



Greater Mekong Sub-region (GMS)
**26th Meeting of the Regional Power Trade Coordination
Committee (RPTCC-26)**

Country Presentation: MYANMAR

Hanoi, Vietnam

Tuesday 26th Nov 2019

Contents

- National Electricity and Energy Policies – extracted
- Status of National Generation, Transmission and Distribution Master Plans
 - Status quo
 - Master plans indications
- Overview of National Grid Codes
- Cross – border cooperation (transmission asset)
- New development initiatives for renewable energy
- Comments on RPTCC activities and recommendation for future

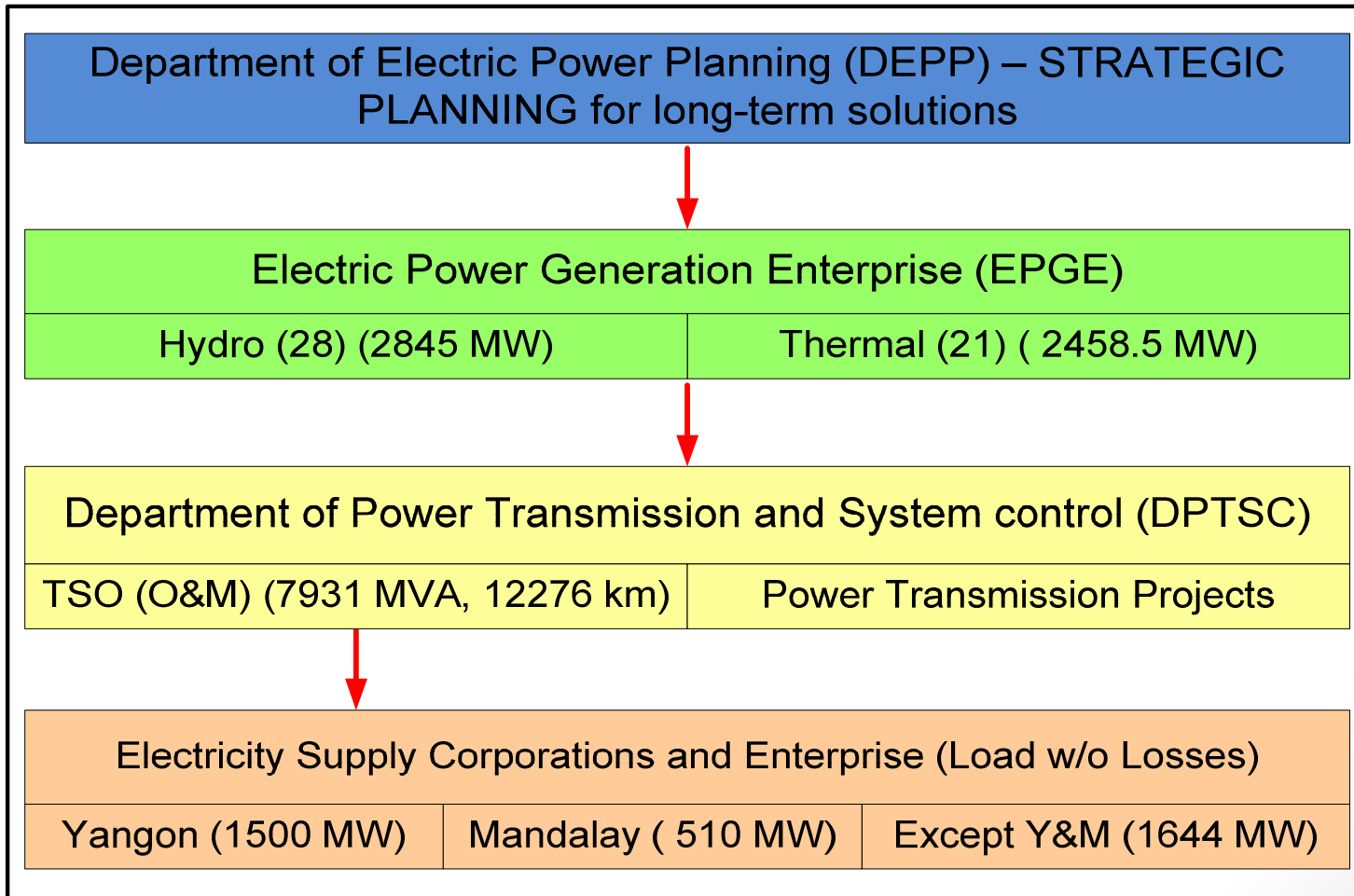
National Electricity and Energy Policies – extracted

- 1. In extraction and utilization of natural resources, the measures to minimize the environmental and social impacts, to include natural resources utilization plan for future generations, to invite the local and foreign investments and to continuously carry out Corporate Social Responsibility (CSR) activities will be taken. – **emphasis on a larger portion of own resources**
- 3. In the energy and electricity pricing, the measures to ensure affordable and reliable energy prices for end users and customers, and to guarantee the economic benefits for both energy producers and energy consumers will be taken in accordance with the market oriented economy. – **vertically integrated and unbundled yet**
- 5. To promote private sector participating in accordance with the national's economic policy for realization of successful activities of electricity and energy – **become prioritized to the participation of cross-border integration in kinds of G to G and other possibilities**

