

VIETNAM LOW ELECTRICITY PRICE AND ENVIRONMENTAL IMPACTS

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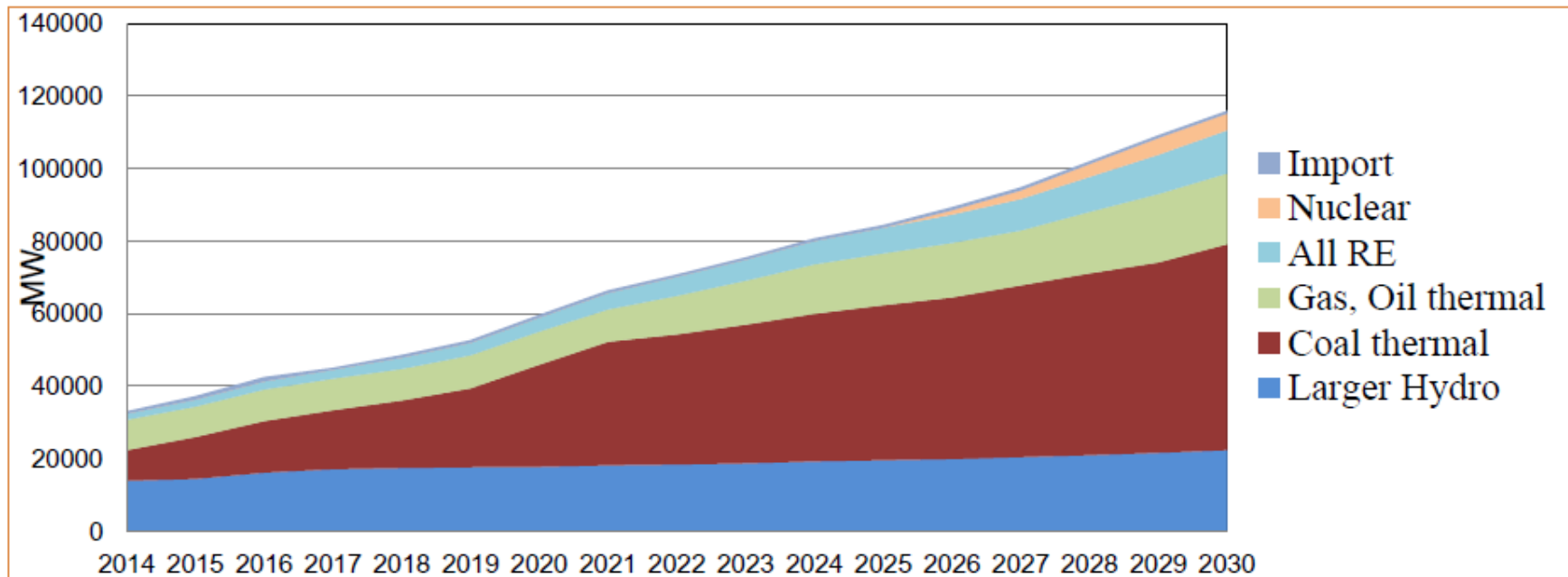
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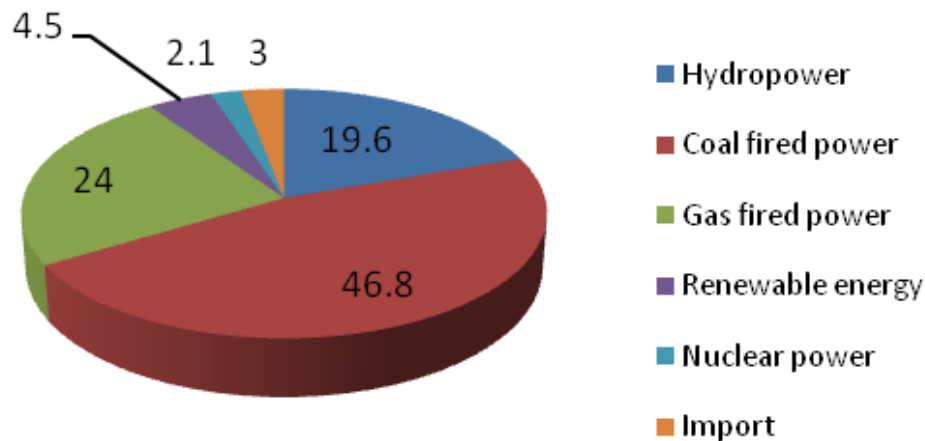
Introduction

- Electricity is important energy source for social economic development for every country and electricity utilization is a surveying rule for human life quality.
- Electricity price plays a big role to form a cost price of all industrial products, agricultural goods and social services.
- Every country has an own policy to regulate electricity price: monopoly market, open market, ..
- In Vietnam, electricity price regulated by Central Government: National Assembly and Government decides a policy by laws and decree law, Ministry Trade and Industry proposes a electricity cost price accounting methods, monopoly corporation EVN decides a selling and buying electricity cost price annually.
- Vietnam low electricity price has a strong impacts (positive and negative) for social economic development.

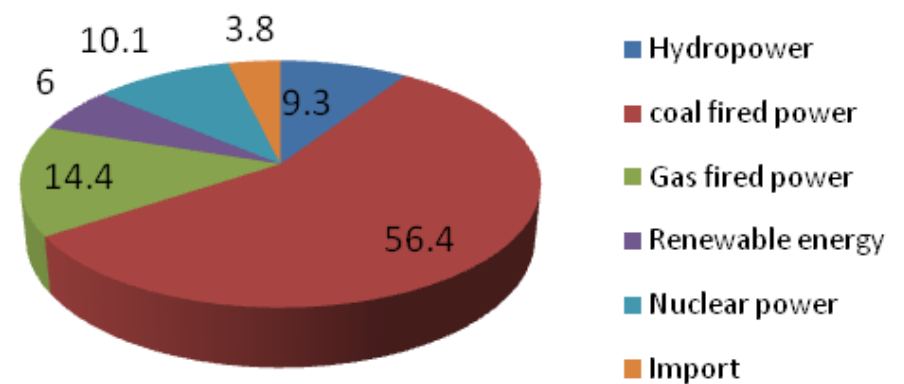
VII Electricity Development Plan



Sản lượng điện năm 2020 (%)



Sản lượng điện năm 2030 (%)



Vietnam Policy on Electricity Price

Law No 28/2004/QH11: Electric Power (3/3/2004)

Policy for national electric power development:

Article 4, Item 1: Sustainable electric development based on optimal exploitation of all source kinds to satisfy electricity needs for people life and socioeconomic development with stable quality, safety and economic, civilized service, to help to guarantee National Military, Security and national energy Security. → That means to satisfy electricity for people and socioeconomic development is an important issue of Vietnam Government.

