



ENERGY

Present and Future of Sustainable Renewable Energy

10th International Forum on Energy for Sustainable Development

Das Na Songhkla, Senior Engineer, Thailand

07 October 2019

Why DNV GL?

More than **3,000** energy staff in **50** locations across **30** countries



>30

**30 offices in 30 countries
in every continent**

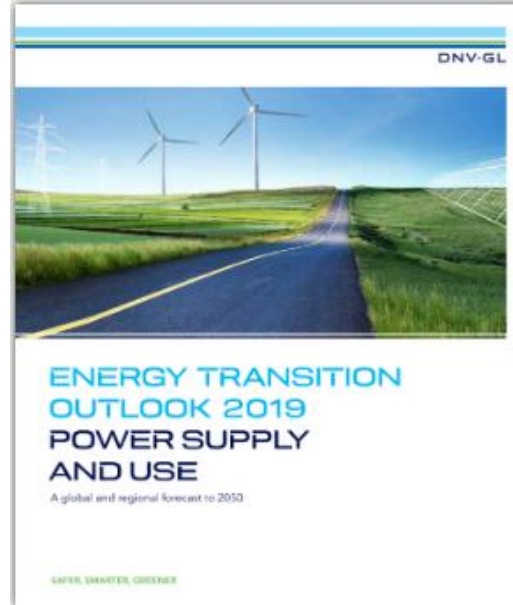
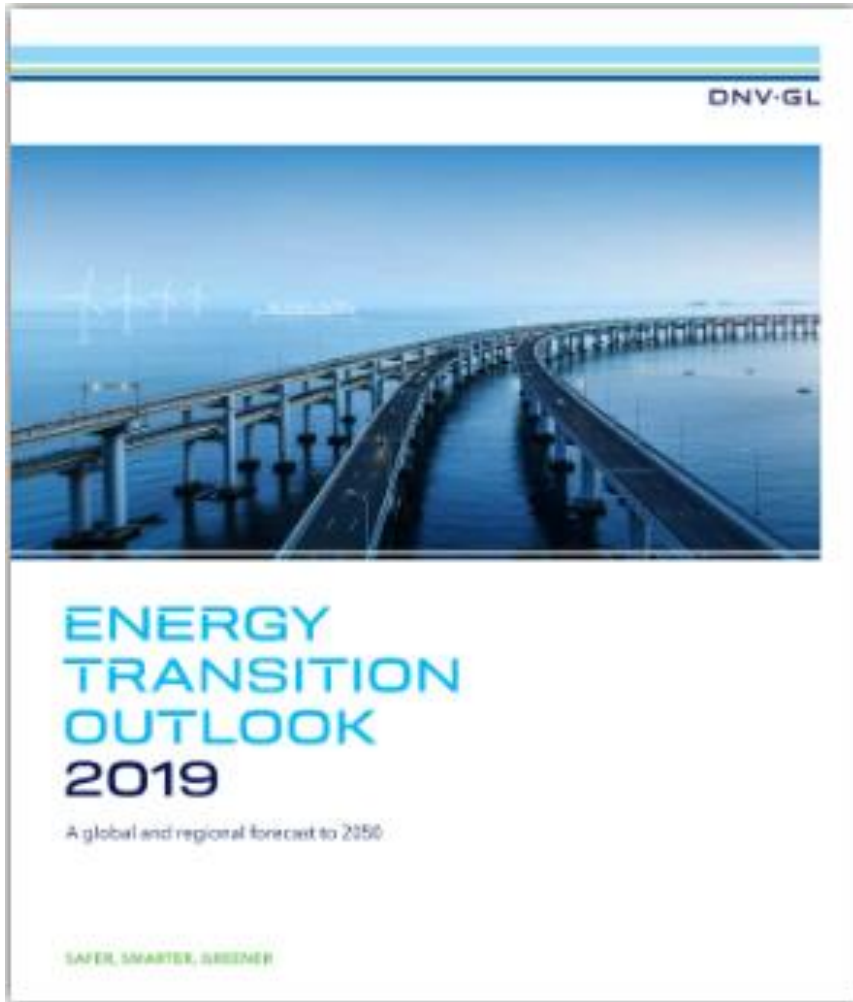
>3,000

**3,000 energy experts in
wind, solar, grids, storage
and energy management**

>90

**90 years experience in the
power industry, including
40 years in wind energy
and energy management
and more than 20 years in
solar**

