

A Road Map for an Energy Independent Sri Lanka by 2030

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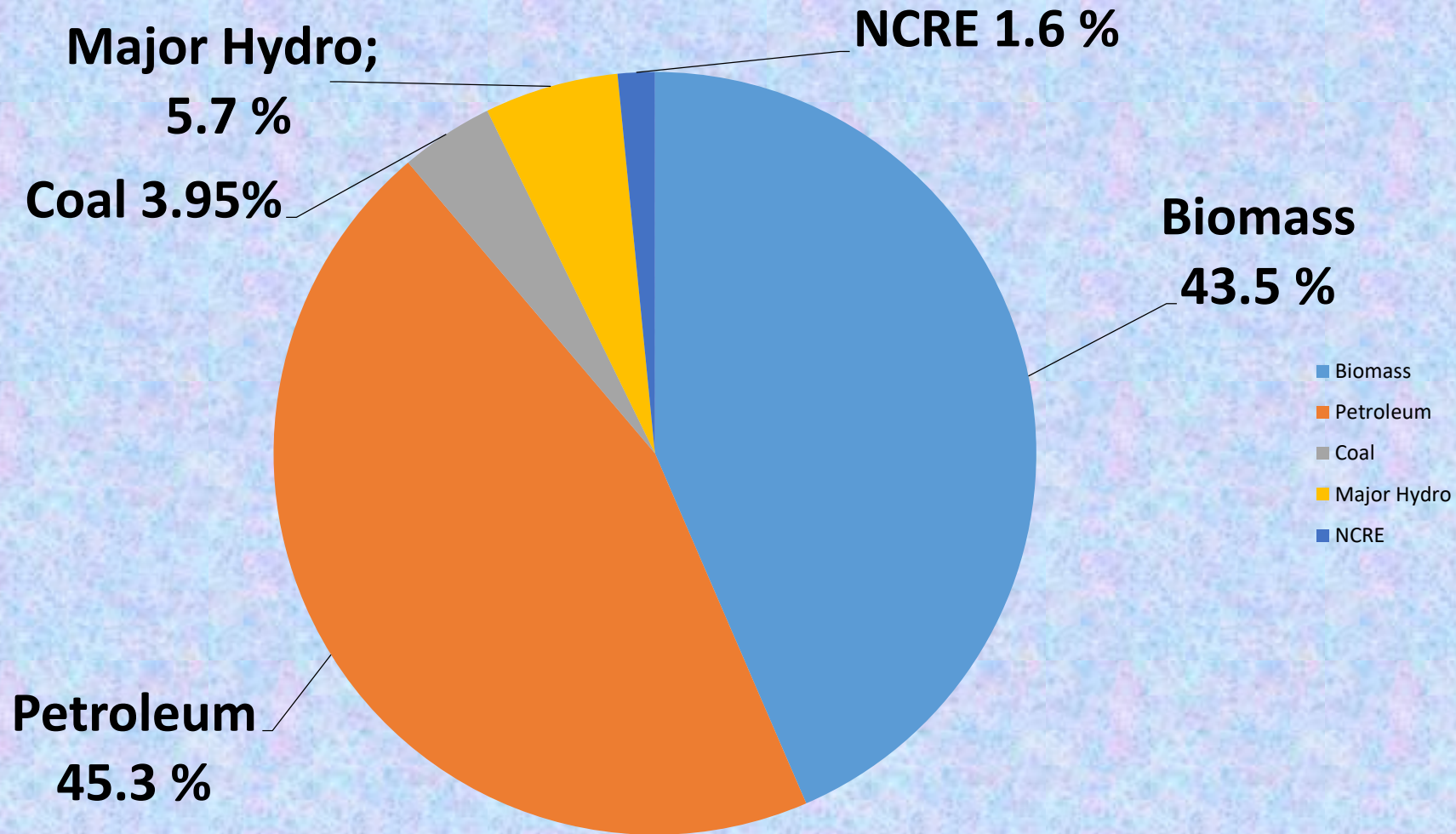
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Energy We Cannot Do
Without!

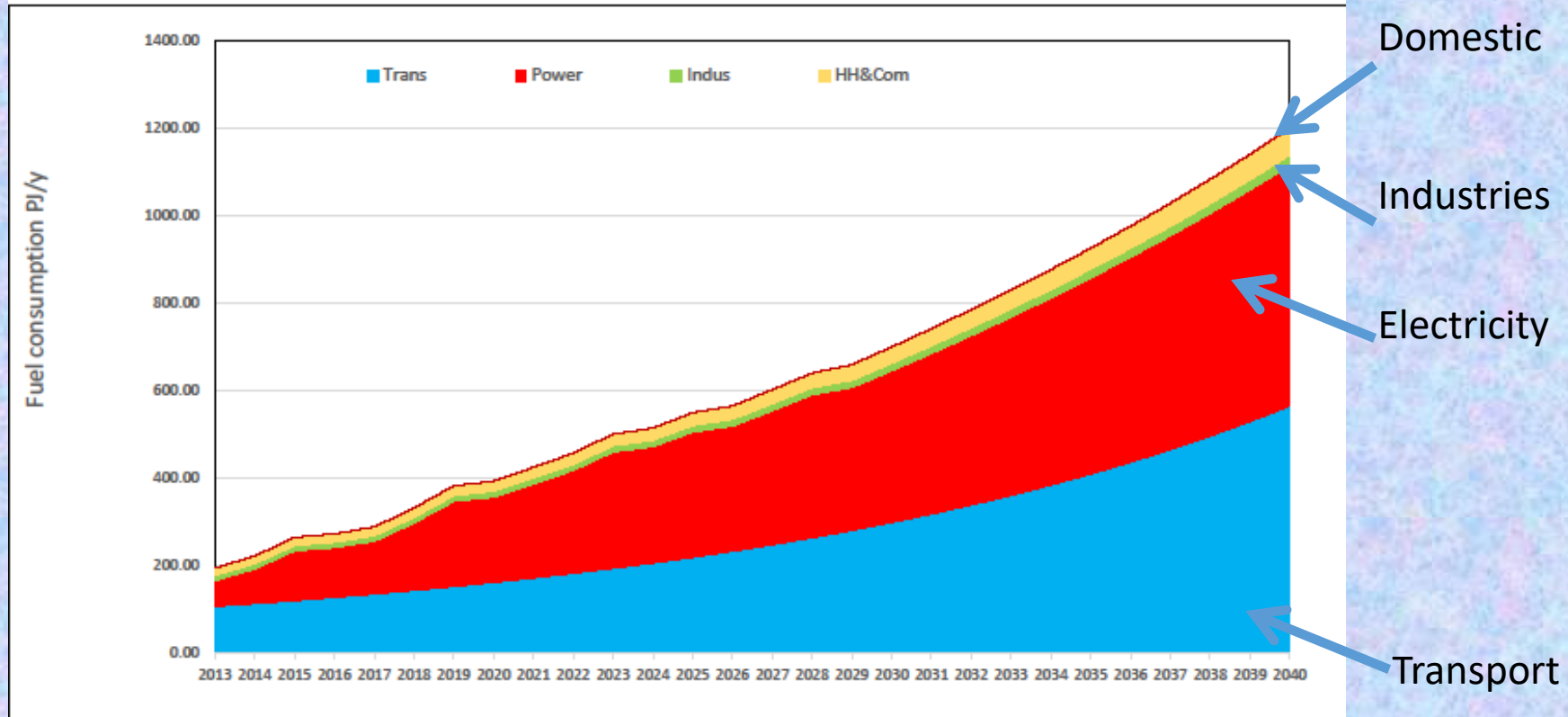
A Paradigm Shift Needed to Ensure
Long Term Energy Security

