

<https://www.ft.lk/columns/Importance-of-renewable-energy-for-future-energy-security-and-economic-growth/4-758488>

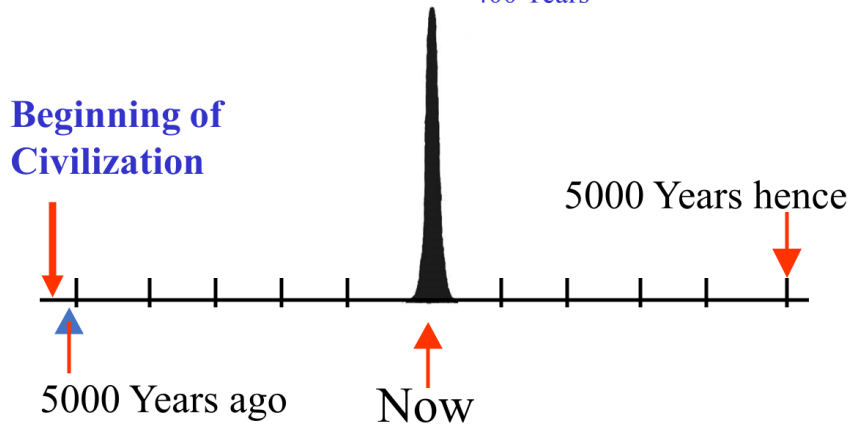
The Importance of Renewable Energy for Future Energy Security and Economic Growth

It is time Sri Lankans took time to consider in depth, the impact of energy on their day to day life and the national economy, as well as the sources of such energy, instead of leaving such matters entirely to the officials and the politicians to make all the decisions and later lament on the hardships passed on to the consumers due to the poor decisions, lacking any kind of wisdom or vision for the future. It is increasingly evident that rampant corruption and deal making are in place if the comments made even by the Supreme Court from time to time as well as the findings of the auditor general are considered. The fact that no pressure is applied to follow up on these allegations and to take action for the culprits to be brought to book, underscores both the lack of understanding and apathy of the general public, who have hitherto seem to believe that they have no role to play.

This is definitely not the case and the consumers must at least now understand that they have both the responsibility as well as the right to make the change necessary, not only for their own benefit but to the economic and environmental well being of Sri Lanka. With out delving in to the various commitments made by Sri Lanka in international fora to change over to Renewable Energy, to tackle the global threat of climate change, Sri Lanka must recognize that they have been trapped in the fossil fuel blip.

Mankind's use of fossil fuel

We too are trapped in the blip - Not wanting to get out ?
“ Renewable Energy - The Key to get out of the trap”



1/28/2024

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Successive administrations have chosen to ignore this sad situation and have opted to remain overly dependent on imported fossil fuels, which Sri Lanka can ill afford, and this is a major cause for the recent Forex and Economic debacle. The various policy statements and targets to make this change has so far remained a scam, if the reality on the ground and the ongoing actions by the authorities are any indication.

They have also chosen to ignore the dramatic changes in technologies already commercially exploited internationally, by trying to find none existent barriers for their adoption in Sri Lanka, without admitting their lack of competence to overcome them or perhaps even worse the desire to maintain the status quo for reasons best known to them.

The Abundant Renewable Energy Recourse of Sri Lanka

Many detailed reports are available on the commercially exploitable renewable energy resources that Sri Lanka has, with the greatest added advantage, that all of them are indigenous resources requiring no expenditure in foreign exchange. The vast resources of Solar and Wind energy are nature's gift to us with no fuel requirements. Even the Dendro Energy, most attractive being a firm source of energy available 24/7 throughout the year, uses only locally grown sustainable fuel wood. Thus the cost of fuel flows right back to the rural farmers with a multitude of other spin off benefits, too numerous to list here.

