NEW EVOLUTIONS, DIRECTIONS AND TRENDS IN CONVERSION AND STORAGE OF RENEWABLE ENERGIES

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ABSTRACT

The special resources of renewable energy identified in Romania have generated far more extensive concerns and research on their capture, storage and use.

The first part of this paper presents a couple of renewable energy sources, technologies for their capture and conversion, and also several new storage methods and technologies applied worldwide, in order to know the issue, scale and complexity of the field, advantages and difficulties encountered in harnessing these resources. By this we aim to identify the new evolutions, directions and trends emerging in recent years in the field of renewable energies so that to direct our own research towards the global trend. The second part of the paper presents several already achieved results consisting, in addition to documentation studies, in filing a patent application submitted to the Romanian patent authority (OSIM), and also in developing an experimental energy conversion and storage station project, which is to be physically developed and tested in the next step. The ultimate goal is to increase the capitalization of renewable sources, with increasing energy efficiency in converting, storing and using, by optimizing the structures and promoting new solutions.

Keywords: renewable energy, energy conversion, storage technologies, wind power, solar energy

INTRODUCTION

In the current context, characterized by **alarming increase in environmental pollution**, caused by the production of energy from the burning of fossil fuels, but also by the **prospect of** their **depletion**, it becomes increasingly important **to develop alternative energy sources,** preferably **renewable energies**, which can ensure the long-term sustainability for human society. In this respect, an intense **research and development** activity is taking place throughout the world in the direction of conceiving new solutions for the capture, conversion and storage of renewable energies, and also the direction of increasing their energy efficiency.

Also, a significant global **investment process** has been started**,** in order to **capitalize on renewable energy sources**. According to known data, they have contributed by over