Article 4, Item 2: The State monopolizes to carry out national electricity transmission and regulation system, to build and to operate big power plants having an especially important significance on socioeconomic, military, security for country. → Following this Item, EVN is monopoly corporation to manage all big power plant and to control electricity buying and selling price. MIT – EVN is in charge ministry to have a right to decide buying and selling electricity price for the country

Vietnam Policy on Electricity Price

Law No 50/2010/QH12: Energy saving and efficiency (17/10.2010).

Article 5. Policy for energy saving and efficiency:

Item 3. Renewable energy development potential in line with conditions of Vietnam and contribute to ensuring energy security, environmental protection.

→ Energy price cost for sustainable renewable energy development depends on state of socio-economic conditions in Vietnam.

Vietnam Policy on Electricity Price

Law No 24/2012/QH13: Reform Electric Power (20/11/2012).

Article 4: National Policy for Electric power development

Item 1. Prioritize the development of electricity for rural, mountainous, border, island and regional economic conditions - especially social difficulties.

Item 4. Promote the exploitation and utilization of new energy sources, renewable energy for electricity generation; have preferential policies for development investment projects generating plants using renewable energy sources, renewable energy.

→ Countryside electrification is top – high mission of Vietnam Government. For this mission EVN do best for building electric transmission lines to countryside areas, even in-shore islands.

MIT Method of Accounting Electricity buying and selling price

- MIT Circular No 41/2010/TT-BCT dated 14/12/2010 “Rule of determining method for price cost to generate electricity, sequence, building order, electricity cost frame promulgation and buying and selling electricity contract ratify”.
 - For Hydropower Plant :
$$g\downarrow T\text{Đ} = TM\text{Đ}T \times (1+i)^{\wedge n} \times i / (1+i)^{\wedge n} - 1 + C\downarrow OM / A\downarrow P \times (1-t\downarrow td)$$
 - $TM\text{Đ}T$ – Total Capital Invest (VNĐ)
 - C_{OM} - Annual Warranty and carriage cost (VNĐ)
 - A_p - Medium plant capacity (KWh)
 - n – Plant operated years
 - t_{td} – Plant utilize electricity percentage
 - i – discount factor
- There are no natural resources cost to add to account of electricity cost

MIT Method of Accounting Electricity buying and selling price

- For Thermoelectricity plant:

$$g_{CN} = FC_{CN} + VC_{CN}$$

g_{CN} - Total generated electricity (leverlized) cost,

FC_{CN} - Fix cost, VC_{CN} - changed cost

Fix electricity cost

$$FC_{CN} = \frac{C_{V\Delta T, CN} + C_{FOM}}{P_t \times T_{max}}$$

$C_{V\Delta T, CN}$ - Plant Capital invest

C_{FOM} - Plant Operated cost

P_t - Total capacity for whole plant life (Kwh)

T_{max} - Maximum annual plant operated time

Changed electricity cost

$$VC_{CN} = HR \times P_F \times (1+f)$$

HR - Consumed fuel (Kg/KWh)

P_F - Fuel cost (VNĐ/Kg)

f - Ratio other cost / fuel cost (%)

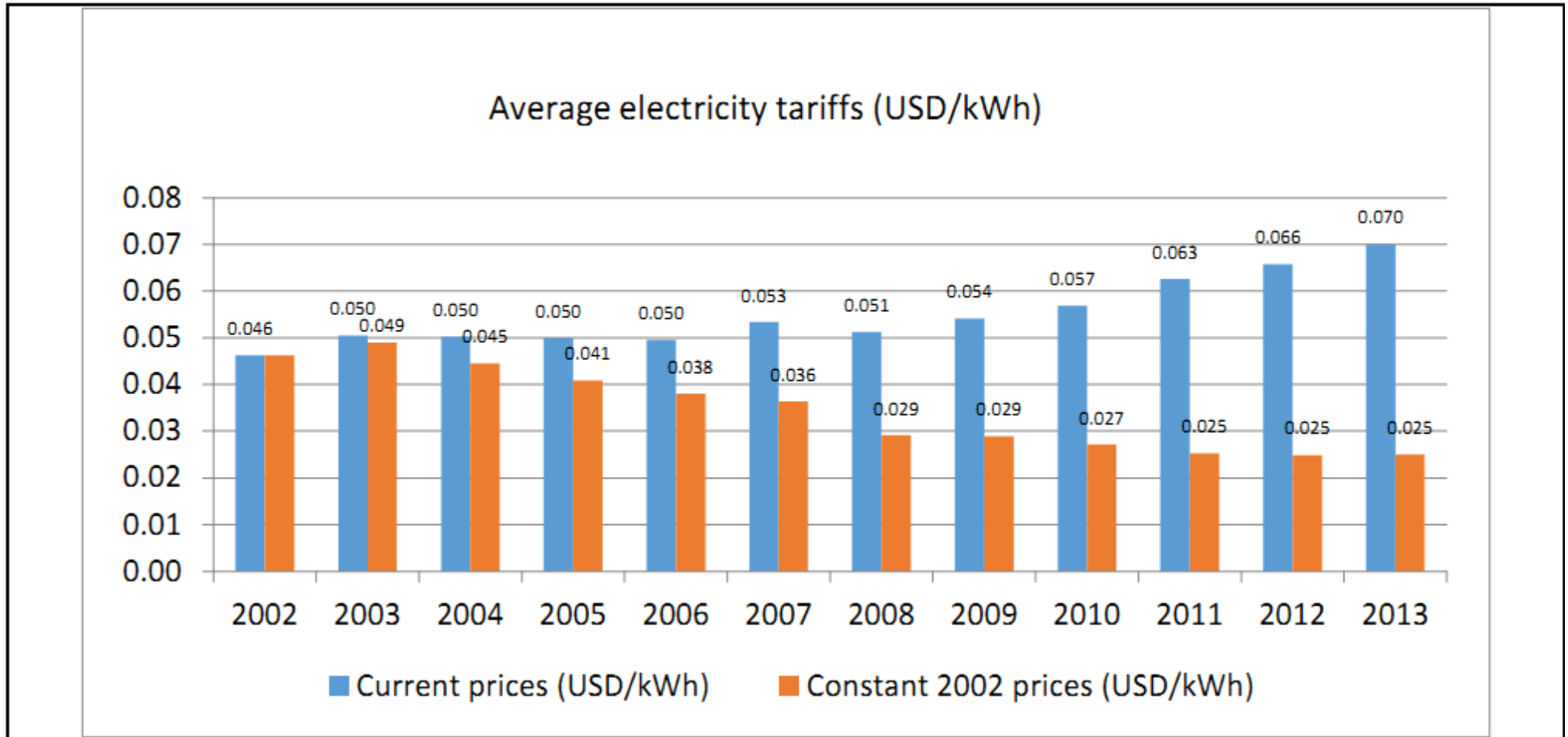
→ There are no cost for environmental protection activity

