POLICY BRIEF

JUST ENERGY TRANSITION:

Opportunities and Challenges for Vietnam

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Design & Printing
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Photos: GreenID and Freepik

Place and year of publication:
Hanoi, June 2019

SUMMARY

This paper summarizes the researches' findings on power development scenarios and analyzing just energy transition parameters in Vietnam[1]. It proposes policies for the post-2020 period on social-economic development, on Power Development Plan VIII, on fighting against climate change, and on improving science, technology and job orientation for Vietnam's decision and policy makers. The analysis on occupational, environmental, and social impacts, energy securities, investments in power plants, and the power generation costs of three different power development scenarios in Vietnam until 2030 showed that transition to clean and renewable energies bring more economic, social, and environmental opportunities than risks to Vietnam.

10 opportunities and benefits that clean electricity development can bring to Vietnam include: 1) Better energy security; 2) Reduced impact on the environment and public health; 3) Significant reductions in greenhouse gas emissions and an improved global image in Vietnam's fight against climate change; 4) Creation of favorable conditions for the economic development of potential remote areas; 5) Increased accessibility to electricity and improved living conditions for people living in the remote areas; 6) Lowered investment cost; 7) Lowered power generation cost; 8) Establishment of new jobs; 9) Improved working environment; and 10) Zero job losses in the coal mines or coal-fired power plants.

04 challenges raised during the transition include: 1) High demand of land for power development may result in land conflicts; 2) Ensuring improved and sustained standards of living and jobs for local communities affected by power projects remains a big challenge; 3) Preparation of human resources for the transition process, especially in the affected communities, is very slow; and 4) The welfare of workers in non-state energy enterprises should also be improved. To overcome these challenges, the Government should coordinate all stakeholders, at all levels, to make their best efforts in developing and implementing policies.

08 recommendations for a just transition with no one left behind are: 1) Integrate the economic, social and environmental co-benefits brought by the energy transition into the national policies for the post-2020 period; 2) Improve the national coordination regime to facilitate the inter-sectoral collaboration, and develop a roadmap to implement the just transition; 3) The Government should develop and harmonize relevant policies that prioritize the use of renewable energy and improve their energy efficiency, and minimize the building of new coal plants; 4) The development of centralized and decentralized renewable energies must be taken into account to avoid land conflict but also secure local livelihoods, and boost the opportunities for cooperation among affected communities; 5) The engagement of local workers and worker's organization in decision making and implementing process is essential and necessary to ensure justice in the transition process; 6) All relevant stakeholders such as educators, scientists, workers, trade unions, and local authorities should keep close track with policy updates and market to actively develop and implement strategic plans and solutions in terms of personnel training, capacity building, the transfer of knowledge, skills and technology to prepare the workforce for new opportunities arising from the energy transition in Vietnam; 7) Research and development of energy transformation, storage and connecting equipment, and strengthened renewable energy management systems must be the top priorities to improve the local production of renewable energy's and energy efficiency's equipment; and 8) The media, scientific, and technological associations and socio-political organizations should actively contribute to raising public awareness on the benefits, opportunities, and challenges of a just energy transition.

1 GreenID, Analysis of future generation capacity scenarios for Vietnam, Hanoi, 6/2018 and GreenID - FES, Analyzing the just transition parameters of Vietnam's energy development, Hanoi, 6/2019

BACKGROUND

Transition to renewable energy towards low carbon development and emissions has become a global trend in order to implement the United Nations' Sustainable Development Goals and the Paris Climate Agreement.

Not only developed but also developing countries are transitioning to renewables for a better national infrastructure. In principle, energy transition is the restructuring of economic development models toward a low carbon economy in order to address concerns for and combat climate change. This transition process would affect the livelihoods of worker groups and economic sectors. Therefore, equitable transition or "the just transition" must be assured for national social acceptance and sustainable development.

Vietnam has entered a period of deep and comprehensive global integration; however, it is among the most affected countries by climate change. Therefore, we cannot be bystanders to this growing trend and persistent problem.

Vietnam's developing economy and energy sector face extreme pressure for continued and fast growth without scarifying environment and social justice. Recently, Vietnam has introduced a number of mechanisms to support renewable energy, though there is no comprehensive policy on equitable energy transition yet. Despite remarkable progress, the big question for Vietnam now asks how to better transition to clean energy while ensuring social equity and justice for affected communities? The period from now until 2020 is opening strategic opportunities for stakeholders to discuss and promote the energy transition process with justice in Vietnam.

