INSTITUTIONAL INFRASTRUCTURE FRAMEWORK

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Presentation Overview

- Brief Overview of PV Implementation Models
- Experiences and Deficiencies
- Institutional Framework Responses
- Needed Institutional Frameworks
- Some Challenges

Main PV Implementation Models :

- Sales Model > Cash Sales, Credit Sales
- Service Model / Fee for Service

What matters here is…

- Neither Model better than the other
- Models can and should co-exist

Experiences : Results of first 10 years of PV projects Funded by GEF

- Allocated 25% of climate change portfolio to SHS in first 10 yrs
- Target of 500,000 system installations, <15% installed

Ref : The GEF Solar PV Portfolio : Emerging Experiences and Lessons (2000)

Why is this… ??

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Sales Model – Defficiencies (see RPGs)

- Insufficient consumer protection (quality, guarantees / warranties)
- Insufficient availability of information to end-users
- Risk averse credit providers => insufficient rural credit => constraint – price before system quality

Service Model - Difficulties

- Many stakeholders, long-term perspective needed, management skills? legal and regulatory frameworks; capacity building activities; users spread over large geographical areas; enough concessions?

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Institutional framework responses :

- **Certification and standards (+ enforcement)**
- **Quality control** along the delivery chain
- **Public information on PV**
- **Encourage after-sales** services
- **Development of appropriate financing mechanisms – guarantees** (see RPGs)

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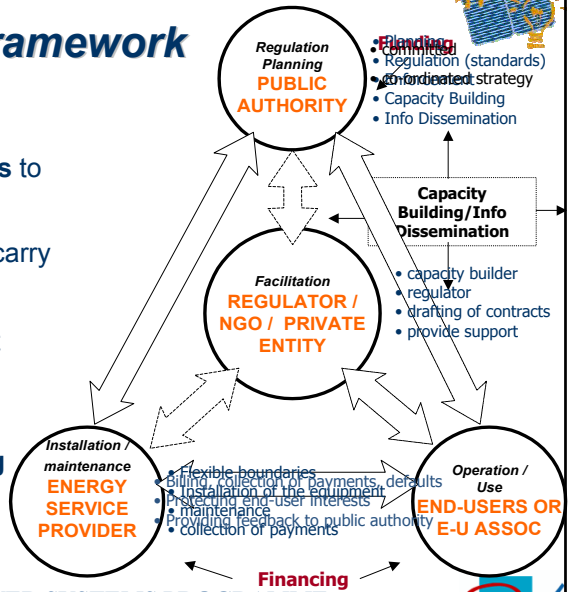
Institutional Framework

- **Fundamental Functions** to be performed
- The **Agents** needed to carry them out
- **Relationships:** contract / code of conduct needed between the agents
- **Financing** and **Funding**



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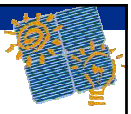

Case Studies:

- Sri Lanka
  - Evolution From Direct Cash Sales Model to Third Party Credit Model
- South Africa
  - Implementation of Government Directed ESCO model

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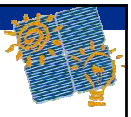

Cash Sales Model: Sri Lanka Pre 1997

- During 1980's: 3 companies
  - *Vidya Silpa (formed 1981),*
  - *Sunpower Systems Limited (formed 1987)*
  - *Power and Sun Limited (formed 1986).*
- Involved with Aid Projects and cash sales in rural areas
- Estimated approx 7000 SHS installed

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Cash Sales Model: Strengths Sri Lanka Pre 1997

- A "true" private industry sales company is customer focused
- These companies did supply and install- had dealers/ technicians in the rural areas
- Customer ownership- greater interest in ensuring system works

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Cash Sales Model: Weakness Sri Lanka Pre 1997

- Market limited to those who could afford upfront capital
- Only 5 to 20% of Sales people are genuinely customer focused!!
- Customers not always told the limitations of SHS or true operations cost- large customer dissatisfaction
- Though few companies-true competition not always occurring since small market
- Companies can leave market- who supports customer after company has left
- Small markets make operating a business very risky

