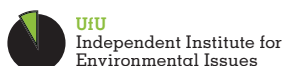


# COBENEFITS POLICY REPORT

October 2020

## Making the Paris Agreement a success for the planet and the people of Vietnam

Unlocking the co-benefits of decarbonising Vietnam's power sector



## Imprint

This COBENEFITS Policy Report has been realised in the context of the project “Mobilising the Co-Benefits of Climate Change Mitigation through Capacity Building among Public Policy Institutions” (COBENEFITS).

This project is part of the International Climate Initiative (IKI). The Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety (BMU) supports this initiative on the basis of a decision adopted by the German Bundestag. The COBENEFITS project is coordinated by the Institute for Advanced Sustainability Studies (IASS, lead) in partnership with the Renewables Academy (RENAC), the Independent Institute for Environmental Issues (UfU), International Energy Transition GmbH (IET), and in Vietnam the Green Innovation and Development Centre (GreenID).

October 2020

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We are also indebted to our highly valued research and knowledge partners, the Institute of Labour Science and Social Affairs (ILSSA), and the Institute of Energy Vietnam for their unwavering commitment and dedicated work on the technical implementation of this study.

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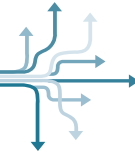


INTERNATIONAL CLIMATE INITIATIVE (IKI)



based on a decision of the German Bundestag





# Reviving Vietnam's economy & health systems from the COVID-19 pandemic

## Foreword in light of recent events

With its updated NDC, submitted in September 2020, Vietnam has set course to connect its socio-economic development targets with its climate commitments.

At the time this report is being published, many economies around the globe have been severely hit by the spread and impacts of the global COVID-19 pandemic. Health systems and economies, along with thousands of businesses and workers, have been shaken to the core. By organising successful emergency actions to protect its population against severe health impacts caused by the pandemic, Vietnam's government has proven its political will and flexibility to initiate political change with the aim of improving the country's capacities to confront – and make its people more resilient to – global challenges.

In times when the global community is similarly confronted with two challenges, it is crucial to develop and implement a mutually reinforcing coping strategy, combining a plan for recovery from the economic shocks caused by the COVID-19 pandemic with actions to mitigate the climate crisis. This report and our recent studies suggest that building up the new energy world of renewables and the decarbonisation of the power sector should play prominent roles in the recovery of the economy (see also IASS 2020a, IASS 2020b). Both actions have the potential to prevent future shocks caused by climate change while similarly boosting employment, fostering rural electrification as the foundation of local value creation, and unburdening national health systems by reducing the incidence of respiratory diseases.

The COBENEFITS programme cooperates with national authorities and knowledge partners in countries across the globe to unlock social and economic co-benefits of climate action. The project supports efforts to develop enhanced NDCs with the ambition to deliver on the Paris Agreement and the 2030 Agenda on the Sustainable Development Goals (SDGs).

The Green Innovation and Development Centre (GreenID), as the Vietnam Focal Point, together with the Institute for Advanced Sustainability Studies (IASS), invited ministries and government agencies to join the COBENEFITS Council Vietnam, to provide their guidance to the COBENEFITS Assessment studies along with the COBENEFITS Training Programme and Enabling Policies Roundtables. Since its constitution in October 2017, the COBENEFITS Council Vietnam has guided the programme in framing its assessment topics for Vietnam and ensuring their direct connection to the current political deliberations and policy frameworks of their respective ministries.

With the studies and policy proposals summarised in this policy report, we deliver scientific assessments quantifying the socio-economic potentials of the transition towards a more climate-friendly power sector. We also propose further initiatives and entry points to unlock the socio-economic co-benefits of decarbonising Vietnam's power system, which has the potential to pave the way towards making the Paris Agreement a success for the climate and the people of Vietnam.

We wish the reader inspiration for the important debate on a green recovery under a just and sustainable energy future for Vietnam!

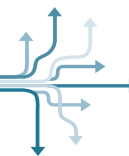
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**COBENEFITS**  
Project Director



Nearly 2 million job years  
can be created in the  
country until 2030.

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# Executive Summary

## COBENEFITS



### Making the Paris Agreement a success for the planet and the people of Vietnam

Unlocking the co-benefits of decarbonising Vietnam's power sector

With several inter-ministerial policies and initiatives initiating the decarbonisation of its energy sector and unbundling green growth, Vietnam set the framework to implement a climate-friendly transition of its economy. In its updated NDC (MONRE, 2020) the government of Vietnam suggests multiple co-benefits of decarbonising the energy sector, entailing important synergies with its socio-economic development goals (Nguyen & Helgenberger 2020). Present decisions – on the extent to which Vietnam's energy pathway will express concepts of green recovery and growth – will define the basis for the country's future development, including economic prosperity, business and employment opportunities, as well as health impacts (GreenID, 2020). At the same time, current investment decisions in Vietnam's energy sector will have a substantial impact on combatting global warming and securing the livelihoods of people in Vietnam and elsewhere.

The COBENEFITS Policy Report for Vietnam compiles key findings from the COBENEFITS Vietnam Assessment series, quantifying the co-benefits of decarbonising Vietnam's power sector in view of future-oriented employment and skills development and energy access, unlocking development in rural areas related to a less carbon-intensive power sector. The COBENEFITS Vietnam Assessment series can be accessed through [www.cobenefits.info](http://www.cobenefits.info). Building on the opportunities presented, the report formulates a set of policy actions to allow government institutions to

create an enabling political environment to unlock the social and economic co-benefits of the new energy world of renewables for the people of Vietnam. The policy options were generated through a series of roundtable dialogues and government consultations with government institutions, industry associations, and expert and civil society organisations during 2019 and 2020.

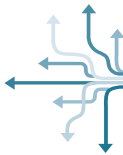
In light of the current crisis, the results indicate that recovering from the economic shocks of the COVID-19 pandemic and avoiding running into severe future shocks triggered through the climate crisis do not represent conflicting interests but instead a mutually reinforcing coping strategy. Vietnam's government has already proven its ability to protect its population by effectively confronting the challenges caused by COVID-19. With the ratification of the Paris Agreement, Vietnam has joined efforts with 189 other countries to combat climate change as another global challenge, especially in relation to the target of safeguarding opportunities for current and future generations to flourish.

With its recent NDC update, the Vietnamese government has made the social and economic opportunities of climate action central to the country's endeavours — an aspiration that is not yet reflected by the new NDC's limited level of ambition. This COBENEFITS policy reports seeks to activate these untapped potentials for both the climate and the people of Vietnam through the political implementation of Vietnam's updated NDC.

### UNLOCKING THE CO-BENEFITS OF RENEWABLE ENERGY FOR THE PEOPLE OF VIETNAM – 10 OPPORTUNITIES FOR POLICY MAKERS

- 1 Integrate renewable energy off-grid solutions – as priority measures for promoting electricity access – into national legislation, plans, and programmes:** Renewable energy solutions are appropriate, sustainable, and cost-effective alternatives to grid connections for electrifying remote rural areas and communities. Linking rural electrification through RE-enabled off-grid solutions with the explicit socio-economic indicators is essential to drive energy access plans within political discourse and legislation.
- 2 Create dedicated funds for mini-grid and stand-alone solar adoption:** Quick measures such as the creation of dedicated funds for mini-grid and stand-alone solar adoption (in collaboration with developmental partners) are favourable to drive the adoption of off-grid renewable energy technologies in rural areas of Vietnam.

Taking energy access to next level

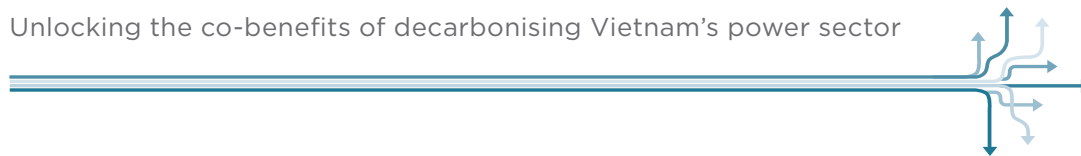


- 3 **Develop local skills to ensure societal welfare:** To ensure the long-term operability of renewable energy solutions in Vietnam's remote areas it is essential to implement skill-development programmes and to mandate project developers to ensure skills transfer to local people. This will ensure that a qualified workforce is always available on-site to repair defects and to keep systems running.
- 4 **Mainstreaming employment opportunities into energy policies with a view to sustainable development:** Future energy policy measures in the country should focus on the question of how to best unleash the job creation potential of renewables and thereby lay the groundwork for substituting as much coal power generation as possible while boosting the job market.
- 5 **Develop a joint strategy for vocational training and university programmes for the renewable energy sector:** Education and skill development are key to opening up new employment opportunities for a large proportion of the population and to meeting the needs of the renewables industry. A strategy and implementation plan to reshape vocational training curricula and university programmes, with a focus on renewable energy technologies, jointly developed by various government ministries, such those responsible for Education and Training (MOET), Labour, Invalids, and Social Affairs (MOLISA), Industry and Trade (MOIT), and Science and Technology (MOST), is a promising method to address current and potential skill gaps in the power sector.
- 6 **Support domestic manufacture of renewable energy equipment:** As a rapidly developing market, the renewable energy sector offers new possibilities to develop future technologies and innovations that are 'made in Vietnam'. The domestic design and manufacture of renewable electricity generation equipment offers multiple benefits to Vietnam's industrial sector; however, in order to realise these opportunities, a tailored strategy for manufacturing renewable energy equipment, developed by MOIT with technical support from MOST and the Ministry of Agriculture, is essential.

Developing future skills and boosting job creation

- 7 **Implement health-smart approaches to energy planning that consider co-benefits for air quality and health:** The use of health-smart energy planning tools within the Eight Power Development Plan (PDP8) is a key opportunity to achieve health benefits through power planning. Health-smart energy planning includes measures to support renewable energies in the power sector, to carry out energy efficiency measures and a constant review of planned power plants, by already taking into account during the decision-making phase the future impacts on air quality. A first step towards achieving health-smart energy planning is to follow a planning scenario for PDP8 that includes a high share of renewable energies among power sources.
- 8 **Strengthen MONRE's competences in emission management:** To improve air quality and the health of the Vietnamese people, competences for emission management should ideally be clearly defined and bundled. A detailed, stand-alone Air Quality Law is a promising tool for such goals: It can further define the competences and responsibilities of the Ministry of Natural Resources and Environment (MONRE) and can staff it with more competences to set up, manage, and monitor emission standards in contributing sectors such as the electricity generation sector. This legal basis should go along with providing MONRE with the necessary budget and trained staff to ensure compliance with the emission standards across the electricity sector.

