

SECURITY OF ELECTRICITY SUPPLY

April- June, 2017

Date of Report: April 13, 2017

PUBLIC UTILITIES COMMISSION OF SRI LANKA



A Summary Results

- The average inflow to the major hydro reservoirs during April 1-April 11, 2017 is about 4.7 GWh per day. If this level continues/ improves during April- June period, the energy supply will be sufficient to meet the demand, even in outage of one 270 MW Plant (Graph C-4)
- Even if the demand in month May grows by an additional 5% (therefore 11% growth compared to April), due to expiration of Self-Generation scheme, energy supply will be sufficient to meet the demand. (Graph E-2)
- However, if the inflow levels are close to the lowest inflow levels received during the respective months in last five years, there is a risk of energy supply being insufficient if a 270 MW plant becomes unavailable during the entire period (in addition to the plants scheduled for maintenance). (Graph D-2)
- If low inflow scenario and additional 5% demand growth in May taken place simultaneously, if one 270 MW plant become unavailable more than 50% of the time (in addition to the plants scheduled for maintenance), there is a risk of energy supply being insufficient to meet the demand. (Graph F-3)

B Basis of Analysis

		Forecast as per the report on		Basis of the revised forecast	
		April 6, 2017	April 13, 2017		
1	Demand growth compared to the previous month (%)	April	-5.1%	-5.1%	2016 data
		May	6.0%	6.0%	2015 data
		June	1.0%	1.0%	2015 data
2	Weekend demand compared to weekdays (%)	Saturday	95%	97%	Actual (March 13-April 9)
		Sunday	82%	87%	
3	Day time NCRE Contribution (MW)	April	70	70	2014 data and considering recent solar plant additions
		May	130	130	
		June	200	200	
	Peak and Offpeak time NCRE contribution (MW)	April	60	60	
		May	120	120	
		June	190	190	
4	Average inflow to Major Reservoirs(Inflow= Major Hydro Generation- Major Reservoir drawdown) in GWh/day	April	6	4.7	Actual April 1-April 11
		May	6	4.7	Assuming minimum inflow of March&April inflow level can be expected in May-June).
		June	6	4.7	
5	Minimum daily Major Hydro dispatch requirement (MWh)	April- June	3.1	3.7	Actual April 1-April 11
6	New Thermal Capacity additions expected (MW)	April	0	0	It is assumed that 100 MW ACE embilipitiya plant will continue operation after April 6, 2017
		May	0	0	
		June	0	0	

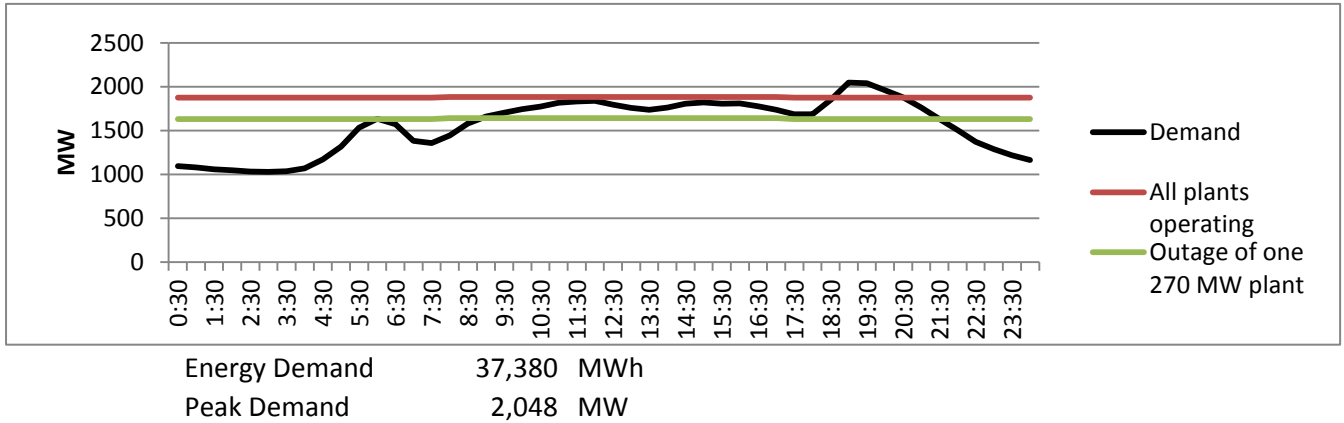
7 Major Thermal Plant availability(source: CEB)				
	Capacity	April	May	June
LVPS Coal I	270 MW			
LVPS Coal II	271 MW			
LVPS Coal III	272 MW		Week 4	Full month
KCCP	165 MW		week 3,4	
Westcoast	270 MW	week 4	week 1-3	
Sojitz	163 MW			
ACE Emb	100 MW			
KPS GT 7	115 MW			
		Unavailable Plants		