In this context, Friedrich-Ebert-Stiftung in Vietnam (FES) and Green Innovation and Development Centre (GreenID) have produced a study on "**Analyzing the just transition parameters of Vietnam's energy development**". This study introduced the concept of a just transition, focusing on the impacts of employment, environment, economic, and social factors of the three power scenarios: PDP VII revised, Base and Renewable energy (B&RE), and Energy Efficiency and Renewable Energy (EE&RE). The report details and analyzes the opportunities, challenges, and provides recommendations for a just energy transition in Vietnam.

POWER DEVELOPMENT SCENARIOS

Three power development scenarios analyzed in this study are described in Table 1 below and include:

Base scenario (PDP VII revised): This is based on the Power Development Plan VII revised and issued on March 18th, 2016. According to this scenario, the total installed power generation and capacity is estimated to increase to 60,000 MW in 2020, 96,500 MW in 2025 and 129,500 MW in 2030.

B&RE scenario: This scenario details a total installed capacity increase from 38,900 MW in 2015 to 123,480 MW in 2030, which is 84,580MW within 15 years, and equivalent to 5,640 MW each year. The power generation capacity by 2030 under this B&RE scenario will be only about 6,000 MW lower than that of the base scenario. However, in this scenario, the power generation capacity of renewable energies, wind and solar, has been significantly increased in lieu of the conventional energies such as coal. In addition, the proposed coal technology for post 2020 period is supercritical - high efficiency and low emissions.

EE&RE scenario: Compared to PDP VII revised, in the EE&RE scenario by 2030, the proportion of renewable energy is expected to increase from 21% to 30%; gas and thermal power increasing from 14.7% to 22.8%; and coal-fired thermal power reducing from 42.6% to 24.4%.

TABLE 1: THE POWER GENERATION CAPACITY OF 3 SCENARIOS

ENERGY SOURCES	CAPACITY (MW)			
Overall	**2015**	**2020**	**2025**	**2030**
A. PDP VII revised	38,900	60,000	96,500	129,500
B. B&RE	38,900	57,200	80,420	123,480
C. EE&RE	38,900	57,130	72,160	105,130
1**. Coal**				
1A. PDP VII revised	12,903	26,000	47,600	55,300
1B. B&RE	13,070	25,970	25,640	42,210
1C. EE&RE	13,070	25,970	25,640	25,640
2. Natural gas				
2A. PDP VII revised	7,998	9,000	15,000	19,000
2B. B&RE	7,450	7,690	18,590	24,400
2C. EE&RE	7,450	7,690	10,600	23,980
3.Wind				
3A. PDP VII revised	135	800	2.000	6.000
3B. B&RE	90	150	2.350	8.500
3C. EE&RE	90	150	2,350	8,140

ENERGY SOURCES	CAPACITY (MW)			
Overall	**2015**	**2020**	**2025**	**2030**
4.Solar				
4A. PDP VII revised	5	850	4,000	12,000
4B. B&RE	-	100	6,970	17,750
4C. EE&RE	-	30	6,700	16,750
5.Biomas				
5A. *PDP VII revised*	380	600	1,160	2,720
5B. B&RE	380	630	1,220	1,950
5C. EE&RE	380	630	1,220	1,950

Source: Analyzing the just transition parameters of Vietnam's energy development

THE JUST ENERGY TRANSITION

Energy transition is the process of transition from fossil fuel-reliant energy models to renewables and energy efficient options. First, energy transition is necessary in Vietnam to reduce our dependency on fossil fuels and imported fuels in order to secure sustainable energy sources that protect our environmental and public health. This will reduce greenhouse gas and carbon emissions while also promoting further economic development, improve energy accessibility, and create new job opportunities for local communities affected during the transition process. The transition process will shift labor practices, engage different stakeholders in the energy market, and harmonize the interests of all stakeholders. These are the core elements of a just energy transition in Vietnam.

