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2017 Outlook for Vietnam Renewable Energy

Latest Regulatory and Market Developments

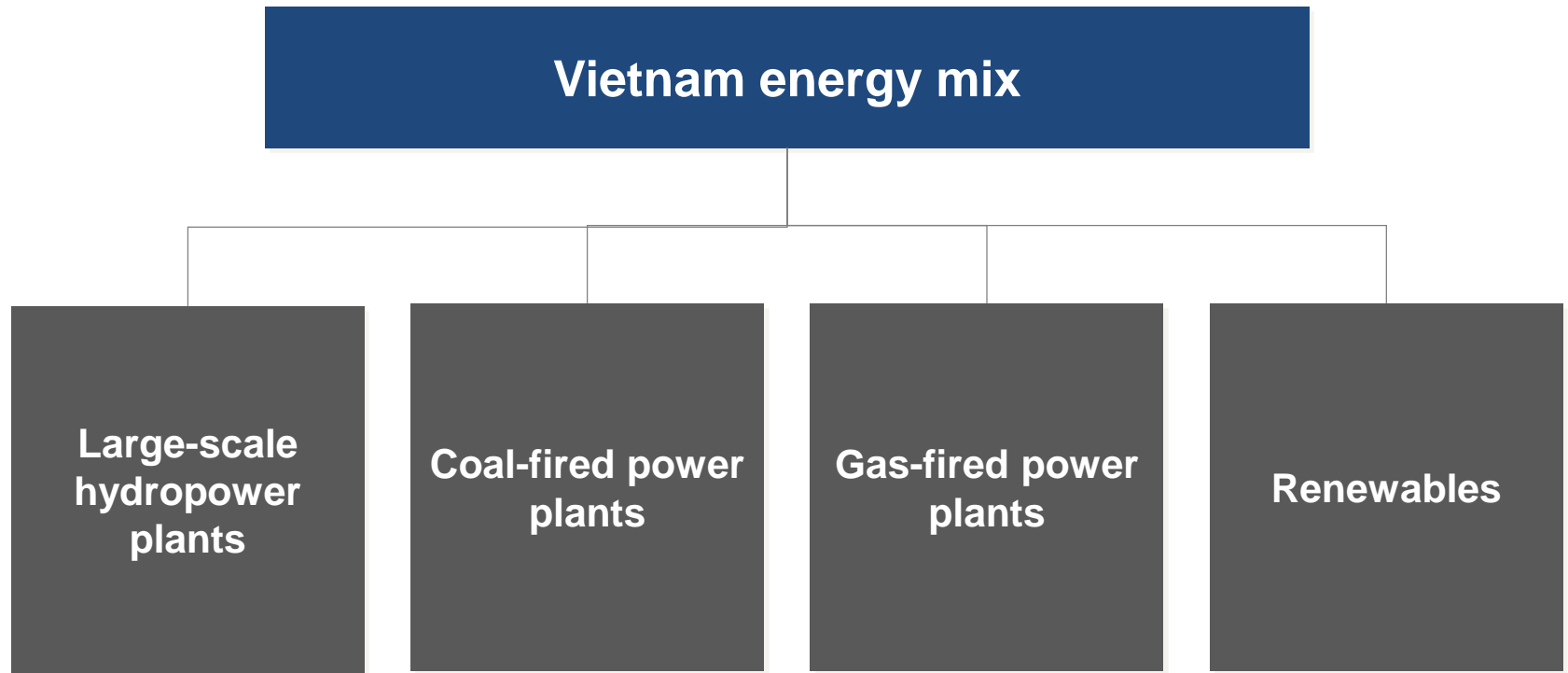
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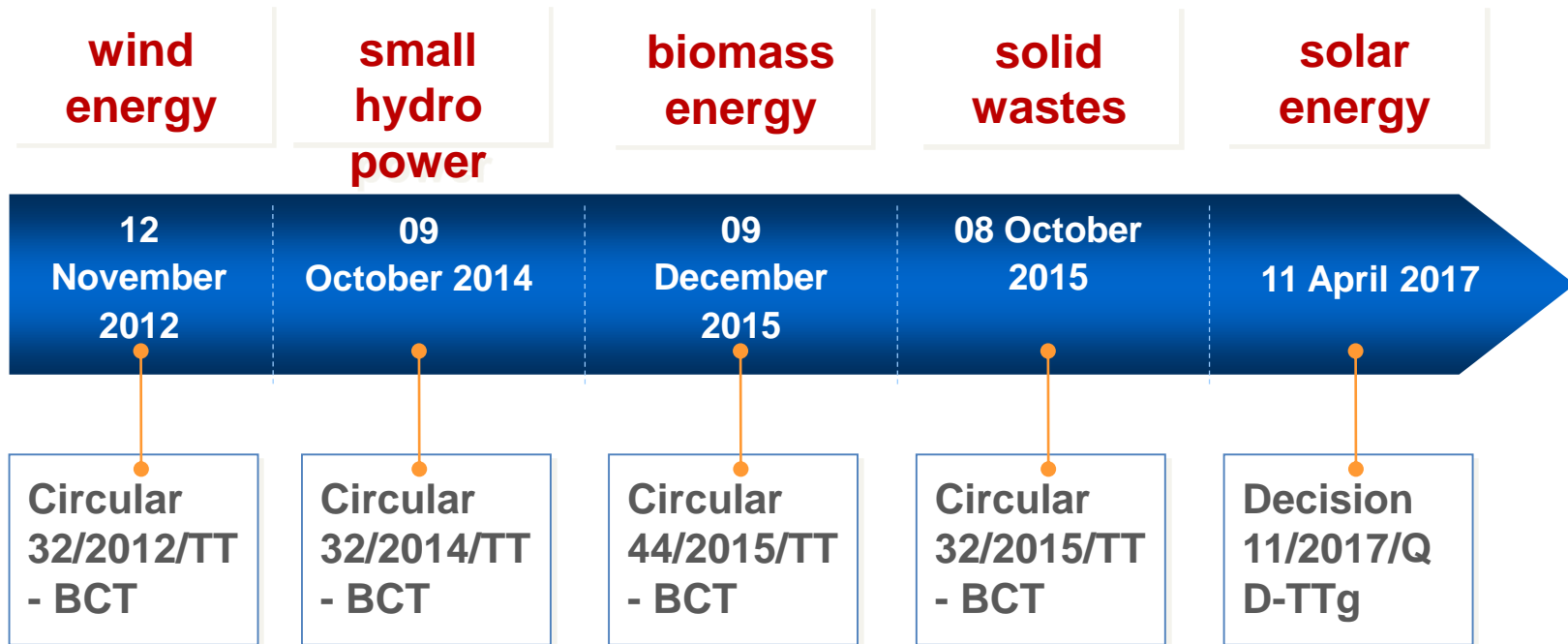
Power generation