MIT Method of Accounting Electricity buying and selling price

- Low electricity price cost of Hydropower plant and Thermoelectricity plant in Vietnam comes from government subsidies of natural resources cost and tax, carbon or environmental tax and environmental treatment fee.
- In case study, we find land tax for hydropower plant in North Vietnam can be equal generated electricity cost. In fact, price electricity cost will be double of EVN normal buying and selling cost ~ about 8 US-cents for 1 KWh.
- With carbon tax, price cost of electricity from thermoelectricity plant can be added 5-6 US-cents for 1 KWh. At least 4.4 US-cents for 1 KWh by UNDP accounting [10].

→ Low electricity in Vietnam comes from government subsidy for all natural resources and environmental spending cost.

Vietnam Low Electricity Price (VLEP)



Average Electricity Price in Vietnam (USD/KWh); source UNDP 2014

Vietnam Low Electricity Price (VLEP)

Electricity Price of some countries (Eurocham

Country	Average Selling Electricity Price (Us-cents)
Australia	22- 46.56
China	7.5 – 10.7
India	9 – 12
Indonesia	8.75
Japan	20 - 24
Malaysia	7.09 – 14.76
Philippines	30.48
German	23.0
USA	12.15
Vietnam	7.58

Electricity price in Vietnam is very low in comparison with developed countries, such as German, Japan, Australia, USA.

The deference in electricity price cost comes from many reasons. Main reason is natural resources and environmental cost adding to electricity price.

Environmental Impacts of VLEP

- Vietnam low electricity price policy have a positive and negative impacts to socio-economic development and sustainable energy development and utilize;
- Important positive impacts of VLEP are countryside electrification, increasing FDI invest, raising people life condition;
- Big negative impacts of VLEP are electricity utilized extravagantness, barriers to renewable energy development, environmental impact to socio-economic development, national energy security;
- To date negative impacts of VLEP have become more serious that needs to change formed policy !!

Achievements on countryside electrification

Region	2001		2006		2011	
	Commune	Household	Commune	Household	Commune	Household
Red River Delta	99%	98.3%		99.8%	99.8%	99.9%
Central Highland	75.5%	52%		97%	100%	97%
Mekong River Delta	99%	61.9%		90.2%	100%	97.1%
North Mountainous Region	76.6%	66.8%		88.4%	99.7%	94.5%
Southeast Region	99.8%	75.2%		93.9%	100%	98.7%
Coastal provinces	90%	86.6%		97%	99.7%	98.9%
Country	89.7%	70.7% ⁰	98.9%	87.6%	99.8%	93.4%