National Energy Resources



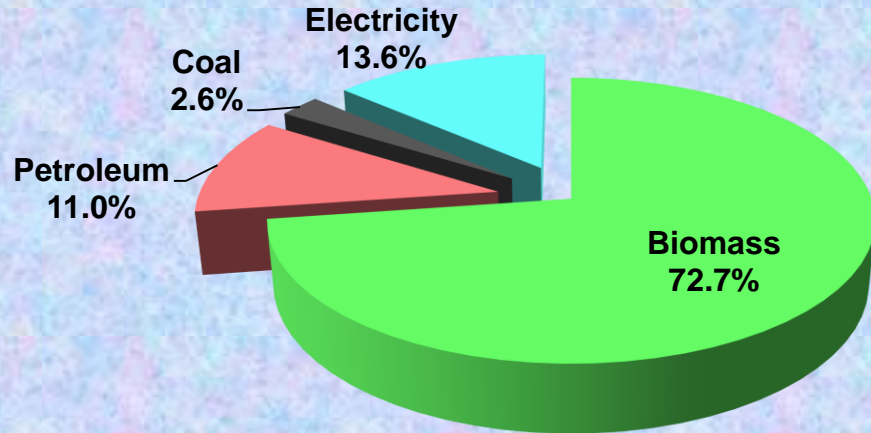
Sri Lanka Primary Energy Supply 2017

Forecast Demand Growth till 2040

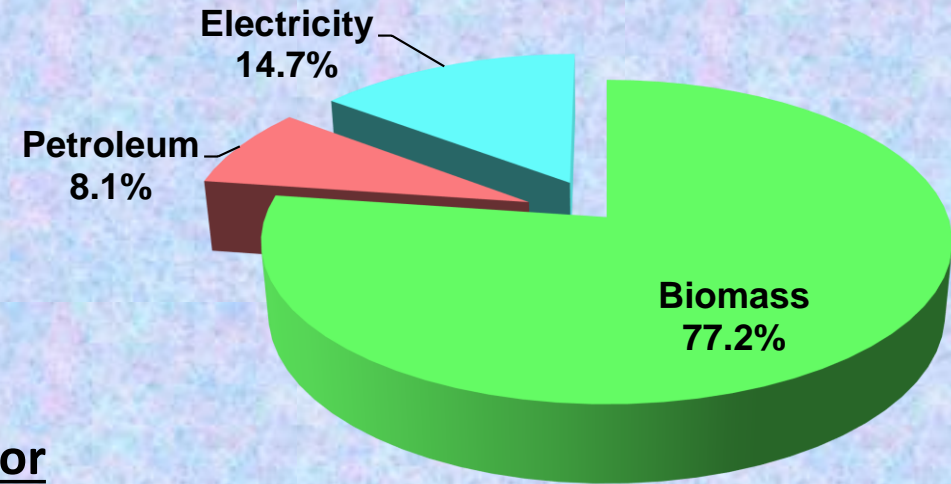


■ Sectoral Energy Supply by Source -

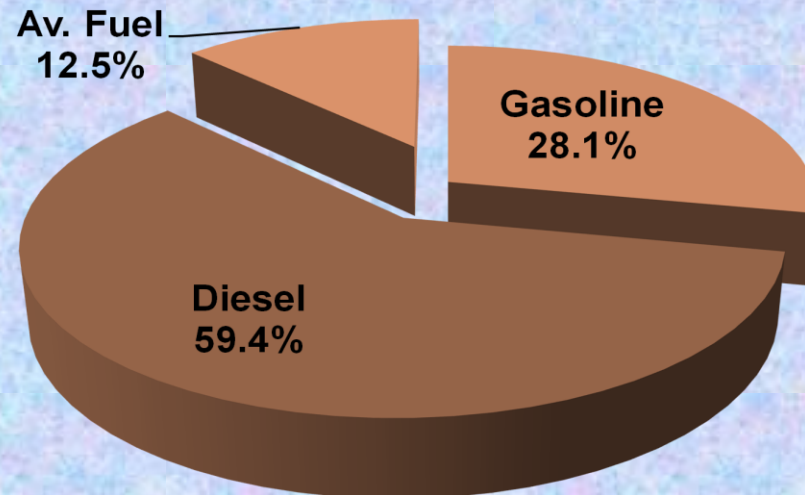
Industrial Sector



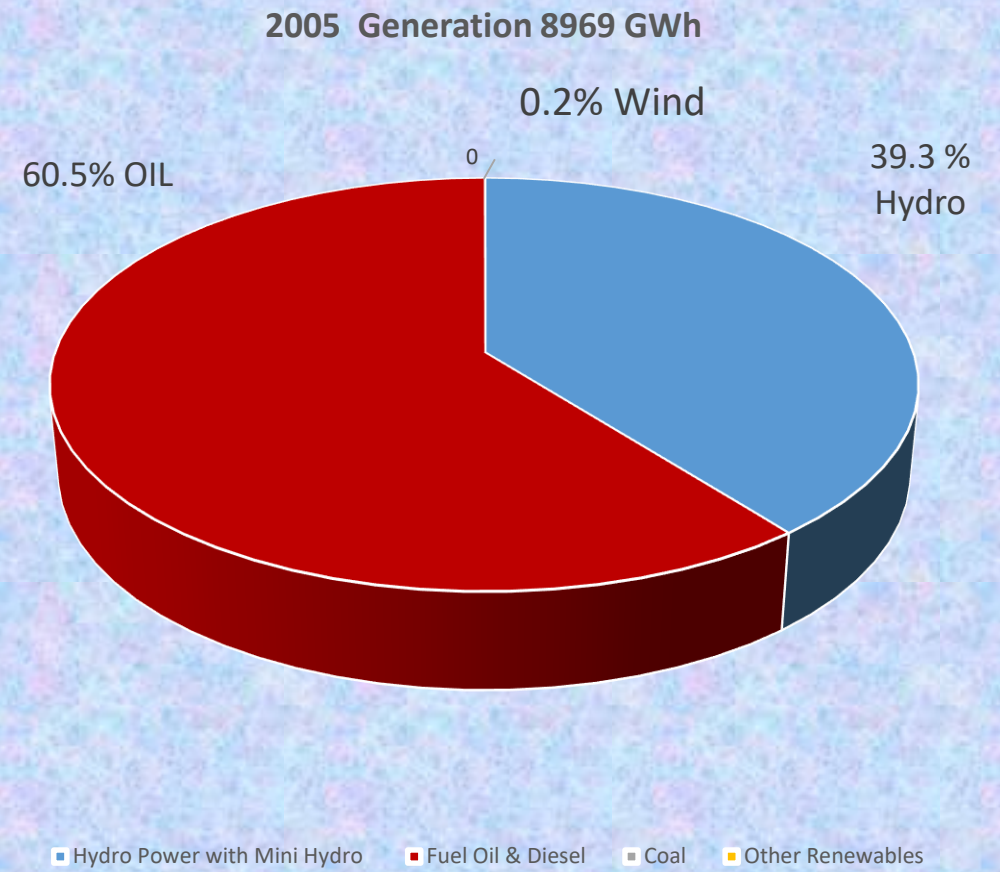
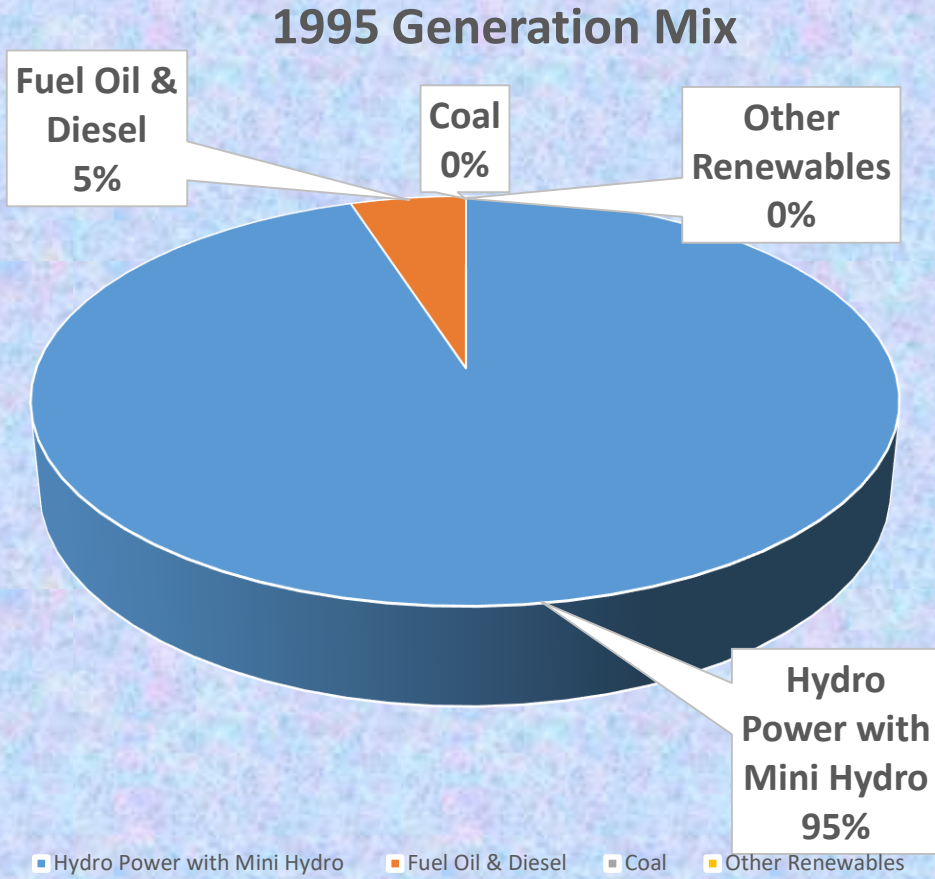
Household, Commercial & others Sector



