

# **SECURITY OF ELECTRICITY SUPPLY**

## **April- June, 2017**

Date of Report: April 6, 2017

PUBLIC UTILITIES COMMISSION OF SRI LANKA



**A Summary Results**

- per day. If this level continues/ improves during April- June period, the energy supply will be sufficient to meet the demand.
- 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.
- 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 become unavailable during the entire period (in addition to the plants scheduled for maintenance).
- 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.

**B Basis of Analysis**

		Forecast as per the report on	Revised Forecast on	Basis of the revised forecast	
		March 30, 2017	April 6, 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	94%	95%	Actual (March 6-April 2)
		Sunday	83%	82%	
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	4.9	6.0	Actual March 29-April 4
		May	4.9	6.0	Assuming minimum inflow of March&April inflow level can be expected in May-June).
		June	4.9	6.0	
5	Minimum daily Major Hydro dispatch requirement (MWh)	April- June	2.8	3.1	Actual March 29-April 4
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	

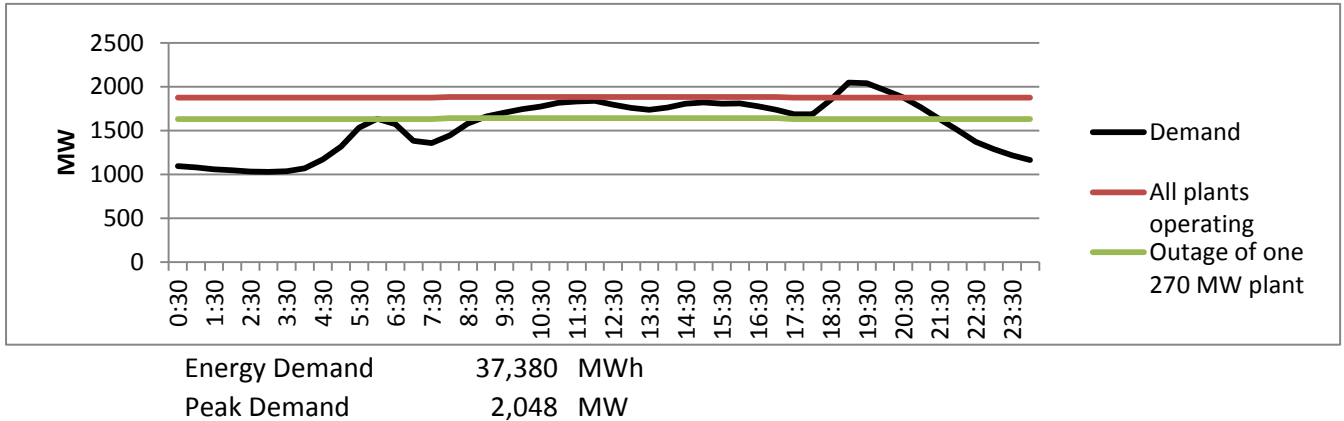
7 Major Thermal Plant availability(source: CEB)				
	Capacity	April	May	June
LVPS Coal I	270 MW			
LVPS Coal II	271 MW			
LVPS Coal III	272 MW		Week 4	Full month
KCCP	165 MW		week 3,4	
Westcoast	270 MW	week 4	week 1-3	
Sojitz	163 MW			
ACE Emb	100 MW			
KPS GT 7	115 MW			
		Unavailable Plants		