In summary the following are worthy of note

According to a study by the Sustainable Energy Authority,

Sri Lanka has a bounty of nature of

- The On Shore and Off Shore wind Potential – 102,000 MW
- The Solar Potential - 106,000 MW

- The ADB and JAICA reports a potential of
- Dendro Energy as - 2500 MW
(The Bio Energy Association predicts this to be - 4500 MW)

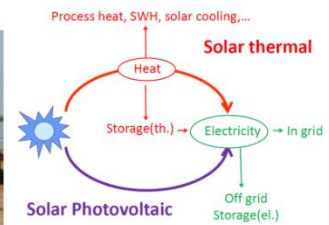
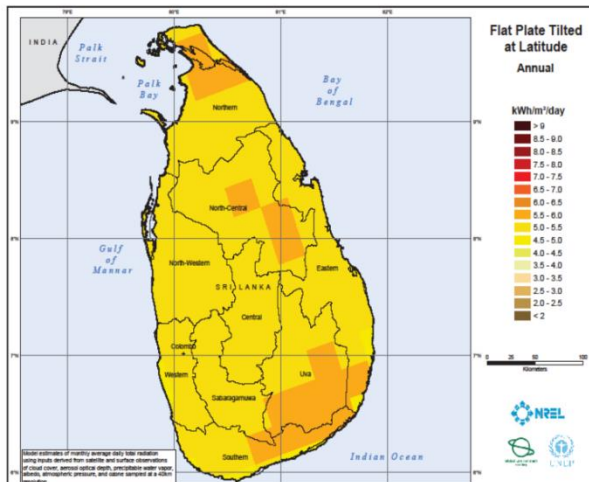
It is important to consider this potential in way of the energy out put as shown below

Resource	Capacity MW	Plant Factor %	Annual Energy GWH
Wind	102,000	35%	312,732
Solar PV	106,000	16%	148,600
Bio Mass	4,500	80%	4,184
Current RE Contribution 2022	2,200		8,562

Just two charts below are adequate to illustrate this

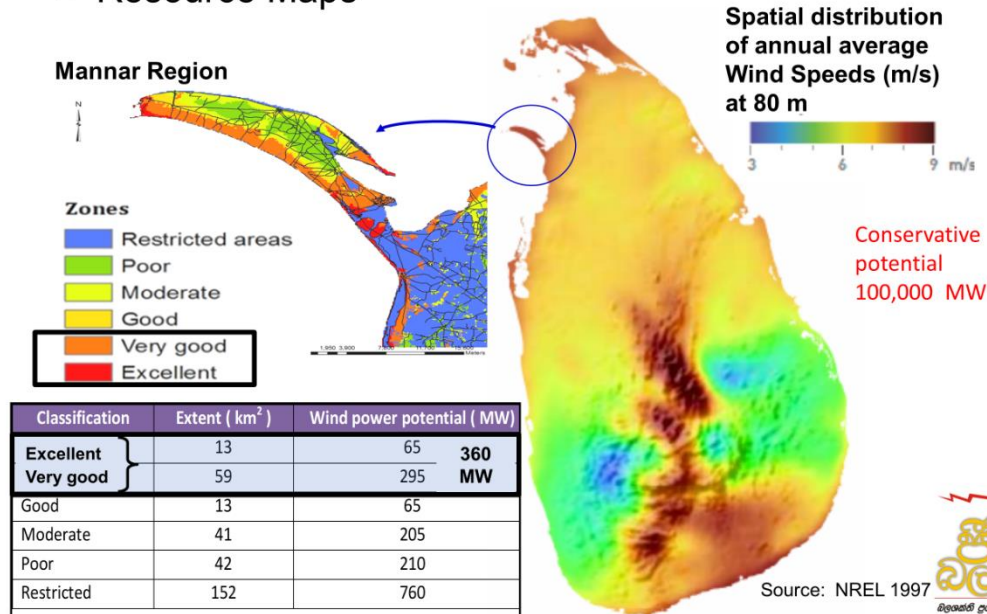
What About Sri Lanka ?

- Annual Electricity Demand 2020 15,000 GWh
- Solar Insolation @4.5 kWh/m²/day 106,762,500 GWh
- **We have at least 7000 times our need to play with**



WIND ENERGY RESOURCE

Resource Maps



Source: Sustainable Energy Authority.

I have chosen not to include the balance resources such as Major and Mini Hydro which have made immense contributions to at least keep Sri Lanka at present level of none dependence on fossil fuels. They would continue to do so even though the additions available may not be very large.

