

SECURITY OF ELECTRICITY SUPPLY

April- June, 2017

Date of Report: March 30, 2017

PUBLIC UTILITIES COMMISSION OF SRI LANKA



A Summary Results

- The average inflow to the major hydro reservoirs during the March was about 4.9 GWh 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 forecast	
		March 23, 2017	March 30, 2017		
1	Demand growth compared to the previous month	April	-5.1%	-5.1%	2016 data
		May	6.0%	6.0%	2015 data
		June	N/A	1.0%	2015 data
2	Weekend demand compared to weekdays	Saturday	93%	94%	Actual (March 1-28)
		Sunday	82%	83%	
3	Day time NCRE Contribution	April	70	70	2014 data and considering recent solar plant additions
		May	130	130	
		June	N/A	200	
	Peak and Offpeak time NCRE contribution	April	60	60	
		May	120	120	
		June	N/A	190	
4	Average inflow to Major Reservoirs in GWh/day (Inflow= Major Hydro Generation- Major Reservoir drawdown)	April	5.6	4.9	Actual March 1-28 (Assuming minimum inflow of March inflow level can be expected in April-June).
		May	5.6	4.9	
		June	N/A	4.9	
5	Minimum daily Major Hydro dispatch requirement	April- June	2.7	2.8	Actual (March 1-28)
6	New Thermal Capacity additions as expected.	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	

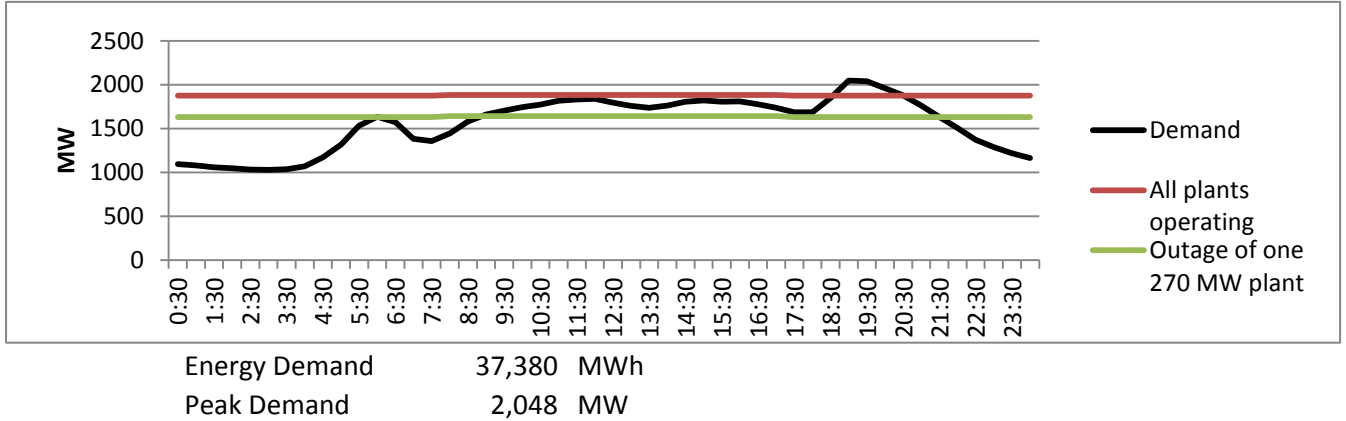
7 Major Thermal Plant availability(source: CEB)				
	Capacity	April	May	June
LVPS Coal I	270 MW			
LVPS Coal II	271 MW			
LVPS Coal III	272 MW		Week 4	Full month
KCCP	165 MW		week 3,4	
Westcoast	270 MW	week 4	week 1-3	
Sojitz	163 MW			
ACE Emb	100 MW			
KPS GT 7	115 MW			
			Unavailable Plants	