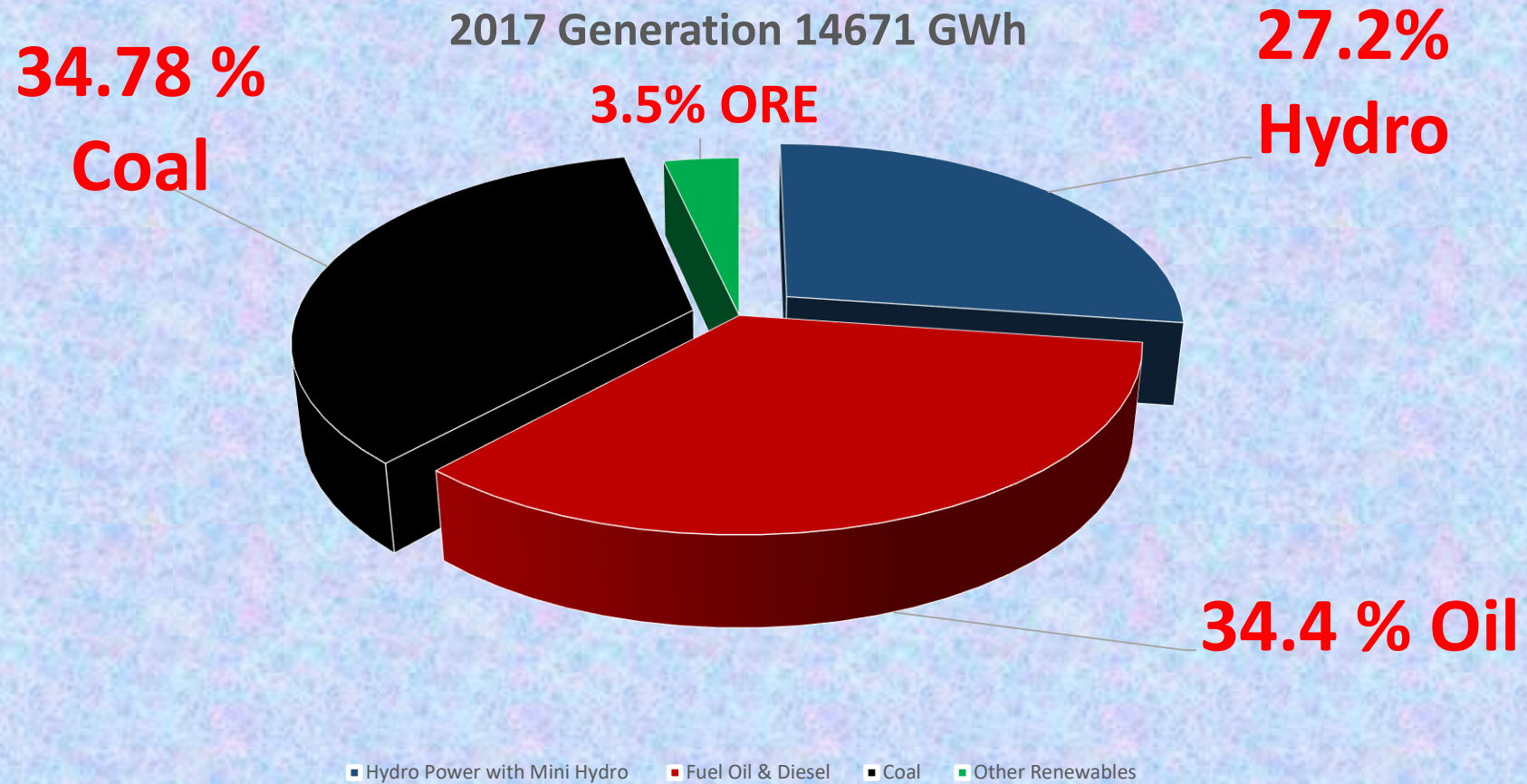
Transport Sector Entirely Oil Based



The Sad Decline since 1995



The Electricity Sector is even worse now



Essential Elements Requiring Non Dependence for National Security

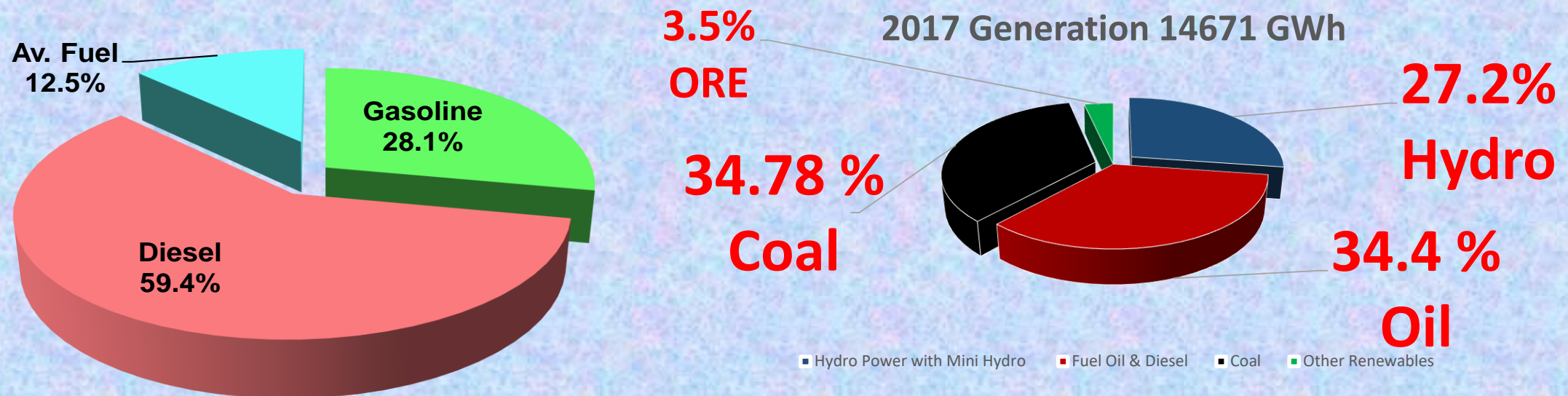
- Food
- Health
- Education
- Defense
- Energy

Energy For what ?

