

International Workshop on Energy Statistics and Energy Balances

Organized by
United Nations Statistics Division (UNSD)
In collaboration with
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Country Presentation
– Sri Lanka –

Physical Features and Climate

- Area Total area : 65,610 sq.km.
- Land area : 62,705 sq.km.
- Inland waters : 2,905 sq.km.
- Climate
 - Low country : min. 24.3°C - max. 31.8°C
 - Hill country : min. 18.2° C - max. 27.2°C
- Annual Rainfall (average) : 2,131 mm

Key Economic Indicators

- Mid-year population ('000) in 2015 : 20,966
- Growth of mid year population in 2015: 0.9%
- Population density (2015) : 334 persons per sq.km.
- Literacy Rate (2014) : Average 93.3%
Male 94.2% Female 92.6%
- Expectation of life at birth : 74.9
- Employment (2014)
 - Employed persons ('000) : 8,424
 - Agriculture : 28.5%
 - Industry : 26.5%
 - Services : 45.0%
- Unemployment rate (2014): 4.3%
- Per Capita GDP (2015) : 3924 US\$
- GDP Growth Rate (2015) : 4.8%

Role of Department of Census and Statistics

- DCS conduct several regular surveys and censuses in addition to those conducted under special circumstances.
- Responsible for Collection, compilation and dissemination of Official Statistics.
- Responsible for providing statistical services including consultancy services, training, data analysis on special requests.

Data Collection Methods

➤ Surveys

➤ Censuses

➤ Administrative records

Major Surveys

- Household Income and Expenditure Survey (HIES)
- Sri Lanka Labour Force Survey (LFS)
- Demographic and Health Survey
- Child Activity Survey
- Computer Literacy Survey
- Industry Survey
- Construction Industry Survey
- **Energy survey**
- Satellite Tourism Account Survey
- Survey of Trade and Services
- Bi - annual Sample Surveys to estimate the average yield of Paddy

Institutional Framework

- Sri Lanka Sustainable Energy Authority (SLSEA) (Dual role as regulator and facilitator)
- Department of Census and Statistics (DCS) (Data collection and Conduct surveys)
- Ministry of Power & Energy (Energy policy & planning)
- Ceylon Electricity Board (Generation, transmission & distribution)
- Lanka Electric Company (Distribution)
- Ceylon Petroleum Corporation (Fuel quality)
- Ministry of Finance & Planning (Fiscal policies)
- Ministry of Environment (Environment policies)
- Central Environmental Authority (Environment / waste regulations)
- Public Utilities Commission of SL (Sector governance)
- Universities and R&D Institutions (RD&D, Training)
- GOs, ESCOs, NGOs, CBOs, Technology Suppliers,.....

Impact of energy on Sri Lankan economy

- The Gross Domestic Product (GDP) of Sri Lanka in 2015 was LKR 8,622.8 billion, which recorded a growth of 4.8%, compared to the previous year.

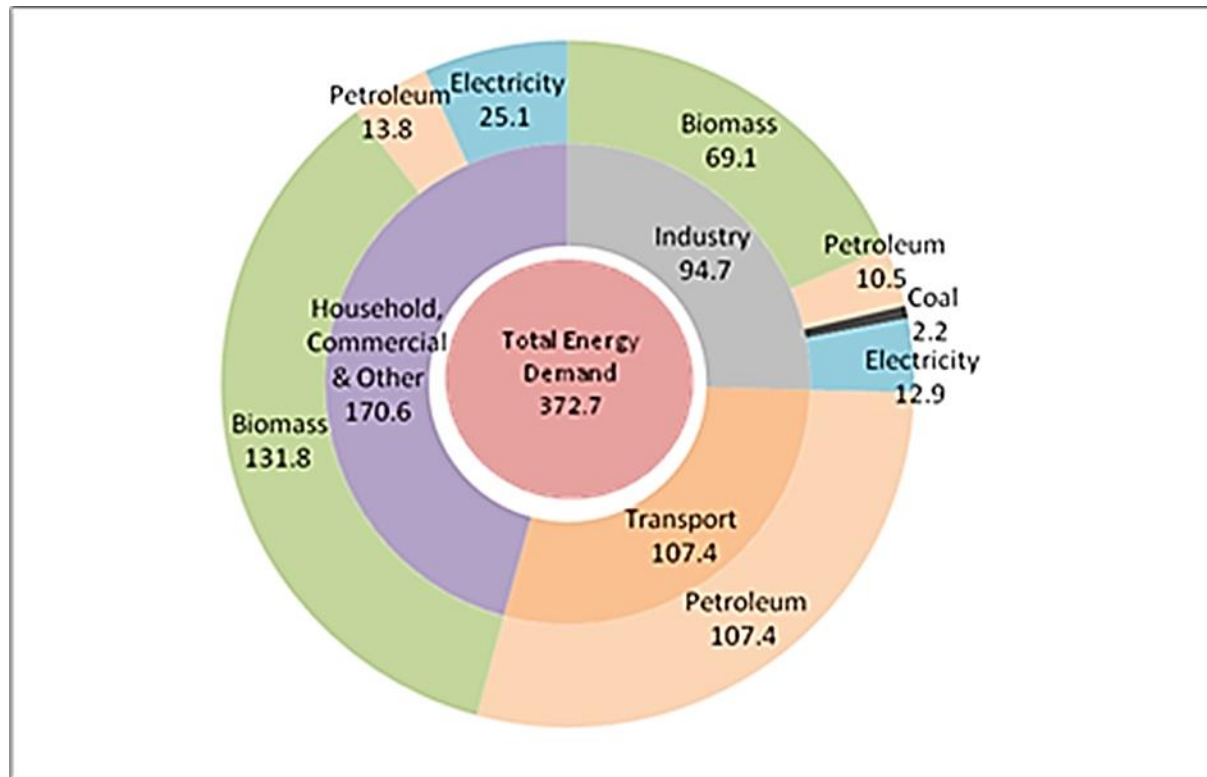
Contribution to GDP by Economic Activity 2015

Economic Activity	Contribution to GDP
Agriculture	7.9 %
Industry	26.2 %
Services	56.6 %
Taxes less subsidies	9.3 %

- The industrial contribution to GDP remains almost static in terms of share of contribution. Sri Lanka's industrial sector is dominated by light industries, with very few energy intensive heavy industries in operation.

