

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
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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

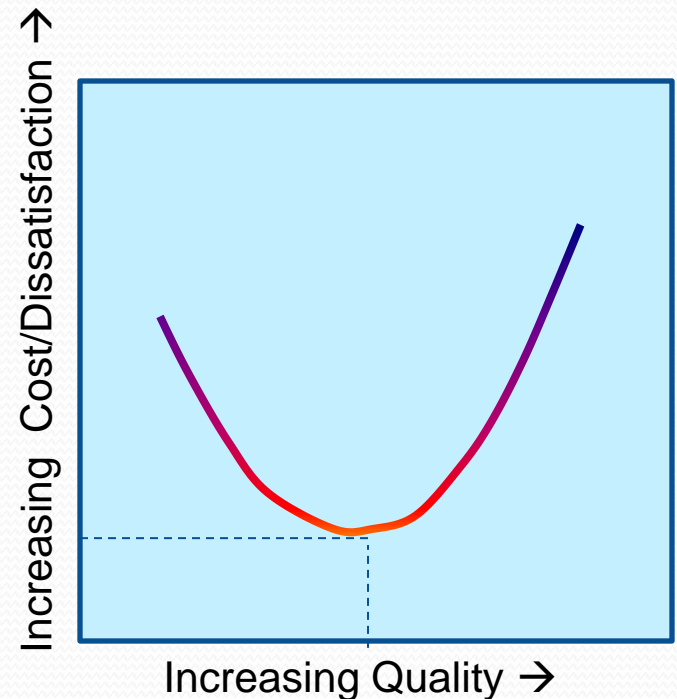
Enforce
Quality
Requirements!

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

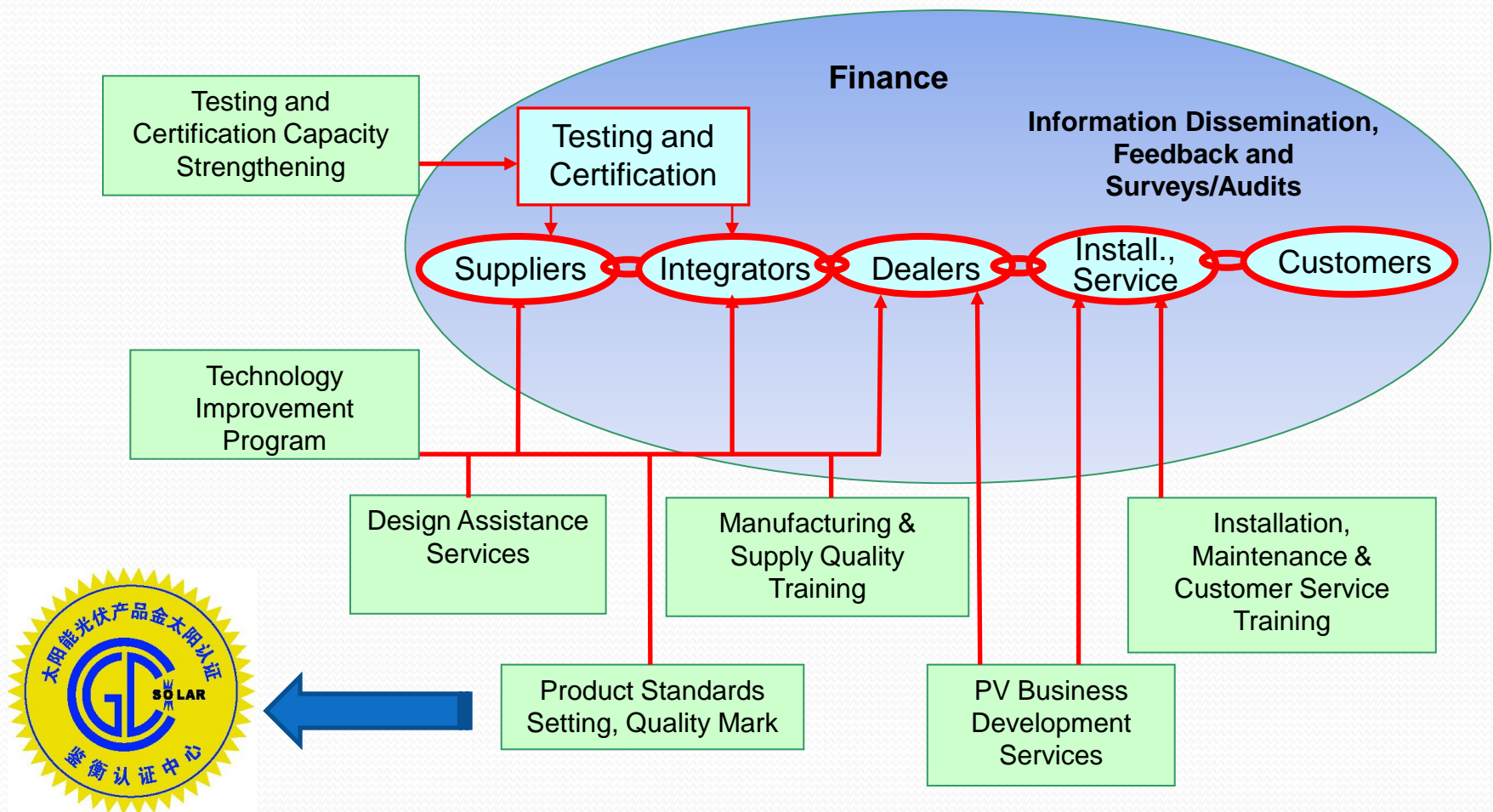
Should quality be at any cost?

- 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
 - Whose decision? User? Financier? Government?
- 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>



Low cost LED torches
for sale in Kenya



Counterfeit LED torch
(3 non-rechargeable batteries; non-
functional mechanical charger)

2010 Lighting Africa Quality Awards

- Barefoot Firefly



- Barefoot Powapack



- Sun King



- D.Light Nova S200



- 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.lightingafrika.org>