Source: General Statistics Office, 2012

Achievements on countryside electrification

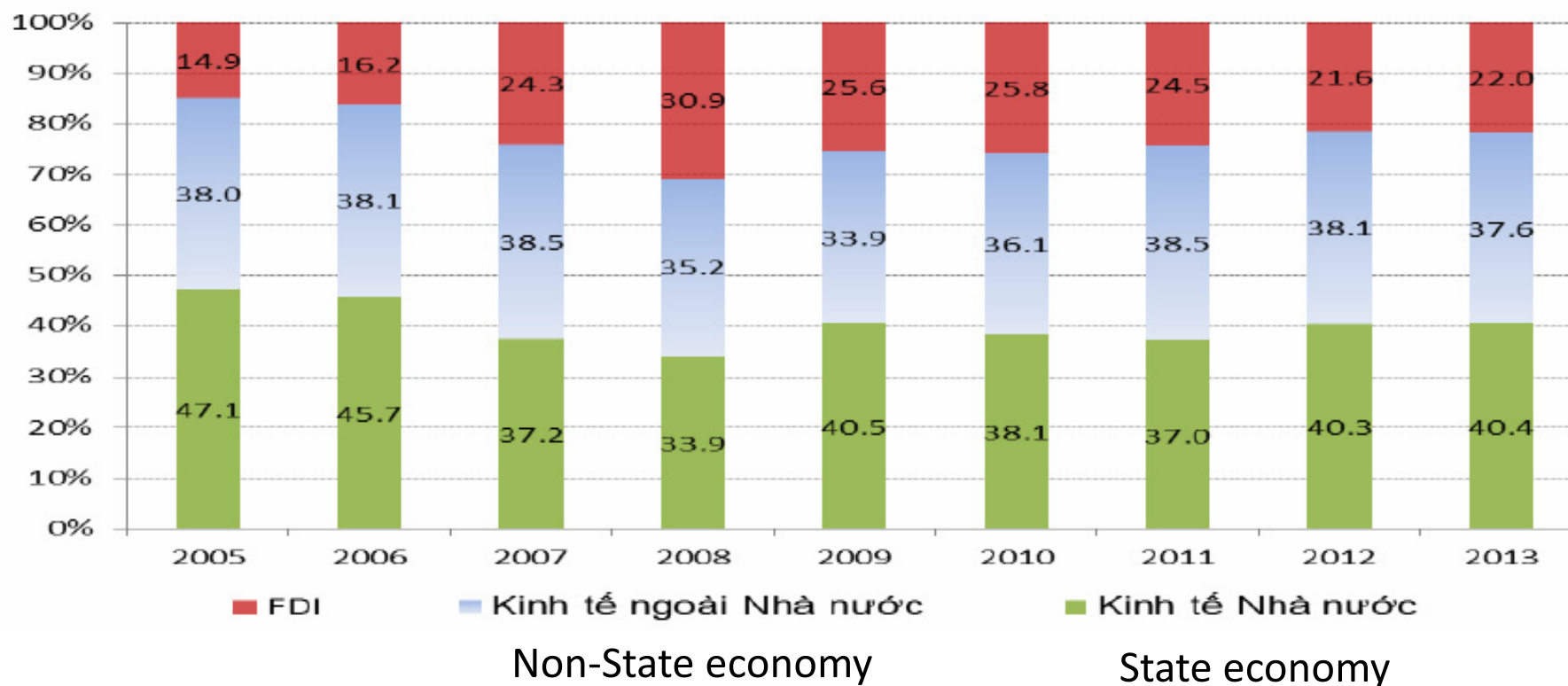
Region	Electrification Commune		Electrification Village	
	Numbers	Ratio %	Numbers	Ratio %
Country	9,054	99.80	77,305	95.55
Red River Delta	1,941	99.85	15,140	99.34
North Mountainous Region	2,264	99.69	23,909	89.19
Central	2,469	99.72	20,727	98.14
Central Highland	598	100	5,965	98.04
Southwest Region	497	100	2,970	98.67
Mekong River Delta	1,303	100	8,594	99.44

Source: General Statistics Office, 2012

Big achievements on countryside electrification in Vietnam depends on government activity, WB and ADB support, especially Low electricity price policy

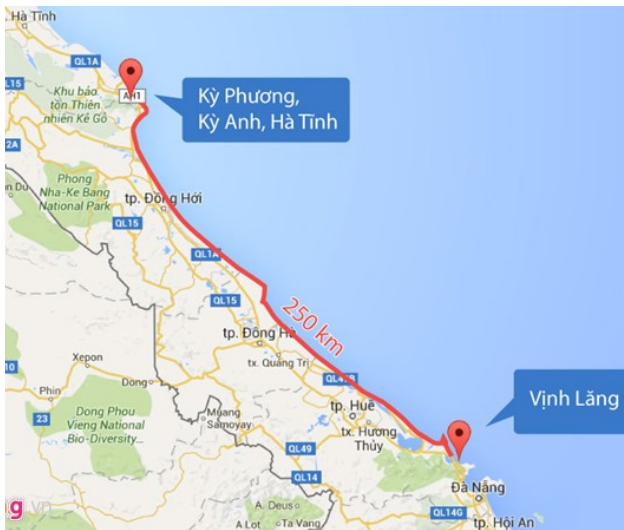
Achievements attracting FDI

- Ratio of FDI investment in total investment for period: 1991 - 2000 is 30%, 2001 - 2005 is 16%, 2006 - 2011 is 28%.
- Ratio of FDI contribution to GDP for period: 2001 - 2005 is 14.5%, 2010 is 20%;
- FDI produces 40% of industrial value with an increasing rate of 17.4%/year during 2001- 2010
- FDI export turnover increasing during 2001 – 2005 is 57.8 bil. USD, 2006 - 2010 is 154.9 bil. USD



Negative Impacts of VLEP

- Many negative impacts of VLEP can be realized such as: FDI orientation invest to high utilized energy industries (e.g., steel industry, thermoelectric power plants, etc.); barrier for renewable energy development, electricity utilized extravagantness
- Low electricity price policy in Vietnam has lead to increasing thermoelectric power development following Electricity planning VII → to increasing air pollutant emission (CO_2 , SO_2 , dust, NO_x , etc..



