Trends of photovoltaics development in Lublin Region

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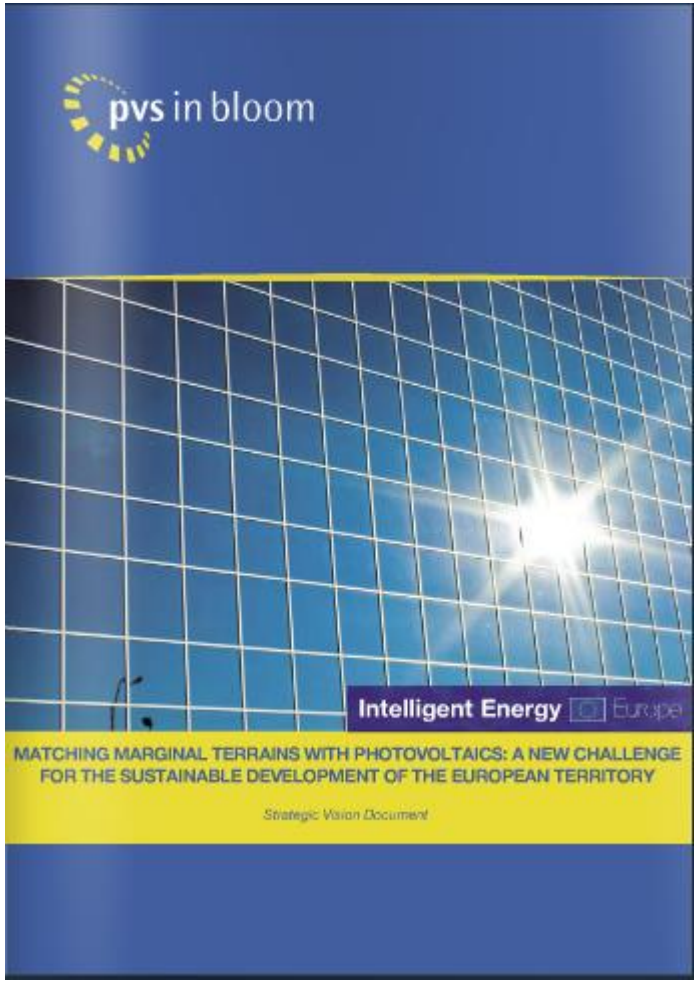
Main activity of Department of Technical Physics and EcoBuilding

- Photovoltaics: from technology up to applications in Lublin Region

Project
„PVs in Bloom”-Farming photovoltaic flowers: a new challenge for land valorization within a strategic eco-sustainable approach to local development,

Contract number IEE/07/762/SI2.499457, financed within the Intelligent Energy Europe Programme (CIP Framework Programme) of the European Commission.

Strategic Vision Document

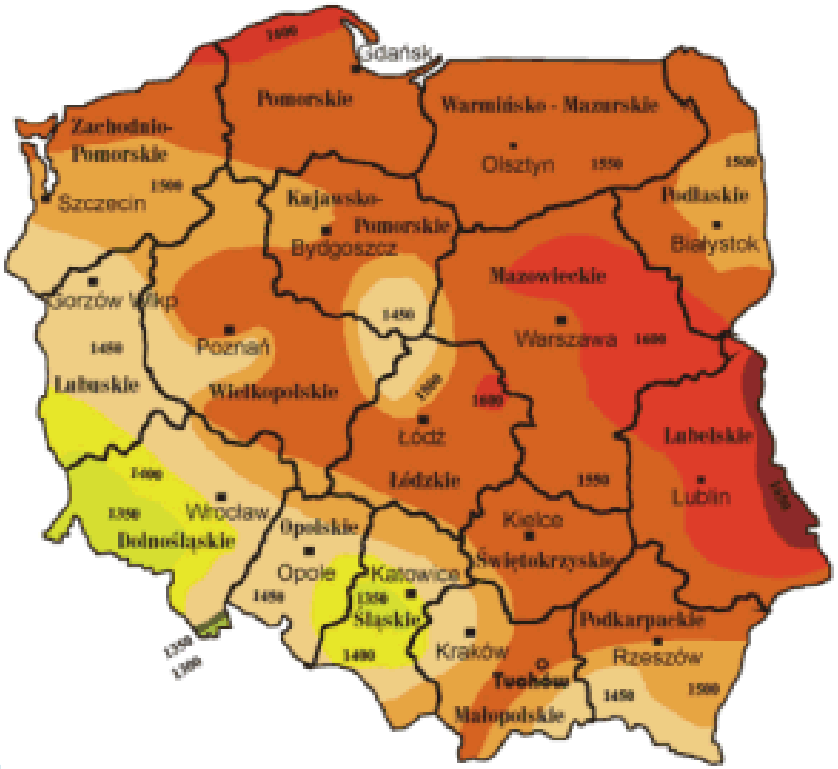


Result for Poland

- First PV farm in Wierzchoslawice (1MWp)