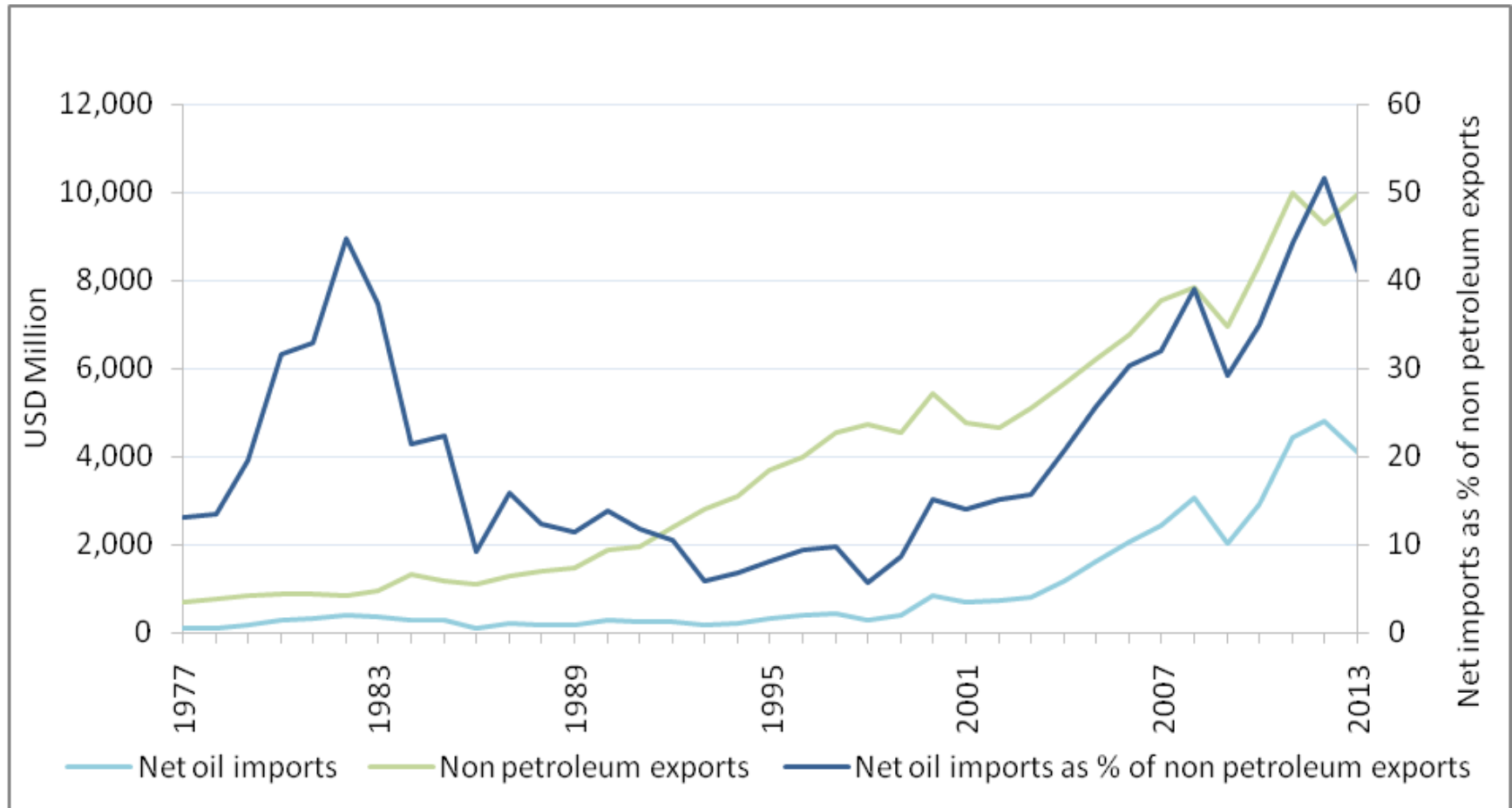
Scale of impact of energy on economy

The total energy demand of the country is 372.7 PJ, of which 46% is from the household and commercial sector. The transport sector and the industry sector account for shares of 29% and 25%, respectively. Biomass accounts for 54% of the total consumption, while petroleum accounts for only 35%.



Energy Consumption Pattern of 2013 (in Peta Joules)

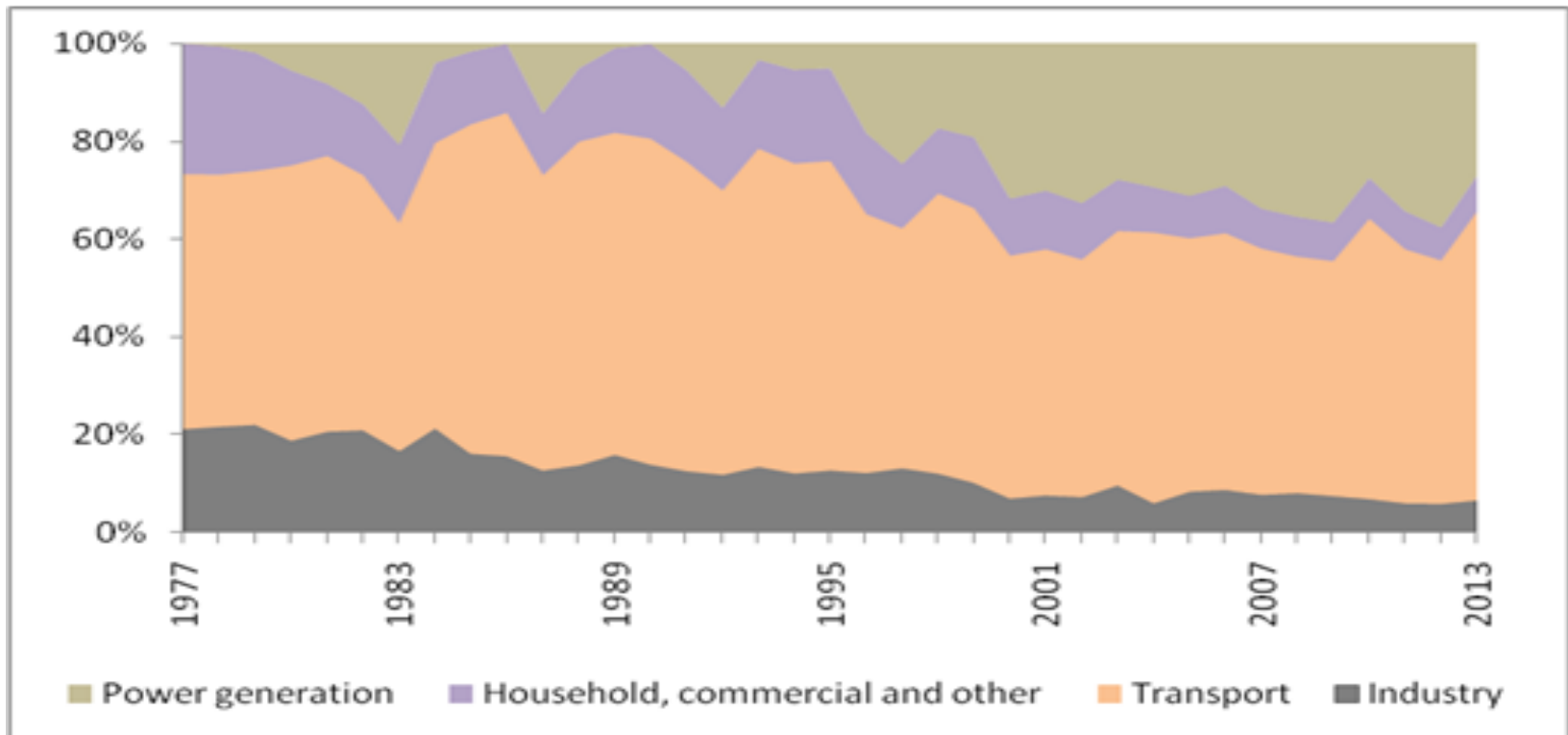
Petroleum Import Costs and its Impact on the Macro Economy



