Federal Ministry
for Economic Affairs
and Energy

Renewable power solutions for Telecommunication Towers in Myanmar

Markus Schwaninger, 28 November 2015

Facilitator

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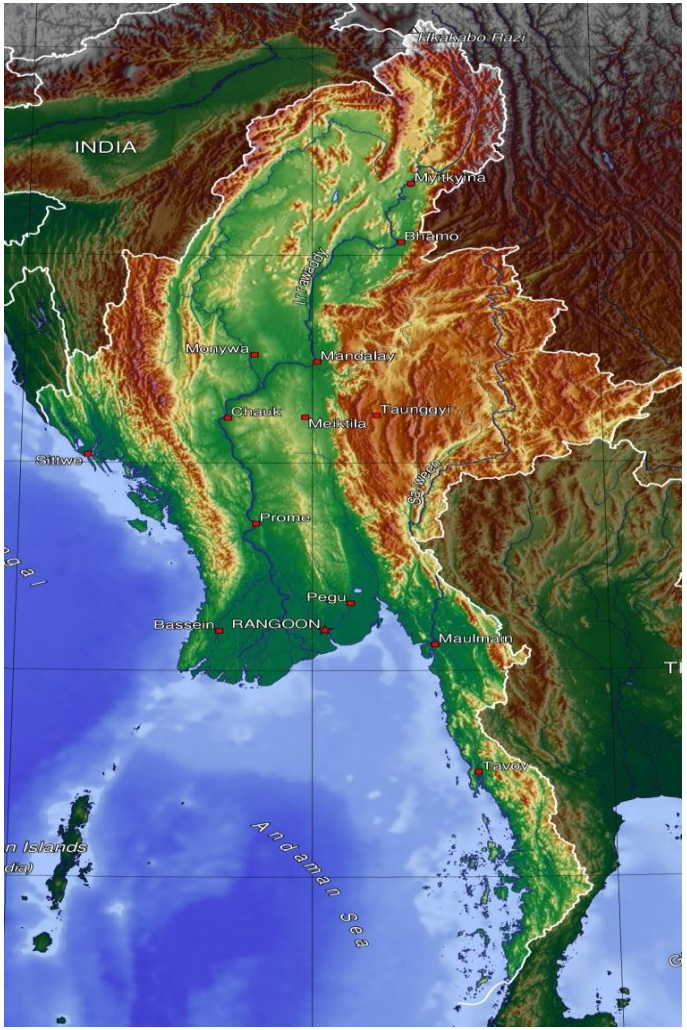
Overview

- Mobile penetration at around 25% (2015). Neighboring countries are more advanced: Laos (67%), Thailand (100%)
- Target until 2021: 100%
- Phase I and II rollout of telecom improvements is completed (Yangon, Mandalay and Naypyidaw and transport links in between)
- Phase III: still on-going (rest of Myanmar)



