and the reliability index that runs short of electric power supplies. Lopez et al., present a system of systems approach to understand, analyze, and design a modern energy Smart Grid using model-based systems engineering principles and provide the guidelines for integrating environmentally friendly energy technologies with legacy systems.

- **Renewable Energy Systems Optimization** – Haghnevis et al., demonstrate how components in a multi-layered power grid structure dynamically interact, evolve and adapt over time. Their proposed framework facilitates the study of the behavior of consumers under different control and incentive strategies. Ozcelik et al., present a work which focuses on the analysis of a two-axis solar tracker system and the design of a control system for maximizing power generated from a solar panel. In the paper written by Lopez and Espiritu, a modeling and simulation methodology using a micro power optimization software (HOMER®) to solve the multi-objective renewable energy integration problem considering various renewable energy
technologies is presented and Ituarte-Villareal and Espiritu present a new viral systems optimization algorithm to find the optimal solution to wind turbine placement problems considering constant wind speed and unidirectional uniform wind with the objective of minimizing the total cost per unit of power produced from the wind park.

- **Computational intelligence Models for Environmental Sustainability** - Kulkarni, demonstrates the utility of Landsat TM imagery for water quality studies in which remote sensing has an important and effective role in water quality management. Anderson and Liu, used x-ray CT methods to measure transport of iodophenol solution in soil cores and estimate spatial distributions of chemical retardation. Their study shows that the CT method is useful for evaluating solute transport on a macropore-scale for porous materials. Sezer et al., present the dynamic modeling and intelligent control of the full railway vehicle against the railway irregularities. Ozbayoglu and Yuksel present an study in which the flow patterns and liquid holdup characteristics of liquid-gas flow is analyzed using experimental data obtained from an eccentric pipe configuration.

- **Auction Market Design and Security Assurance** – Poreddy and Corns, present an approach to documenting an assurance case for system security. Their paper deals with the Assurance cases for Generic Avionic Mission Control Computer system, by constructing tangible claims and investigating potential vulnerabilities and Liao and Sugianto, explore the applicability of Revenue Equivalence theorem in the context of the electricity market. They develop experimental test cases using agent-based simulation to examine the impact of different pricing rule on total dispatch cost.