

Candles, Carbon Tax and Surya Bala Sangramaya

There shall be power cuts in 2017. So says our self-proclaimed energy experts, both inside and outside the CEB. While the blame for this calamity has been assigned by them as the cancellation of the Sampur Coal power plant, conveniently ignoring the fact that, the Sampur Power Plant would not have been commissioned even in 2021. However mother nature has not been kind to us in Sri Lanka in year 2016, and may continue to be less accommodating even in 2017. The onset of periodic draughts triggered by the El Nino, and La Nina phenomena is nothing new to us in Sri Lanka, and only we can be blamed for not planning properly to face the consequences.

This issue was highlighted by the author back in April 2016 by “Are Your Ready for the Next Black Out” <http://www.bioenergysrilanka.lk/content/are-you-ready-next-blackout> or even earlier in 2013 titled “Ignore the Sun and Miss Another Bus”. <http://www.bioenergysrilanka.lk/content/ignore-sun-and-miss-yet-another-bus>

While possible measures were spelled out therein, as usual the “Experts” continue to harp on more and more coal power plants. The only advice they can give the consumer now is to stock up with candles.

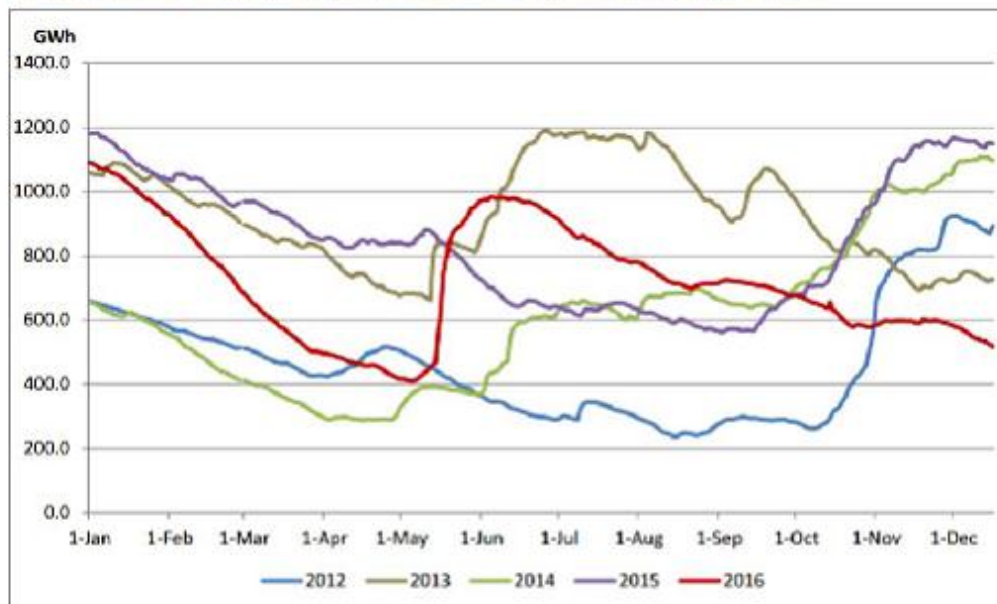
Perhaps it is forgotten that we faced a similar crisis back in 2012, when the rains failed and the reservoir levels dropped drastically.

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http://www.pucsl.gov.lk/english/wp-content/uploads/2016/12/Generation-Report_19-12-2016.pdf

