May 5th, 2105 Aperoffy
Thanh Pho Ho Chi Minh, Vietnam

Visions of a low carbon society: results for France and discussions for Viet Nam

Dr. Minh Ha-Duong

Outline

1) Clean Energy and Sustainable Development lab in Vietnam France University

2) Vision of low carbon society in France

3) Elements to discuss energy in Vietnam

Minh Ha-Duong's Publication List

Energy, climate, society economics & uncertainty

About me

My research is on energy, climate change, society, economics and uncertainty.
I am interested in imprecise probabilities, especially using possibility theory for scenario-making and the Transferable Belief Model for expert opinion fusion, with applications to environmental and energy economics issues such as

Articles in peer-reviewed journals

36. Nguyen Trinh Hoang Anh and Minh Ha-Duong. **Perspective of CO_2 capture & storage (CCS) development in Vietnam: Results from expert interviews.** *International Journal of Greenhouse Gas Control*, 37:220-227, June 2015.

35. Jeff M. Bielicki, Guillaume Calas, Richard S. Middleton, and Minh Ha-Duong. **National corridors for climate change mitigation: Managing industrial CO_2 emissions in France.** *Greenhouse gases: science and technology*, 3 (4):262-277, June 2014.

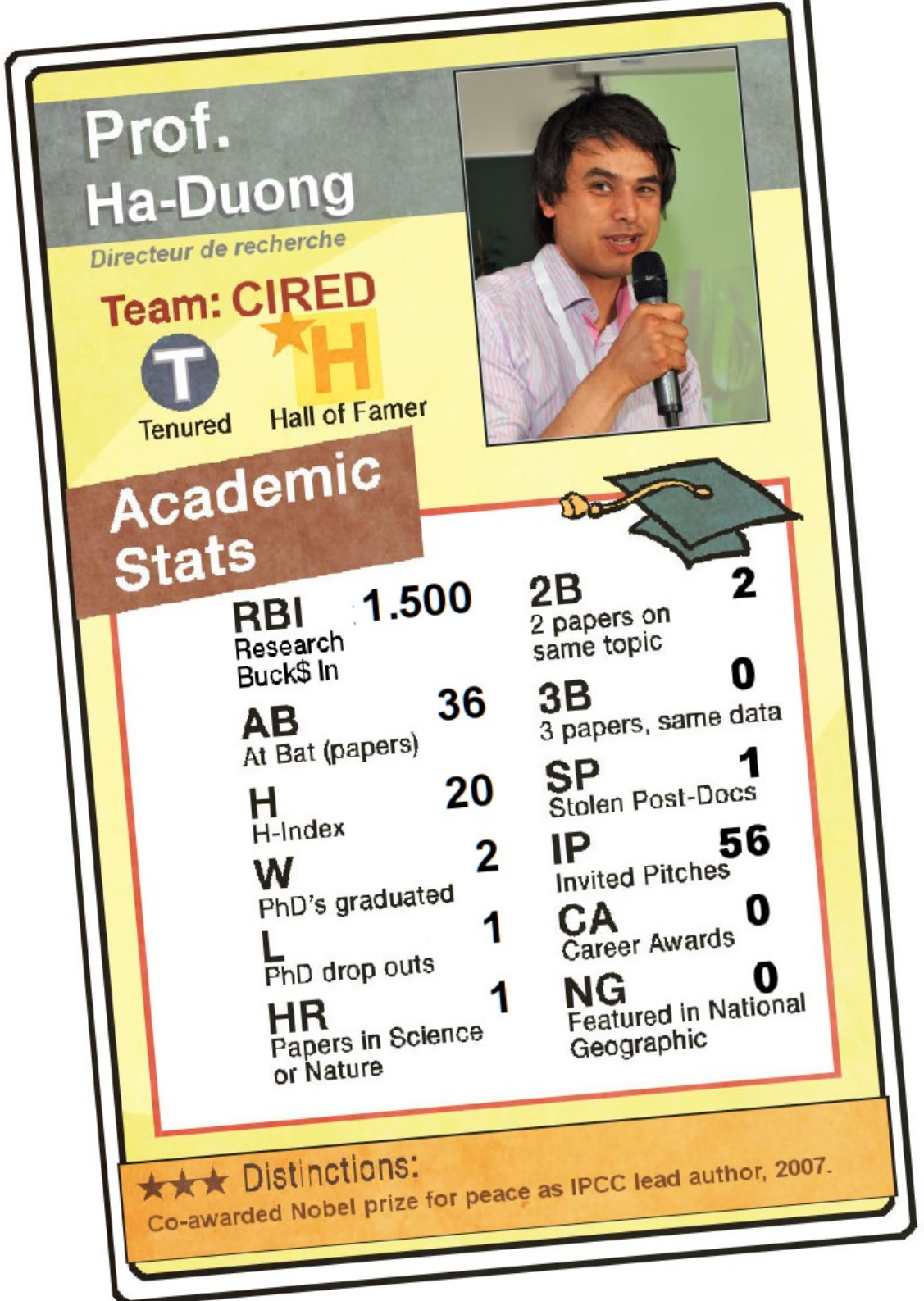
34. Minh Ha-Duong and Venance Journé. **Calculating nuclear accident probabilities from empirical frequencies.** *Environment Systems and Decisions*, 34 (2):249-258, May 2014.

