

PV Potential in Central America:
The Sun Shines for All

Richard Hansen
Soluz, Inc.



CESC
Webinar
June 17, 2014

Soluz, Inc.

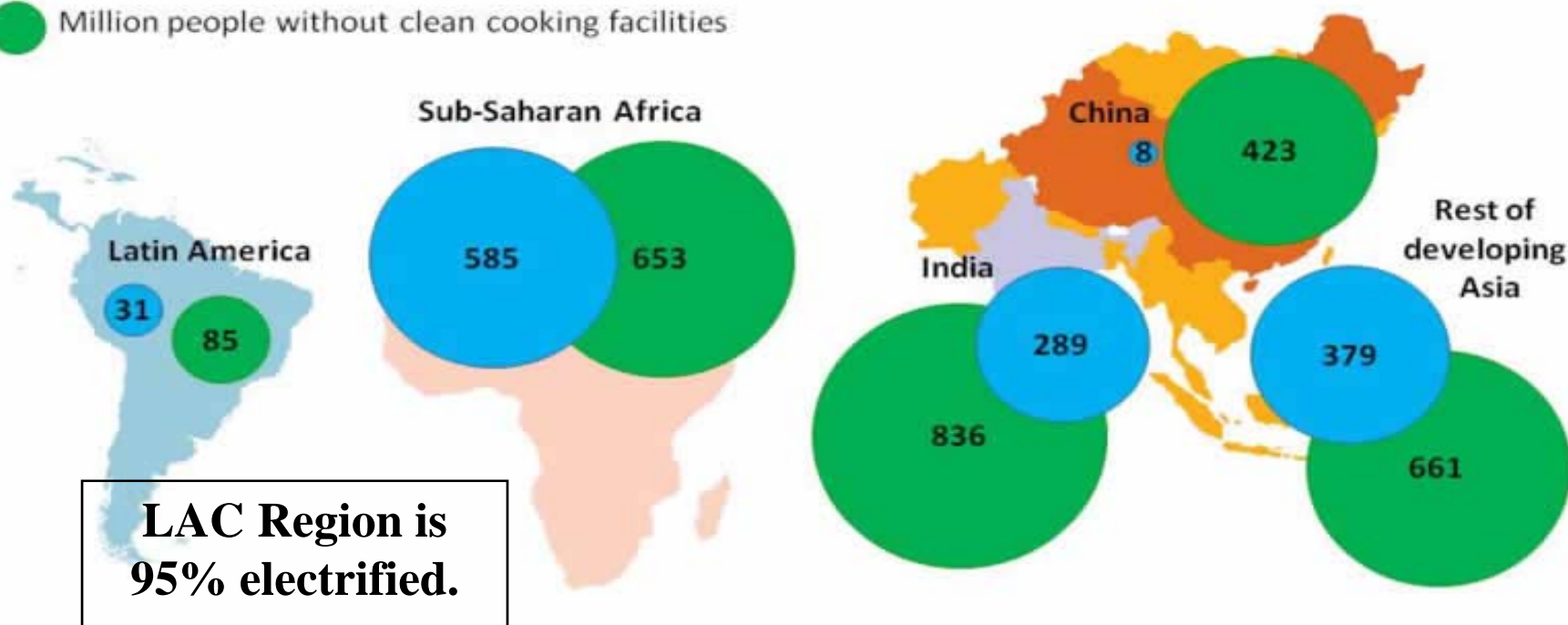
- Company incorporated in Massachusetts, USA in 1993, (with roots in the Dominican Republic since 1984) advancing solar photovoltaic (PV) in developing countries.
- Two lines of business:
 - Product – Through its subsidiary enterprise, **Soluz Honduras**, founded in 1994, following several years of south-south exchange.
 - Consulting – Assisting institutions to advance the Global Transition to Sustainable Energy.

Energy Poverty around the World (IEA)

WORLD 2011
ENERGY
OUTLOOK 1

Energy poverty is widespread

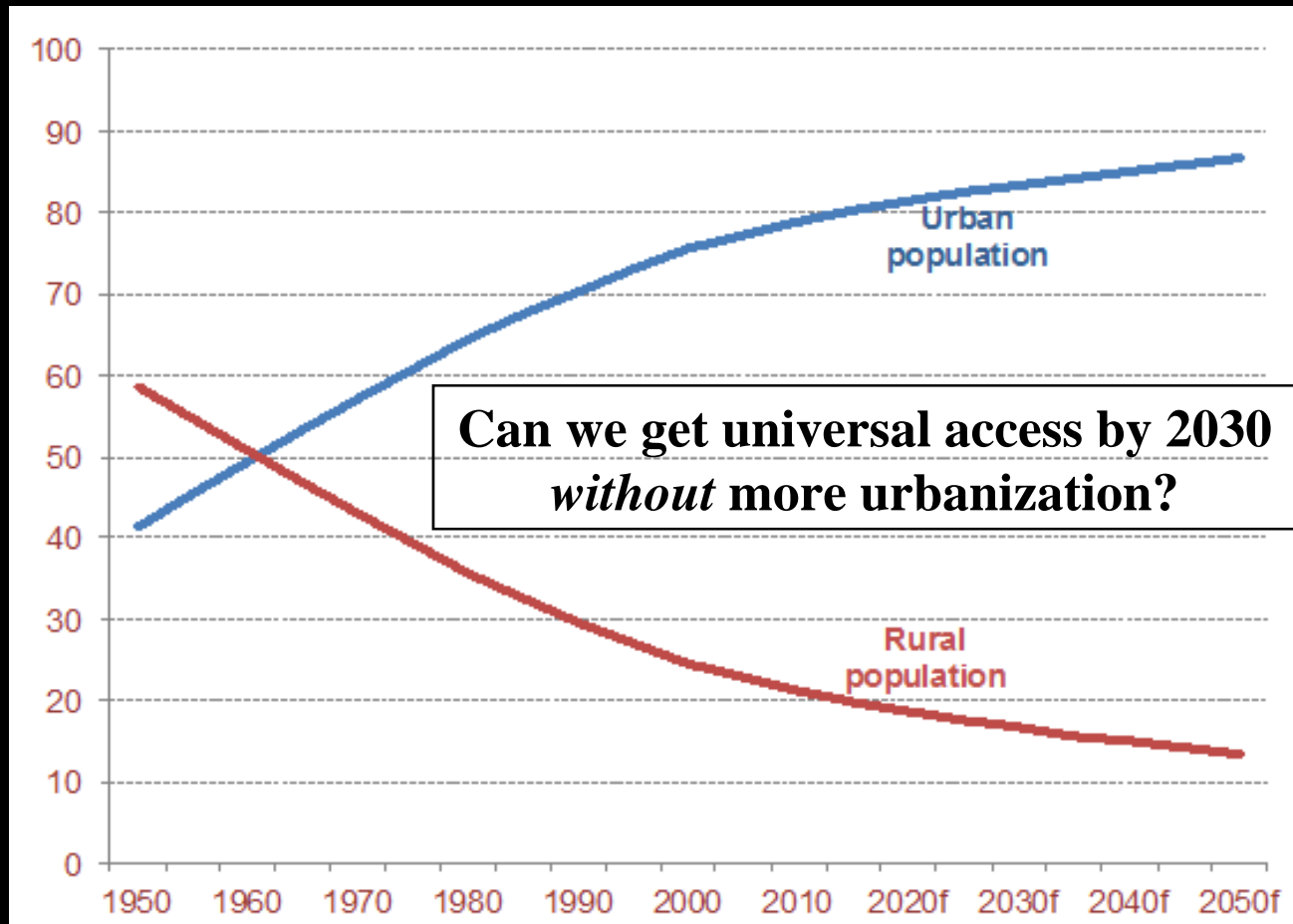
- Million people without electricity
- Million people without clean cooking facilities



