

India - Sri Lanka Electricity Grid Interconnection



Sri Lanka Power Scenario



Sri Lanka Power Supply Scenario

- **Installed capacity** - **2400 MW**
- **Peak Demand** - **1840 MW**
- **Energy** - **9820 GWh**
- **Capacity Mix** - **Hydro 55% Thermal 45%**
- **Energy Mix** - **Hydro 40% Thermal 60%**
- **Demand growth** - **7-8%**
- **System losses** - **15.7%**
- **Load Factor** - **53%**



Sri Lanka Power Grid - Salient Features

❖ Transmission voltage levels

- 220kV
- 132kV

❖ Transmission lines

- 220kV 331 km
- 132kV 1684 km

❖ Grid Substations	No.	MVA
• 132/33 kV	40	2570
• 220/132/33 kV	6	2205
• 132/11 kV	4	306

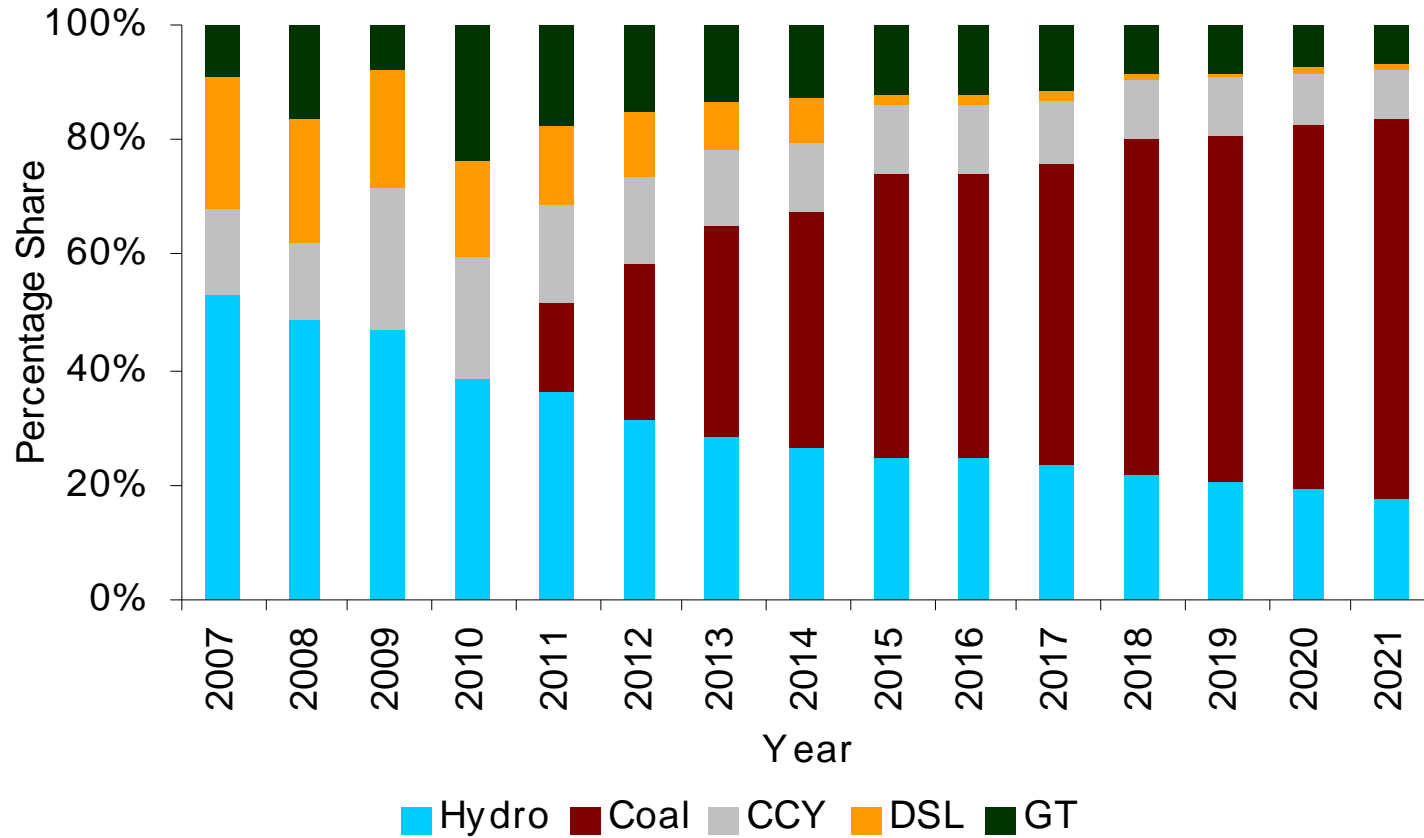


Sri Lanka Power Supply Future Scenario

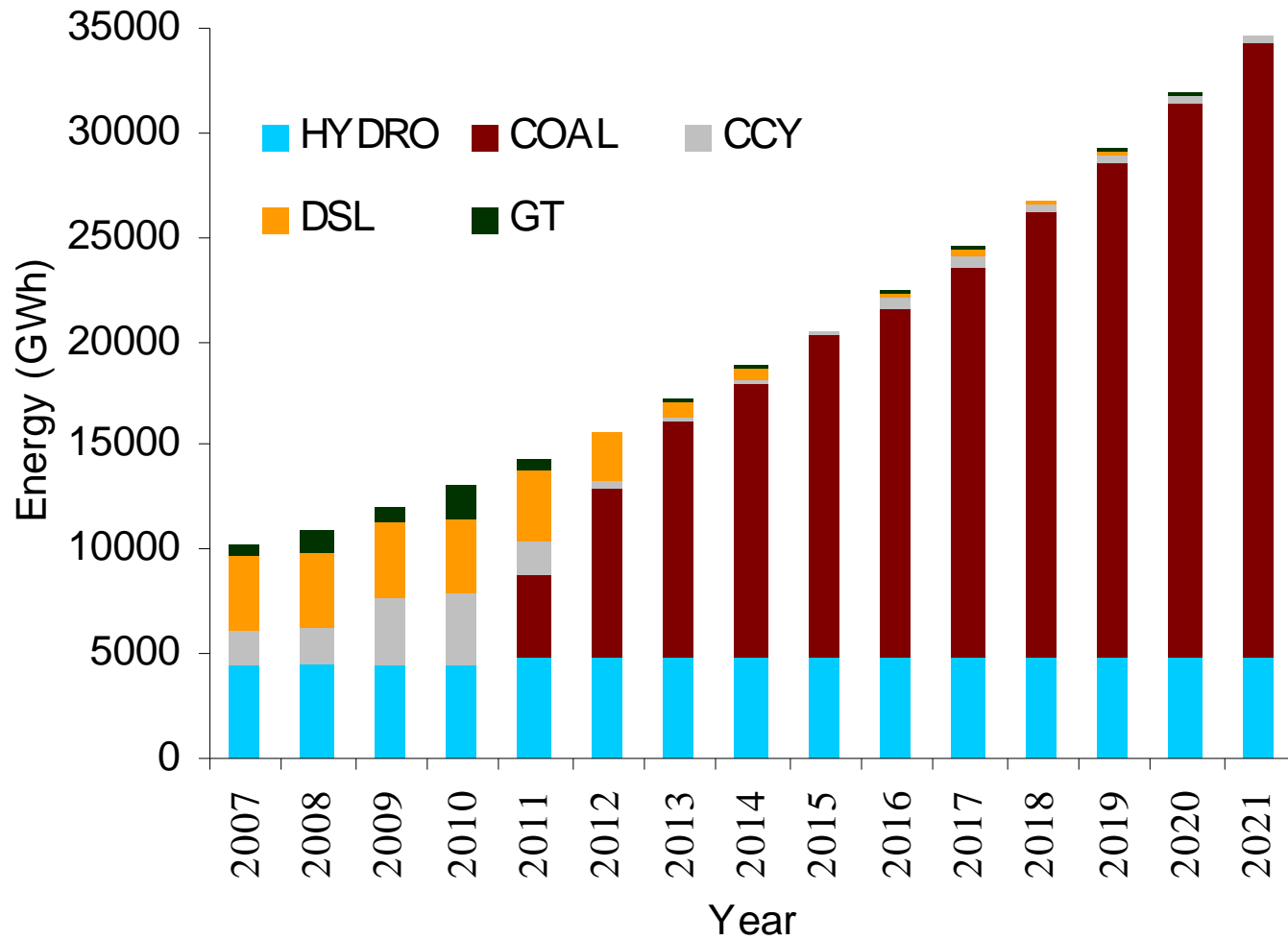
2008	2x100 MW GT of Kerawalapitiya Combined Cycle Power Plant
2009	100 MW ST of Kerawalapitiya Combined Cycle Power Plant
2010	525 MW GT
2011	270 & 300 MW Coal 150 MW Upper Kotmale Hydro Power Plant
2012	2x300 MW Coal
2013	2x300 MW Coal
2014-2016	3x300 MW Coal
2017-2020	6x300 MW Coal
2021	2x300 MW Coal



