



INSTITUTE OF ENERGY – MINISTRY OF INDUSTRY AND TRADE



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Clean Energy Transition in Vietnam

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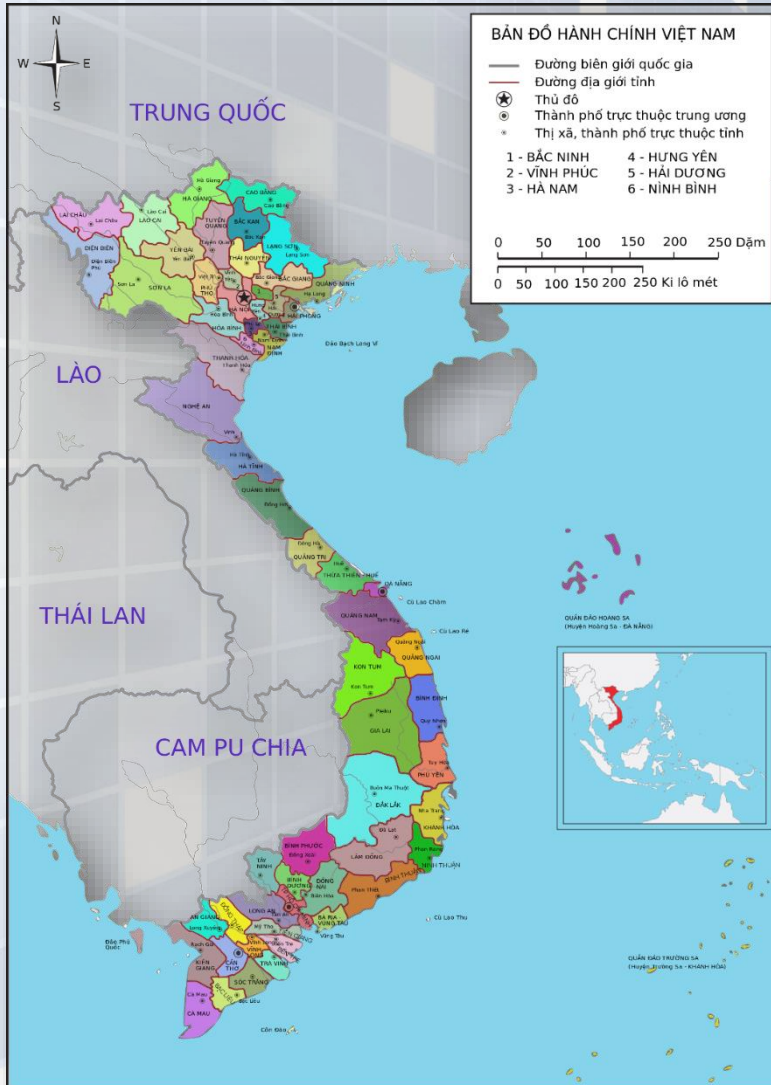
1. Background

2. Clean Energy Policies in Vietnam

- Low carbon development
- Energy efficiency
- Renewable energy

3. Conclusions

BACKGROUND



- Population: 91.7 million persons;
- Area: 331,698 km²;
- Urbanization: 34% in urban areas (2015);
- GDP (nominal): US\$193,4 billion (2015) → 2,109 US\$ per capita;
- GDP growth rate: 5.64% p.a. in 2011-2015;
- Primary energy consumption: 70.6 MTOE (~17% non-commercial) → 770 kgoe per capita (2015);
- Total electricity consumption: 143 TWh → 1,559 kWh per capita (2015);
- Electrification rate: 98% of households (2015);
- Total GHG emission: 246 mt, in which Energy sector: 57% (2010).

ECONOMIC AND ENERGY OUTLOOK

- **Outlook to 2035 (from Energy Development Plan):**
 - Economic: GDP increases at 7.2% p.a.;
 - Energy: TPES increases at 6.0% p.a.;
 - CO₂ emission for energy sector: 6.8% p.a.;
 - Energy import requirements: coal 49.3 mt and 153.8 mt; LNG 5.9 and 15.6 BCM by 2025 and 2035;
- **Challenges:**
 - ‡ Rapid increased energy/electricity demands;
 - ‡ Limited indigenous resources and huge energy import requirements;
 - ‡ Energy market reform and efficient energy pricing;
 - ‡ **Environmental impacts of energy developments;**
 - ‡ Shortage of sustained fund for clean technologies;
 - ‡ Lack of sufficient energy database for policy design and MRV.