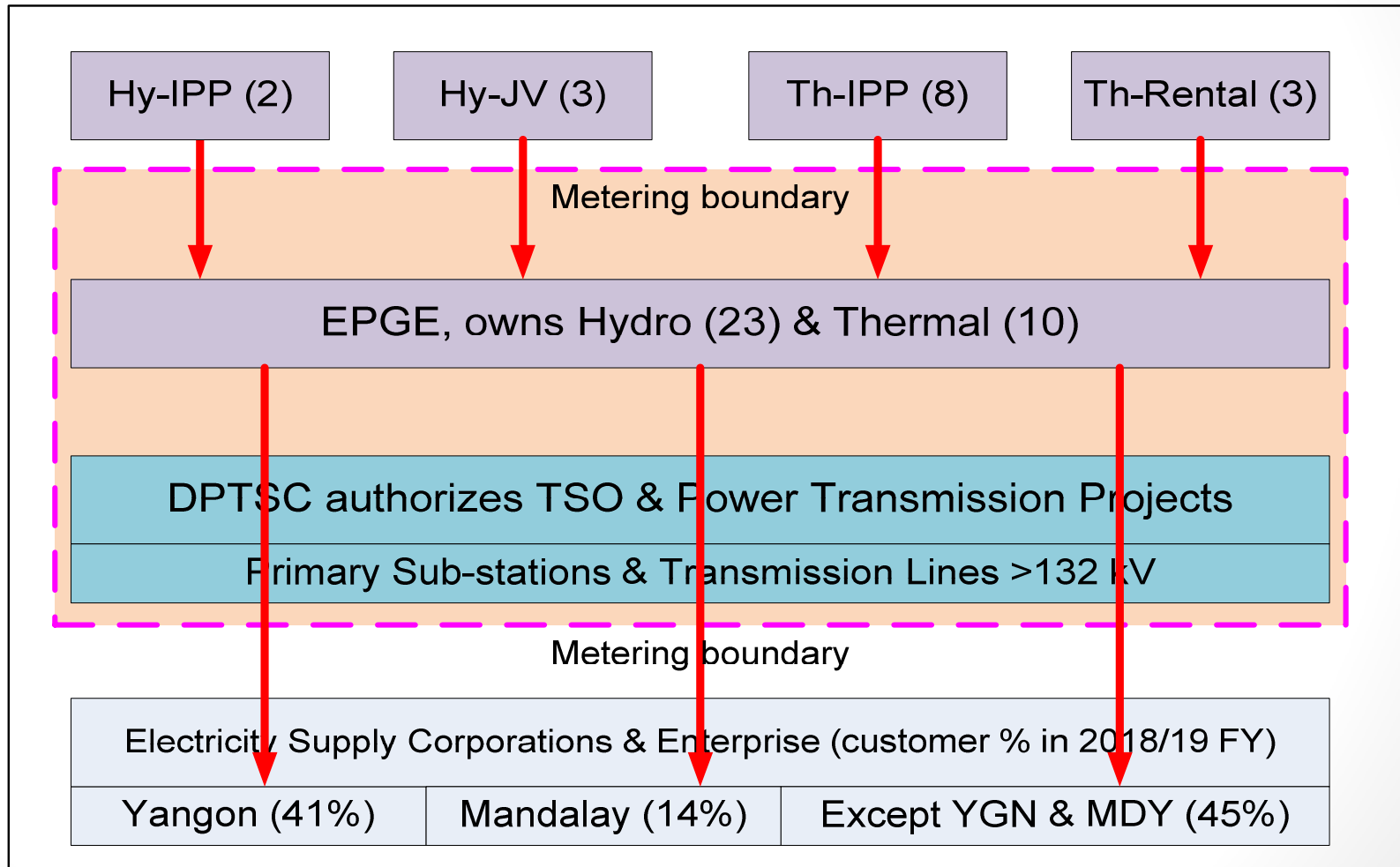
National Electricity and Energy Policies – extracted

- 6. To promote the electricity generation from the domestic energy resources of hydro, renewable and thermal in prioritized reliability for the domestic electricity demand – **tendency towards purchaser's priorities in electricity trade**
- 7. To lay down the short term and long term plans for utilization of LNG, coal and feasible alternative fuel energy sources. – **cross border trade as feasible alternative with economies of scale**
- 8. To expand to the regional power trade on the excess from the domestic demand – **on the shortage for it become reconsidered**
- 9. To cooperate with neighboring countries in regional power grid and pipeline network – **but the technical reliability and economic tariff shall be preferred based on current situations possibly from buyer's side**
- 11. To make the long term plan for promotion of electricity and energy stockpiling for energy security.