KEY RESEARCH'S FINDINGS

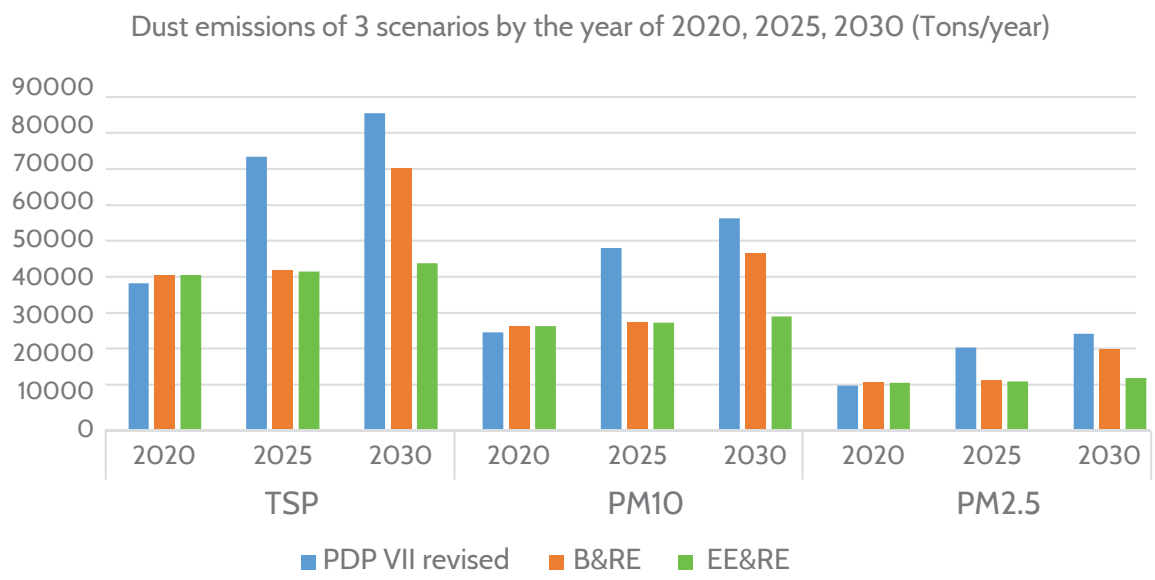
The major research findings demonstrated that transitioning from fossil fuel-based energy to renewables and higher energy efficiency brings increased opportunities to Vietnam's economic, socio and environmental progress. In addition, predicted challenges requires an increased engagement and efforts made by all multi-sector stakeholders involved to overcome barriers arising during this transition process and ensure the social justice in Vietnam.

The opportunities and benefits that clean electricity development can bring to Vietnam include:

1. Better energy security: Taking into account three dimensions of *energy supply diversification, import energy rate, and fossil-fuel energy share*; two power scenarios developed by GreenID are both superior to the PDP VII revised for better energy security. These two scenarios, particularly EE&RE, will lead to improved energy diversification than that of PDP VII revised due to a balanced share of diverse energy sources. The ratio of power produced from imported primary energy or imported electricity in both B&RE and EE&RE scenarios are lower than that of PDP VII revised. These two scenarios therefore bring less risks for fuel supply and energy costs than PDP VII revised. The level of dependence on fossil-fuel energy sources of these two options are lower than that of PDP VII revised in all phases with higher shares of renewables. The proportion of electricity generated from fossil fuel sources will be less volatile, including exchange rate fluctuations.