Comparison of Total Reservoir Storage Levels with Past Years

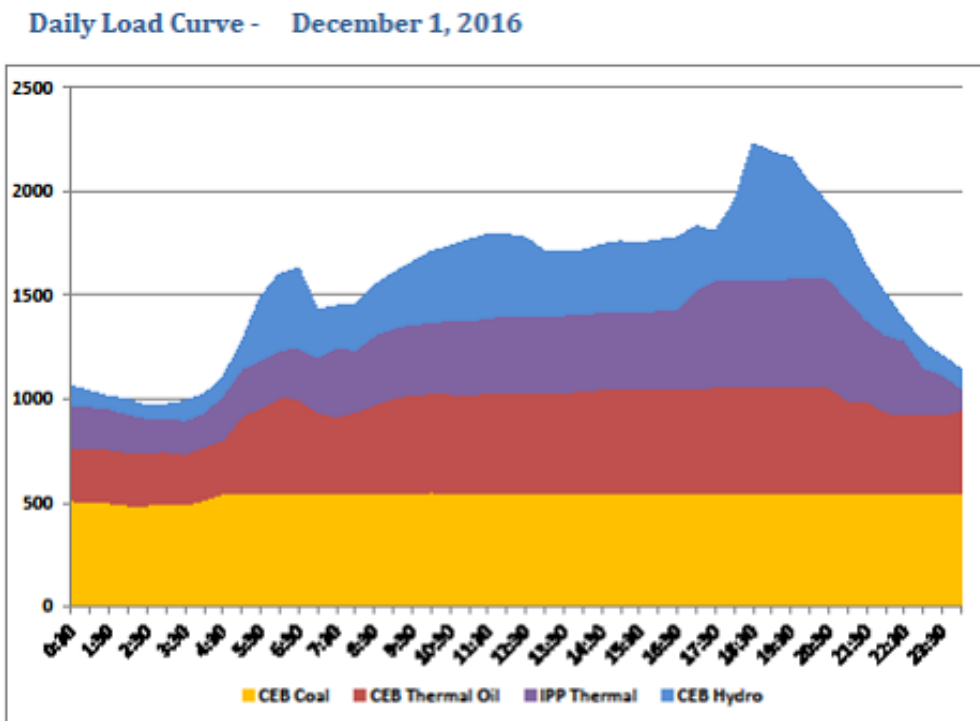


It is seen that the situation now is even worse than that of 2012. However, there was early recognition of the problem in 2012 and there were concerted efforts to educate the public to reduce consumption and wide media coverage on the issue, which successfully averted the need for power cuts or any significant dependence on expensive oil based power generation.

There has been no such effort made this year other than lamenting on the cancellation of Sampur. Thankfully there is still room for electricity consumers themselves to take pro-active measures, to face the impending crisis, rather than stocking up with candles as advised by the foremost expert on electricity.

Let us look at our own options

The generation mix for the month of December 2016 shows shares contributed by all sources of energy throughout the day



The PUCSL has worked out the different scenarios based on the level of rainfall in their “Briefing Note – A Power Supply Situation December 2016 – March 2017” available in their web site www.pucsl.gov.lk

Accordingly, a minimum 500 MW of hydro power is needed to meet the night peak demand. Further with the inevitable dry weather from January to March, the hydro power utilization will need to be limited to 6 GWh per day. The PUCSL data indicated that this has been consistently higher during the month of December, perhaps due to the non-availability of Unit No 1 at

Norochcholai. For the period Jan to March it is essential that the unit No 1 of Norochcholai coal power plant should be on line by the 1st January 2017 and all other thermal power plants should be operational. Thankfully the Unit 1 has come back on line by Mid January. Please see PUCSL note on recommendations in their web site. Of course all three units of the coal power plant should remain healthy.

However, going by the experiences the consumers have faced in the past, there is more than even chance that the predicted power shortages will occur.

So what can the consumers themselves do?

The answer is evident. The PUCSL briefing note and a look at the daily demand curve points the way. A positive contribution by individual consumers of all levels, will not only release them from the vagaries of power cuts to some extent, but a sufficient number of such interventions will provide some relief to the much besieged CEB.

The reality is that when the rains fail, the sun shines and in case of Sri Lanka for nearly 12 hours a day and ever so brightly. The expectations of the PUCSL can be met by Solar generation during the day time hours instead of the continued use of hydro resources even during the day. The constant excuse by the CEB that they do not have total control over the hydro reservoirs is not defensible and will not be discussed here as it is totally misleading.

So let us make electricity when the sun shines and stock up with electrical energy.

Surya Bala Sangraamaya - SBS

The Ministry of Power and Renewable Energy has launched the most laudable Surya Bala Sangraamaya, which underscores the appreciation of this vast and most benign resource, hitherto ignored by the CEB and even now being actively discouraged by the CEB, dishing out lame excuses. It is reported that the CEB is reported to be ready to accept only 60 MW of Solar. It is a great wonder if, even in this age of omnipresent World Wide Web and the plethora of sources of information, the nearly 1000 highly qualified engineers at the CEB are unaware of the vast strides made by technology to overcome the kind of problems cited by the CEB, as the reason for not accepting a much larger contribution of Solar Energy to the National grid.