Status quo – electricity

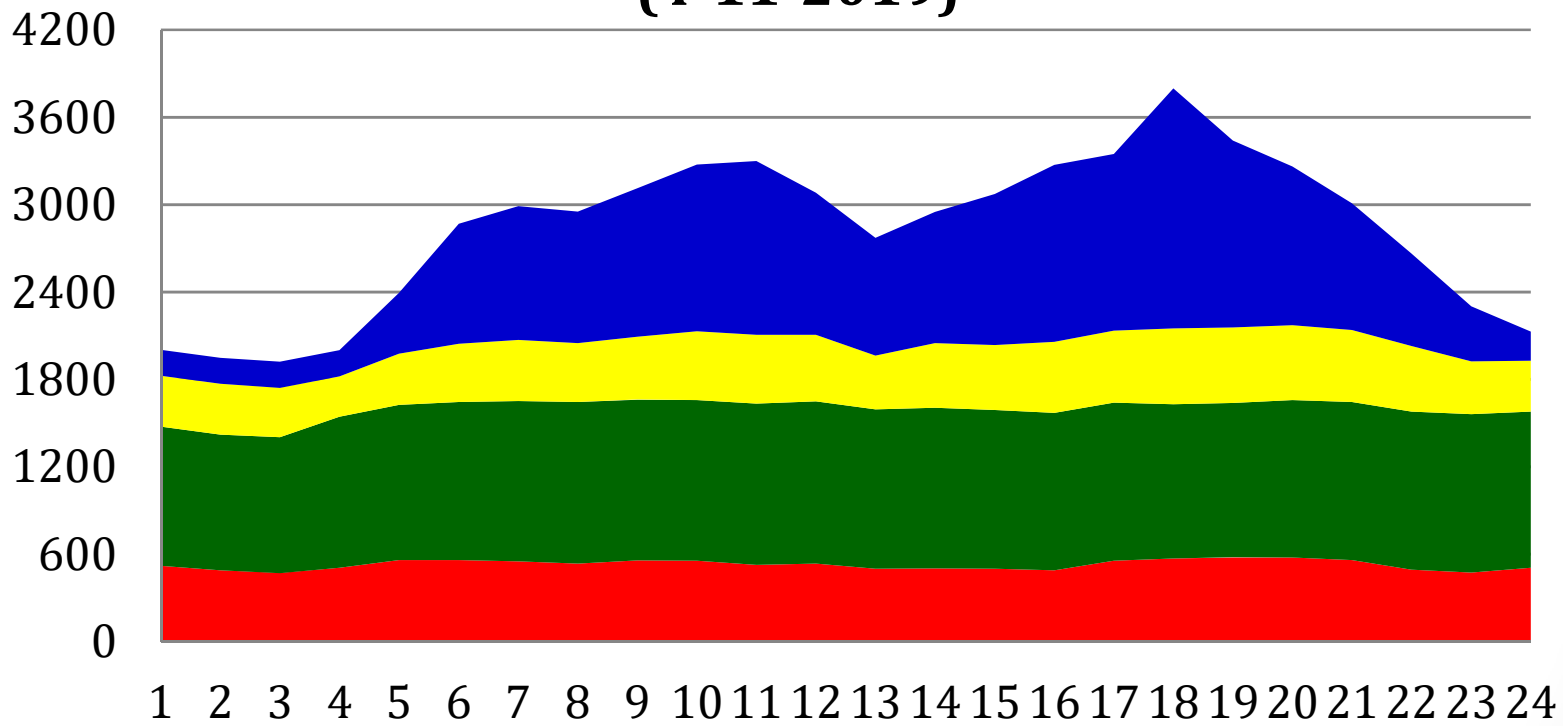


Status quo – market



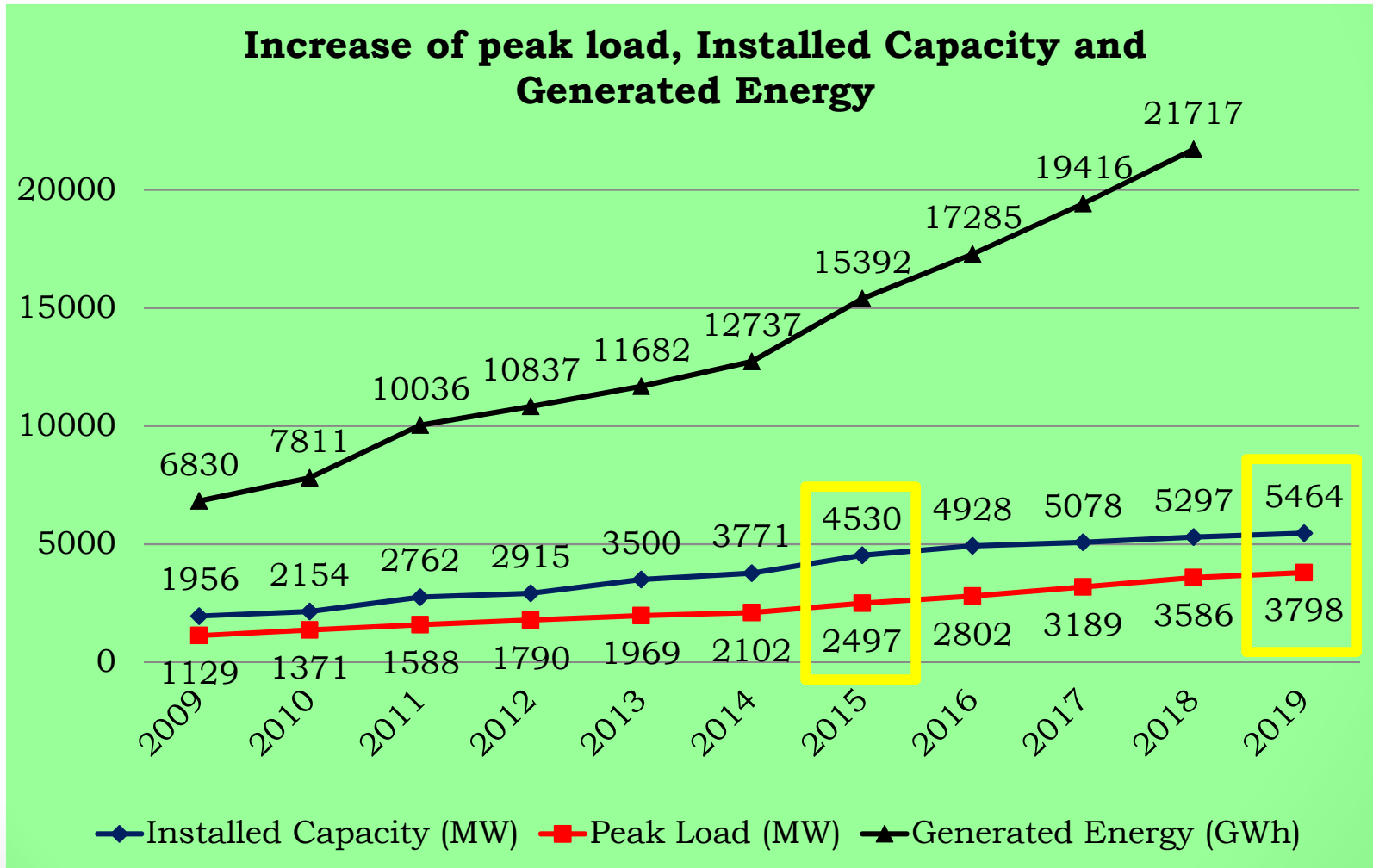
Status quo – Generation Mix on historical peak – base load under high tariff

(4-11-2019)