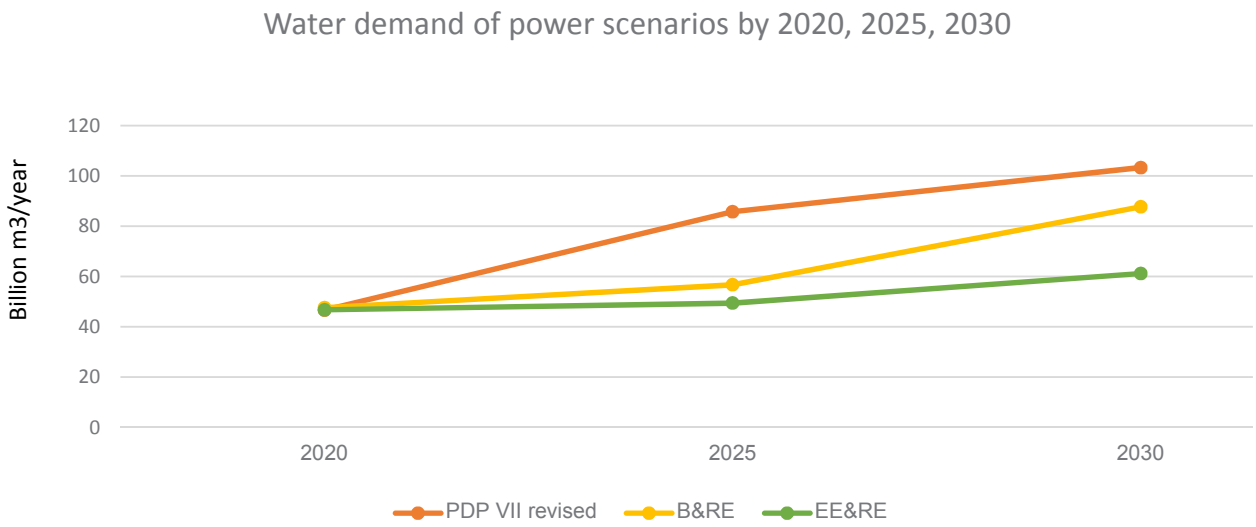
2. Reduce impact on environmental and public health: The energy transition scenario contributes significantly to the improvement of air and water quality and thus greatly reduces public health risks to the community. The EE&RE scenario estimates a 48% reduction in total dust emissions (TSP, PM10 and PM2.5) by 2030 as compared to the emissions caused by the PDP VII revised scenario. Additionally, the B&RE scenario is estimated to reduce 17% of total dust emissions compared to that of PDP VII revised. Moreover, the TSP, PM10 and PM2.5 emissions of EE&RE scenarios between 2020 to 2030 are expected to slightly increase only by 8%. In contrast, in the PDP VII revised scenario, dust emissions up to 2030 will increase by 115% compared to that of 2020 as illustrated in Figure 1.

FIGURE 1: COMPARISON OF DUST EMISSIONS OF 3 SCENARIOS BY THE YEAR OF 2020, 2025, 2030



In regards to water demand, for all scenarios, it is mainly used for cooling purpose. Cooling water accounts for about 63% of a coal power plant's water demand (Figure 2). By 2030, the PDP VII revised scenario expects the total water demand to be 103.3 billion m^3/year; whereas the B&RE scenario expects 87.7 billion m^3/year; and for the EE&RE scenario it expects 61.2 billion m^3/year. The water requirement of the B&RE scenario is about 58% lower than the PDP VII revised scenario, and the EE&RE scenario only expects 84% of the water demand of the PDP VII revised scenario.

FIGURE 2: COMPARISON OF WATER DEMAND OF POWER DEVELOPMENT SCENARIOS

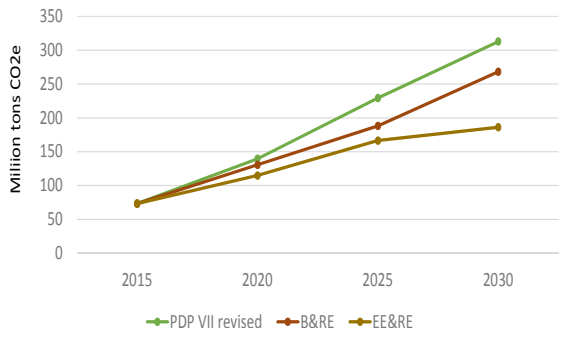


Based on preliminary estimates, the EE&RE scenario could reduce about 7,600 premature deaths per year by 2030 compared to that number of PDP VII revised[2]. Both B&EE and EE&RE scenarios will ensure increased and necessary protections of air and water quality.

2 GreenID, Analysis of future generation capacity scenarios for Vietnam, page 6, Hanoi, 6/2018

3. Reduce greenhouse gas emissions significantly and improve Vietnam's image in the fight against climate change, aiming towards the implementation of the Paris Agreement: According to the calculations of each scenario, the GHG emissions in the EE&RE scenario are 126.6 million tons of CO2 equivalence lower than that of PDP VII revised, which accounts for 40.5%. GHGs of the B&RE scenarios are 44.6 Mt CO2 equivalence lower than that of PDP VII revised, accounting for about 14.3%. Thus, if the energy transition happens in Vietnam, we will be pioneers in the effort to reduce harmful carbon emissions, and inspire international communities to follow our lead. As a result, the opportunities for international cooperation are widened.