**C Analysis**

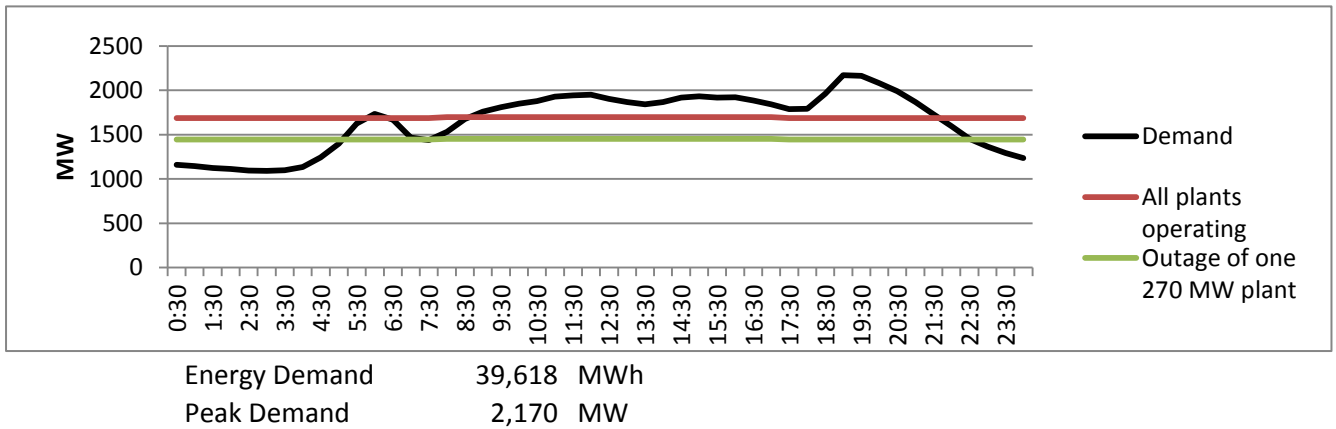
**C-1 Average weekday demand curve and Thermal Plant Availability**

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

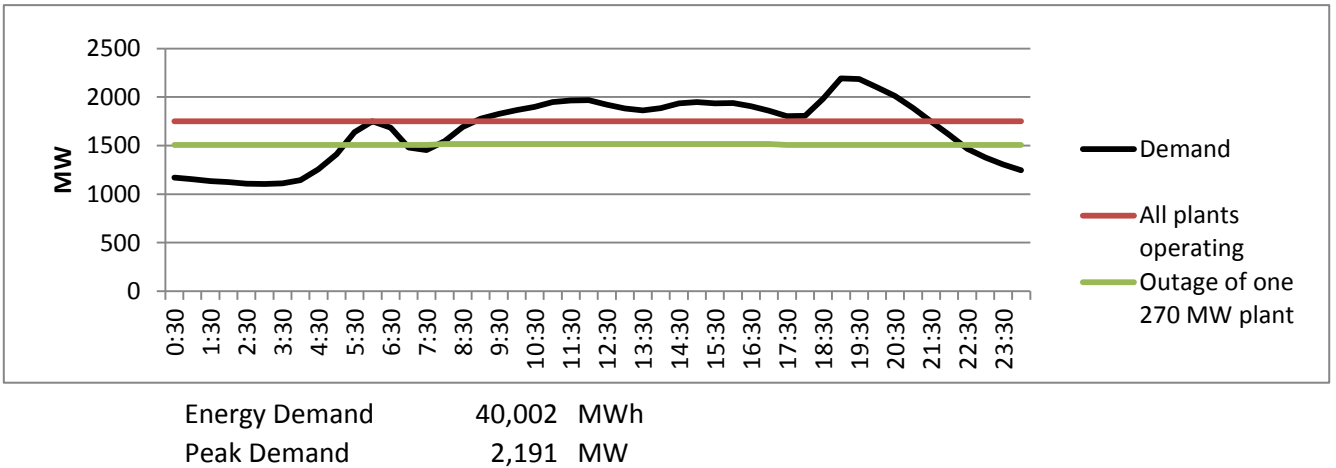
April



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 3,100 MWh (Section B. 5)