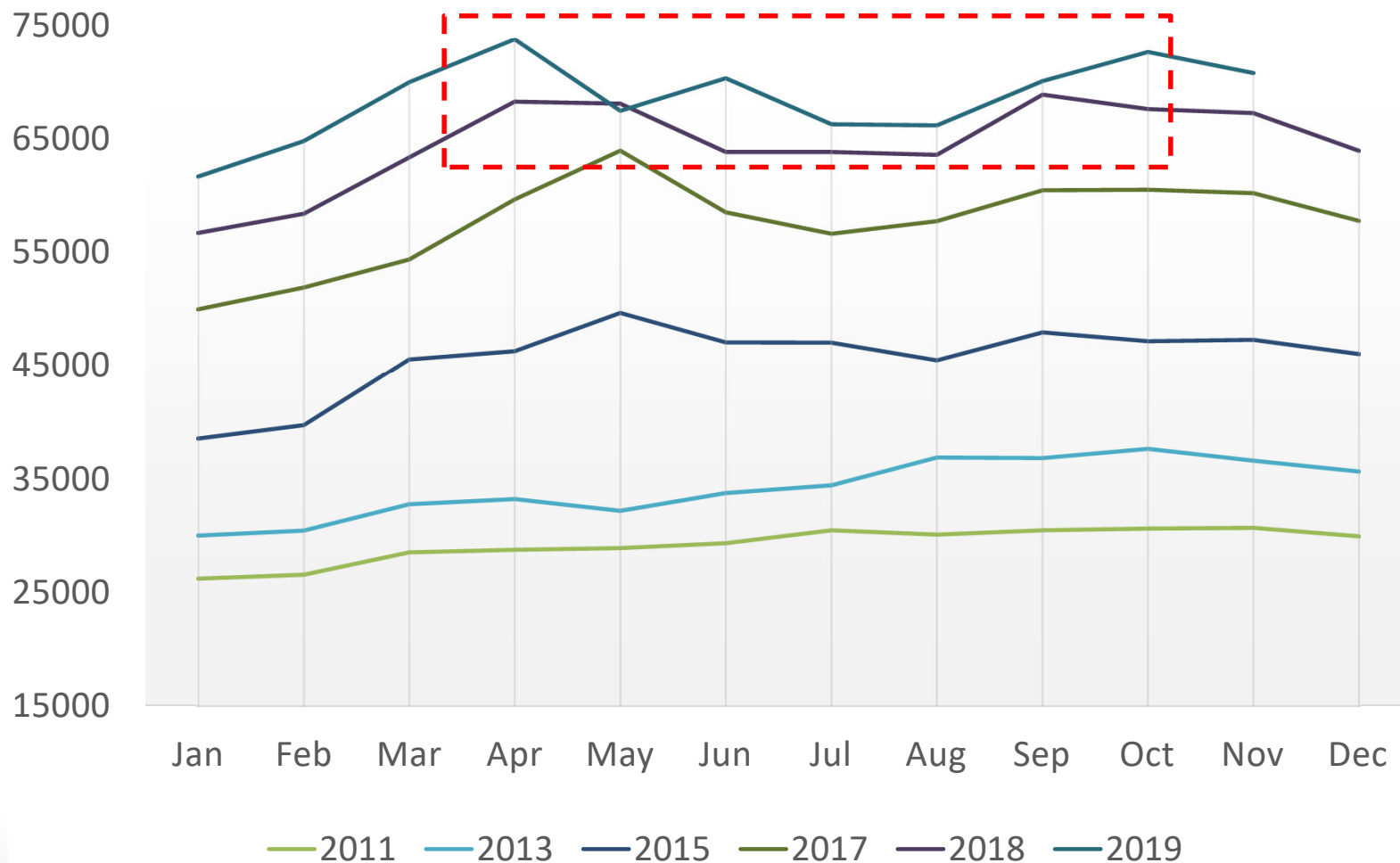


- Hydro (Public)
- Hydro (PPA)
- Thermal (PPA)
- Thermal (Public)

Status quo – capacity overview – insufficient new generations

