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Training for Renovated Energy Efficient Social housing

Intelligent Energy -Europe programme, contract n° EIE/05/110/SI2.420021

Section 1 Techniques
1.5 Photovoltaic systems

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Main issues and definitions

- **Well-insulated houses have reduced energy need but still require electricity for lights, fans and other equipment**
- **Photovoltaic systems (PV) generate electricity from solar radiation, a renewable energy source, at the point of use.**
- **As the cost of fossil fuels steadily increases, PV becomes also economically attractive.**
- **Electricity produced by PV can be used on the spot, stored in batteries, or sold to the electricity distribution network.**
- **Mature technology with increasing demand worldwide.**
- **No noise, no moving parts, no emissions on-site.**

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Main recommendations

- **PV replacing a traditional building element, e.g. roof or facade cladding, reduces investment cost & provides « free » electricity**
- **Wide range of off-the-shelf PV products in various shapes, colours, costs and efficiencies to match the building project.**
- **Design guidelines for PV system:**
  - Access to solar radiation: horizontal orientation within due South +/- 45^0, vertical tilt within 90^0 minus site latitude +/- 45^0
  - Access to building surfaces on which to install PV: roof, facade, balconies, glazing, solar shading, ...
  - Avoid shading by surrounding vegetation or buildings
  - Sizing of PV according to electricity needs
  - Electricity storage by means of battery arrays or electricity distribution

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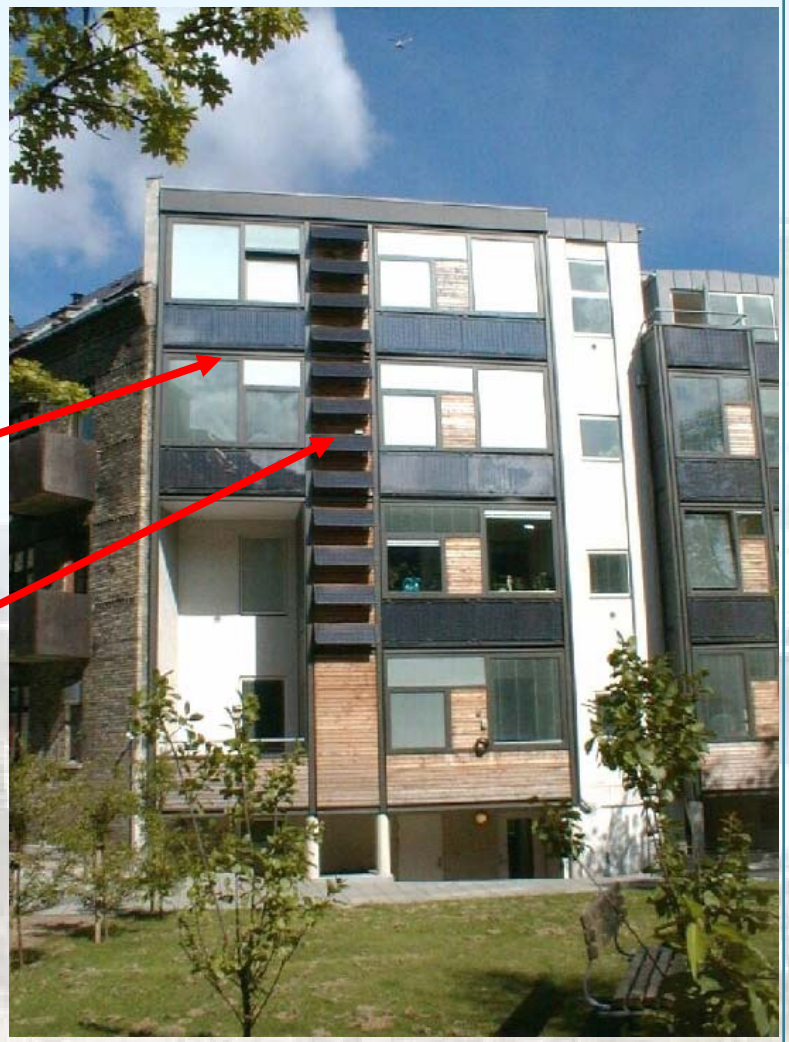
Example : The Yellow House (Aalborg, DK)

- **4 storeys, 8 apartments**
- **Built in 1900, renovated in 1996, with focus on solar energy**
- **22,3 m² of PV panels:**
  - Some tilted vertically for optimal integration with building facade
  - Some with 30^0 tilt off vertical axis for maximised solar incidence

- **Electricity production:**
  - ~ 30 kWh / m² per year
  - ~ 25 % of the electricity sold to the electricity distribution network



Picture: Jørgensen & Nielsen

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