

# **Transitioning the South Asian Energy Market**

**July 11-13,2011, Male**

## **Clean Energy Development in Sri Lanka**

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# Power Sector Overview

**Installed Capacity 2,878 MW**

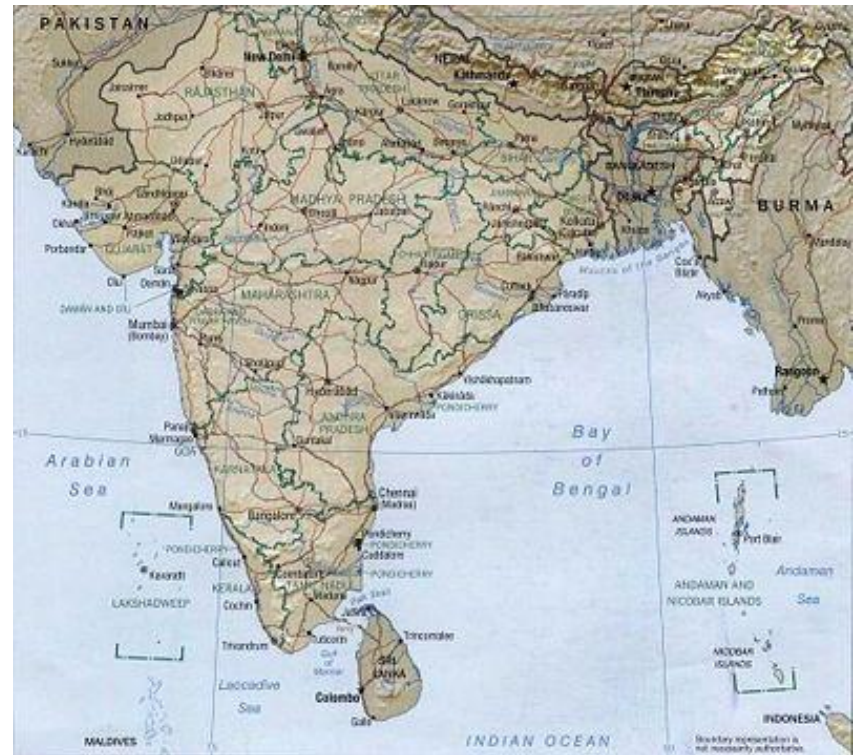
Hydro	1,205 MW
Thermal	1,560 MW
NCRE	213 MW

**Generation**

Hydro	40%
Thermal	60%

**Electrification Level 89%**

Grid Connected	87%
Off-Grid	02%



# A brief history of Renewable Energy initiatives

- Plantation industry has benefited from Small Hydro Power (SHP) in either electrical or mechanical form from late 1880's
  - Capacity of these captive power plants reached almost 10MW by late 1950's
- With the availability of cheap grid electricity most of these installations went into disuse by 1960's
- Renewed interest from mid 1970's and a new enthusiasm in 1980's, due to oil shocks

# National Policy on Renewables

**The Government will Endeavour to reach a level of 10% of electricity generation using Non Conventional Renewable energy resources by 2015 (it is near 6% today)**

- Availability of Standardized Power Purchase Agreement (SPPA) for less than 10 MW plants.
  - Simple approach
  - What ever produced will be purchased
  - Acceptable to the Banks
  - Low transaction costs
- Resource allocation
  - First Come first served basis
  - Devoid of cumbersome competitive processes

