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Reducing the Long-term Cost of Solar Thermal Power Generation



Aguadulce, Spain - April 2002

“PDF - BRA/98/G41/A/99”

Presented by: MANOEL NOGUEIRA

MOTIVATION

- Limited northeastern hydro resources
- Opportunity for other generation sources
- Clean energy
- Integration with hydropower system (complementarity)
- Technology improvement

OBJECTIVES

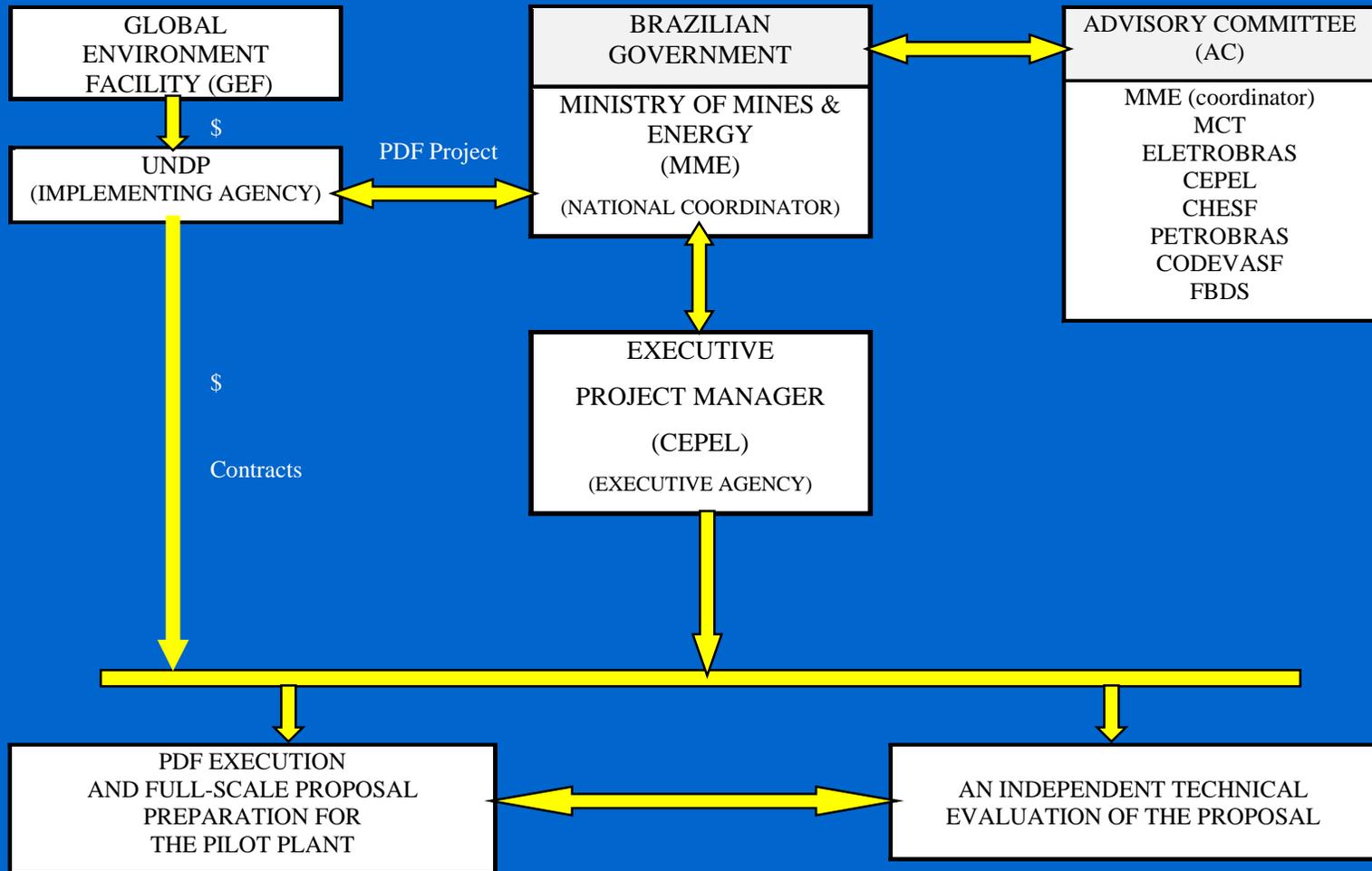
- Feasibility study for initial solar power plant with technical, economical, environmental and social analysis;
- Identification of the most promising technology to be integrated into the Brazilian electric system;
- Market Size Assessment;
- Perspectives for Components in Brazil

