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ASIA CLEAN ENERGY FORUM

Vietnam Wind Power Development Status

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WIND ENERGY ROADMAP OF VIETNAM

ITEM	QUANTITY	ITEM	QUANTITY
Total Installed Wind Power	135.2MW	Wind Energy Tariff	\$7.8 cents/kwh (exl VAT)
Total Wind Projects Pipeline	993 MW	Averaged Retail Power Tariff (2015)	\$7.7 cents/kwh (exl VAT)
Total Realizable Wind Potential at 80m height	2,099,333 MW	Averaged Wholesale Power Tariff (2016)	\$5.8 cents/kwh (exl VAT)
Country Renewable Energy Target by 2030	27,195 MW	Other Incentives:	Cooperate tax, Land-use tax, environment tax
Total Installed Generation Capacity by 2030	129,500MW	Import Tariffs Waived	Exemption for imported equipment
Total Load demand by 2030	506 billion kwh	Tax Holiday	4 years
Electrification Ratio by 2020 (by on and off grid solutions)	100%		

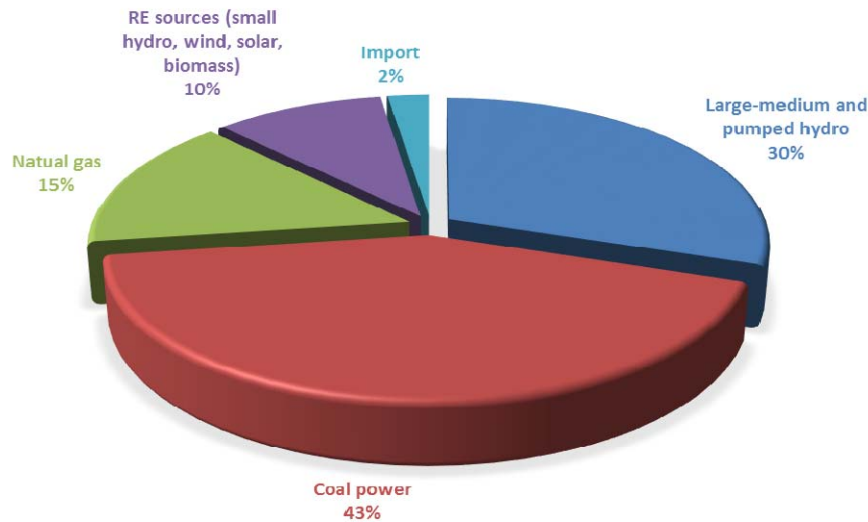


National Renewable Energy Targets

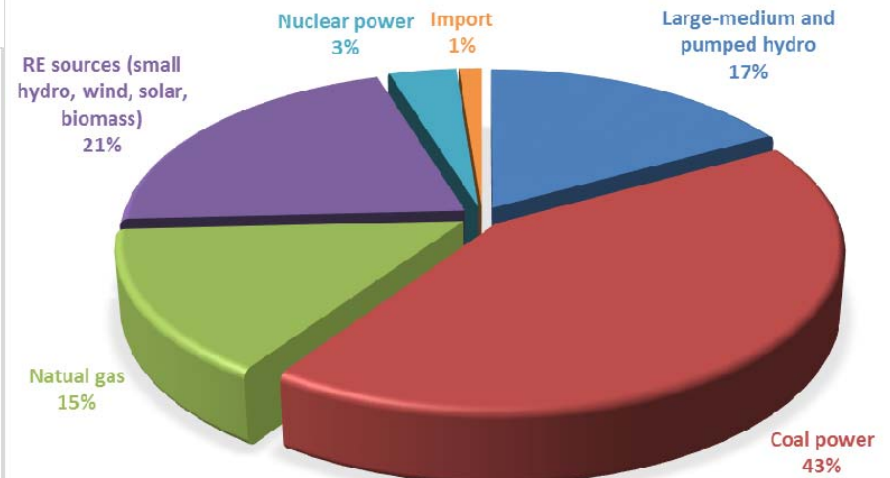
Revised National Power Development Plan 2011-2020, and outlook 2030
Capacity share of RE sources (small hydro, wind, solar, biomass, etc.)