C Analysis

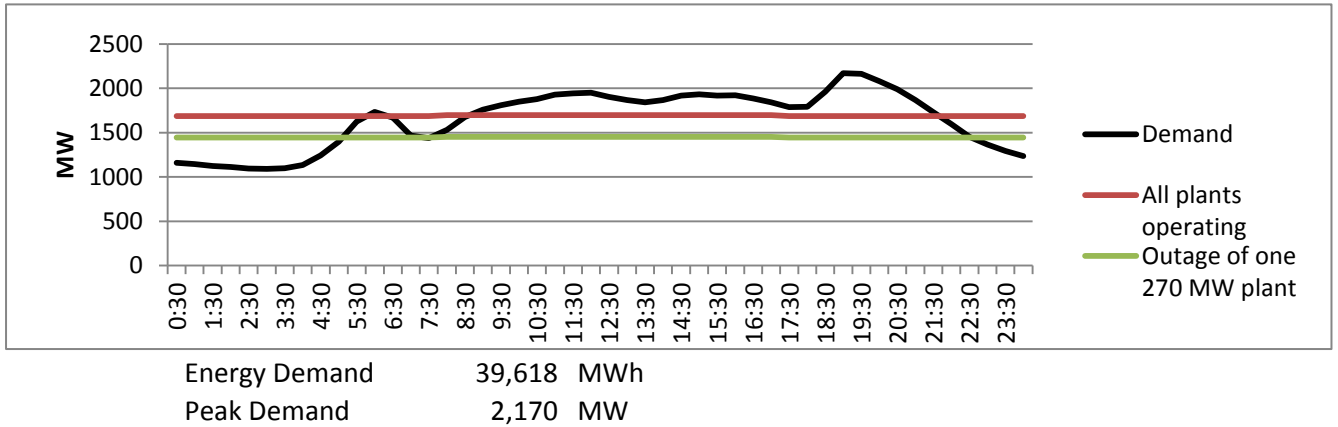
C-1 Average weekday demand curve and Thermal Plant Availability

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

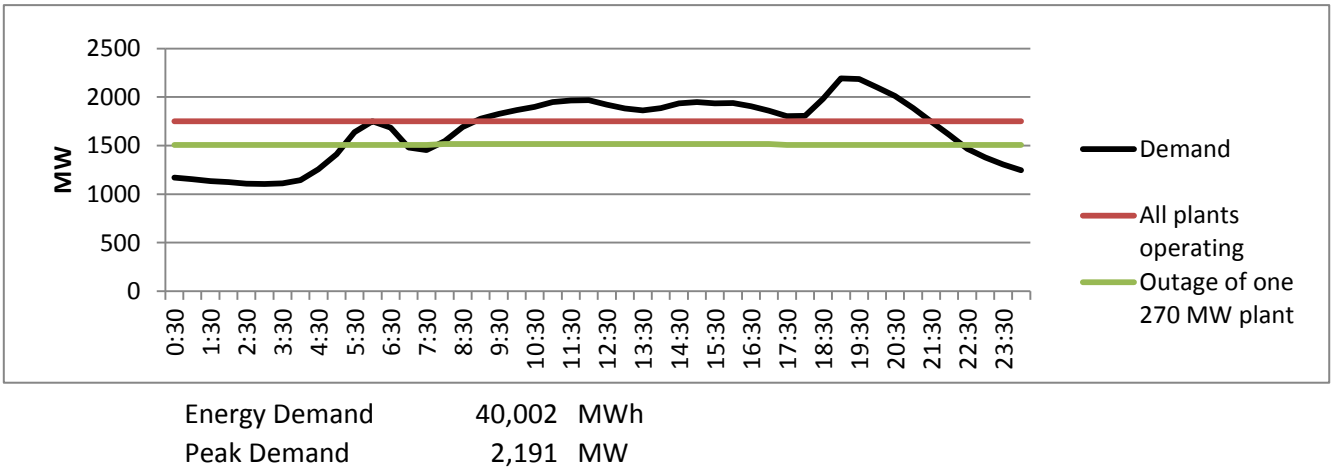
April



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 2,800 MWh (Section B. 5)

