CHAPTER 2 **ENERGY AND ELECTRICITY**

OVERVIEW

In the Global Leaders Dialogue on Climate Change and Access to Clean Energy in Vietnam on 5th September 2016[1], Dr. Mary Robinson, United Nations Special Envoy on El Niño and Climate and Former President of Ireland, has shared the message of urgency in addressing climate change, which is having clear influences on society while encouraging support for clean energy in developing countries. At the event, Vice Minister of Industry and Trade Mr. Hoang Quoc Vuong also highlighted a strong commitment to enhance the importance of renewable energy in future policy-making, and particularly, informed that the Ministry of Industry and Trade has been working on direct power purchase agreements. EuroCham Green Growth Sector Committees (GGSC) highly appreciates such efforts in opening doors to the mechanism for promotion of the energy market in Vietnam.

To support the Government in accelerating the transition, on 5th December 2016, GGSC presented the Made in Vietnam Energy Plan (MVEP) to the Prime Minister of Vietnam in Hanoi. The MVEP outlines a national energy plan using indigenous resources to deliver a sustainable energy future to 2030. European Union – Vietnam Business Network (EVBN) and Dragon Capital Group Ltd. supported the production of MVEP with assistance from American Chamber of Commerce in Vietnam (AmCham) and Nordic Chamber of Commerce in Vietnam (NordCham Hanoi).

MADE IN VIETNAM ENERGY PLAN (MVEP)

Relevant Ministries: Ministry of Industry and Trade (MOIT), Ministry of Planning and Investment (MPI), Ministry of Finance (MOF), Office of Government (OOG)

Made in Vietnam Energy Plan has been written to assist Vietnam in supplying its growing energy needs, its climate change goals from the 21st session of the Conference of the Parties (COP21)[2] and to achieve its economic development goals, building on the Power Development Plan VII (PDP VII)[3] (MOIT revised for 2016-2030), the *Exploring a Low-Carbon Development Path for Vietnam Report*[4] sponsored by the World Bank Group, the Asian Development Bank *Renewable Energy Development and Potential in the Greater Mekong Sub-region Report*[5] and the World Bank's *Financial Recovery Plan for Vietnam Electricity*.[6]

The MVEP outlines the advantages of greater emphasis on cleaner domestic solutions for Vietnam's future energy needs and to demonstrate the advantages of prioritizing domestic versus imported energy resources with respect to Vietnam's social, economic, energy security goals, Vietnam's global and domestic environmental commitments, and to attract private sector investment. The report also provides key policy and regulatory measures that could help move Vietnam towards these goals.

1 'Vietnam seeks more international support to combat climate change', *The Saigon Times*. Available at <http://english.thesaigontimes.vn/49661/Vietnam-seeks-more-international-support-to-combat-climate-change.html>

2 'A COP of firsts', *COP21's website*. Available at <http://www.cop21.gouv.fr/en/la-cop-des-premieres-fois/>

3 Decision 1208/2011/QD-TTg dated 21st July 2011 of the Prime Minister approving the national master plan for power development in the 2011-2020 period, with considerations to 2030.

4 Audinet, Pierre; Singh, Bipulendu Narayan; Kexel, Duane T.; Suphachalasai, Suphachol; Makumbe, Pedzisayi; Mayer, Kristin, 'Exploring a low-carbon development path for Vietnam,' *World Bank Group*. Available at <http://documents.worldbank.org/curated/en/773061467995893930/Exploring-a-low-carbon-development-path-for-Vietnam>

5 'Renewable Energy Developments and Potential for the Greater Mekong Subregion,' *Asian Development Bank*. Available at <http://hdl.handle.net/11540/5054>

6 Maweni, Joel J.; Bisbey, Jyoti, 'A financial recovery plan for Vietnam Electricity (EVN): with implications for Vietnam's power sector,' *World Bank Group*. Available at <http://documents.worldbank.org/curated/en/971901468196178656/A-financial-recovery-plan-for-Vietnam-Electricity-EVN-with-implications-for-Vietnam-s-power-sector>

The MVEP focuses on analysis and regulatory support for the following:

1. **Energy Efficiency** - including enhancing the role of Government and using Demand Side Management tools to reduce waste and attract private sector investment and innovation in efficiencies.
2. **Renewable Energy** - preparing the policy and regulatory framework to enable the further development of successful markets and attract the needed investments in renewables for local and foreign investors, technology and service providers.
3. **Vietnam's Natural Gas** - accelerating and expanding investment in the use of domestic natural gas as a more flexible, cheaper and cleaner fuel than imported coal. Gas remains the least polluting (with 60 percent less CO_2 emissions than coal) and most cost effective fossil fuel which can serve as a secure bridge fuel.

This report concludes that Vietnam can successfully continue to make maximum use of its indigenous energy resources to reduce the risks and maximise the socio-economic benefits of future energy development building on its achievements to date.

Issue description

1. Risks in the Current Plan

Vietnam's current PDP VII expects 55 GW of power to be fuelled by coal by the year 2030, up from 14 GW today. PDP VII projects the percentage of coal fired power in Vietnam's energy mix by 2030 to increase to 53.2% of installed capacity. This increase in coal energy would be primarily fuelled by importing coal at great financial cost and risk to the Government. It would need Vietnam to import approximately 10 million tons of coal per year from 2017 onwards, an enormous financial and transportation burden that is not fully reflected in the assumed costs of coal.

Vietnam currently ranks as the twentieth largest global user of coal-fired plants but, under PDP VII, by 2030, it would be burning 15 times as much coal making Vietnam the eighth-largest user in the world. Vietnam's use would be similar to that of Russia and Indonesia despite a population projected at only two-thirds of Russia's and one-third of Indonesia's. In the Mekong Delta alone, 14 coal-fired power plants with an installed capacity of 18 GW are planned by 2030. A joint study by Green Peace and Harvard University[7] estimated that air pollution from coal-fired power plants kills around 4,300 people in Vietnam each year and that this would rise to 25,000 per year if the Mekong Delta plants went into operation.

In May 2016, World Bank President Jim Yong Kim said a decision by Vietnam to build the full 40 GW of coal power stations country wide would be a 'disaster' for the planet, and announced the World Bank would devote 28% of its funding to helping developing countries invest in renewables.[8]

Electricity of Vietnam (EVN) does not have the resources to realize the plan, and private investment support for coal technology is fast disappearing except perhaps in a small group of countries on which it may be politically risky to over rely, and most official development assistance (ODA) is now contingent to the adoption of renewable energy and the opening of the markets to private investment.

The MVEP outlines how Vietnam's energy needs can be met with greater emphasis on cleaner domestic sources of energy including: renewables including biomass, wind and solar; sustainable energy efficiencies, and the increased development of Vietnam's offshore natural gas - all reducing the effects on the environment and the need for imported coal. The MVEP report derives regulatory and policy recommendations that can deliver the private sector investment necessary to meet the USD100 billion required by 2030 to meet Vietnam's energy needs and doing so in a way that maximises the use of indigenous resources and delivers on Vietnam's environmental goals.

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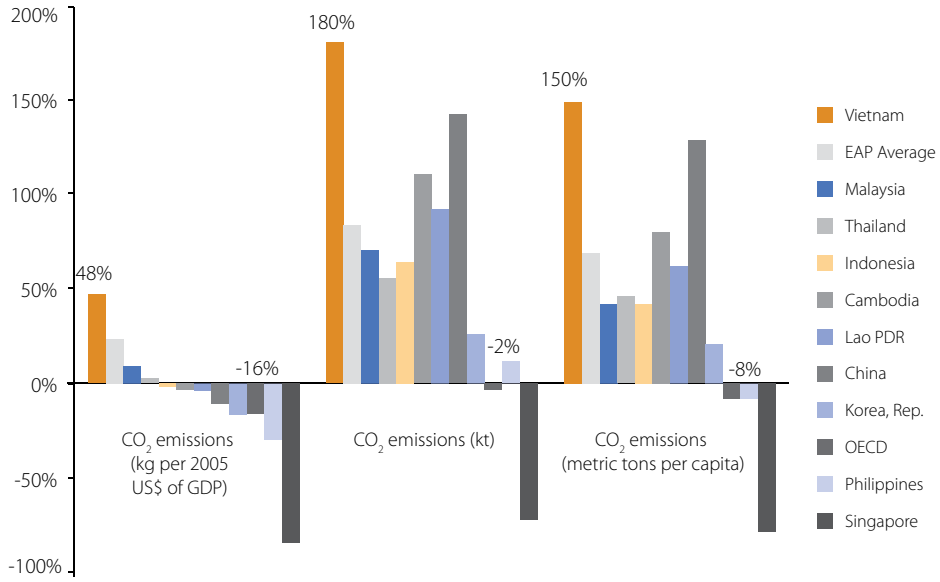
7 'Coal expansion in Vietnam could claim 25,000 lives per year,' *Green Peace*. Available at <http://www.greenpeace.org/seasia/Press-Centre/Press-Releases/Coal-expansion-in-Vietnam-could-claim-25000-lives-per-year>