However, fortunately for Sri Lanka the Surya Bala Sangraamaya has already made an impact. It has already empowered at least the high end domestic consumers to embrace the net metering scheme with renewed vigor, further encouraged by the provisions of the Net Accounting System. There is also evidence that the industrial consumers with significant areas of sunlit roof spaces, are making use of the opportunities offered under the Net Plus scheme. If a significant number of these categories of consumers do implement their plans, then the expectations of the PUCSL to limit the use of Hydro reserves during the day time hours will be achieved to some extent, and hopefully to ensure that the lights can be on during the peak hours.

But the vast majority of the domestic consumers , whose lighting load is the major contributor to the peak period electricity demand, are unable to become the foot soldiers to win the Surya Bala Sangramaya, however willing they would be to help avert the impending calamity. Their level of consumption and the monthly electricity bill are not adequate to recover the capital required for even the smallest Solar PV installation for decades, thus eliminating any potential to venture into the net metering scheme. The same could be said for the Net Accounting and Net Plus schemes too. . However, the national benefit by encouraging this segment of consumers to join the Solar battle needs to be evaluated correctly. This would highlight the fact that each self generated unit of electricity by these consumers with monthly consumptions up to 180 units per month, saves money for the CEB as shown below.

Table 1 – Domestic Sector Consumer Tariff

Category Units per Month	No of Consumers millions	Energy Consumed annually GWh	Tariff (in 2015)	Fixed Charge per Month
0-30	1.163	233	2.50	30.00
31-60	1.341	756	4.85	60.00
0-60			7.85	nil
61-90	1.109	1,018	10.00	90.00
91-120	0.507	666	27.75	480.00
121-180	0.344	588	32.00	480.00
181-600	0.139	492	45.00	540.00
>600	0.007	100	45.00	540.00
Total	4.61	3,853		

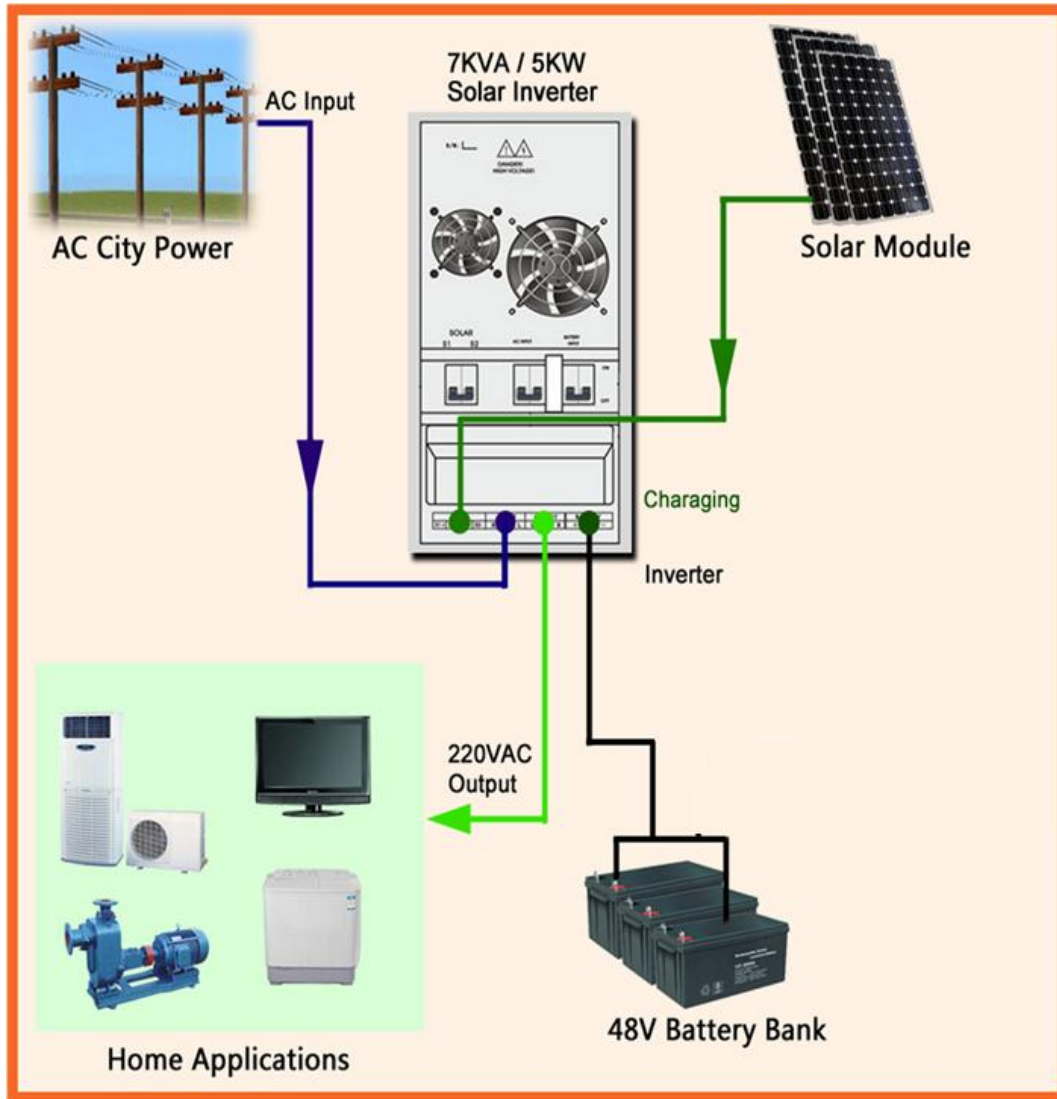
Table 2- Average Potential Saving to CEB per kWh

