

ELECTRICAL, ELECTRONICS AND COMMUNICATIONS ENGINEERING

CRT/DENERG - Methods and models for energy security and transition

Funded By	Dipartimento DENERG FONDAZIONE CRT CASSA DI RISPARMIO DI TORINO [Piva/CF:06655250014]
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Context of the research activity	The area of study will be at the intersection of energy transition with energy security in a multilayer perspective, including not only physical and infrastructural layers but also geopolitics of energy, economic, social and cyber dimensions
Objectives	Energy is crucial for mankind and modern societies. A set of criticalities connected with the present energy paradigm, with special reference to the environmental issues, prompts for a deep revision of the energy policies. The shift from fossil fuels to renewable primary energy sources is mandatory to mitigate climate change and air pollution. In this sense, an energy transition is needed and encompasses various layers, not only physical and energetic but also geopolitical, economic, social and cyber. The security in terms of being able to acquire the needed amount of primary energy shifts from the security of primary energy commodities to the security of critical raw material for the transition. Decision must be assumed at various level, municipal, national and sovra-national and policy decision maker can benefit of "science-based" models and tools that can capture the behavior of real systems, modelled as dynamic complex and multilayer systems. The research activity will be devoted to analyze and compare different mathematical techniques and approaches and to compare them in order to design appropriate models relating the decisions with their outcomes, quantified by proper metrics and KPIs, in such a way that the decision maker can undertake "in silico" analyses of policy scenarios and actions.
Skills and competencies for the development of the activity	Background in energy systems, energetics, energy/sustainability analysis at various geographical scales, from cities to nations, attitude to team working and problem solving mindset