Improving air quality and people's health with renewables



**9 Improve research and data collection and exchange on the impacts of energy production on air quality and health:** Gaining further insights into the connections between energy planning, air quality, and related health impacts is crucial to ensure health-friendly energy planning in Vietnam. Collection of continuous ambient air quality and emission data is a prerequisite for further research. The ongoing installation of automatic air-quality monitoring stations should be expanded to other locations with power production and heavy industry complexes, while making information on Vietnam's National GHG inventory system accessible to researchers and the public would contribute to further research towards health-smart energy planning.

Consider co-benefits of power sector decarbonisation to improve Vietnam's NDCs and SDGs

**10 Vietnam's Power Development Plan (PDP8) and Long-Term Strategy (LTS) as keys to maximising the social and economic opportunities of implementing Vietnam's updated NDC:** In order to seize the full range of socio-economic co-benefits described in this report, in the political implementation of its updated NDC the Vietnamese government is advised to transition to a courageous renewable energy pathway, reflecting the full economic potential of renewable energy sources. More specifically, this can be put into practice through the country's upcoming Power Development Plan (PDP8) issued by MOIT; and by developing a long-term strategy (LTS), and long-term goals for the power-sector, as suggested by the Paris Agreement.

Consider co-benefits of power sector decarbonisation to improve Vietnam's NDCs and SDGs

The presented policy actions assemble measures to seize the socio-economic co-benefits in the area of Electricity Access as well as Employment and Skill Development identified in the COBENEFITS Vietnam Assessment Series.

The COBENEFITS study on Electricity Access and Local Value Creation indicated that small-scale wind turbines are a cost-competitive alternative to grid extension in rural areas with challenging terrain. The investment in off-grid renewable energy, e.g., by developing suitable financing mechanisms for households or businesses located more than 10 km from the nearest medium-voltage line, can stimulate value chains and the localisation of skills for off-grid solar PV and small wind turbines, thereby helping to overcome the techno-economic moot

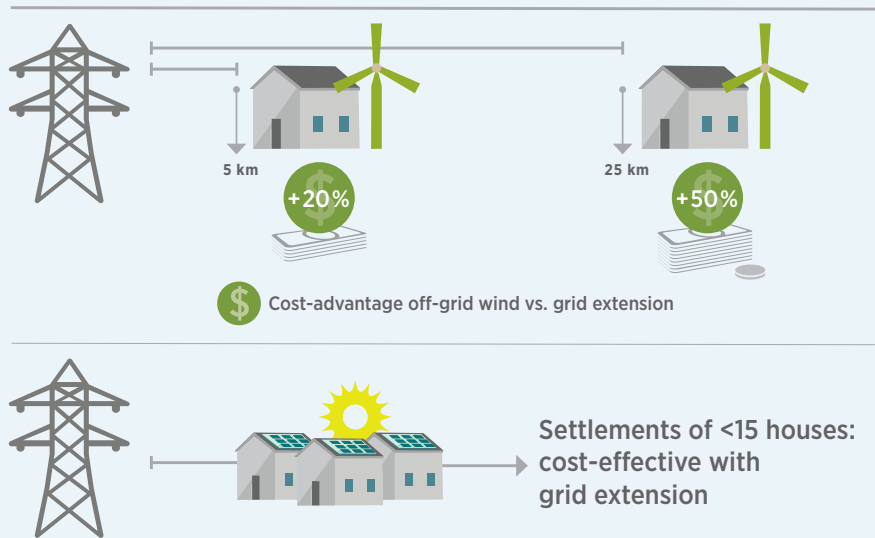
point of providing electricity access to populations living in areas that are rarely accessible at present.

With Vietnam being in the kick-off phase for the broader uptake of renewable energies, the COBENEFITS study on Employment and Skill Development found that a transition towards low-carbon planning pathways in the power sector showed substantial promise for job opportunities: In Vietnam, renewables can create twice as many jobs as the fossil-fuel sector per average installed MW. Around 25% of the jobs created require high-skilled workers. This makes it very promising to reconcile training capacities at universities and technical schools, while supporting affected workers and communities domiciled in the coal-power-generating regions of the country.

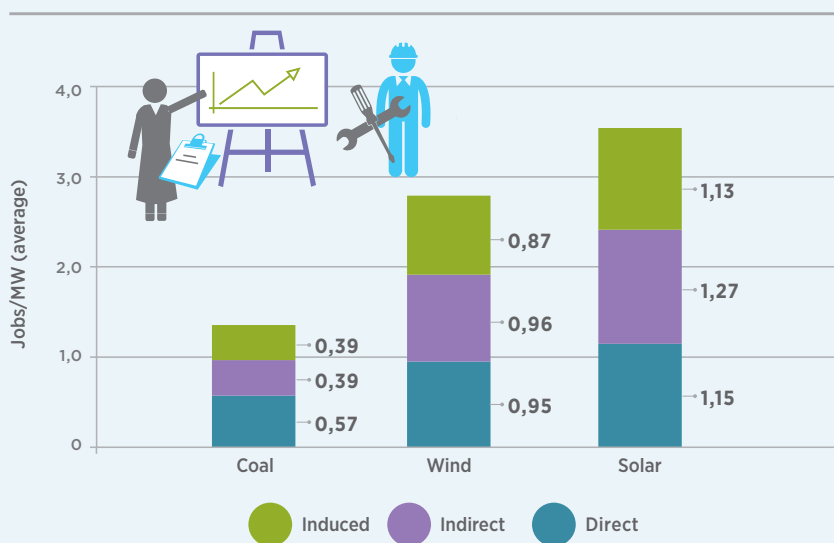
**COBENEFITS**  
Making the Paris Agreement a success for the planet and the people of Vietnam

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## Electrifying rural areas in Vietnam with renewables is at least **20%** cheaper than extending the grid

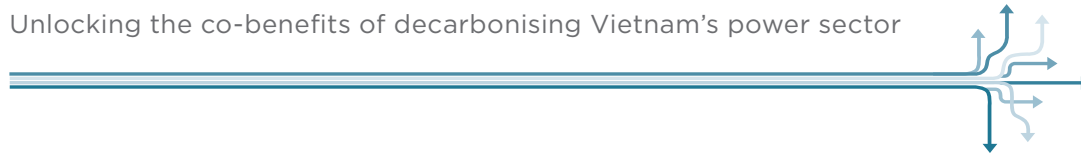


## Replacing coal power plants in Vietnam with solar or wind will more than double the number of jobs per average MW capacity



\*Results are based on Vietnam-specific assessments.





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# 1. Creating opportunity and prosperity for the people of Vietnam in the new energy world of renewables

Decarbonising the power sector by spurring the growth of renewable energy generation goes along with multiple social and economic opportunities for the people of Vietnam (GIZ/MOIT 2019). These benefits can include improvements and new opportunities in various aspects of daily life, including health, air quality, the job market, education, rural development, water quality and availability, poverty reduction, and many more.

In its updated NDC (MONRE, 2020), the government of Vietnam suggests multiple co-benefits of decarbonising the energy sector, entailing important synergies with its socio-economic development goals. With this update, Vietnam has set course to connect its socio-economic development targets with its climate commitments (Nguyen & Helgenberger 2020).

Political decisions on Vietnam's energy future link the missions and mandates of many government departments and agencies beyond energy and power, such as environment, industry and trade, education and labour. Hence, the timely debate on Vietnam's energy future boils down to assessing how renewables can improve the lives of the Vietnamese people – and in light of recent events, how the new energy world of renewables can play an important role in securing the country's economy and health systems following the global effects of the COVID-19 pandemic (IASS 2020a, IASS 2020b).

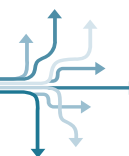
In the context of the COBENEFITS project, a series of assessment studies were conducted to identify potential social and economic co-benefits of renewable energy in Vietnam and to develop policy options for creating an enabling environment to unlock these opportunities for people, communities, and businesses in the country. The key findings of this process are presented in this COBENEFITS Policy Report for Vietnam.

The COBENEFITS programme cooperates with national authorities and knowledge partners in countries worldwide, to connect national socio-economic development objectives with the joint efforts to act on climate change through a mutually reinforcing co-benefits approach. The project supports efforts to enhancing NDCs, with the aim of delivering on the Paris Agreement and the 2030 Agenda on the Sustainable Development Goals (SDGs).

With its recent NDC update, the Vietnamese government has made the social and economic opportunities of climate action central to the country's endeavours — an aspiration that is not yet reflected by the new NDC's limited level of ambition. This COBENEFITS policy reports seeks to activate these untapped potentials for both the climate and the people of Vietnam through the political implementation of Vietnam's updated NDC.

**The term 'co-benefits' refers to simultaneously meeting several interests or objectives resulting from a political intervention, private-sector investment, or a mix thereof.**

*Sebastian Helgenberger, Martin Jänicke, & Konrad Gürtler (2019): Co-benefits of Climate Change Mitigation. Encyclopedia of the UN Sustainable Development Goals*

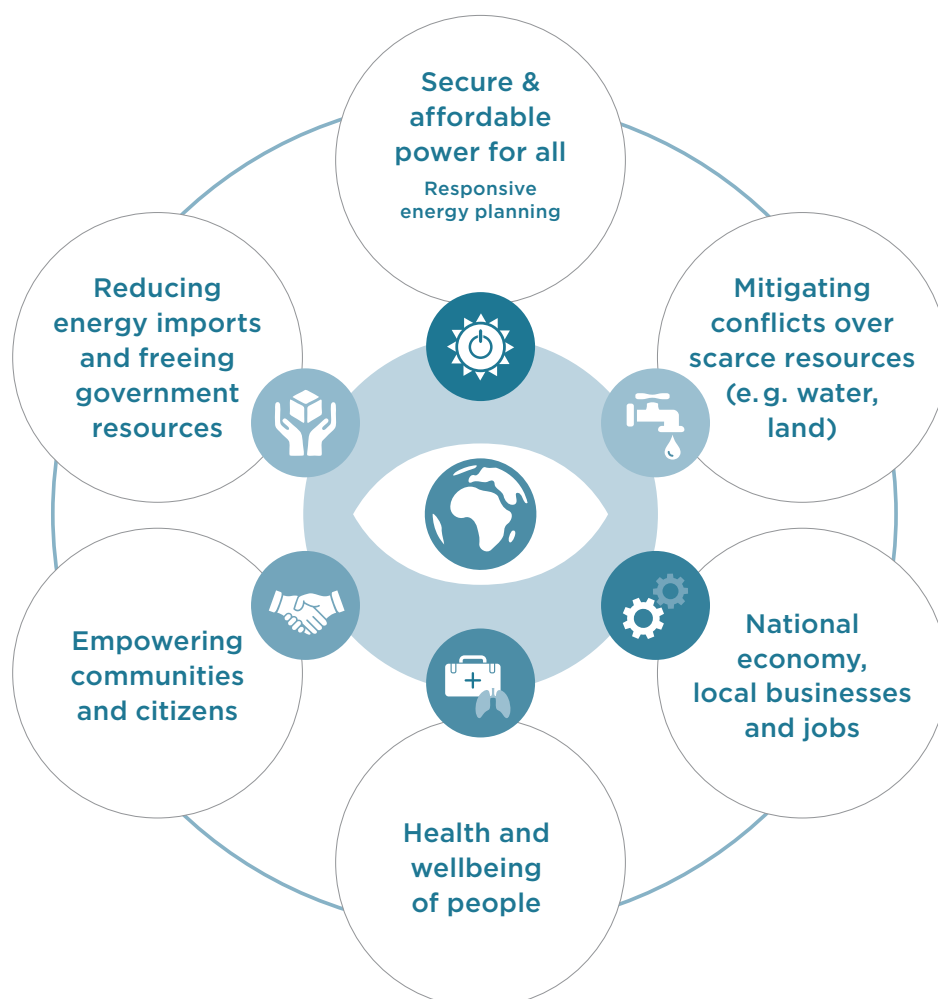


The COBENEFITS project assessed and quantified some of these co-benefits while using different scenarios for power generation pathways in the partner countries. An inter-ministerial panel served as a council to define research demands and to co-design and accompany the COBENEFITS studies that were carried out. The council has selected the following expected opportunities as co-benefit priorities, as the basis for assessment studies and capacity building activities:

1. Electricity access and local value creation for the un-electrified population in Vietnam (energy access opportunities) (IASS/GreenID 2019a).
2. Future skills and job creation through renewable energy in Vietnam (employment opportunities) (IASS/GreenID 2019b).