MAJOR CLEAN ENERGY POLICIES

Legal document	Description in related to clean energy transition
Law on Energy Efficiency and Conservation (2010)	Promoting energy efficiency and conservation activities through regulations, standards, incentives etc.
Electricity Law (2004) and Amendment of Electricity Law (2012)	Prescribing the electricity development planning and investment; electricity saving; electricity markets and others.
Sustainable Development Strategy (2012)	Reduction in energy intensity to GDP; Increased share of renewable energy in energy consumption.
Viet Nam Green Growth Strategy (VGGs) (2012)	Introducing GHG reduction targets aiming to reducing fossil fuel and promoting renewable energy.
Law on Environment Protection (2014)	Promoting clean and renewable energy; environmental protection fee; environmental protection fund; strategic environmental assessment.
Intended Nationally Determined Contributions (INDCs) (2015)	Quantitative GHG emission reduction objectives for all the sectors of the economy; Reduction compared to BAU scenario; Reduction of emission intensity (GHG/GDP, GHG/per capita); GHG emission reduction measurement policies.
Renewable Energy Development Strategy (2015)	Setting RE targets in energy and power sectors; supporting schemes for RE development (FITs; RPS, Net metering etc.).

MAJOR ENERGY POLICY TARGETS

✓ Several development targets in agenda:

Item	By 2015	By 2020	By 2030
Energy saving	5-8%		
Energy intensity	Reduce by 1.5-2% per year		
Electricity elasticity to GDP	Reducing to 1 (from ~2 currently)		
RE share in total primary energy		31%	44% (by 2050)
RE share in total electricity generation		38%	43% (by 2050)
GHG emission reduction			
<i>Green growth strategy</i>		<i>10-20%</i>	<i>20-30%</i>
<i>Intended Nationally Determined Contributions (INDCs)</i>			<i>8% unconditional; 25% conditional reduction</i>

MAIN POLICY OBSTACLES FOR CLEAN ENERGY TRANSITION

- **Regulatory and policy barrier:** lack of technical capacity in designing and implementing RE and EE policies and projects;
- **Institutional and administrative:** lack of effective system for data collection, baseline assessment, RE and EE planning and MRV;
- **Market:** Lack of effective incentive mechanisms for RE & EE to compete with mature fossil fuel technologies;
- **Financial:** Shortage of sustained fund to finance EE & RE;
- **Awareness and skill:** Lack of awareness, expertise and technology knowledge in developers and consumers.