What is important is to view the above numbers against the predicted gross demand by 2030 when Sri Lanka is expected to reach a goal of 70% share of Renewable Energy for Electricity generation. This is only 27,300 GWh according to the latest Long Term Generation Plan vs the current 16,000 GWh

As such contrary to common held myth, Sri Lanka is an **Energy Rich** nation, but kept as a beggar sitting on a gold mine, due to the ineptness or otherwise of our energy authorities and policy makers.

Energy and National Security.

In present day world **Energy Security** constitutes an important factor for ensuring National Security much as

Food,

Health

Education and Defense

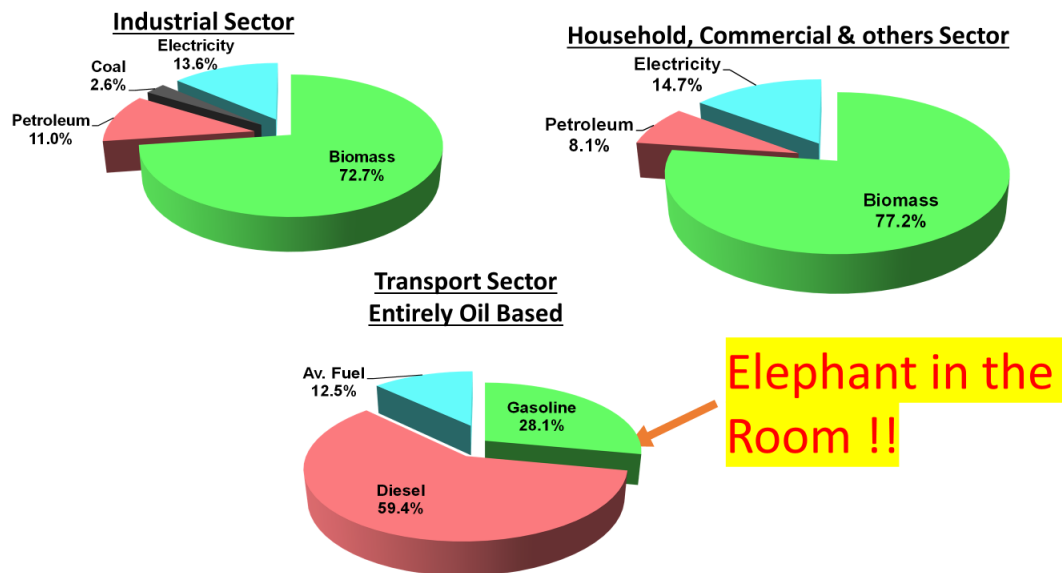
But future energy security cannot be guaranteed, if we are dependent on imported sources of energy such as Fossil Fuels including Oil, Coal and Natural Gas or even Liquid Petroleum Gas.

We have already seen the impact of this dependence in 2022 , with long queues even for the cooking fuels , LPG and Kerosene.

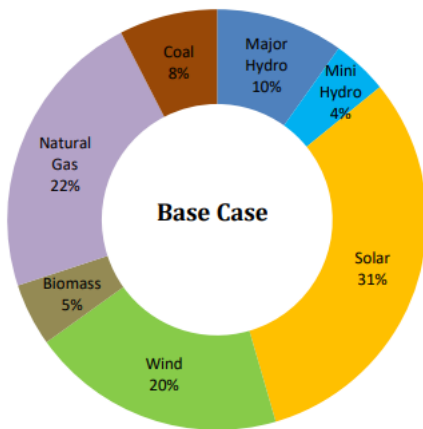
Another sorry situation in Sri Lanka is the emphasis on electricity alone which even now provides only about 12% of the total energy demand, in any discussion on energy. Thus the massive drain on foreign exchange for import of transport fuels remains below the radar and continues to drain the scarce dollars earned by the other productive sectors. This is one more area of the insensitive and irrational stance of the energy authorities, even when once more the ministries of Power and Petroleum are under one Minister.

On the other hand the engineers , technologists and the academia are at fault for not highlighting the fact that Electricity is the most desirable form of energy which can serve any form of energy demand. With our bounty of Renewable Energy resources for electricity generation, Sri Lanka is best placed to tread this path for the benefit of all, in particular for the Transport Sector, which is making vast strides all over the world. More Frogs in the Well? Or are there other agendas in play?