C Analysis

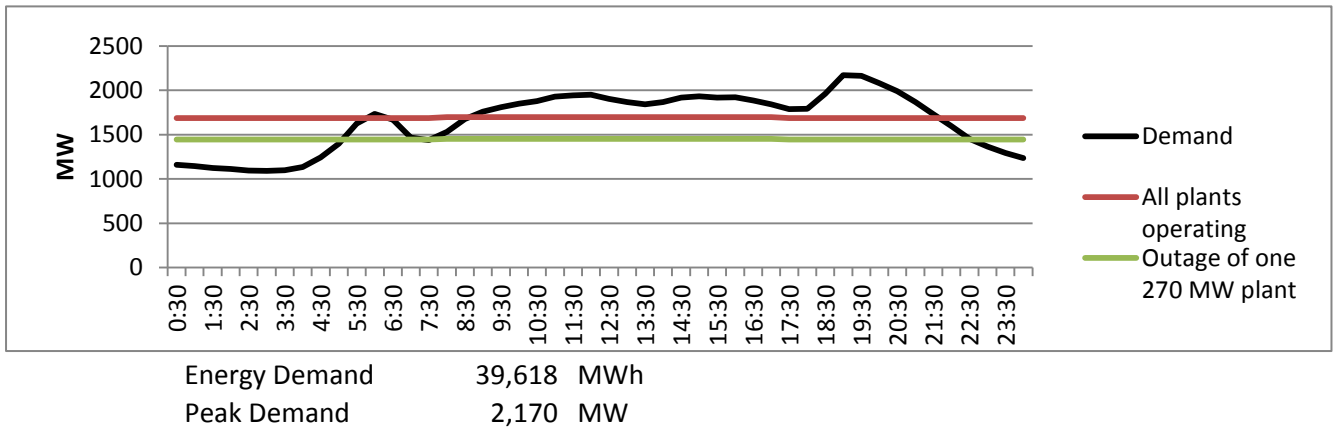
C-1 Average weekday demand curve and Thermal Plant Availability

Weekday demand curves are estimated considering average weekday demand curve in March 2017 and demand growth forecast in B (1)