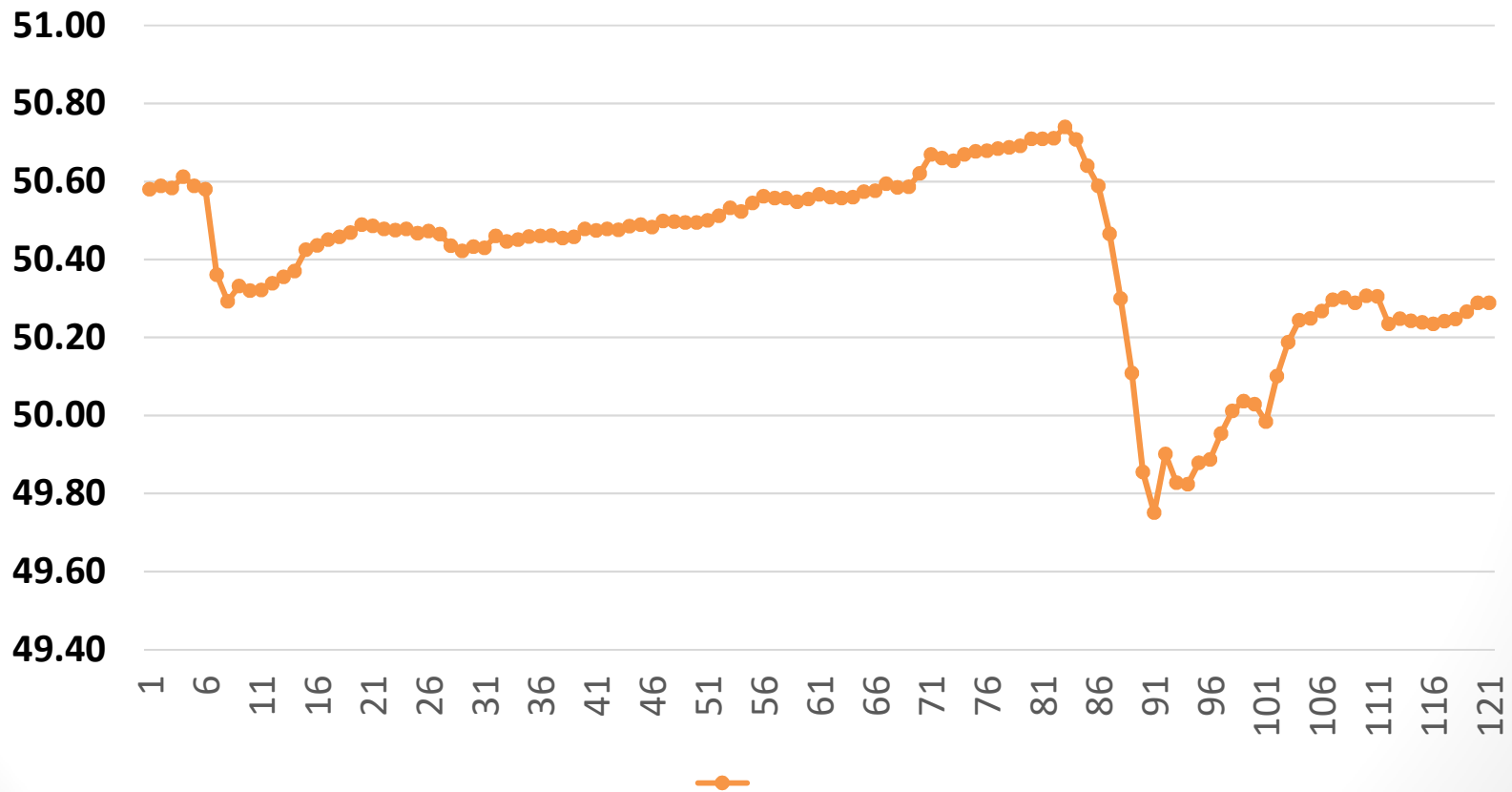


Status quo – Maximum generated energy/day in month – recent constraint to supply the demand under the increase of electrification