▪ Sectoral Energy Supply by Source -



In the meanwhile the CEB continues its journey of carrying old “Hana Miti “ by proposing to replace oil with LNG, forgetting that LNG is also a fossil fuel to be imported and there is absolutely no guarantee that it will be economical, both by way of the initial cost of infrastructure or the cost of energy in the years to come. Various numbers are cited by the CEB engineers and energy experts without any concern for the world trends. The insanity of predicting world prices for imported fossils fuels is clearly seen in their own data cited in the LEGP 2022-2043, when the current prices are compared with the past records they use as gospel. This is seen in the projected energy mix for 2030 submitted by the CEB, with a massive contribution expected by LNG.



Ref: LTEGP 2022-2043

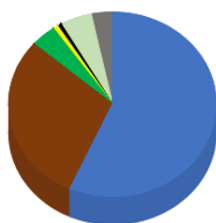
Need I say anything about the most lunatic proposal to being in Nuclear Energy ?

Why cannot we utilize the massive bounty of nature explained above. Happily, even with the present state of technology and level of private sector inputs, the initial positive steps have been taken. Even in year 2022, and 2023 we have reached the goal of 70% RE on some days as shown below even passing 80% on 13th January 2024.

DAILY ELECTRICITY GENERATION

Date: Monday, October 17, 2022

Total Energy	36.39 GWh	Peak Demand	1945.0 MW
• Renewable	25.60 GWh (70.36%)	• Renewable	1407.0 MW (72.3%)
• Fossil Fuel	10.79 GWh (29.64%)	• Fossil Fuel	538.0 MW (27.7%)

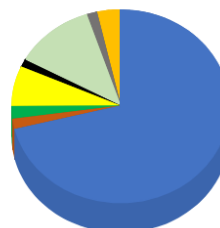


CEB Hydro	20.62 GWh
CEB Thermal Coal	10.79 GWh
CEB Thermal Oil	0 GWh
CEB Wind	1.46 GWh
SPP Solar ¹	0.28 GWh
SPP Biomass ²	0.23 GWh
SPP Minihydro	1.8 GWh
SPP Wind	1.22 GWh
IPP Thermal Oil	0 GWh

DAILY NET ELECTRICITY GENERATION

Date: Saturday, January 13, 2024

Total Net Energy	40.24 GWh	Peak Demand	2112.3 MW
• Renewable	32.68 GWh (81.21%)	• Renewable	1482.8 MW (70.2%)
• Fossil Fuel	7.56 GWh (18.79%)	• Fossil Fuel	629.4 MW (29.8%)



CEB Hydro	24.53 GWh
CEB Thermal Coal	5.75 GWh
CEB Thermal Oil	0.58 GWh
CEB Wind	0.73 GWh
SPP Solar ¹	2.31 GWh
SPP Biomass ²	0.43 GWh
SPP Minihydro	4.14 GWh
SPP Wind	0.53 GWh
IPP Thermal Oil	1.23 GWh

Of course this feat was possible with the increased contribution of Hydro Power which would not persist. But is there any reason why the reduced hydro contribution during the dry months cannot be replaced with other Renewables, particularly with Roof top Solar PV which can be deployed very rapidly and Wind, Solar Parks and Dendro projects developed in an accelerated pace, to cater for the increased demands in the coming years.

This effort could have a very significant impact not only on the energy security, but on the economy as well. Using the projections by the CEB on the energy mix for 2024, accepting the unit costs of generation used, the immense value of removing the oil based generation as a first step is illustrated in the two tables below.