8 'Remarks by World Bank Group President Jim Yong Kim: Development in a Time of Global Interdependence,' *World Bank*. Available at <http://www.worldbank.org/en/news/speech/2016/04/05/remarks-world-bank-group-president-jim-yong-kim-development-global-interdependence>

Figure 5: Vietnam's carbon emissions are growing at the fastest rate in the region



Source: World Bank (2015) Vietnam Low Carbon Options Assessment[9]

2. With no change, Vietnam's inefficient use of energy is expected to worsen

Electricity demand growth has exceeded income growth, the result has been a rapid rise in electricity intensity. Between 2004 and 2014, the increase of electricity demand has been outpacing that of GDP growth. In 2004, producing one dollar of GDP required 0.9 kWh of electricity. By 2014, this had risen to almost 1.5 kWh of electricity for one dollar of GDP (at constant prices).

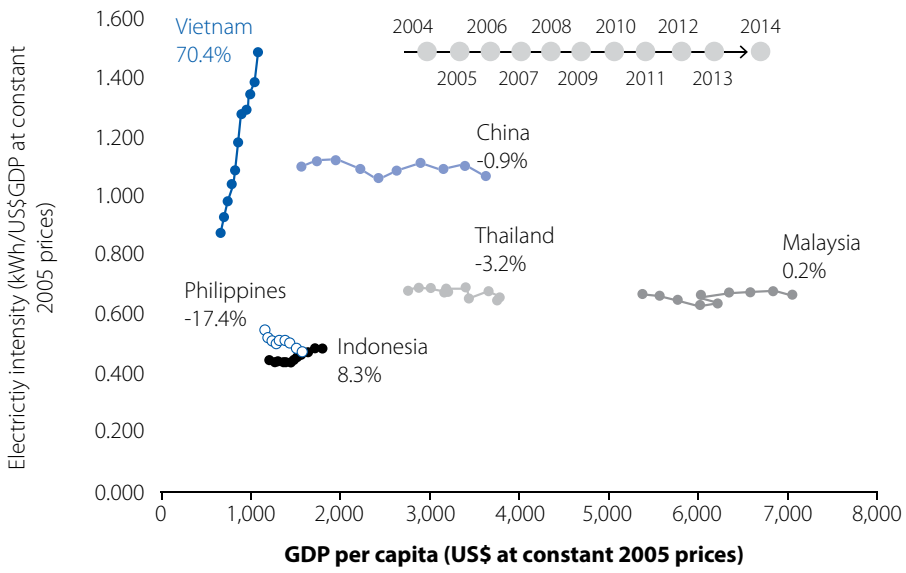
Compared to the 70% increase in electricity intensity seen in Vietnam over this 10-year period, other countries in the region have seen flat or declining intensities. Vietnam's electricity intensity now exceeds that of China and is approaching levels seen in such notoriously inefficient countries as the Ukraine. And projections are for further increases in electricity intensity reaching as high as 2.3 kWh for each dollar of GDP by 2030. The implication is clear - Vietnam is hugely inefficient in its use of electricity and projected to remain so without significant regulatory correction.