The DNV GL ETO studies trends in energy around the world



ENERGY TRANSITION OUTLOOK 2019

A global and regional forecast to 2050

Visit: eto.dnvgl.com

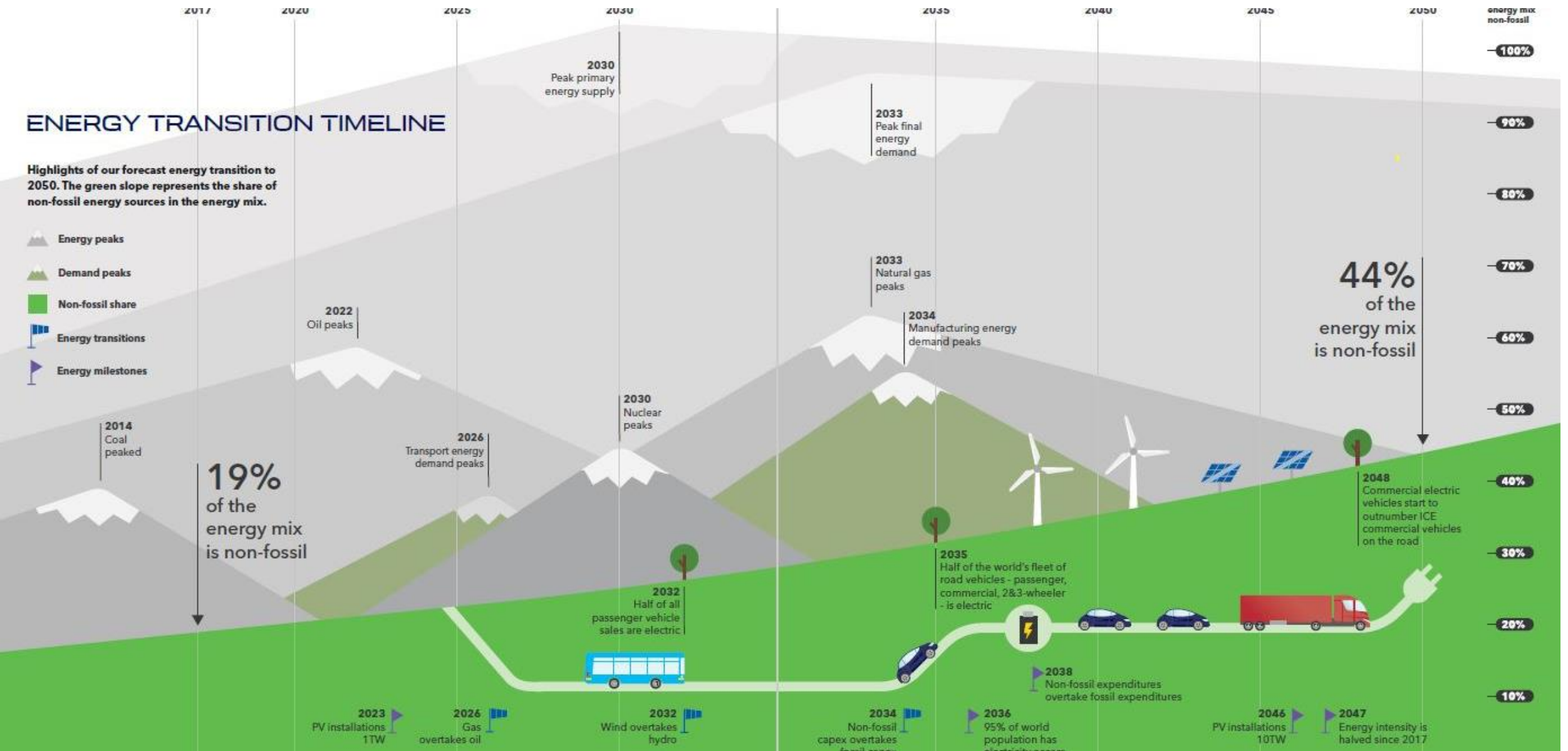
YouTube: [DNV GL Energy Transition Outlook 2019 – the next generation](#)

Source: DNV GL Energy Transition Outlook, 2019

ENERGY TRANSITION TIMELINE

Highlights of our forecast energy transition to 2050. The green slope represents the share of non-fossil energy sources in the energy mix.