BACKGROUND

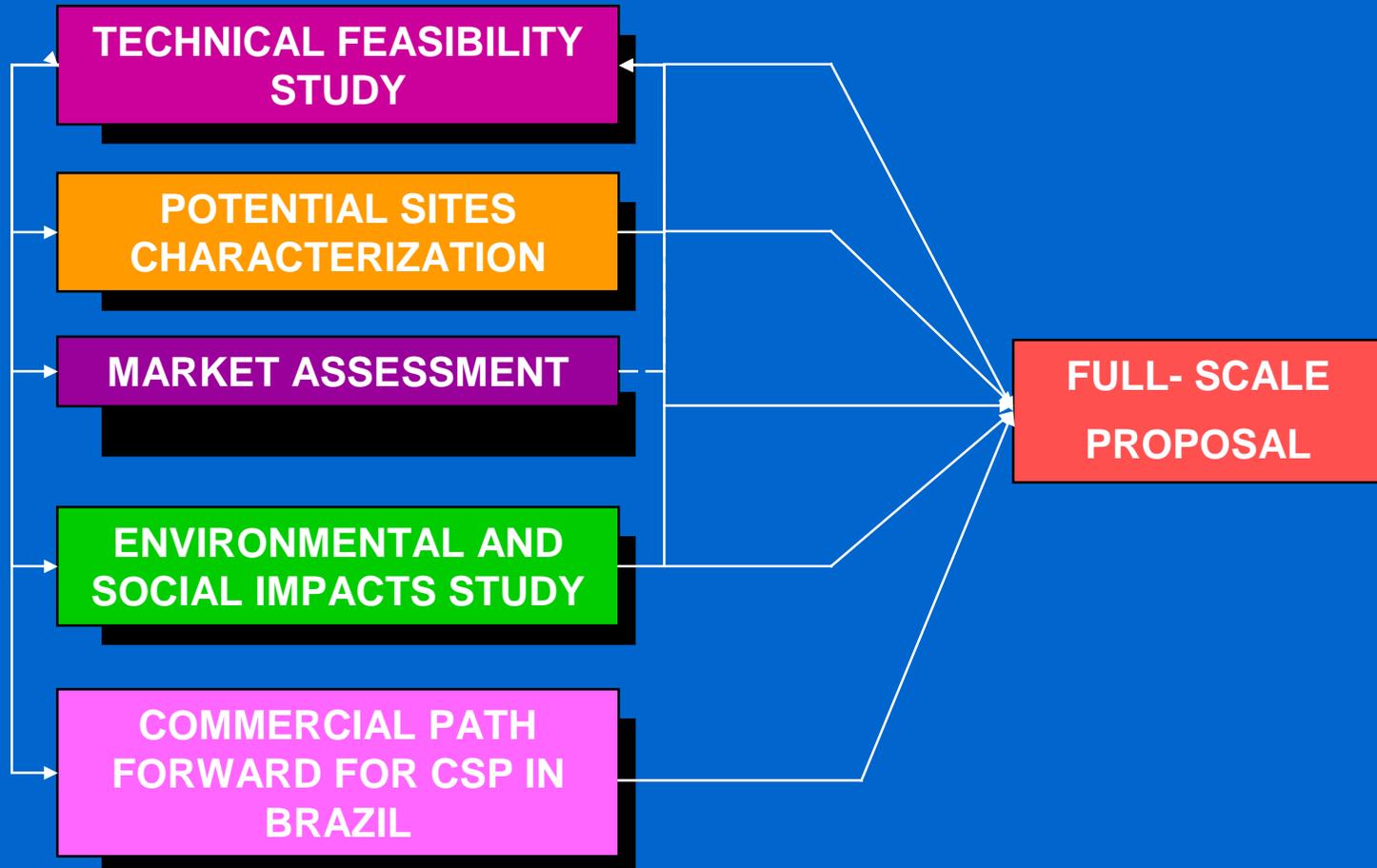
PDF Project Proposal Directed to UNDP

- **JAN/97**
- **UNDP Submits PDF Project to GEF**
- **JUN/97**
- **GEF Indicates PDF for New Scientific Fundings**
- **DEC/97**
- **STAP Recommends GEF to Finance New PDF Project**
- **MAR/98**
- **GEF Approves the Financing to PDF Project**
- **APR/98**
- **UNDP Submits to CEPEL Final Version of PDF Project**
- **CEPEL Sends PDF Project to SEAIN/MOG**
- **DEC/98**
- **CEPEL Informs UNDP Implementation Agreement of PDF Project**
- **JUN/99**
- **GEF Approval for PDF Project Implementation**
- **DEC/01**
- **CEPEL Starts PDF Project Activities**

