An Overview of Sri Lanka's Energy Sector

Sarath K. Malavisooriya

Chief Internal Auditor

Ministry of Power & Renewable Energy

Sri Lanka.

Location


India
Ahmedabad
Surat
Mumbai
Hyderabad
Bengaluru
Chennai
Mysuru
Kochi
Sri Lanka
Colombo
Bay of Bengal
Andaman Sea
Gulf of Thailand
Myanmar (Burma)
Naypyitaw
Chiang Mai
Laos
Hanoi
Thailand
Bangkok
Pattaya
Cambodia
Vietnam
Ho Chi Minh City
We are here.. :)

Basic Facts

Population	:	20.8 Million
Population Density	:	323/km2
Official Languages	:	Sinhala, Tamil and English
Capital City	:	Sri Jayawardhanapura Kotte
Major Industry	:	Apparel Industry, Tea Industry
Major Exports	:	Apparel Products, Tea, Spices
Major Imports	:	Petroleum, Fertilizer, Chemicals
GDP	:	US$ 71 Billion (60% Services, 28% Industry, 12% Agriculture)
Per capita GDP / Annum	:	US$ 3,385
Energy / GDP	:	1162.1 toe/million US$
Life expectancy	:	77.9 yrs (10% higher world avg)
Literacy rate	:	92.5% (computer literacy 35%)
Geography	:	costal plains , mountains (2,500 m)
Average Temperature	:	28 ºC (17ºC to 33ºC)

NCRE Potential

Reference: Sustainable Energy Authority Sri Lanka (Web: www.energy.gov.lk)

- Small Hydro

  Economically feasible potential – 500MW (present installed capacity - 282 MW)

- Wind – 23,500 MW

  20,000 MW (6% of land)

  3,500 MW (lagoons, 700 sqkm)

  Offshore potential is unknown

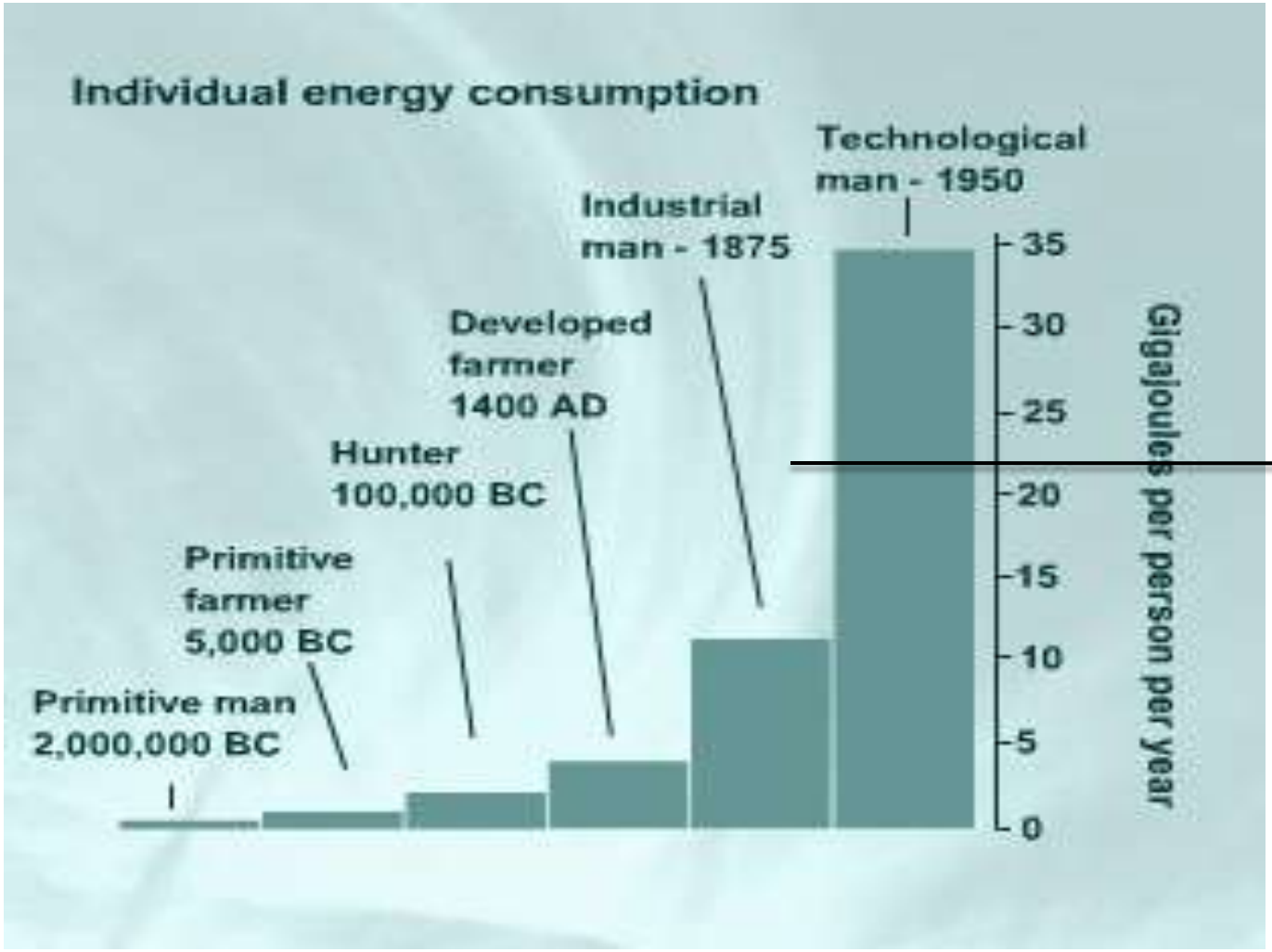
- Solar

  4.0 - 4.5 kWh/sqm/day (two thirds of land)

  2.0 – 3.5 kWh/sqmm/day (high plains)

