IEA INTERNATIONAL ENERGY AGENCY

PHOTOVOLTAIC POWER SYSTEMS PROGRAMME

TASK 2

Performance, Reliability and Analysis of PV Systems

OBJECTIVE

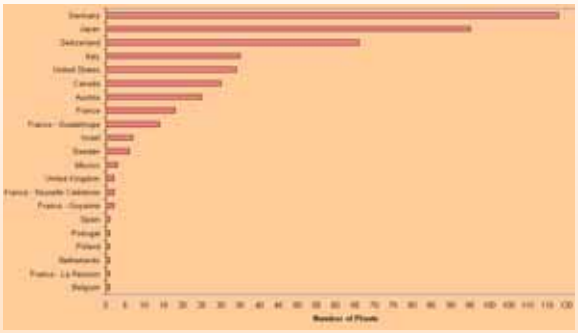
- To improve the performance, long-term reliability and the economic output of photovoltaic systems

TARGET GROUPS

- Engineering sector
- PV industry and utility sector
- Research sector
- Education sector
- End users

PERFORMANCE DATABASE

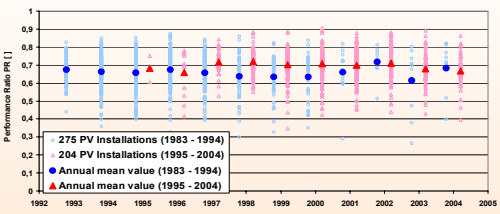
- Information on 461 PV plants in 21 countries
- System, monitoring, performance and cost data
- Selection and export of result data



- Free download of database programme at **http://www.iea-pvps-task2.org**

TRENDS IN SYSTEM PERFORMANCE

479 PV systems in 17 countries: 929 + 729 datasets

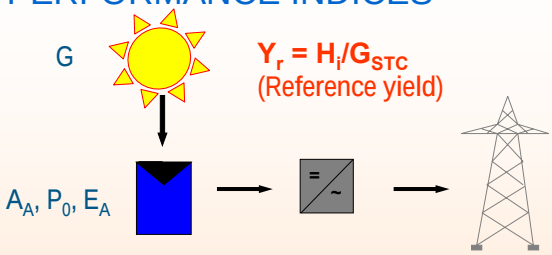


PR = 0.66 before 1995

PR = 0.70 after 1995

- Annual performance ratios (PR) for 275 early systems compared to 204 new PV systems
- New systems have higher PV values due to
  - Realistic PV module ratings
  - Higher component efficiencies (inverter)
  - Increased reliability of PV systems

PERFORMANCE INDICES



$Y_r = H_i/G_{STC}$ (Reference yield)

$Y_A = E_A/P_0$ (Array yield)

$Y_f = E_{PV}/P_0$ (Final yield)

$L_c = Y_r - Y_A$ Capture losses

$L_s = Y_A - Y_f$ System losses

$PR = Y_f/Y_r$ Performance ratio

$Y_f + L_c + L_s = H_i/G_{STC}$

$\eta_A = E_A/H_i \cdot A_A$ Array efficiency

$\eta_s = E_{PV}/H_i \cdot A_A$ Global efficiency

DELIVERABLES

- PV Performance Database
- Analysis reports
- Workshops

OUTLOOK

- Improve operation and reliability of PV systems by collecting, analysing and disseminating information
- Provide performance data and extended experience for general assessments on PV system technologies

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CONTACT

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http://www.iea-pvps-task2.org