Key challenges in the power sector

- long-term security of power generation supplies
- high emissions and high energy imports
- increasing dependency on coal imports
- key policy challenges:
 - ✓ achieving sufficient generation capacity to meet future energy demands
 - ✓ mobilizing major debt and equity investments in power
 - ✓ reducing energy and carbon intensity and promoting energy efficiency
 - ✓ reducing reliance on coal and promoting renewable energy

Renewables regulatory framework



- Revised PDP7
- Vietnam's Renewable Energy Development Strategy (REDS)
- PM approval of National Green Growth Strategy

Revised PDP7

- high growth power demand anticipated in Revised PDP7
- substantial potential for renewable energy resources, particularly solar PV, wind, biomass and small hydropower
- stronger emphasis placed on RE development for power generation
- incremental increase in the proportion of electricity produced from RE resources
- targeted electricity production from RE
 - ✓ 7% by 2020
 - ✓ over 10% by 2030

Revised PDP7

- electricity production from solar energy
 - ✓ 0.5% by 2020
 - ✓ 1.6% by 2025
 - ✓ 3.3% by 2030
- electricity production from wind energy
 - ✓ 0.8% by 2020
 - ✓ 1.0% by 2025
 - ✓ 2.1% by 2030

Revised PDP7

- electricity production from biomass energy and power co-generation at sugar plants
 - ✓ 1.0% by 2020
 - ✓ 1.2% by 2025
 - ✓ 2.1% by 2030
- electricity production from hydropower (including large-scale projects)
 - ✓ 29.5% by 2020
 - ✓ 20.5% by 2025
 - ✓ 15.5% by 2030

Solar energy

- favourable solar irradiation in Vietnam
- international cost prices are steadily reducing
- currently modest solar installations
- projected installed capacity
 - ✓ 850MW by 2020, 4,000MW by 2025, 12,000MW by 2030
- recent market developments on solar farms
 - ✓ Fujiwara Binh Dinh solar and wind power project (a 64MW solar power plant COD in Q1 2019 and a 36MW wind power plant COD in Q1 2020)
 - ✓ Thanh Hoa 1 (160MW developed by BS Heidelberg Solar)
 - ✓ JinkoSolar plans 40MW solar project in Hau Giang