Base Case 2024 From Presentation by DGM

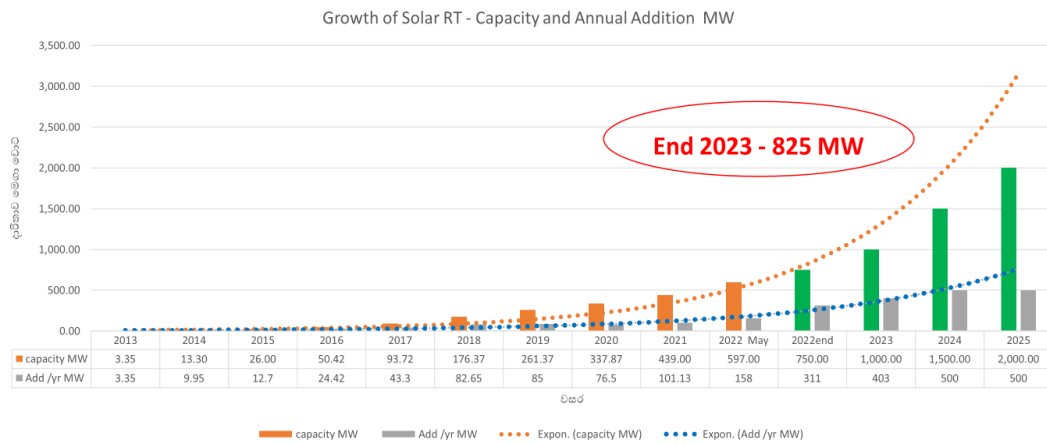
2024 Forecast		GWh	Rs/kWh	Cost Rs Mn
Energy Source				
CEB Hydro		4,417.70	4.50	19,879.56
Thermal Complex		1,994.50	63.00	125,653.50
coal		5,254.40	32.00	168,140.58
CEB NCRE		300.00	4.00	1,200.00
Private NCRE		2,169.00	26.00	56,394.00
Private Thermal		1,147.00	64.00	73,408.00
Roof Top Solar		750.00	32.00	24,000.00
Average Cost /kWh	29.23	16,032.60		468,675.64
Cost of Fin Trans. and Distribution				204,000.00
Total				672,675.64

Impact of Stopping all Oil Based Power Plants

2024 Forecast Ver 2		GWh	Rs/kWh	Cost Rs Mn
Energy Source				
CEB Hydro		4,417.70	4.50	19,879.65
Thermal Complex		0.00	63.00	0.00
coal		5,254.40	32.00	168,140.80
CEB NCRE		300.00	4.00	1,200.00
Private NCRE		3,300.00	26.00	85,800.00
Private Thermal		0.00	64.00	0.00
Roof Top Solar		2,500.00	32.00	80,000.00
DSM		-300.00	0.00	0.00
		15,472.10		355,020.45
Cost of Finance Transmission and Distribution				204,000.00
Total				559,020.45
The potential Saving				113,650.19

Thus a cost saving of **Rs 113.65 Billion** is possible for the CEB, by this means alone. While this can be done in steps , first by stopping all oil based IPP to start with, (The Embilipitiya Ace Power Contract is due to expire on the 24th of February) how soon the full benefit can be achieved depends entirely on the CEB and the Ministry. The required RE input can be forthcoming rapidly from the private developers, once more spear headed by the Roof Top Solar PV which is the fastest means, and the track record and potential are illustrated below.

The low hanging fruit – Roof Top Solar PV



These savings in cost can continue by adding more and more renewable energy projects to reach the target of 70 % by 2030 which would leave only the coal power plant to be the fossil fuel dependent plant, and without falling into the trap of LNG which is tantamount to falling in the same pit in broad day light.

The next tantalizing target is the electrification of the transport vehicles. To get the maximum benefit for this change a new industry to convert the existing serviceable light vehicles, Motor Cycles, Three wheelers and passenger cars can be initiated. Thankfully some companies have already ventured in to this enterprise starting with the three wheelers. The natural technical cleverness of our mechanics could thus be harnessed without fear of their losing their livelihood as traditional motor mechanics. Without much detail, even if electrification of 25% of the light vehicles are converted, we can minimize, the nearly USD 5000 Million spent annually for import of petroleum, products Petrol and Diesel . Please refer <https://www.bioenergysrilanka.lk/the-elephant-in-the-room/> for details

What is even more important is the added advantage to the motorists by installing the roof top solar panels and there by save the expense of both electricity and transport fuel. This will greatly improve the pay back on the investment on the Solar System and expedite the elimination of oil for power generation.