33. Olivier Boucher, Piers M. Forster, Nicolas Gruber, Minh Ha-Duong, Mark G. Lawrence, Timothy M. Lenton, Achim Maas, and Naomi E. Vaughan. **Rethinking climate engineering categorization in the context of climate change mitigation and adaptation.** *WIREs Clim Change*, 5 (1):23-25, 2014.

32. Patrice Dumas and Minh Ha-Duong. **Optimal growth with adaptation to climate change.** *Climatic Change*, 117 (4):691-710 April 2013.

31. Marta Benito-Garzón, Minh Ha-Duong, Nathalie Frascaria-Lacoste, and Juan Fernández-Manjarrés. **Extreme climate variability should be considered in forestry-assisted migration.** *BioScience*, 63 (5):317, 2013.

30. Marta Benito-Garzón, Minh Ha-Duong, Nathalie Frascaria-Lacoste, and Juan Fernández-Manjarrés. **Habitat restoration and climate change: dealing with climate variability, incomplete data and management decisions with tree translocations.** *Restoration Ecology*, 21 (5):530-536, 2013.



TRƯỜNG ĐẠI HỌC KHOA HỌC VÀ CÔNG NGHỆ HÀ NỘI
UNIVERSITÉ DES SCIENCES ET DES TECHNOLOGIES DE HANOI

USTH

VIETNAM FRANCE UNIVERSITY

Trường Đại học Khoa học và Công nghệ Hà Nội (USTH)