# Renewable Energy Resources

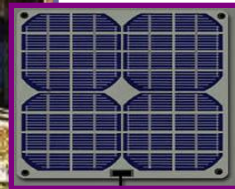
## Biomass



## Wind



## Solar

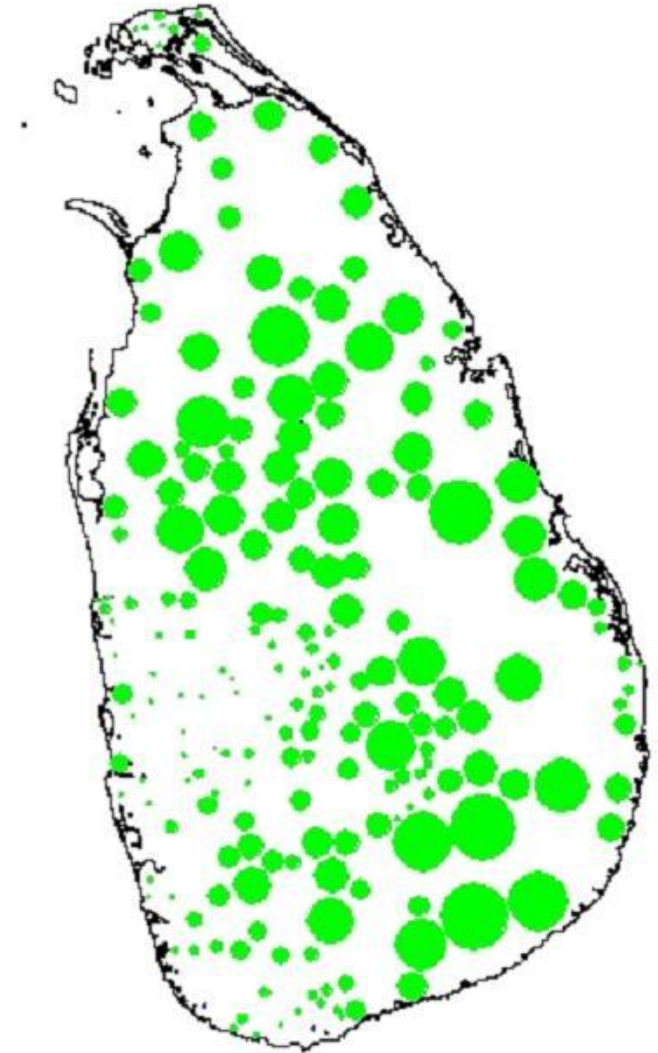


## Hydro



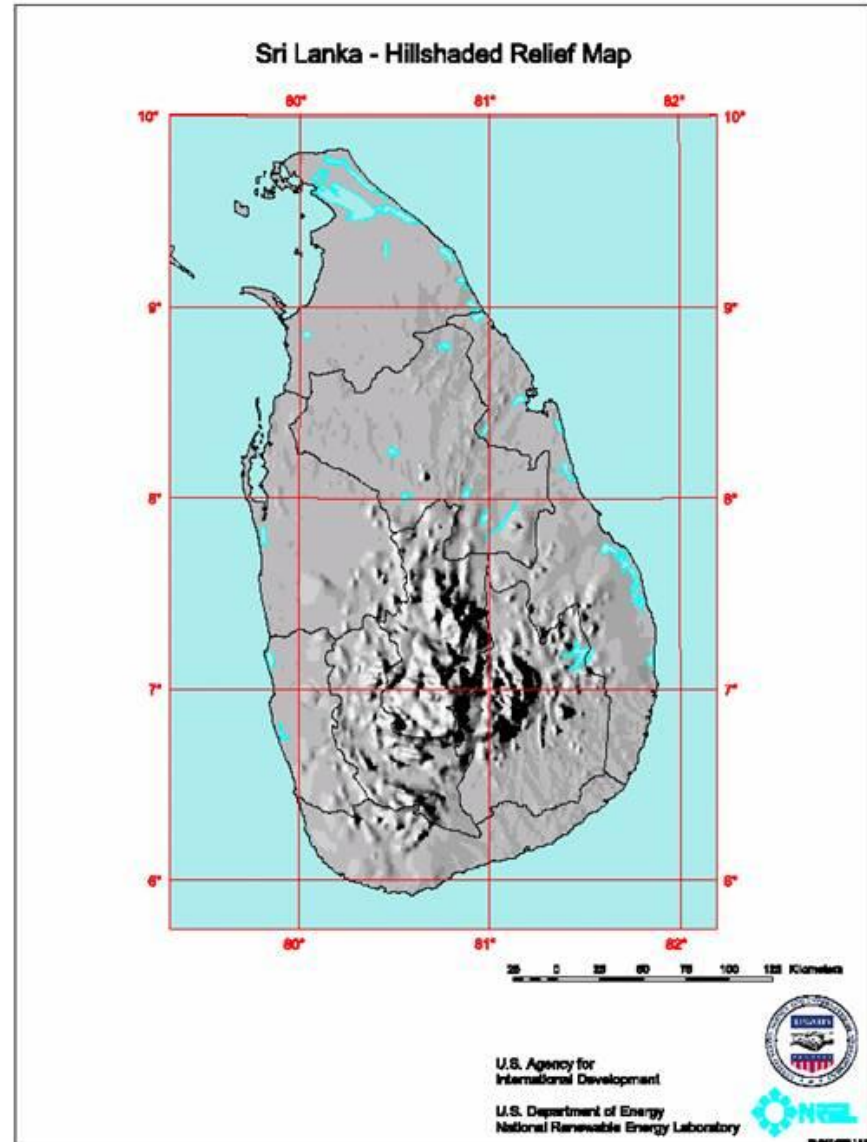
# Biomass Resources

- 1,600,000 ha of marginal land available for utilisation
- 400,000 ha of coconut land available for underplanting