  Substantial potential exists

Energy Use

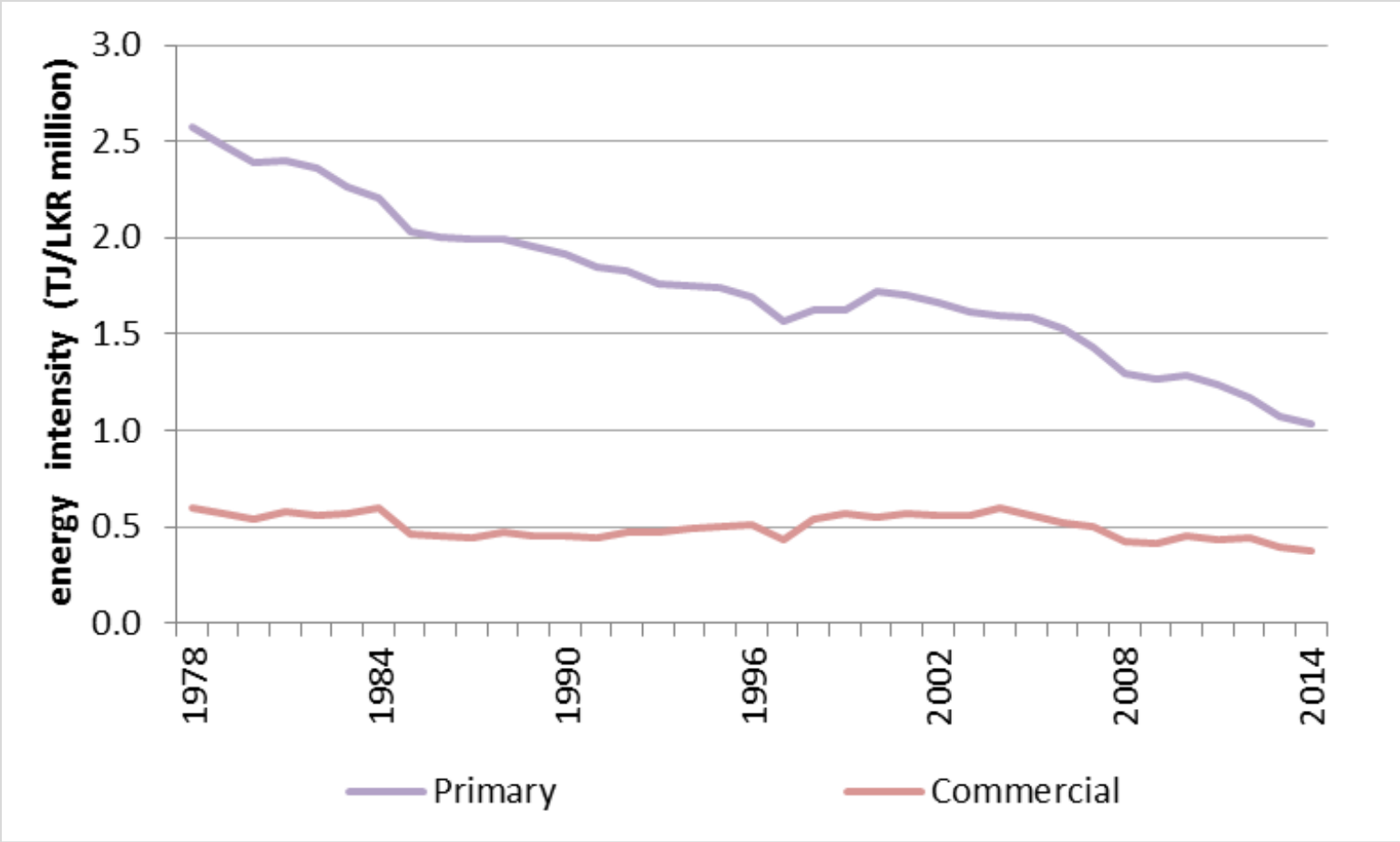


Sri Lanka Today 21.65 GJ

Economic impact of Energy

- Energy is considered the mother of economic development
- Petroleum imports in 2011 amounted to 7.5% of GDP in market prices
- Petroleum imports annulled more than half of all our export earnings in 2012
  - Consumes around 41% of our export earnings by 2014