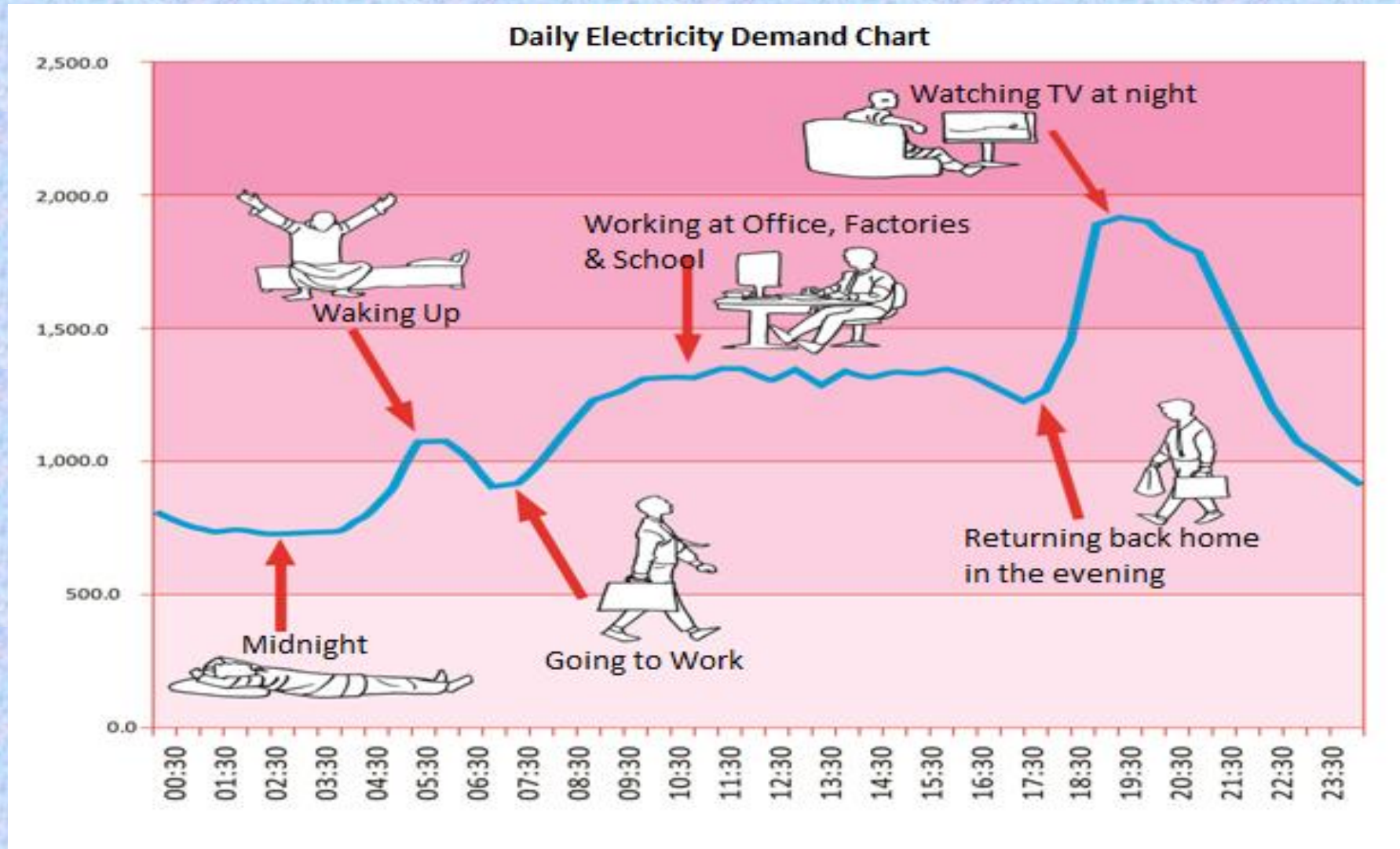
- Cooking
- Lighting
- Climate Control
- Transport
- Entertainment
- Industrial and Agricultural Energy
- **All these can be provided by electricity !!**

But !!

- Electricity in National Energy Pie is only about 10% **but receives the greatest attention**
- High Price, Supply constraints and other issues maintain the demand for other energy sources for the other sectors
- Transport still depends essentially on fossil fuels

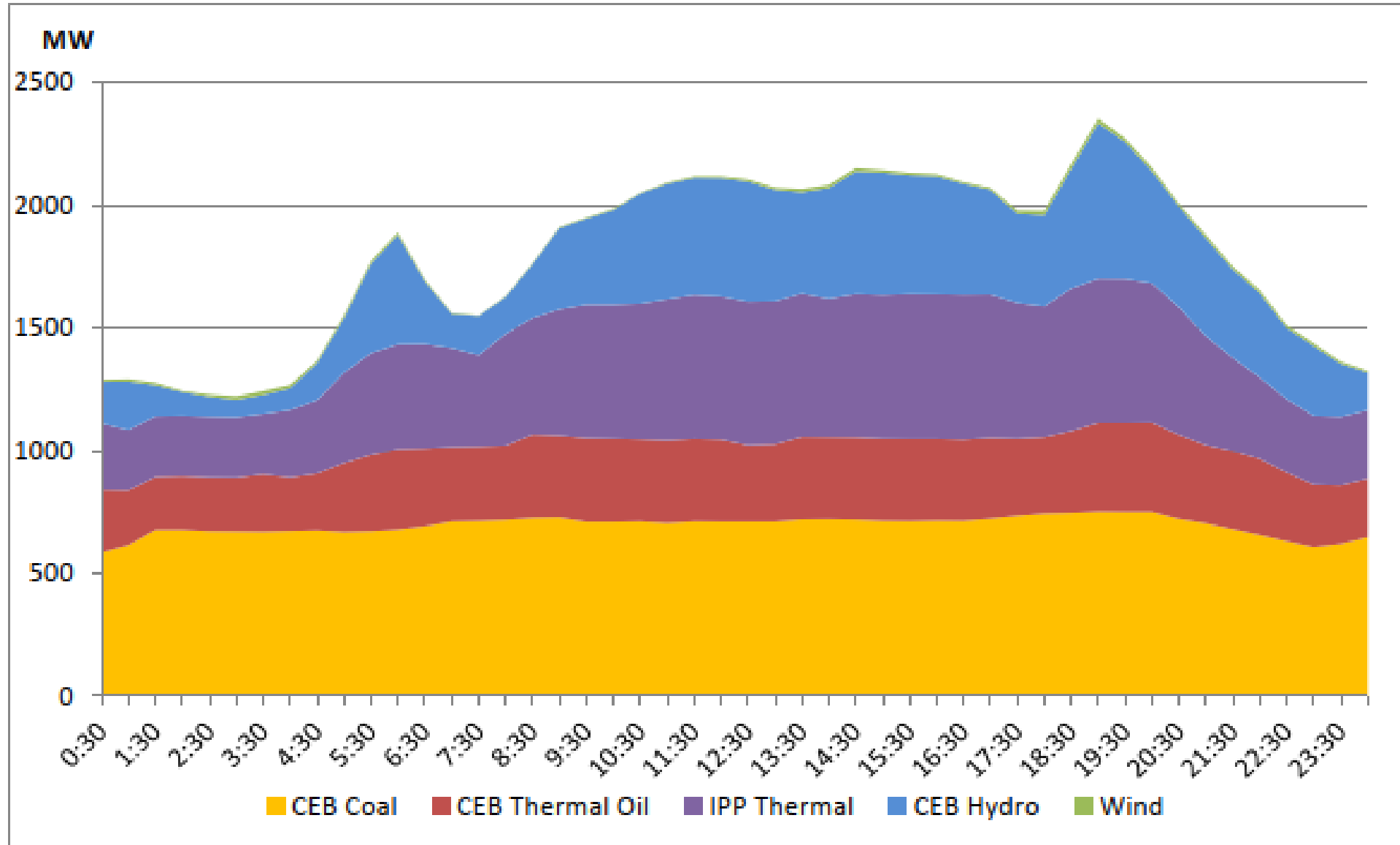


How the Majority of Consumers Use Electricity



Current means of meeting the demand

Daily Load Curve - April 25, 2018

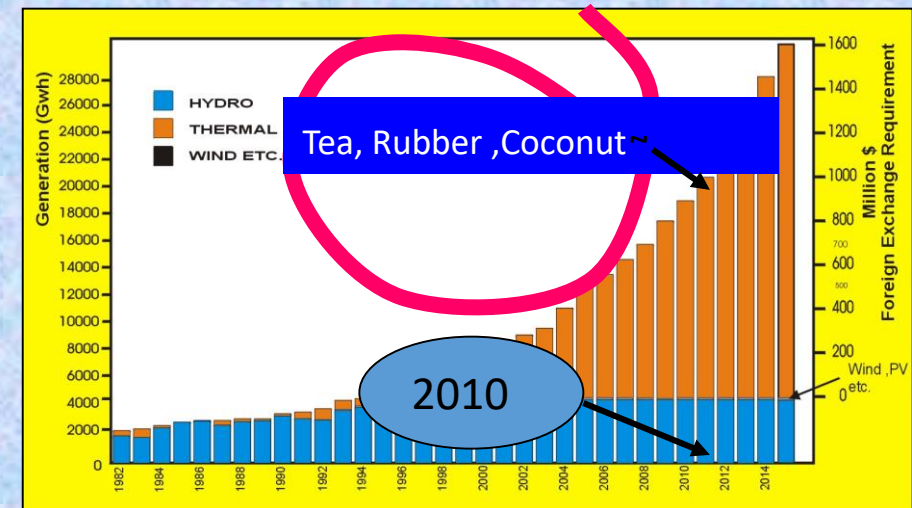


Why is this a problem ?

