

# Integrating Climate Change into EIA and SEA Processes in Vietnam (the case study of five-year plan for energy)

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**Abstract:** *In the global context of climate change, many countries have realized that climate change can not only impact on development projects but also projects can have an impact on greenhouse gas emissions, and therefore affect the global climate change phenomenon. The Government of Vietnam soon has addressed the issues of climate change with the sustainable development of the country and green growth. National climate change adaptation and response approaches have clearly been defined in the National Target Program to cope with climate change (2008). Since developed, strategic environmental assessment (SEA) has been a very effective tool for assessing environmental aspect of the policies, plans and programmes in Vietnam and the “Vietnam National Power Development Master Plan for the 2011- 2020 period with a vision to 2030” as an example. As required by Environmental Protection Law and the Government, long term planning for power energy in Vietnam has been carried out with regarding to all potential climate change factors to ensure national energy security, environment protection and sustainable development.*

## 1. Introduction

Climate change is one of the most significant challenges facing human being today. Climate change has already affected agricultural production and socio- economic structures and will extensively and intensively alter the development process and security issues including food, water, energy and social safety as well as political, cultural, economic, diplomatic and commercial security.

Vietnam is considered as one of the countries to be severely affected by climate change<sup>1</sup> and thus response to climate change is of crucial importance to Vietnam. The Government of Vietnam has formed a number of national strategies to adapt with the context and also to reduce contribution to global greenhouse gases emission, in order to achieve many sustainable development set goals, including National Target Program to cope with climate change (2008); Vietnam's sustainable development strategy for 2011-2020; The National Strategy for Green Growth in the period 2011-2020 and Vision to 2050; the National Action Plan on Green growth period 2014-2020; National Environmental Protection Strategy up to 2020 with a vision to 2030 and Action Plan for implementation of National Environmental Protection Strategy up to year 2020, vision to 2030. In general, the main targets that above policies focused on are (1) To restructure and perfect economic institutions toward a green economy and encouraging the development of economic sectors using energy and resources efficiently; (2) To research and adopt more advanced technologies in order to make more efficient use of natural resources, reduce greenhouse gas

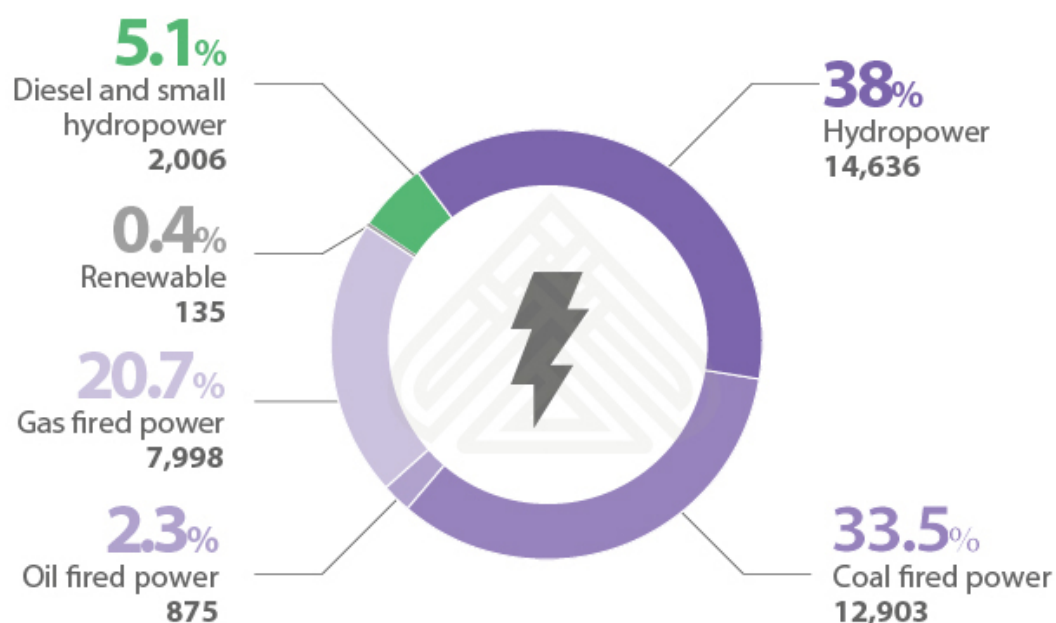
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<sup>1</sup> Vietnam scenario for climate change and sea level raise 2016

emissions, and coping effectively with climate change; (3) Improve people's living standard, build an eco-friendly lifestyle through creating jobs from green industries, agriculture and services; and increase capital investing in green infrastructure development.

Energy sector is one among a few important sectors which have to be reformed according to the Government's strategies for future development in the context of climate change. Currently, energy sources are diverse in Vietnam, ranging from coal, oil, natural gas, hydropower, and renewable energy. Vietnam Electricity Annual Report 2016 indicates that, to the end of December 2015, hydropower and coal fired power occupied the most of the power generation sources. Renewable energy, which includes wind, biomass, and solar accounted for less than half a percent of power generated in the country (Figure 1).