LAC Region is 95% electrified.

*1.3 billion people in the world live without electricity
and 2.7 billion live without clean cooking facilities*

Proportion of urban and rural population in Latin America 1950-2050* (2014: 80% urban)



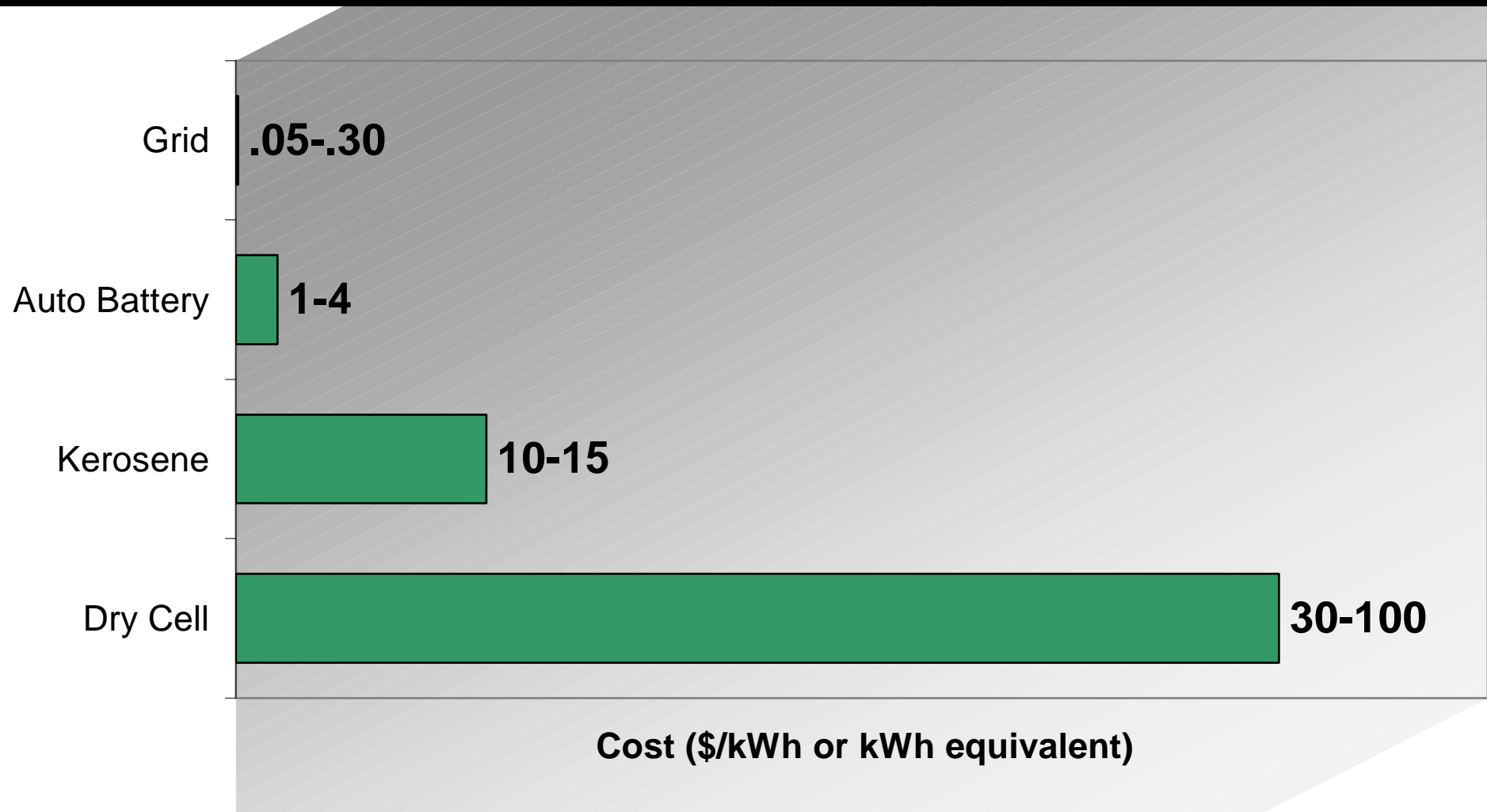
* Source: AMI based on data from the United Nations Department of Economic and Social Affairs' Population Division
Figures for 2020-2050 are based on forecasts . (AMI Americas Market Intelligence)