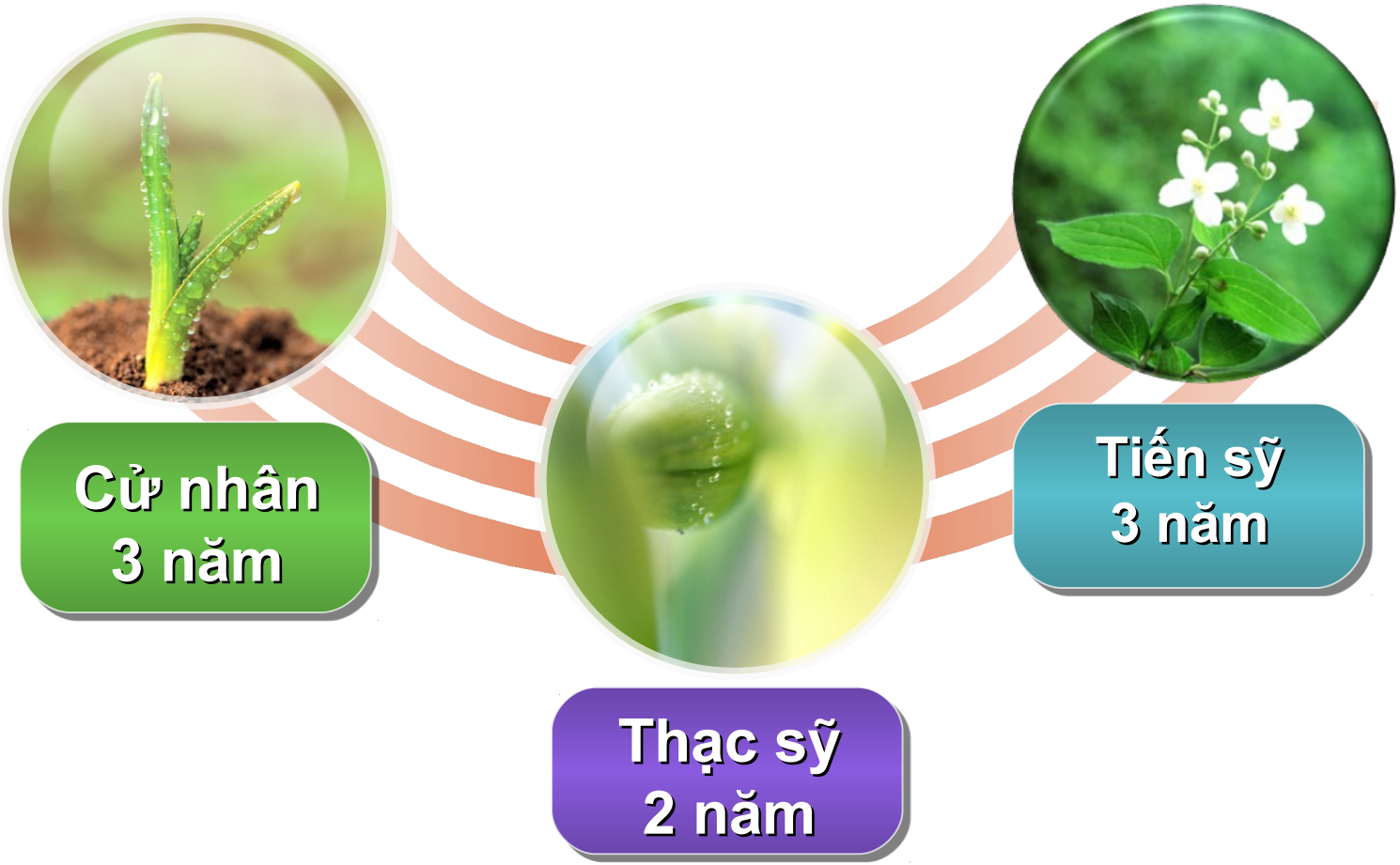
Tòa nhà Đào tạo và Dịch vụ

18 Hoàng Quốc Việt, Hà Nội

Hiệp định kí kết giữa Bộ trưởng Bộ Giáo dục và Đào tạo – Nguyễn Thiện Nhân và Bộ trưởng Bộ Đại học và Nghiên cứu Pháp – Valerie Pécresse năm **2009**.

Hệ thống đào tạo 3 + 2 + 3

Trường Đại học công lập đầu tiên ở Châu Á áp dụng hệ thống đào tạo và cấp bằng LMD Bologna (Cử nhân – Thạc sỹ - Tiến sỹ)



Các hoạt động nghiên cứu

Các phòng thí nghiệm nghiên cứu liên kết với nước ngoài tại trường <http://www.usth.edu.vn/ri/>

LMI RICE – Plant Biotechnology and Rice Genomics

RELISH – Information and communication technology

HILO – Oceanography

MaSeNo – Magnetic and semiconducting nano-objects

CleanED – Clean Energy and Sustainable Development

Phòng thí nghiệm CleanED

Trung tâm nghiên cứu Năng lượng sạch và Phát triển bền vững

Thành lập năm 2014. Dự án hợp tác giữa USTH/CNRS/CIRAD. Hỗ trợ tài chính ban đầu từ Đại sứ quán Pháp

2. Vision of low carbon society in France

Results from the R&Dialogue research project

R&Dialogue

Building a low-carbon future together

10 European countries, 15 teams

Miriame Cherbib et Minh Ha-Duong

An Europe-wide research action

1. Preparation

Survey by interviews on the social dialogue in France

Identify barriers and issues for the actors

2. Dialogue process

Day-long conferences

+

Organized discussions in small groups

3. Common Visions

Results of the dialogue

National level, then European level

2012/06 **2015/09**

Given 15 key issues, our stakeholders choose to talk about

- Wind power: social acceptance and difficulties
- Oil and dependence
- Energy transition and European construction
- Territorial organization of the energy transition

Our participants' vision of a low carbon society

- Reduced oil consumption especially in the transport sector
- Better energy efficiency in housing
- More power to regions, local communities and citizen for energy planning and implementing renewable energy projects
- The scientists are more connected to the industry and communicate better with the public
- A more united European society with a strong energy and climate change strategy
- More stable energy policies allowing industry to make long term investments

On getting there

- Technology and innovation alone are not enough to make the energy transition happen;
- Social dialogue allows the members of the society to co-create a common and sustainable future;
- The energy transition is an opportunity to change European society and institutions towards more participatory and democratic processes of decision making.