Next step

- Multiplication of experience of Wierzchoslawice to Lublin Region (the most insolated part of Poland)



Lublin PVBUS transport project 2013-2015

PVBUS

1 workday

200 km

200 kWh
to overcome
motion
resistances

15 h of work

25 kWh
to power
electrical
devices

PVBUS

25 kWh
to power electrical devices

11,7 kWh
per liter of fuel

210 kWh
of energy in fuel

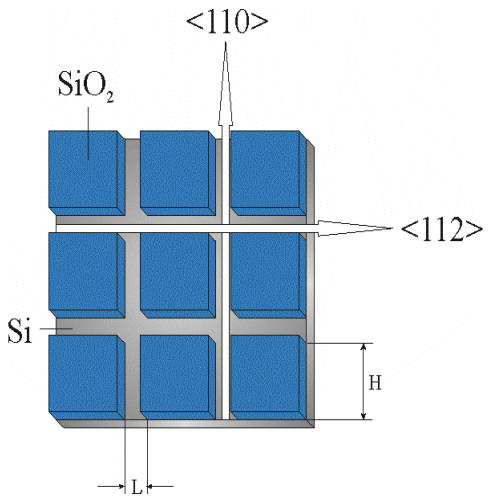
18 liters of fuel
500 g CO_2

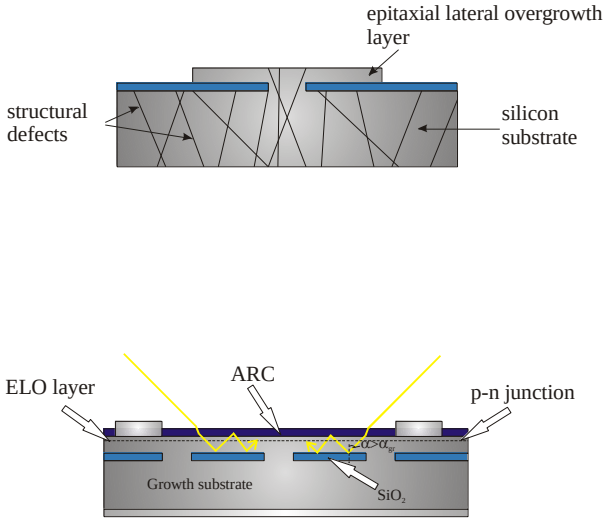
Renewable Energy Conversion Laboratory

- Equipment
  - LPE laboratory
  - Photolithography set;
  - Current-voltage response of photovoltaic cells measurement set with solar simulator.
  - Internal and External quantum efficiency under monochromatic light illumination measuring set;
  - Photovoltaic cell response mapping set.
  - Magnetron thin film sputtering machine.
  - Screenprinter.
  - Clean room