- Fuelwood yields range from 20-45 metric tonnes / year on a dry matter basis
- Green circles representative of fuelwood generation potential



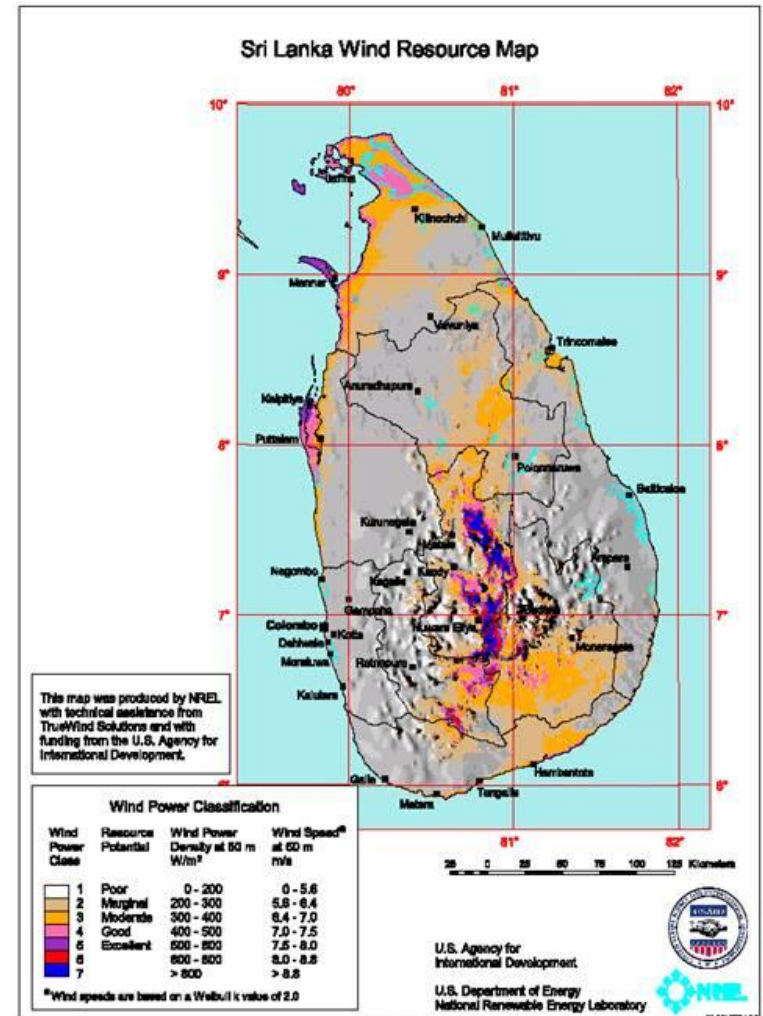
# Hydro

- Central Hill Region
  - Peak of 2500m
- Good Rainfall
  - 2500-5000mm annual rainfall
  - Two monsoons