The main constraints facing Energy Efficiency measures are:

- a lack of policy framework and its enforcement,
- too low electricity tariffs, and
- missing financial mechanisms for investment in energy efficient technology and conservation.

[9] Audinet, Pierre; Singh, Bipul; Kexel, Duane T.; Suphachalasai, Suphachol; Makumbe, Pedzi; Mayer, Kristy, 'Exploring a Low-Carbon Development Path for Vietnam,' *World Bank*. Available at <https://openknowledge.worldbank.org/handle/10986/23522>

Figure 6: Vietnam's electricity intensity is extremely high and growing rapidly



Source: ECA calculations using data from BP Global's Statistical Yearbook (electricity generation) and World Bank (real GDP and GDP per capita).

Globally, countries have added regulatory requirements on household, office, factory and other electricity using technological innovation and updated equipment to enhance efficiencies. Such regulatory requirements have led to investment in innovation and savings.

Building construction and manufacturing codes can greatly reduce electricity use in office, residential, retail and factory buildings and manufacturing production. Raising prices to reflect actual costs has been shown to reduce use across the board, enhance revenue streams and enabling governments to focus resources on assistance for the truly needy.

Additionally, educating the public about the benefits of energy saving and ways to participate would help build support for renewables and efficiencies, and encourage innovation, private sector investment, involvement and support for an overall plan to ensure a clean and sustainable environment in Vietnam.

Potential gains/concerns for Vietnam

The adoption of Made in Vietnam Energy Plan (MVEP) will allow:

- A more flexible power development plan that can be adjusted to fit future demand, low or high, and removes the risk of either stranded assets or of failing to meet demand if growth exceeds estimates.
- Attract much greater new investment from multiple domestic and foreign sources, in particular mobilising private sector resources, building local manufacturing capabilities, reducing the reliance on foreign governments and for the need of Vietnam government revenues, subsidies and guarantees or Government Guarantees and Undertakings Agreements (GGUs).
- Achieve a more efficient use of electricity that will reduce energy waste and make Vietnam more competitive, productive and attractive for FDI.
- Immediately deliver private investment in cleaner energy after a decade of slow action, thereby freeing Vietnam from its reliance on mega-sized coal power plants which require many years of lead-time, unnecessary costs and put greater pressure on public sector borrowing, and Government borrowing capacity.
- Reduce the social and environmental costs of pollution from a new generation of coal power plants which

contribute to poor air, water and land quality and high health costs. Following the International Monetary Fund (IMF) calculations, we estimate the costs of health and environmental impacts of the current power development plan with its reliance on coal could be as high as $15 billion annually by 2030[10].

- Avoid building a new dependence on imported coal with its consequent risks for security of supply and tens of billions of dollars in foreign exchange demands and balance of payment risk.
- Decrease the heavy financial, logistical and severe environmental costs of transporting coal and coal waste.
- Add an estimated $15 - $20 billion in Government revenues over the project lifetime in developing 3 GW of indigenous gas-fired power plants, compared to an estimated $20 - $25 billion in foreign exchange costs to import coal for an equivalent coal-fired development.
- Solar installations require only one year to be completed, and even wind farms are much faster to come to market than thermal plants and are scalable, so they can be increased as the need arises.
- Build new and high tech industries such as batteries and solar panels and create new employment.

Recommendations

A more sustainable energy future path that attracts investment can be implemented immediately with the enacting of some key policy, regulatory and institution reforms, which have been identified for government and utilities through the advice of supporting donors and private sector experts and which have been successful in other similar countries.