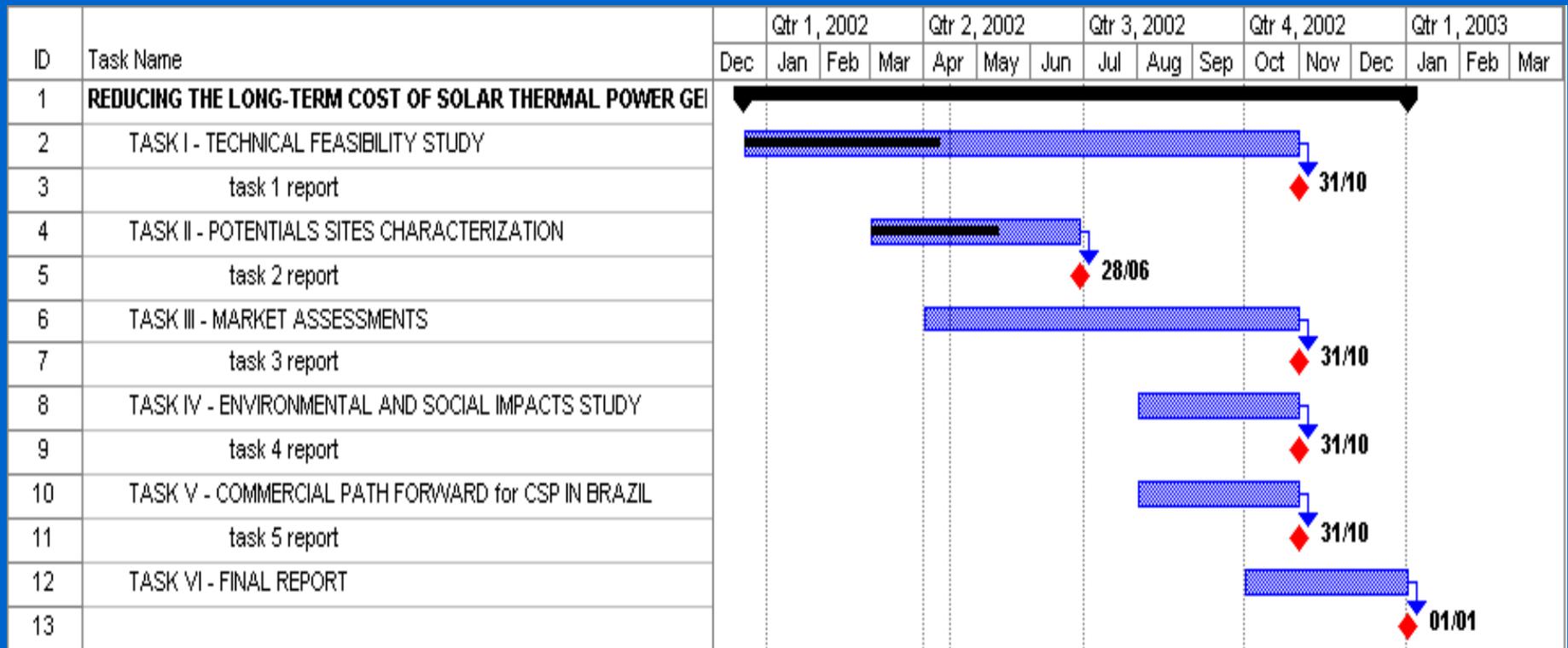
ORGANIZATION



WORK PLAN



PROJECT PLANNING



TASKS AND SUBTASKS

- ✓ Task I - Technical Feasibility Study (started)
 - Literature survey (finished)
 - Technology characterization (finished)
 - Grid connection studies
 - Cost reduction perspectives - technical overview
 - Technology selection
 - Pilot plant project
 - Brazilian potential solar plant components manufactures identification

