



HIGHLY EFFICIENT ELECTRICAL ENERGY PRODUCING NANOSTRUCTURE

Model Experimental Lyceum of University of Patras

Introduction

The energy deprivation issue is one of the two major issues that afflict the global community; along with the economic recession .It can be divided into three basic components; the over-exploitation of the energy production units, with devastating effects on local ecosystems, the rapidly rising human population rates, a fact that requires even more natural and monetary corps. Also, the educational process is largely affected, as many schools in Greece do not have permanent central heating. Despite that, the energy consumption rates still remain high, resulting in cuts on educational funds. Furthermore, due to the warm Greek climate, schools need cooling systems, the installation of them consists on unattainable dream. Unfortunately, the Greek state doesn't seen to consider any solution to the problem, mainly because of the political and financial situation of Greece. Thus we have to begin a research on alternative and environmentally friendly energy, for example the use of "green" nanotechnology and the consumption of fossil fuels with the quick evolution of nanotech being a succor.

Exploitation of the constant movement and sound produced daily in our school, during lessons or breaks, in the gym or in the corridors, in order to generate the energy needed for its daily function.

How?

By exploiting three basic natural phenomena:

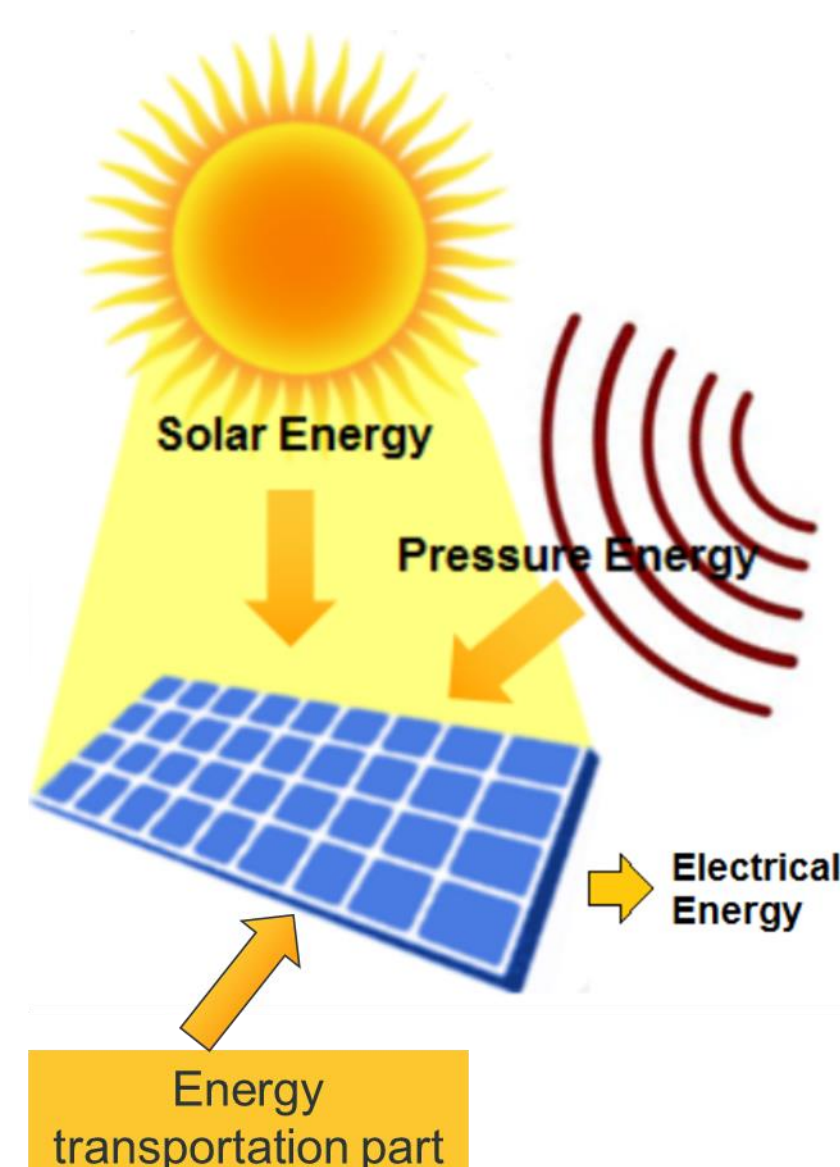
Superconductivity

Photovoltaic Effect



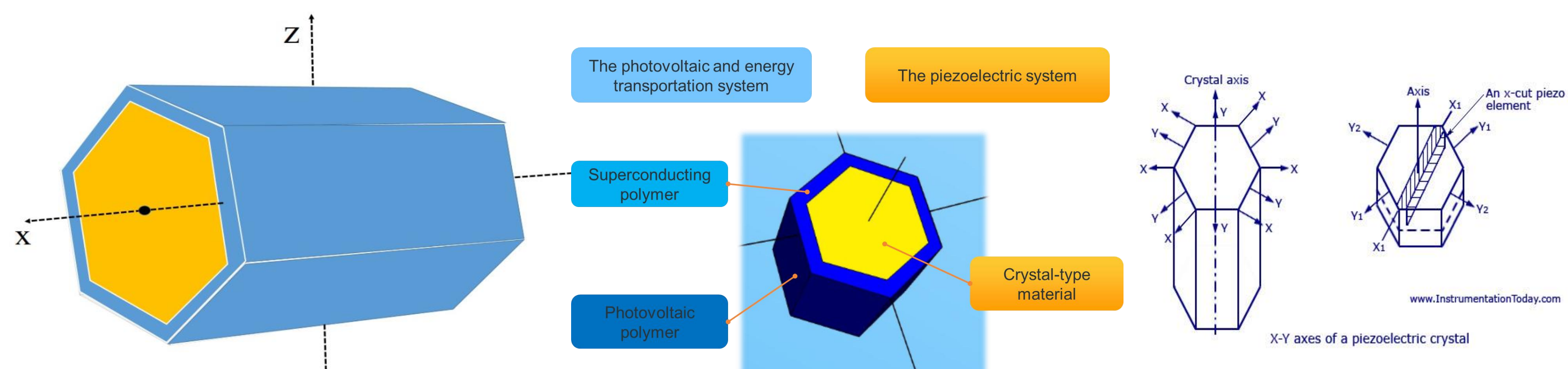
Piezoelectric Effect

Converting the Energy



The structure

The first part of the nanosystem (the photovoltaic and energy transportation system) is located on the surface layer of the nanostructure and consists of a superconducting, photovoltaic polymer. This material is designed, not only to convert the solar energy into electrical power, but also to transport it with minimal resistance



The second part lies deeper, within the second layer and consists the main and most important part of the nanosystem, its core. Here, the material used is a piezoelectric, crystal – type material. It plays its role as a "filling", as it fills up the empty space inside the nanostructure. In order to produce electrical power, the piezoelectric material needs to receive waves of mechanical energy

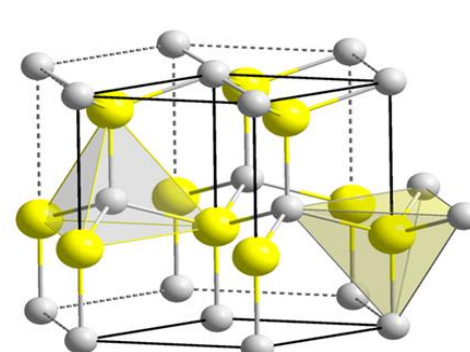
Effects, Materials and Methods

- Piezoelectric effect: certain materials (mostly crystal but some ceramic as well) to produce electrical voltage as a result of applying certain mechanic pressure or oscillation
- Photovoltaic: artificial semiconductors (usually made of silicon) which are combined in order to create an electrical circuit in series
- Superconductivity: the state in which a material (usually metal and ceramic) have zero ohmic resistance