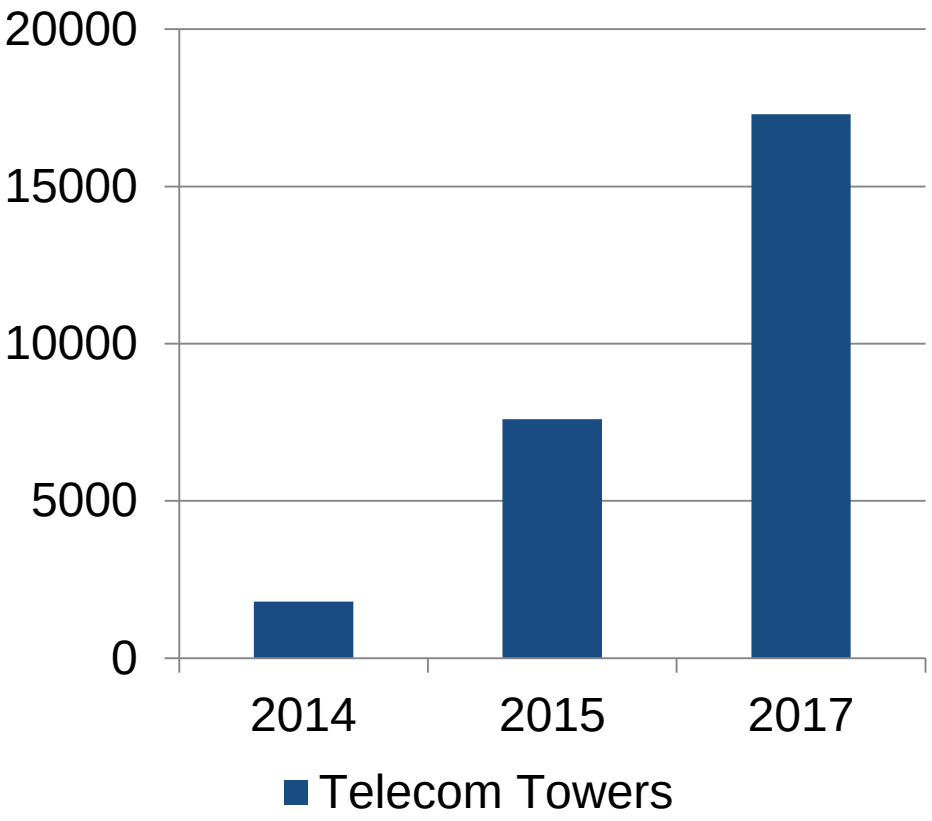
Mobile Network Operators in Myanmar

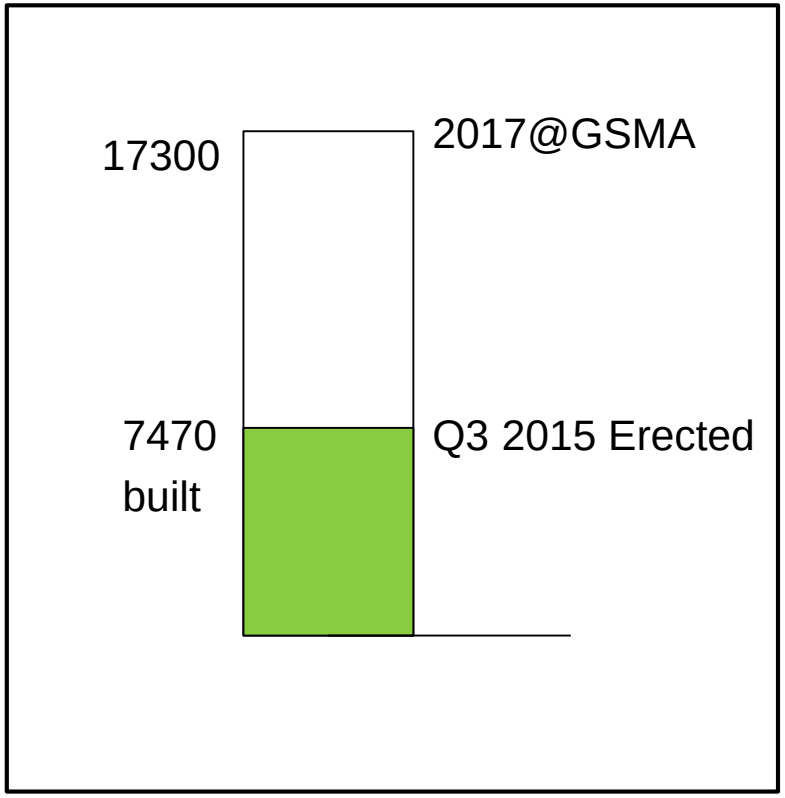
Rank	MNOs	Subscribers (Million)	Ownership
1	MPT	14	State-owned, KDDI-Sumitomo JV KSGM
2	Telenor	9.5	Telenor 100%
3	Ooredoo	4.3	Ooredoo 100%
4	Not known yet		

Tower companies and their partner MNOs

Tower Companies	MNOs
Chinese contractors	MPT/KSGM
Irrawaddy Green Towers Ltd (IGT)	Telenor and Ooredoo
Apollo Towers Myanmar Ltd	Telenor
Pan Asia Majestic Eagle Co. Ltd (PAMEL)	Ooredoo
Digicel Myanmar Tower Company (MTC)	Ooredoo
Eco-Friendly Towers (EFT)	Telenor
Myanmar Infrastructure Group (MIG)	Ooredoo