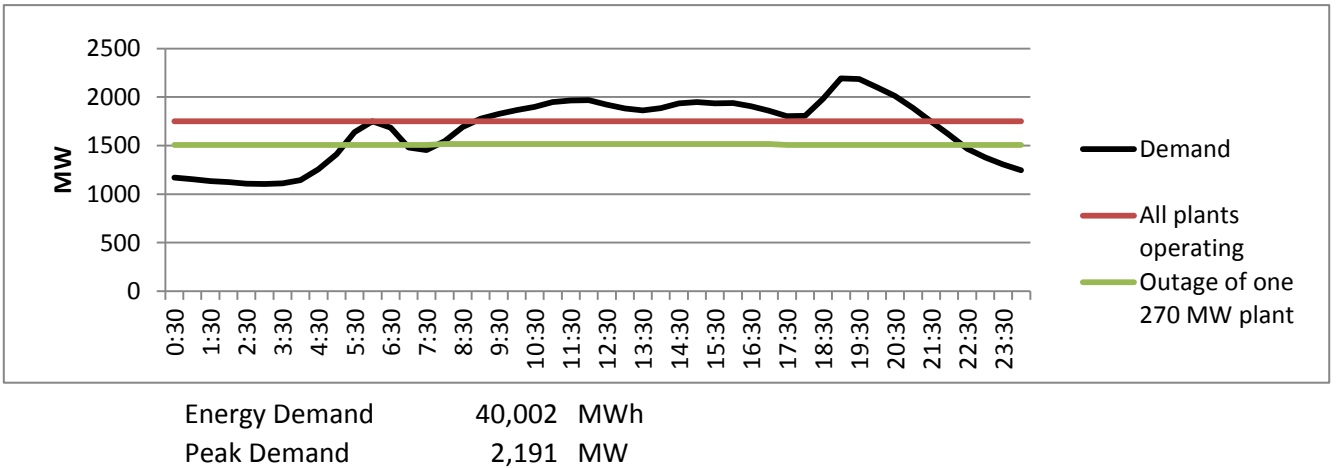
April



May



June



It can be observed that the thermal plants alone cannot meet the daily demand. Such deficit need to be provided with Hydro generation

C-2 Assessment of Daily hydro energy requirement

Minimum Daily Hydro Dispatch 3,700 MWh (Section B. 5)

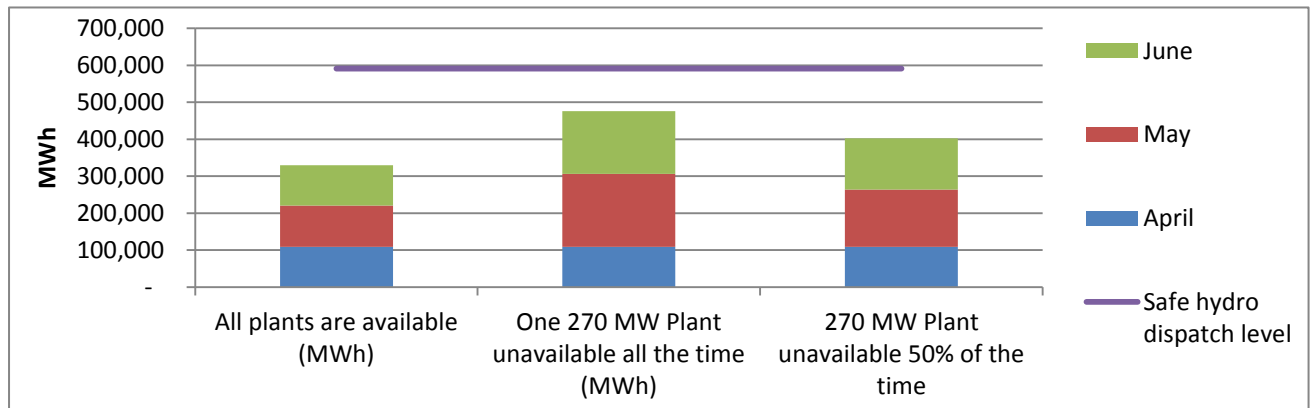
Hydro requirement		All plants are available (MWh)		One 270 MW Plant unavailable all the time (MWh)	
Month	No of days/month	Perday	Per month	Perday	Per month
April	30	3,700	108,632	3,700	108,632
May	31	3,700	112,332	6,511	197,660
June	30	3,700	108,632	5,775	169,559
		Total	329,596	Total	475,851

C-3 Assessment of Daily Hydro Energy Availability

Reservoir Level at March 31, 2017	463,000	MWh
Minimum Safe Reservoir Level	300,000	MWh
Inflow/day	April	4,700 MWh
	May	4,700 MWh
	June	4,700 MWh

Safe daily hydro dispatch level	6,491	MWh
Safe hydro dispatch level for the 3 months	590,700	MWh

C-4 Graphical representation of Hydro energy requirement under different plant availability scenarios and Safe hydro dispatch level (MWh)



C-5 Observations

The energy supply in the country will be sufficient to meet the demand, even without one 270 MW plant.