TASKS AND SUBTASKS

- ✓ Task II - Potential Sites Characterization (started)
 - Solar resources mapping
 - Hydro resources identification
 - Electric grid analysis
 - Environmental restrictions identification
 - Site selection

TASKS AND SUBTASKS

- ✓ Task III - Market Assessment (just start)
 - Brazilian energy market evolution
 - Penetration of concentrated solar technology into the Brazilian market
 - Brazilian taxes survey
 - Economic feasibility study
 - Investment risks identification
 - Cost reduction perspectives in near and long terms - economical overview

TASKS AND SUBTASKS

- ✓ Task IV - Environmental and Social Impact Study
 - Social and environmental diagnosis
 - Direct impact survey
 - Region prognostic with and without the solar plant

TASKS AND SUBTASKS

- ✓ Task V - Commercial Path Forward for CSP in Brazil
 - Barriers and opportunities
 - R&D efforts Prioritization
 - Financial incentives mechanism
 - Identification of possible investors

TASKS AND SUBTASKS

- ✓ Task VI - Final Report
 - Final report presentation
 - UNDP/GEF suggestions
 - MME suggestions
 - Advisory Committee suggestions
 - Final report revised

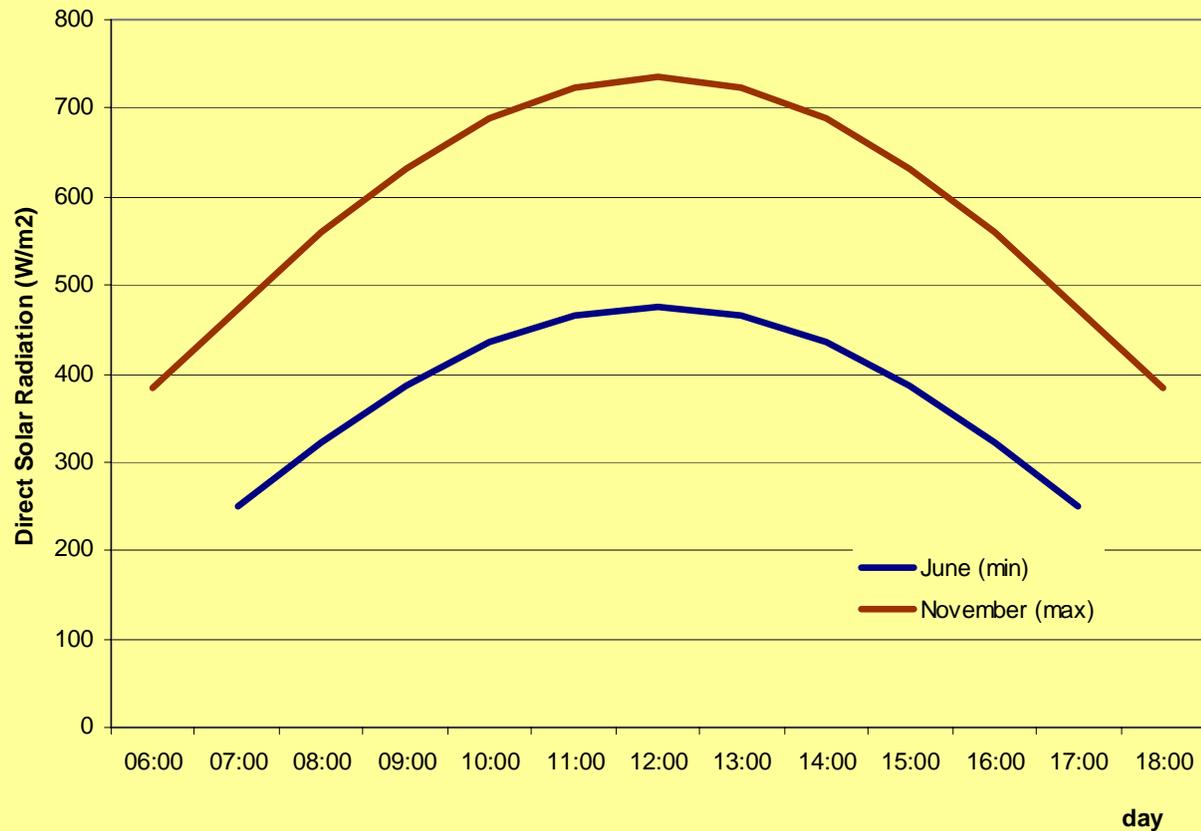
POTENTIAL AREA



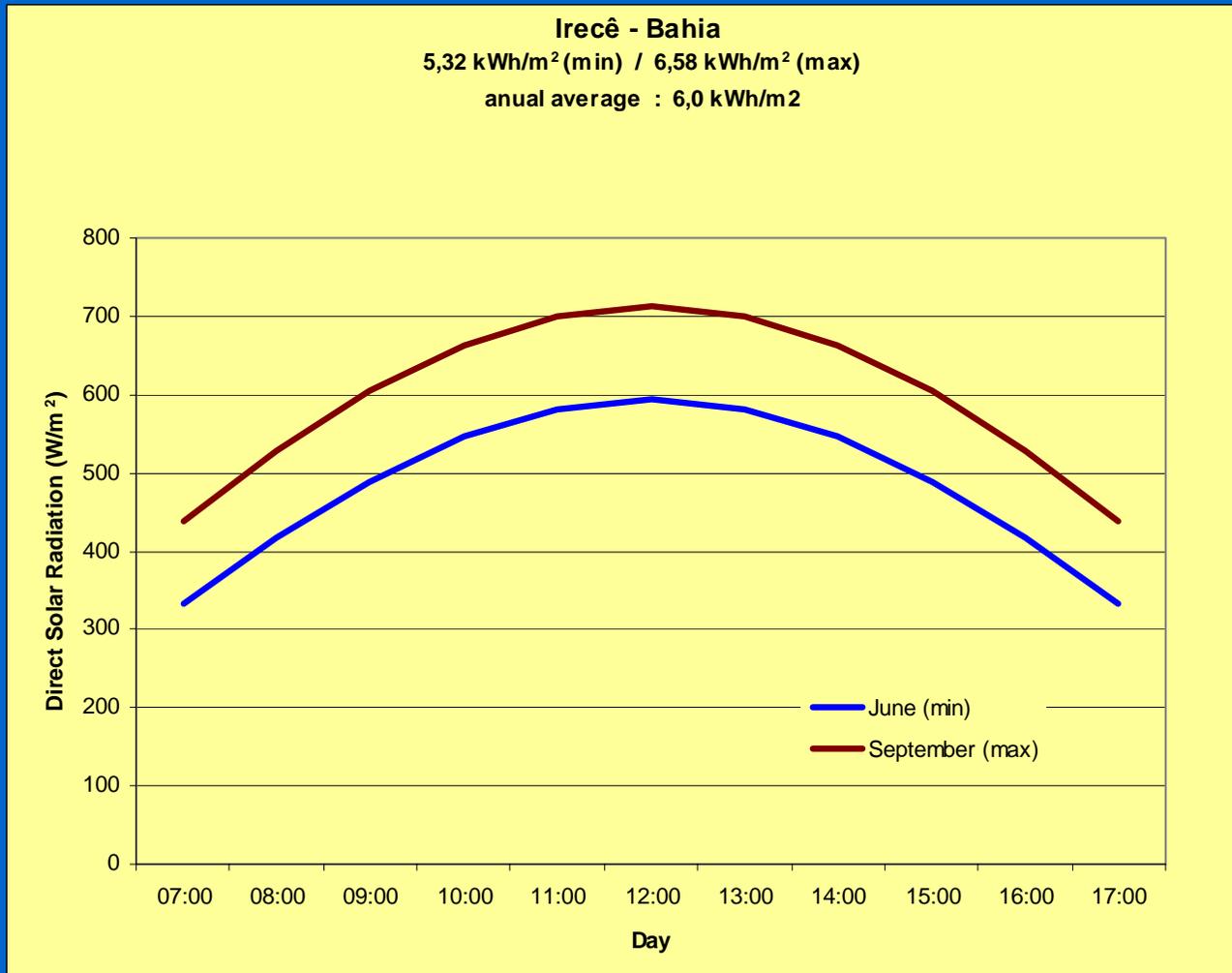
- Semi-arid region
- ✓ The highest incidence of direct solar beam in Brazil
- ✓ Hydro resources availability
- ✓ Low humidity
- ✓ Low precipitation

Radiation Barra - Bahia

Barra - Bahia
4,20 kWh/m² (min) / 7,65 kWh/m² (max)
anual average : 5,86 kWh/m²



Radiation Irece - Bahia



CONTACTS

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THANK YOU