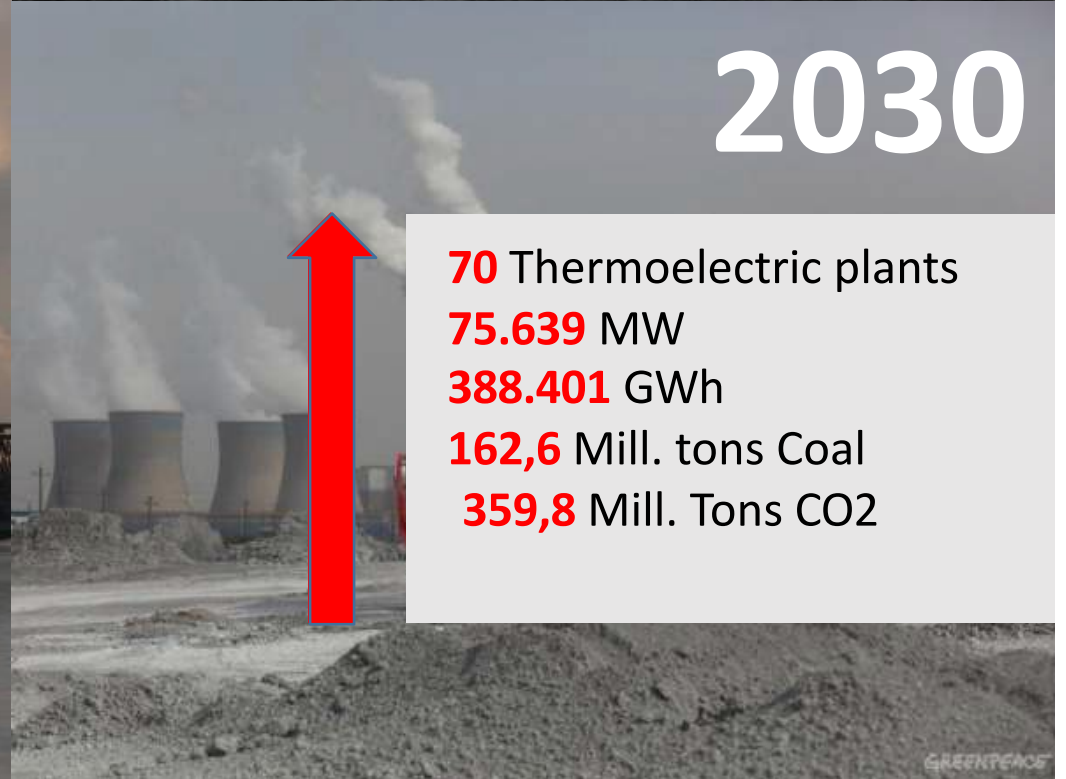
2010

12 Thermoelectric plants
4.000 MW
17.562 GWh
8,7 Mill. tons Coal
17,56 Mill. Tons CO₂



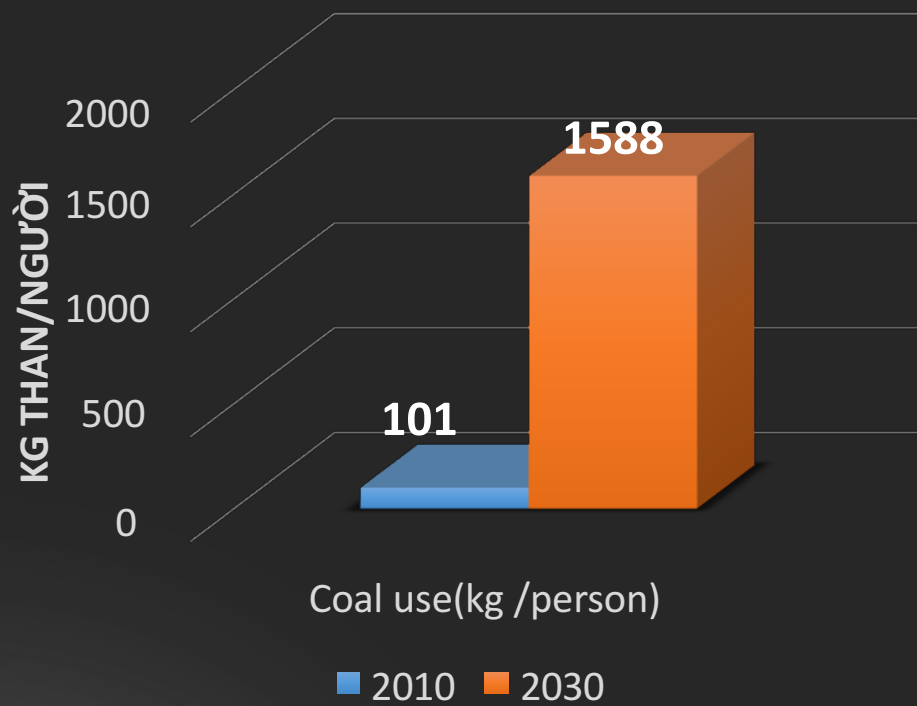
2030

70 Thermoelectric plants
75.639 MW
388.401 GWh
162,6 Mill. tons Coal
359,8 Mill. Tons CO₂

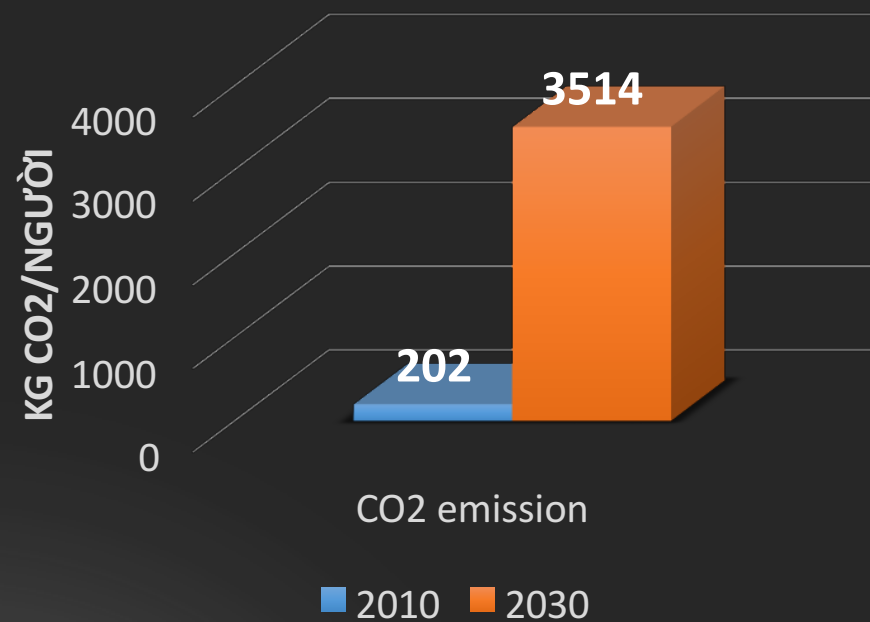




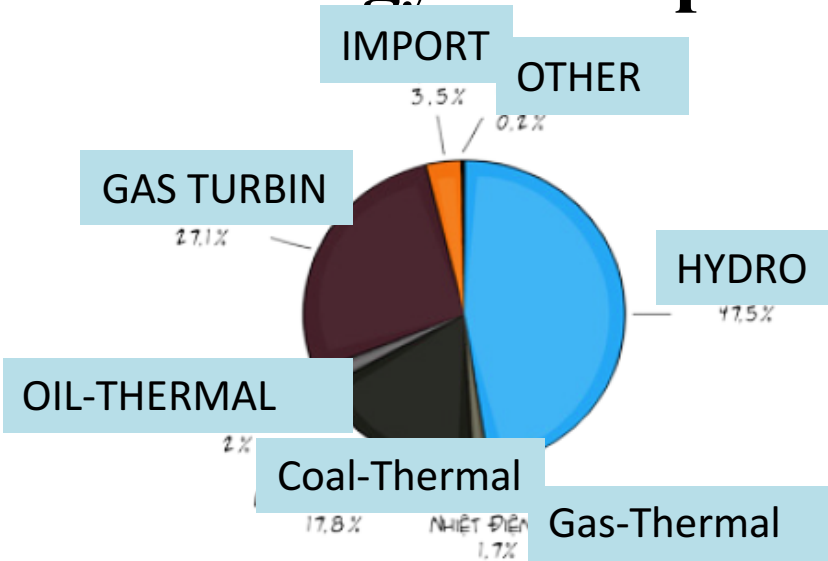
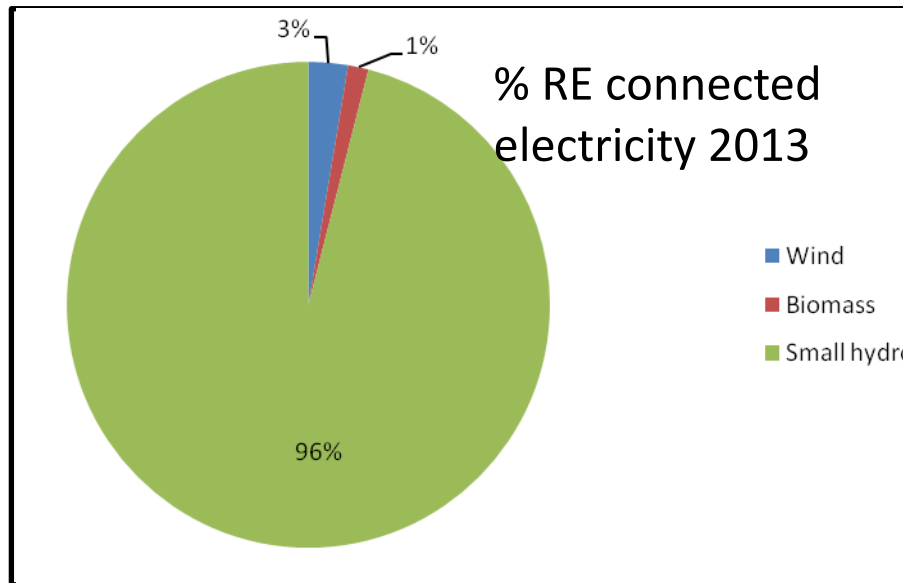
COAL USED FORECAST