- by 2020: 5,940MW (9.9%);
- by 2025: 12,062MW (12.5%)
- by 2030: 27,195 MW (21%)

GENERATION STRUCTURE BY 2020



GENERATION STRUCTURE BY 2030





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Wind Power Potential in Vietnam

Wind resource atlas of Vietnam prepared by AWS TruePower for Vietnam (2011): with average density of 10MW/km²

Mean speed at 80m height (m/s)	Estimated developable land area (km ²)	Percentage of developable land (%)	Approximate Megawatt potential (MW)
<4	96,916	45.7%	959,161
4-5	70,868	33.8%	708,678
5-6	40,473	19.3%	404,732
6-7	2,435	1.2%	24,351
7-8	220	0.1%	2,202
8-9	20	0.01%	200
>9	1	0.001%	10
Total	209,933	100%	2,099,333

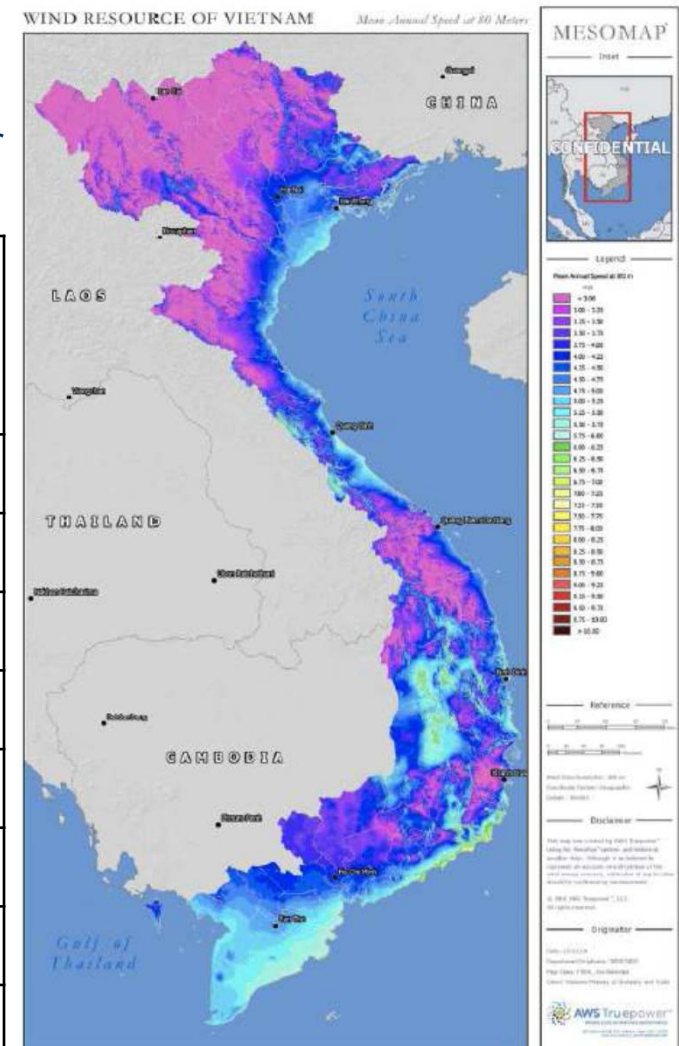


Figure 3. Wind speed map of Vietnam for a height of 80 m.



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Wind Power Development Targets

Revised National Power Development Plan 2011-2020, outlook 2030 (2016)

Targeted wind power capacity share:

- by 2020: 800MW
- by 2025: 2,000MW
- by 2030: 6,000MW

Share of electricity generation in kWh from wind energy source:

- By 2020: 0.8% (equal to 2.12 billion kWh)
- By 2025: 1% (equal to 4 billion kWh)
- By 2030: 2.1% (equal to 12.01 billion kWh)