Sin Electricidad en las Américas: 7%, 31M Personas, 6M Hogares

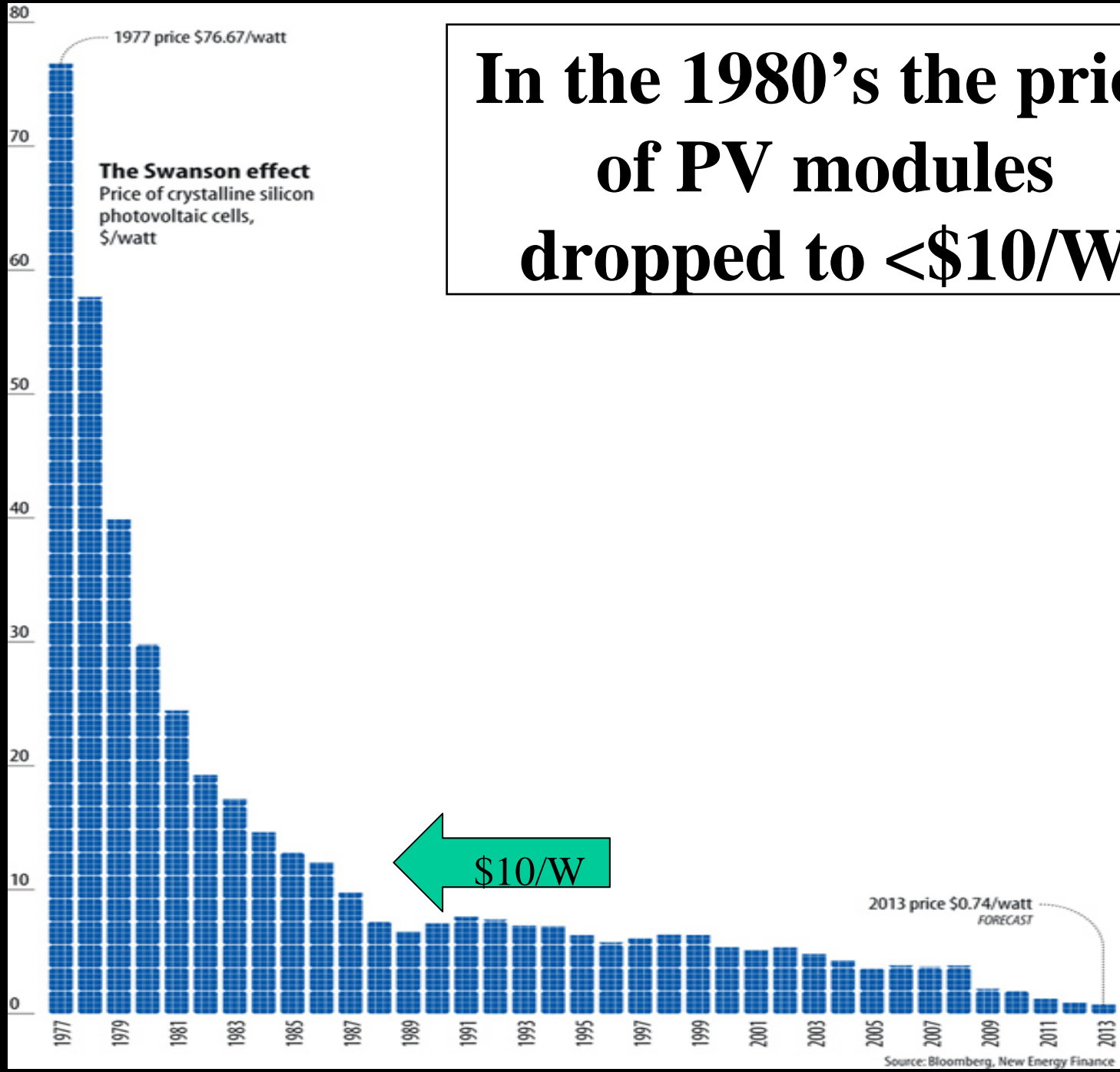
- Los 8 Países con >10% sin Acceso:
 - Haiti: 61.5%, 6.2M (1,240,000 viviendas)
 - Honduras: 29.7%, 2.2M (440,000 viviendas)
 - Nicaragua: 27.9%, 1.6M (320,000 viviendas)
 - Bolivia: 22.5%, 2.2M (440,000 viviendas)
 - Guatemala: 19.5%, 2.7M (540,000 viviendas)
 - Peru: 14.3%, 4.2M (840,000 viviendas)
 - El Salvador: 13.6%, 0.8M (160,000 viviendas)
 - Panama: 11.9%, 0.4M (80,000 viviendas)

– Fuente: IEA-<http://www.iea.org/weo/electricity.asp> (2009)

Rural Energy Sources, Costs (\$/kWh)