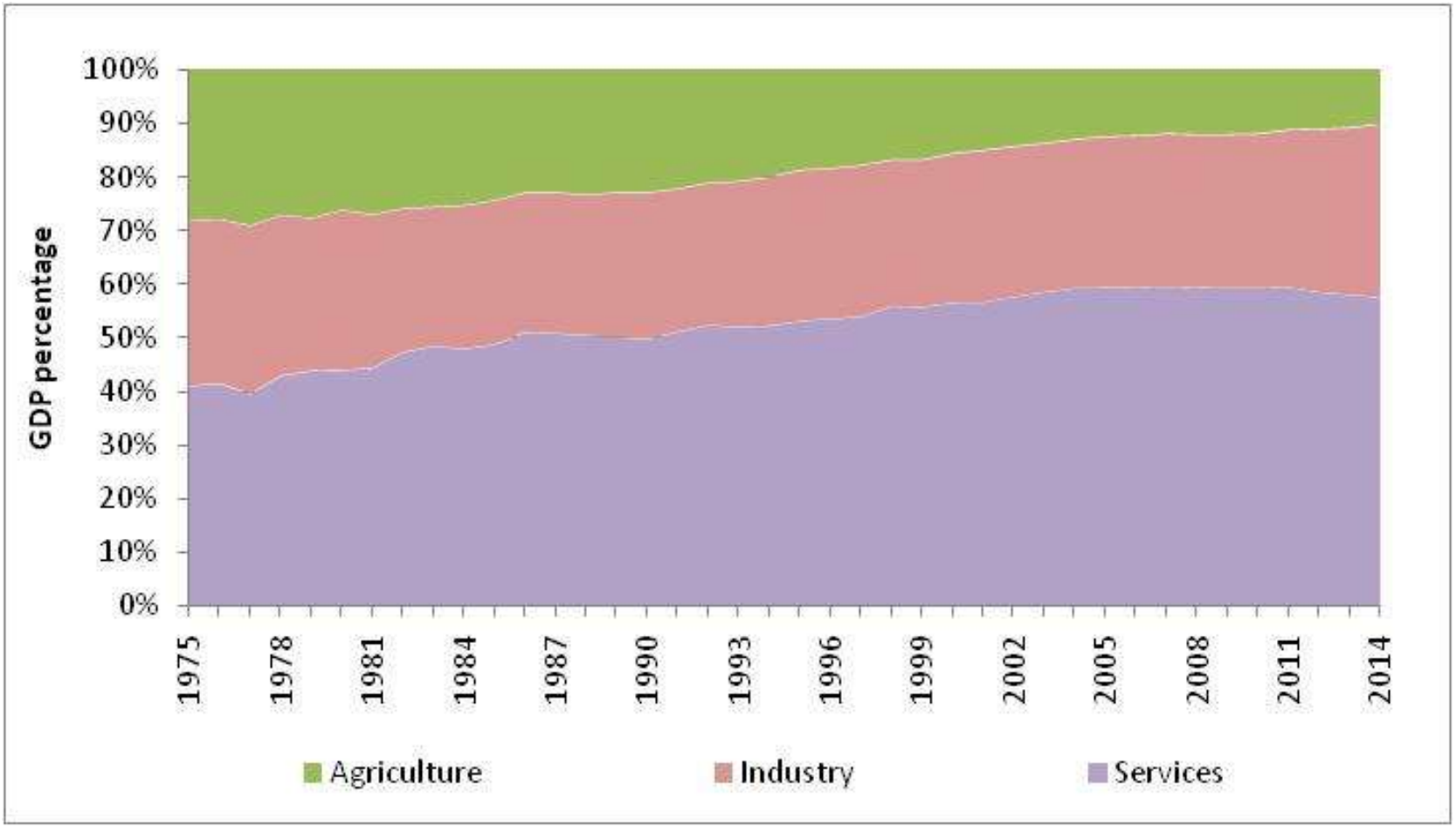
A different development path



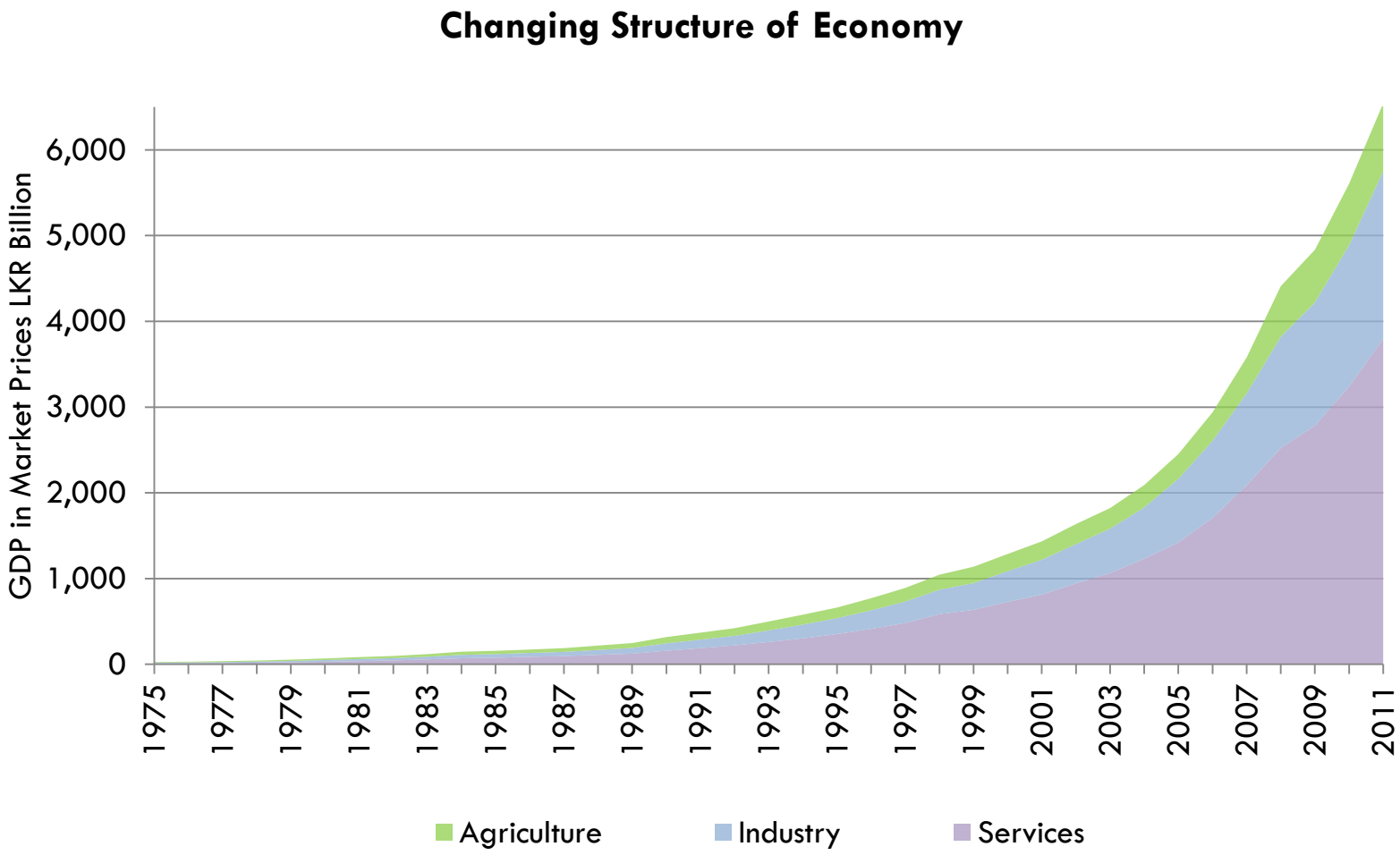
Where are we headed..?

- We use less and less energy to produce economic output
  - Structure of the economy altered
- No major energy consuming industries setting up operations here
  - Not only due to high energy costs
  - Near absence of an Engineering infrastructure
- Electrification level reaching saturation
  - Energy consumption for non-economic activities expected to rise