Vehicle to Load Energy Flow

While this technology has not taken root in Sri Lanka yet, this would open the possibility of the car battery serving as the source of power during any power cuts too without the need for special home battery systems. Happy to report that this system is available for me.

The Big Picture

The above comments has been entirely on the possibility of using sources of Renewable Energy , particularly Solar to gain none dependance on imported fossil fuels for the domestic energy, starting with electricity and the possibility of expanding to the transport sector as well.

However, as mentioned before we are sitting on the Renewable Energy Gold mine. The massive potential of both solar and wind can elevate Sri Lankan economy to overcome the present debt crisis as well as become the developed nation that the President promises by 2048, within this decade itself. Just as an indication consider tapping only a fraction of such bounty

Export Potential of Renewable Energy					
Source	Capacity addition Target by 2030 MW	Plant Factor Average %	Annual Energy Generation GWh	Potential Earning annually @ \$ 80 /MWh	
Solar PV	25,000	0.16	35,040,000	2,803,200,000	
Wind	20,000	0.35	61,320,000	4,905,600,000	
			96,360,000	7,708,800,000	

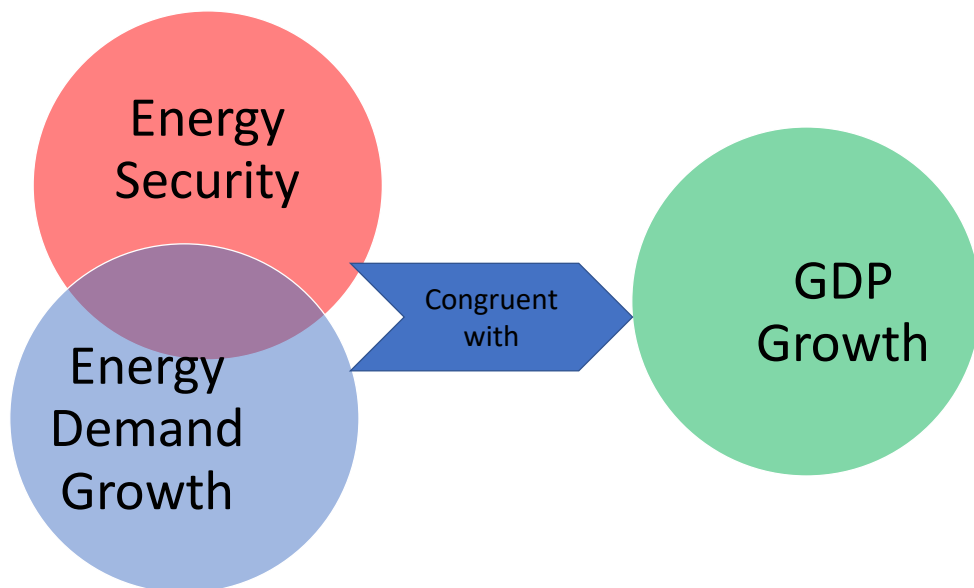
Consider this in relation to the sorry status that the Central Bank reports year after year



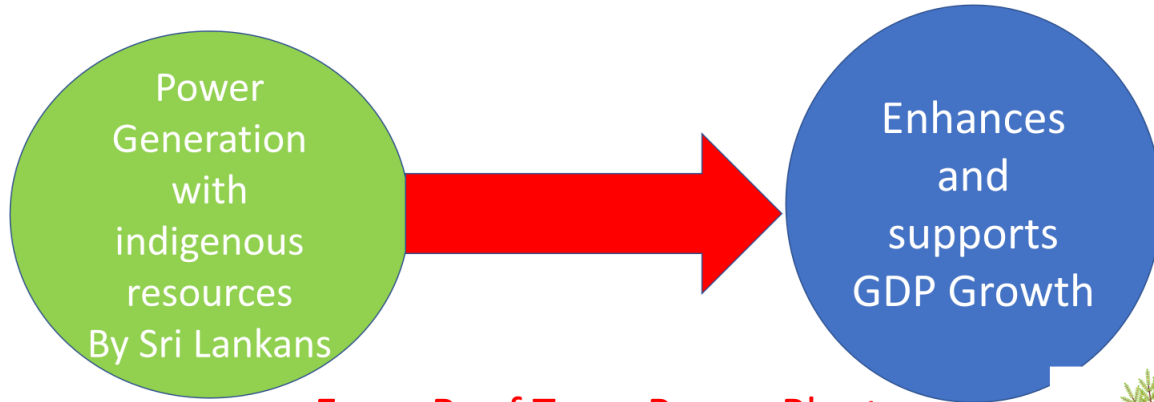
It was reported yesterday that while the treasury earned only Rupees Three Trillion during the year 2023, we are supposed to have spent Rupees Thirteen Trillion. This if only partly true gives goose bumps to any concerned citizen. No doubt a considerable amount would have gone into import of oil and coal, purely to support the political agenda to claim 24/7 power at what ever cost.