**In the 1980's the price
of PV modules
dropped to <\$10/W**

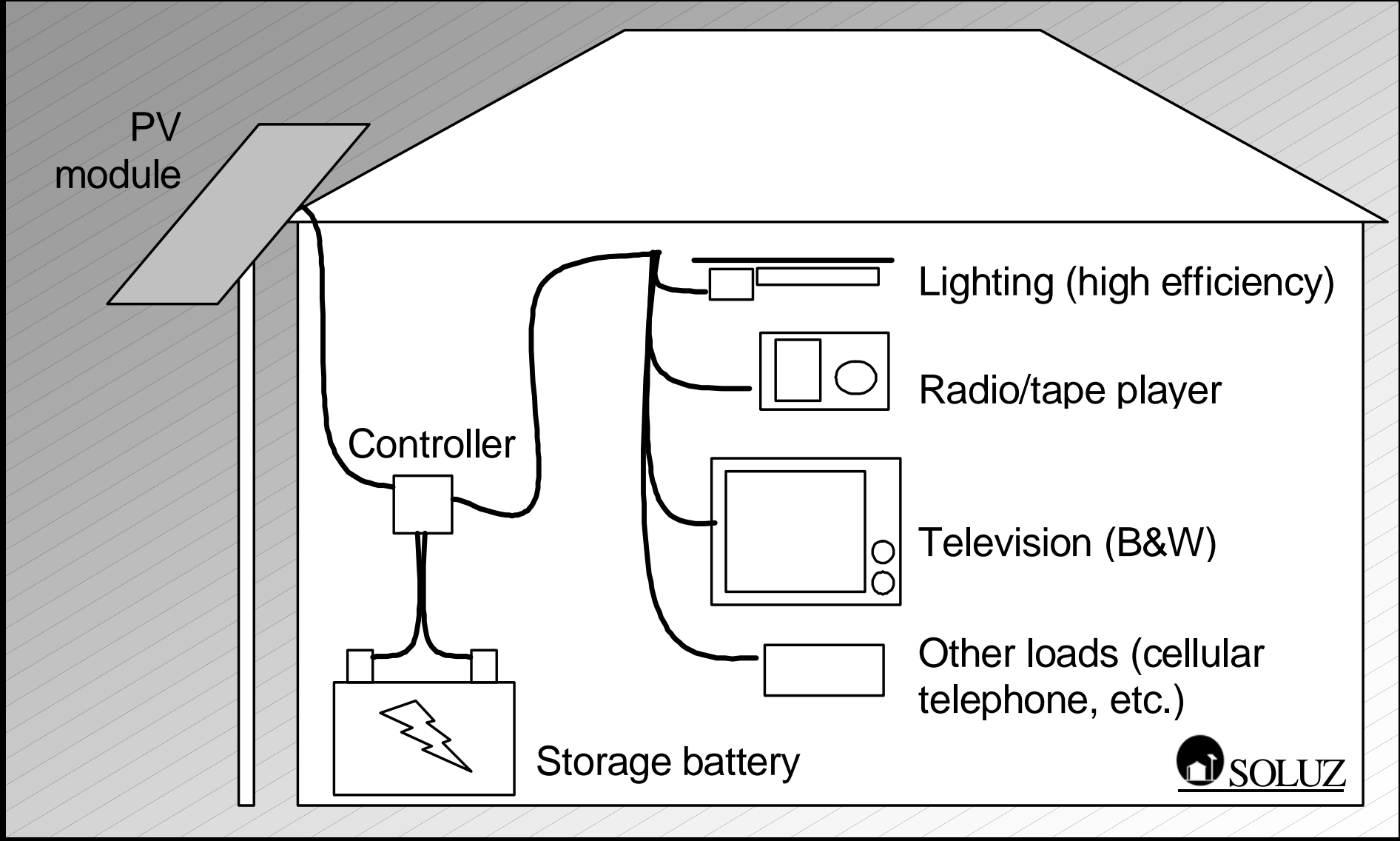


**First Home/Store in DR with PV & Microfinance
Felipe Martínez: Bella Vista, April 1984**



Killer App: Domestic PV System

Typically 20-100W @ \$15/W Installed



1991 Honduras Planning Meeting in DR

- **Peace Corps Honduras**
John Rogers & Mark O'Donnell
- **Sandia National Lab**
Max Harcourt & Beth Richards

Harish Hande, Student



SELCO India, founded 1995

41 Branches, 310 Employees,
>210,000 PV Systems



**Dr. Harish H. Hande,
Co-founder of SELCO**



1991-1995 Enersol: PV Training in Honduras

Trainer: Ing. Diana Solis, Enersol



**Participant: Andrés Carbajal,
Plan International**



World Bank: “Best Practices for PV”

WORLD BANK TECHNICAL PAPER NUMBER 324
ASIA TECHNICAL DEPARTMENT SERIES

Best Practices for Photovoltaic Household Electrification Programs

Lessons from Experiences in Selected Countries

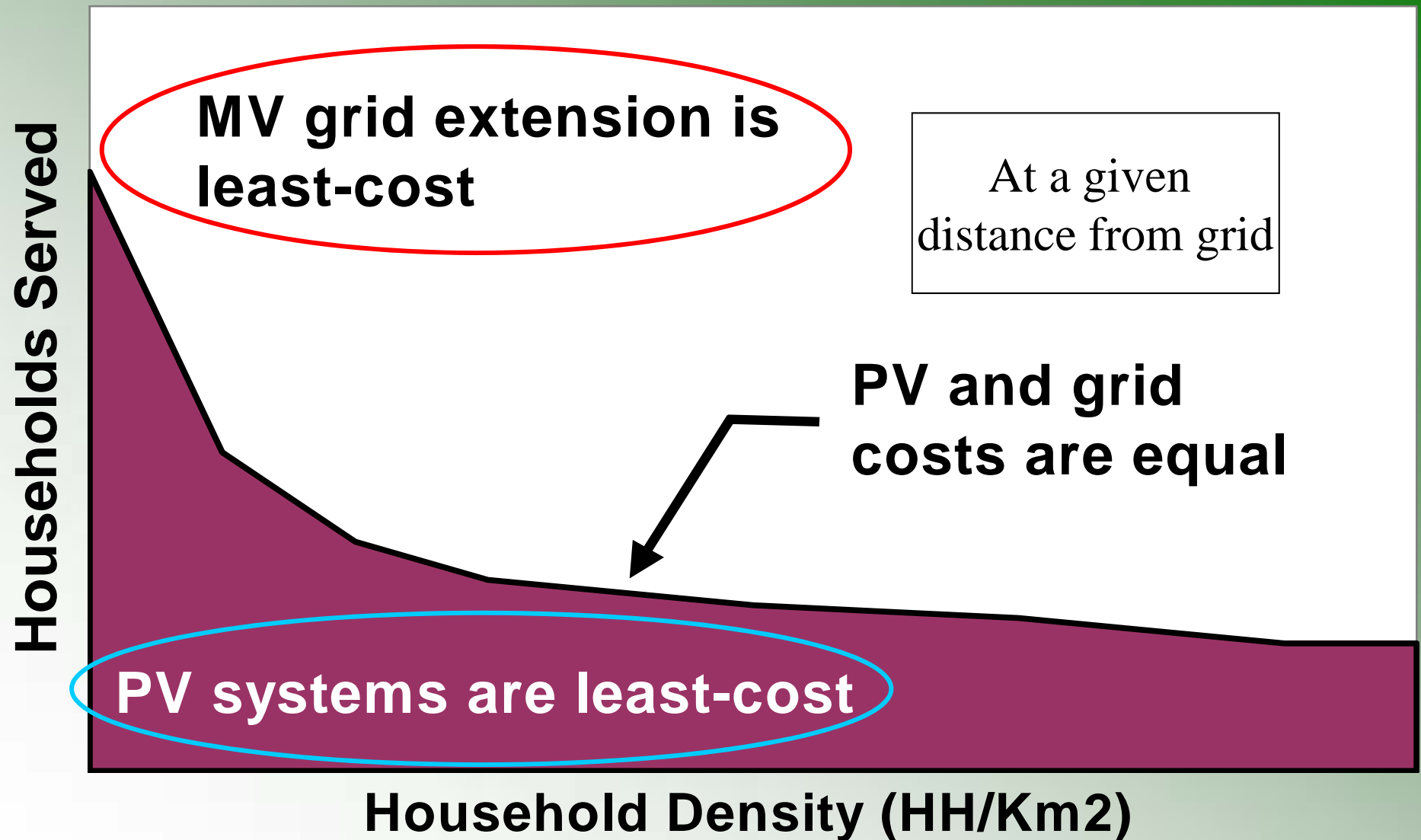
Anil Cabraal, Mac Cosgrove-Davies, and Loretta Schaeffer