Evolution of GDP



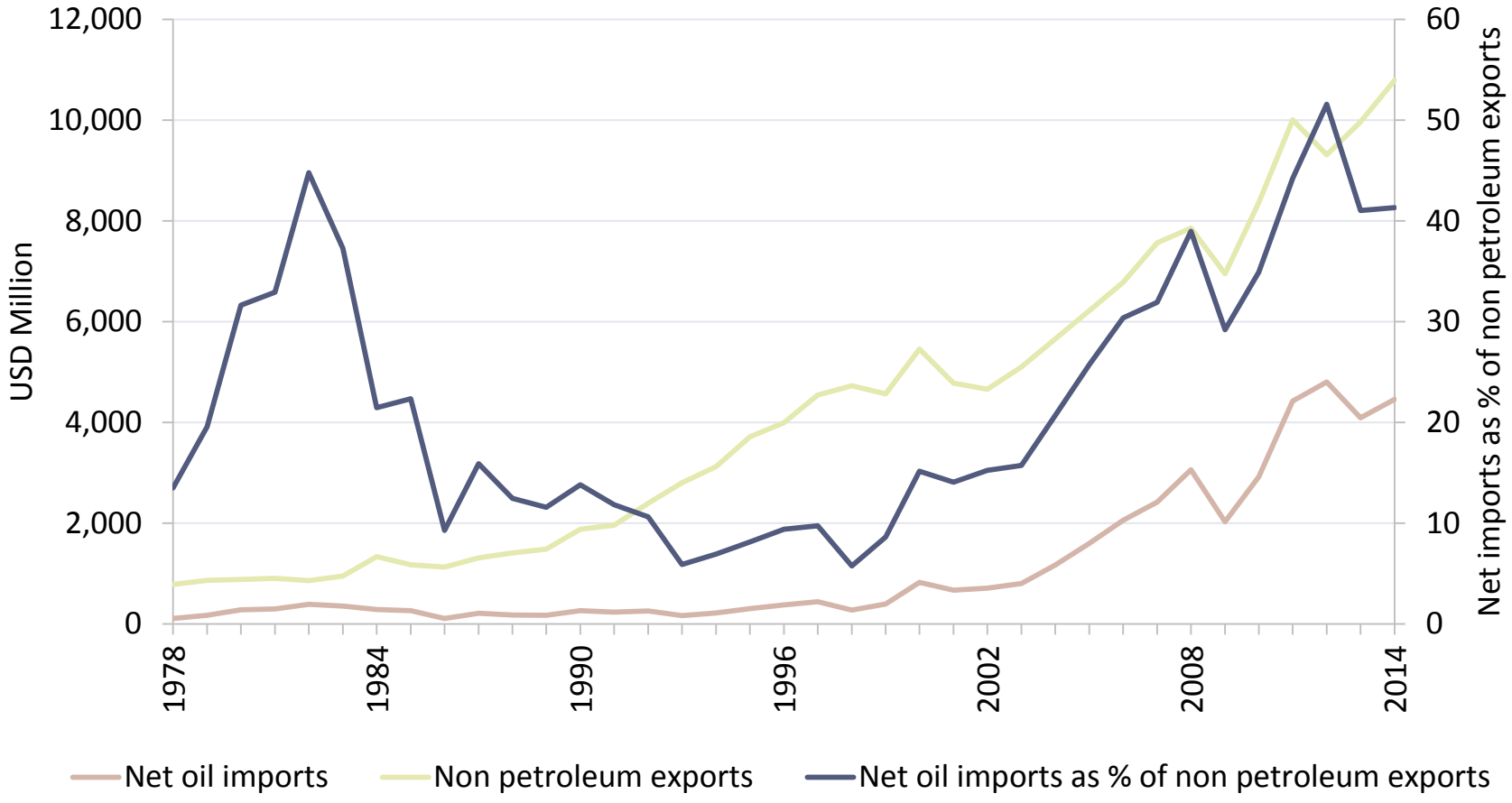
New challenges



Is this a healthy trend..?

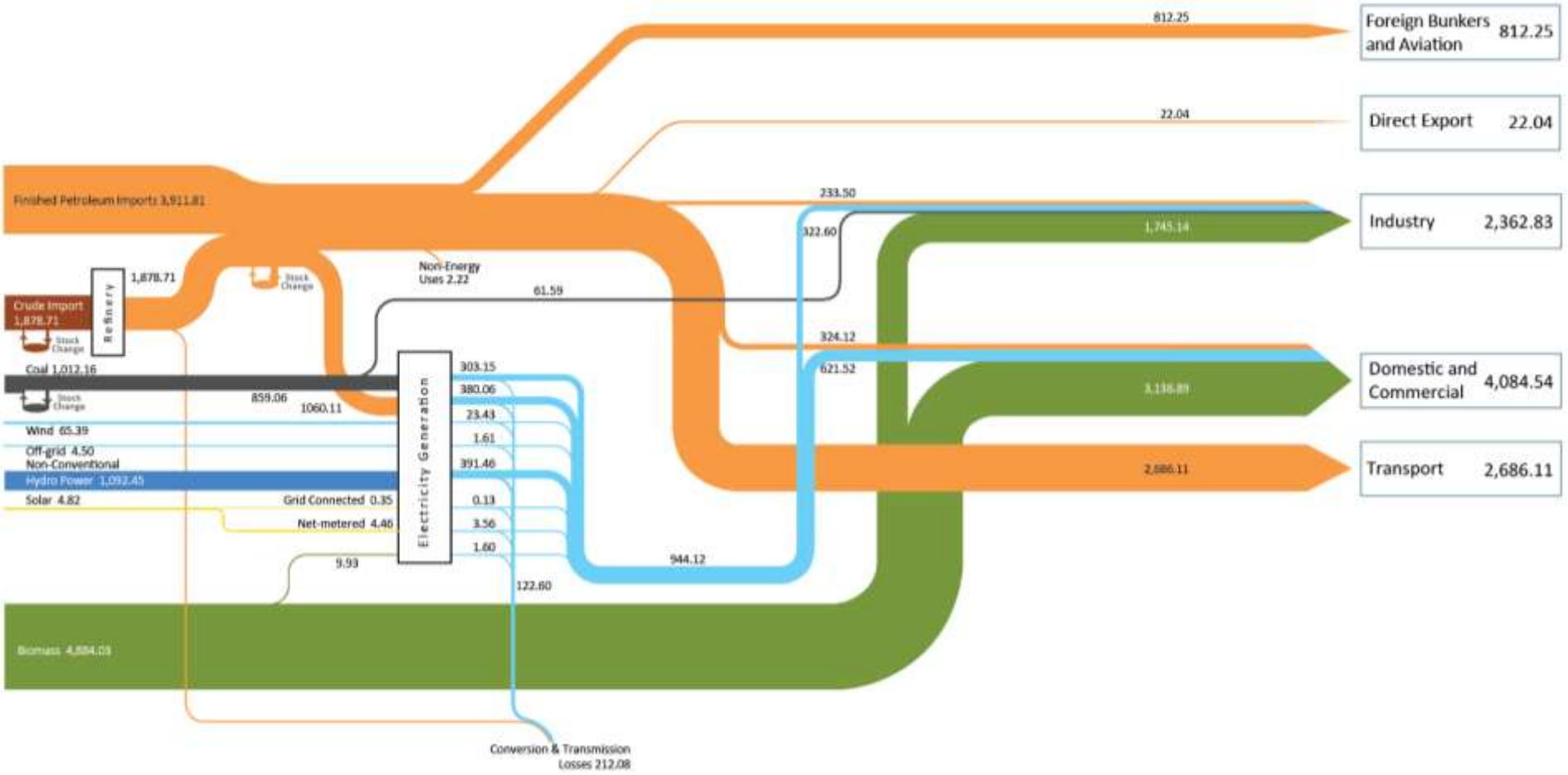
- Energy intensity of economy may not give the full picture of the situation
  - Only an indicator of how much energy input was made to produce one million LKR of output
  - A better indicator would be how much was spent on energy to produce one million LKR of output
- This will paint a gloomier picture
  - Nevertheless, lesser energy intensity in a national economy could be a survival trait in the medium term