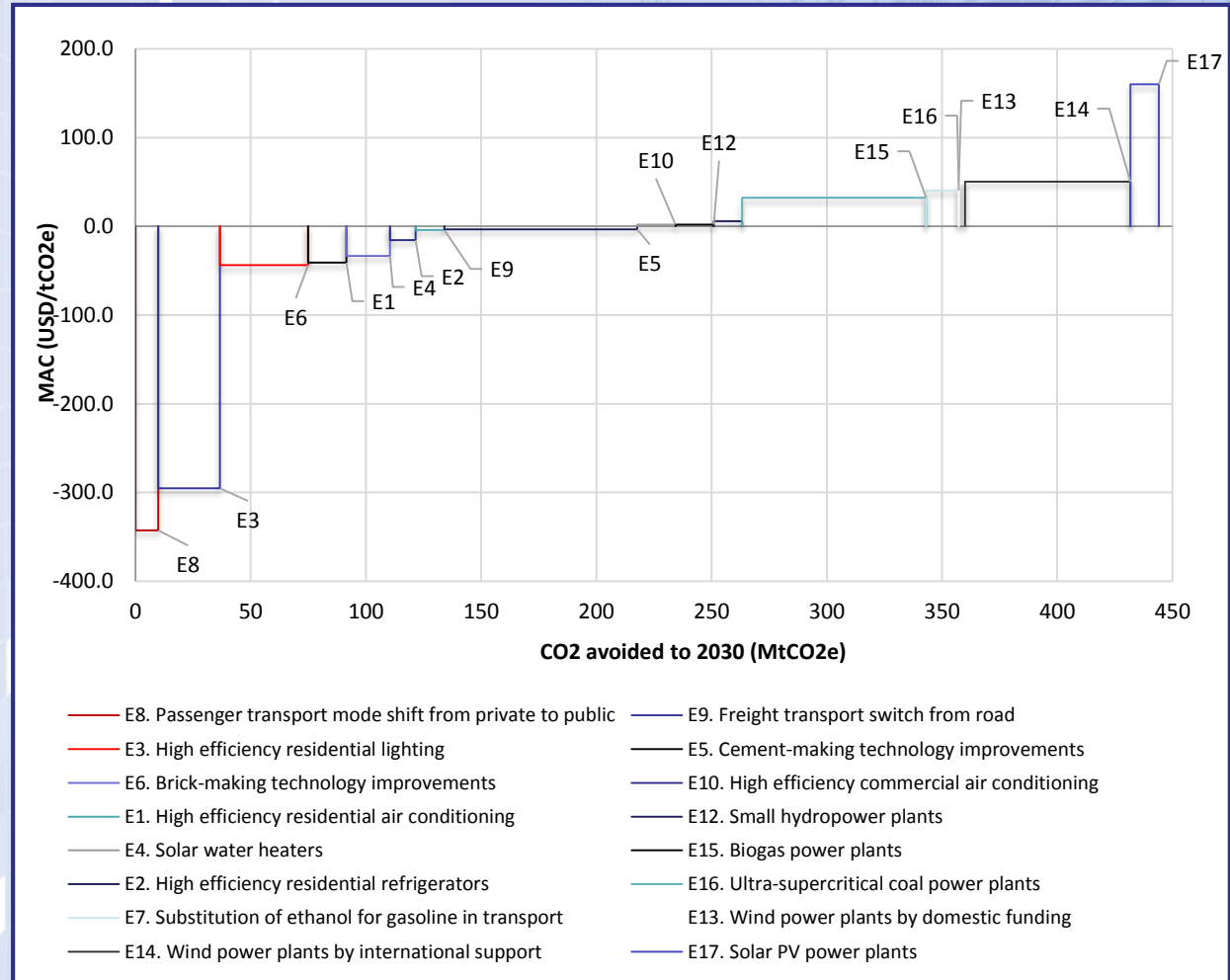
GREEN GROWTH STRATEGY (GGS)

The Viet Nam Green Growth Strategy (VGGS) is linked to both the national climate change and the economic restructuring policy agenda. Low carbon growth is one of three core strategic directions. Important targets:

- **By 2020:**
 - GDP per capita doubled compared to 2010;
 - Establish modern economic structures;
 - Reduce GHG emission per GDP by 8 to 10% compared to 2010;
 - Reduce energy consumption per GDP by 1.5 to 2% per year;
 - Reduce GHG emissions from energy activities by 10% (voluntary) to 20% (with support) compared to BAU.
- **By 2030:**
 - Reduce total GHG emissions at least 1.5% to 2% per year;
 - Reduce GHG emissions from energy activities by 20% (voluntary) to 30% (with support) compared to BAU;
 - Environmental degradation addressed and natural capital improved while improved basic standards for clean and green technology established.
- **By 2050:**
 - Green economic development is mainstreamed.

Intended Nationally Determined Contributions (INDCs)

- National contribution to international climate change commitments;
- Short – term and medium – term targets to implement GGS;
- 17 options in energy sector have been identified.
- CO₂ reduction targets for energy sector: unconditional 4.4% (29.46 MtCO₂e) and conditional 9.8% (65.93 MtCO₂e) corresponding to levels of 8% and 25% of the nation.