World Bank Mission in DR 1993
Asia Technical Department Preparing:
Indonesia and **Sri Lanka** PV rural
electrification projects

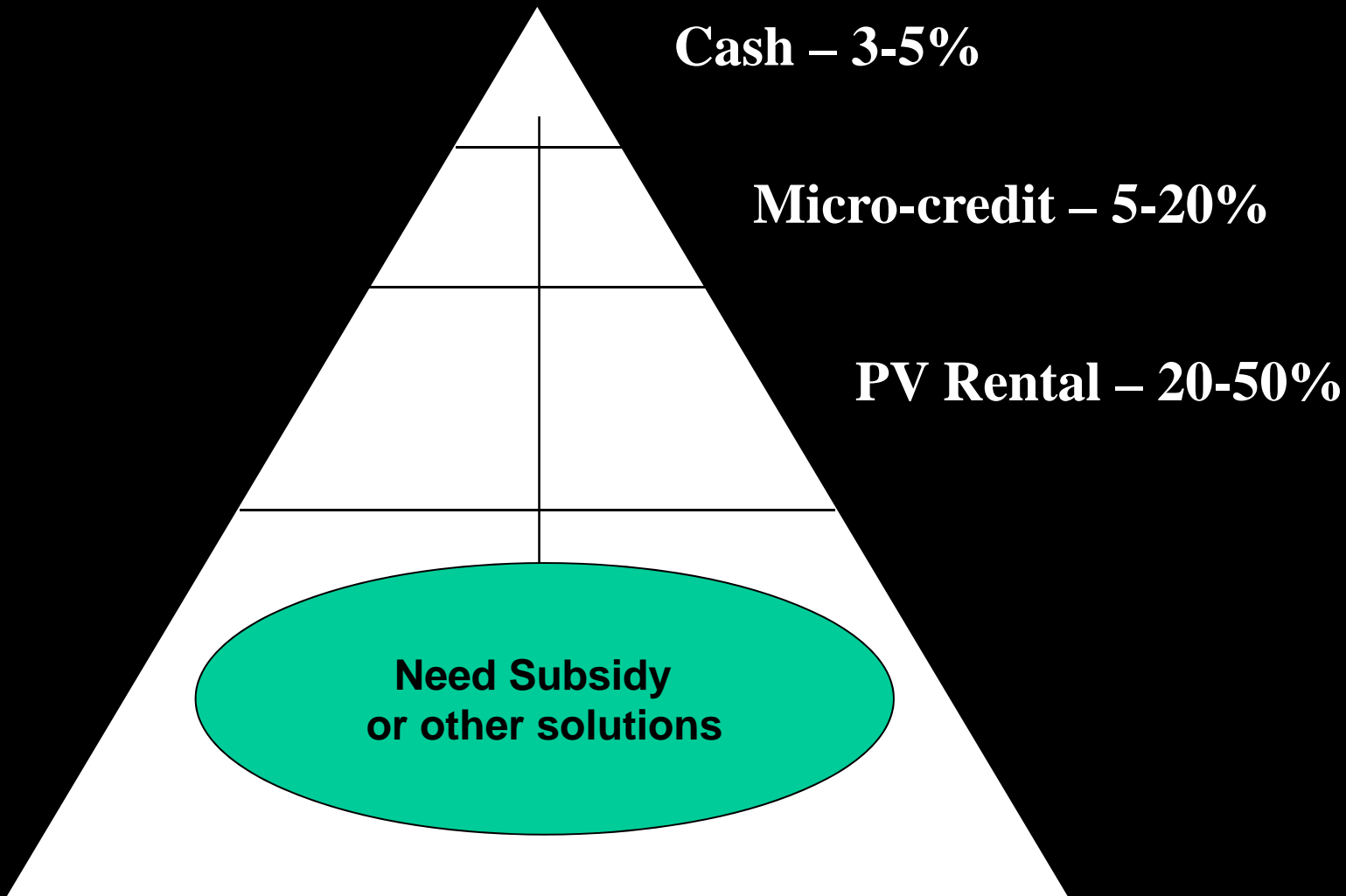


Where does PV Fit?



