One right way to make use of Energy in Accordance with the Second Law of Thermodynamics: the "Technical Polo" of Engineering Faculty of Catania University (first part)

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Abstract

Nowadays thermal energy generated by fossil sources plays a preminent role on energy conversions to provide to amount exhausted by human activities. Unfortunately all real processes of energy conversions not only are at increasing entropy but they are regulated too by Second Law of Thermodynamics that establishes the degradation of heat energy. More, the utilization of renewable energies at current time do not allows to satisfy the whole amount of different shapes of energy that people needs. For previous reasons in all plannings, both architectural and industrial, it needs to design "complex systems" (poligeneration, solar energy etc. etc.) for energy conversions that care in regard of previous problems supplying the various types of energy request by users of the civil or industrial parks. On this ground the Authors, Designers of Technical Polo too, compatibly with financial budget available for complete construction, utilized technologies feeded by renewable sources leaving to thermal energy coming from combustion of fossil fuels only the smallest share of energy (peak request). However, the share of thermal energy utilized by the "complex system" has been utilized at different decreasing thermic levels of temperature required by the technologies on purpose chosen by Designers. In this way the share of thermal energy supplied will be utilized more and more times but at different decreasing temperatures in observance to the Second Law of Thermodynamics. The Authors will show the global design of "Technological Polo", already built in 28 months with a final cost of 14,000,000.00 of euro, tested the 4th of November 2014 indeed and now operative for Engineering Faculty. In this first part the paper wants to show:- the "complex system" of energy supply designed for "Technological Polo"; - the request output of electrical energy, of thermal energy and of "cold" energy;- the energy saved by designed "complex system" by means of comparison between the energy should be necessary feed by use of traditional system and that one feeding "complex system".

Keywords: Energy, Rationalize, Environmental Control, Renewable

Biography

Francesco Patania is full Professor (Applied Physics-Plants, Environmental Control Techniques, Ecosustainable Technics of Energy Conversions) and Director of Department of Industrial Engineering too in Catania University. He earned five years degree in Engineering Sciences in Padova University. He is scolar of Wessex Institute of Technology (London). Author of scientific and technical papers in international journals and conferences. He is a Designer of Thermodynamic Architecture and Plants in public constructions (Hospitals, Schools, Laboratories etc. etc.). He had stake in applied research in fields of HVAC, Renewable Sources, Energy Conversions, Acoustic and Environmental Control.

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