Share of transport energy in the oil bill

Transport in Sri Lanka, is entirely based on fossil fuel and accounts for a substantial share in the energy consumption portfolio. Even though the transport sector is accounting for the major portion of energy imports.

Share of Transport Energy in the Energy Consumption Portfolio



Country at a glance

Energy Sector

- Primary Energy Supply by Sources:

-Petroleum & Coal:	49.8%
-Biomass :	43.3%
-Large hydro :	4.3%
-NREs (Small hydro, wind, solar):	2.6%

- Energy Consumption by Sectors:

-Industry :	25.4 %
-Transport :	28.8 %
-Domestic & Commercial:	45.8 %

- Electricity Sector:

-Total Installed Capacity:	3900 MW
-Peak Load :	2200 MW
-HH electrification :	99% (Grid Access - 96% + Off-grid - 3%)

Generation by Source

- Hydro	:30%
- Thermal	:60%
- NRE	:10%

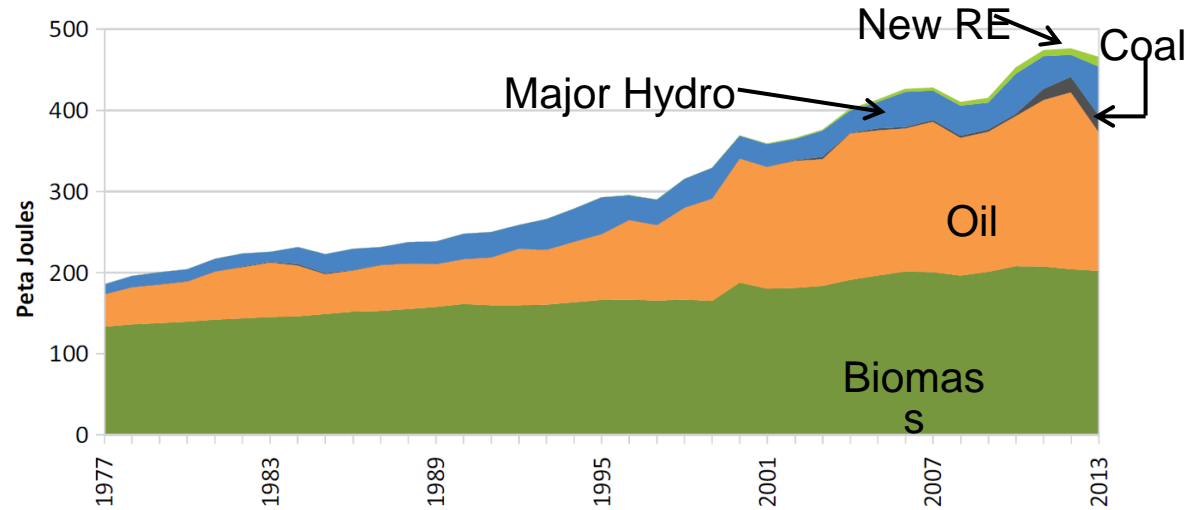
NRE Capacities

- Small hydro	:310 MW
- Wind	:125 MW
- Solar	:15 MW
- Biomass	: 20 MW

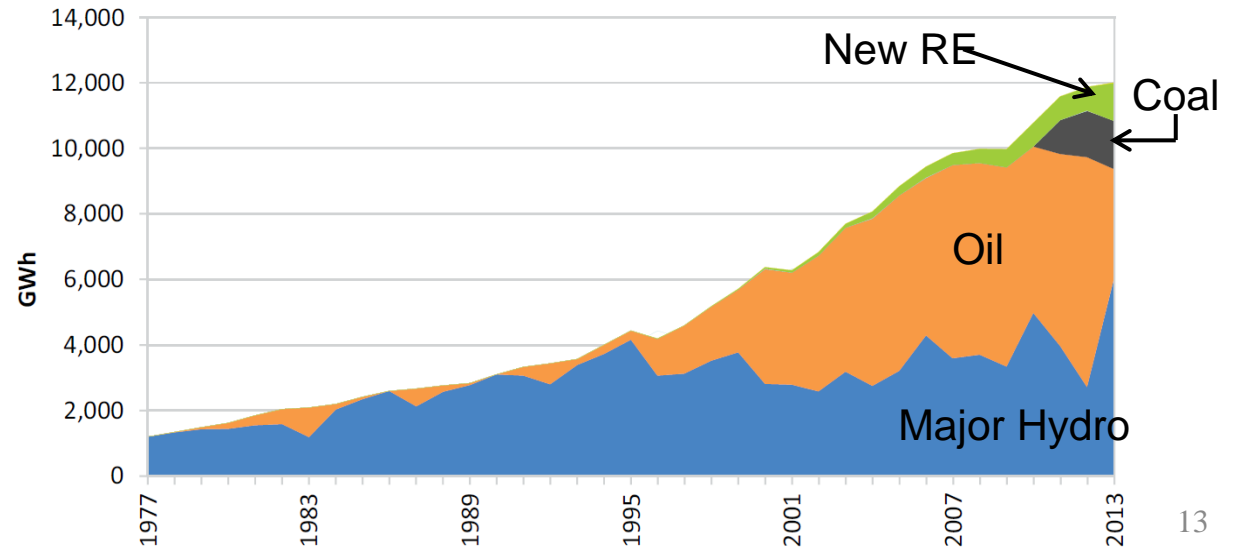
National Energy Scenario

Role of RE in Energy Sector

Primary Energy Supply by Source



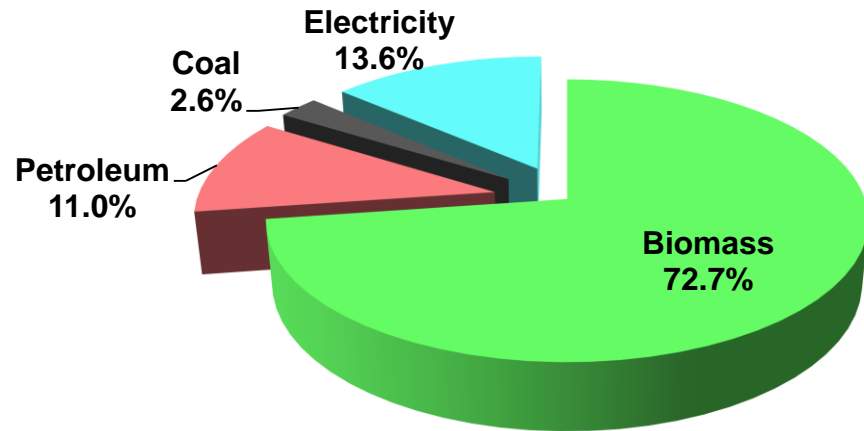
Gross Electricity Generation of Grid Connected Power Plants