LAW ON EE&C 2010

- **Objective:** Promoting energy efficiency in every sectors by regulations, standards, financial supports and incentives;
- **Obligations for designated energy users:** annual and 5-year EE plans, energy manager, energy management model; compulsory energy audit for every 3 year;
- **Standards and labelling:** domestic appliances, industrial equipment and power generation technologies;
- **Supporting measures:** tax reduction, land acquisition, preferable loans from Vietnam Development Bank, the Science and Technology Development Assistance Fund, the Fund for National Technology Innovation, the Environmental Protection Fund; and National Target Programs on Energy Efficiency and Conservation (VNEEP)
- **Organization:** Ministry of Industry and Trade (MOIT) takes the lead in state management of EE activities with involvements from other ministries, provincial authorities...

VIETNAM EE PROGRAM (VNEEP)

- **Targets:**

- Energy saving 5-8% of total energy consumption;
- Implementation of EE&C Law;
- Promotion the use of efficient appliances by MEPS and labeling;
- Reducing 10% in energy intensity of energy intensive sectors;
- Mandatory implementation of the Building Code;
- Meeting 10-15% of transportation in big cities by public transport.

- **Incentives:**

- Training for capacity building for enterprises in EE;
- Supporting for enterprises in applying ISO 50001 (energy management system);
- Supports for energy audit;
- Supporting partly investment in EE measures;
- Technical assistances for EE activities.

ENERGY LABEL & STANDARDS

- **Compulsory labeling and minimum energy performance standard (MEPS):**
 - **Household:** CFL, fluorescent lamp, electronic and magnetic ballasts, air conditioner; refrigerator, washing machine, rice cook, electric fan, television, LED and storage water heater;
 - **Service:** photocopy, monitor, printer, fridge and laptop;
 - **Industrial:** distribution substation and electric motor;
 - **Transport:** passenger car (less than 9 seats) and motorcycles;
 - **Power (MEPS only):** coal-fired (efficiency 41% for unit from 600 to 800 MW), open cycle gas turbine (efficiency 39% for unit ≥ 300 MW) and combined cycle gas turbine (efficiency 58.5% for unit of gas turbine ≥ 300 MW);
- # Compulsory labeling started from 2012: 665 products in 2012; 1532 products in 2013 and 2655 in 2014.

RE DEVELOPMENT STRATEGY

- **Objective:** Promoting energy efficiency in every sectors by regulations, standards, financial supports and incentives;
- **General target:**
- **Specific targets:**
- **Supporting measures:** tax reduction, land acquisition, preferable loans, feed-in tariff (FIT), renewable portfolio standard (RPS), net-metering etc.;
- **Organization:** Ministry of Industry and Trade (MOIT) takes the lead in state management of RE promotion with involvements from other ministries, provincial authorities, utilities, developer etc.
- ✓ The strategy set very ambitious targets for RE development in Vietnam;
- ✓ The proposed supporting mechanisms should be soon issued for efficient promotion of RE