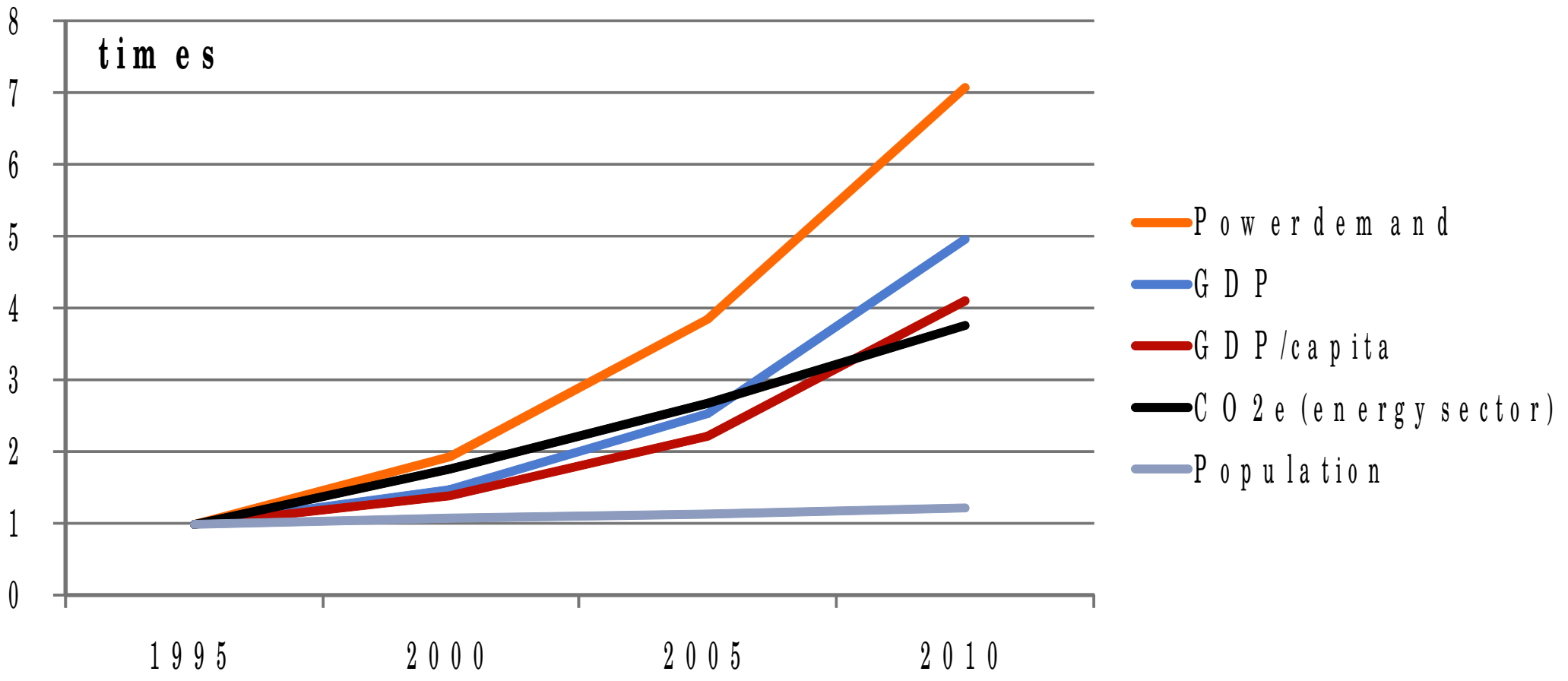
3. Elements to discuss energy in Vietnam

Past trends and future policy choices

With thanks to :