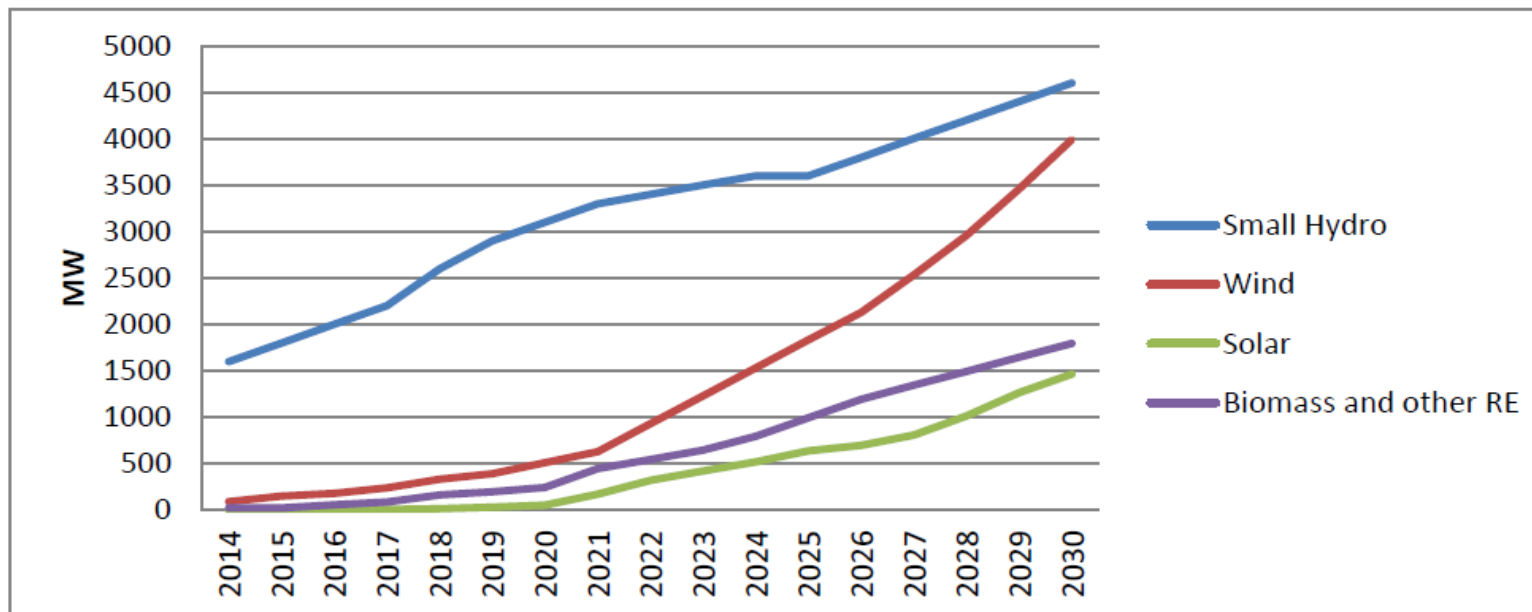
CO₂ EMISSION FORECAST



VLEP – barrier for renewable energy development

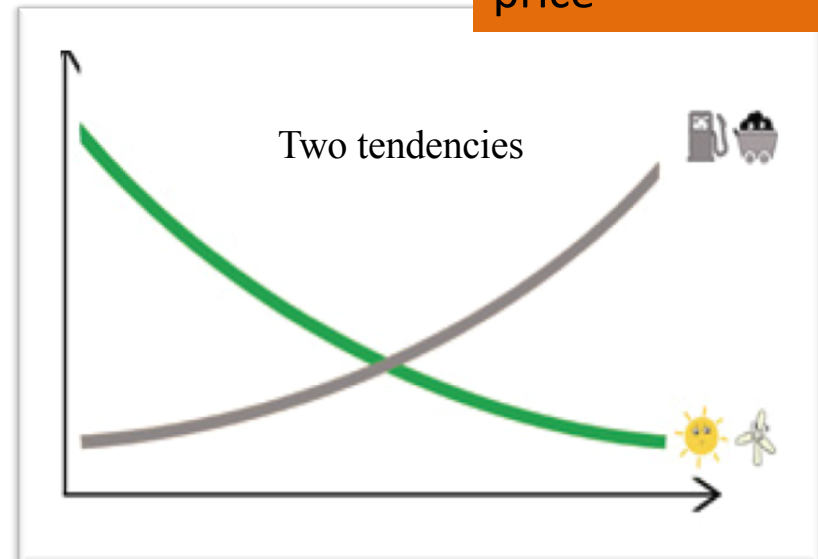