# Wind Power Development

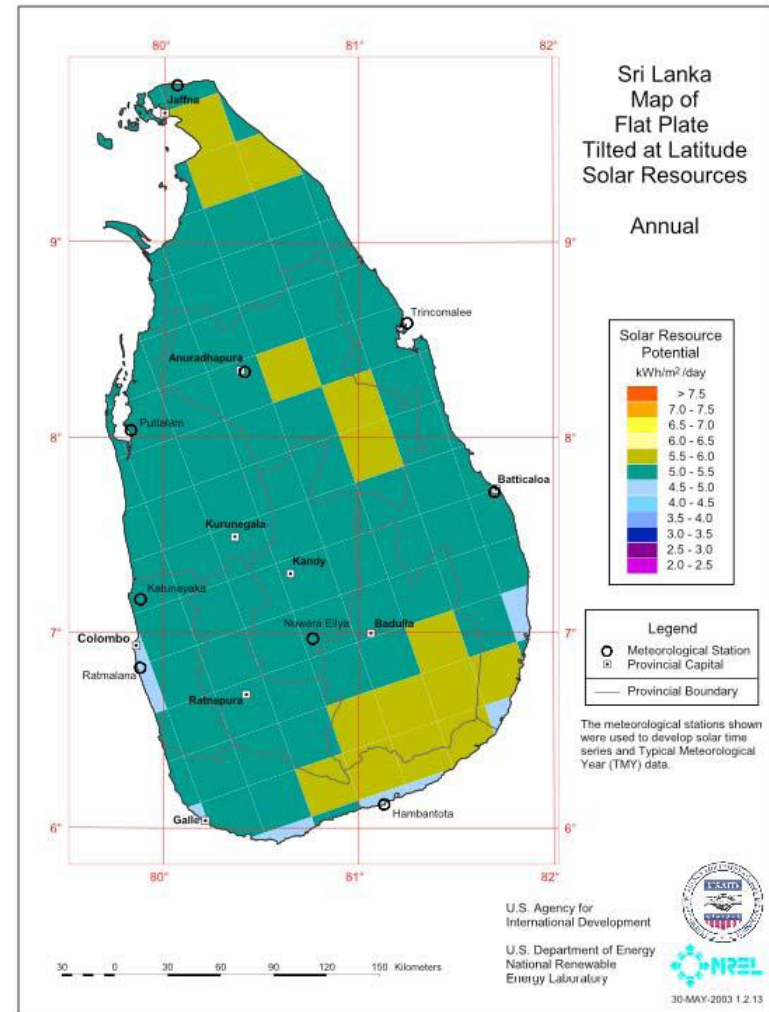
- Good Potential
  - Reliable monsoons
  - Long coastal belt
- West coast and central hills
  - 6-7 m/s mean annual wind speeds



# Solar

Close to the equator

- In lower plains  
4.0 – 5.5 kWh/m<sup>2</sup>/day
- 2.0 – 3.5 kWh/m<sup>2</sup>/day  
in higher elevations



# Development Plan

Cumulative Renewable Energy Capacity Additions MW					
Year	Biomass	Hydro	Wind	Other	Total
2007	1	119	3		123
2008	11	155	3		169
2009	15	165	14		194
2010	15	200	34	1	250
2011	20	225	34	1	280
2012	20	280	35	1	336
2013	20	295	85	2	402
2014	30	310	85	2	427
2015	40	330	85	5	460