Adapted from Cabraal, et al., "Accelerating Sustainable PV Market Development", World Bank

Analysis of Financing Options (20-100W)



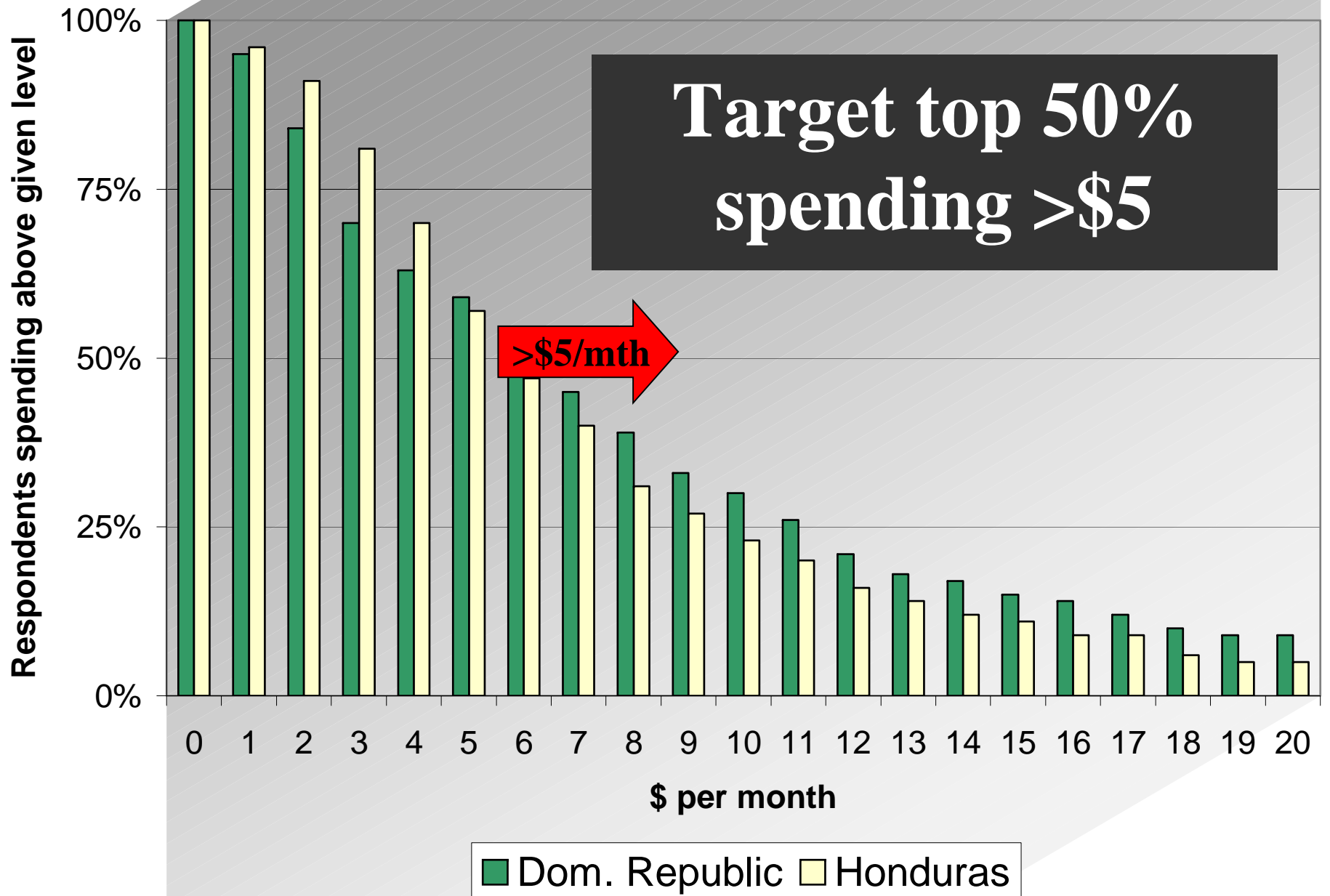
Soluz Honduras-Business Model

- Basic business challenges:
 - Provide dispersed population with product & service
 - Make systems affordable for the rural poor
- Potential solutions to challenges:
 - Establish local delivery structure to serve customers
 - Target customers with right products combined with microfinance