CURRENT SUPPORTING MEASURES FOR RE

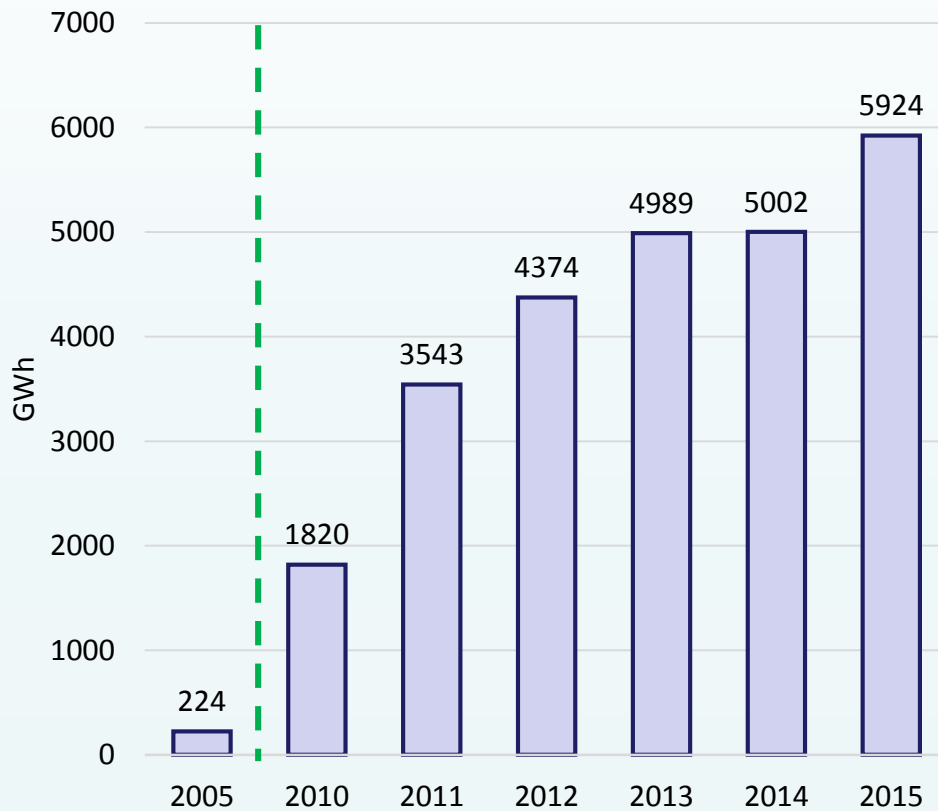
RE type	Technology	Tariff type	Tariff level
Small hydro <30 MW (2009)	Power	Avoided cost (annually adjusted)	598-663 VNĐ/kWh (by season and region) 2158 VNĐ/kWh (capacity charge)
Wind (2011)	Power	20-year FIT	7.8 USc/kWh (onshore)
Biomass (2014)	Cogeneration	20-year FIT	5,8 USc/kWh
	Power	20-year FIT	7.55 USc/kWh (North) 7.35 USc/kWh (Central) 7.48 USc/kWh (South)
Waste (2014)	Incineration	20-year FIT	10.5 USc/kWh
	Landfill gas	20-year FIT	7.28 USc/kWh
Solar (2017)	Photovoltaic	20-year FIT	9.35 USc/kWh
	Rooftop		Net-metering

- FITs are identified as main supporting measure for RE development;
- Avoided cost tariff have had great effect on small hydro power;
- Other FITs seem to be insufficient for other RE types;
- FIT for wind power is being considered to improve.



RE STORY #1: AVOIDED COST FOR SMALL HYDROPOWER

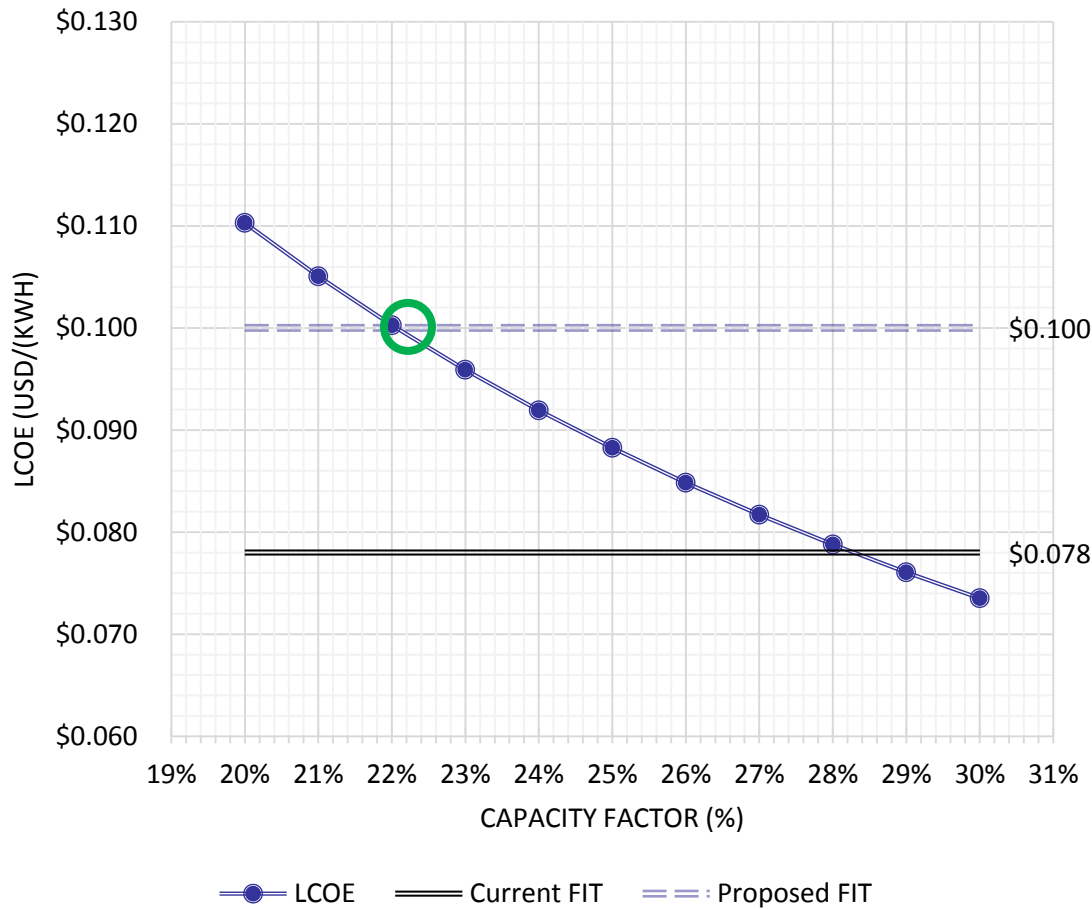
Power generation from small hydropower (>30MW)