- Energy peaks
- Demand peaks
- Non-fossil share
- Energy transitions
- Energy milestones



Forecast wind capacity 2050

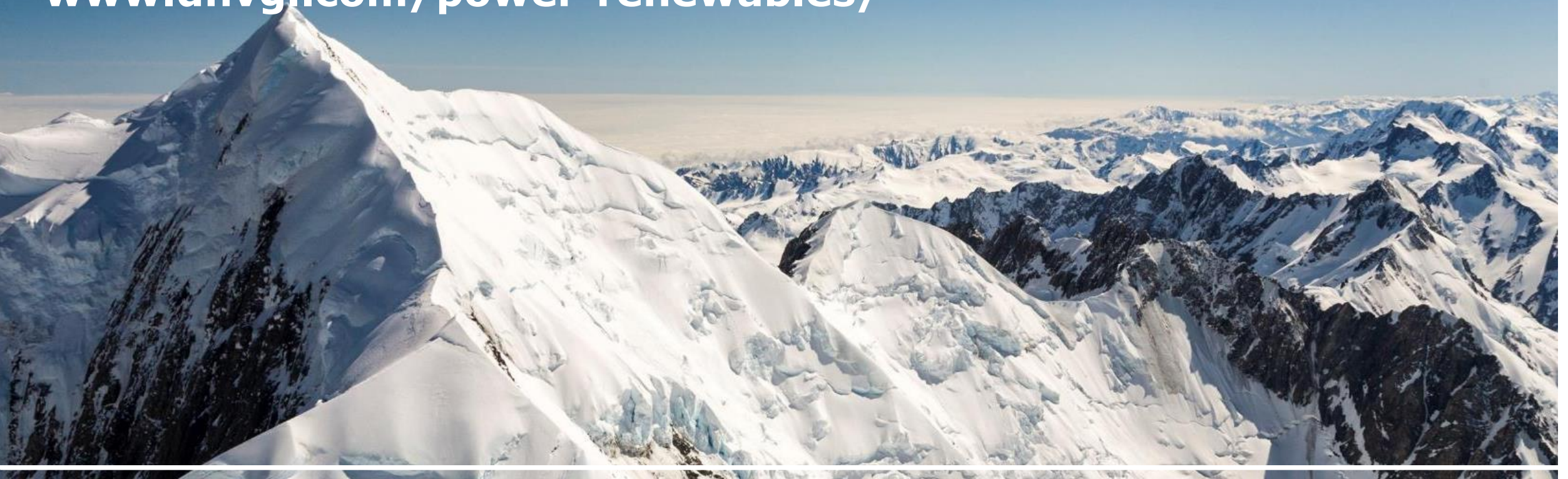
Installed onshore and offshore wind capacity by region

Units: GW		2017		2030		2050	
		Onshore	Offshore	Onshore	Offshore	Onshore	Offshore
NAM	North America	100	0	318	69	476	355
LAM	Latin America	22	0	66	1	169	100
EUR	Europe	155	16	287	56	330	168
SSA	Sub-Saharan Africa	3	0	8	1	100	27
MEA	Middle East and North Africa	9	0	39	1	207	94
NEE	North East Eurasia	1	0	9	0	75	0
CHN	Greater China	162	3	641	8	1 543	175
IND	Indian Subcontinent	34	0	34	4	122	360
SEA	South East Asia	1	0	8	7	104	159
OPA	OECD Pacific	10	0	162	2	296	116
World		496	19	1 571	148	3 421	1 554