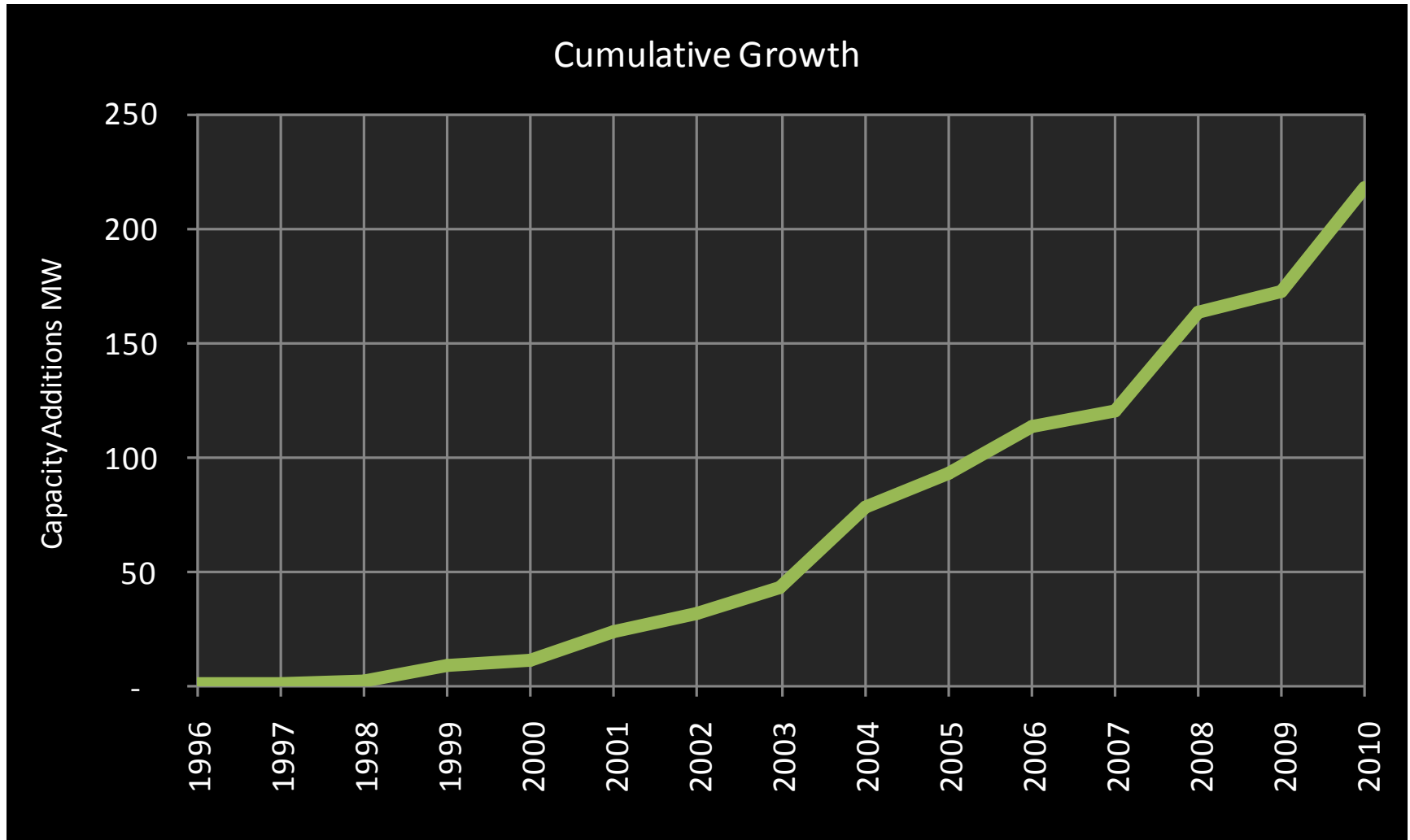
# Steady growth of SHP sector

- The SHP sector grew at phenomenal phase due to the conducive environment
  - Acceptance of industrial norms – SPPA and procedure
  - Availability of attractive funding
    - First from ESDP\*
    - Thereafter from REREDP\*\*
  - Requirement of additional generation capacity

\*Energy Services Delivery Project

\*\* Renewable Energy for Rural Economic Development

# Exponential growth of small renewable capacity



# Wind - Past / Ongoing Activities

- Pilot Wind Power Project in 1999
  - 3 MW, 5 Turbines
  - in Southern region
- Commercial Scale wind plants
  - 33 MW in operation
  - 60 MW under construction
  - 100 MW Wind Farm by 2015



# Business Environment

- Enthusiasm on renewable energy development is high among the local private sector
  - Relatively risk free investment
- World Bank is operating a special credit line for renewables.
  - More than 80 projects benefited
- Carbon trading policies are being developed.
  - pCDM instrument to be developed

# A Growing Manufacturing Industry



few kW then...



Multi MW now...