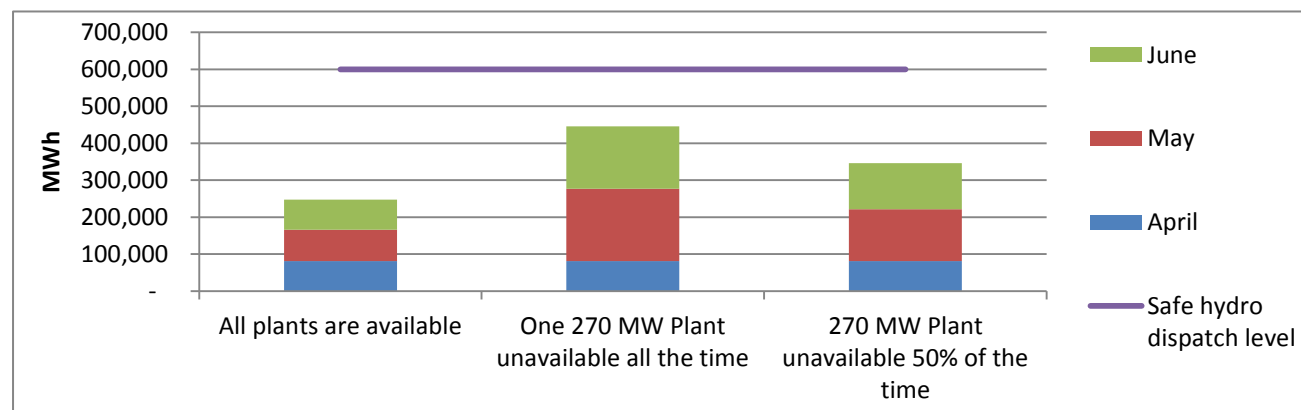
Hydro requirement (MWh)		All plants are available		One 270 MW Plant unavailable all the time	
Month	No of days/month	Perday	Per month	Perday	Per month
April	30	2,800	81,424	2,800	81,424
May	31	2,800	84,224	6,511	195,837
June	30	2,800	81,424	5,775	167,942
		Total	247,072	Total	445,203

C-3 Assessment of Daily Hydro Energy Availability

Reservoir Level at March 28, 2017	454,000	MWh
Minimum Safe Reservoir Level	300,000	MWh
Inflow/day	April	4,900 MWh
	May	4,900 MWh
	June	4,900 MWh

Safe daily hydro dispatch level	6,592	MWh
Safe hydro dispatch level for the 3 months	599,900	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 4.9 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

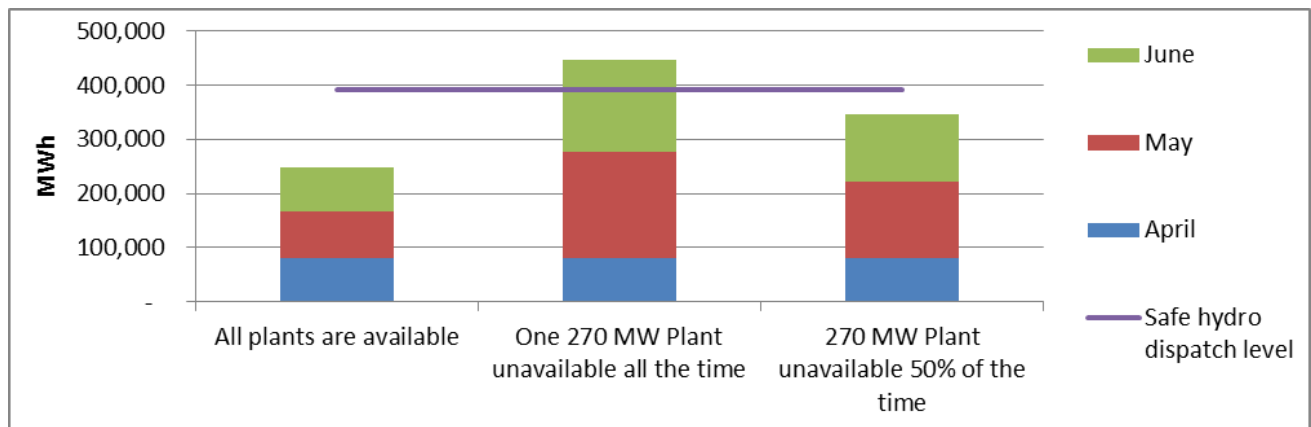
April	4.1 GWh (in 2016)
May	1.7 GWh (in 2012)
June	2.1 GWh (in 2012)

D-1 Revised Assesment of Daily Hydro Energy Availability

Reservoir Level at March 28, 2017	454,000	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	4,315	MWh
Safe Hydro Dispatch for the 3 months	392,700	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).