- Adopt Energy Efficiency Measures
  - Make most consumers pay for the true cost of energy to increase energy efficiency pull and issue regulations to enhance the push, to encourage individual households and businesses to reduce energy use and install their own solar, wind or other renewable energy sources to relieve pressure on the power distribution system.
  - Include the private sector investment into smart grid and smart transition technologies providing effective cost-saving solutions.
  - EuroCham recommends mandatory energy efficiency requirements for particular products such as appliances, generators and air-conditioning units, as well as improved construction standards for housing, office, factory, and retail development.
  - Develop small and large-scale well-structured waste-to-energy systems, especially to benefit local communities through improved health and hygiene, increased power supply, and decreased carbon emissions and health effects from the open burning of agricultural waste and trash. Landfills with mixed waste make it especially difficult to and hazardous to use or recycle the waste.
  - Start a public education campaign to raise awareness of the ability of consumers to reduce energy waste and to create a clean environment for the good of all including the generations to come.
- Allow more private investment into electricity generation
  - Introduction of direct power purchase agreements (DPPA) between power producers and large power consumers in 2017, as they have shown to be extremely effective in other similar countries. Companies such as Apple, Nike, Coca Cola, Google, TetraPak and other multinational corporations have publically made global commitments to work towards using energy from renewables and energy efficient projects. This will attract additional investment and global brands that will help carry Vietnam up the manufacturing value chain.
  - Implementation of the recommendations of German Agency for International Coorporation (GIZ) and United Nations Development Programme (UNDP) on changes to wind and solar PPAs to make these 'bankable' increases in Feed-In-Tariffs (FIT) for renewable energy (to at least 10.4 US cent/kWh for wind and 15 US cent/kWh for solar power under 20-year PPAs).
  - Issuance of a rational Power Price Roadmap for the full introduction of Market-Based-Pricing by 2020 with

[10] Calculated using planned coal-fired generation of 311 TWh in 2030 and IMF estimates of the health and environmental costs of coal consumption in Vietnam of $ 2.26/GJ (equivalent to around 8.07/MWh of electricity generated). A cost of carbon of $ 35/tCO2e is applied. Available at <http://www.imf.org/external/np/fad/environ/data/data.xlsx>

a vision to 2025, including definition of variable pricing between the three main tariff groups (residential, commercial and industrial). The provision of actual cost information can empower businesses, consumers and investors as to the most effective way to invest in higher efficiency equipment and processes. Energy efficiency investment and innovation is not occurring in high volumes now because businesses and consumers believe that power prices will remain subsidised by the Government. Meanwhile, investors require Government guarantees because prices do not reflect the full costs of production.

- Continue the restructuring of EVN to enhance its creditworthiness. Increasingly international donors are offering support and guarantees for renewables and clean energy development and procedures which can assist in increasing EVN's creditworthiness from the perspective of new investors in these projects at low cost to Vietnam. This credit enhancement for EVN would aid the government of Vietnam to reach energy and environment goals and help encourage developers to consider Vietnam as an attractive market for investment on commercial terms.
- The Government is encouraged to work with private sector solar experts and business groups quickly to provide adequate supporting regulations to attract private capital investment. GGSC's Solar Expert Survey published in July 2016 can serve as a starting point for a review.[11] The following move could be a comprehensive Renewable Energy Law that contemplates an independent Energy Agency from renewable sources that speeds up all administrative tasks, given the otherwise very rapid deployment of the investments.

- Develop the offshore gas potential
  - Careful analysis indicates that offshore gas development cost and revenue structure is favourable to imported fuel options. Further, the high cost of 'clean coal' technology far outweighs natural gas. Therefore, EuroCham hails the recent contracts signed for gas extraction and plans to build combined cycle gas fired power plants, as this is one of the key measures to reduce air, water and land pollution, alleviate the logistic burden and meets the favour of the populations involved.

Conclusion

In 2016, there have been several promising changes which seem to follow the right direction. One recent and worth-mentioning shift is the renouncement of nuclear power plant projects[12] in the central of Vietnam. The establishment of a department dedicated to new and renewable energy and of one dedicated to energy efficiency under the Ministry of Industry and Trade is also a good signal to the business community on a movement of the Government towards cleaner sources of energy. Beyond that, a more sustainable energy future path can only be realised with concrete actions and enforcement starting from now.

ACKNOWLEDGEMENTS

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11 Available for download at <http://www.eurochamvn.org/node/15802>

12 'Vietnam abandons plan for first nuclear power plants,' *Reuters*. Available at <http://www.reuters.com/article/us-vietnam-politics-nuclearpower-idUSKBN13H0VO>