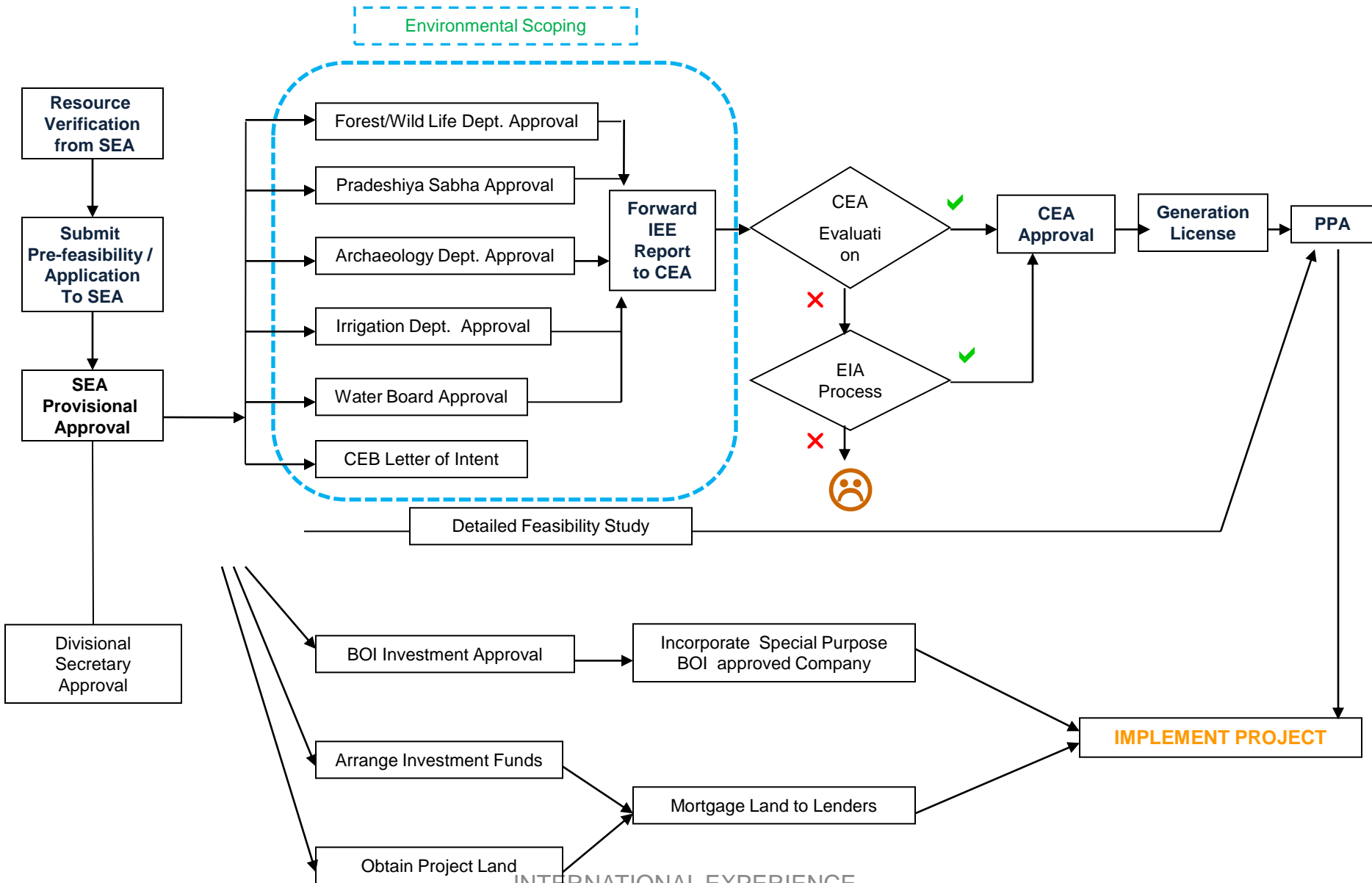
# Institutional Framework

- Sustainable Energy Authority
  - (a) to identify, assess and develop renewable energy resources with a view to enhancing energy security and thereby derive economic and social benefits to the country;

# Powers, Duties and Functions

- Assist the Minister in formulating national energy policy, including renewables
- Identify, conserve, inventorise and manage all renewable energy resources and technologies
  - Assess resource potential and prepare resource maps
  - Declare energy development areas
  - Render professional services in project formulation
- Develop a long term renewable energy plan
  - Interim targets for each resource
  - Prepare development guidelines
- Mobilise financing
  - Grants for pilots, Credit enhancement and concessionary funds
  - Technical services to DNA on CDM projects

# RENEWABLE ENERGY DEVELOPMENT PROCESS IN SRI LANKA



# Success factors

- Virtually free from market risks
  - What ever produced will be purchased
  - Guaranteed purchase price
- Availability of Standardized Power Purchase Agreement (SPPA)
  - Simple approach
  - Acceptable to banks
  - Low transaction costs
- Resource allocation
  - First come first served basis
  - Devoid of cumbersome competitive processes