However, if this path is to be trodden, there is an immediate need for a paradigm shift in the way we look at Energy, as illustrated below.

The Conventional Wisdom !!



A New Paradigm !! The Energy Sector to be a Sri Lankan Industry



Every Roof Top a Power Plant
Every Garden an Energy Plantation
The Consumer to be a “ Prosumer”



1/29/2024

Perhaps even more important is to ensure the following policy initiatives by the governments to prevent this bounty being stolen (There is no other word) by foreigners. In fact this trend is already evident with active support of our energy authorities, even ignoring and subverting the existing laws which could have provided some protection. Therefore, we as citizens have to be most vigilant to prevent this happening so that we don't lose this new found resource, as all our primary products have been stolen over centuries, first by the colonials and now by our own people.

Some essential firm policy decisions are needed for a Secure Energy Future

1. **Energy is Sri Lanka's own asset and belongs to the citizens**
2. **Ensuring future energy security, depends on achievement of none dependence on imported fossil fuels and to be a Sri Lankan Industry, controlled and governed by Sri Lanka**
3. **While any foreign investments are welcome and encouraged to make the transition smooth and on target, there shall be no tariff paid in foreign exchange when the consumption is for local usage. They are welcome to repatriate the capital and profits under the prevailing BOI schemes.**

4. **Electricity industry should be viewed as a sector which can contribute heavily to the economy and GDP growth with employment generation, high level skills development and technical advancement.**
5. **The well recognized bounty of renewable energy should be developed as a means of earning foreign exchange, which is the segment to invite foreigners to invest in this sector , who can be paid in foreign exchange , while ensuring the fair share of the benefits to flow to the national economy as done by the middle eastern countries with their oil reserves.**

While the current thinking is on the transmission link to India, this may not be wise decision given the poor record of all our trade agreements. We are however fortunate that the new technology of **Green Hydrogen** is now available to convert our excess energy to an easily managed energy form, not dependent on expensive and vulnerable transmission lines.

While the chances of our leaders having the wisdom or the national interest to ensure the above, are remote, it is our duty to initially adopt the earlier mentioned steps which will at least diminish the present balance of trade woes, we need to be vigilant to prevent any steps being taken by the Politicians by short sighted laws and regulations to barter away this national wealth.

The oft repeated excuse of needed foreign investments is no excuse. The Middle East used foreign investments to develop their oil and gas resources, but ensured that their fair share was ensured to become a powerful economic force. That is because their rulers had national interests as the primary objective. Can we even hope for that in Sri Lanka?

In the meanwhile the present 850 MW, of Renewable energy development plus 815 MW of Roof Top Solar was done entirely by Sri Lankans. There is no reason why this cannot be doubled and tripled in the next few years, particularly in the roof top Solar PV sector. The Sri Lankan Banks could be of great help with the now reduced rates of interest. It is encouraging that some banks have already offered some programs for the domestic solar PV. They can extend such schemes to larger projects to their advantage.

Under the present circumstances when Sri Lanka continues to spend for imports way above its Forex earnings, thus increasing the debt burden and the chances of any viable economic revival, the energy sector developed by the private sector, is the only short term option to reverse this trend.

This invitation is to both individual householders as well as Sri Lankan entrepreneurs to embrace this new opportunity , which under the present financial condition will prove to be a most attractive investment with payback of less than 4 years, with or without the active support of the State.

I will be happy to share the workings with any one interested

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29th Jan 2024