Locally exposed…

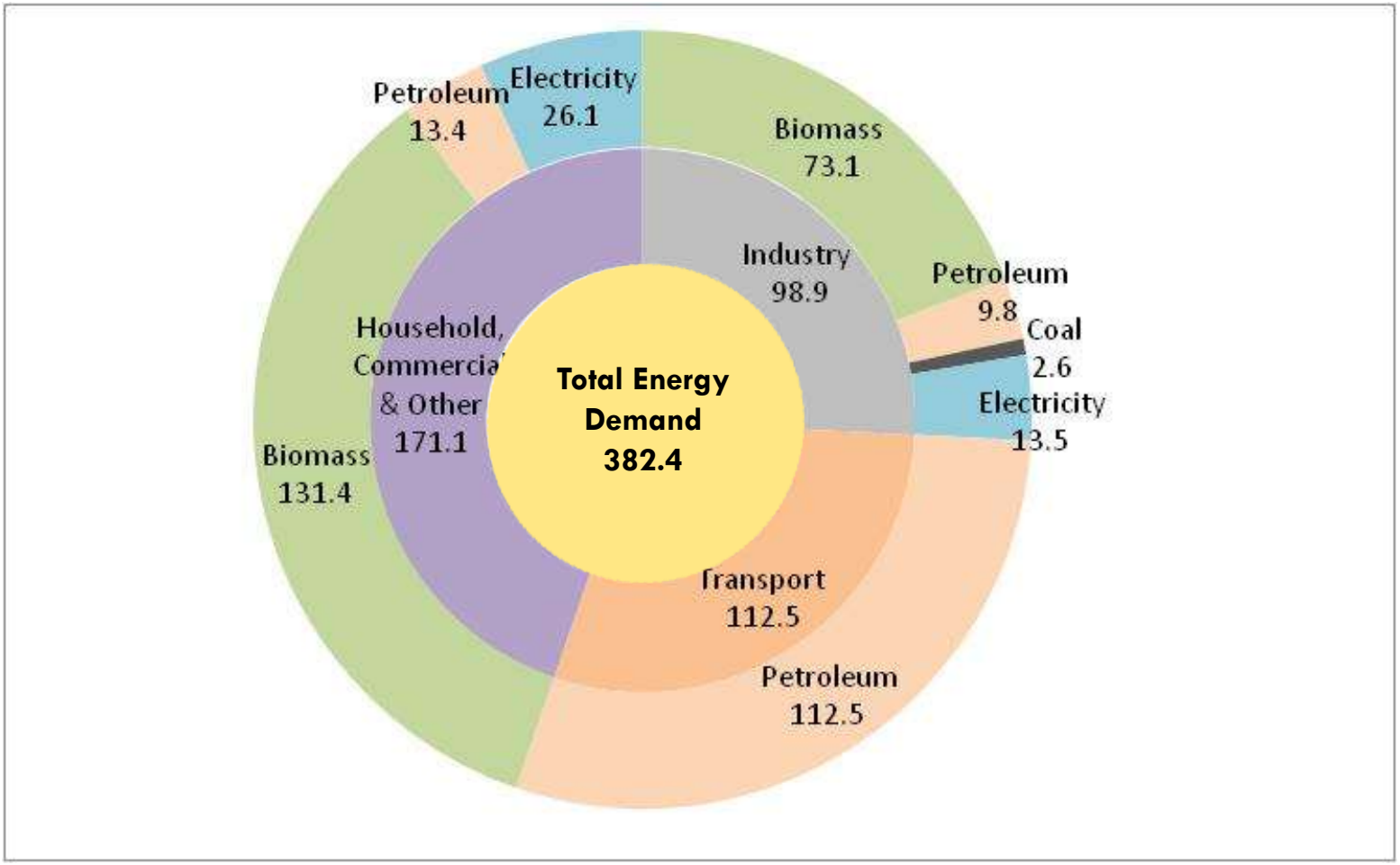


Energy Balance of Sri Lanka 2014

A snapshot of where it came from where and where it went



Another view – 2014 demand in PJ



Energy measured in Peta Joules (1PJ≃8 days of electricity used in the country)

Generators in the National Grid 2014

Installed Capacity

Total Capacity	4,040 MW
Hydro	**1,377 MW**
CEB Thermal	**1,444 MW**
PPP Thermal	**769 MW**
NRE	**437 MW**
Net Metered	**13MW**
Peak Demand	**2,152 MW**