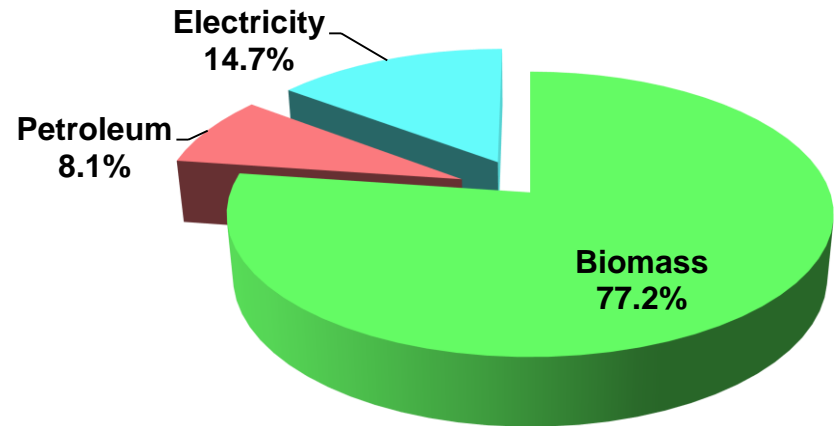
National Energy Scenario

Role of RE in Energy Sector

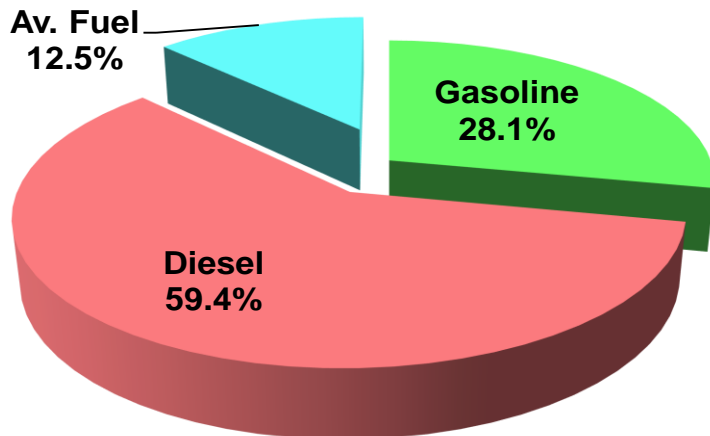
Industrial Sector



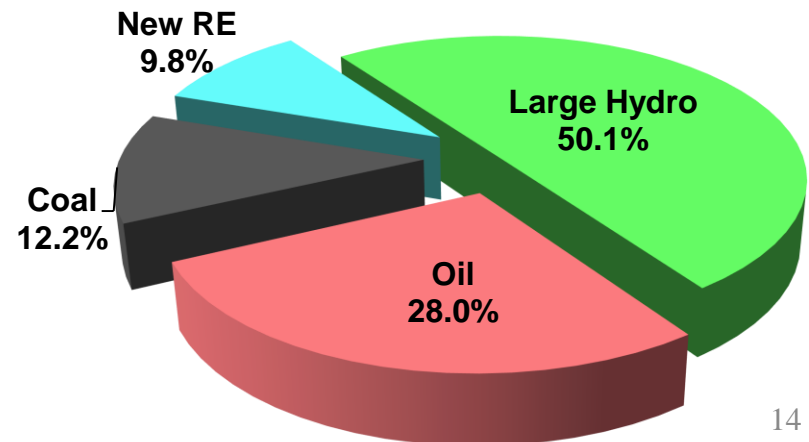
Household, Commercial & others Sector



Transport Sector



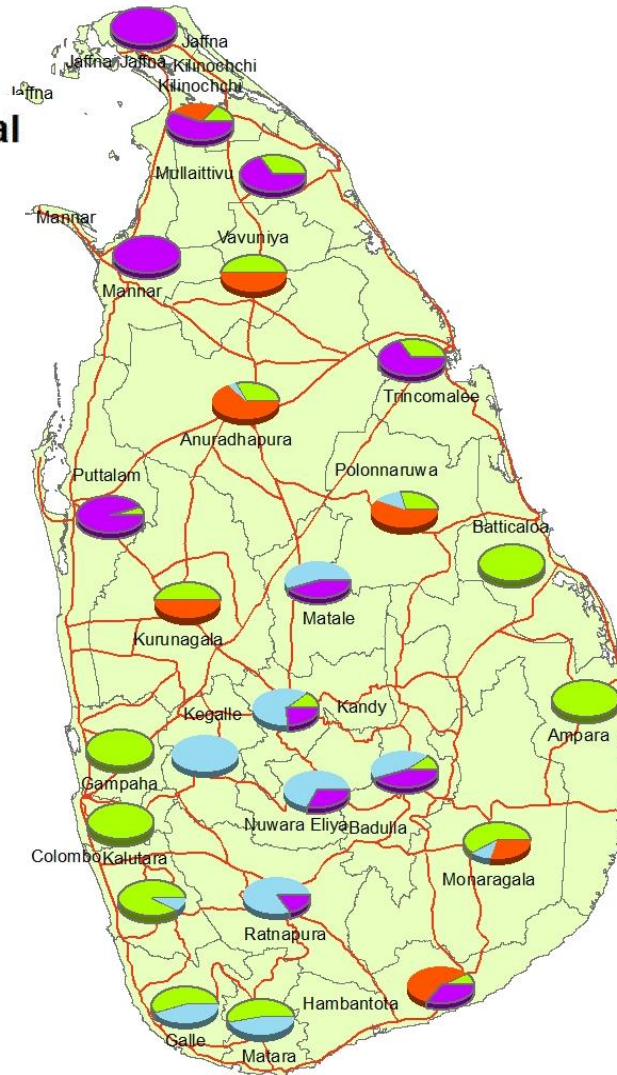
Electricity Sector



Renewable Energy Resources

RE Resource Inventory

District base potential



No	District	Biomass	Solar	Wind	Hydro	Total
1	Ampara	30	0	0	0	30
2	Anuradhapura	15	30	0	2	47
3	Badulla	15	0	60	61	136
4	Batticaloa	15	0	0	0	15
5	Colombo	40	0	0	0	40
6	Galle	15	0	0	12	27
7	Gampaha	5	0	0	0	5
8	Hambantota	15	100	60	1	176
9	Jaffna	0	0	100	0	100
10	Kalutara	30	0	0	3	33
11	Kandy	15	0	30	80	125
12	Kegalle	0	0	0	94	94
13	Kilinochchi	15	30	60	0	105
14	Kurunegala	30	30	0	0	60
15	Mannar	0	0	260	0	260
16	Matale	0	0	30	38	68
17	Matara	15	0	0	13	28
18	Monaragala	30	15	0	6	51
19	Mullaittivu	15	0	30	0	45
20	Nuwara Eliya	0	0	60	133	193
21	Polonnaruwa	15	30	0	8	53
22	Puttalam	15	0	260	0	275
23	Ratnapura	0	0	30	151	181
24	Trincomalee	15	0	30	0	45
25	Vavuniya	15	15	0	0	30
	Total	360	250	1010	602	2222

Sources of Emissions