- Danger of imminent Power Shortages
- Severe financial losses by the CEB being passed on the public
- Dangerous financial stress on state banks due to non performing loans to CEB
- Intolerable pressure on balance of payments driving down the Rupee against all currencies due to extensive imports of fossil fuels for electricity and transport – currently consuming near to 40% of total FE earnings

Cost of Fuel Imports
for Electricity and
Transport -
US \$ 6000 Million
and will continue to
increase

The Burden



Can we change this situation?

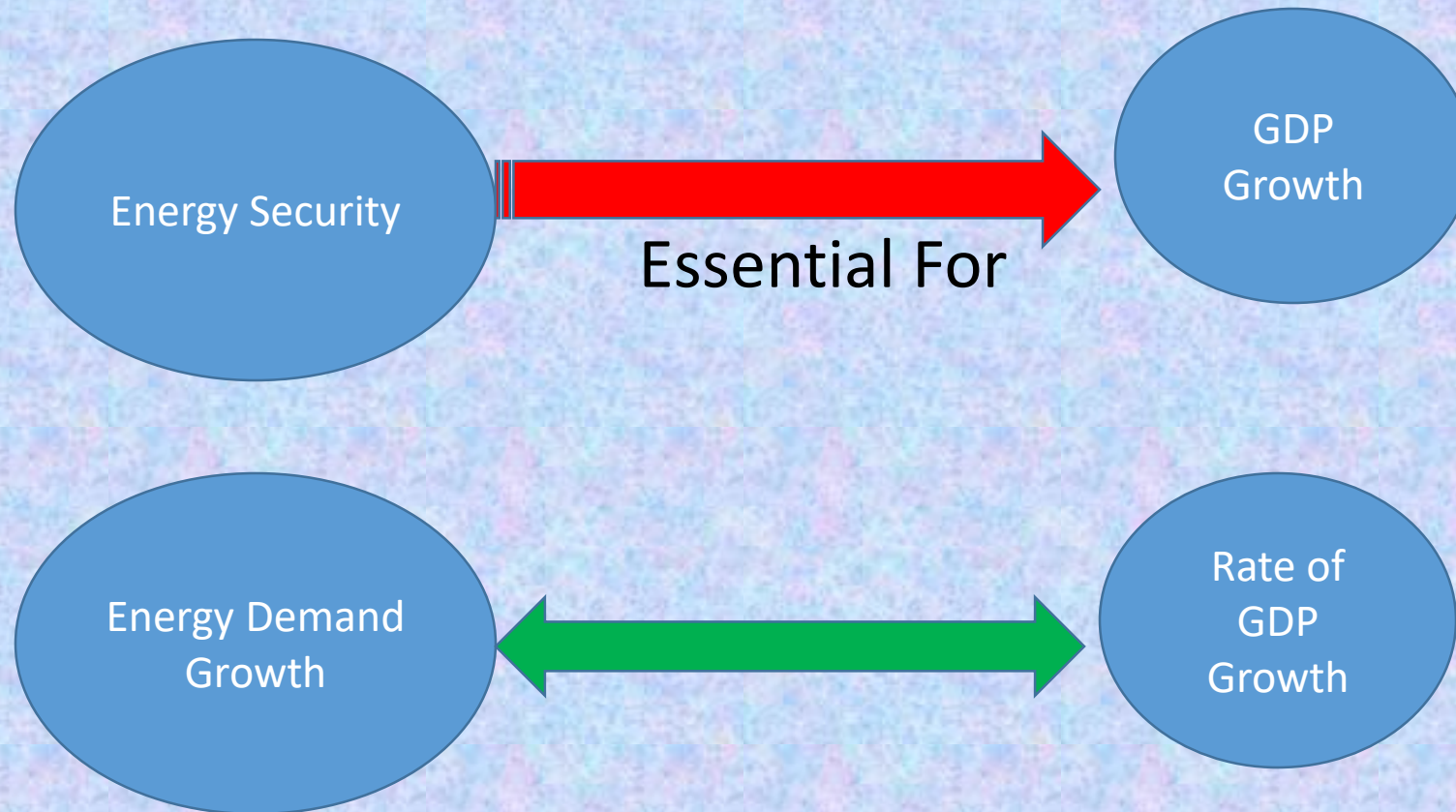
Yes We can !!

The time is right !!

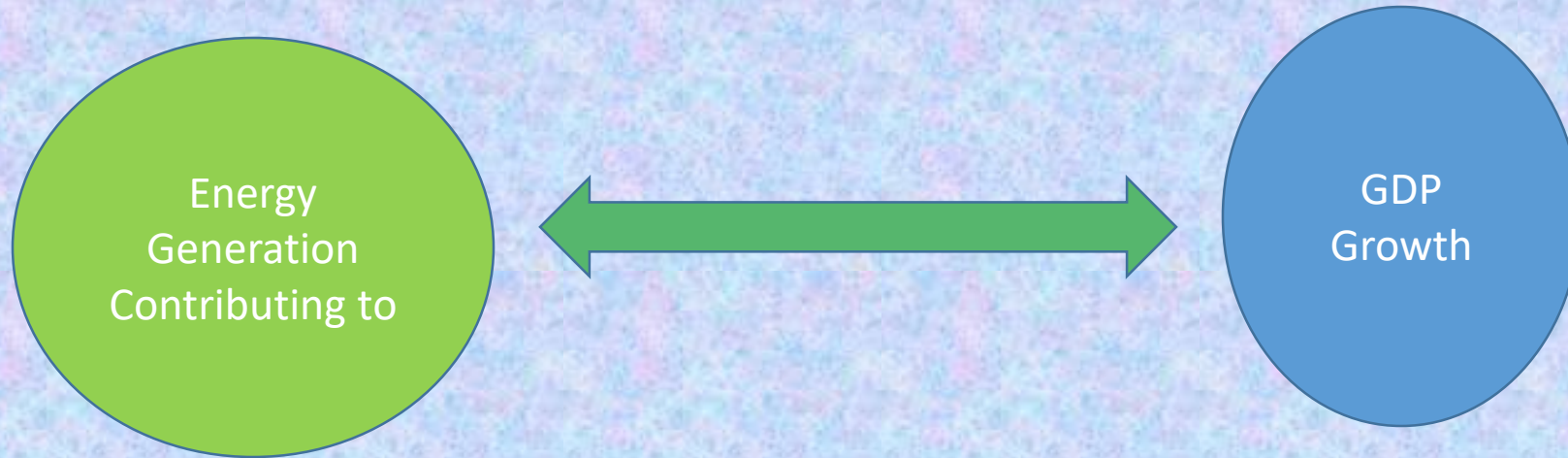
But we need to change the
way we look at Energy !!!

Energy is all our right !!!

The Common Wisdom



A New Paradigm needed



The Potential Target contribution

US \$ Six Billion

Every Roof Top a Power Plant

Every Garden an Energy Plantation

The Consumer to be a "Prosumer"

This picture has changed now

An all electric energy future is no longer a
dream

and it can be a Sri Lankan Industry

Access to Clean Energy is our right !!!