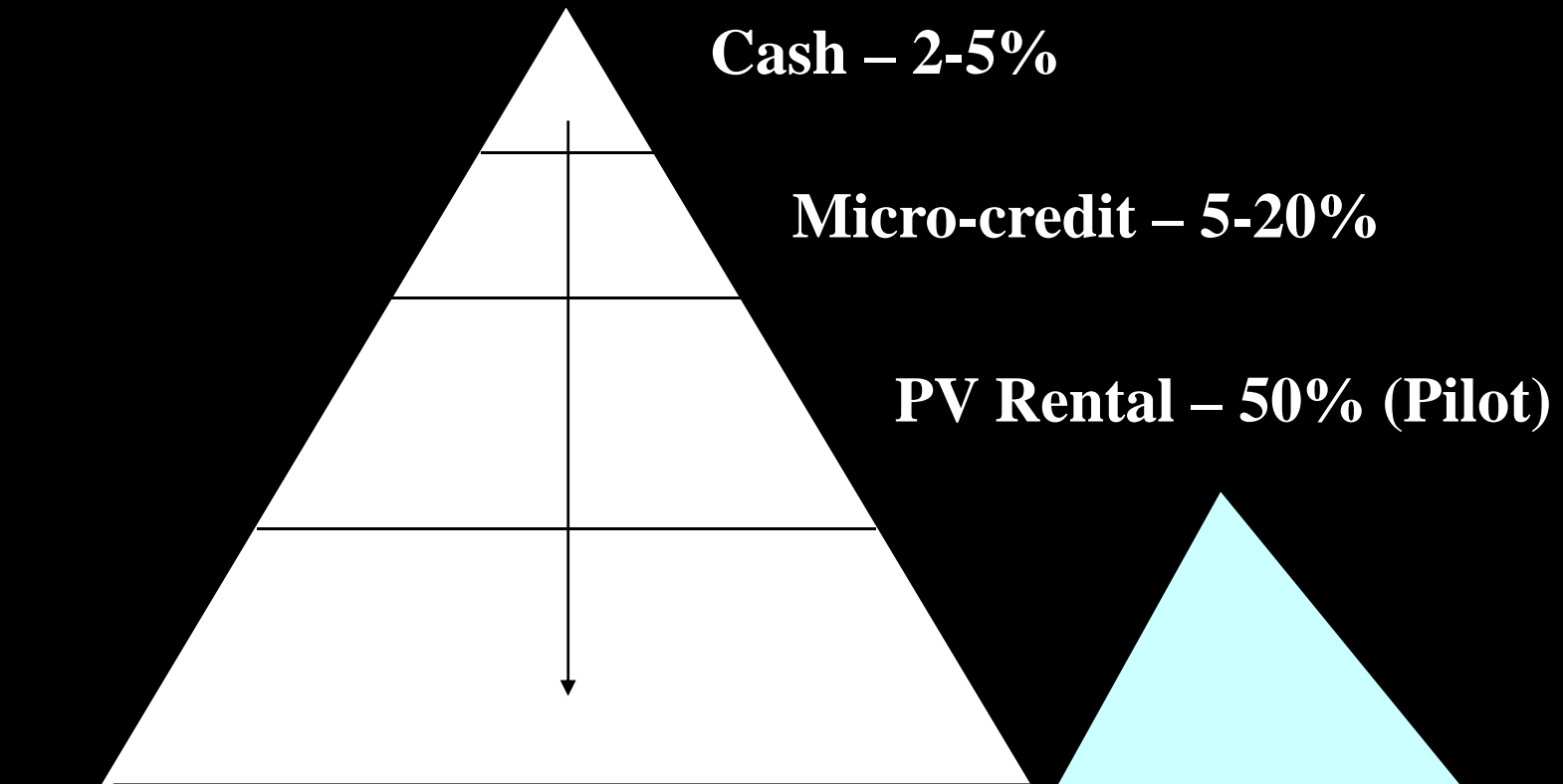
Soluz Honduras: PV Markets

20W-300W for Households and Micro-enterprises





Soluz Honduras Model 1998: Unsubsidized Offers



- 1994 in DR we introduced “**PV Rental**” now called “**Pay-as-You-Go**”
- US\$5-25/month, 20W to 100W, easiest offer for customers
- Company assumed technology and electrification risks (more on that later)



Soluz Honduras: PV Rental 1998-2005

Soluz Honduras – Progress (1998-2005)



- Investment – \$1.5M (IFC and others)
- Innovative “PV Rental” business model
- Customers (*Unsubsidized*)– **5,000+**
 - Cash
 - Micro-credit – 1,300+ systems
 - PV Rental – 2,500+ customers (with churn)
 - ~100,000 payments collected
- Early Stage, High Risk: Could not co-exist with *subsidized* Government PV project in World Bank planning pipeline in 2004
- Sold off PV Rental Assets to pay off the debt (US\$) & adjusted business model.

World Bank/FHIS PROSOL Project 2004-12

PROSOL: Public-Private PV Electrification Model

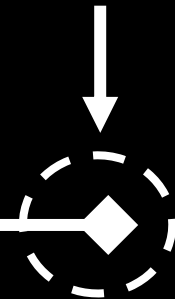
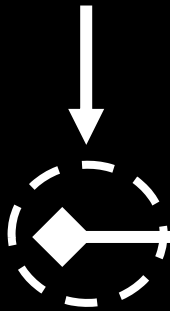
- 4 years planning, 4 years executing (Based on Sri Lanka Model)
- Utilized capacity of five (5) local PV companies
- Companies partnered with Micro-Finance Institutions
- Improved affordability for **5000 HH** with **40% subsidies**
- **Soluz Honduras** installed PV for 2000 homes & 50 schools



Challenge-Range of Subsidies

Customer
Pays

Systems
Donated



100%

Cost Recovery from User

0%

COVELO
IDB/MIF

PROSOL
World Bank

PRONADERS?
Korean

Products Emerging from “Lighting Africa” LED/PV Lanterns with Phone Charger <\$50



Ethiopia, África



Senegal to Honduras

Soluz Honduras: Telecom PV Projects



- 6kW PV system with CELTEL Telecom.
- 4G service in 4 communities in La Mosquitia.



18/06/2014

SOLUZ Honduras S.A. de C.V.