Due to dire warnings of climate change experts, much attention is paid to gaseous emissions from various human activities. The severity of each type of emission is spelt out in a unit known as Global Warming Potential (GWP). The GWP of a tonne of carbon dioxide is taken as one, and all other emissions are tagged with a GWP value, to indicate how potent each such source of emission is, against carbon dioxide. Major sources of gaseous emissions with noticeable GWP attributed to the country are given in the Table below.

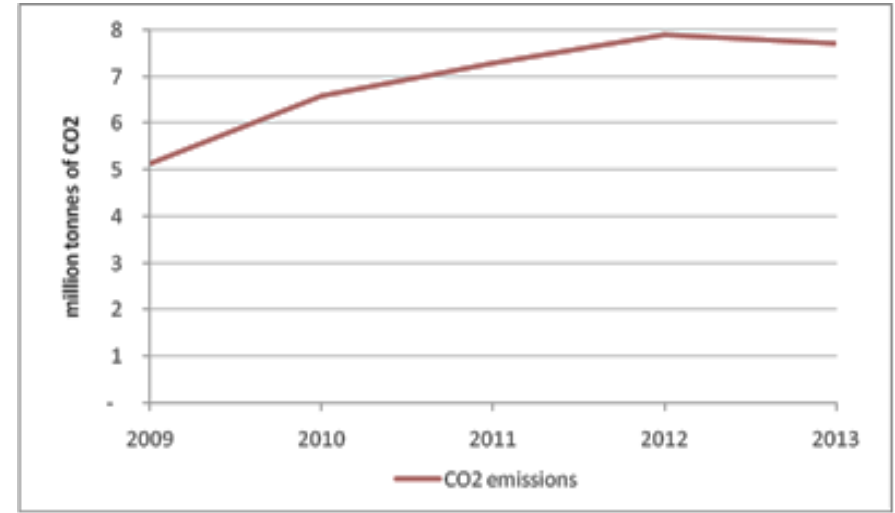
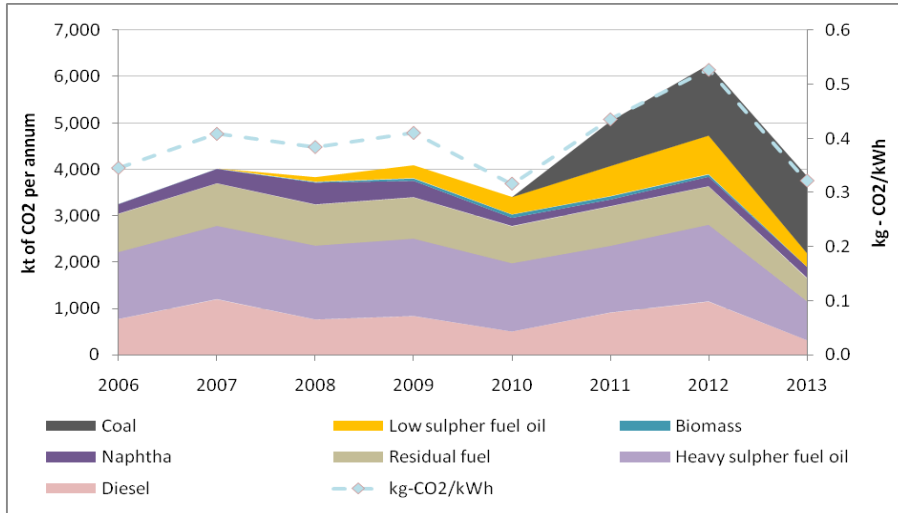
Emissions	Source	GWP	Impact (eq. CO2 tonnes/year)	Share of total emission inventory (%)
Methane	Paddy cultivation ¹	21	3,641,119	10.13
HCFC - R 22	Refrigerant ²	1,700	386,529	
HCFC - 141b	Refrigerant	725	5,612	
	Sub total (refrigerants)		392,141	1.09
Methane	Forests ³		10,507	0.03
CO2	Power generation (oil)	1	2,197,166	
	Power generation (coal)		1,663,580	
	Power generation (biomass)		3,317	
	Sub total (power)		3,864,063	10.75
CO2	Transport	1	7,705,779	21.44
CO2	Industry (oil)	1	654,543	
	Industry (biomass)		6,560,038	
	Industry (coal)		205,101	
	Sub total (industry)		7,419,682	20.64
CO2	Household (biomass)	1	12,519,912	34.84
Total			35,939,731	100.00