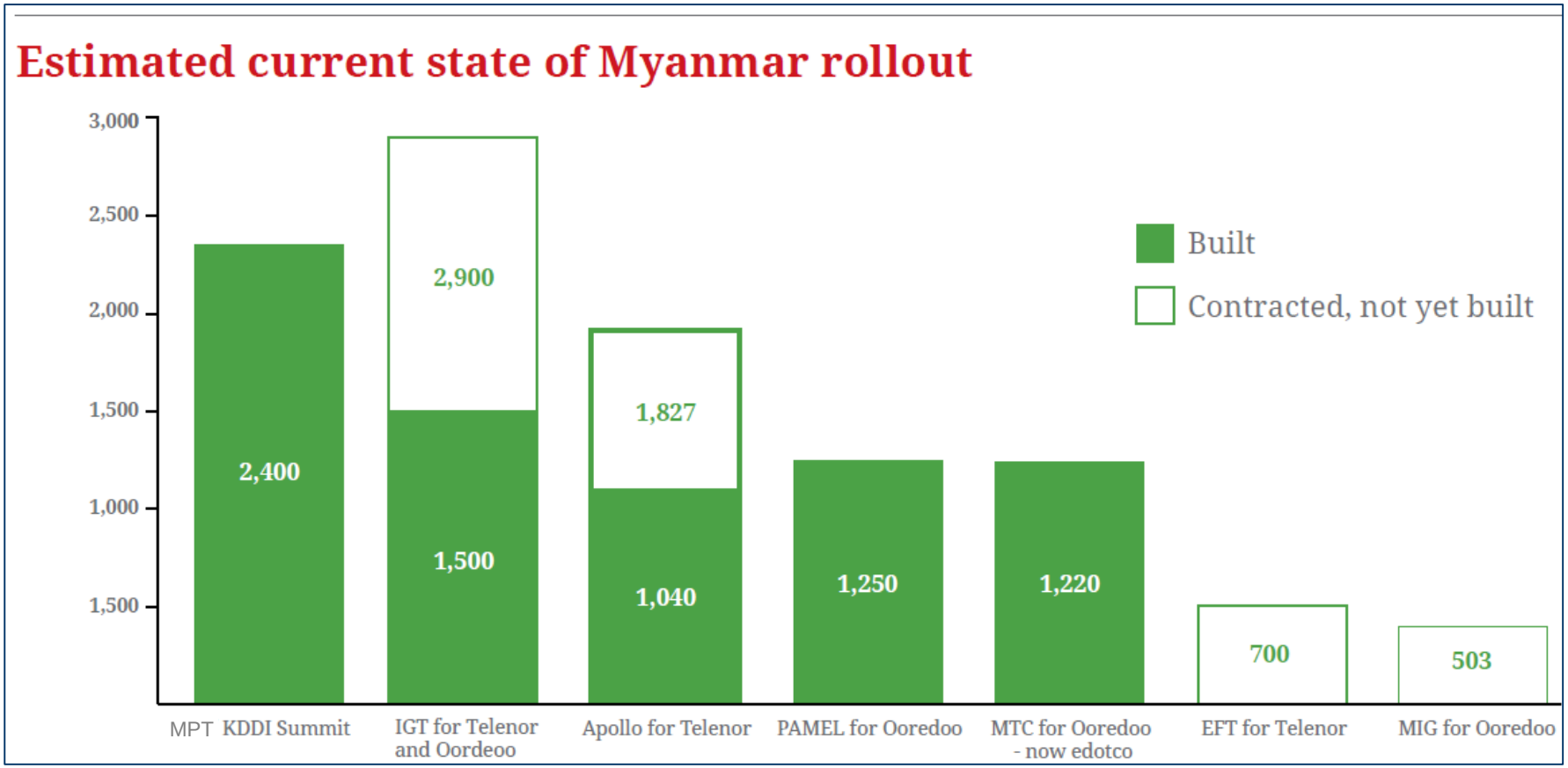
Tower rollout: towers expansion plan and reality