The council also prioritised the co-benefits of air quality and health opportunities. While a lack of data precluded a specific study of these aspects, it was decided that they will be addressed by an additional COBENEFITS roundtable..

The three COBENEFITS roundtables in Vietnam were conducted in June 2019 to define high-impact actions and further incentives to create an enabling environment to seize the socio-economic opportunities quantified in the COBENEFITS studies. The interdisciplinary discussions between stakeholders from politics, business, civil society, and science supported the identification of policy actions with the potential to make better use of these opportunities while requiring manageable efforts.



## 2. Unveiling the co-benefits of decarbonising Vietnam’s power sector

With its rapid economic growth, combined with an enormous potential for renewables, Vietnam is in the midst of an energy transition, which goes hand in hand with important social and economic implications depending on the pathways that are chosen. Vietnam’s energy pathway will define the basis for the country’s future development, including economic prosperity, business and employment opportunities, as well as health impacts.

This policy report section synthesises key findings from the COBENEFITS Vietnam study series. The study results have been processed to provide direct and useful input for policy makers and policy implementers who are working to further progress the social and economic environment for communities, businesses, and citizens in Vietnam.

Both the co-benefits areas for Vietnam – namely energy access as well as employment and skill development – and also the reference policy pathways on which the co-benefits assessments are based, have been defined and specified in repeated consultation with the Ministry of Planning and Investment (MPI), the Ministry of Natural Resources and Environment (MONRE), the Ministry of Labour, Invalids, and Social Affairs (MOLISA), and the Ministry of Health (MOH).

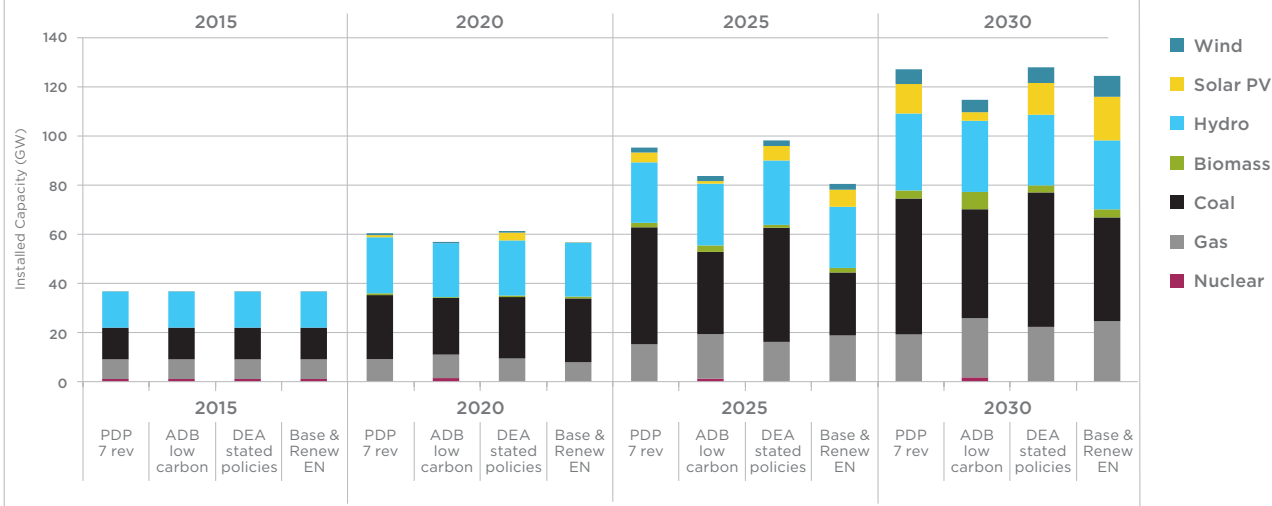
Additional information on the reference policy pathways is provided in Box 1. Key findings and figures are presented in this section. The full reports, including detailed methodology and results sections, can be found at:

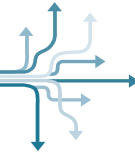
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### BOX 1: REFERENCE POLICY PATHWAY DEFINED FOR THE COBENEFITS VIETNAM STUDIES

In order to compare the socio-economic impacts of differing levels of ambition in decarbonising Vietnam’s power system based on different power generation sources, four contrasting reference pathways were defined in collaboration with Ministry partners and analysed for the future development of the power sector in Vietnam until the year 2030.

**COBENEFITS Vietnam: Power System Reference Scenarios  
Installed Capacities (GW)**





The four scenarios are based on partial end-use methods and/or econometric models of the basic drivers of population and GDP growth in the country across sectors. While one of the scenarios represents the current energy-planning pathway of the Vietnamese Government, the other three are independent planning scenarios from developmental agencies and Vietnamese think tanks. The latter represent forward-looking pathways towards low-carbon development and/or a higher share of renewable energies. It is noteworthy that the use of different – yet comprehensible – assumptions for each scenario means that they cannot be compared directly if modelled exactly. Nevertheless, despite having different underlying assumptions, all scenarios show similar tendencies, thereby indicating their accuracy.

#### **Power Development Plan VII (revised) scenario**

The government-level scenario from the Vietnamese Ministry of Industry and Trade (MOIT) represents the planned official composition of Vietnam's energy mix over the short- and medium-term planning horizons, and forms the basis for assessing the employment impacts of deploying different generation sources in the country. The power supply mix and new capacity additions from the Power Development Plan VII revised (PDP7 (rev)) (MOIT, 2017) developed by MOIT are chosen as the baseline, representing the policy planning status quo in the power sector. PDP7 (rev) predicts for 2030 an installed capacity of 126.9 GW, with a 17% share of renewable energies (biomass, wind, solar), 24% hydro, and 59% fossil fuels (coal, oil, gas).

#### **DEA Stated Policies scenario**

The Danish Energy Agency developed in 2017 a Stated Policy scenario (DEA/MOIT, 2017), which runs in 5-year periods until 2050 based on the PDP7 revised plan for power development in the near term, while it allows investments in generation-capacity for all energy types beginning in the year 2020 and in the transmission capacity from the year 2030. It is also in line with Vietnam's Renewable Energy strategy by considering its RE goal requirements. For 2030, the DEA Stated Policies scenario predicts an installed capacity of 127.7 GW in the power sector, of which 17% is renewable energies, 23% hydro power, and 60% fossil fuel-based energy sources.

#### **ADB Low-Carbon scenario**

The "Pathways to low-carbon development for Vietnam" scenario (ADB, 2017) from the Asian Development Bank is oriented on the latest power generation planning (mostly PDP7 (rev)), but for power generation assumes the (partial) substitution of (mostly imported) coal with renewable energies such as biomass, solar, and wind. The ADB Low-Carbon scenario models for 2030 an installed capacity of 114.5 GW in Vietnam. In 2030, combined coal, gas and fuel is predicted to account for 61% of the installed capacity for power generation in Vietnam, while hydro will have a share of 25%. Combined biomass, wind, and solar power are predicted to reach 14% of the country's total installed capacity by 2030.

#### **Base & Renewable Energy scenario (Base & Renew En) developed by GreenID**

GreenID developed a Base & Renewable Energy scenario (Nguyen Quoc Khanh, 2017) that is based on the demand forecast described in PDP7 (rev) and uses MARKAL, a dynamic, multi-period, linear programming bottom-up model, to predict the future power generation mix under consideration of some updated assumptions such as fuel price forecasts and specific investment costs for technologies with consideration of cost evolution. In addition, it also includes updated assumptions regarding renewable energies, such as their resource potentials and updated investment costs, as well as the consideration of the external costs of renewables. Base & Renew En predicts for 2030 an installed capacity of 123.7 GW, with shares of 23% renewable energy, 23% hydro, and 54% fossil fuel sources.

## 2.1 Provide sustainable energy access for everyone

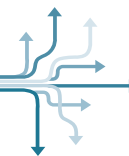
### KEY FIGURES

- Renewables are a cheaper way to provide electricity to rural areas, especially with off-grid wind being 20% cheaper (9087 VND/kWh or USD 0.039/kWh)<sup>1</sup> than extending the grid (11300 VND/kWh or USD 0.048/kWh).
- For more remote areas, where distances from the nearest medium-voltage (MV) line exceed 25 km, the cost advantage for off-grid wind more than doubles compared with extending the grid (17445 VND/kWh or USD 0.075/kWh).
- For smaller villages, off-grid solar (11873 VND/kWh or USD 0.051/kWh) is cost competitive with extending the grid (11300 VND/kWh or USD 0.048/kWh) for longer distances; this is particularly the case for villages of approximately 15 households that are more than 5 km away from the nearest MV line.
- Stand-alone solar PV becomes cost competitive at 11873 VND/kWh (USD 0.513/kWh), when the number of households is less than 15 and the distance from the nearest medium-voltage line does not exceed 5 km.
- To electrify households in rural areas, irrespective of distance from the nearest MV line, costs 9087 VND/kWh (USD 0.393/kWh) using appropriate turbines designed for low wind speeds, while the cheapest grid extension costs 11300 VND/kWh (USD 0.488/kWh).
- It costs approximately 17445 VND/kWh (USD 0.754/kWh) to electrify households and rural settlements by means of grid extension when the distance to the nearest MV line exceeds 25 km. This is approximately 8358 VND/kWh (USD 0.361/kWh) more expensive than the cheapest off-grid renewable energy alternative.