Capacity Expansion



Energy Mix



- Sri Lanka needs new generation to meet increasing demand
- Power exchange with India be a candidate for meeting future power demand



Background of Electricity Grid Interconnection

- Under consideration since 1970
- Pre-feasibility study conducted with assistance of USAID in 2002 by Nexant
- Review of the Pre-feasibility study with assistance of USAID in 2006 by Nexant/ Power Grid Corporation of India



Unit Sizes

At present

Hydro 70 MW

Thermal 165 MW

By 2011 - Thermal 270 MW



Possibilities of Quantum of Power Exchange

2009 -10 onwards 500 MW

2011-12 onwards 1000 MW

Energy Transfer -5000GWh



Indian Power Scenario



Indian Power Scenario

- **Installed Capacity - 126 839 MW**
Thermal 66%, Hydro 26%, Renewable 5% and Nuclear 3%
- **Peak Demand - 95 583 MW**
- **Five electrical regions**
 - Northern
 - Southern
 - Western
 - Eastern and
 - North-eastern



Indian Power Scenario

- **Transmission System**
 - ✓ **765kV - 1 150 ckt km**
 - ✓ **400kV - 68 000 ckt km**
 - ✓ **220kV - 110 000 ckt km**
 - ✓ **HVDC - 8 000 ckt km**

Interregional links : about 11 500 MW



Indian Power Scenario - 2012

- **Installed Capacity - 203 529 MW**
- **Peak Demand - 150 000 MW**
- **Interregional links : about 39 700 MW**



Indian Southern Region Power Supply Scenario

- Southern region is connected with Eastern (3150MW) and Western (1400MW) Regions through asynchronous links
viz HVDC back-to-back and HVDC bipole links

	Installed Capacity	Peak Demand	Surplus/Deficit	
			Peak	Off-peak
Present	36936	23750	(-) 740	3000
2011-12	46260	38310	(-)3400	5100



Interconnection with India

- Possible Power Transmission Technology
HVDC link including under sea submarine cables
- Possible Interconnection Points in Sri Lanka
Anuradhapura, Puttalam



Interconnection Alternatives proposed in 2002 study

1. Madurai-Anuradhapura Interconnection using HVDC
2. Tuticorin-Puttalam Interconnection using HVDC
3. Madurai-Puttalam Interconnection using HVDC - length of cable 100km
4. Madurai-Anuradhapura Interconnection using HVAC with back-to-back DC conversion - length of cable 50km