Nguyen Trinh Hoang Anh, PhD candidate

Power consumption increases 1.5 times faster than GPD

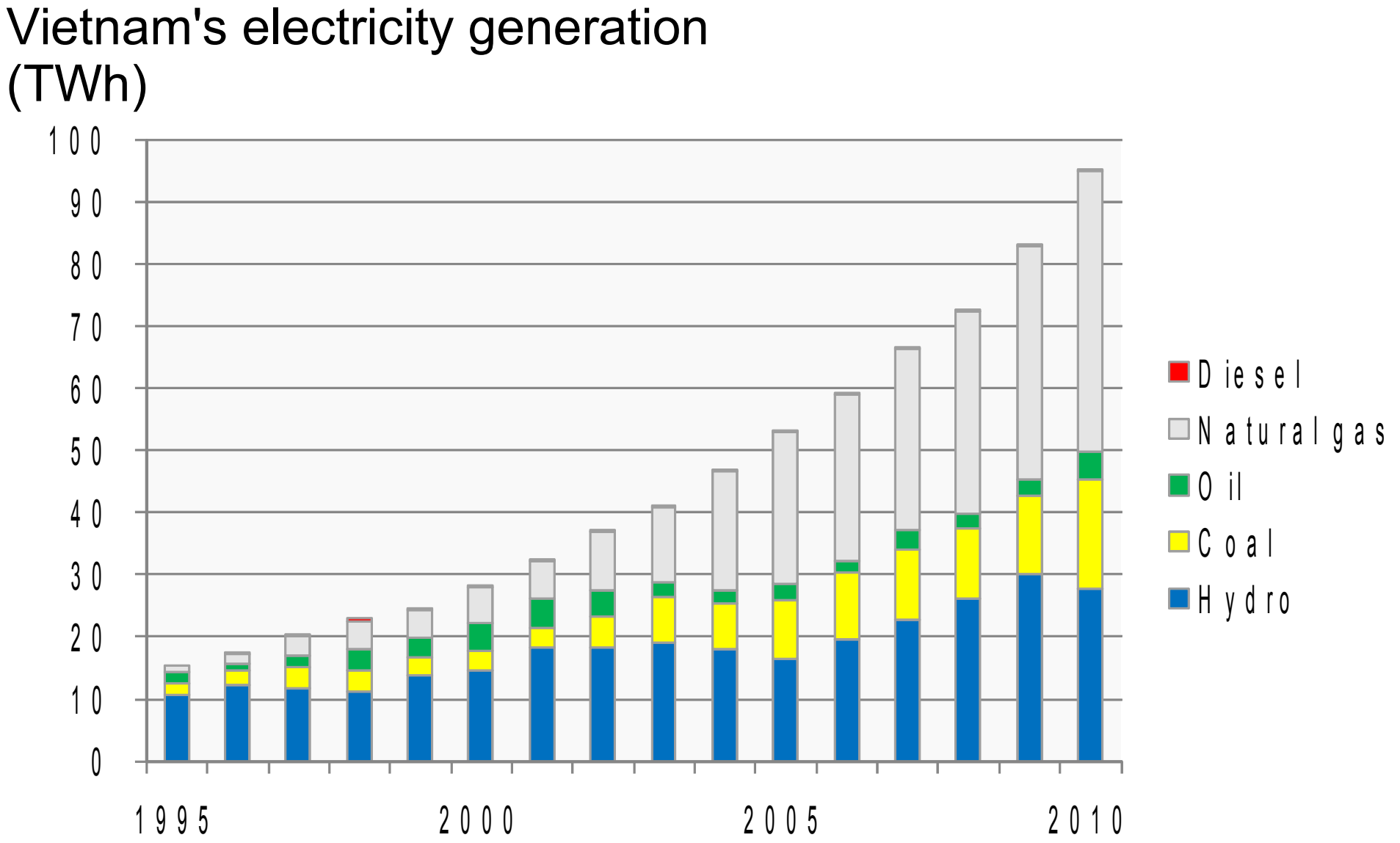


Statistics and sources of the previous graph

Vietnam	Unit	1995	2000	2005	2010
Power consumption	TWh	14	27	54	99
GDP	US$	21	31	53	104
GDP/capita	US$/habitant	289	402	642	1204
CO_2e (in energy sector)	Million tons	30	53	80	113
Population	Million	72	77.6	82.4	86.9