Source: GSMA, TowerXchange

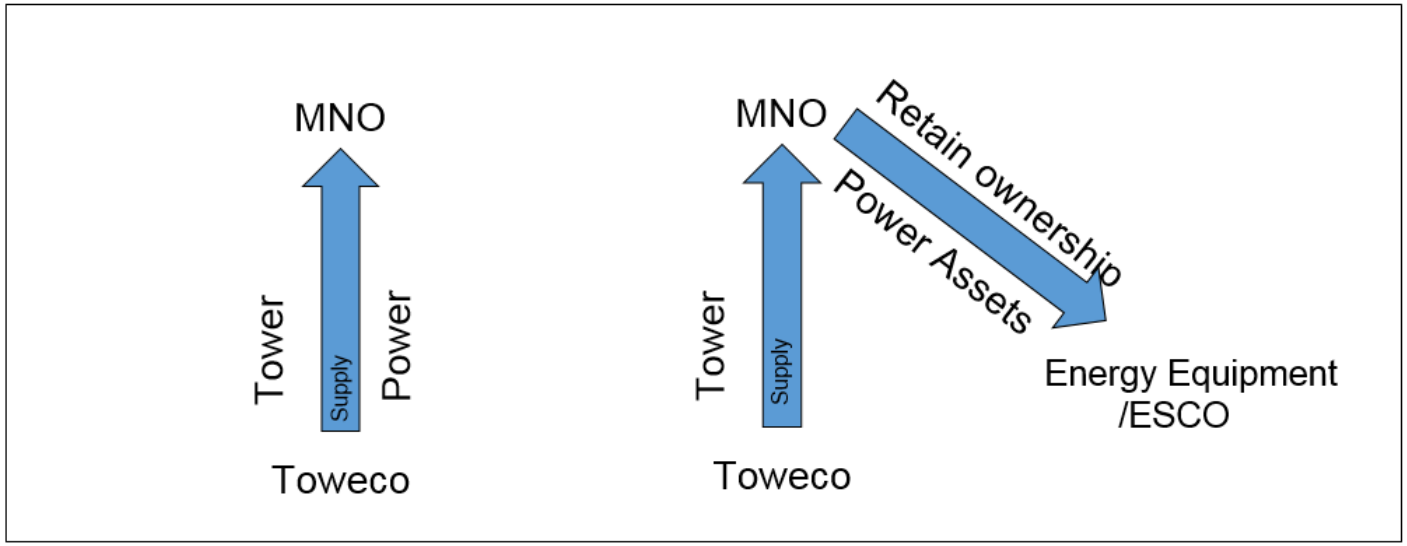
Tower rollout in Myanmar



Soure: TowerXchange

Power supply business models with telecom towers

- In Phase I and II

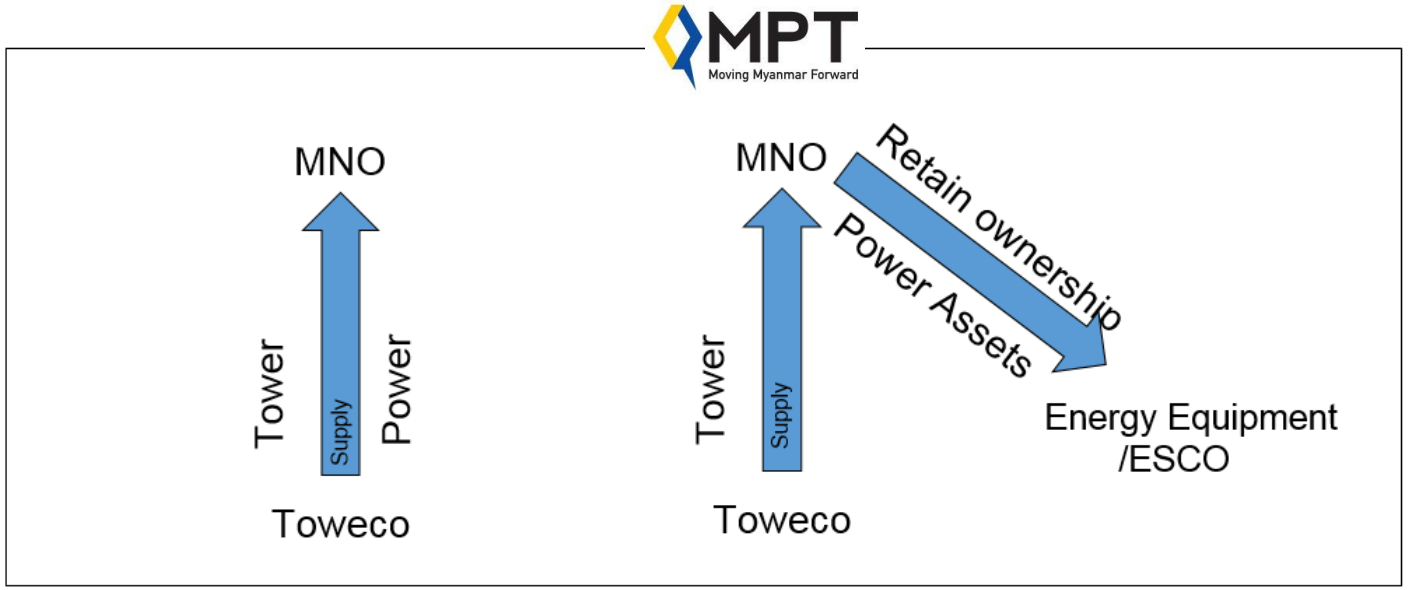


- In Phase III: likely to be Tower + Power