Status quo – huge gap between off and peak in load profile, capacity mix challenge and reactive power control

Frequency response at 30 seconds interval
(14/11/2019 00:00:00 ~ 14/11/2019 01:00:00)



Master plans indications – energy source scenarios (by NEMP 2014)

Energy resources	Scenario (in % of Resource Composition)		
	Option 1 Domestic Energy Consumption	Option 2 Least Cost	Option 3 Power Resource Balance
Hydro (Large)	42	42	8
Hydro (S & M)	24	24	32
Natural Gas	17	9	20
Coal	18	18	33
Renewable	7	7	9
Total Installed Capacity (MW)	28784	28552	23594

Challenges on environmental countermeasures from social institutions for large dams and CO2 emissions of coal PPs.

Alternative considerations towards importing Electricity across borderlines and LNG to power

Master plans indications – transmissions (2019-20)

No	Project Name	mile
1	500kV Payarkyi- Hlaingtharyar (West University) Transmission Line & Substation	60
2	500kV Phayargyi- East Dagon Transmission Line & Substation	50
3	230kV Ahlone-Thida Transmission Line & Substation	4
4	230kV Hlawgar-Wartayar Transmission Line	10
5	230kV Khayan-(Thanlyin- Thilawa-Kamanut) Transmission Line & Substation	1
6	230 kV Mawlamyine - Ye - Dawai Transmission Line & Substation	180
7	230 kV Minhla - Hinthada -Athoke Transmission Line & Substation	100
8	230 kV Phayargyi -(Kamanut- Myaungtagar) Transmission Line	23
9	230 kV Hlawga -East Dagon Transmission Line	12
10	230 kV Dawai - Myeik Transmission Line	145
11	230 kV Myingyan - Kankaung -Taungdwingyi Transmission Line & Substation	124
12	230 kV Nyaungpingyi -Gangaw Transmission Line & Substation	95

Master plans indications – transmissions (2019-20)

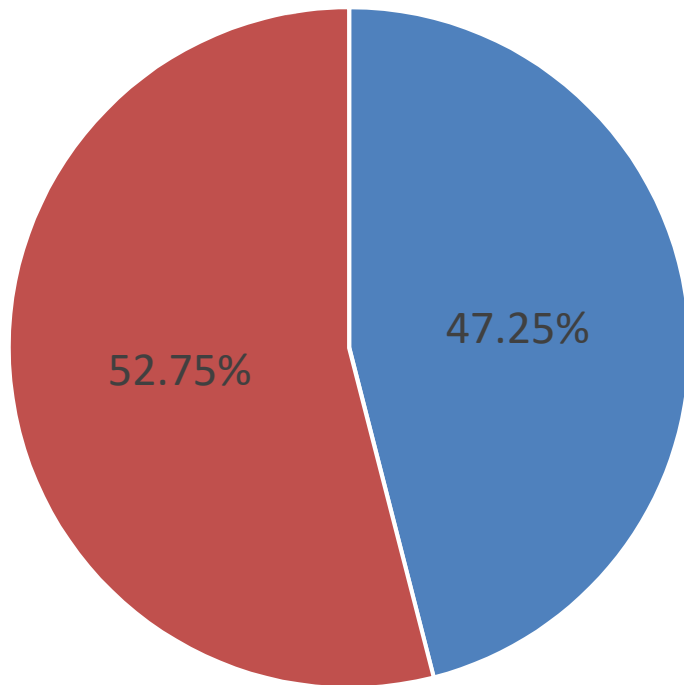
No	Project Name	mile
13	230 kV Thapyaywa - 500 kV Kankaung Transmission Line & Substation	14
14	230 kV Mann - Taungdwingyi Transmission Line & Substation	85
15	230 kV Nyaungpingyi -Kyunchaung Transmission Line & Substation	92
16	230kV Daungyway -Shwesaryan Transmission Line & Substation	8
17	132kV Upper Kyaungtaung - Namsam Transmission Line & Substation	50
18	132 kV Dedoke - Belin Transmission Line & Substation	13

Master plans indications – transmissions (2020-21)