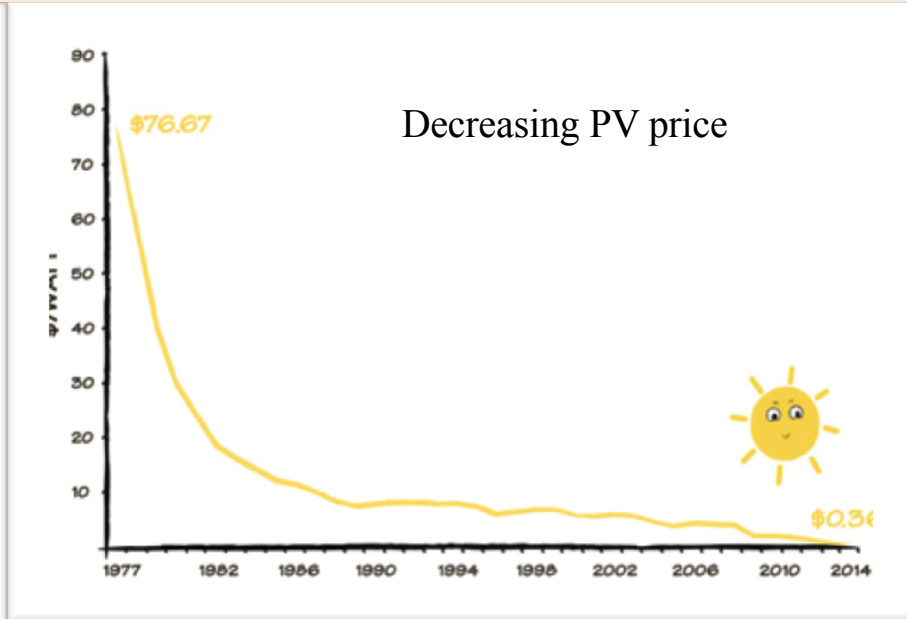
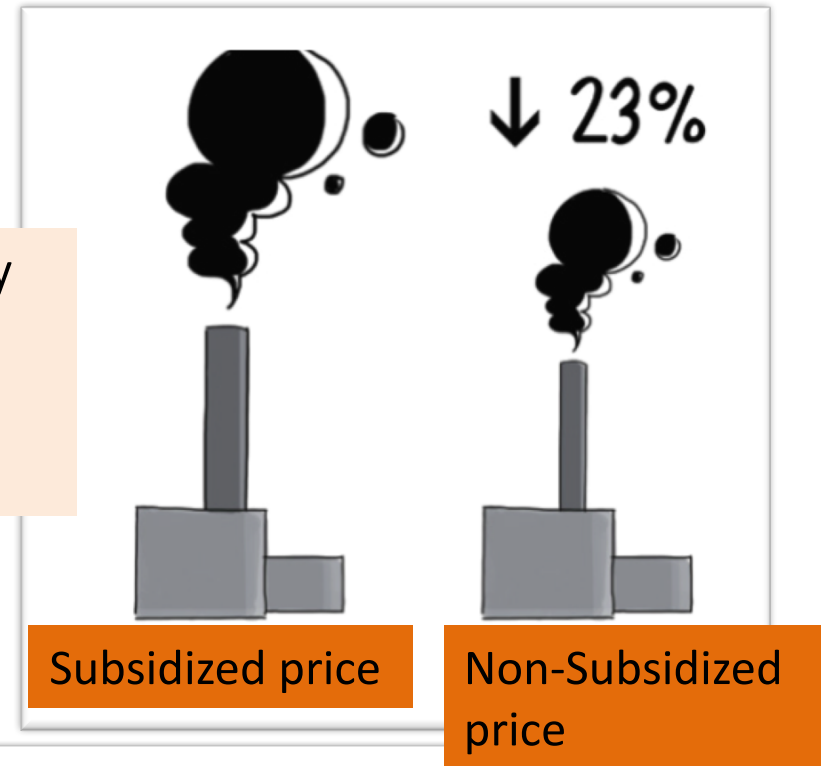
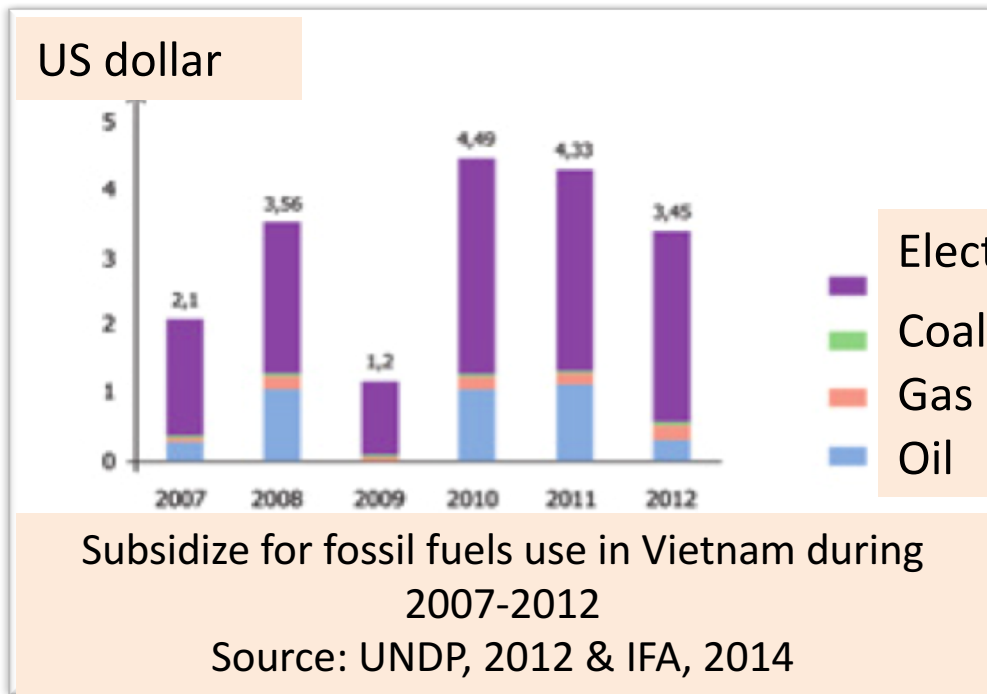