(Source: towerXchange & interviews)

Power supply business models with telecom towers - MPT

- In Phase I and II

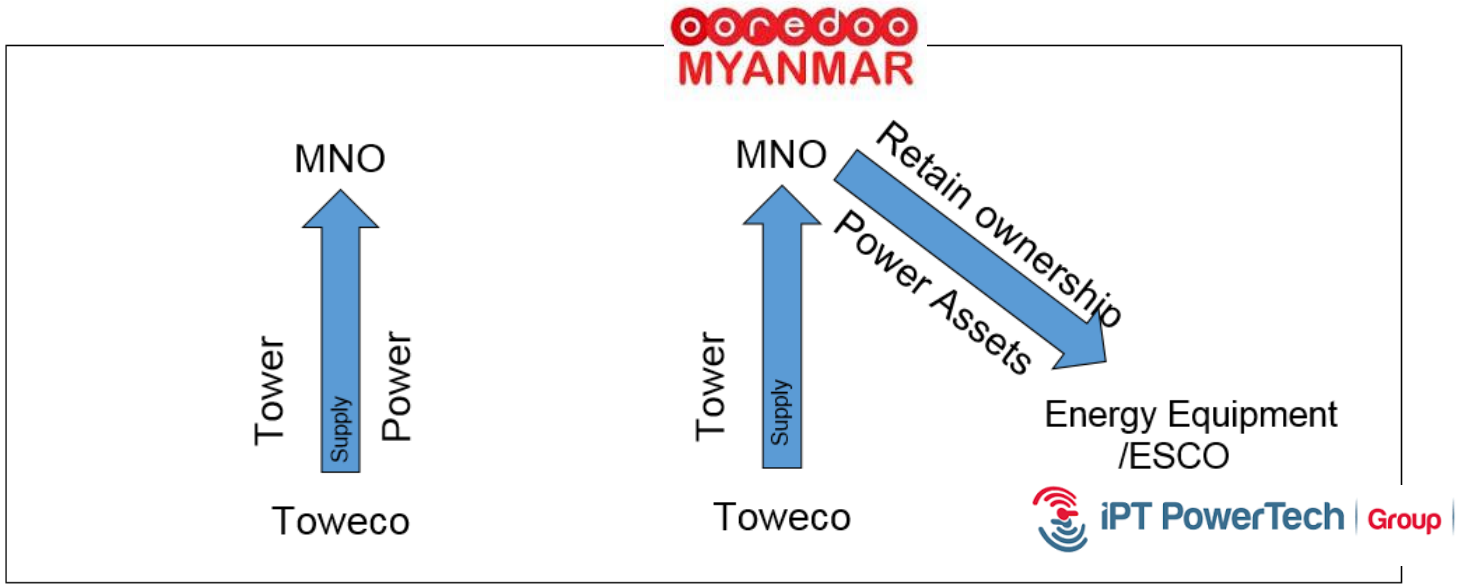


- In Phase III: likely to be Tower + Power

(Source: towerXchange & interviews)