Power Transmission Interconnection options: India and Sri Lanka

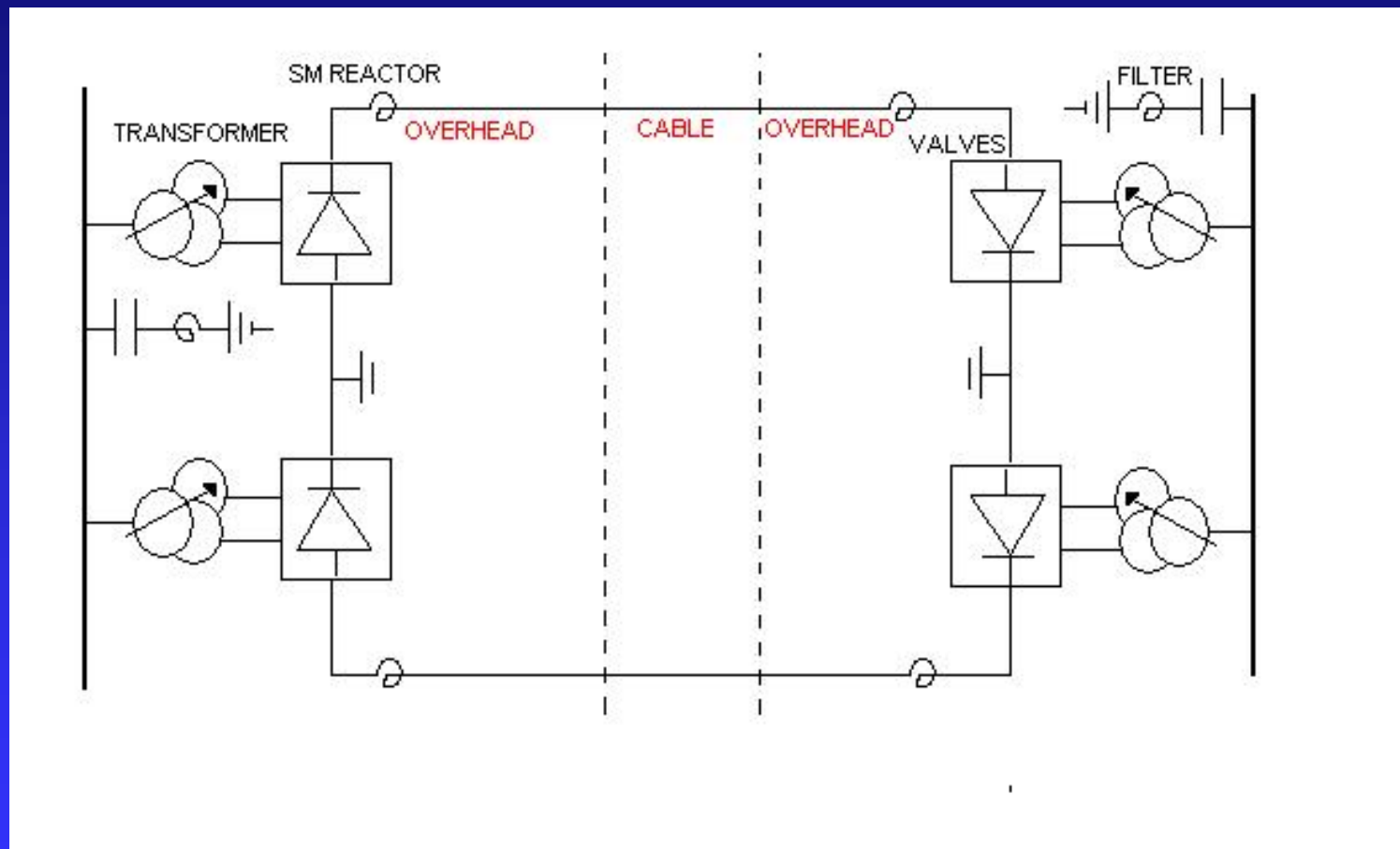


Proposed Interconnection

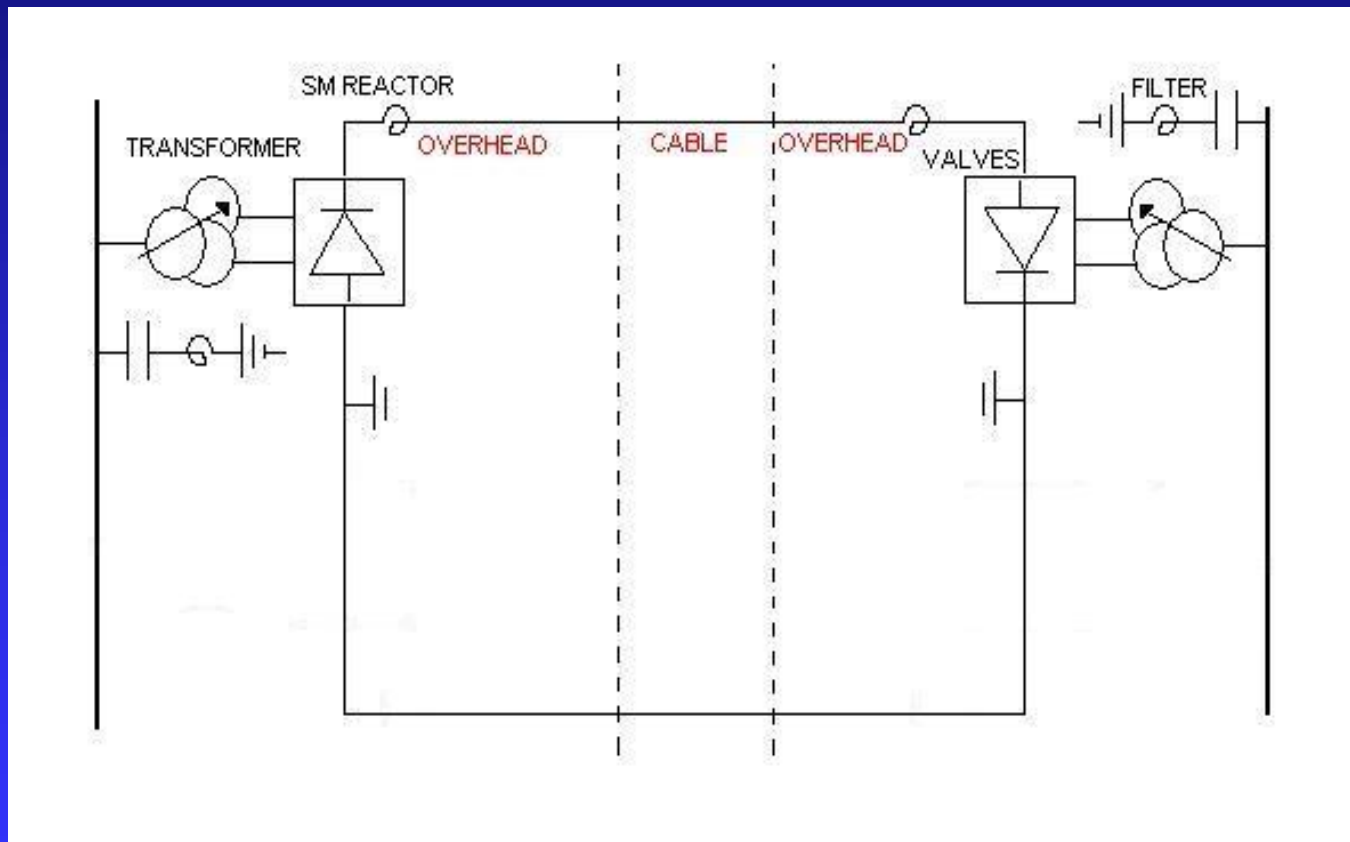
- \pm 400kV HVDC overhead line from Madurai - Indian Sea Coast (Rameshwaran) 185km
- \pm 400kV HVDC cable from Indian Sea Coast (Rameshwaran) - Sri Lankan Sea Coast (Thalaimannar) 50km
- \pm 400kV HVDC overhead line from Sri Lankan Sea Coast (Thalaimannar) to Anuradhapura 150km



Proposed HVDC Interconnection



Proposed HVDC Interconnection - Initial Stage



Tentative Cost

- HVDC Interconnection (2x500MW)
Tentative cost - US\$ 430 million
- Stage 1 - HVDC Interconnection
(1x500MW)
Tentative cost - US\$ 340 million



The END

