

Combined Systems for Generating Electrical and Thermal Energy from Renewable Sources, with Storage of it through Conversion to other Energy Forms, for use in Isolated Places

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Abstract

Starting from the great potential of renewable resources existing in Romania, in order to harness and use these renewable resources, the current paper presents some research conducted at the Institute INOE 2000-IHP aiming at creating combined/hybrid systems for generating electrical and heat energy, and also targeting the development of energy storage technologies so that they can be used in any conditions regardless of their fluctuation, especially in isolated places.

To do this, on the basis of extensive documenting studies regarding the worldwide achievements in the field, using the more than fifty years experience of the institute in the field of hydraulics and pneumatics, there have been conceived functional diagrams for combined/hybrid generation systems and for energy storage technologies. The results obtained consist in achievement of innovative solutions for combined systems of producing electrical and heat energy, and also innovative solutions for storing electricity from photovoltaic panels and wind power plants, by conversion of electrical energy to pneumatic or hydrostatic potential energy, which enables continuous use of energy, regardless of momentary/temporary climate conditions.

Keywords: combined energy systems, hybrid energy systems, electrical energy, heat energy, pneumatic energy, hydrostatic energy, energy storage technologies