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Cash Sales Model: Weakness Cont Sri Lanka Pre 1997

- Customers often long distance from dealer/technician and/or no phone so after sales service difficult.
- Maintenance contracts rarely offered
- Customer owns equipment so owns risk of equipment failure etc
- Customer generally does maintenance-Need for good customer training
- Need for some form of regulation to ensure good installation and reliable products
- Lack of capital to invest in marketing and building delivery/service infrastructure in rural areas, industry grows slowly.

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Credit Model: Energy Services Delivery (ESD) Program Sri Lanka 1997-2002

- Goal - 30,000 SHS
- Grant of US$100 per system
- Funds available to Participating Credit Institutions to lend money for the purchase of SHS

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Transition Cash-Credit: Snapshot of Sri Lanka 1998

- Solar Power and Light
  - 26 staff (10 in field)
  - Approx 15 dealers in field
  - Approx 300+ SHS per year
- SELCO(RESCO)
  - 33 staff
  - Approx 200-250 per year
- Alpha Thermal
  - 3 staff on PV
  - Entered SHS market

Credit Model: ESD Program Sri Lanka 1997-2002 Mid Term Review- 2000

- Only 723 systems installed (aim 6000)

Reasons

- PCI's not interested in promoting small credit
- Solar companies not skilled (or interested) in being credit providers (offering dealer credit)

Credit Model: ESD Program Sri Lanka 1997-2002 July 2002

- 18,619 systems installed

Reasons

- SEEDS- became a PCI
- Shell had purchased SPL and Access Solar entered market
- Regional Govt-promoted PV with US$100 grant

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Credit Model: RERED Program Sri Lanka 2004

- 15,000 plus systems a year
- 9 solar companies
- 1700 staff
- 115 rural service outlets
- 5 rural credit providers

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Credit Sales Model: Sri Lanka Weaknesses to Strengths

Typical weaknesses with this model include the large risk to credit provider for the following reasons:

- Customer dissatisfaction with system – oversold on system-customer not making credit repayments
- System not working-system not being maintained correctly-customer not making credit repayments

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Credit Sales Model: Sri Lanka Strengths

- Credit provider create MOU's with the solar providers that they do undertake a specified number of service visits in a set period.

Also

- AU has complaint procedures and SIA monitors

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Credit Sales Model: Sri Lanka Strengths

- Need for Upfront capital removed
- An active market so real investment by companies (eg Shell)
- Encouraged more companies therefore real competition
- Created rural employment

Credit Sales Model: Sri Lanka Weakness

- Customer still owns equipment – therefore responsible for battery replacement in future- also possible long term maintenance
- Credit company does have high service costs in collecting the payments.
- Generally high interest rates (above 20%)
- Systems only provided to those customers who are able to obtain credit (estimated by SELCO that 50% of potential customers could be in this category)
- Fortunately inflation stable in Sri Lanka – this is risk in other countries

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ESCO Model: South Africa

- call for utility based non-grid service providers
- 28 proposals received - 5 contracts signed
- submitted business plans and financial analysis which were reviewed by Management Consultants
- Review led to setting of subsidy level and monthly service fees.

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Service Contracts

- 5 Interim Service Contracts let
- Service Contracts provided for:
  - R3500 (Euros 428) subsidy per system installed (ex VAT)
  - R100 (Euros12.2) connection fee
  - R58 (Euros 7.1) monthly service fee (inc. VAT)