FIGURE 3: COMPARISON OF GHG EMISSIONS OF 3 POWER DEVELOPMENT SCENARIOS



4. Create favorable conditions for the development of remote areas. The development of renewable energy in remote areas will improve the basic infrastructure in these areas, e.g. transportation and information infrastructure. The power development project accompanies new buildings or upgraded roads for transportation of equipment to the project site. The development of renewable energy projects in remote areas would create new jobs, which will help retain the young labor force in the locality and reduce migration to big cities. This also helps local people, including members of ethnic minorities, to have opportunities for increased non-agricultural income, learn new skills, and promote science and technology among agricultural production communities in rural areas. These communities will have more economic opportunities by attracting capital investments for clean electricity development, thereby increasing tax and money earned from this investment.

5. Increase the accessibility to electricity and improve the living conditions for people in the remote areas: The development of renewable energy, especially large-scale solar power in localities, will quickly reduce the cost for solar roof panels. As a result, poor families and remote communities can benefit from local on-site power-supply facilities. In case it is impossible to access the national grid, decentralization of the renewable energy system is considered the best solution for Vietnam to achieve its electricity access target by 2020. Decentralized renewable energy is achievable, which means small-scale-RE systems work effectively with low capital costs, quick and easy installation processes, little running costs, and independence from the national grid. These households and communities can make their own decisions on the size and capacity of the system based on their actual need.

6. Lower investment cost: the PDP VII revised requires a higher investment cost than those of both transition scenarios proposed by GreenID. It is $5,294 million (equivalent to 15.4%) higher than B&RE scenario, and $ 3,625 million (equivalent to 10.6%) higher than EE&RE scenario (Table 2).

TABLE 2: INVESTMENT COST OF 3 SCENARIOS

Scenarios	Present value of investment cost (million USD)
PDP VII revised	34.321
B&RE	29.027
EE&RE	30.696

Lower power generation cost: Calculations of the total cost based on 2015 present value for the three scenarios between 2016-2030 showed that PDP VII revised has the highest costs with $107.4 billion (USD), which is 15.6% more than B&RE and 43% more than EE&RE scenarios. All cost items of PDP VII revised are also greater. If the external costs are taken into account, the real difference is even more significant. As a result, the cost of generating electricity of PDP VII revised is 9.56 US cents per kWh, 36% higher than the B&RE. This is only 10% higher than the EE&RE scenario because this scenario has an overall lower demand for electricity.

TABLE 3: COMPARISON OF POWER PRODUCTION COSTS OF 3 SCENARIOS

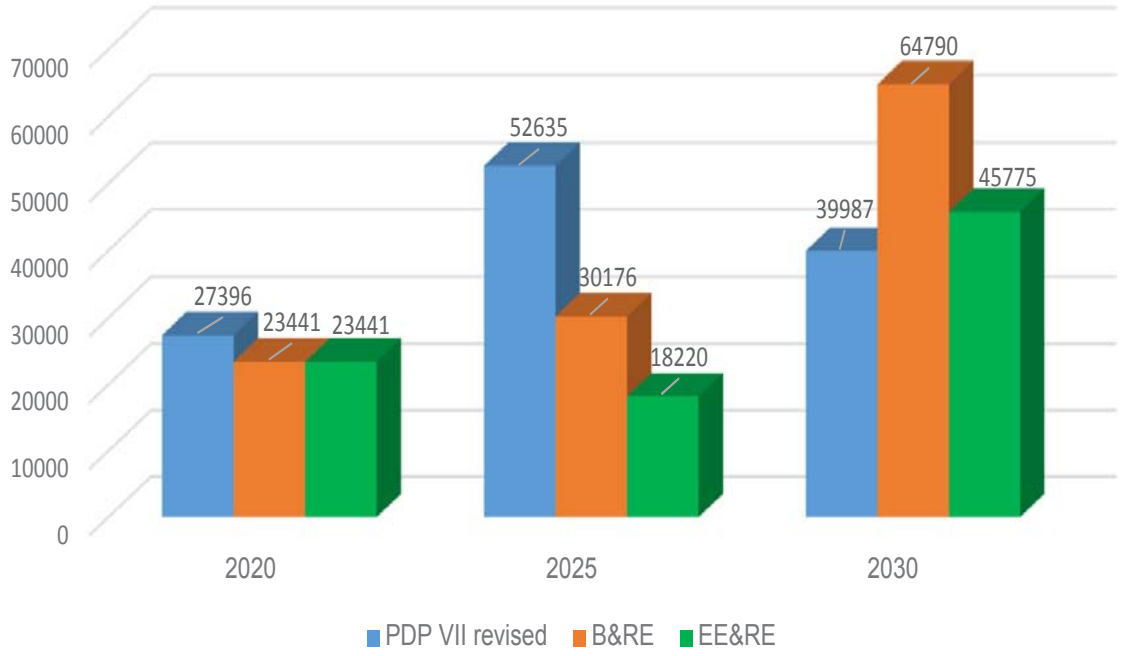
Costs	PDP VII revised	B&RE	EE&RE
Investment cost for power generation	39.343	33.230	29.876
Investment cost for grid	24.537	20.724	18.175
O&M cost for power plants	7.584	6.156	5.039
O&M cost for grid	1.308	1.082	974
Fuel cost*	34.593	30.892	20.821
Total cost (billion USD)	107.366	92.084	74.885
The cost for power generation (US cent/kWh)	9.56	8.20	8.67