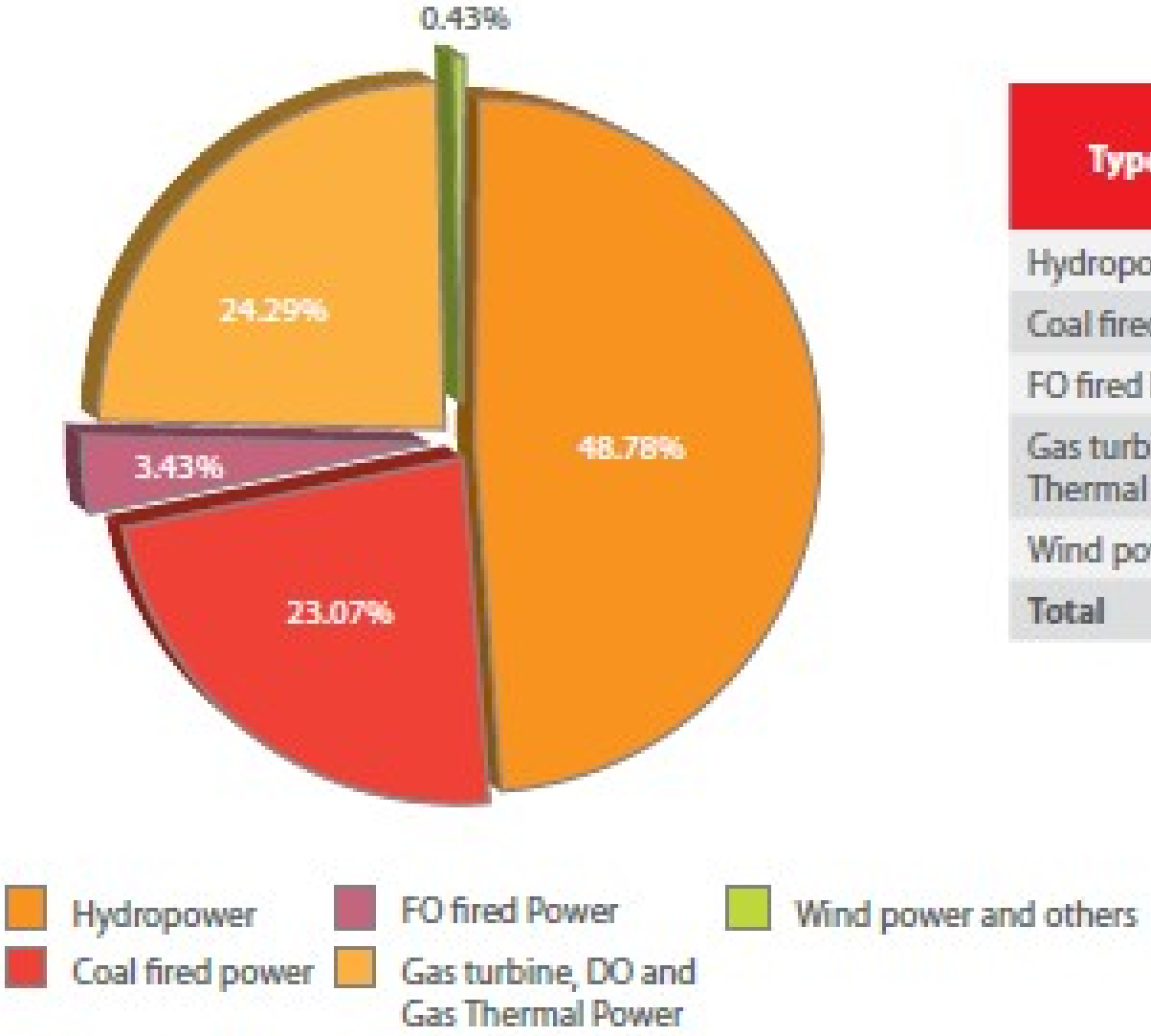
Source: National Load Dispatch Center 2011: Annual report 2010; , Electricity Of Vietnam (EVN) 2011: Annual Report 2010, World Bank Database 2015: http://data.worldbank.org/country/vietnam

Power generation in the past : 1995-2010
From “mostly Hydro” to “Hydro + Gas”