Tỷ trọng các loại hình sản xuất điện năng trong hệ thống điện Việt Nam
(Nguồn: Trung tâm Điều độ Hệ thống điện Quốc gia, 2012)



Nguồn: Dự thảo Quy hoạch điện 7, 2014

VLEP – barrier for renewable energy development



Environmental Impacts of VLEP

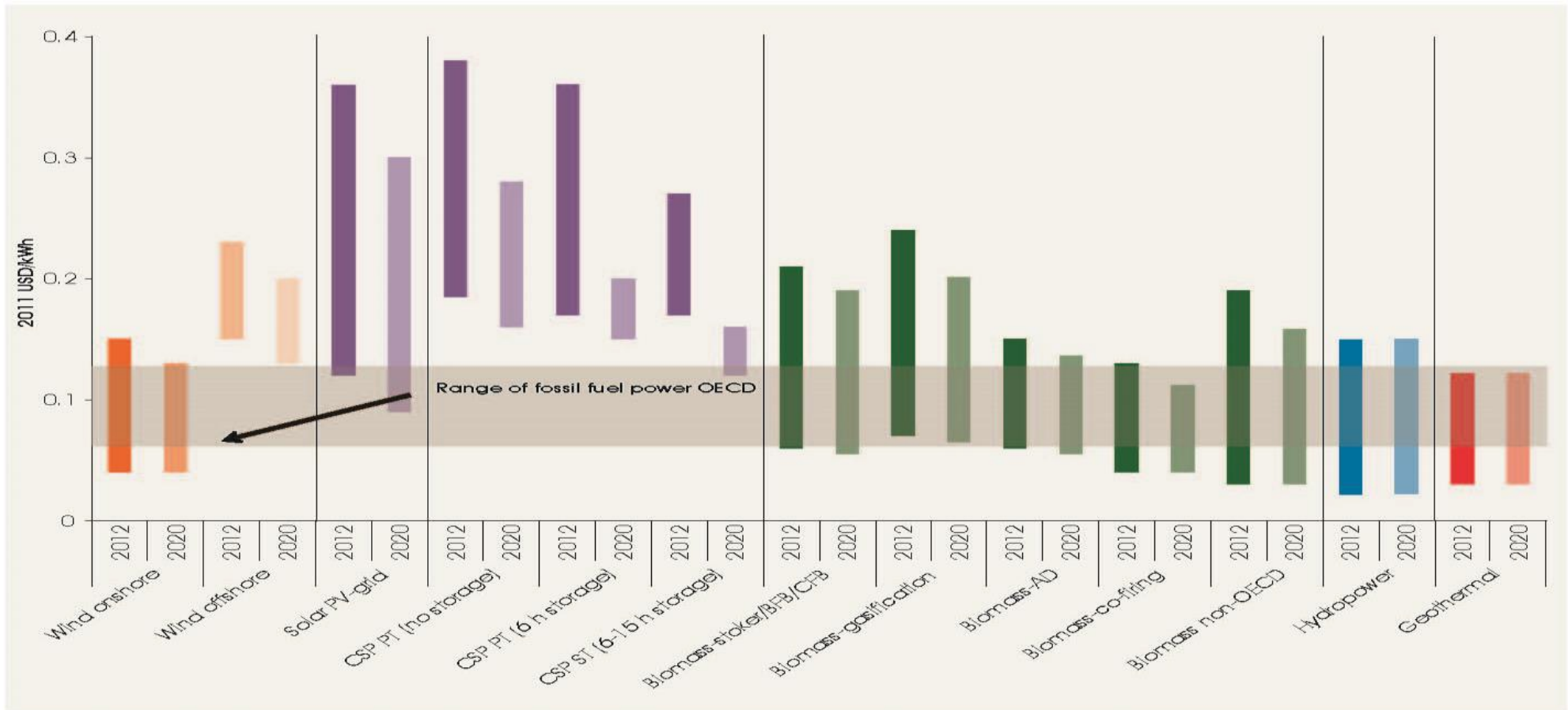


FIGURE ES.2: TYPICAL LCOE COST RANGES FOR RENEWABLE POWER GENERATION TECHNOLOGIES, 2012 AND 2020

Note: PT = parabolic trough, ST = solar tower, BFB/CFB = bubbling fluidised bed/circulating fluidised bed, AD = anaerobic digestion.

Conclusions and Remarks

1. Vietnam low electricity price policy has brought many positive impacts for a long time in the past, such as better environment for FDI invest, countryside electrification and poverty decreasing; but to date VLEP has caused many negative impacts to socio-economic development and renewable energy development.
2. Government subsidies on natural and environmental cost for thermoelectric power and hydropower plants are reasons of low electricity price cost.
3. To change low electricity policy and worldwide tendency of decreasing price cost of generated electricity from RE source can be become prospective era of Vietnam RE potential.

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