Material

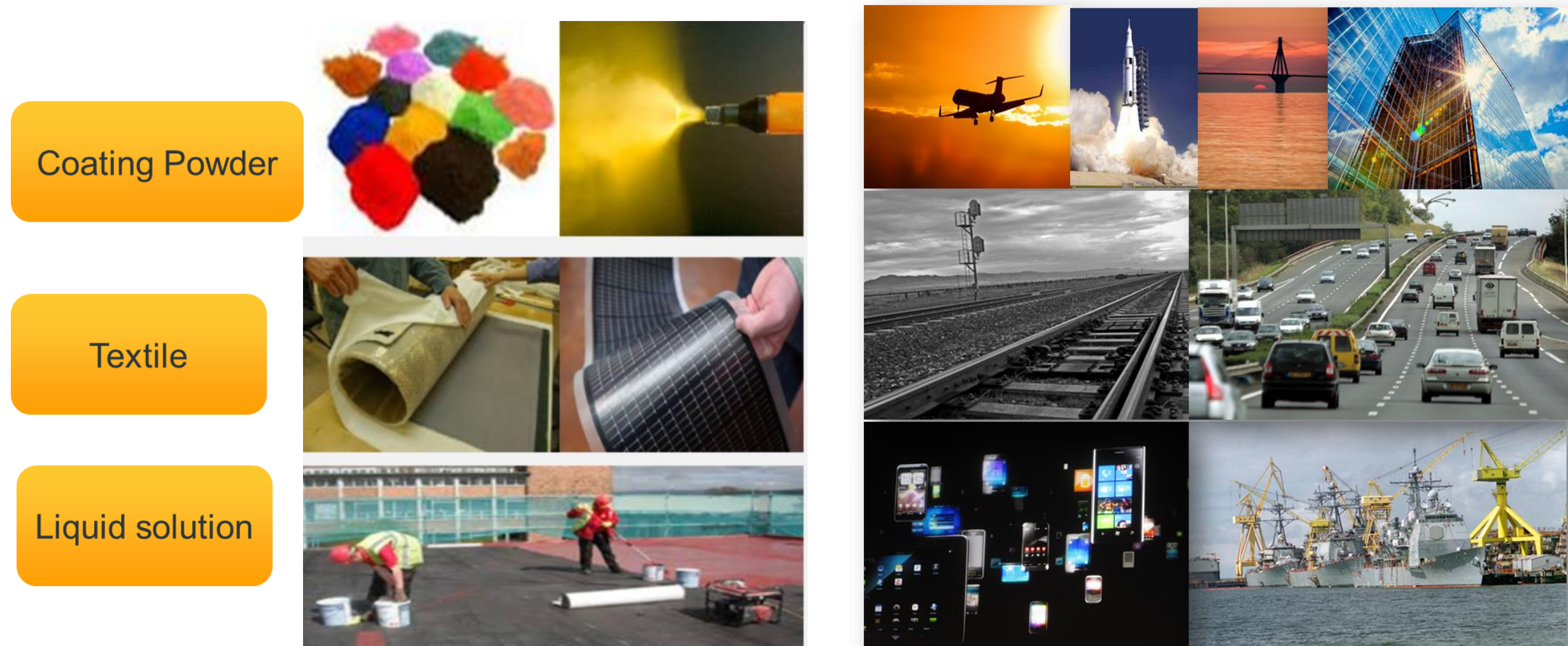
Zinc oxide

The ZnO has applications to piezo-electricity



The Industrial Manufacturing

Possible Applications



Conclusions

- Nanotechnology can be applied in many fields of our life helping us to solve a great variety of issues. Taking this into account, we managed to create a nanoprodukt which causes decrease in the major financial and energetic school problems.



- Throughout this project and while facing major and minor difficulties, we did feel like responsible, eco-conscious and self-awake citizens.
- While we deeply acknowledge that our product may not be a panacea, we maintain that it would be a serious milestone in this eco-salvation "race".

Literature cited

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