Electricity Generation

Gross Generation: 12,830 GWh

Hydro	**28.4%**
Thermal-Oil	**34.4%**
Thermal-Coal	**27.5%**
NRE	**9.6%**

HHs Access to Electricity

Total	**98%**
National Grid	**98%**
Off-Grid	**0.5% ?**

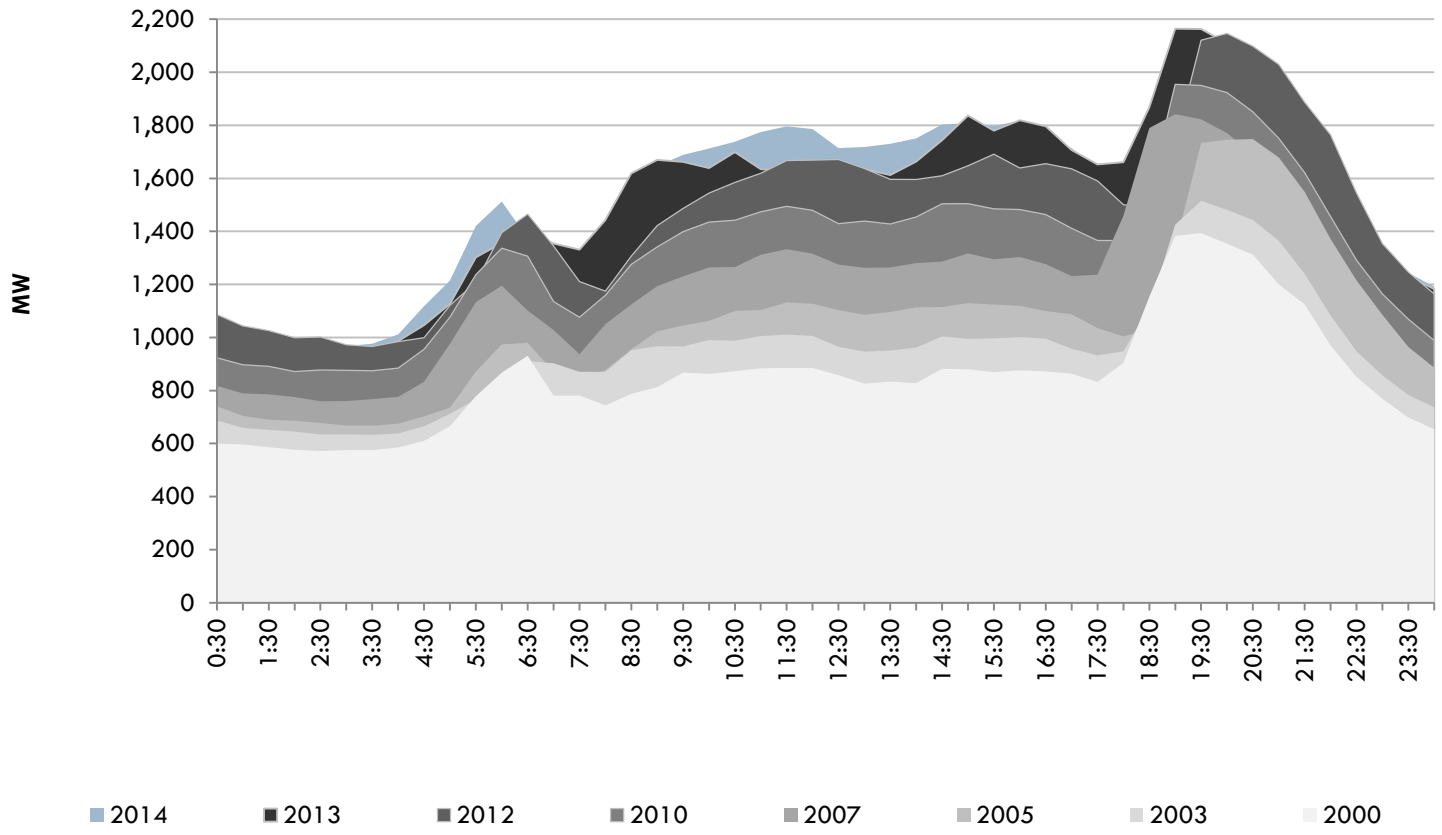
Grid Emission Factor

In 2012: 0.7202 t-CO_2/MWh

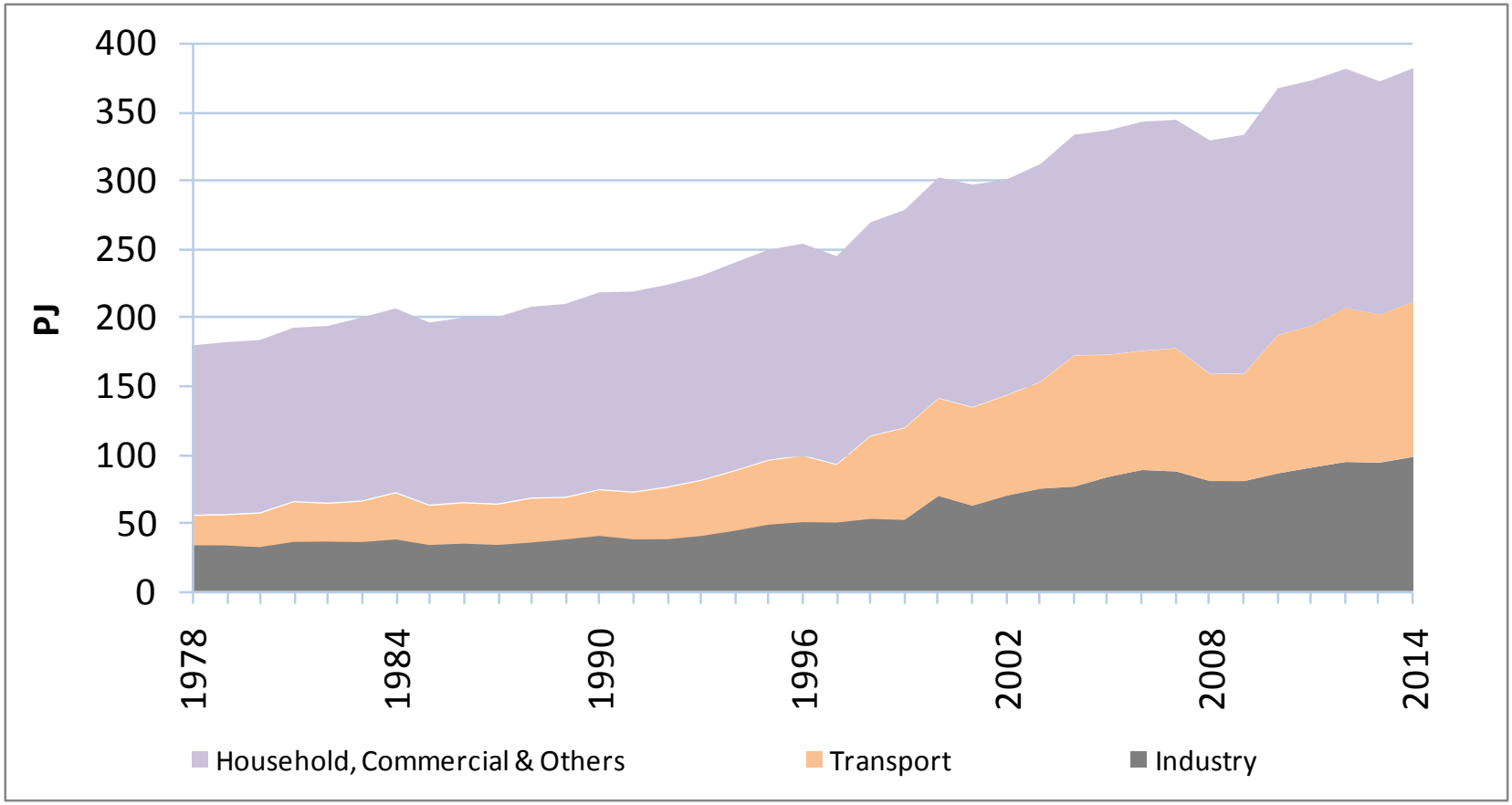
In 2013: 0.7193 t-CO_2/MWh

In 2014: 0.7043 t-CO_2/MWh

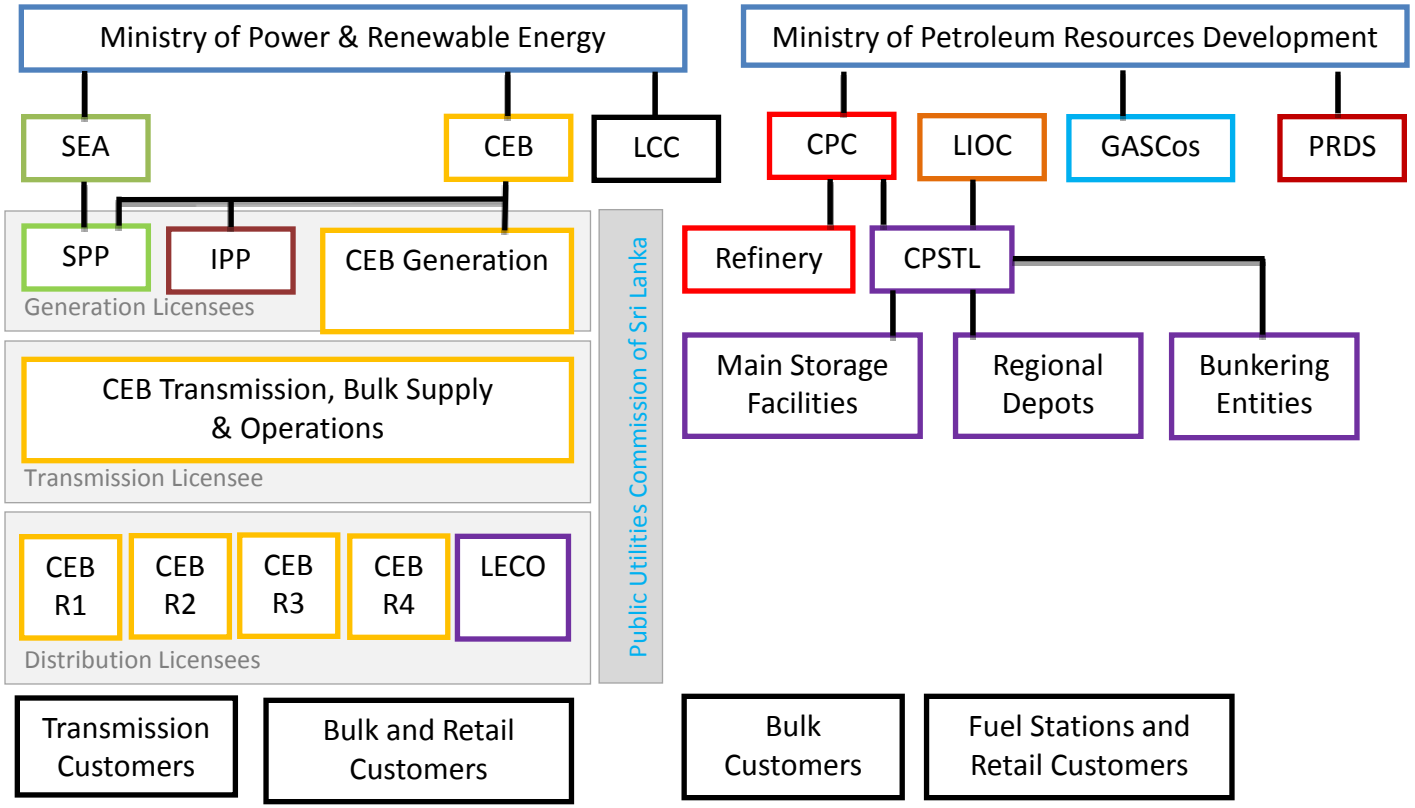
Electricity Demand Profile



Energy Demand



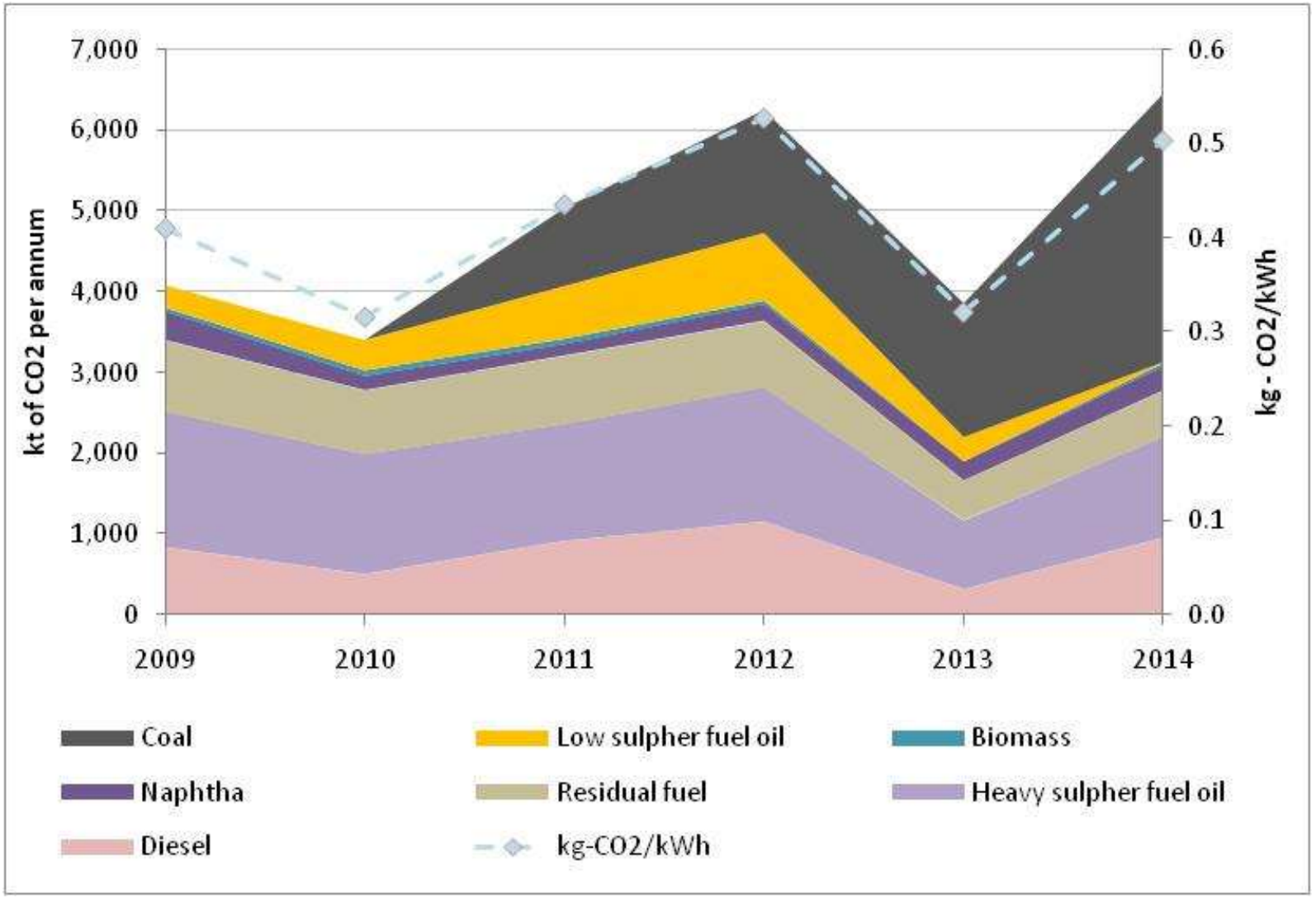
Energy Sector 2016



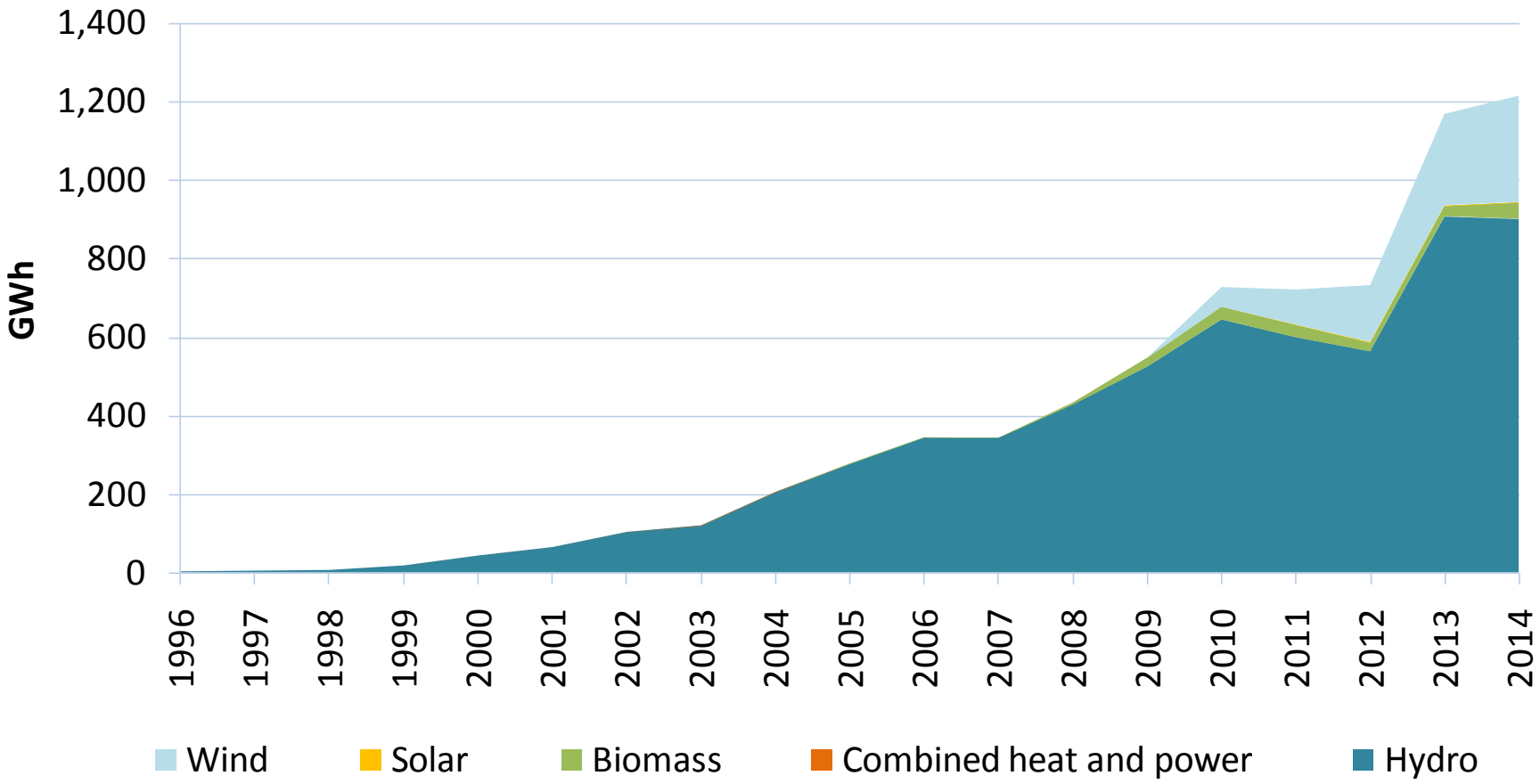
Abbreviations

CEB	Ceylon Electricity Board
CPC	Ceylon Petroleum Corporation
CPSTL	Ceylon Petroleum Storage Company