**: Including imported electricity*

8. Create new jobs: In the long run, the development of renewable energies brings more direct jobs during installation and operation and maintenance (O&M) phases. The number of new jobs created in construction, operation, and maintenance by renewable energies (wind, solar and biomass) could be more than the number of jobs in the thermal power industry (coal and gas). Specifically, in order to meet the same electricity demand in 2030, the construction work required under the B&RE scenario is higher than the labor of PDP VII revised. During a short and medium period, the number of installation jobs might be lower, however, in B&RE scenario, the number of new jobs created from 2026 to 2030 is 64,790[3] new jobs per year, which is 24,803 jobs/year higher than that of PDP VII revised. In the same period, the installation jobs created in the EE&RE scenario is on average 5,788 jobs per year higher than that PDP VII revised (Figure 4).

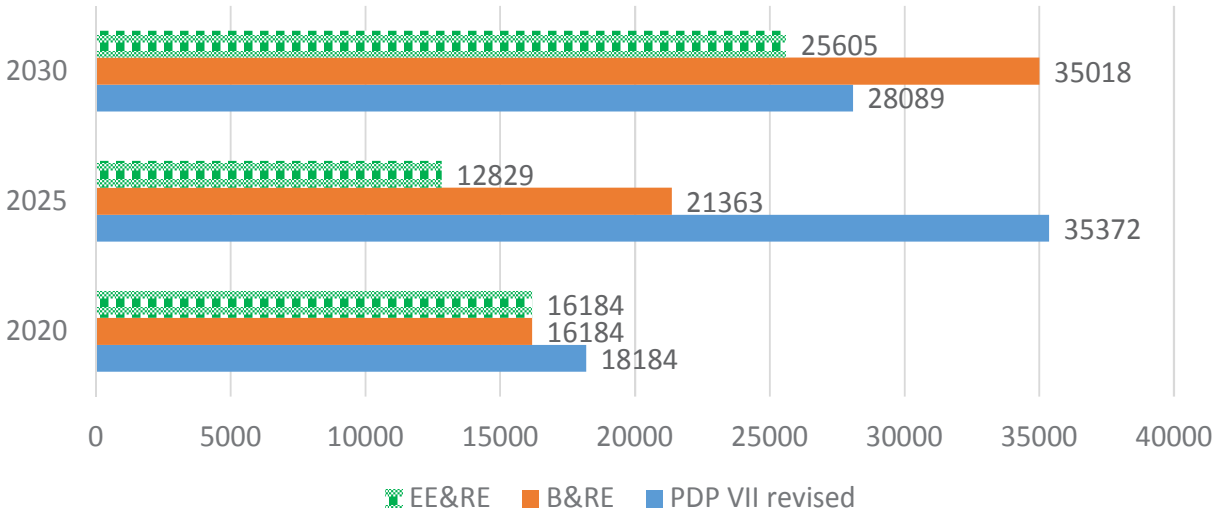
3 Job calculation is for 5 power generation sources, including coal, gas, wind, solar, and biomass. Hydro-power is excluded.

