

PhD Program in Energy and Sustainable Development

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This multidisciplinary PhD course is aimed at moving towards the sustainable development of energy systems as well as their conscious use. The course synergistically integrates skills with regard to (i) the development of machines and technologies within both the traditional and innovative energy supply chain (engineering area), and to (ii) energy saving within the framework of agricultural, food and construction sectors (in the engineering and agricultural sciences fields). It also involves the investigation of management tools, analysis and monitoring of the territory with the purpose of investigating the potential exploitation of energy resources (agricultural sciences and land engineering fields), such as their effects on human health (medical science field), with the purpose of evaluating possible risks and vulnerability for the population. The PhD course is organized in two curricula: "Energy and its effects on human health" and "Energy, agricultural and land resources".

Energy and its effects on human health

This PhD curriculum is aimed at training professionals to face the research challenges pertaining to sustainable development, by studying the impact of energy systems on both human health and the environment. The PhD students will be investigating energy efficiency and new technologies for the use of traditional and renewable energy systems, with a specific focus on bio-based materials and bioenergy. The main research issues dealt with within this curriculum will concern new materials designed for energy efficiency and microclimate mitigation, local climate change phenomena imputable to anthropogenic action and their effect on population vulnerability, life cycle assessment of processes and products applied to artificial environments, lighting, environmental acoustics and noise pollution.

Energy and resources from agriculture and territory

This PhD curriculum is aimed at training professionals in management and promotion of the sustainable development of the territory, for the dissemination of the scientific culture and skills dedicated to monitoring and evaluating available energy resources, also by means of planning, surveying and sensing techniques. PhD students will become experts on the supply chain integration between agriculture and energy production, with a subsequent optimization of the energy/environmental impacts and costs. PhD students will also learn to investigate innovative ICT methods aimed at prevention actions on territory decision-making processes.