- Avoided cost for small hydropower has been built based on generation cost of gas turbine;
- The avoided cost tariff was first issued in 2009 and has been adjusted annually;
- Different tariffs by region and season plus capacity charge;
- Significant impact on small hydropower development in recent years.

RE STORY #2: FIT FOR WIND POWER

Wind power: LCOE vs. capacity factor



Investment	\$/kW	1700
Life	years	25
Discount rate	%	8%
O&M cost	%	2%
Current FIT	USc/kWh	7.8
Proposed FIT	USc/kWh	10.4

- Current FIT 7.8 USc/kWh is not attractive for wind power developers, with 6.8 USc paid by EVN and 1.0 USc by Environmental Protection Fund;
 - 4 existing projects (159.2 MW): ~20% of 2020 and ~2.7% of 2030 targets!
 - Need for improved FIT for wind power: ≥ 10 USc for onshore projects
- ‡ **How to fund the deficit?**

ACTIONS REQUIRED FOR EE & RE

Area	Measure/Scheme	Short	Medium	Long
Information	Raising public awareness on EE & RE	X		
Institutional	Capacity building for governmental agencies and local authorizes in EE programs, targets and measures	X		
	Supervision of law compliance	X	X	
	Enhancing database collection and management	X	X	
	Enhancing M&V capacity of relevant agencies	X	X	
Financing	Increasing funding sources from the State budget	X		
	Seeking funding sources from international donors	X	X	X
	Sufficient incentive mechanisms for EE & RE	X	X	
	Energy pricing and fiscal instrument reform (i.e. subsidies, CO ₂ tax etc.)		X	X
	Establishing clean energy fund with involvements of local banks		X	X
	Climate financing (NAMA, JCM...)	X	X	
	Promoting ESCO and setting up mature ESCO industry		X	X
Labeling and Standards	Expanding EE labeling and standards to further		X	
	Promoting implementation of Building code			
	Expanding benchmarks for industrial sectors and buildings	X	X	
	Fuel economy disclosure & standards for transport vehicles	X	X	

CONCLUSIONS

- Legal framework for clean energy transition has been established in Vietnam;
- Label & standards in EE and avoided cost tariff in RE have been proved as successful stories in clean energy transition;
- Concrete measures/actions are needed for promotion of clean energy to meet the development targets:
 - Capacity building in EE & RE policy design, planning and project developments;
 - Sufficient incentive mechanisms for EE & RE;
 - Sustained funding for EE & RE.



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THANK YOU FOR YOUR ATTENTION!

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