Power supply business models with telecom towers - ooredoo

- In Phase I and II

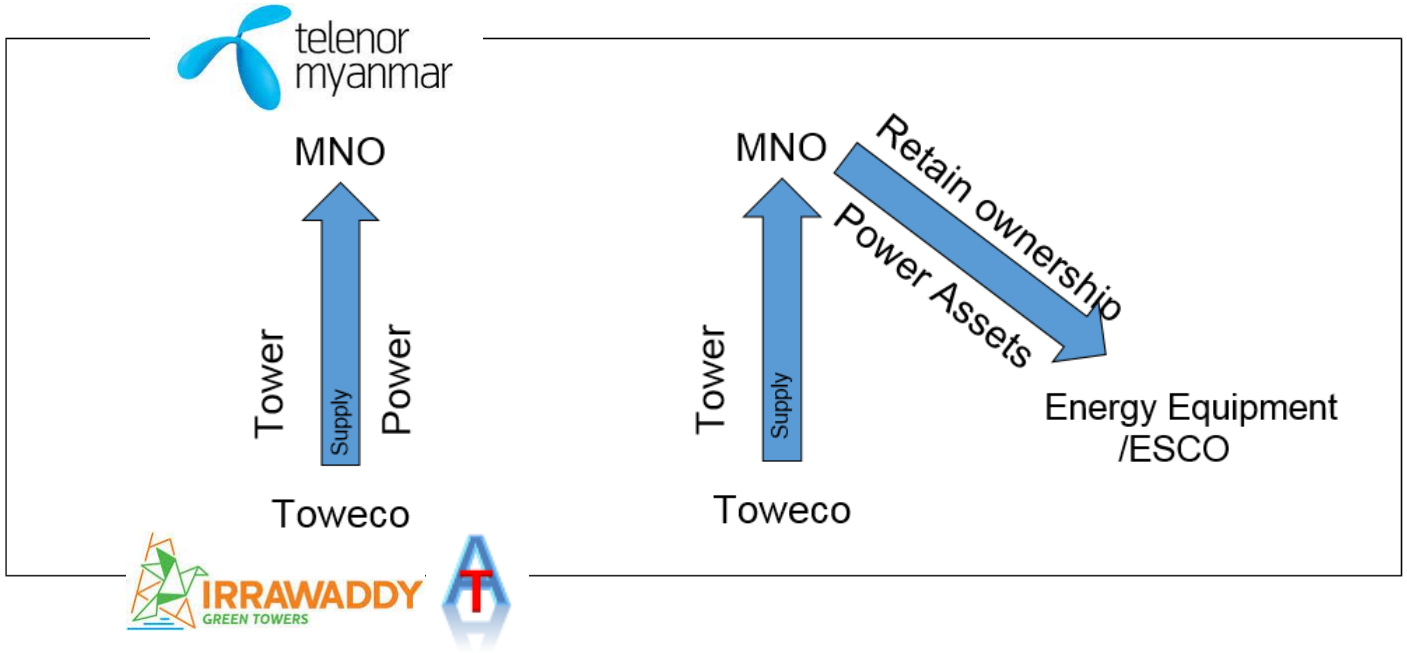


- In Phase III: likely to be Tower + Power

(Source: towerXchange & interviews)