No	Project Name	mile
1	500 kV Pharyargyi -Mawlamyine - Kanbauk Transmission Line & Substaion	
2	230 kV Namsan -Taunggyi - Thapyaywa Transmission Line & Substaion	150
3	230 kV Kyunchaung - Chauk - Mann Transmission Line & Substaion	100
4	230 kV Hinthata - Myaungaung - Oakshitpin Transmission Line & Substaion	120
5	230kV Gangaw - Harkhar Transmission Line & Substation	60
6	230 kV Kamanut - Mawlamyine Transmission Line & Substation	147
7	230 kV Kanbauk - (Mawlamyine - Yae - Dawai) Transmission Line	

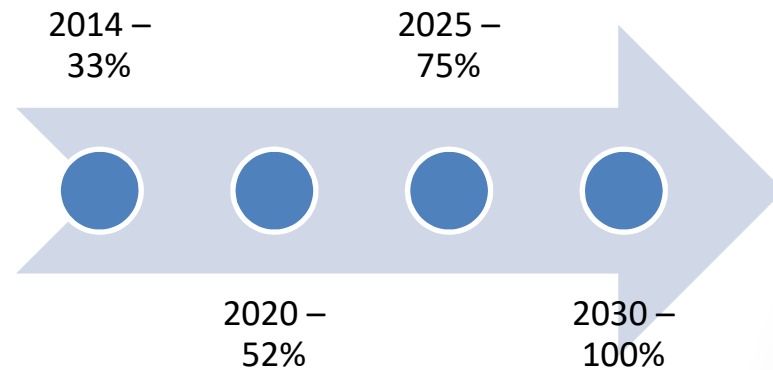
Master plans indications – electrification

As of 2019 September



■ electrified ■ un-electrified

Roll out plan



Overview of National Grid Codes

- Under NVE financing, DNV-GL simplified the technical formalities in accordance with the current Myanmar Grid to MOEE working group and submitted to DEPP.
- MOEE WG held technical clarification meetings to the supervisory management about the indications concluded in it.
- The WG was also called to clarify to the MOEE Technical Steering Committee.
- The TSC resolute further considerations to carry out on any aspect of regulatory uniformities, stakeholders participations, development of technical harmonization and accept it as the draft Code to exercise before submitting to the MOEE EC.
- On the basis of the draft Grid Code, MOEE WG prepared a preliminary set of National Power Quality Standards (NPQS) for transmission system and submitted to the Power System Department to exercise until the Code.

Overview of National Grid Codes – NPQS transmission – general provisions

1. The TSO shall strive to maintain the Transmission System performance within the limits and ranges specified in this Minimum National Power Quality Standard for the Myanmar Transmission Grid.
2. Users shall ensure that their plant and apparatus at connection points are also designed and operated such that these operate satisfactorily within the specified limits and ranges set out in this Minimum National Power Quality Standards.
3. Measurements of voltage and current quality shall be made according to IEC 61000-4-30.

Overview of National Grid Codes – NPQS

transmission – frequency variations

1. The Frequency of the Transmission System shall be nominally 50.0 Hz and shall be controlled within the limits of 49.5 - 50.5 Hz unless exceptional circumstances prevail.
2. The System Frequency could rise to 52.0 Hz or fall to 47.0 Hz in exceptional circumstances. Design of user's plant and apparatus must enable operation of that plant and apparatus within that range in accordance with the following frequency range requirement:
 1. 51.5 Hz – 52 Hz, Operation for a period of at least 15 minutes is required each time the Frequency is above 51.5 Hz.
 2. 51.0 Hz - 51.5 Hz, Operation for a period of at least 90 minutes is required each time the Frequency is within the range 51.0 – 51.5 Hz.
 3. 49.0 Hz – 51.0 Hz Continuous operation is required.
 4. 47.5 Hz - 49.0 Hz, Operation for a period of at least 90 minutes is required each time the Frequency is within the range 47.5 - 49.0 Hz.
 5. 47.0 Hz - 47.5 Hz, Operation for a period of at least 20 seconds is required each time the Frequency is below 47.5 Hz.
3. For the avoidance of doubt, disconnection, by frequency or speed based relays is not permitted within the frequency range 47.5 Hz to 51.5 Hz, unless agreed with the TSO. Other users should ensure that their equipment is designed or protected for these exceptional circumstances.

Overview of National Grid Codes – NPQS transmission – voltage variations

1. The voltage at any point on the Transmission System will normally remain within $\pm 5\%$ of the nominal value as stated in the table below, unless abnormal conditions prevail. The minimum voltage is -10% and the maximum voltage is $+10\%$ during abnormal conditions, but voltages between $+5\%$ and $+10\%$ will not last longer than 30 minutes.
2. The TSO and a user may agree greater or lesser variations in voltage to those set out above in relation to a particular connection site, and insofar as a greater or lesser variation is agreed, the relevant figure set out above shall, in relation to that user at the particular connection site, be replaced by the figure agreed.

