Quality Assurance in Photovoltaic Projects at the World Bank: Experiences & Lessons

Focus: Quality Assurance for Products and Services
Off Grid Power Conference
Inter Solar Trade Fair
Munich, Germany

Anil Cabraal
June 10, 2010
Outline

- World Bank PV Project Portfolio
- Lessons
- Examples
  - NDRC/World Bank/GEF China PV Market Development Project
  - World Bank/IFC Lighting Africa Program
World Bank Group PV Projects

- Over 50 projects/programs since 1995
  - Solar home systems – Dominant application
  - PV systems for rural enterprises, schools, clinics
  - PV water pumping
  - Grid connected PV
- Benefiting about 2.7 million households and other facilities
- Using ~140 MW of PV
- Projects valued at about US$1.4 billion
- Over 30 countries
  - Smallest: Solar home systems for teachers, PNG: 2,500
  - Largest: Carbon finance for solar home systems, Bangladesh: 1 million
Failure modes

- **Products**
  - Defective or deficient components
  - Counterfeits
  - Over promise performance - mislead
  - Warranties not honored
  - Companies go out of business

- **Installation and service**
  - Inadequate design and installations
  - Lack of trained technical support
  - Lack of access to/delays in provision of spares or services

- **Use**
  - Improper use
  - Abuse
  - Theft/vandalism
Quality at Entry

- Necessary but not sufficient
  - Set technical product and service standards
  - Procure quality products and installation services
  - Quality certification alone less effective than quality labeling
- Require enforceable warranties
- Avoid project goals that may be conflicting
- Create sense of ownership
Don’t just demand quality, help achieve it

- Standards adoption/development/improvement
- Support quality monitoring and enforcement
- Quality improvement/technology development support
- Quality testing and certification, and quality labeling support
- Training
- Capacity building for installation and service improvement
- Fund/ensure provision of maintenance/repair services/spares
- User outreach and awareness
Should quality be at any cost?

- Depends on application
  - Cost of failure/malfunction
  - Service life of application
- Depends on willingness to pay
  - If affordability is an issue, offer products with reduced level of service but not low quality
  - Must be based on informed decision
- Most challenging compromise has been batteries
  - High import tariffs
  - High quality battery availability limited
  - PV-specific battery performance information lacking
  - Even if first battery is high quality, replacements may not be
Example: China Renewable Energy Development Project

- 400,000+ quality PV (10 Wp to multi-kWp) systems (~10 MW) marketed and sold by over 30 PV companies in NW China
Example: World Bank/IFC Lighting Africa Program

- Primary QA Components:
  - Performance Standards and Evaluation Methods
    - Solar CFL lanterns (PVGAP PVRS 11A)
    - LED lanterns (PV or other power supply) – Lighting Africa test protocol
  - Product Reviews & Information Dissemination
  - Products of the Year Awards
  - Technical Advisory Services
    - Technical Notes
    - Quality Assurance Industry Advisory Committee
    - Lighting Africa Quality Label (future)

http://www.lightingafrica.org
2010 Lighting Africa Quality Awards

- Barefoot Firefly
- Sun King
- D.Light Nova S200
- Barefoot Powapack
- Sun Transfer ST2
Summary

- Need to constantly emphasize and pay attention to product and service quality
- Help customers recognize good quality and its value
- Enforcement is important but so is giving the means to improve and maintain quality
For more information...

http://www.worldbank.org/projects
http://www.worldbank.org/energy
http://www.worldbank.org/retoolkit
http://www.lightingafrica.org