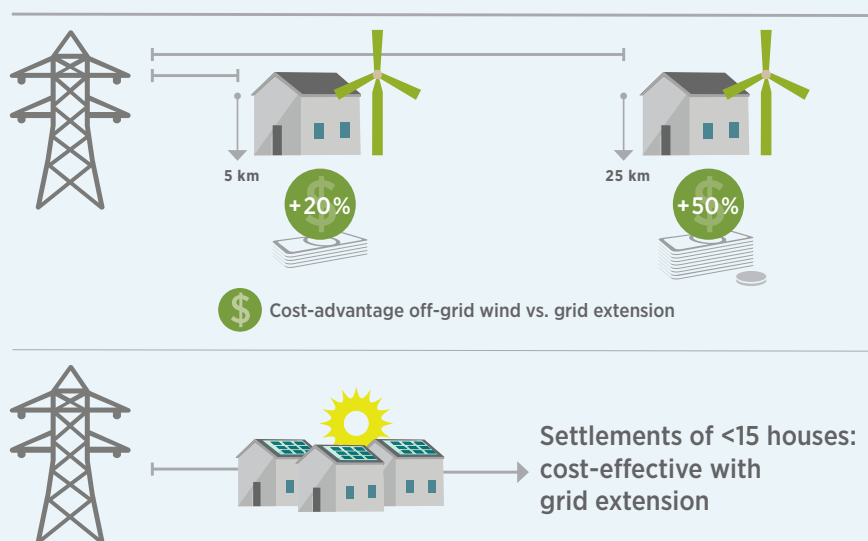
### KEY FINDINGS

- Communities in Vietnam that are far (>5 km) from the nearest medium-voltage distribution system **are best served by off-grid renewable energy technologies**. Grid extension is only viable in rural communities that have large clusters of households per unit area.
- **Small (locally manufactured) wind turbines** are the most cost-efficient means of electrifying most un-electrified rural households in Vietnam. Stand-alone solar PV is cost-competitive in rural locations with low energy or demand density.
- Access to electricity **improves rural households' access to information and value-added extension services** (e.g., in the agricultural sector), thereby improving opportunities to generate additional income.
- **Opportunities for direct employment** in the local renewable energy value chain can be fostered through effective collaboration between local technical schools and the private sector for planned projects; this essentially aids the "localisation of industry", which in turn drives local employment creation and skills transfer.

<sup>1</sup> 1 US Dollar (USD) = 23144.5 Vietnamese Dong (VND): Based on 2018 historical average (<https://www.investing.com/currencies/usd-vnd-historical-data>)



## Electrifying rural areas in Vietnam with renewables is at least **20%** cheaper than extending the grid



## 2.2 Seize employment opportunities and develop future skills for renewables

### KEY FIGURES

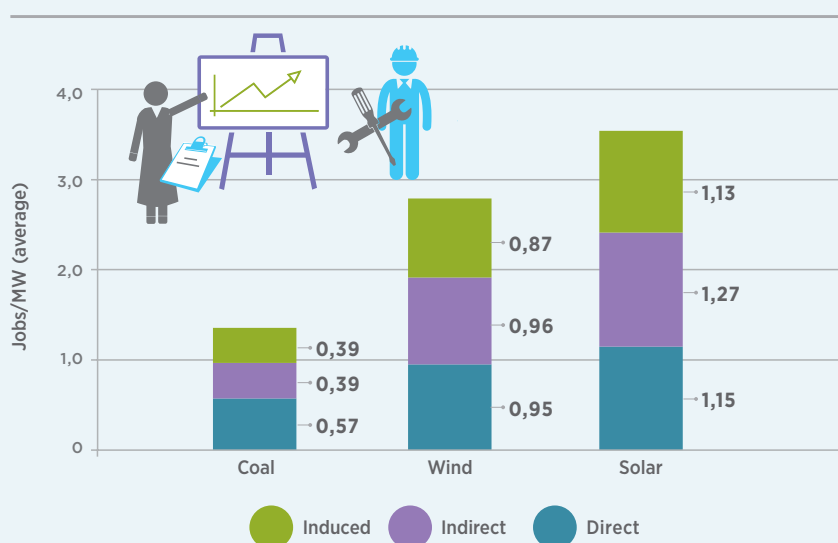
- Replacing coal-powered plants with solar or wind will more than double the number of jobs per average MW capacity. Replacing coal with gas alone will lead to around 0.5 job losses per average installed MW.
- Up to 1.94 million job-years can be created in the country through transformation of the power sector between 2015 and 2030.
- Over that 15-year period, solar and wind will create 3.5 jobs and 2.8 jobs respectively per average installed MW capacity, whereas coal creates only 1.4 jobs/MW.
- Across all scenarios, around 80% of the jobs created in the power sector by the year 2030 are in construction and installation.



**KEY FINDINGS**

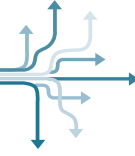
- **For each direct job created in the power sector in Vietnam, two additional jobs (indirect & induced) are created in the country irrespective of the scenario assessed.** More than 60% of the jobs created through changes in the power sector are positive-increase employment opportunities in the broader Vietnamese economy.
- **In the ambitious renewable energy (RE) scenario by GreenID, solar and wind power contribute more than 20% of the jobs created in the power sector by 2030;** coal and hydropower are established technologies in Vietnam and are projected to constitute approximately 60% of gross employment in the power sector.
- **A shift to GreenID’s ambitious RE scenario (Base & Renew En) will increase gross employment in the RE sector to approximately 434,000 job-years,** a 38% increase from the PDP7 (rev) scenario of 315,000 job-years. These jobs are created in the solar, wind, and biomass sectors.
- **By the year 2030, the demand for higher-skilled workers in the power sector should grow by 38% for jobs during the construction and installation phase, and by 25% for jobs in operation and maintenance.** This change is partially associated with the growth in demand for RE sources, especially solar and wind, which have lower demand for unskilled or low-skilled labour during the construction and installation phases.
- **There is still limited availability of local technical expertise in the solar and wind power sectors.** To meet the present demand, project developers in the power sector currently recruit engineers who are not specifically trained in the renewable energy sector, or else rely on foreign-trained experts. RE companies are willing to recruit skilled local workers if training at Vietnamese universities and technical schools is aligned with the technical skills demanded in the RE sector.

**Replacing coal power plants in Vietnam with solar or wind will more than double the number of jobs per average MW capacity**



\*Results are based on Vietnam-specific assessments.





## 2.3 Improving air quality and people's health with renewables

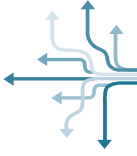
### KEY FIGURES

- Contributing to more than 7.6% of all deaths worldwide in 2016, air pollution is one of the main impacts of the energy sector on the environment and human health (WHO, 2016), while polluted air burdens the global economy with an estimated annual cost of USD 225 billion (World Bank, 2016).
- There is a close, quantifiable relationship between exposure to high concentrations of PM<sub>10</sub> and PM<sub>2.5</sub> and increased mortality and morbidity caused by diseases such as stroke, lung cancer, heart disease, as well as chronic and acute respiratory diseases, including asthma (WHO, 2018).
- In 2018, the annual mean ambient PM<sub>2.5</sub> concentration in Vietnam's largest cities Ho Chi Minh City and Hanoi were 30.9 µg/m<sup>3</sup> and 40.1 µg/m<sup>3</sup> respectively, thereby exceeding the international WHO guidelines by more than three to four times (GreenID, 2019). The WHO guidelines are also widely exceeded in other northern provinces of Vietnam (Amann et al., 2019, p.16).



The connections between energy planning, air quality, and health effects should be further assessed.

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## KEY FINDINGS

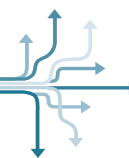
The COBENEFITS project included a systematic review of the existing literature on air quality and health in Vietnam, which informed the following findings:

- **There is a need for a solid database.** Vietnam has few (publicly available) consistent and long-term data series on emissions, emission sources, and ambient air quality, as well as related health data that are necessary to inform the development of national scenarios about current and future air quality and health impacts based on power planning and low-carbon pathways.
- **The number of premature deaths associated with coal power plants is expected to increase under current policy scenarios.** A study by Kopitz et al. (2017) calculated cases of premature death originated from air pollution based on the planned power generation with coal as the main energy source. Comparing PDP7 (rev) as the BAU-scenario until 2030 with a zero-coal scenario, the study concludes that coal power plants operating in Vietnam were responsible for 4,250 premature deaths in 2011, a number that is projected to rise to 19,220 by 2030 under the power planning scenarios outlined in PDP7 (rev) (Kopitz et al., 2017).
- **Emissions from the power sector will be responsible for the largest increase in ambient PM<sub>2.5</sub> in northern Vietnam between 2015 and 2030.** Amann et al. (2019) calculated ambient PM<sub>2.5</sub> concentrations in northern Vietnam when development and energy projections based on the Socio-Economic Development Plan from 2016, the Renewable Energy Development Strategy to 2020 with vision to 2050, the Vietnam Green Growth Strategy to 2030 with vision to 2050, and sectoral development plans for agriculture, transport, and industry take place and planned emission control policies in Hanoi are fully implemented. The study findings suggest a slight increase in ambient PM<sub>2.5</sub> concentrations, and the emergence of new areas with high PM<sub>2.5</sub> concentrations in the Greater Hanoi and Red River Delta. The largest increase in ambient PM<sub>2.5</sub> between 2015 and 2030 is expected to result from power sector emissions (Amann et al., 2019, p.16).



Small wind turbines boost value chains in rural areas of Vietnam.

© GIZ Energy Support Programme Vietnam



### 3. Tapping the full potential of co-benefits for Vietnam based on sustainability and prosperity

**HIGH-IMPACT ACTIONS FOR VIETNAM**

- Integrate off-grid renewable energy solutions within national legislation, plans, and programmes
- Joint strategy for vocational training and university programmes for the renewable energy sector
- Implement health-smart energy planning, considering how REs may benefit air quality and health in PDP8

The COBENEFITS studies for Vietnam assembled and quantified evidence that the decarbonisation of Vietnam's electricity sector, through more intensive development of renewables, can provide numerous social and economic benefits to Vietnam: from enabling full electricity access throughout the entire country, to boosting the labour market while gaining future-oriented skills, and reducing health issues arising from air pollution. The findings also substantiate the strong interrelatedness of energy and climate policy with development action in Vietnam.

**How can policy makers and policy implementers in Vietnam contribute to unlocking social and economic opportunities for communities, businesses, and families?**

Quantifiable evidence and knowledge of the socio-economic potentials are pivotal for developing enabling policies to unlock the identified co-benefits. Ministries and other government institutions can thereby shape an enabling political environment to unlock and maximise the social and economic opportunities for communities, businesses, and families in Vietnam.