C-6 Uncertainties in the above calculation

- a Variations in inflow level: The actual inflow may become lower than the assumed level of 6 GWh/day.
- b Variations in demand growth: This analysis is conducted considering the contribution from Self-Generation scheme as a negative demand. However, the scheme expires in April 30, 2017. Hence, demand in month May, may become higher than the assumed growth of 6% compared to month April

D Analysis of security of energy supply under low inflow levels

Lowest inflow levels received in past 5 yers

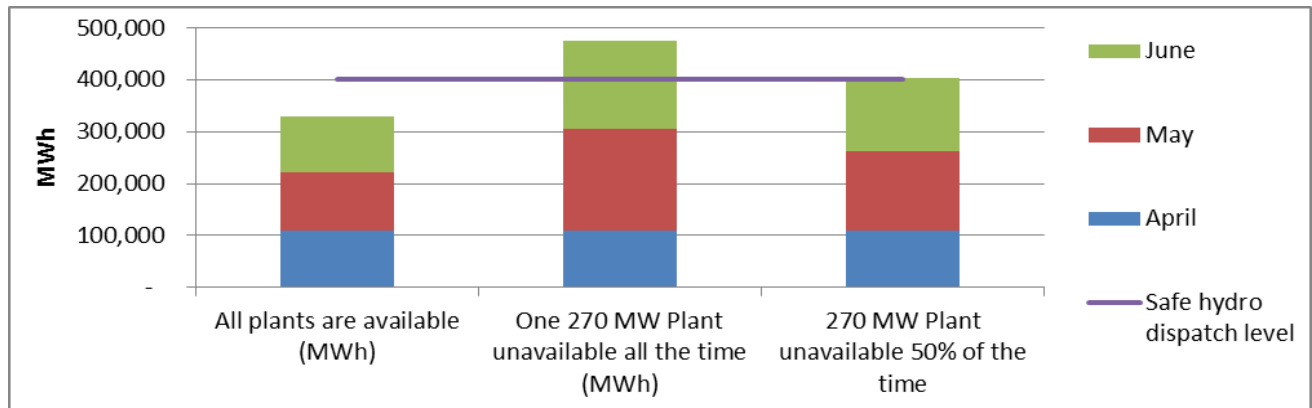
April	4.1 GWh (in 2016)
May	1.7 GWh (in 2012)
June	2.1 GWh (in 2012)

D-1 Revised Assesment of Daily Hydro Energy Availability

Reservoir Level at March 31, 2017	463,000	MWh
Minimum Safe Reservoir Level	300,000	MWh
Inflow/day	April	4,100 MWh
	May	1,700 MWh
	June	2,100 MWh

Safe Daily Hydro Dispatch	4,414	MWh
Safe Hydro Dispatch for the 3 months	401,700	MWh

D-2 Revised Graphical representation of Hydro energy requirement (MWh), for low inflow levels



D-3 Observations

If the inflow levels are close to the lowest inflow levels received during the respective month in last five years, there is a risk of energy supply being insufficient if a 270 MW plant become unavailable during the entire period (in addition to the plants scheduled for maintenance).

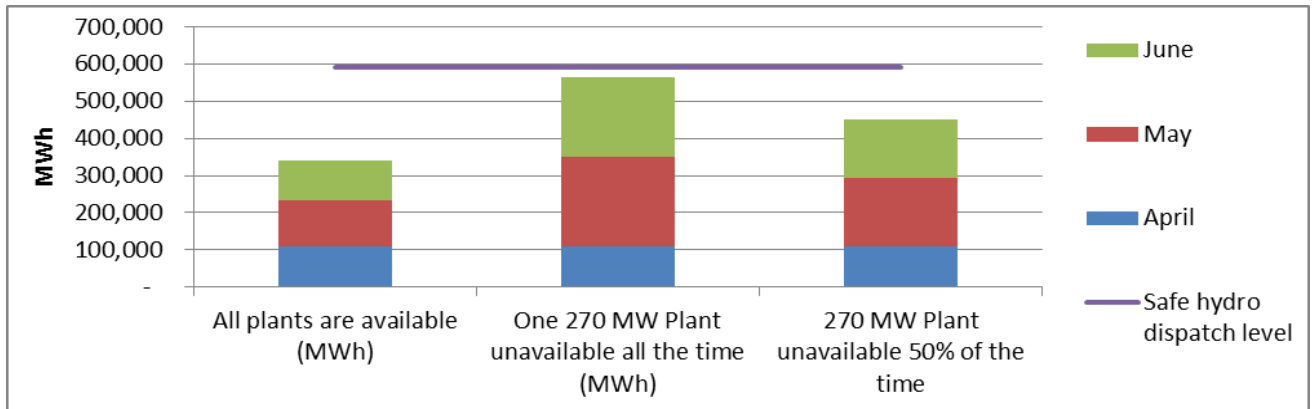
E Analysis of security of energy supply in case of demand in May grow by additional 5% compared to April due to expiration of Self-Generation scheme