FIGURE 4: NUMBER OF INSTALLATION JOBS/YEAR OF 3 SCENARIOS



The number of new jobs for O&M operation in the period 2026-2030 of the B&RE scenario would reach 35,018, which is 6,929 jobs higher than that of PDP VII revised (Figure 5). However, the number of jobs in this stage under the EE&RE scenario is lower because the work created in the energy efficiency sector is not included and this scenario has lower total capacity.

FIGURE 5: NUMBER OF NEW O&M JOBS IN 3 SCENARIOS



9. Improve work quality: Beside the increased number of new jobs created, energy transition brings a better working environment, less dust, and decreased risks to worker health. The renewable energy industry is a new industry, with opportunities to create new and green-friendly jobs that to improve the quality of work in the field of green development. Establishing more green-friendly jobs is the right direction and trend for Vietnam to follow. This will contribute to the implementation of strategies for "growth and quality jobs" for sustainable environmental and economic development in the future. The transition from coal power to renewable energy opens opportunities for Vietnam's skilled workforce, and advance vocational training opportunities to supply skillful workers for this development. In addition, workers' income in this new industry is competitive and high for some particular positions. These are extremely important criteria for a quality job as recommended by the International Labor Organization (ILO).

10. No job losses in the coal mines or coal-fired power plants. Most coal-fired power plants in Vietnam have been newly built and operated in the past 10 years, so these plants are not expected to close in all scenarios. Only two older thermal power plants are expected to shut down, and according to EVN and the managers of these companies, the workers' jobs are protected by the trade unions. These young workers will move and work for the new thermal power plants that are under construction until 2020. In fact, there are more newly built thermal power plants to be constructed than the ones to be closed. The older workers, who reach, or almost reach, retirement age will receive retirement pensions. Workers in the coal industry are not affected by energy transition, but rather by changes in the use of mining technologies (from opencast to underground mining), as the amount of domestic coal used for coal-fired thermal power plants in all three scenarios remains almost unchanged. On the contrary, as estimated, there are more jobs created during the transition than those lost.


HÔNG

THE STUDY ALSO OUTLINES SOME OF THE CHALLENGES THAT THE ENERGY TRANSITION PROCESS NEEDS TO CONSIDER FROM THE BEGINNING TO ENSURE SOCIAL JUSTICE:

1. LAND CONFLICT:

The high demand of land for power development would result in land conflicts if there are no radical solutions applied from the beginning. According to the prediction, the demand of land for power development in 2030 by PDP VII revised scenario is 538 km^2; the B&RE scenario is 735km^2, 36% larger; and EE&RE scenario is 688 km^2, 28% higher than the PDP VII scenario.

The B&RE and EE&RE scenarios require larger land areas than the PDP VII revised scenario, as wind and solar energy require more land than thermal-power plants. The EE&RE scenario have smaller area of occupied land than B&RE as complimented by the use of energy efficiency measures, and therefore expects the power demand to be less than that of B&RE.

From the complexity of land reclamation for power development projects in recent years, recent conflicts in provinces where solar panels are rapidly deployed proved that special attention from the beginning is needed to avoid conflicts when renewable energy is developed. International experiences suggest that this risk can be managed if integrated, multi-objective, multi-benefit development solutions are studied, discussed and implemented with the engagement of all stakeholders and affected communities.

2. LOCAL LIVELIHOODS AFFECTED:

Ensuring livelihoods and jobs for the local people and communities affected by power projects is a big challenge. The livelihoods of local people are affected mostly by land acquisition and resettlement. Resettlement and land compensation for people in Vietnam is always complicated. In addition, insufficient vocational training or inadequate job introductions make local people more unsatisfied. Failure to solve these problems in a timely and thorough manner will make local people feel insecure and distrustful. The lessons learned from the above-mentioned cases show that the development of renewable energy will be limited if the information is suppressed, if dialogue with the affected communities is not carried out, or when people are treated unfairly. The people will only be supportive when their rights are guaranteed. A successful energy transition requires long-term development goals with clear objectives, active participation, and collaboration between people and governments.