Category kWh/Month	Energy Charge	Average Energy Charge Rs./kWh	Cost of generation 2014 Rs./kWh	Saving per Unit
60	291	4.85	19.97	15.12
90	591	6.57	19.97	13.40
120	1423.5	11.86	19.97	8.11
150	2256	15.04	19.97	4.93
180	3216	17.87	19.97	2.10

Note : The cost of generation as per CEB statistics of 2014 is used. This is reportedly lower in 2015 with high hydro availability, but would have reversed in 2016.

However, to garner the highest benefit to there needs to be some battery storage, so that the solar energy of the day can be used at night.

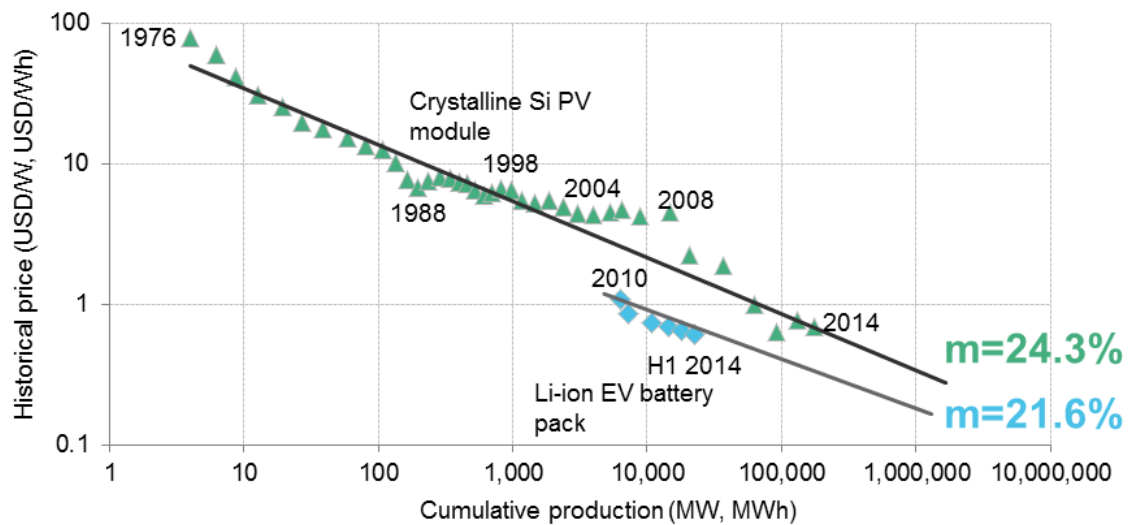
Simply stated, this involves the addition of battery storage to all rooftop Solar PV systems. A minimum storage capacity would be to meet the specific consumer's needs during the peak hours of 6.30 PM to 10.30 PM, when the national grid is loaded to the maximum.



The numbers will need to be matched to individual consumer requirements.