### Power Generation by fuel type (Dec 2015)



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Figure 1 – Power generation by fuel type (Source: Renewable in Vietnam: Current Opportunities and Future Outlook)

To comply with Environment Protection Law 2014, which implies that climate change factors have to be considered during strategic environment assessment process for policy, plan and programme<sup>2</sup>, the “Vietnam National Power Development Master Plan for the 2011- 2020 period with a vision to 2030” (Master Plan VII revised), which has been approved by the Government in 2016, was revised to reflect climate change situation in the country.

<sup>2</sup> Section 4, Environment protection law 2014

## **2. Climate change is integrated into Strategic Environmental Assessment (SEA) and Environmental Impact Assessment (EIA)**

### **2.1. National Power Development Master Plan VII (revised) with climate change**

The SEA works for National Power Development Master Plan VII (revised) (Master Plan in short) were carried out in 2014 and the SEA report was reviewed and appraised in March 2015. Mid-year 2015, the Minister of Ministry of Natural Resources and Environment submitted a report of the SEA review results to the Prime Minister and, on March 2016, Prime Minister issued Decision No. 428/QĐ-TTg dated 18/3/2016 to approve the Master Plan. In the SEA report, there are a number of important aspects considered, including power security, water resource depletion, pollution from coaled thermal power plant, new trends for renewable energy. Being reflected from SEA outcomes, the Master Plan also was being adjusted according to fit with the report research results and findings. It is clearly stated in the Master Plan that, in Vietnam context, future development trends are less-dependending on hydro power, no-more construction of large-scale hydropower plants, reduced usage of coaled thermal power and increasing investments in renewable energy sources. As the results, the SEA research had worked to address issues, based on climate change scenario, to adjust previous Power Master Plan for Vietnam.

In addition, the report on climate change scenario for Vietnam 2016 shows that Vietnam is considered as one of the countries which are affected by climate change, indicated by the rises in average temperatures over the last decades, as well as substantial changes to precipitation patterns. The average temperatures have been rising and the total precipitation has increased, especially during the rainy seasons, which is important for flood water management. In northern Vietnam the precipitation during the dry seasons has decreased, which poses important challenges to water resource management.

The impacts of climate change are said to be unpredictable in incoming decades, especially the impacts on average temperature and water resource across the country. Impacts of climate change on annual flows vary between regions and river systems across Vietnam. For example: the annual flow of rivers in the Red River Delta and the northern part of the North Central region tend to increase by less than 2% in 2040–2059 and by from 2 to 4% in the period 2080–2099. In contrast, the projected annual flow of rivers from the southern part of the North Central region to the northern part of the South Central Region and the Southeastern region (Dong Nai river system) tend to decrease at different levels, by 2% in Thu Bon river and Ngan Sau river, and more significantly by 4–7 % in the period 2040–2059 in the Dong Nai river and the Be river basins, and up to 7–9 % in the period 2080–2099.<sup>3</sup> Flood events in most rivers tend to increase by 2–4 % in the period 2040–2059 and by 5–7 % in the period 2080–2099, but to varying degrees. After 2020, groundwater levels may decrease considerably due to both overexploitation and decreased groundwater recharge during the dry season. In the south, if the flow of the rivers decreases by 15–20% in the dry season, the corresponding groundwater level may decrease by 1m as compared to the current level.

Due to unpredicted fluctuations of water resource, the occurrence of more extreme weather events, and extended impacts from constructing large hydro-power plants, the Government

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<sup>3</sup> Vietnam scenario for climate change and sea level raise 2016

realized that the construction of high capacity plant will be inefficient and costly besides many risks associated. Instead, to ensure power securities and protect the environment and biodiversity, there is a need to increase the number of small hydropower plants and to develop other source of energy apart from hydropower<sup>4</sup>.

In the next decade, coal-fired power plants seem to be the main contributor to the national source of power, however, the domestic coal supply is predicted to be short to meet the future demands and this type of energy generation is said to be associated with a lot of environmental problems especially greenhouse gas emission and solid waste management.

As the results, considering the climate change factors, the revised National Power Development Master Plan for the 2011- 2020 period with a vision to 2030 aims to increase the share of renewable energy to around 7% in 2020 and more than 10% in 2030; reduce the use of coal-fired electricity; reduce number of high capacity hydropower plants in order to ensure energy security, climate change impacts mitigation, environmental protection, and sustainable socio-economic development.

## 2.2. Climate change contents considered in EIA process for power projects

According to the Environment Protection Law 2014, personal/organization have responsibility to help response and adapt to climate change through the followings: management of ozone layer depleting substances; encouraging of renewable energy development; environmental friendly production and consumption; energy recovery from waste; etc.