Overview of National Grid Codes – NPQS transmission – frequency-voltage variations

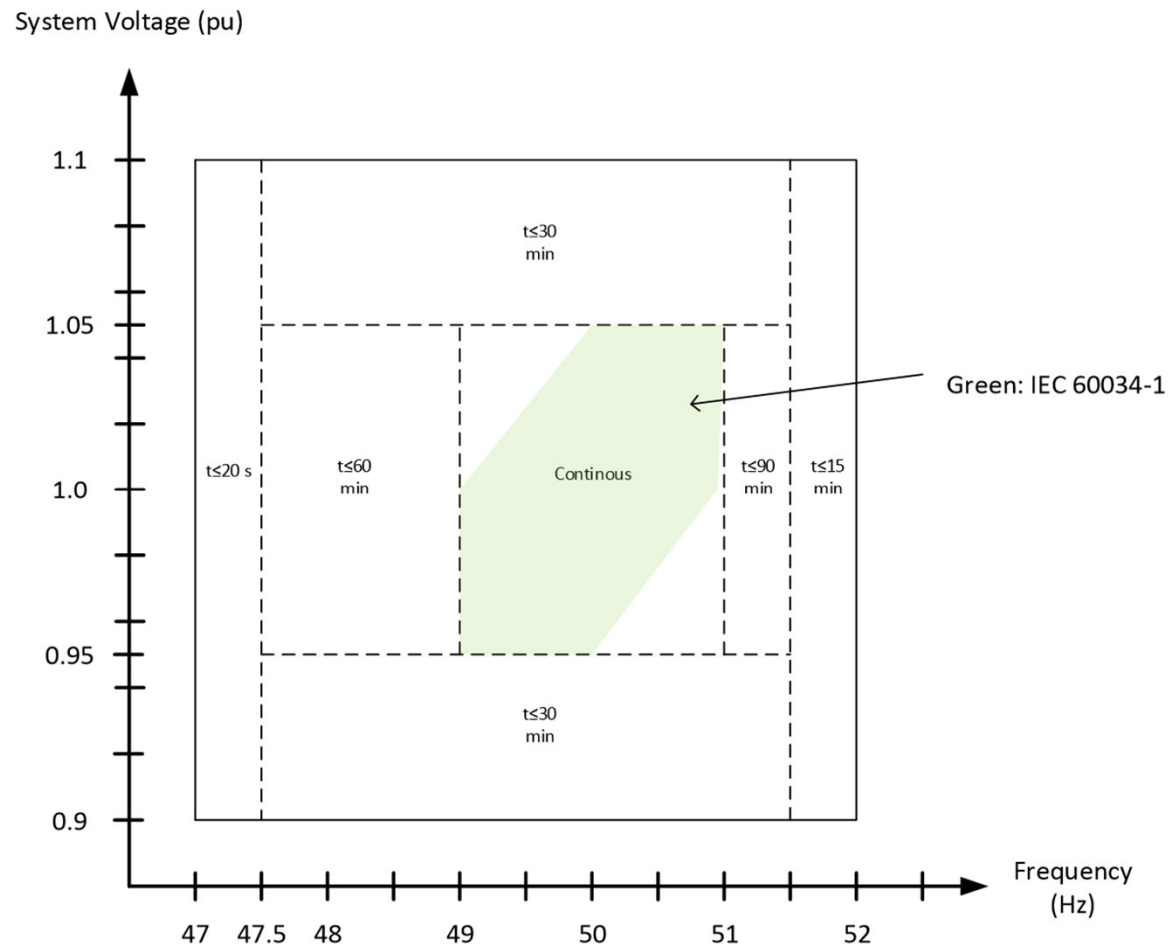


Figure 1 Frequency/Voltage operation ranges

Cross-border cooperation

- By using the existing facilities under operation with China, Myanmar shall have probabilities to increase import upon transmission system reinforcement projects, namely; Shweli (200 MW) and Tapein (more than royalty)
- There are also bi-laterally increased understandings between both China and Laos vs. Myanmar.
- The main barriers may preferably be tariffs which has alterations on the investment comprising from the resultant of technical configurations such as AC or DC.

New development/initiatives for renewable energy

Sr	Project Name	MW	Resource	PPA Status
1	Chaung Thar	30	Wind	
2	Shwemyo (Thinkhaypa)	10	Solar	
3	Thapyaysan	100	Solar	
6	Nabuai	150	Solar	Phase 1 passed, 2 ongoing
7	Wantwin	150	Solar	Phase 1 passed, 2 ongoing
8	Minbu Solar	170	Solar	Ph-1 operational, 2 und-con

Comments on RPTCC activities and recommendations for future

- No National Transmission Charges yet in Myanmar
- In considering commercial arrangements relating to wheeling asset and contracted capacity, also effects of possible changes of system topologies to the asset in the purchaser's side shall be considered.
- Tariff variation upon duration and time of day may face conflicts on different operabilities on both TSOs, but least conflict on IPPs abroad.
- Short-term contracts and tariff is related.
- Transmission unbundling options need to be described more detailed and it can tend to be a status quo.
- In order to be a viable TSA between Transco and TSO, a clear identification in both regulatory and market sector is needed.

Comments on RPTCC activities and recommendations for future



Thank you for kind attention

Power System Department, DPTSC, MOEE, MYANMAR