Technology

- AIIIBV PV cells for space applications
- ELO PV cells

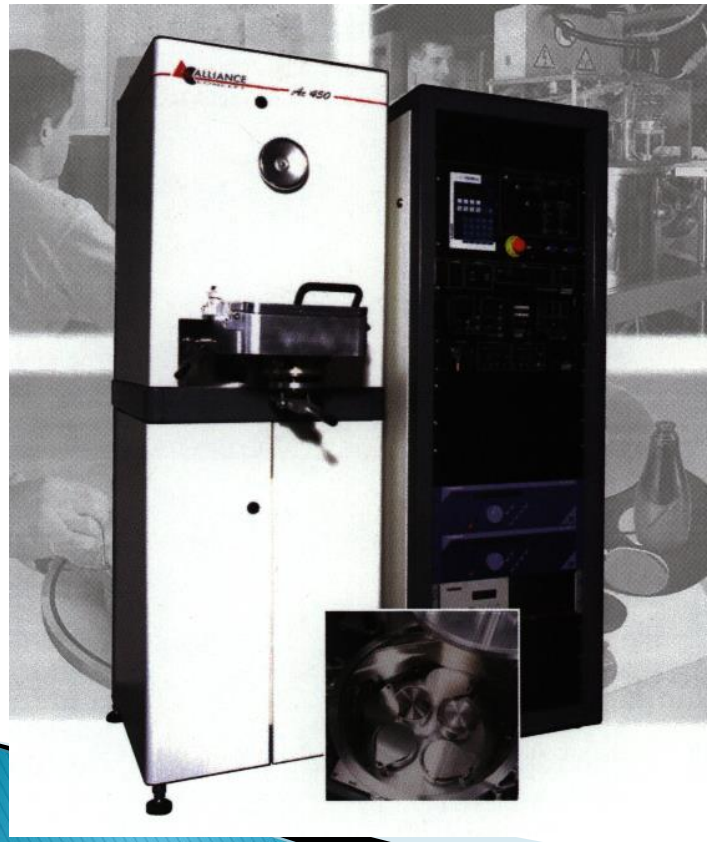




Cross-section of the ELO-based solar cell with an inner mirror composed of SiO_2

Thin films technology

- Magnetron sputtering
- AC 450

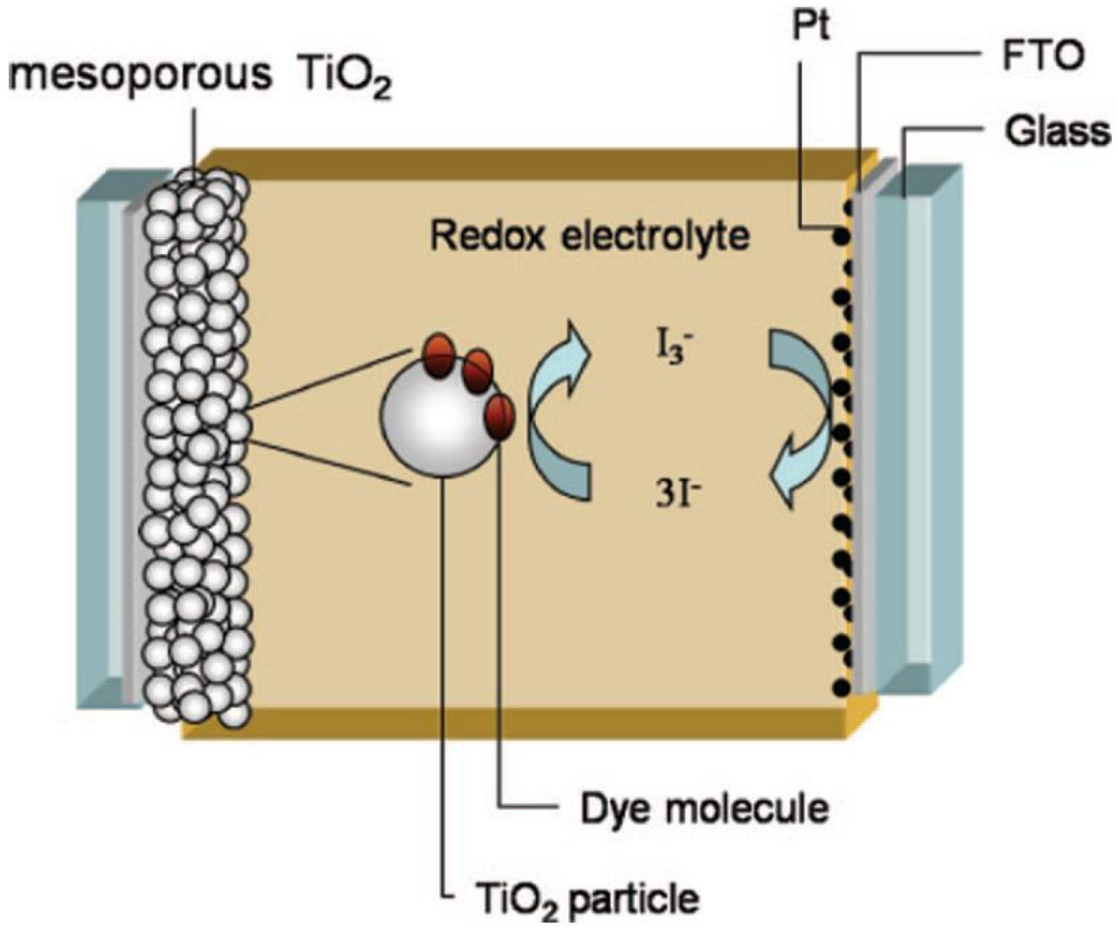


AC 440 Line

Dye-sensitized Solar Cell (DSSC)

- Building integrated photovoltaic applications .
- Higher efficiency than pc-Si in diffuse light and cloudy conditions
- Easy recycling

Dye-sensitized Solar Cell – operation principle



Hagfeldt A. et al., Chem. Rev. 110 (2010) 6595.

Aim:

- Obtaining quantitative information about electronic density redistribution in the excited state of TiO_2 „nanoparticles – dye assemblies”
- It helps to choose the proper materials and conditions deciding of DSSC efficiency

- Thank you,