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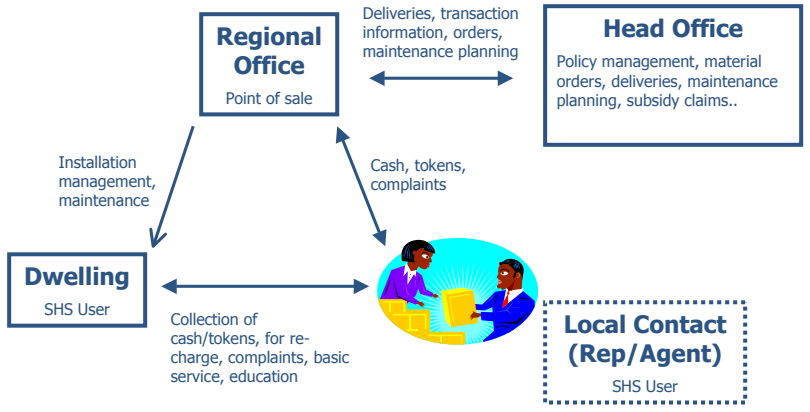
Service Providers

- KwaZulu Natal Energy Services Company (central KwaZulu Natal)
- Renewable Energy Africa (Eastern Cape)
- Solar Vision (Limpopo/Northern Province)
- Eskom/Shell Solar Home Systems (southern KwaZulu Natal)
- Nuon-Raps SHS Utility (northern KwaZulu Natal)

Generic Business Model



Job Creation

- 148 full-time appointments
  - 18/130 W/PDI
  - 51 in Head offices
  - 49 in Regional offices
  - 30 in Energy Stores (1 concessionaire only)
- 163 contract appointments
  - mainly installation teams & village representatives

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Purchasing & Equipment Procurement

- Procurement generally by tender /term contracts
- Some concessionaires are tied to PV manufacturers
- 3 concessionaires use the same ENERGYstream™ product range for charge controller/credit meters
- Systems costs R3500 - R3800 (Euros 428-465) (55Wp SHS)

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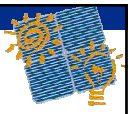

Technical Issues

- Interim Contract specifies technology requirements (based on NRS 052)
- Problems with 1 charge controller/pre-payment meter leading to increased call-outs and maintenance costs
- Early problems with module security devices led to 150 panels being replaced

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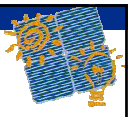

Security

- All concessionaires experienced problems
- Use of roof mounting of panel has reduced incidence of theft
- Low rate of user interference
  - battery/controller steel enclosure
  - mechanical and electronic locks
  - R150-R300 tampering fee applied

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Payment and willingness to pay

- Collection rates over target 80%
- Average expenditure on basic energy services R25 - R40 /month in un-electrified areas
- Incentive based payment of fee-collectors (linked to collection rate)
- Complications through 'Free Basic Electricity' scheme - subsidy of R48 / month

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Financial Analysis

- 4200 installations/year with current service fee is not viable:
  - Service fee needs to be increased to R61.4
  - Capital subsidy needs to be increased to R4000
- Installation rate needs to be increased to 10000/yr
- DME capping installation rate at 4200/month

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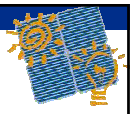
South Africa; ESCO Model Strengths

- Government Supported
- ESCO's provided long term concessions (potentially)
- Systems will be maintained- Customer does not own risk
- Selected through tendering process

South Africa; ESCO Model Strengths or Weakness

- Systems greatly subsidised so therefore affordable by rural poor- Strength
- Systems greatly subsidised- How many systems a year will Govt be able to afford? Weakness that it might roll out slowly

South Africa; ESCO Model Weakness



- Companies on a very steep learning curve with respect to managing a solar ESCO
- Strong management/leadership required
- Actual operating costs for maintenance etc still not completely known so is it sustainable?
- Ownership of system is in doubt?

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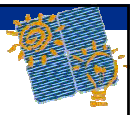
Challenges…



- All models require differing levels of government intervention / institutional set up – ensure that no one model hinders the other…
- Appropriate frameworks need agents and stakeholders – do they exist? Skilled people, time and money - building delivery chain
- Are there enough incentives to entice potential players to become energy service providers

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THANK YOU