1. Emissions from Rice Fields – A Review – Journal of Scientific and Industrial Research (February, 2004)

2. National Ozone Unit

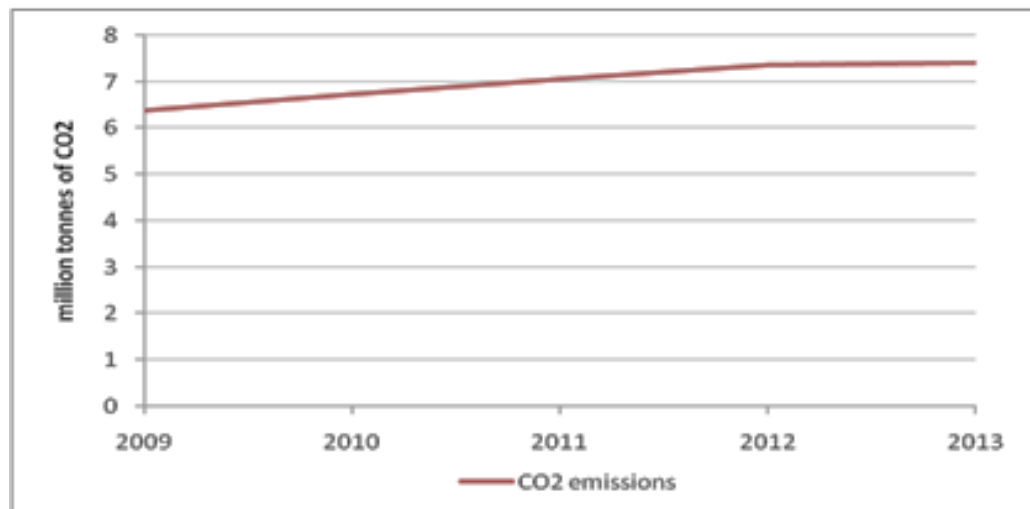
3. Methane emissions from terrestrial plants under aerobic conditions (2006) – Keppler

Emissions from power generation/ Transportation/ Other energy uses



Emissions from the Power Generation Sector

Emissions from the Transport Sector



Emissions from Other Sectors

Energy-economy Indicators

Energy-economy indicators include supply, final consumption, renewable sources, and the structure of the industry; energy dependency, energy efficiency, and energy prices.

Energy-economy Indicators

1	Energy use per capita
2	Energy use per unit of GDP
3	End-use energy prices by fuel and by sector
4	Transport energy intensities
5	Efficiency of energy conversion and distribution (to be limited to electricity)
6	Industrial energy intensities
7	Agricultural energy intensities
8	Service/commercial energy intensities
9	Household energy intensities
10	Stocks of critical fuels per corresponding fuel consumption

Energy access / Sustainability Indicators

Energy access / sustainability indicators cover areas ranging from access to energy services to share of renewable energy in the energy portfolio, among many other dimensions.

Energy Access/ Sustainability Indicators

11	Rate of electrification grid / off-grid
12	Share of household income spent on fuel and electricity
13	Renewable energy share in energy and electricity
14	Share of fossil fuel imports in total imports
15	Modal split of public passenger transport - % in total inland passenger-km
16	Modal split of road freight transport - % in total inland freight tonne-km
17	Fuel shares in energy and electricity
18	Net energy import dependency
19	Greenhouse gas emissions from transport – 1,000 tonnes of CO ₂ equivalent
20	Unserved demand for electricity
21	Household energy use for each income group and corresponding fuel mix
22	Emissions of nitrogen oxides (NO _x) and sulphur oxides (SO _x) from transport – tonnes
23	Emissions of particulate matter from transport – tonnes

Environment Indicators

Environment indicators include few selected indicators related to environmental impact of energy, such as greenhouse gas emissions, waste generation from coal power plants...etc.

Environment Indicators

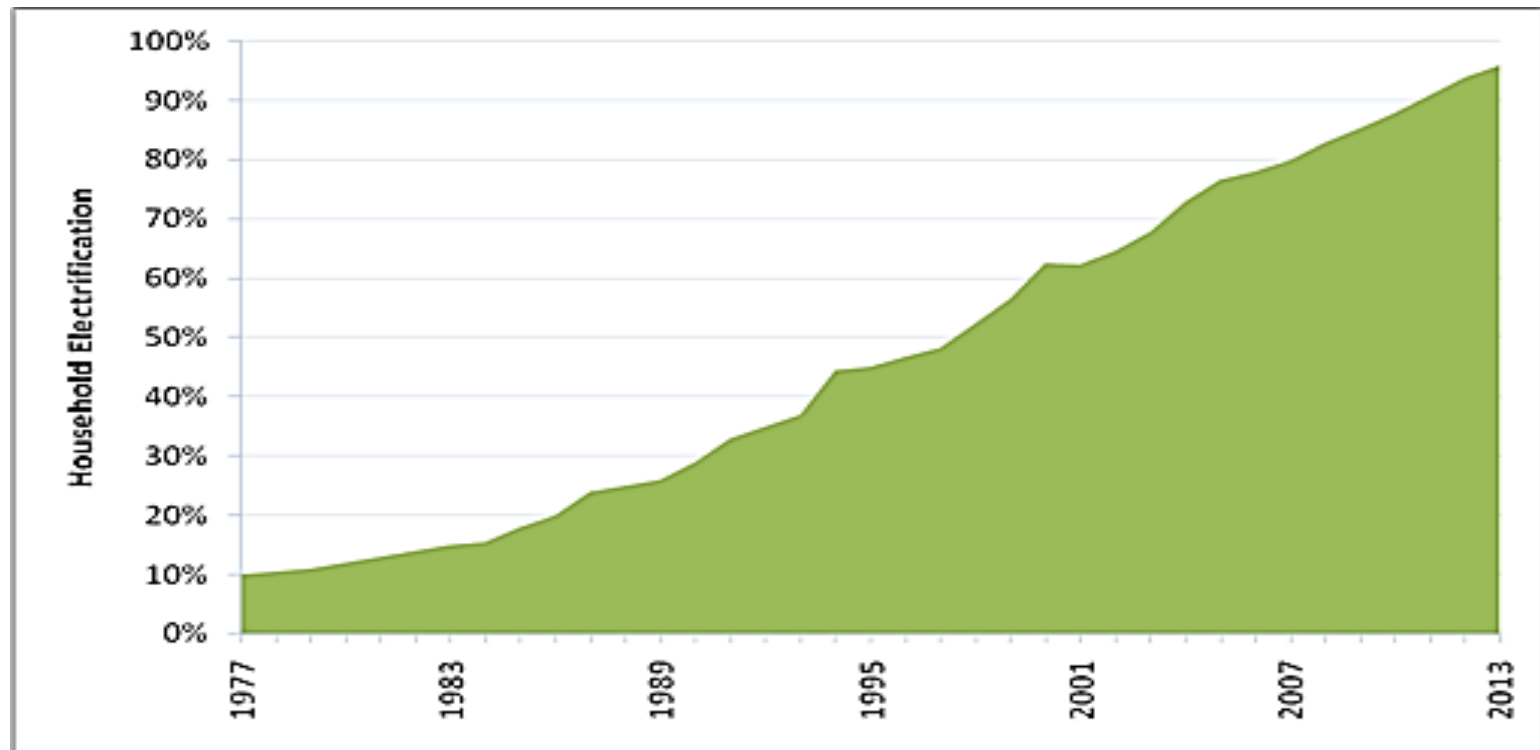
24	GHG emissions from energy production and use per capita and per unit GDP
25	Air pollution from energy systems