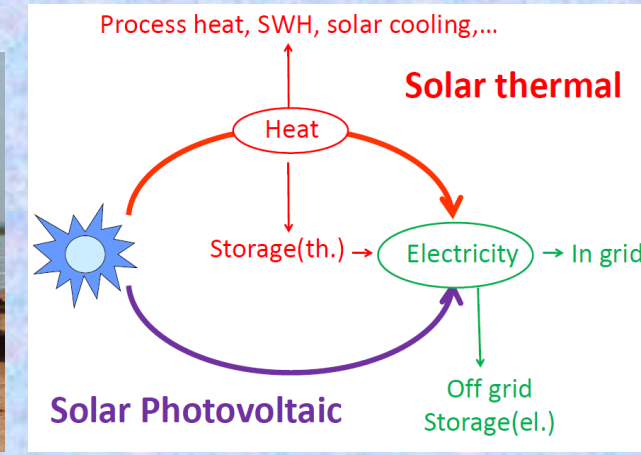
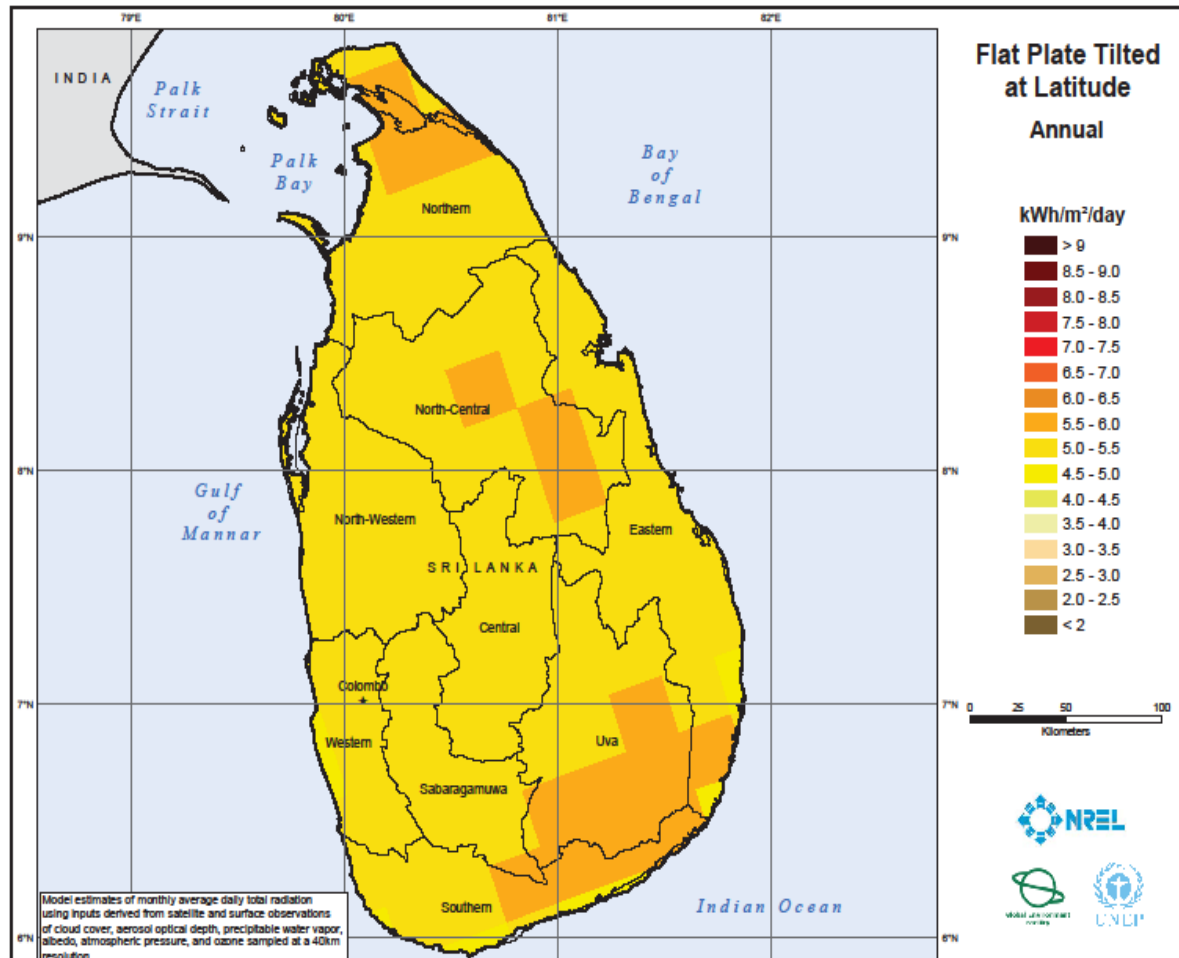


**The Sun –
The Source of All Energy Forms-
and it is free**

**Let us harness this Bounty of nature
effectively**

What About Sri Lanka ?

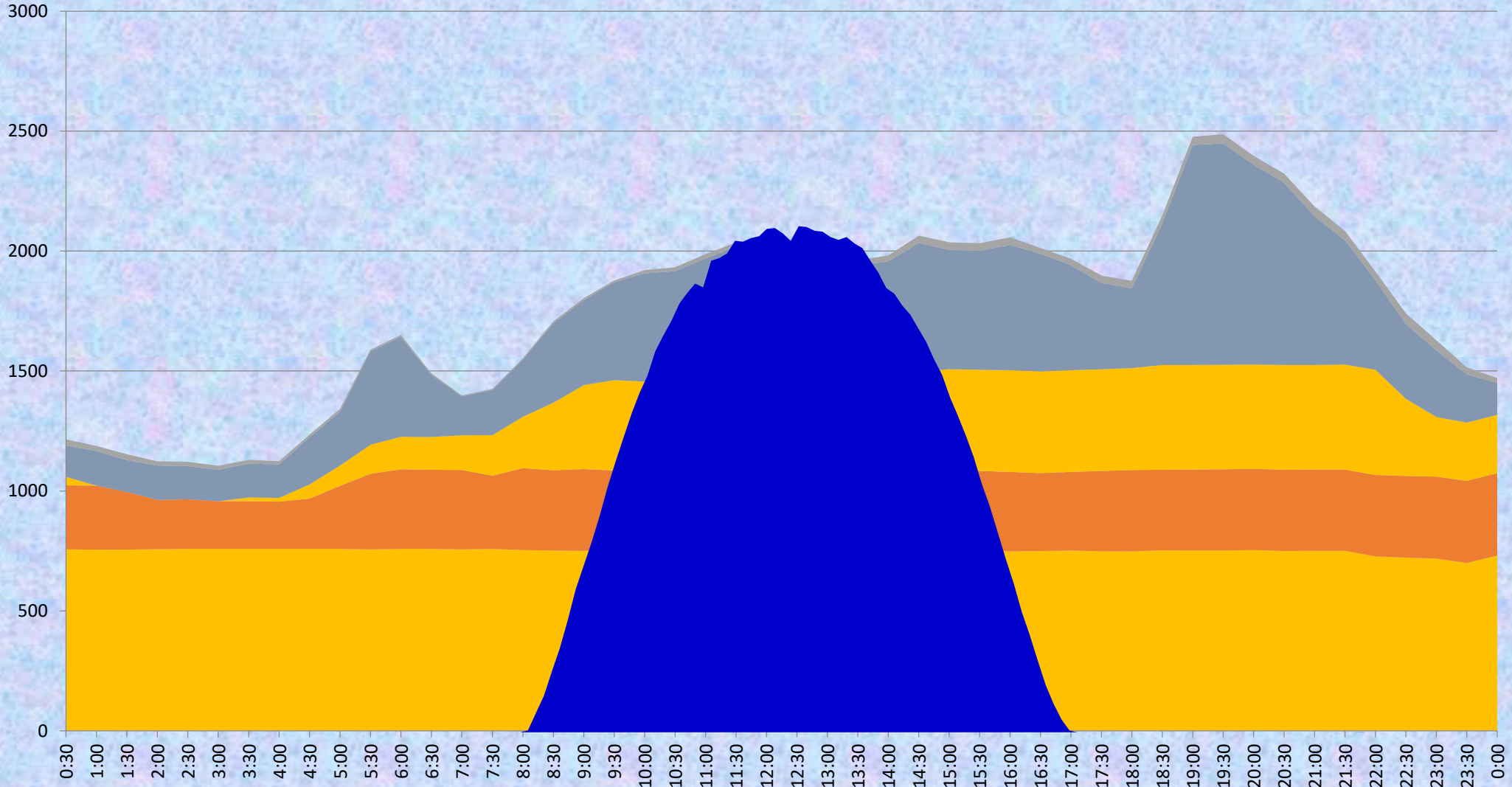
- Annual Electricity Demand 2020 20,000 GWh
- Solar Insolation @4.5 kWh/m²/day 106,762,500 GWh
- We have at least 5000 times our need to play with