Source: National Load Dispatch Center 2011: Annual report 2010

POWER GENERATION BY INSTALLED CAPACITY IN 2013

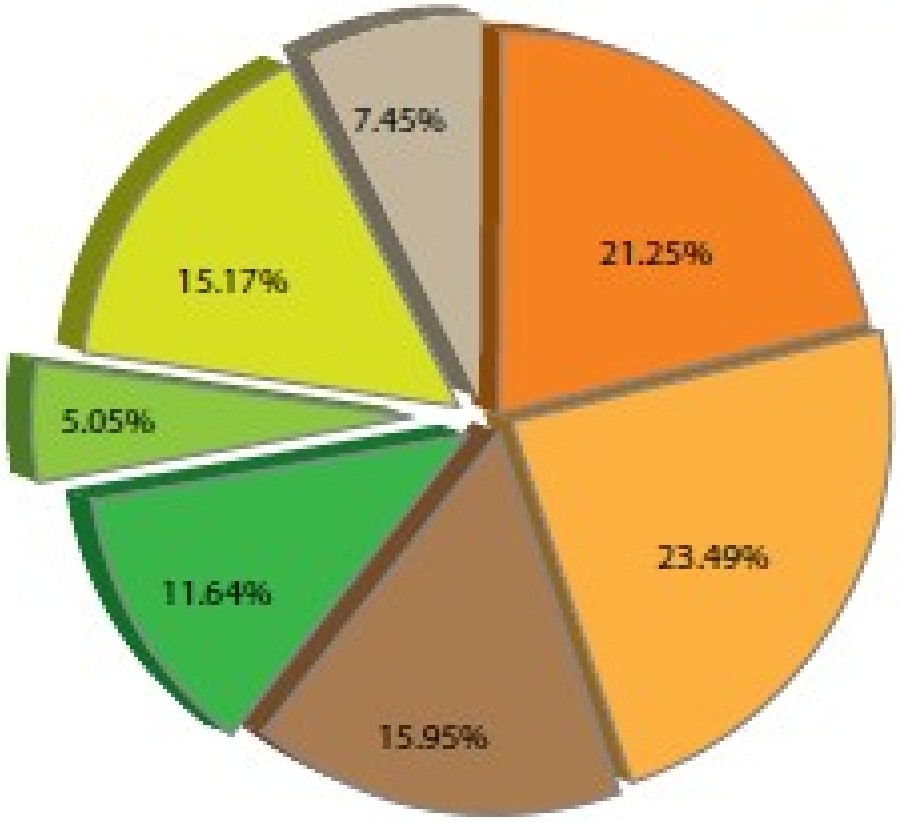


Type of Generation	Installed capacity (MW)	Percentage (%)
Hydropower	14,925	48.78
Coal fired power	7,058	23.07
FO fired Power	1,050	3.43
Gas turbine, DO and Gas Thermal Power	7,431	24.29
Wind power and others	133	0.43
Total	**30,597**	**100.00**