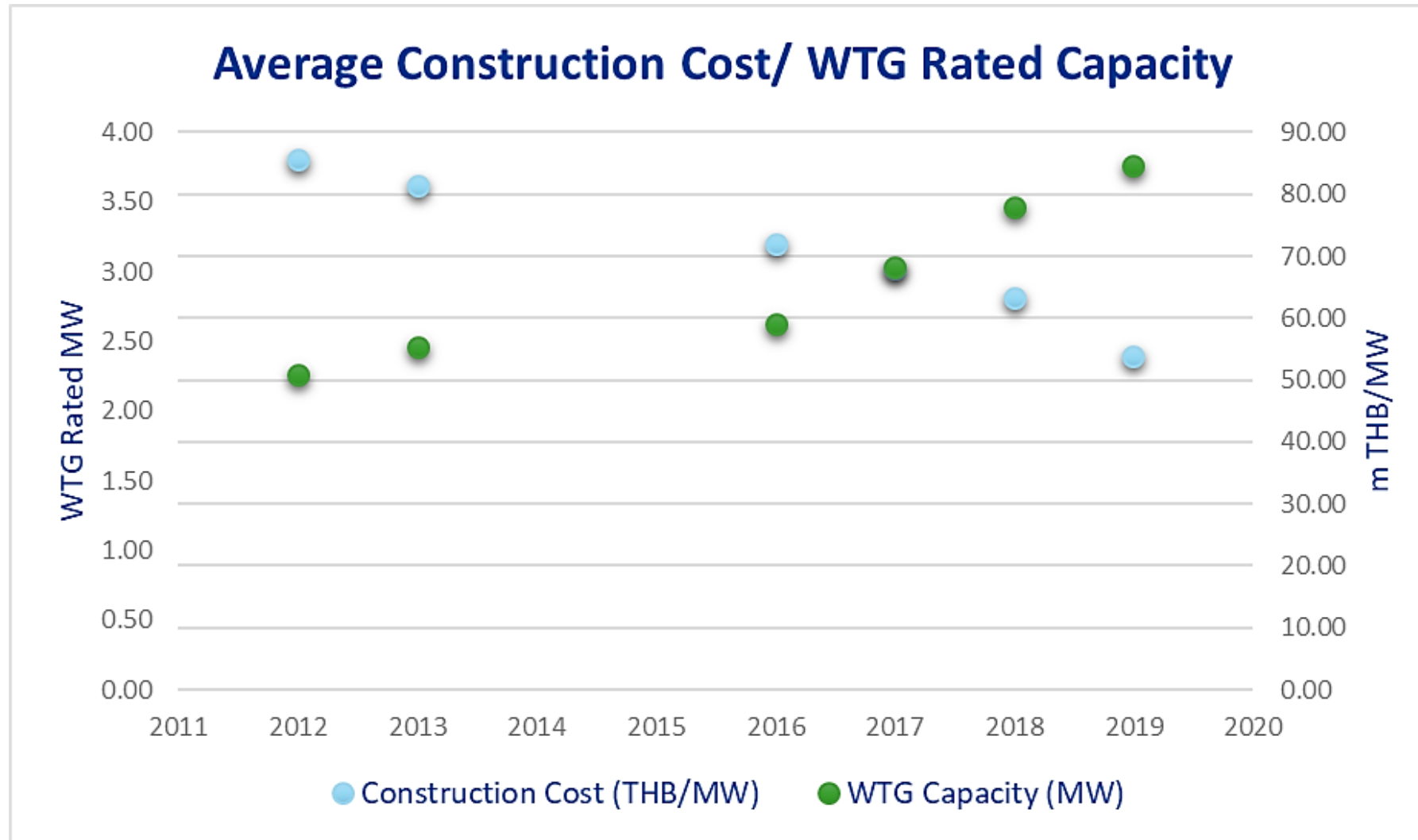
Source: DNV GL ETO, 2019

Thailand

www.dnvgl.com/power-renewables/



Average construction cost/WTG rate capacity in Thailand



Source: ThaiWEA report Feb 2019

Thai PDP (2019-2037) expects little new wind capacity, but much solar

Renewable energy type	PDP 2018	AEDP 2018
Solar Cells	12,725	15,574
Biomass	3,496	5,786
Wind Farm	1,485	2,989
Biogas (Waste)	546	928
Community Waste	400	900
Industry Waste	44	75
Small Hydro Plant	-	188
Large Hydro Plant (EGAT)	-	2,918
Total (MW)	18,696	29,358
Total Energy Demand	257,221	257,221
% Renewables Energy	19.76 %	32.89 %

* Seminar on 8 Aug 2019 by Ministry of Energy

* Current wind energy installation is 1.5 GWh

PDP : Power Development Plan (Approved by The National Energy Policy Council)

AEDP : Alternative Energy Development Plan (Draft)

Current challenges

1. Permitting

- Agricultural land issue – Government waived the issue on previous developing wind farms in 2017.
- No clear regulation for new development wind farms.

2. Policy

- Currently, no policy on new tariff – wind farm.

3. Investment

- Investor and Development are seeking to develop in other countries.

Information from GWEC/ Global Wind Report 2018 (Dated April 2019)

Thank you

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