3. INADEQUATE VOCATIONAL TRAINING:

The preparation of human resources for the transition process, especially in the affected communities, is very slow. There is a shortage of training for renewable energy jobs in Vietnam.

Vietnam's Universities can only provide basic trainings in this field. Very few in-depth trainings with focus on operation, maintenance, and repairing renewable energy facilities (e.g. turbine, generator, modules, inverters, etc.) are available in Vietnam.

Most workers are trained on-the-job when they work with foreign experts. At local level, there is no plan for this type of training, even in the places with renewable energy facilities. It is highly recommended that Vietnam should develop training programs for renewable energy to supply the emerging demand in the labor market.

4. SOCIAL WELFARE FOR WORKERS:

The welfare of workers in non-state energy enterprises should be improved to comply with the Labor Code, support the rights and welfare of workers, and ensure quality employment. An in-depth study on job quality in renewable energy sector in Vietnam is necessary as a base for the feasible transition process. Enforcement of labor law must be monitored to assure all legalized benefits for workers.

RECOMMENDATIONS

Based on the above findings, it is recommended:

1. All relevant State agencies in the areas of socio-economic, energy, climate change, green growth, and education should develop policies for the post 2020 period that consider the co-benefits brought by the energy transition. These opportunities for economic growth and social justice must be integrated into the National policies and sectoral strategic plans for sustainable and equitable development.

2. Energy transition will lead to changes in the economy and labor, thus, it is necessary to have multi-sector coordination between different stakeholders. This leads to **the need of establishing a State coordination agency that promotes the cooperation of all stakeholders in policy enforcement.** This agency must be responsible for **developing a roadmap and organizing the implementation of the just transition towards "economic growth and job quality"** based on ILO's Guidelines for a just transition towards environmentally sustainable economies and societies for all.[4]

3. The Government should continue to **promote the construction and implementation of consistent policies that prioritize energy efficiency in association with the development of the renewable energy industry, limiting the investment of coal power plants** to ensure energy security, protect public health, increase access to electricity, reduce electricity production costs in the long term, and create more green jobs and security for the workers.

4. In order to avoid land conflicts, **ensuring the livelihoods of affected people and communities in the transition**, renewable energy policies should focus on both **centralized and decentralized systems and integration**. A combination of solutions could be applied:

i. Land for renewable energy development should be on fallow, barren, abandoned land, with low farming efficiency. It is recommended not to deforest or use fertile farmland.

ii. Local authorities should develop plans for vocational training in a timely manner to help

4 ILO, "Guidelines for a just transition towards environmentally sustainable economies and societies for all", available online at http://www.ilo.org/global/topics/green-jobs/publications/WCMS_432859/lang--en/index.htm, last accessed on 24 August 2018.

local people find appropriate jobs and ensure their livelihoods during the transition.

iii. Implementing a financial assistance scheme to support households and small enterprises to install rooftop solar panels and other decentralized energy supply models at their house or communes.

iv. Research and development of pilot integration models, e.g. combining renewable energy with agricultural production, fisheries, tourism, etc. From that, developing a legal mechanism to create good conditions for these integration models will minimize the damage and sustain livelihoods for households. Thus, local communities can benefit from the transition and take ownership.

5. The workers, workers' union, and local communities must be engaged in the energy related policy making and implementing process to ensure justice through public participation.

6. All relevant stakeholders such as educators, scientists, workers, trade unions, and local authorities play a crucial role in promoting the realization of new job opportunities created by the energy transition. These stakeholders should keep close track with policy update and market to actively develop and implement strategic plans and solutions in terms of **personnel training, transfer of knowledge, skills and technology to prepare the workforce for new opportunities** arising from the energy transition in Vietnam.

7. The Government should invest in the research, development and manufacturing of transformation, storage and connecting equipment to improve domestic content of renewable energy and energy efficiency sector. This will significantly improve the domestic production capacity, create quality jobs, increase domestic share in the production chain, and reduce costs.

8. **The media, scientific and technological associations, and socio-political organizations should actively contribute to public awareness campaigns** on the benefits, opportunities, and challenges of a just energy transition. The formation of relevant networks and alliances will help transfer information better, promote collaboration between local communities with shared experiences, and encourage local initiatives for the transition.