Can we harness this bounty ?
The time is right

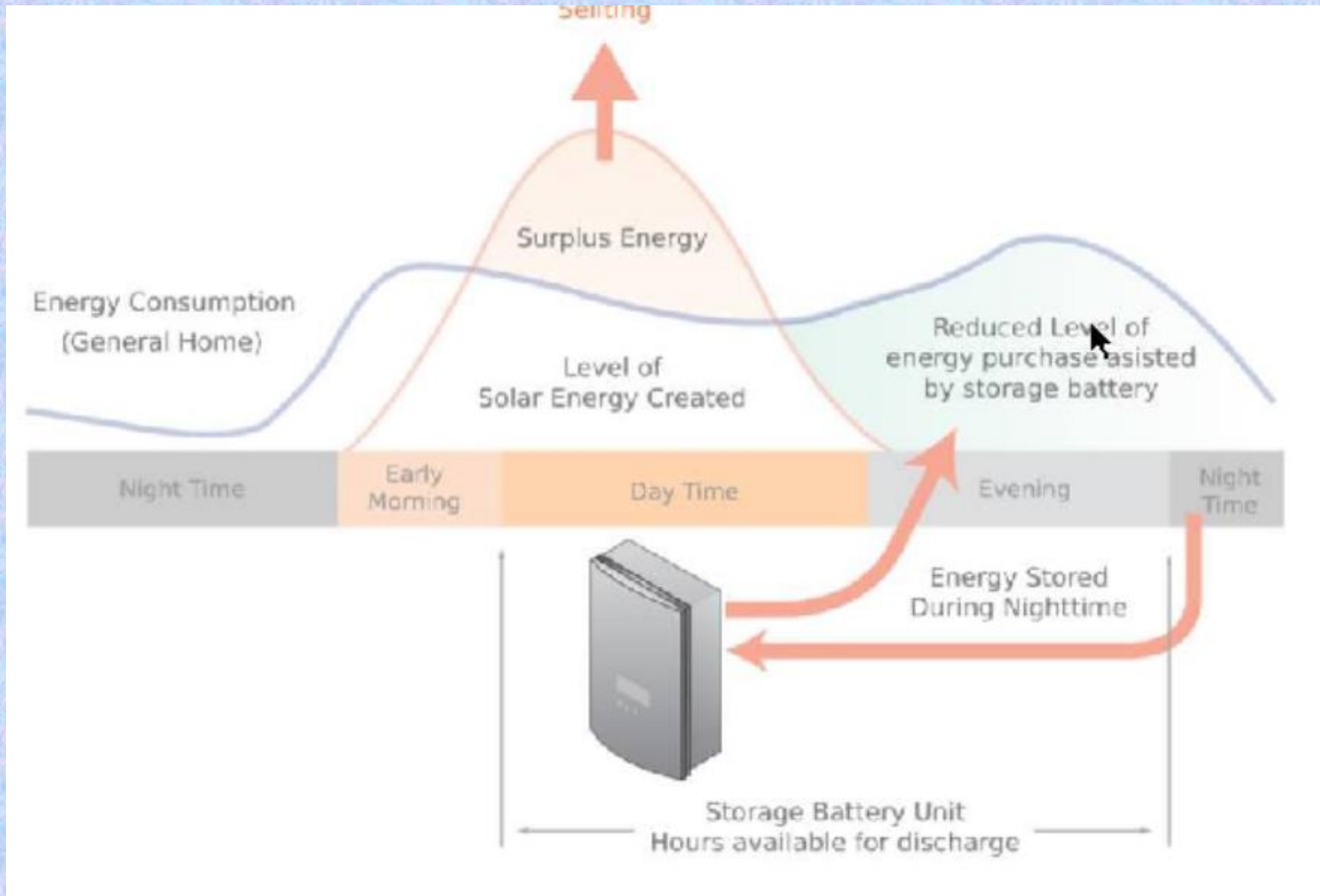
MW

Load Curve -May 01- 2018



■ CEB Coal ■ CEB Thermal Oil ■ IPP Thermal ■ CEB Hydro ■ Wind

Peak Shaving by Solar & Wind



Common Objections

- Cost of building equivalent RE power capacity; **Let the Private Sector Invest**
- Grid instability issues due to intermittency, - **The NREL Study indicates this is not a problem until we reach 20-30% RE integrations**
- Cost of additional plant required for use as reserve and for regulation. - **Storage will remove this barrier**
- **Lack of commitment . – Make it mandatory for the state monopoly to achieve the targets**

The whole world is moving in the right direction !!

Global storage deployments to hit 2,850 GWh by 2040, increasing 122-fold –(Bloomberg NEF)

renewables will account for almost 40% of the world's electricity by 2040,

<https://www.utilitydive.com/news/global-storage-deployments-to-hit-2850-gwh-by-2040-increasing-122-fold-b/560016/>

Gliricidia to Electricity The Role of Dendro



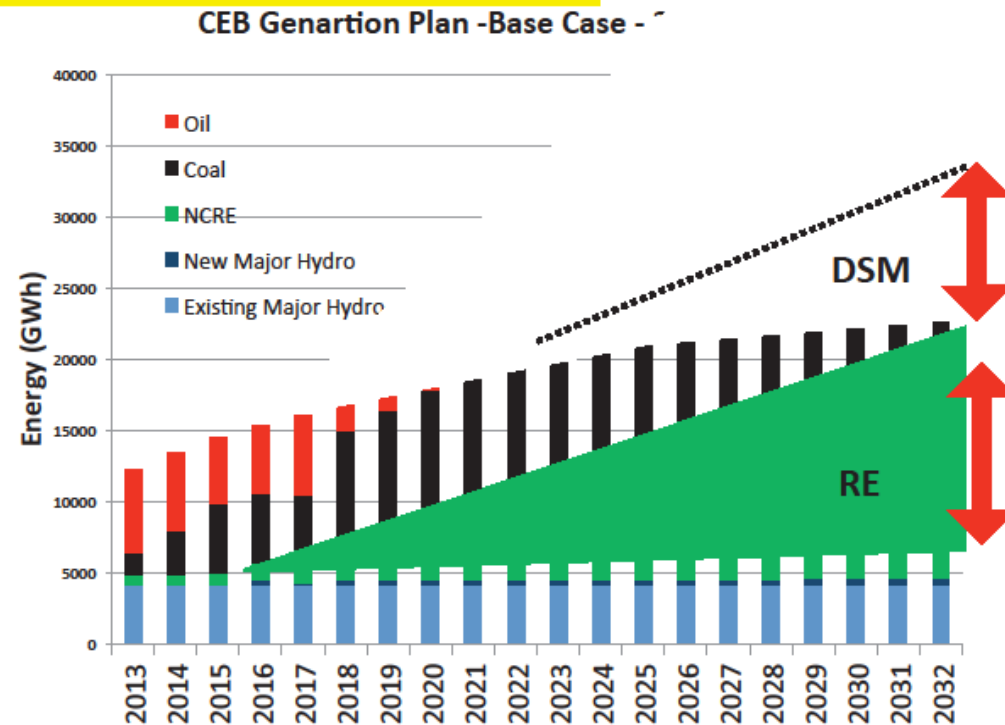
Multiple Benefits of Dendro Power which does not have any of these problems

- Firm power with Plant factor exceeding 80%
- Entirely indigenous fuel supply
- Massive cash inflows to the rural economy @ Rs 25 Million per MW annually
- Multiple Social , environmental and economic benefits
- Path opened for organic fertilizer and milk production
- The One Billion Gliricidia Tree program would have supported 500 MW
- Totally firm and dispatcheable electricity

DSM Potential - The priority Option

- In 2011 300 MW was saved with 65% penetration of CFLs
- The next target - LEDs and Efficient Motors. Refrigerators & ACs
- The projected potential saving by 2020 is 1997 GWH

CEB vs Govt. Policy



Source: CEB

Clean Coal?

- There is no such animal !!
- All we can do is to improve efficiencies and gain better specific fuel consumption.
- But the reduced amount of coal is as dirty as any
- Also this comes at a significant capital and operating cost
- Thus the myth of cheap electricity is even further from the truth
- **The [new Lazard](#) report puts the unsubsidised levelled cost of energy (LCOE) of large scale wind and solar at a fraction of the cost of new coal or nuclear generators, even if the cost of decommissioning or the ongoing maintenance for nuclear is excluded.**

What about gas ?

- The only positive attribute is that it is cleaner than coal
- At present the cost too could be cheaper than coal
- But a lot of infrastructure has to be in place before we can think of gas as an option
- The present plans on the LNG plants at Kerawalapitiya is a laugh
- No one knows for how long the plant will have to run on diesel and at what cost
- The Mannar Gas is an option for the future when the economies are right .