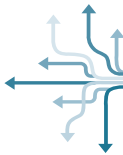
Building on the evidence from the COBENEFITS studies, a broad and intensive consultation process with

political partners, industry experts, scientists, and representatives of civil society has yielded concrete policy opportunities to deliver on the identified co-benefits for the Vietnamese people by creating an enabling environment to push forward the agenda of decarbonising the power sector in Vietnam.

A series of roundtable consultations were hosted in 2019 by GreenID in partnership with the Independent Institute for Environmental Issues, which were complemented by bilateral consultations with experts until March 2020.

In this section, those policy opportunities are presented according to the three main co-benefits areas. After outlining stimuli for shaping favourable policy environments, selected High-Impact Actions are defined and described in detail, and a candidate political institution is suggested to champion the HI-Action, and collaborative bodies to successfully implement the policy opportunity.

The presented policy opportunities seek to activate the untapped synergies between reducing carbon emissions and achieving Vietnam's socio-economic development targets during the political implementation of Vietnam's updated NDC.



### 3.1 Creating an enabling environment to foster electrification in Vietnam's remote areas

The COBENEFITS study showed that communities in Vietnam that are far (>5 km) from the nearest medium-voltage distribution system are best served by off-grid renewable energy technologies. Small (locally manufactured) wind turbines are the most cost-efficient means of electrifying most un-electrified rural households in Vietnam. Also, stand-alone solar PV is cost-competitive in rural locations with low energy or demand density. Grid extension is only viable in rural communities that have large clusters of households per unit area.

#### How can national and local government agencies maximise the combined benefits of renewable energy solutions for Vietnam's remote areas?

- Create dedicated funds for mini-grids, small wind turbines, and stand-alone solar adoptions
- Support small wind turbines as a promising technology to boost value chains in rural areas
- Develop local skills to maintain growth
- Build up capacities and awareness among provincial and local administrations, and clearly define competencies
- **High-Impact Action: Integrate off-grid renewable energy solutions as priority measures for promoting electricity access within national legislation, plans, and programmes**

#### Create dedicated funds for mini-grid and stand-alone solar adoption

Quick measures such as the creation of dedicated funds for mini-grid and stand-alone solar adoption (in collaboration with developmental partners) are favourable to drive the adoption of off-grid renewable energy technologies in rural areas of Vietnam.

#### Support small wind turbines as a promising technology to boost value chains in rural areas

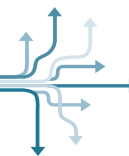
The following activities are best suited to supporting local employment: Explore the value chain potentials of small wind turbines to provide energy for rural areas that have favourable wind speed conditions; Explore further opportunities at the nexus of wind energy and agricultural productivity for farmers in rural areas; Implement measures to improve the technical skills of local people.

#### Develop local skills to maintain growth

To ensure the long-term operability of renewable energy solutions in Vietnam's remote areas it is essential to implement skill-development programmes and to mandate project developers to ensure skills transfer to local people. This will ensure that a qualified workforce is always available on-site to repair defects and to keep systems running.

#### Build up capacities and awareness among provincial and local administrations and clearly define competencies

A strong network of institutions, experts, and government institutions is essential for ensuring energy access in remote areas through off-grid renewable energy solutions. The tasks and responsibilities of local and provincial administrations, in implementing off-grid electrification solutions and improving energy access for local people, need to be clearly defined. Provincial and local administrations (especially the local departments of Industry & Trade and Science & Technology) require training in order to build institutional capacity and raise awareness of off-grid electrification solutions.



### 3.2 High-Impact Action to foster electrification in Vietnam’s remote areas

**High-Impact Action: Integrate renewable energy off-grid solutions – as priority measures for promoting electricity access – into national legislation, plans, and programmes**

Institution to champion the HI-Action	Collaborative bodies to successfully implement the HI-Action	Timeframe of the HI-Action
Ministry of Agriculture and Rural Development	<ul style="list-style-type: none"> <li>Ministry for Industry and Trade</li> </ul>	Short to medium term

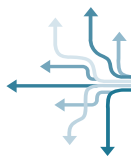
Renewable energy solutions are appropriate, sustainable, and cost-effective alternatives to grid connections for electrifying remote rural areas and communities. Electricity access in rural areas helps to deliver and improve lighting and information access that, in turn, improve school enrolment rates for children in low-income rural areas of Vietnam.

Linking rural electrification through RE-enabled off-grid solutions with explicit socio-economic indicators is essential to drive energy access plans within political discourse and legislation. An exemplar approach to planning off-grid renewable energy is elucidated in Park et al. (2018).

One such window of opportunity, for prioritising renewable-based off-grid energy planning in rural areas of Vietnam, is provided by the review process for the National Criteria on New Rural Communities (Decision 1980/QĐ-TTg). Policy makers, especially at the provincial level, can use similar, already available opportunities to integrate RE-enabled off-grid electrification options as priority solutions in the ongoing legislative plans. This involves the power sector and also the development process for the power development plan eight (PDP VIII).



Fostering rural electrification with renewable energy.  
© GreenID



**Additional impact action: Tailor renewable energy solutions to local conditions and enable local supply**

Institution to champion the HI-Action	Collaborative bodies to successfully implement the HI-Action	Timeframe of the HI-Action
<p><b>Ministry of Agriculture and Rural Development</b></p>	<ul style="list-style-type: none"> <li>■ Ministry for Industry and Trade</li> <li>■ Ministry for Labour, Invalids, and Social Affairs</li> <li>■ Ministry of Science and Technology</li> <li>■ Ministry for Education and Training</li> <li>■ Provincial administrations</li> </ul>	<p>Short to medium term</p>

The term “remote areas in Vietnam” encompasses a variety of landscapes with unique environmental features; the communities and households in these areas are also diverse. Thus, there are varying energy access needs and demands across these communities. Given this high variety of demands, the development of individual tailor-made and transferable technical solutions for local conditions is a very promising approach. It includes data collection and assessment of local households, complemented by community-specific cost-benefit analyses that consider the socio-economic development dynamics and peculiarities of

the areas: Rural areas that have predominantly agrarian economies will essentially have differing developmental objectives from tourist-focused rural communities. Such specificities also need to be considered throughout the country.

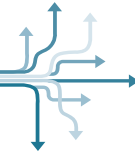
The basis for successful implementation of this approach is adequate training for professionals in provincial and local governments, to enable them to effectively conduct the necessary assessments of needs and cost-benefit analyses.

### 3.3 Creating an enabling environment to boost employment with renewables

The COBENEFITS study showed that ambitious RE scenarios, such as GreenID’s Base & Renew En scenario, will increase gross employment in the RE sector to approximately 434,000 job-years, a 38% increase from the PDP7 (rev) scenario of 315,000 job-years. These jobs are created in the solar, wind, and biomass sectors. The study also revealed that by the year 2030, the demand for higher-skilled workers in the power sector should grow by 38% for jobs during the construction and installation phase, and 25% for jobs in operation and maintenance. However, there is still limited availability of local technical expertise in the solar and wind power sectors. To meet the growing demand for workers, action is needed to increase educational opportunities by aligning training at Vietnamese universities and technical schools with the technical skills demanded in the RE sector.

**How can government Ministries maximise employment benefits in Vietnam’s renewable energy sector and alleviate negative externalities in the country resulting from shifts away from coal?**

- Mainstreaming employment opportunities into energy policies with a view to sustainable development
- Discovering new drivers of growth that go hand in hand with ambitious decarbonisation
- Education and skill development are key to opening up new employment opportunities for a large proportion of the population and to meeting the needs of the renewables industry



- Broaden the visibility of job opportunities in the renewable energy sector
- Support domestic manufacture of renewable energy equipment
- **High-Impact Action: Develop a joint strategy for vocational training and university programmes for the renewable energy sector**

### **Mainstreaming employment opportunities into energy policies with a view to sustainable development**

Future energy policy measures in the country should focus on the question of how to best unleash the job creation potential of renewables and thereby lay the groundwork for maximising the substitution of coal power generation while boosting the job market.

### **Discovering new drivers of growth that go hand in hand with ambitious decarbonisation**

The power sector transition forms part of a larger decarbonisation process in Vietnam. Planning for this transition involves identifying new opportunities for existing sectors, or new sectors that can serve as drivers of growth and ambitious decarbonisation efforts, especially positive gains from energy efficiency.

### **Education and skill development are key to opening up future-oriented employment opportunities in the renewables industry**

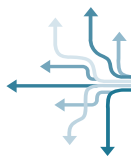
Further development and support of education and vocational training for key jobs in technical areas such as electrical engineering and mechatronics are very promising strategies for working towards new employment opportunities for Vietnamese citizens, as such approaches also support increased collaboration between demand- and supply-side institutions.

### **Broaden the visibility of job opportunities in the renewable energy sector**

Although the COBENEFITS study showed the RE sector's potentials as a job generator, young people in Vietnam often tend to choose education and skilling courses that target jobs in more 'established' sectors. Information on job profiles and employment options in the RE sector are often difficult to access. The development of a **job orientation strategy for the RE sector** is key to communicating the multiple employment opportunities available in the sector. Furthermore, more locally available vocational training opportunities on-site, where RE projects are developed, would also help to improve the visibility and public awareness of the sector.

### **Support domestic manufacturing of renewable energy equipment**

As a rapidly developing market, the renewable energy sector offers new possibilities to develop future technologies and innovations 'made in Vietnam'. The domestic design and manufacture of renewable electricity generation equipment offers multiple benefits to Vietnam's industrial sector; however, in order to realise these opportunities, a tailored strategy for manufacturing RE equipment, developed by MOIT with technical support from MOST and the Ministry of Agriculture, is essential. Its implementation can be ensured by integrating this strategy into policies and regulations directed towards implementing MOIT's Industrial Development Strategy through 2025, vision toward 2035. This strategy gives priority to the processing, electronic-telecommunications, and renewable energy industries. With a government-led initiative to expand and institutionalise support for local companies providing technological support and equipment manufacturing to the domestic RE sector, MOIT and MOST can contribute effectively to fostering the competitiveness of the RE manufacturing industry in Vietnam.



### 3.4 High-Impact Action to boost job creation and skill development in the renewables sector

#### High-Impact Action: Develop a joint strategy for vocational training and university programmes for the renewable energy sector

Institution to champion the HI-Action	Collaborative bodies to successfully implement the HI-Action	Timeframe of the HI-Action
<b>Ministry of Education and Training</b>	<ul style="list-style-type: none"> <li>■ Ministry of Labour, Invalids, and Social Affairs</li> <li>■ Ministry of Industry and Trade</li> <li>■ Ministry of Science and Technology</li> </ul>	Short to medium term

In Vietnam, several pioneering universities and colleges offer university or vocational training programmes on the application of renewable energy technologies. However, graduates from both universities and vocational training programmes do not always meet the highly specific needs of the renewable energy sector, while the existing pool of experts and skilled workers with the capabilities to carry out the practical work of construction, operation, and maintenance of RE technologies still need to be retrained.