Power supply business models with telecom towers - Telenor

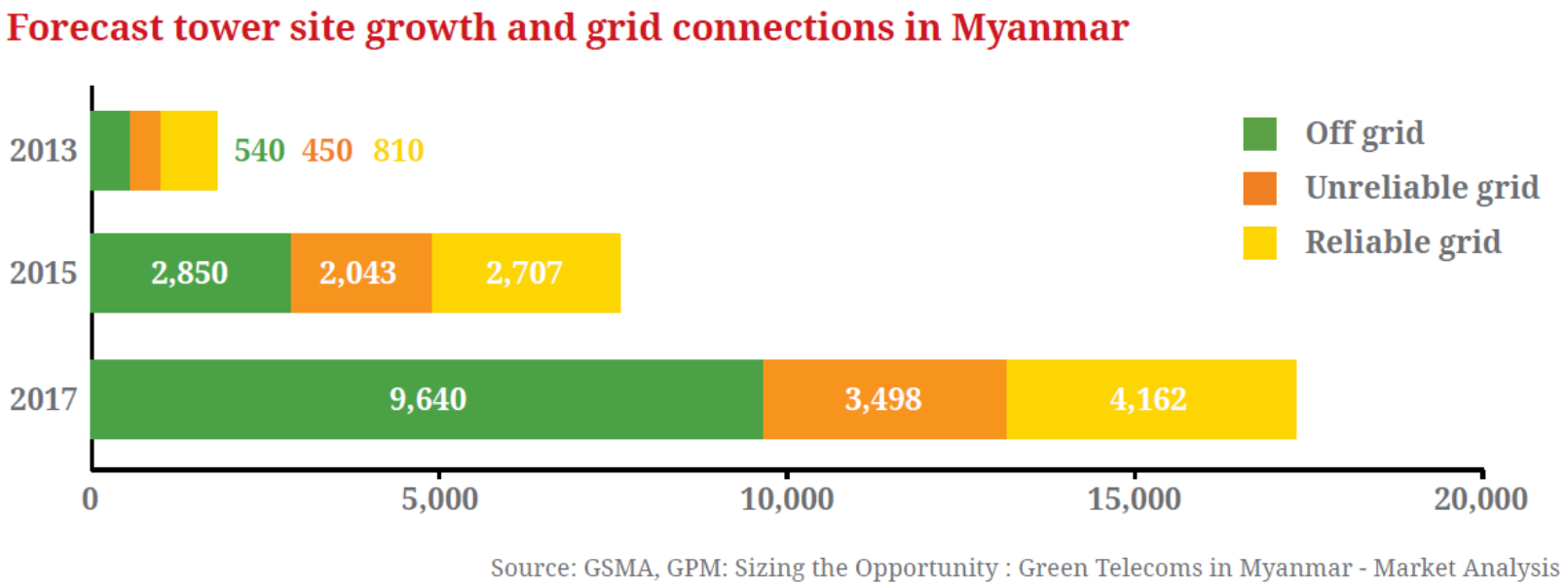
- In Phase I and II



- In Phase III: likely to be Tower + Power

(Source: towerXchange & interviews)

Structure of the power supply: Off-grid and on-grid



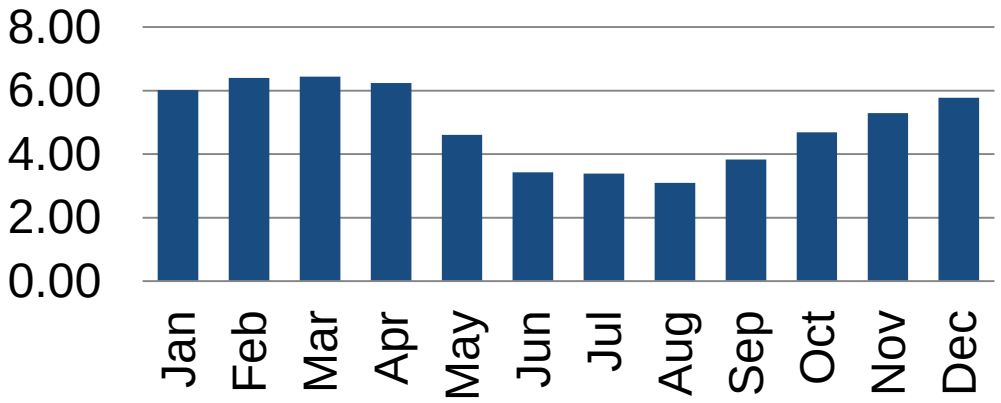
In 2017 more than 75% of the towers will need special power supply since they will be off-grid or on unreliable grid.