Revised demand growth in
May(compared to April) 11%

E-1 Revised assesment of Daily hydro energy requirement for 11% demand growth in May

Hydro requirement		All plants are available (MWh)		One 270 MW Plant unavailable all the time (MWh)	
Month	No of days/month	Perday	Per month	Perday	Per month
March	31	3,700	108,632	3,700	108,632
April	30	4,065	123,409	8,024	243,612
May	31	3,700	108,632	7,237	212,470
		Total	340,673	Total	564,714

E-2 Revised Graphical representation of Hydro energy requirement (MWh), for high demand growth in May



E-3 Observations

Even if the demand in May increased by additional 5% compared to April, the energy supply will be sufficient to meet the demand

F Analysis of security of energy supply if both low inflow and high demand in May occurred simultaneously

F-1 Assessment of Daily hydro energy requirement

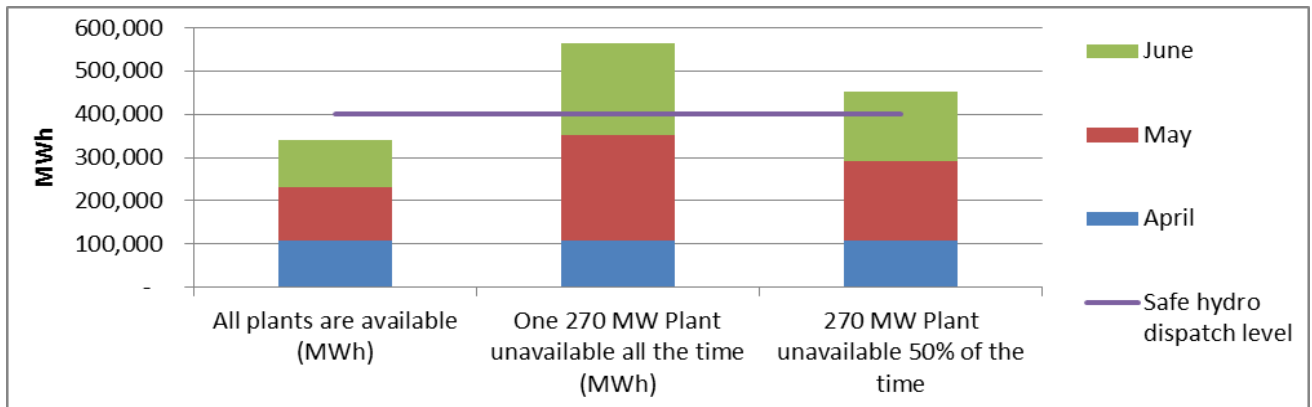
Hydro requirement		All plants are available (MWh)		One 270 MW Plant unavailable all the time (MWh)	
Month	No of days/month	Perday	Per month	Perday	Per month
March	31	3,700	108,632	3,700	108,632
April	30	4,065	123,409	8,024	243,612
May	31	3,700	108,632	7,237	212,470
		Total	340,673	Total	564,714

F-2 Assessment of Daily Hydro Energy Availability

Reservoir Level at March 1, 2017	463,000	MWh
Minimum Safe Reservoir Level	300,000	MWh
Inflow/day	March	4,100 MWh
	April	1,700 MWh
	May	2,100 MWh

Safe daily hydro dispatch level	4,414	MWh
Safe daily hydro dispatch level for the 3 months	401,700	MWh

F-3 Graphical representation of Hydro energy requirement under different plant availability scenarios and Safe hydro dispatch level (MWh)



F-4 Observations

- If low inflow scenario and additional 5% demand growth in May taken place simultaneously, if one 270 MW plant become unavailable more than 50% of the time (in addition to the plants scheduled for maintenance), there is a risk of energy supply being insufficient to meet the demand.