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Installed Wind Capacity



Binh Thuan Wind Power Project: 30MW
developed by REVN



Bac Lieu Wind Power Project: 99.2MW
developed by Cong Ly Co, Ltd



Phu Quy Wind Power Project:
6MW developed by PVPower
RE



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Pipeline of Wind Projects

Province	Planned by 2020 (MW)	Name of project	Approved Capacity (MW)	In operation (MW)	Comissio ning date	Current situation
BINH THUAN	700	Phong điện 1 - GĐ 1	30	30	2009	O
		Phong điện 1 - GĐ 2	90		2016	A
		Phú Lạc - GĐ 1	24		2016	U
		Phú Lạc - GĐ 2	26		2018	
		Phú Quý	6	6	2012	O
		Thuận Nhiên Phong	32			U
NINH THUAN	220	Điền gió Công Hải	47		2016	U
		Điền gió Trung Nam	90			U
		Điền gió Mũi Dinh	32		2016	U
SOC TRANG	200	Điền gió Trasesco - EAB	65			IL
		Điền gió Âu Mỹ	40			
BEN TRE	150	Điền gió Thanh Phong	29.7		2017	F
		Điền gió Hàn Quốc - Bến Tre	60		2017	F
		Điền gió Bình Đại-BT GĐ1	30		2017	F
		Điền gió Bình Đại-BT GĐ2	90			
QUANG TRI	110	DA Hướng Linh	30		2017	A
BẠC LIÊU		DA Bạc Liêu- GĐ 1	16	16	2013	O
		DA Bạc Liêu- GĐ 2	83.2	83.2	2015	O
LÂM ĐỒNG		DA Cầu Đất- GĐ 1	30		2017	
BÌNH ĐỊNH		DA Phương Mai 1	30		2017	A
		DA Phương Mai 3	21		2017	A
		DA Nhơn Hội	61.1		2017	
Total	1,380		993	135.2		

O: Under operation
 U: Under construction
 A: FA approved
 F: FS Preparation
 L: Land acquisition
 IL: Investment license given



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Current Tariffs and Policies

- 2011: GoV's Decision No. 37/2011/QD-TTg on mechanisms to support development of wind power projects.
 - FIT for grid-connected wind power project: 7.8 US\$/kWh (VAT exclusive; subject to VND/USD fluctuation)
- 2012: MOIT's Circular No. 32/2012/TT-BCT promulgating implementation of WPP development and standard PPAs for wind power projects.
 - Procedures for development of wind power projects
 - SPPA for wind power projects
- 2013: MOIT's Circular No. 06/2013/TT-BCT promulgating content, order, procedure for formulation, appraising and approving wind power planning
- Other supporting mechanisms for WPP
 - Import tax: Import tax exemption for imported equipment
 - Deferred corporate income tax
 - Exempt land-use tax/charges.
 - Exempt environmental protection fees.



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Active Developers

Some active wind power developers in Vietnam:

- Cong Ly Trade and Tourism Ltd
- Vietnam Renewable Energy JSC
- PVPower Renewable Energy Ltd
- HDRE Wind Energy Solution Ltd
- EAB (Germany) & Trasesco Ltd
- Binh Thuan Wind Power JSC



Barriers and Opportunities to Accelerate Wind Power Development in Vietnam

<p>Opportunities</p>	<ul style="list-style-type: none"> • Legal documents available: Vietnam Renewable Energy Development Strategy and provincial Wind Power Development Plans • Many investors (domestic and foreign) interested in investing wind power projects in Vietnam
<p>Barriers</p>	<p><u>Mechanism</u></p> <ul style="list-style-type: none"> • Feed-in-tariff still not attractive to wind investors • Fossil-fuel based power plants being developed
	<p><u>Institutional</u></p> <ul style="list-style-type: none"> • Lack of a national wind power development plan not yet developed • Lack of a central body to coordinate investment on wind power projects (from natural resource management)
	<p><u>Technical</u></p> <ul style="list-style-type: none"> • Limited capacity in managing and operating wind power projects • Lack of grid integration standard for wind power
	<p><u>Impact on national electricity system</u></p> <ul style="list-style-type: none"> • Dispatch and mobilizing capacity • Increased reserve capacity of the electricity system • Wholesale electricity market (2017)



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Thank You!