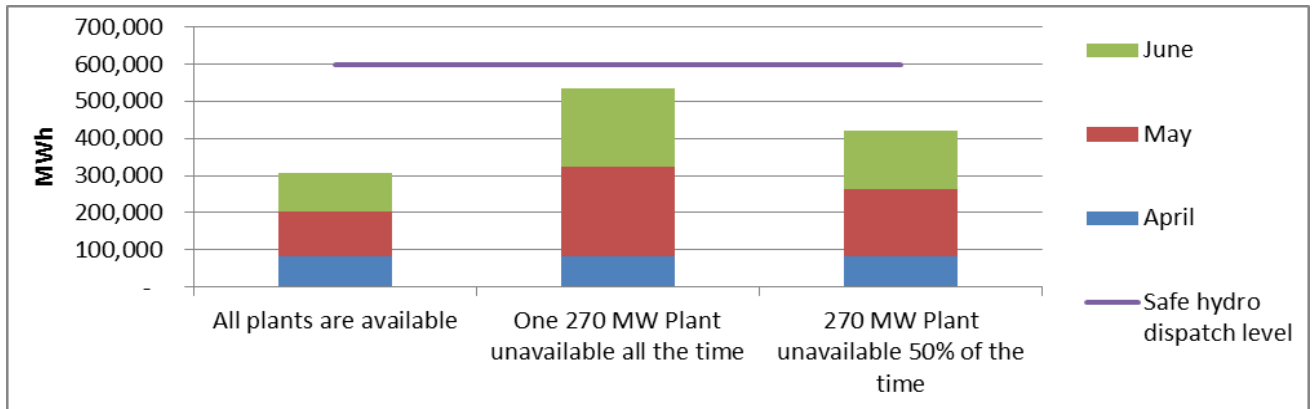
E Analysis of security of energy supply in case of demand in May grow by additional 5% compared to April due to expiration of Self-Generation scheme

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 (MWh)		All plants are available		One 270 MW Plant	
Month	No of days/month	Perday	Per month	Perday	Per month
March	31	2,800	81,536	2,800	81,536
April	30	4,065	122,433	8,024	241,686
May	31	3,504	102,024	7,237	210,734
		Total	305,993	Total	533,956

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

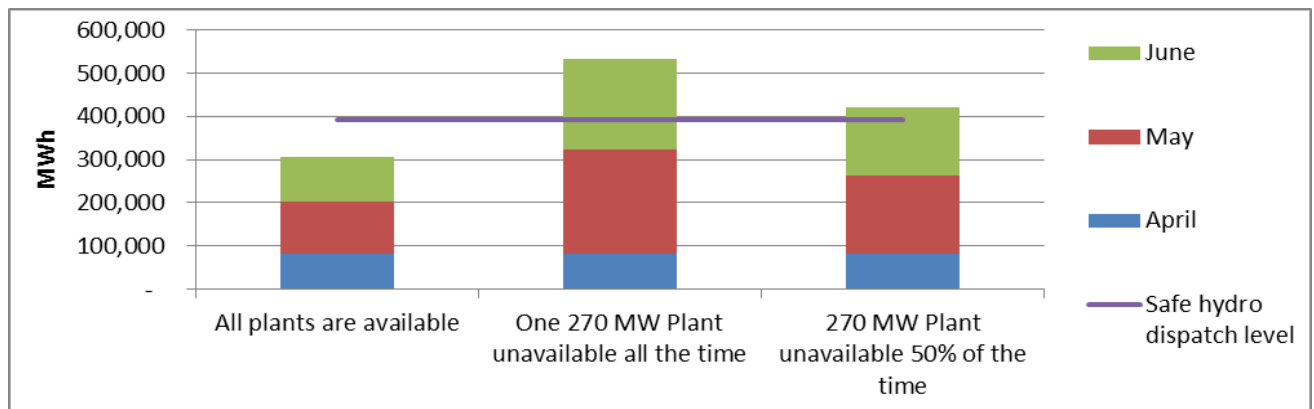
Hydro requirement (MWh)		All plants are available		One 270 MW Plant	
Month	No of days/month	Perday	Per month	Perday	Per month
March	31	2,800	81,536.00	2,800	81,536.00
April	30	4,065	122,432.96	8,024	241,686.02
May	31	3,504	102,023.60	7,237	210,733.51
		Total	305,993	Total	533,956

F-2 Assessment of Daily Hydro Energy Availability

Reservoir Level at March 1, 2017	454,000	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	4,315	MWh
Safe daily hydro dispatch level for the 3 months	392,700	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.