Source: TowerXchange

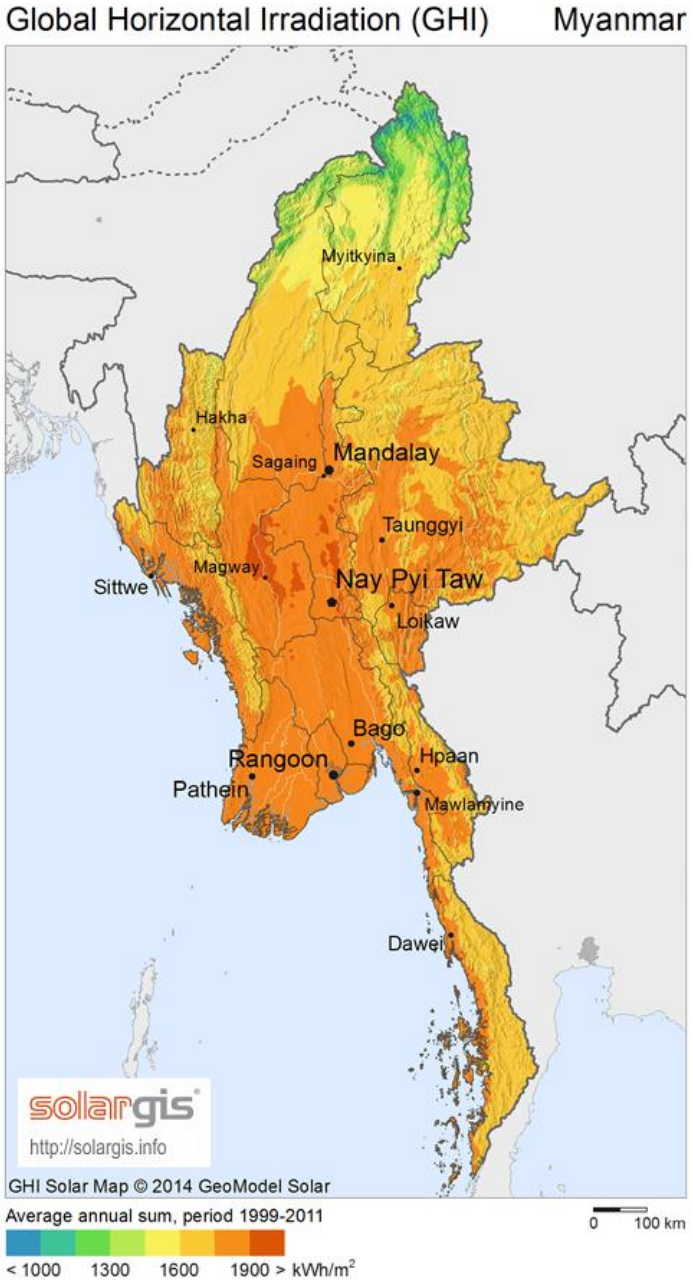
Solar Potential in Myanmar

- Avg. solar irradiation:
  4.5-5.5 kWh/m2/day

Daily solar yield in Yangon
[kWh/m2/day]



Source: http://solargis.info/doc/_pics/freemaps/1000px/ghi/SolarGIS-Solar-map-Myanmar-en.png & http://solarelectricityhandbook.com/solar-irradiance.html



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OPEX saving opportunities with renewable energy

	2014	2015	2017
Potential number of sites	1544	3054	9990
Investment Required (US $ million)	60.0	118.8	388.5
Potential OPEX Savings (US $ million per year)	21.2	42.0	137.4
Savings in Diesel Consumption (million liters per year)	11.8	23.3	76.1
CO2 emission reduction (Tonnes per year)	31,527	62,359	203,985

- high cost savings; 2.83 years payback period
- 83% of consumption for a diesel based solution

Soure: Green Power for Mobile Market Analysis – Myanmar, 2014

Conclusion

- The tower market will grow strongly within the next years
- Phase III is rolling out for remote areas
- High demand for special energy solutions since 75% of the towers are without reliable power supply from the grid (either off-grid or simply unreliable)
- Insufficient power and voltage fluctuations even in major cities (e.g. high voltage spikes and interruptions once or twice a day even in downtown Yangon)
- Battery back-up and renewables seem to be a no-brainer since it is highly cost efficient

Questions for the discussion

- What is needed to scale-up to market? What will change in rollout phase 3 and what impact does it have on power provision?
- Are 3rd party models with power supply by an ESCO needed? Which companies would provide ESCO services in Myanmar?
- How close are rural villages to the towers? Are A-B-C business models applicable in Myanmar? Has anyone already tried to implement?
- How is reliability currently achieved? Which power equipment is used and from which countries is it sourced?

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Thank you for your attention!

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