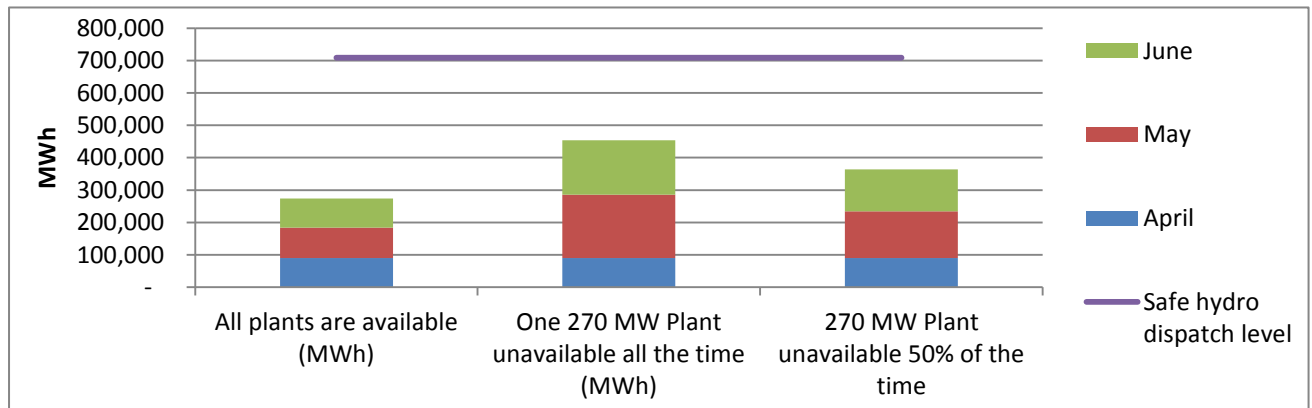
Hydro requirement		All plants are available (MWh)		One 270 MW Plant unavailable all the time (MWh)	
Month	No of days/month	Perday	Per month	Perday	Per month
April	30	3,100	90,148	3,100	90,148
May	31	3,100	93,248	6,511	195,837
June	30	3,100	90,148	5,775	167,942
		Total	273,544	Total	453,927

**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	6,000 MWh
	May	6,000 MWh
	June	6,000 MWh

Safe daily hydro dispatch level	7,791	MWh
Safe hydro dispatch level for the 3 months	709,000	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

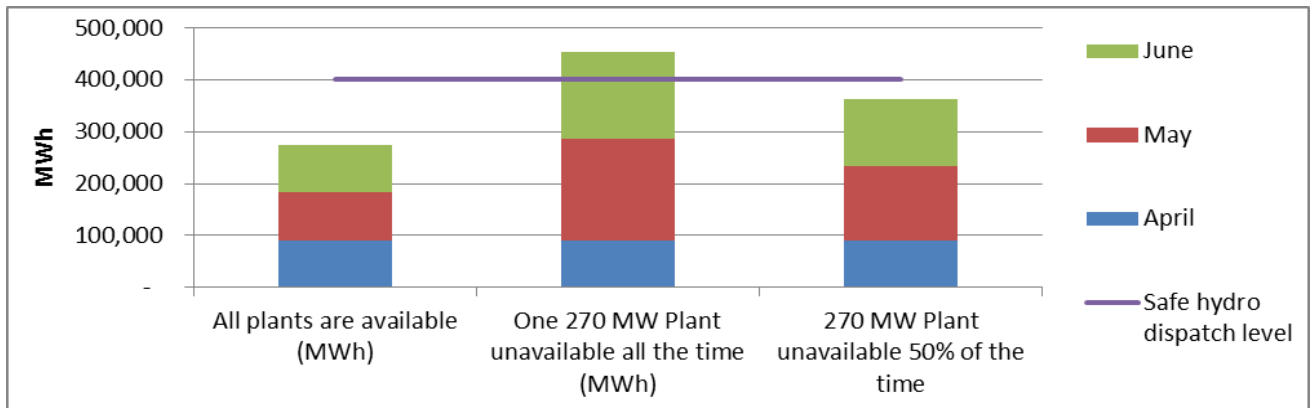
April	4.1 GWh (in 2016)
May	1.7 GWh (in 2012)
June	2.1 GWh (in 2012)

**D-1 Revised Assesment of Daily Hydro Energy Availability**

Reservoir Level at March 28, 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).