Definitions of some Indicators

Rate of electrification

The rate of electrification is published by the Ceylon Electricity Board

Rate of electrification = $\frac{\text{number of households with electricity connection from the grid}}{\text{total number of households in the country}}$

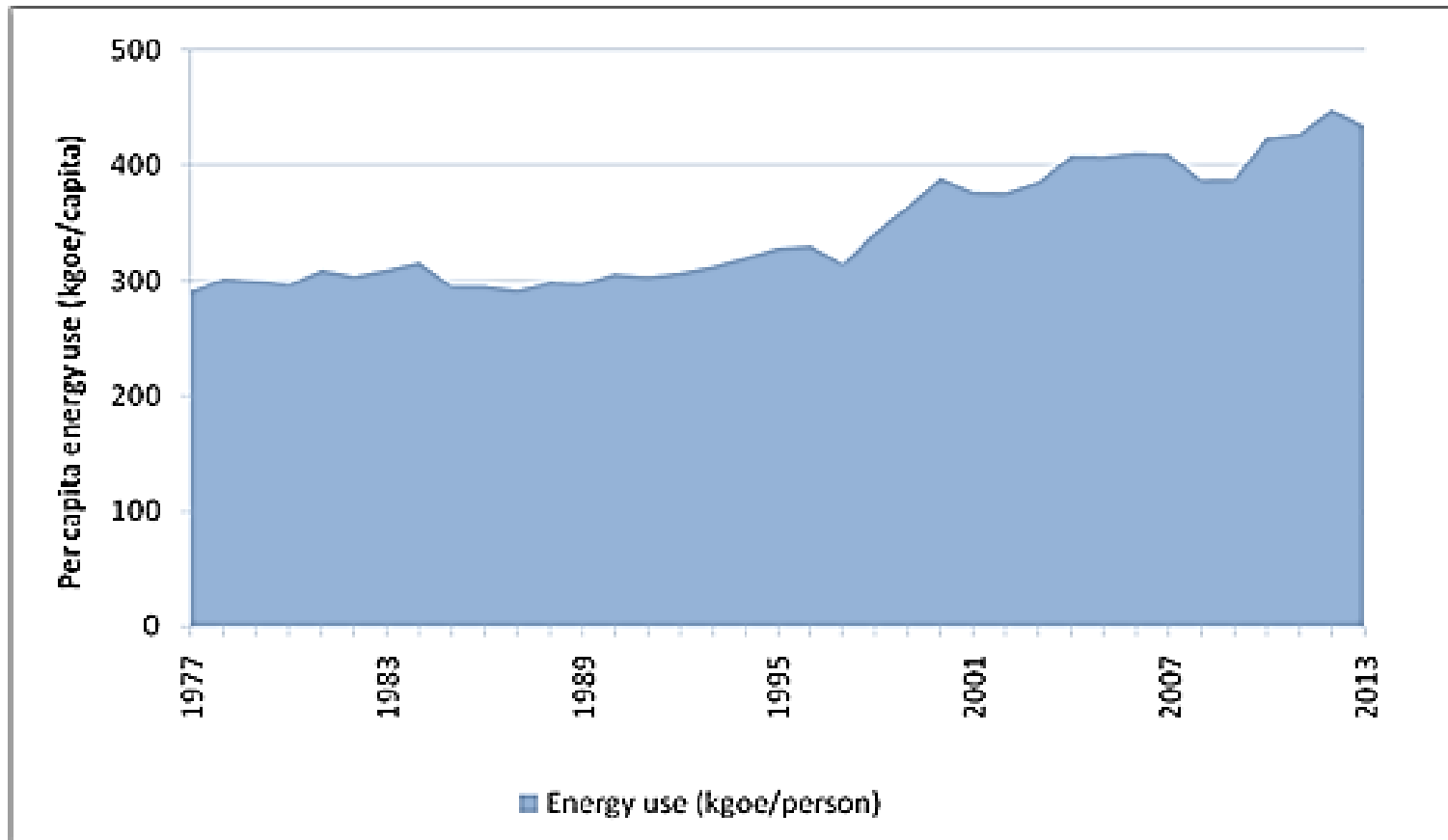


Rate of Electrification (Country Total)

Energy Use Per Capita

This indicator is compiled by the Sustainable Energy Authority.

Energy use per capita = energy demand (energy delivered to customers)/ mid-year population



Energy Use Per Capita (1977 - 2013)

Renewable Share in Electricity

The share of new renewable energy (NRE) in electricity generation is computed by the Sustainable Energy Authority. It is expressed as the total of NRE against the total gross generation of the country (Figure A), and also, generation by type of NRE resource (Figure B).