Wind energy

- good potential of large-scale wind energy
- 65 projects registered to generate more than 5,700MW
- currently 190MW wind installations
- wind farms in operation
 - ✓ Bac Lieu (99.2MW offshore, developed by Cong Ly)
 - ✓ Tuy Phong (30MW, developed by REVN) in Binh Thuan
 - ✓ Phu Lac (24MW, developed by TBW) in Binh Thuan
 - ✓ Phu Quy (6MW, developed by PV Power RE) in Binh Thuan
 - ✓ Huong Linh 2 (30MW, developed by Tan Hoan Cau) in Quang Tri

Wind energy

- projected installed capacity
 - ✓ 800MW by 2020 (unlikely to achieve), 2,000MW by 2025, 6,000MW by 2030
- under construction (230MW)
 - ✓ Mui Dinh (37.6MW, developed by EAB) in Ninh Thuan
 - ✓ Trung Nam (90MW, developed by Trung Nam) in Ninh Thuan
 - ✓ Khai Long (100MW, developed by Cong Ly) in Ca Mau
- new wind farm projects
 - ✓ Phu Cuong (800MW, 150 - 200 MW Phase 1, developed by Phu Cuong, GE & Mainstream Renewable Power (MRP)) in Soc Trang
 - ✓ Dam Nai (40MW developed by Blue Circle/TSV) in Ninh Thuan

Biomass

- biomass and co-generation (sugar)
- currently approximately 150MW biomass installations
- projected installed capacity
 - ✓ 500MW by 2020
 - ✓ 2,000MW by 2030

Feed-in tariff

- power tariffs in Vietnam are lower than those of other countries
 - ✓ US cents 9.35/kWh for solar (initially proposed US cents 11.2/kWh)
 - ✓ US cents 7.8/kWh for onshore wind (including US cent 1.0/kWh Government support via VEPF) and US cents 9.8/kWh for offshore wind
 - ✓ US cents 5.8/kWh for power co-generation, other biomass projects subject to avoided costs regime
 - ✓ US cents 10.05/kWh for solid wastes to power
 - ✓ subject to avoided costs regime for small hydropower projects
- no escalation clause, tariff in the draft solar PPA is not adjustable on account of CPI or FX

EVN's offtake obligations

- Vietnam adopts a monopoly “single buyer” RE electricity market
- EVN and its authorised member companies remain the sole intermediary power offtaker and aggregator of renewable energy projects
- no mechanism for direct corporate PPAs

Decision 11 re solar energy

- regulates the conventional solar photovoltaic (PV) power system
- classifies two types of solar PV projects:
 - ✓ roof-mounted solar
 - ✓ grid-connected solar
- requires all PPAs that are already executed before 01 June 2017 must be amended in accordance with the model form of the solar PPA
- leaves open many of fundamental bankability issues critical to the ultimate success in increasing the use of solar energy

Draft solar PPA

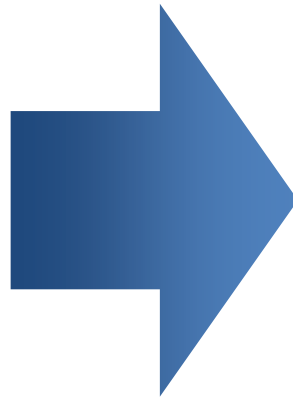
- MOIT's first draft of the PPA model form is non-bankable, AmCham, VBF and other chambers submitted analysis and recommendations to the Government
- feed-in tariff
- EVN's offtake obligations
- grid connection issues - seller currently bears the risk of connecting the power plant with the grid
- PPA term - 20 years from COD, no extension rights
- dispute resolution - no provision on international arbitration in a neutral forum
- termination rights and termination payments

Other bankability issues

- complex and lengthy RE master planning and licensing processes
- lack of a robust and consistent risk allocation framework to provide greater certainty on certain key risks that should be retained by the Government
- Government support on foreign currency conversion
- complex land acquisition process and compensation
- EVN creditworthiness

2017 outlook for Vietnam RE

Vietnam attracts plenty of attention from international investors on RE projects, including solar and wind energy



optimistic about market trends and project pipeline

- feed-in tariff remains unattractive to investors
- Government needs to act quickly to address policy lags and issues on RE development and investments
- numerous regulatory challenges need to be addressed for international lenders to project finance the development of medium and utility-scale RE projects

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