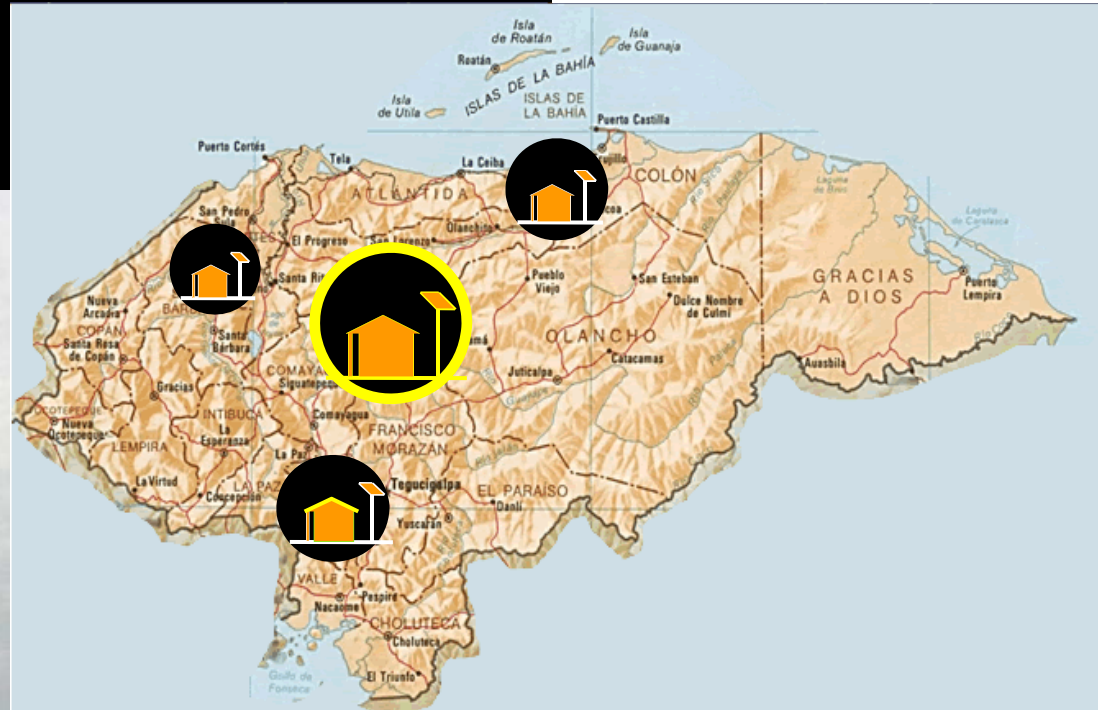


Soluz Honduras: 1994-2014

- * Off-grid PV
- * Grid-Tied PV

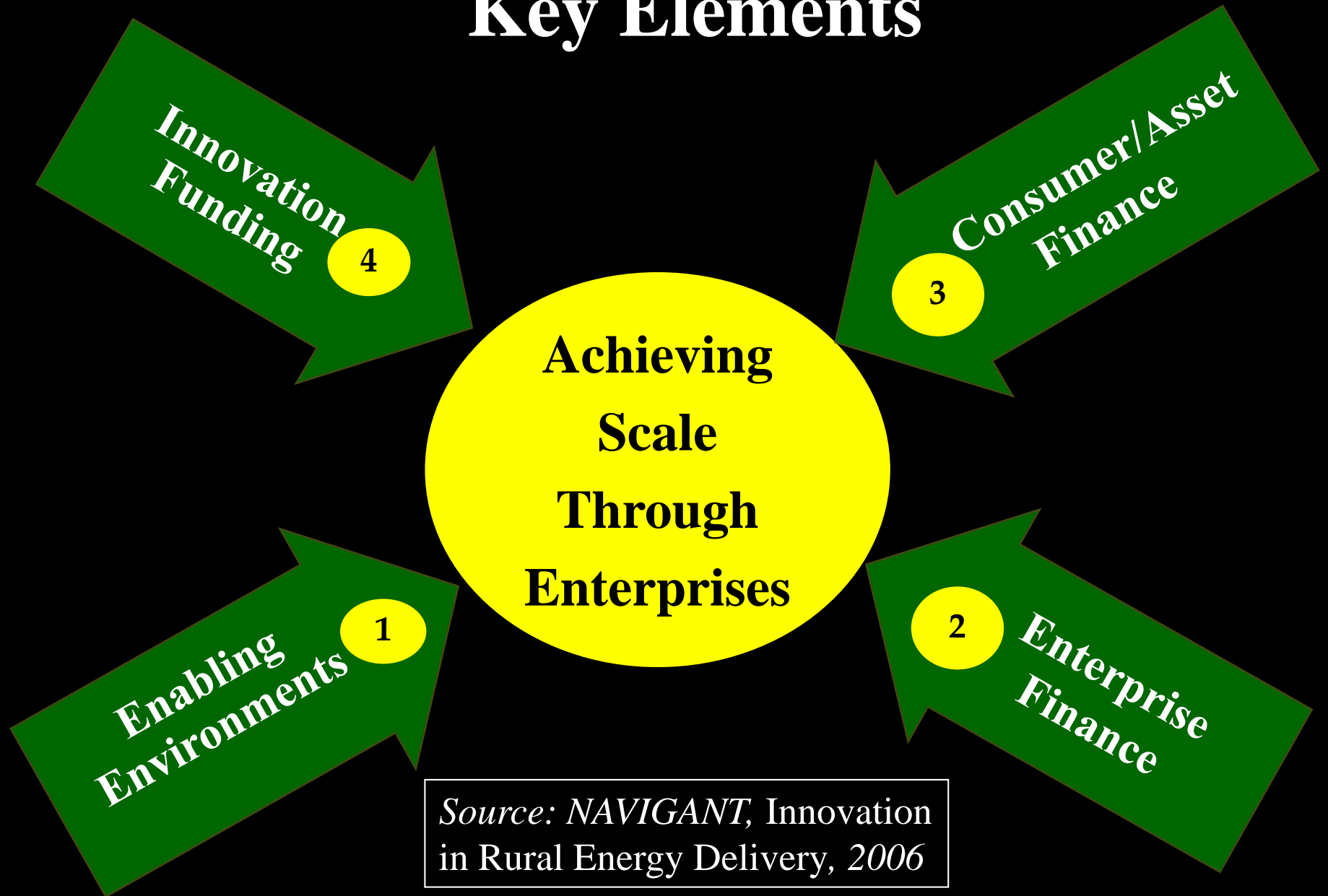


Andrés Carbajal,
General Manager



Main Office in SPS
2 Branch Offices
+ Tegucigalpa
>20,000 PV Systems

Key Elements



Source: NAVIGANT, Innovation in Rural Energy Delivery, 2006

What do we need to reach the goal of universal energy access?

- Establish integrated off-grid electrification plans *rather than* have various government agencies developing projects without any coordination.
- Establish a range of offers/models technical & financial to meet the *variety* energy needs, not just “SHS” (SHS is a blinding term that should be replaced).
- *Support* rather than *obstruct* the technical & financial innovations of leading solar companies.

Team “Bureaucracy” *versus* Team “SOLUZ”

Team Bureaucracy: Over design of power panel for a 65W PV system with 110V Inverter to power old TV and Cell Phone charger.

Team SOLUZ: Efficient design for 65W PV system including 12V LED TV & 12V phone charger.



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