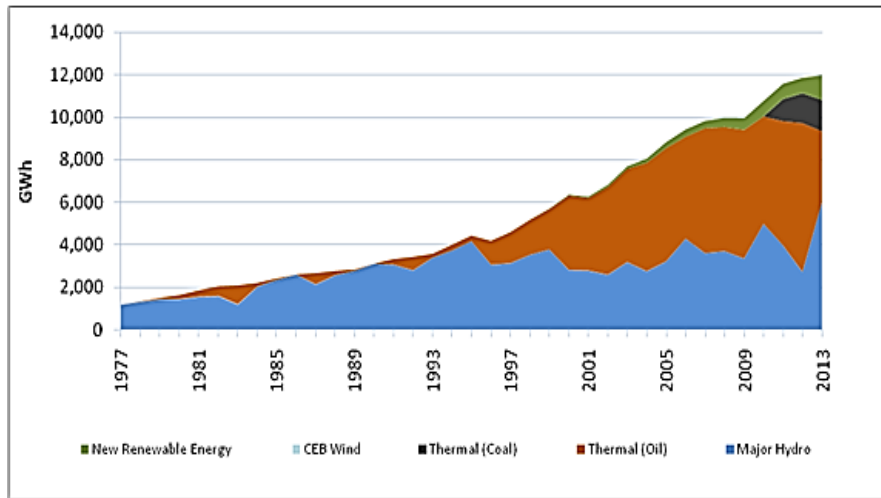
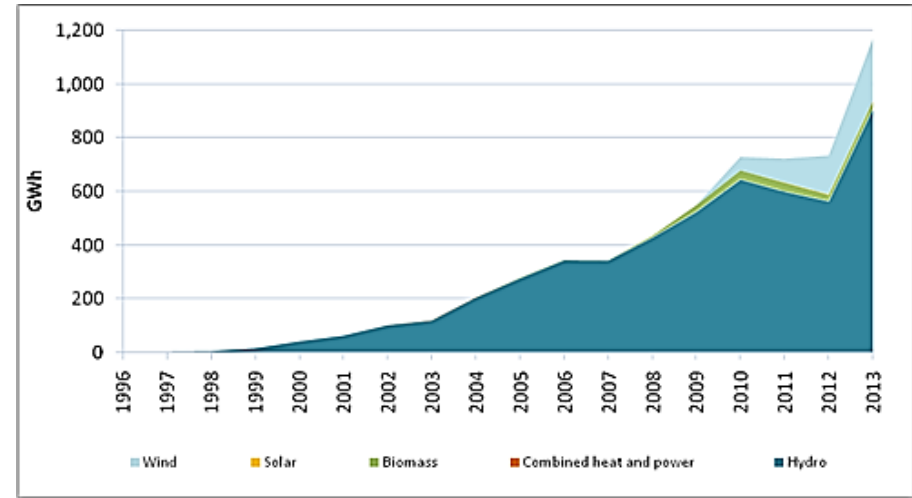


Figure A - Share of NRE in Total Generation (1977 - 2013)

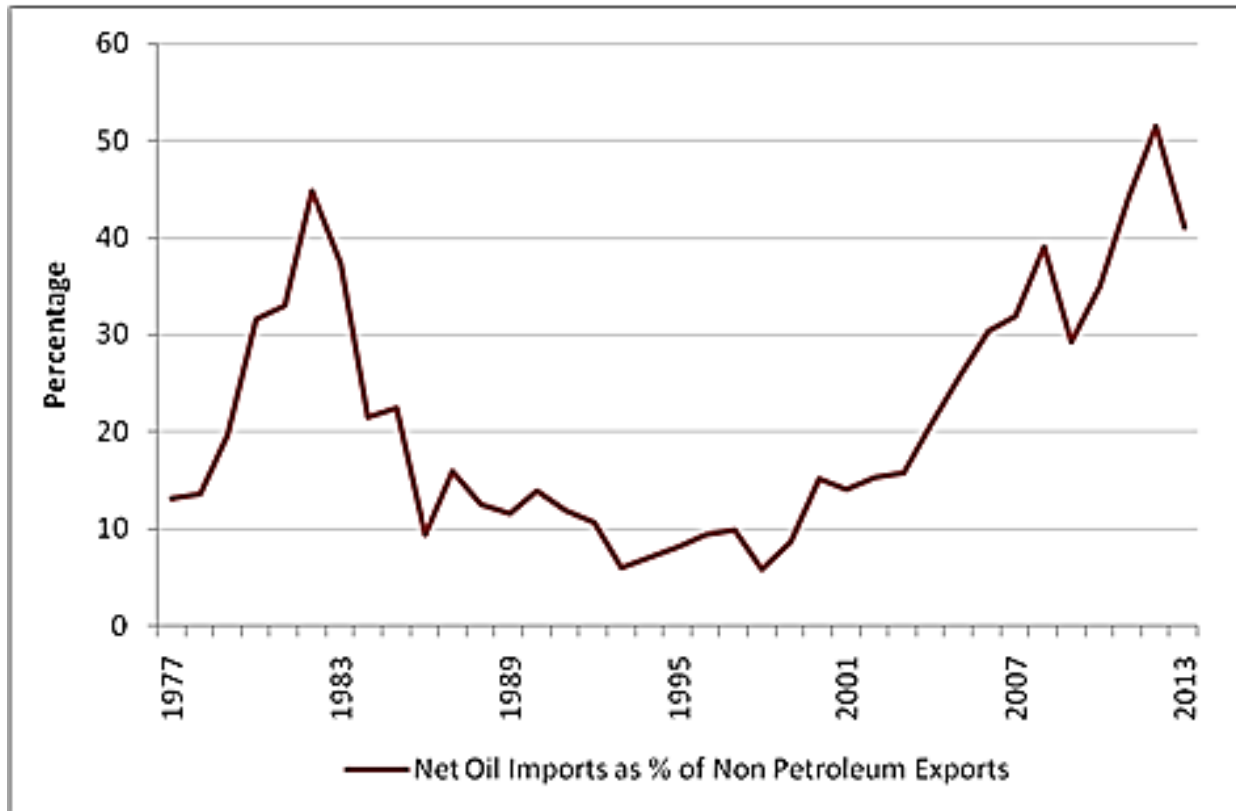


(Figure B) - Electricity Generation by type of NRE resource (1996 - 2013)

Net energy import dependency

The Sustainable Energy Authority computes the impact of petroleum product imports on the trade balance.

$$\text{Net energy import dependency} = \text{net oil imports} / \text{non petroleum exports} * 100$$



Net Energy Import Dependency

THANK YOU