GASCos	LP Gas Marketing Companies
IPP	Independent Power Producer
LCC	Lanka Coal Company
LECO	Lanka Electricity Company
LIOC	Lanka Indian Oil Company
PRDS	Petroleum Resources Development Secretariat
SEA	Sri Lanka Sustainable Energy Authority
SPP	Small Power Producer

Electricity Sector Emissions



NRE Programme, the success



NRE Programme, the success

Technology / Status	Small Hydro		Wind		Biomass		Solar		Total	
	No.	MW	No.	MW	No.	MW	No.	MW	No.	MW
Commissioned	**144**	**296.97**	**15**	**128.45**	**6**	**23.50**	**3**	**1.36**	**168**	**450.28**
Energy Permits	**104**	**197.55**	**1**	**1.10**	**20**	**101.53**	**5**	**50.00**	**130**	**350.18**
Provisional Approvals	**103**	**122.59**	**14**	**105.00**	**14**	**75.00**	**2**	**20.00**	**133**	**322.59**

Grid Electricity

Mix of New Renewable Energy in 2014

1,215 GWh, 9.5% of total Grid-electricity generation

Electricity Sector
Future Challenges & Targets

- Achieve 100% electrification (present 96%)
- Further improve reliability indices
- Esthetic aspects (UG system)
- Distribution automation/SCADA/Smart Grid

  Colombo & Kandy already completed (UG & SCADA)
- GIS (transmission & MV distribution)
- Low cost energy (oil reserves found in Mannar sea)
- Energy diversification & security (20% NCRE in 2020)

Sri Lankan Success Stories

Thank You

E-mail sarathkmalavi@gmail.com

Explore our site www.powermin.gov.lk