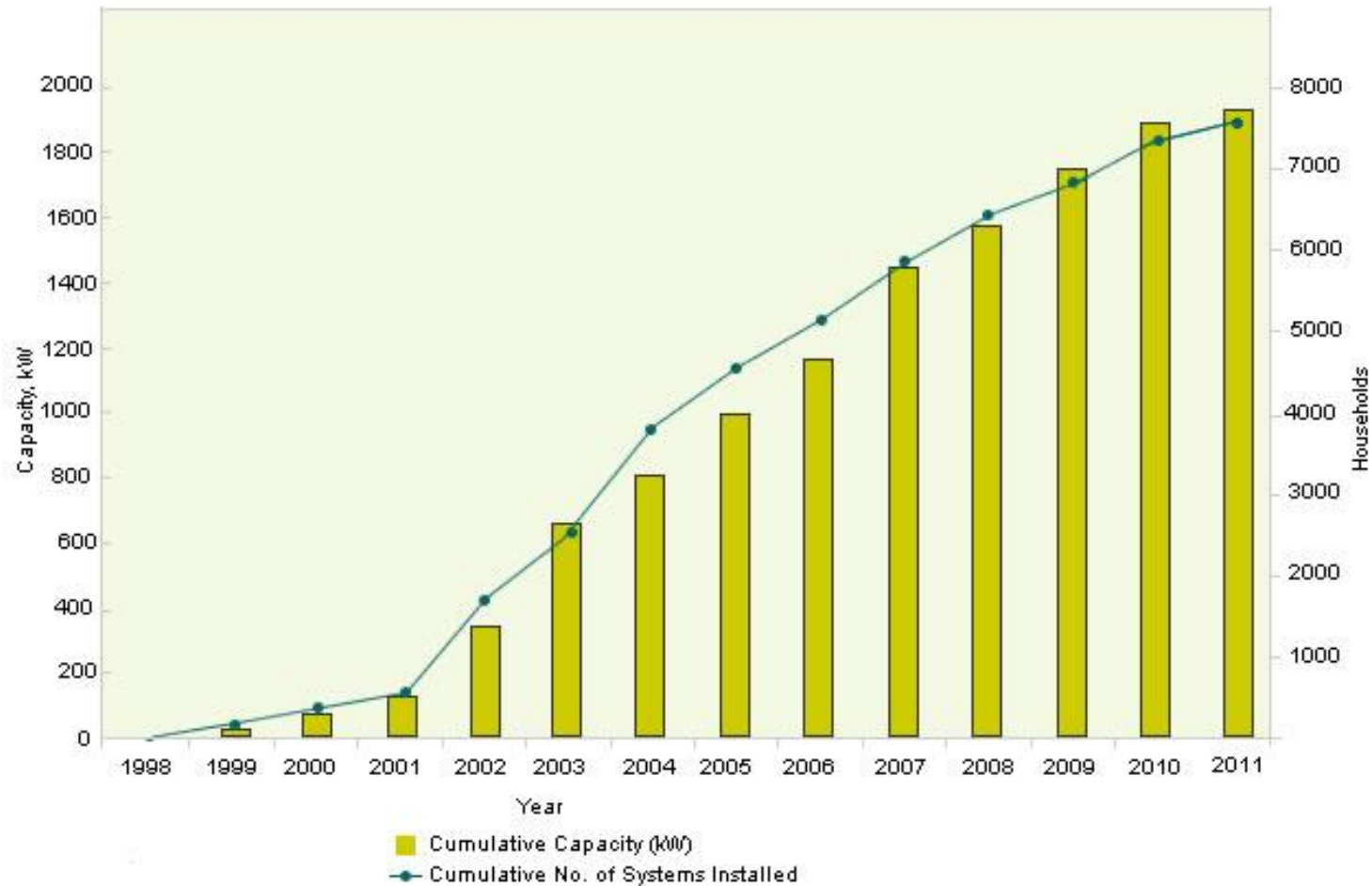
# Success factors... contd.

- Financing mechanism in place
  - Two consecutive World Bank projects (ESDP and REREDP) with a sound disbursement procedure
- Technology development keeping pace
  - Local Engineering know how developed to commendable levels
  - Capacity of construction companies developed