The Road Map – Further Action

Short Term Actions

- Provide the security for the present three systems under Net Metering until the 1000 MW target is reached. This can be achieved before 2023
- Promote the addition of Battery Storage for existing and new net metering systems by removing the duties and other levies on imported deep cycle batteries – Presently over 100% addition
- Promote the use of battery stored energy during the peak hours
- Ensure CEB supports this by clearing any bottle necks for grid connections
- Obtain the services of Diesel Generators presently with the State and Privates sector as an interim measure instead of costly emergency power

Medium Term Actions

- Remove the blockage by the CEB on development of 88 MW of Dendro Power and 150 MW of Mini Hydro since 2016
- Release the permits for 1500 MW of Solar Park projects already with the SLSEA
- Continue the present NCRE system for solar parks until 2023 up to 1000 MW installed capacity. Provide adequate FIT for battery storage on such parks.
- Establish transparent and proactive tender specifications and procedures for larger Solar Parks already identified. Make adequate Battery Storage mandatory

Medium Term

- Recognize the synergy between agriculture and Dendro Energy and promote cultivation of Gliricidia to enhance the rural economy
- Encourage Electrical Vehicles by removing the unfair duty and couple with solar roof top to make both transport and electricity independent of the state involvement
- National energy planning to be done independently for its economic , social and environmental benefits , rather than the financial considerations of CEB only -Perhaps by the National Planning Dept/ covering all forms of energy not limited to electricity

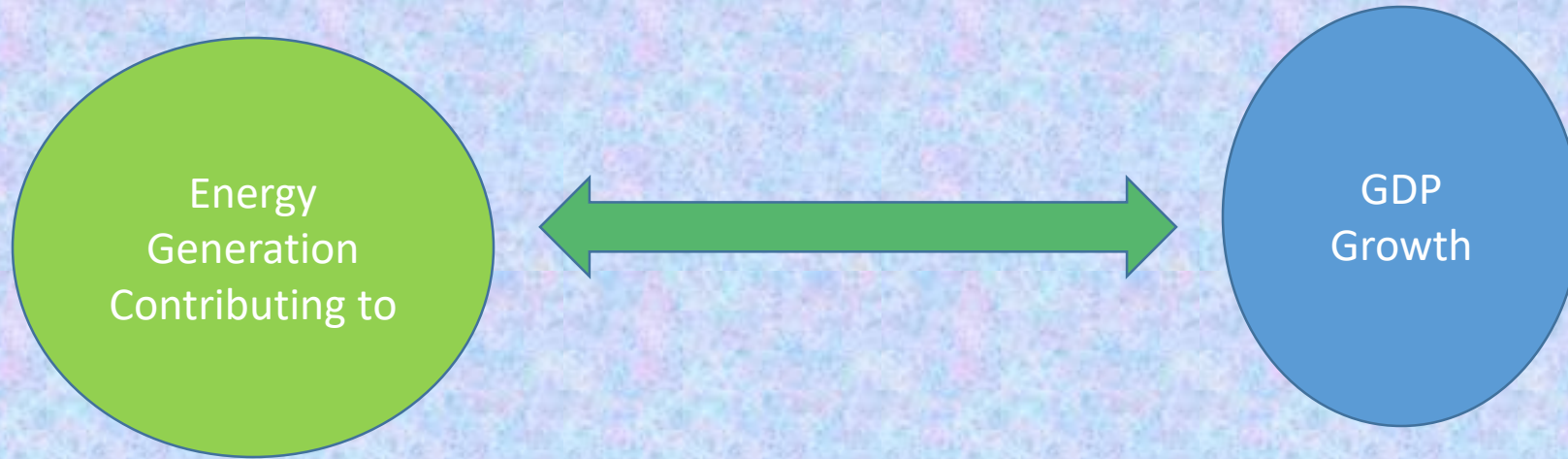
Long Term

- We need to be independent (non dependent) of imported energy at least by 2040
- Energy Industry by itself to be a driver of the GDP Growth
- Board Base the contributors to this industry by pursuing the concept of “Prosumers”
- Set challenging targets for electrification of all transport
- Plan for an electric economy covering all forms of energy generation and consumption
- Let the Utilities be made responsible for achieving the targets including the intermediate targets
- Make use of the private sector involvement with strict and transparent regulation through the PUCSL

The Ground Reality

- There has to be a clear National Policy on Energy (not only on electricity) with time bound targets and goals
- The Ministries and State owned agencies and monopolies CEB, SEA,CPC has to be given the mandate to achieve the time bound targets.
- The means of achieving them should be subject to clear consultation with all stake holders who can contribute positively
- **The overarching need is the national interest**

A New Paradigm needed



The Potential Target contribution

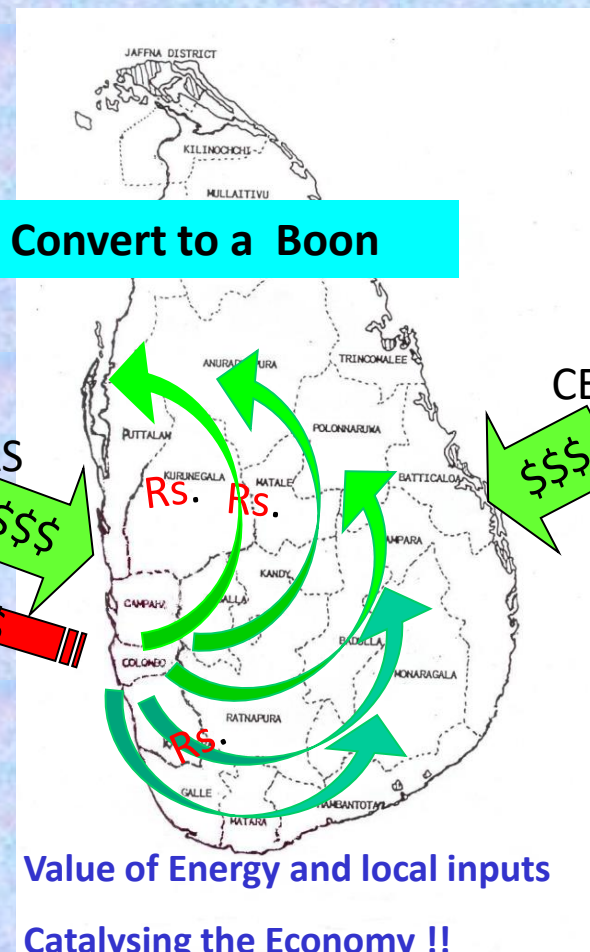
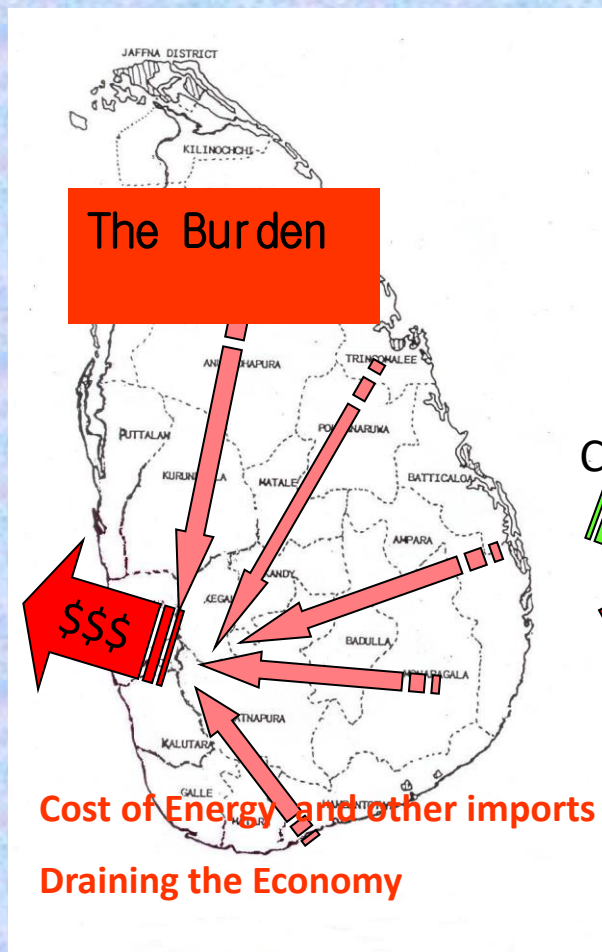
US \$ Six Billion

Every Roof Top a Power Plant

Every Garden an Energy Plantation

The Consumer to be a "Prosumer"

Converting the Drain to a 'Spin'



Cost of Fuel Imports for Electricity and Transport
US \$ 6000 Million and will continue to increase

“Our Responsibility “ make Energy a consumers business

Let him too
participate and
benefit from
the energy
economy



**Future Energy Security is in
our hands.**

Let us make it happen !

Thank You