Hence, a strategy and implementation plan to reshape vocational training curricula and university programmes with a focus on renewable energy technologies, jointly developed by various government ministries, such as those responsible for Education and Training (MOET), Labour, Invalids, and Social Affairs (MOLISA), Industry and Trade (MOIT), and Science

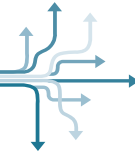
and Technology (MOST), would help to resolve the current and potential skill gaps in the power sector. Working partnerships can be explored with local and international organisations as a means of developing “Train the Trainer” equipping-courses for ministerial staff. These can examine how educational and training opportunities can be aligned with the skills needed in the power sector, as informed by global expertise in low-carbon technology trends.

Additionally, the Vietnamese Government can actively manage a just transition to low-carbon energy sources by redeveloping vocational training curricula and university programmes towards the new energy world of renewables while supporting affected workers and communities domiciled in the coal-power-generating regions of the country, such as the Mekong Delta.

#### Additional impact action: Update curricula with skills required by renewable energy companies

Institution to champion the HI-Action	Collaborative bodies to successfully implement the HI-Action	Timeframe of the Impact Action
<b>Ministry of Labour, Invalids, and Social Affairs</b>	<ul style="list-style-type: none"> <li>■ Ministry of Education and Training</li> <li>■ Ministry for Industry and Trade</li> </ul>	Short to medium term





It is essential that curricula of courses that prepare students for work in the RE sector are based on up-to-date information on the latest technological developments. This is only possible if curricula maintain a certain flexibility regarding their contents. Ongoing dialogue between universities/vocational training institutions and representatives of the RE industry would ensure that educational curricula constantly adapt to the latest developments in technology and in the job market. The skills needed in the renewable energy sector can be developed by extending educational programmes to include mandatory professional internships and traineeships in cooperation with the public and private sectors.

Furthermore, the public and private sectors can be involved in developing standards to ensure that graduates are effectively prepared for the skill demands of companies operating in the RE sector. This can be achieved through developing feedback systems, whereby companies and universities engage in co-creation processes to determine whether graduates possess the skill sets required in the job market. Supporting re-training by companies (e.g., for local mechanics and workers) and additional vocational training programmes directly in the communities where RE projects are located are ways to ensure that less-educated people and residents of relatively remote areas also benefit from RE projects in their regions.

### 3.5 Creating an enabling environment to improve air quality and health

Within the COBENEFITS project, the assessment of recent studies indicates that power sector planning has a considerable impact on air quality in Vietnam's main cities and surrounding provinces. Only one prior study has examined the relationship between energy production and public health impacts at the national level in Vietnam (Koplitz et al., 2017). However, the wider COBENEFITS project quantified the possible health benefits of an increased share of renewable energies in the power sector for India and South Africa, which offer some insights for such scenarios in Vietnam (IASS/TERI, 2019). In both countries, the findings show that ambitious deployment of renewable energies will reduce health impacts compared with scenarios assuming a higher share of conventional energy sources in the next 20 to 30 years. In India, for example, moving from a BAU scenario to a more ambitious NDC PLUS pathway would reduce the number of premature deaths in 2050 by 58% (from 57,000 to 24,000 persons) (IASS/TERI, 2019).

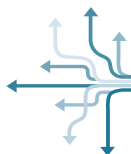
Besides improving people's livelihoods, ambitious deployment of renewables in the power sector in both South Africa and India is predicted to reduce economic losses in the health sector. By scaling up the share of renewable energies in South Africa, by moving from current policies to a rapid decarbonisation pathway, the health costs resulting from the power sector will be cut by 25% in 2050, thereby saving between USD 3.21 billion and USD 11.24 billion (IASS/CSIR, 2019).

India could also significantly cut economic losses by deploying renewables: By following an ambitious strategy for deeper decarbonisation over and above the NDC scenario, economic losses in 2050 could be reduced by as much as USD 168.6 billion in the health sector alone (IASS/TERI, 2019).

Assuming that Vietnam might face similar (economic) developments, the results of these assessments might give impulse to creating an enabling environment to maximise the health co-benefits associated with power production based on renewable energies.

#### How can national and local government agencies maximise health co-benefits for the people of Vietnam and unburden the health system?

- Introduce progressive air quality legislation that embeds emission management in the power sector, and ensure its enforcement
- Improve research and data collection concerning the impacts of energy production on air quality and health
- **High-Impact Action: Implement health-smart energy planning, considering how REs may benefit air quality and health in PDP8**



**Establish progressive air quality legislation that embeds emission management in the power sector, and ensure its enforcement**

Detailed provisions within the revised Law on Environmental Protection (LEP), or a stand-alone Air Quality Law, are among the principal mechanisms for improving air quality by managing emissions from the most polluting sectors such as power generation. Such a law will further define the competences and responsibilities of MONRE in enforcing air quality legislation. It can also grant MONRE additional (legal) competences to establish, manage, and monitor emission standards in contributing sectors such as electricity generation. This legal basis can go hand in hand with providing MONRE the necessary budget and trained staff to fulfil its responsibility to ensure compliance with emission standards for the electricity sector. Beginning in 2019, the Law on Environmental Protection is in the process of being revised and updated to include air quality management. However, the revised LEP still adopts a general approach to air quality management. Moreover, the Report on Policy Impact Assessment (2020) highlighted air pollution from the transportation sector, but did not mention or propose appropriate solutions to air quality issues arising from other sources such as the power sector. Such a policy gap could be addressed within the LEP by a more detailed chapter on air quality; or, as a longer-term ambition, through a stand-alone Air Quality Law/ Act.

**Improve research and data collection on how energy production impacts air quality and health**

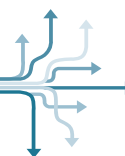
Gaining further insights into the connections between energy planning, air quality, and related health impacts is crucial to ensure health-friendly energy planning in Vietnam. Collecting continuous ambient air quality and emission data is a prerequisite for further research. The ongoing installation of automatic air quality monitoring stations should be expanded to other locations that host power production and heavy industrial complexes. To enable such future research, it is crucial that researchers and the public have access to data from the GHG inventory system and smokestack tele-monitoring systems (mandatory for power plants), for example by establishing a platform to present the collected data.

The connections between energy planning, air quality, and health effects should be further assessed to make optimum use of this knowledge in energy planning. The creation of a joint air quality–health–energy nexus research programme by MOST, MONRE, and MOH and/or its inclusion in existing research programmes is the right approach to strengthen cooperation and data exchange between DONREs, hospitals, and State Departments of Health.

**3.6 High-Impact Action to improve people’s health and unburden the health system**

**High-Impact Action: Implement health-smart energy planning, considering opportunities for REs to co-benefit air quality and health in PDP8**

Institution to champion the HI-Action	Collaborative bodies to successfully implement the HI-Action	Timeframe of the HI-Action
Ministry of Industry and Trade	<ul style="list-style-type: none"> <li>■ Ministry of Health</li> <li>■ Ministry of Natural Resources and Environment</li> </ul>	Immediate, starting within a year



Smart energy planning combines the deployment of renewable energies, energy efficiency measures; and a decision-making process on new electricity generation sources that, during the early planning phase, already considers the power source’s future impacts on air quality.

In order to actualise this planning approach, an important prerequisite is to consider the opportunities that health-smart energy planning can unlock for air quality and health while undertaking power planning for PDP8.

Integrating MONRE and MOH in the development of PDP8 and the following PDPs ensures that actual information about future air quality impacts from existing and planned power plants is considered in energy planning, as well as alternatives such as a higher share of renewables and energy efficiency measures.

In the event that the adoption of renewable energies and energy efficiency measures make the installation of some planned power plants redundant, the decision about respective policy changes should take into consideration the effects of the planned power plants on air quality and health.

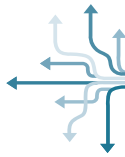
**Additional impact action: Extend environmental impact assessment for industrial sites and power plants by cumulative EIA combined with the use of Best Available Technologies (BAT)**

Institution to champion the Impact Action	Collaborative bodies to successfully implement the Impact Action	Timeframe of the Impact Action
Ministry of Industry and Trade	<ul style="list-style-type: none"> <li>■ Ministry of Natural Resources and Environment</li> <li>■ Ministry of Science and Technology</li> </ul>	Immediate (<1 year)

The application of environmental impact assessment (EIA) in the approval process for new heavy industries and power plants often fails to consider the cumulative impacts of the entire power plant and/or heavy industry complex on surrounding regions.

Cumulative environmental assessment enables authorities to consider the agglomerated impacts on air quality experienced by inhabitants of surrounding areas, and to plan alternative scenarios if carrying capacities are exceeded in related regions.

Specifying that new power plants must always employ best available technologies (BAT) for emission control when they start operating and during their operational lifespan is an expedient addition to the cumulative EIA approach. Regular updates to these technological standards can be ensured by appropriate regulations from the Ministry of Science and Technology.



## 4. Making the Paris Agreement a success for the planet and the people of Vietnam

**NDC ACTIONS FOR VIETNAM**

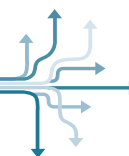
- Ambitious PDP8 and LTS to maximise co-benefits of Vietnam's updated NDC
- Position Vietnam's Green Growth Strategy as enabling environment to unlock NDC co-benefits
- Monitoring and evaluation system for co-benefits of energy-related NDCs and SDGs
- Making Vietnam's power system transition to renewables a priority action of Vietnam's Socio-Economic Development Strategy

By organising successful emergency actions to protect its population against severe health impacts caused by the COVID-19 pandemic, Vietnam's government has proven its political will and flexibility to initiate political change with the aim of improving the country's capacities to confront – and make its people more resilient to – global challenges.

With the ratification of the Paris Agreement, Vietnam has joined efforts with 185 other countries to combat climate change as another global challenge, especially in relation to the target of safeguarding opportunities for current and future generations to flourish. With this COBENEFITS impact report, we seek to contribute to

the success of this international endeavour by offering a scientific basis for harnessing the social and economic co-benefits of building a low-carbon, renewable energy system while facilitating a just transition, *thereby making the Paris Agreement a success for the planet and the people of Vietnam.*

By identifying synergies within Vietnam's development strategies for the energy sector, climate mitigation plans, and strategies framing Vietnam's overall socio-economic development, actions have been determined that serve to strengthen all of these agendas simultaneously. Therefore, the opportunity of the hour is to strengthen the following policies and activities:



## 4.1 NDC Action: PDP8 and LTS as keys to maximising the social and economic opportunities of Vietnam’s updated NDC

Institution to champion the NDC Action	Collaborative bodies to successfully implement the NDC Action	Timeframe of the NDC Action
<b>Ministry of Industry and Trade</b>	<ul style="list-style-type: none"> <li>■ Ministry of Natural Resources and Environment</li> </ul>	Short term

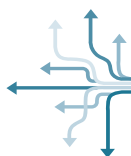
The COBENEFITS studies and roundtables showed that adopting less carbon-intensive pathways in the power sector goes along with socio-economic co-benefits for the job market, energy access, and better air quality and health in Vietnam.