The first reaction to such a suggestion would be that the cost of battery storage is prohibitive. While this is a reasonable reaction, even to date, the market situation is changing so rapidly. Those who have already installed the net metering systems would be a ready and willing market segment to initiate this process. The continuing reduction of Solar PV prices is repeated in the storage market too.

LITHIUM-ION EV BATTERY EXPERIENCE CURVE COMPARED WITH SOLAR PV EXPERIENCE CURVE



Note: Prices are in real (2014) USD.

Source: Bloomberg New Energy Finance, Maycock, Battery University, MIT

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Until the world market trends are reflected in Sri Lanka, there is the need for an intervention by the Sustainable Energy Authority, the agency responsible for formulating the SBS to accelerate this pace of cost reduction, perhaps by advocating the removal of some levies at the point of import, not only on the solar panels but on other essential accessories. The recent budget has provided some measure of comfort by offering a 50% rebate on the interest charged on loans taken for Solar installations up to maximum of Rs 150,000.00 It is hoped that this proposal is implemented very early.

The segment of consumers in the range 90 – 150 units per month are the most likely group that can be drawn in to the SBS scheme, if the financing scheme is tweaked to enable them to recover the investment well within the 7 year high FIT regime. The statistics indicate that the number of consumers in this cohort exceed 3,000,000 in number consuming approximately 2500 GWh annually. If even 50% of these consumers install 1 kW capacity Roof top solar systems, the benefit to the national grid and the CEB is easily calculated.

No of Consumers 1,500,000

Average Capacity of Roof top Unit 1.0kW

Annual solar Energy generated @ 4.0 kWh/kW per day 2,190 GWh

Value of savings to CEB by avoided generation @ Rs 19.97/ kWh Rs 43.73 Billion

There may be some arguments on the above method of calculation of the savings by citing the loss of revenue to the CEB by the reduced sales. But the numbers are highlighted to illustrate that :

- The saving to CEB is greater by avoiding costly oil based generation both during the day directly and by saving the hydro resource for use during the peak hours whereby the actual savings could even be higher by using hydro resources rather than oil.
- The potential to postpone any additional generation capacity.

How can this transition be achieved? Carbon Tax to the rescue

The title of this article included the issue of “Carbon Tax” already in place in many countries, but being discussed for the first time openly in Sri Lanka, and with a welcome intervention in the national budget. The extract from the 2017 budget speech states

Quote ...

Carbon tax

474. Honorable speaker, I propose to introduce a Carbon Tax for all carbon fuel run motor vehicles. The emission test fee also will be included in the Carbon Tax. The Department of Motor Traffic will be the collecting authority of the Carbon Tax. Unquote.

However, what is most important is for what purpose the revenue collected from such a tax would be used for and how transparently the funds collected are managed. In this respect it should be recalled that the provision for charging a cess or a carbon tax on fossil fuels (not limited to oil as envisaged by the Hon Minister) has already been incorporated in the Sri Lanka Sustainable Energy Act No 35 of 2007 (section 45 of the Act) [http://www.energy.gov.lk/sites/default/files/files/SLSEA%20Act-E\(3\).pdf](http://www.energy.gov.lk/sites/default/files/files/SLSEA%20Act-E(3).pdf)

While the intension and importance of this clause is quite clear, over the last nine years no action has been taken to implement its provisions. Now that the Hon Minister of Finance has complied with the requirement of bringing this to the notice of the Parliament as required under Section 45 Sub Section 3, there is no reason why the required Gazette not be published to enact the provision.

How such funds are to be utilized for the intended purpose is also clarified in the SLSEA Act Clause 46 on the establishment of a Sustainable Energy Fund and its deployment.

Nothing could be more comprehensive and so closely tailored to the current requirements of funds to get Sri Lanka out of the hole it has allowed the relevant agencies to dig with impunity.

As such the ball is now in the hands of the consumers to ensure that they are not forced to stay in the dark. However, the Ministry of Power and Renewable Energy has a big role to play by enabling the deserving consumers to access the funds and facilities which can be mobilized as pointed out above. The Ministry has to crack the whip to ensure that the agencies under the Ministry do their duty for the benefit of the country, rather than pursuing their private agendas or at least are not allowed to block the initiatives of the consumers in the right direction for over all national benefit.

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