Thus, during EIA process for power projects, all the factors that contribute to climate change have to be considered, such as type of coal used, gas emissions, environmental friendly technologies, energy conservation, waste management. Moreover, the technical guidelines for carrying out EIA for thermal power projects recommend that the impacts caused by climate change should be also taken into account when carrying out impact assessment, for instance: sea level rises impacting coastal plants, weather extremes incidents, consideration of average water temperature and flows when discharging coolant, solid waste storage space, etc.

## 3. Renewable energy development in Vietnam

As approved Plan, with energy demand projected to increase by more than 10% annually in the next five years and required power capacity to double; the Government is moving forward to develop the renewable energy sources to ensure energy security and addressing the growing power demand. According to the targets, renewable solar power is expected to become the main new renewable energy source in the future, with an installed capacity to be increased from around 6-7 MW by the end of 2017 to 850 MW by 2020 (equivalent to 1.6 percent of the country's power generation) and 12,000 MW by 2030 (equivalent to 3.3 percent of the country's power generation)<sup>5</sup>.

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<sup>4</sup> SEA report of National Power Development Master Plan for the 2011- 2020 period with a vision to 2030

<sup>5</sup> Vietnam Electricity (EVN)

**Table 1: Developing power generation from renewable energy in accordance with Master Plan VII (revised):**

<b>Year</b>	<b>Capacity (MW)</b>	<b>Proportion in total installed capacity (%)</b>	<b>Total energy (TWh)</b>	<b>Proportion in total energy (%)</b>
<b>2015</b>	<b>2.046</b>	<b>5.2</b>	<b>6,047</b>	<b>3.7</b>
<b>2020</b>	<b>6.004</b>	<b>9.9</b>	<b>17,265</b>	<b>6.5</b>
<b>2025</b>	<b>12.009</b>	<b>12.5</b>	<b>27,761</b>	<b>6.9</b>
<b>2030</b>	<b>27.199</b>	<b>21.0</b>	<b>60,907</b>	<b>10.7</b>

Source: Institute of Energy, Ministry of Industry and Trade (2016)

Vietnam has seen a steady increase in foreign investment in power projects. The total capacity of foreign-invested power producers accounted for 2,800 megawatts in 2015.

According to Mr. Nguyen Duc Cuong – Director of Renewable Energy and Clean Development Mechanism Center (Institute of Energy, Ministry of Industry and Trade), in previous years, it was needed a quite big investment rate to develop the solar power generation. But now, the investment rate is more interesting, fluctuating from 1,400 – 1,800 USD/kWh (depend on each location) and have decreasing tendency. Currently, Vietnam has more than 30 major investors (domestic and foreign) have been established to promote solar power projects with capacity from 20 MW to over 300 MW at some potential localities, concentrated in the Central region. A solar power project with capacity of 19.2 MW was started in August 2015 in Mo Duc district, Quang Ngai province. There are about 5-6 other projects being completed the required procedures and documents for adding in Master Plan and getting investment permits.<sup>6</sup>

Regarding the wind power, about 140 MW have been installed and operating in Vietnam. More than 500 MW of nearly 10 projects are being invested in the Mekong Delta river region and Southern Central area. There are 6 provinces having plans for wind power with expected total installed capacity is over 1,000 MW by 2020.

In one of the most recent investments, General Electric (GE), Mainstream Renewable Power, and Phu Cuong Group are working together on a 800 MW wind farm in the Soc Trang province. The agreement worth up to \$2 billion was signed in early June 2017. Other recent investors include US based AES Corporations, Vietnamese firm Xuan Thien Daklak, Long Thanh Infrastructure Development and Investment Company, Japanese firm Fujiwara, and South Korea's Solar Park Global investing in renewable energy projects worth US\$45 million to US\$ 2.2 billion.<sup>7</sup>

#### **4. Challenges and recommendations for renewable energy development**

<sup>6</sup> Vietnam Electricity (2016)

<sup>7</sup> Vietnam Briefing (Dezan Shira & Khoushan Das) Renewables in Vietnam: Current Opportunities and Future Outlook

Although the foreign and domestic investment is on the rise in the renewable energy sector in Vietnam, much more needs to be done. In spite of the development of supportive policies in the last few years, investors are facing numerous obstacles such as: lack of sufficient funding, low tariffs coupled with high investment costs in newer technologies, lack of qualified human resources, underdeveloped supporting industries<sup>8</sup>.

The renewable energy is an indispensable element for sustainable development of Vietnam in the future. To achieve this goal, the most critical issue now is to design and promulgate appropriate electricity tariffs for wind and solar power, to harmonize benefits of three parties, which is: investors (the power seller), EVN (the power buyer) and the development goal of the Government on green power (no greenhouse gas emission). Accordingly, there should be solid mechanisms on supporting the development of renewable power.

## Reference

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6. Vietnam environmental protection law 2014.

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<sup>8</sup> Vietnam Briefing (Dezan Shira & Khoushan Das) Renewables in Vietnam: Current Opportunities and Future Outlook