With its recent NDC update the Vietnamese government has placed the social and economic opportunities of climate action at the centre of the country’s endeavours. However, this aspiration is not reflected by the new NDC’s limited level of ambition (Nguyen & Helgenberger 2020), which comes with the risk of not capitalizing on the full socio-economic potential for Vietnam’s people and economy.

In order to build a basis for seizing the full range of socio-economic co-benefits described in this report, in the political implementation of its updated NDC the Vietnamese government is advised to transition to a courageous renewable energy pathway, reflecting the full economic potential of renewable energy sources. More specifically, this can be put into practice through the country’s upcoming Power Development Plan (PDP8) issued by MOIT; and by developing a long-term strategy (LTS), and long-term goals related to the power sector, as suggested by the Paris Agreement.

## 4.2 NDC Action: Position Vietnam’s Green Growth Strategy as enabling environment to unlock NDC co-benefits

Institution to champion the NDC Action	Collaborative bodies to successfully implement the NDC Action	Timeframe of the NDC Action
<b>Ministry of Planning and Investment</b>	<ul style="list-style-type: none"> <li>■ Ministry of Industry and Trade</li> <li>■ Ministry of Labour, Invalids, and Social Affairs</li> <li>■ Ministry of Agriculture and Rural Development</li> </ul>	Medium term



Action Plans supporting the implementation of Vietnam’s Climate Change Strategy and the Vietnam Green Growth Strategy covering the period until 2020 will expire this year and will be followed by similar inter-ministerial planning documents for post-2020. This is a window of opportunity to position activities and measures that will build an enabling environment for socio-economic co-benefits of implementing Vietnam’s updated NDC into broader national development strategies.

The placement of activities proposed in chapters 3.3 and 3.4 within the follow-up Green Growth Strategy and Action Plan can boost inter-ministerial action to secure the substantial number of additional jobs that will be created through ambitious decarbonisation of the power sector, especially if those activities are supported by well-defined responsibilities and necessary budgets. These proposed activities include the intensification of activities to support capacity building for green jobs

through vocational training and education, especially in the renewable energy sector and related areas such as electrical engineering and mechatronics. This could be complemented by a job orientation strategy for green jobs in the renewable energy sector. For the integration of the described activities into the Action Plan for the post-2020 VGGs, MOLISA would be best suited as the lead agency, supported by MOIT, MOET, and by communities and enterprises.

Another entrance point to seize co-benefits through the new VGGs is to supplement current green growth activities focused on rural areas (activity N°63 in the current VGGs) through measures that implement renewable-based off-grid energy planning in remote areas, and which support the development of RE solutions tailored to local conditions (see chapters 3.1 and 3.2). The Ministry of Agriculture and Rural Development would be the lead institution, supported by the Ministry for Industry and Trade.

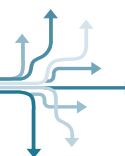
### 4.3 SDG Action: Joint monitoring and evaluation system for co-benefits of energy-related NDCs and SDGs

Institution to champion the SDG Action	Collaborative bodies to successfully implement the SDG Action	Timeframe of the SDG Action
<b>Ministry of Planning and Investment</b>	<ul style="list-style-type: none"> <li>■ Ministry of Industry and Trade</li> <li>■ Ministry of Natural Resources and Environment</li> <li>■ General Statistics Office of Vietnam</li> <li>■ VUSTA (Monitoring structures)</li> </ul>	Short term

By including a chapter on the socio-economic co-benefits of climate policies in its updated NDC communications, the Government of Vietnam highlighted the multiple benefits of ambitious climate action. To ensure that Vietnam’s progress will be assessed for the next national communications of the NDCs, monitoring and reporting structures and processes for the socio-economic co-benefits should be built up. The Enhanced Transparency Framework (ETF), as foreseen in Vietnam’s updated NDC, can lay the foundation for evaluating and, if needed, broadening

the activities necessary to realise ambitious renewable energy targets and to create an enabling environment to seize the range of available co-benefits.

Besides unveiling potential opportunities and rallying domestic support for climate action (IASS 2020b), addressing co-benefits in NDC-related communications can spark imitation and contribute to creating a global momentum toward building a strong alliance for ambitious and early climate action.



In recent years, the Ministry of Planning and Investment worked closely with other ministries and the General Statistics Office to define and develop approaches, statistical indicators, and metadata for monitoring and reporting on progress towards achieving the Vietnamese Sustainable Development Goals (VSDGs) (Socialist Republic of Viet Nam, 2018).

Since many of the co-benefits of renewable energies overlap with aspects of the VSDGs, it is recommended to further assess how to best use synergies in the monitoring of SDGs and co-benefits. Data collected for monitoring certain VSDGs could then be used to monitor co-benefits, and vice versa.

Entry points to couple and amplify SDG and co-benefit monitoring structures might include:

- The establishment of permanent structures for the exchange of defined metadata for such indicators (including content, method of calculation, monitoring period, data sources, etc.) between the stake-

holders responsible for NDC reporting (MONRE) and SDG monitoring and reporting (MPI).

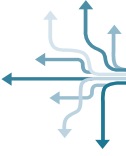
- Connect co-benefits monitoring and reporting to the structure of the Enhanced Transparency Framework (ETS) in Vietnam’s NDC.
- The development of some indicators coupling co-benefits with energy-related NDC actions while adding them to the existing monitoring structures of those VSDGs that have linkages to broader co-benefits (e.g., VSDG3, VSDG4, and VSDG8). In the VSDG8 reporting, for example, an additional indicator measuring jobs related to the energy transition (as defined in IASS/GreenID 2019b) would provide an overview of the socio-economic co-benefits in this area. The indicator system, methodologies, and data collection for VSDG7 recently prepared by VUSTA (Tran Dinh Sinh, 2020) could also be reviewed and adapted in order to broaden its suitability to serve as a basis for measuring the co-benefits of renewable energies.

## 4.4 SDG Action: Making Vietnam’s power system transition to renewables a priority action of Vietnam’s Socio-Economic Development Strategy

Institution to champion the SDG Action	Collaborative bodies to successfully implement the SDG Action	Timeframe of the SDG Action
Ministry of Planning and Investment	<ul style="list-style-type: none"> <li>■ Ministry of Industry and Trade</li> <li>■ Ministry of Natural Resources and Environment</li> <li>■ Ministry of Labour, Invalids, and Social Affairs</li> </ul>	Short term

The Socio-Economic Development Strategy (SEDS) 2021 to 2030, and the related Socio-Economic Development Plan 2021–2025 are inter-ministerial planning documents with the potential to seize opportunities to support more comprehensive achievement of Vietnam’s Sustainable Development Goals by reducing the carbon intensity of the power sector.

The development process of SEDS 2021–2030 and SEDP 2021–2025 during 2020 therefore presents a window of opportunity to safeguard the synergies between energy and climate policies and sustainable socio-economic development in Vietnam.



Making decarbonisation of the power sector through a higher share of renewable energies a priority action of SEDS 2021–2030 and SEDP 2021–2025 while supporting this process by means of the necessary funding and political support would similarly unlock further potentials to contribute to the achievement of multiple VSDG targets.

The consideration of suggested High-Impact Actions in SEDS 2021–2030 and SEDP 2021–2025 would leverage synergies that unlock further development opportunities

by creating an enabling environment that safeguards the co-benefits of renewables in the power sector while similarly supporting the achievement of multiple VSDGs.

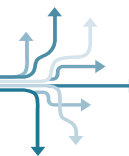
Apart from the MPI as the government entity responsible for developing the mentioned development strategy and plan, the most comprehensive means of integrating High-Impact Actions within SEDS and SEDP and seizing related synergies would require collaboration between MOIT, MONRE, and MOLISA.



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## References

- Amann, Klimont, An Ha et al. 2019.** “Future air quality in Ha Noi and Northern Vietnam.” Available at: <http://pure.iiasa.ac.at/id/eprint/15803>.
- Asian Development Bank (ADB). 2017.** “Pathways of low-carbon development for Viet Nam.” Available at: <https://www.adb.org/sites/default/files/publication/389826/pathways-low-carbon-devt-viet-nam.pdf>.
- Climate Action Tracker. 2020.** Available at: <https://climateactiontracker.org/>. (accessed: 09.07.2020)
- Danish Energy Agency, Ministry of Industry and Trade, DEA/MOIT. 2017.** “Vietnam Energy Outlook Report 2017.” Available at: [https://ens.dk/sites/ens.dk/files/Globalcooperation/Official\\_docs/Vietnam/vietnam-energy-outlook-report-2017-eng.pdf](https://ens.dk/sites/ens.dk/files/Globalcooperation/Official_docs/Vietnam/vietnam-energy-outlook-report-2017-eng.pdf).
- GIZ/Ministry of Industry and Trade, GIZ/MOIT. 2019.** “Technology Assessment of Smart Grids for Renewable Energy and Energy Efficiency: Final Report.” Available at: <http://gizenergy.org.vn/en/item-detail/technology-assessment-of-smart-grids-for-renewable-energy-and-energy-efficiency-final-report>.
- Green Innovation and Development Centre, GreenID. 2019.** “Air Quality Report 2018.” Available at: [http://en.greenidvietnam.org.vn/app/webroot/app/webroot/upload/admin/files/GreenID\\_AirQualityReport\\_2018.pdf](http://en.greenidvietnam.org.vn/app/webroot/app/webroot/upload/admin/files/GreenID_AirQualityReport_2018.pdf).
- Green Innovation and Development Centre, GreenID. 2020.** “Policy Proposal: Degree on Emissions: Economic tools to reduce air pollution (in Vietnamese).” Available at: [http://greenidvietnam.org.vn/app/webroot/app/webroot/upload/admin/files/GreenID\\_Nghi%20dinh%20phi%20khi%20thai.pdf](http://greenidvietnam.org.vn/app/webroot/app/webroot/upload/admin/files/GreenID_Nghi%20dinh%20phi%20khi%20thai.pdf).
- Helgenberger, Sebastian, Martin Jänicke, and Konrad Gürtler. 2019.** “Co-benefits of Climate Change Mitigation. Encyclopedia of the UN Sustainable Development Goals.”
- IASS/CSIR. 2019.** “Improving health and reducing costs through renewable energy in South Africa. Assessing the co-benefits of decarbonising the power sector.” Potsdam/Pretoria. Available at: <https://www.cobenefits.info/resources/cobenefits-south-africa-health/>.
- IASS/GreenID. 2019a.** “Electricity access and local value creation for the un-electrified population in Vietnam. Assessing the co-benefits of decarbonising the power sector.” Potsdam/Hanoi. Available at: <https://www.cobenefits.info/resources/electricity-access-and-local-value-creation-for-the-un-electrified-population-in-vietnam/>.
- IASS/GreenID. 2019b.** “Future skills and job creation through renewable energy in Vietnam. Assessing the co-benefits of decarbonising the power sector.” Potsdam/Hanoi. Available at: <https://www.cobenefits.info/resources/future-skills-and-job-creation-through-renewable-energy-in-vietnam/>.
- IASS/TERI. 2019.** “Improving health and reducing costs through renewable energy in India. Assessing the co-benefits of decarbonising the power sector.” Potsdam/New Delhi. Available at: <https://www.cobenefits.info/resources/improving-health-and-reducing-costs-through-renewable-energy-in-india/>.
- IASS. 2020a.** “Reviving national economies and health systems following the COVID-19 pandemic. COBENEFITS Factsheet.” Potsdam. [www.cobenefits.info](http://www.cobenefits.info).
- IASS. 2020b.** “Moving as One: Integrating the Health and Climate Agendas for Planetary Health in a Post-Pandemic World”. IASS Policy Brief 02/2020. Potsdam
- Koplitz, Shannon N., Daniel J. Jacob, Melissa P. Sulprizio, Lauri Myllyvirta and Colleen Reid. 2017.** “Burden of Disease from Rising Coal-Fired Power Plant Emissions in Southeast Asia.” *Environmental Science and Technology* 2017. Vol. 51: 1467–1476.
- Nguyen, Minh Anh and Sebastian Helgenberger. 2020.** Vietnam’s updated climate goals aim at maximizing the co-benefits of climate action. Available at: <https://www.iass-potsdam.de/en/blog/2020/10/vietnams-updated-climate-goals-aim-maximizing-co-benefits-climate-action>