Source: Electricity Of Vietnam (EVN) 2014: Annual Report 2013

POWER GENERATION BY OWNERSHIP IN 2013

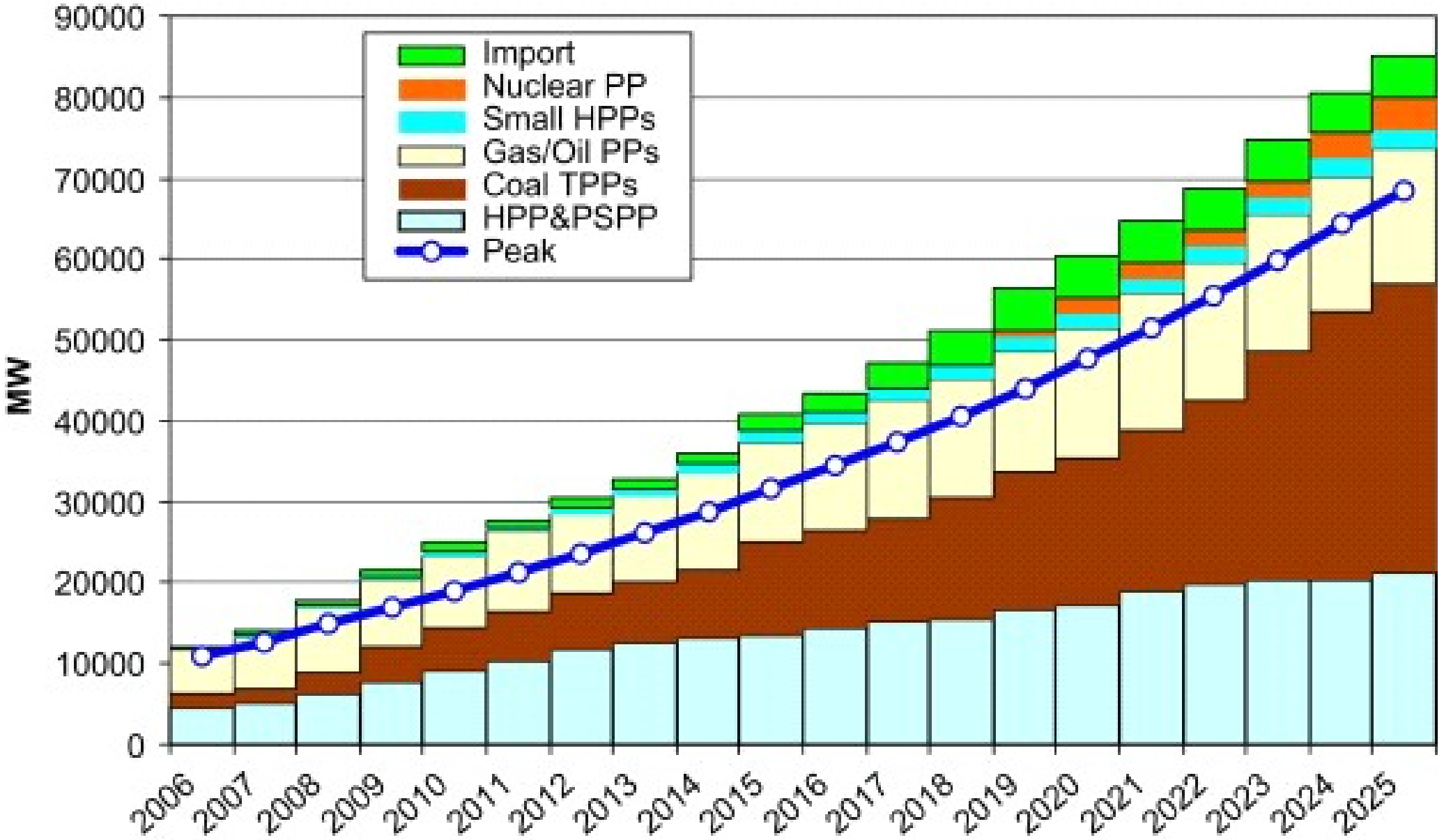
Total installed capacity: **30,597 MW**



Owner	Installed capacity (MW)	Percentage (%)
EVN	6,502	21.25
EVNGENCO	7,187	23.49
Joint Stocks Co. with EVN-GENCO's shares	4,880	15.95
Petro VN	3,560	11.64
VN Coal & Mineral Co.	1,545	5.05
Domestic Investor	4,642	15.17
Foreign investor	2,281	7.45
Total	**30,597**	**100.00**

Source: Electricity Of Vietnam (EVN) 2014: Annual Report 2013

A power generation future : 2006-2025 where fossil fuels take off



Source: Pham et al. 2011: Energy supply, demand, and policy in Viet Nam, with future projections, Energy Policy, Volume 39, Issue 11, 2011, 6814 - 6826

... pollution and dependence also take off

Total Environmental Costs for Each Pollutant ($ million)

Year	2011	2015	2020	2025	2030
Particulate matter	98.86	134.95	289.57	439.40	710.24
Sulfur dioxide	93.77	148.09	311.85	448.18	728.74
Nitrogen oxides	234.15	274.48	386.09	494.30	638.86
Carbon dioxide	1,215.5	2,190.5	4,118.7	6,075.9	9,071.9

Net energy import dependence and CO_2 intensity

	Unit	2005	2010	2015	2020	2025	2030
Net energy import dependence (by power capacity)	%	1	4	18	25	32	39
CO_2 intensity	tCO_2 per mil US$ GDP	404	535	744	780	798	812

Source: Soussan et al. 2012: Internalizing the Externalities: Strategic Environmental Assessment of the Viet Nam Power Development Plan VII, 32nd annual conference of the international association for impact assessment: Energy Future 2012; Nguyen-Trinh 2012: "The future prospective evolution of the Vietnamese power sector : the vulnerability and externality analysis", EEM/SESAM and PPRE Yearbook 2012, University of Flensburg and University of Oldenburg

A number of policies/targets for energy transition in Vietnam

- Share of renewable energy of 5% in the total commercial primary energy supply in 2020, 8% in 2025, and 11% in 2050
- Priority to low cost renewable energy sources : small scale hydro, sugarcane bagasse, municipal solid waste, rice husk, wind, geothermal power and heat.
- Establishing a competitive electricity retail market in the period after 2022; and establishing a coal and petroleum product business market by 2015
- First nuclear power plant in 2020, then nuclear power's share will be about 15–20% of total commercial energy consumption nationwide
- The National Strategic Program on Energy Savings and Effective Use: to improve energy efficiency, reduce energy losses, and implement extensive measures for conservation of energy.
- The National Energy Efficiency and Conservation Program: to reduce national power consumption from 3-5% for the period of 2006-2010, 5-8% for the period of 2011-2015.

Sources: Decision No. 1855/QD-TTg (2007), on approving Vietnam's National Energy Development Strategy up to 2020 with 2050 vision; MOIT (2009): Renewable Energy Master Plan in Vietnam (draft); the Law on Energy Efficiency and Conservation; Prime Minister (2008): Decision 158/QD-TTg on approval of the National Target Program to respond to climate change; Prime Minister (2004): The Strategic Orientation for Sustainable Development in Vietnam