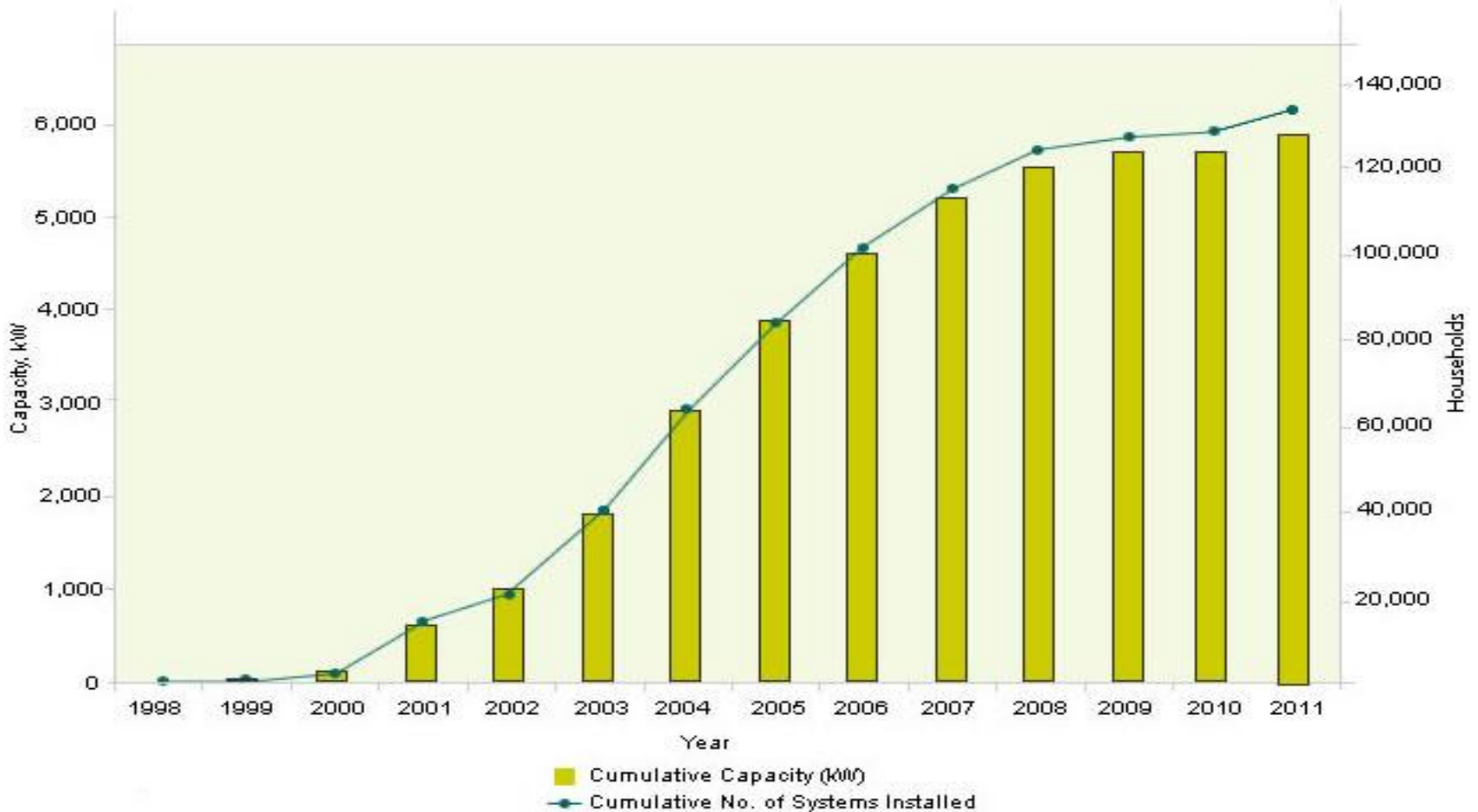
# Off-grid Renewable Energy Development

- 1978 – Rural Energy Centre (REC), Model village at Pattiyaapola (CEB) - UNEP assisted
- 1980 – Grid assisted battery charging scheme
- 1983 – Pilot project on photovoltaic to electrify remote villages, Siriyagama and Bundala and solar home systems island wise. (CEB)
- 1985 – Pilot project on Efficient fuel wood stove (Hambantota and Ratnapura districts) (CEB)
- 1000 Solar Home Systems in a model village named Pansiyagama
- 1992 – First off grid village hydro project. (ITDG, CEB)
- 2002 – First Gliricidia wood based dendro power plant - Sapugaskanda. (Alternative Energy Division of Ministry of Science and Technology)
- 2004 – First off grid community based dendro plant .

# Off-Grid Village Electrification Schemes Completed under ESD (1997-2002), RERED (2003-2007) & RERED Additional Financing (2008-2011) Projects



# Solar Home Systems Installed under ESD (1997-2002), RERED (2003-2007) & RERED Additional Financing (2008-2011) Projects



# Thank You

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