**Nguyen, Quoc Khanh. 2017.** “Analysis of future generation capacity scenarios for Vietnam.” Available at: [http://en.greenidvietnam.org.vn/app/webroot/upload/admin/files/BCN\\_Eng\\_Final\\_compressed.pdf](http://en.greenidvietnam.org.vn/app/webroot/upload/admin/files/BCN_Eng_Final_compressed.pdf).

**Ministry of Natural Resources and Environment, MONRE 2020.** “Updated Nationally Determined Contribution”. Available online: [https://www4.unfccc.int/sites/ndestaging/PublishedDocuments/Viet%20Nam%20First/Viet%20Nam\\_NDC\\_2020\\_Eng.pdf](https://www4.unfccc.int/sites/ndestaging/PublishedDocuments/Viet%20Nam%20First/Viet%20Nam_NDC_2020_Eng.pdf).

**Ministry of Industry and Trade, General Directorate of Energy, MOIT. 2017.** “Viet Nam’s Power Development Plan. Version 2.” Hanoi.

**Ministry of Industry and Trade, MOIT. 2019.** “Rooftop Solar PV Promotion Program. Government of Vietnam.”

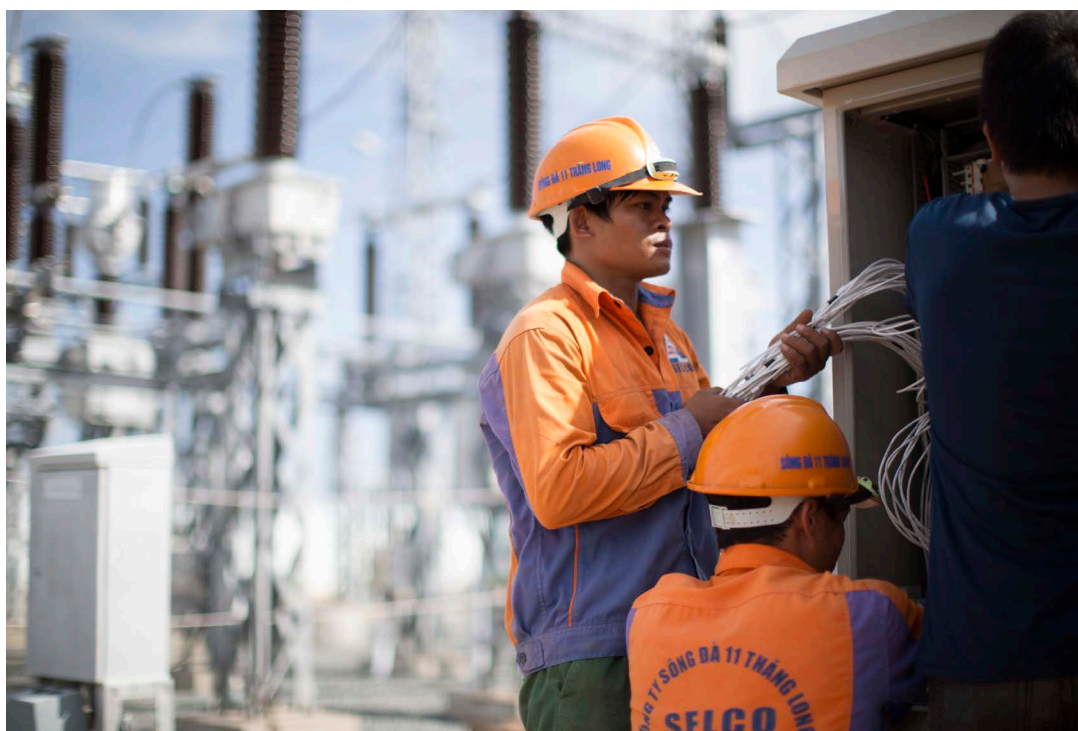
**Socialist Republic of Viet Nam. 2018.** “Viet Nam’s voluntary national review on the implementation of the sustainable development goals.” Available at: [https://sustainabledevelopment.un.org/content/documents/19967VNR\\_of\\_Viet\\_Nam.pdf](https://sustainabledevelopment.un.org/content/documents/19967VNR_of_Viet_Nam.pdf).

**Tran, Dinh Sinh. 2020.** “VUSTA’s recommendations for the GSO Roadmap and Indicator System for selected SDG indicator methodologies and their data collection methodologies.”

**World Bank. 2016.** “Air Pollution Deaths Cost Global Economy US\$225 Billion.” Available at: <https://www.worldbank.org/en/news/press-release/2016/09/08/air-pollution-deaths-cost-global-economy-225-billion>. (accessed: 18.05.2020)

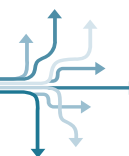
**World Health Organization (WHO). 2018.** “Ambient (Outdoor) Air Pollution.” Available at: [https://www.who.int/news-room/fact-sheets/detail/ambient-\(outdoor\)-air-quality-and-health](https://www.who.int/news-room/fact-sheets/detail/ambient-(outdoor)-air-quality-and-health). (accessed 18.05.2020)

**WHO. 2016.** “Mortality and Burden of Disease from Ambient Air Pollution, Global Health Observatory (GHO) data.” Available at: [https://www.who.int/gho/phe/outdoor\\_air\\_pollution/burden/en](https://www.who.int/gho/phe/outdoor_air_pollution/burden/en). (accessed 18.05.2020)



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## Abbreviations

<b>ADB</b>	Asian Development Bank
<b>BAT</b>	Best available technologies
<b>BAU</b>	Business as usual
<b>BMU</b>	Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety
<b>DEA</b>	Danish Energy Agency
<b>DONRE</b>	Department of Natural Resources and Environment Vietnam
<b>EIA</b>	Environmental impact assessment
<b>GDP</b>	Gross domestic product
<b>GHG</b>	Greenhouse gas
<b>GreenID</b>	Green Innovation and Development Centre
<b>HI-Action</b>	High-impact-actions
<b>IASS</b>	Institute for Advanced Sustainability Studies
<b>IET</b>	International Energy Transition GmbH
<b>IKI</b>	International Climate Initiative
<b>ILSSA</b>	Institute of Labour, Science, and Social Affairs
<b>MARKAL</b>	Market allocation model
<b>MARD</b>	Ministry of Agriculture and Rural Development Vietnam
<b>MOET</b>	Ministry of Education and Training Vietnam
<b>MOH</b>	Ministry of Health Vietnam
<b>MOIT</b>	Ministry of Industry and Trade Vietnam
<b>MOLISA</b>	Ministry of Labour, Invalids, and Social Affairs Vietnam
<b>MONRE</b>	Ministry of Natural Resources and Environment Vietnam
<b>MOST</b>	Ministry of Science and Technology Vietnam
<b>MPI</b>	Ministry of Planning and Investment Vietnam
<b>MV</b>	Medium voltage
<b>MW</b>	Megawatt
<b>NDC</b>	Nationally determined contribution
<b>PDP</b>	Power Development Plan
<b>PM</b>	Particulate matter
<b>PV</b>	Photovoltaic
<b>QĐ-TTg</b>	Decision of the Vietnamese Prime Minister
<b>RE</b>	Renewable energy
<b>RENAC</b>	Renewables Academy
<b>SDG</b>	Sustainable Development Goals
<b>SEDP</b>	Socio-Economic Development Plan
<b>SEDS</b>	Socio-Economic Development Strategy
<b>TERI</b>	The Energy and Resources Institute
<b>TWh</b>	Terawatt-hours
<b>UfU</b>	Independent Institute for Environmental Issues
<b>USD</b>	US Dollar
<b>VGGS</b>	Vietnamese Green Growth Strategy
<b>VND</b>	Vietnamese Dong
<b>VSDG</b>	Vietnamese Sustainable Development Goals
<b>VUSTA</b>	Vietnam Union of Science and Technology Associations
<b>WHO</b>	World Health Organization



## COBENEFITS

### Connecting the social and economic opportunities of renewable energies to climate change mitigation strategies

COBENEFITS cooperates with national authorities and knowledge partners in countries across the globe such as Germany, India, Mexico, South Africa, Vietnam, and Turkey to help them mobilise the co-benefits of early climate action in their countries. The project supports efforts to develop enhanced NDCs with the ambition to deliver on the Paris Agreement and the 2030 Agenda on Sustainable Development (SDGs). COBENEFITS facilitates international mutual learning and capacity building among policymakers, knowledge partners, and multipliers through a range of connected measures: country-specific co-benefits assessments, online and face-to-face trainings, and policy dialogue sessions on enabling political environments and overcoming barriers to seize the co-benefits.

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