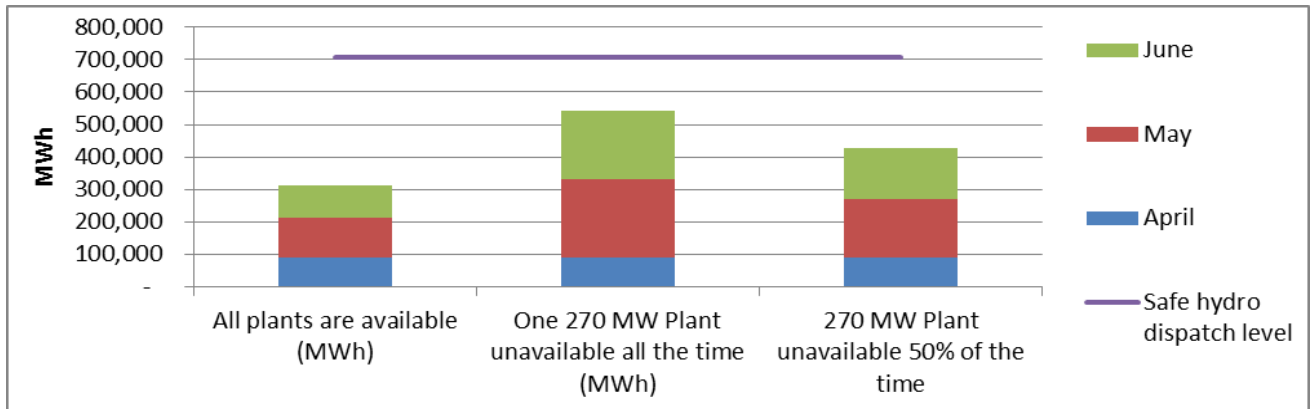
**E Analysis of security of energy supply in case of demand in May grow by additional 5% compared to April due to expiration of Self-Generation scheme**

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	3,100	90,148	3,100	90,148
April	30	4,065	122,270	8,024	241,365
May	31	3,504	101,883	7,237	210,444
		Total	314,302	Total	541,957

**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**

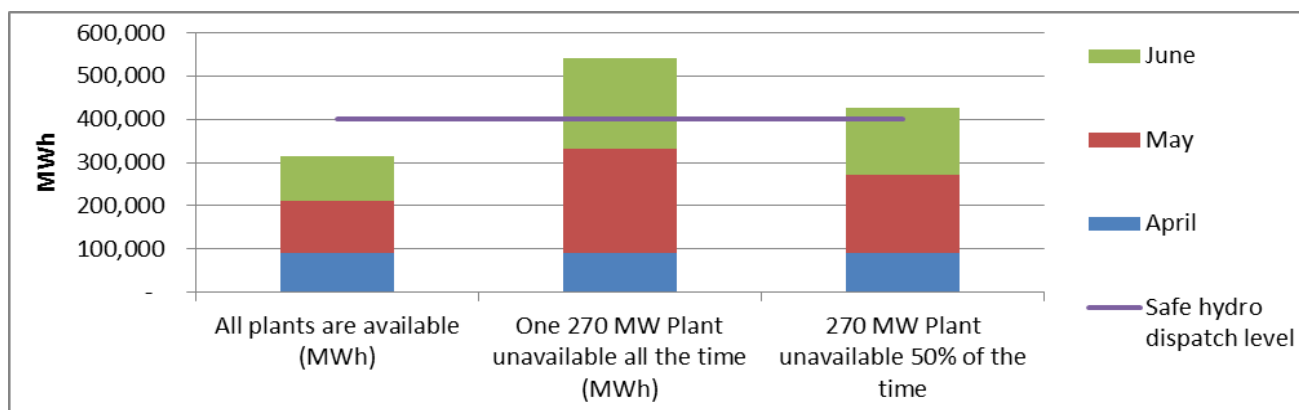
Hydro requirement		All plants are available (MWh)		One 270 MW Plant unavailable all the time (MWh)	
Month	No of days/month	Perday	Per month	Perday	Per month
March	31	3,100	90,148	3,100	90,148
April	30	4,065	122,270	8,024	241,365
May	31	3,504	101,883	7,237	210,444
		Total	314,302	Total	541,957

**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.