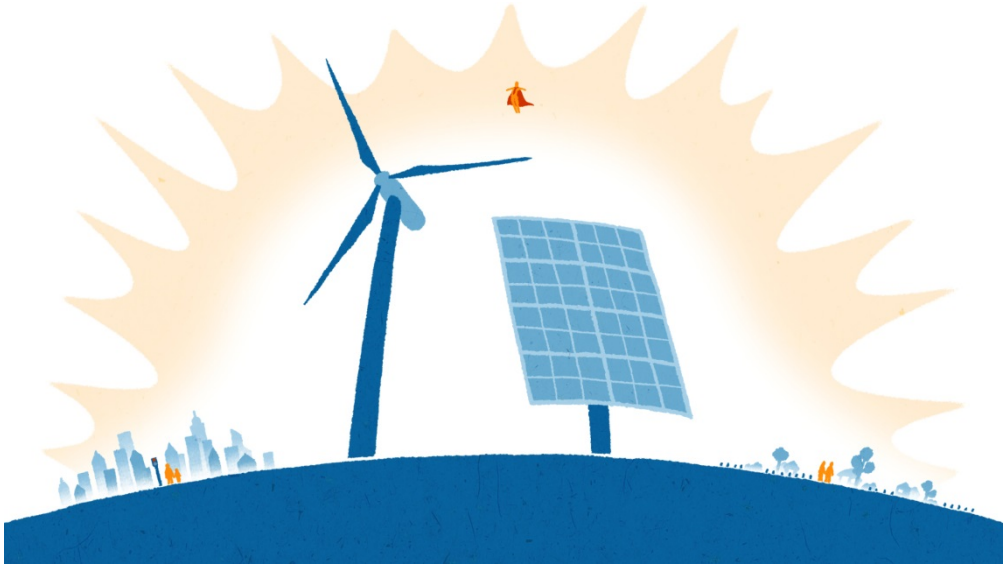
COBENEFITS FOR VIETNAM

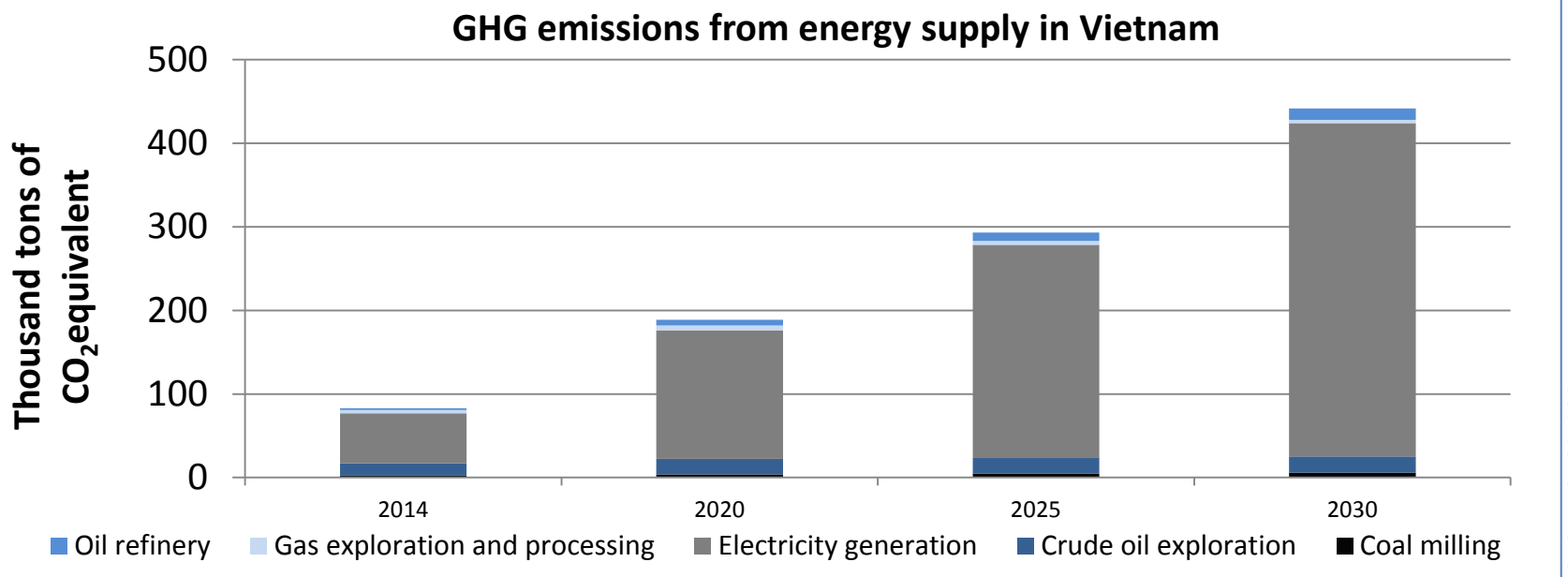
THE FUTURE DEVELOPMENT OF EMPLOYMENT IN VIETNAM's POWER SECTOR



SOCIOECONOMIC COBENEFITS OF RENEWABLE ENERGY AND CLIMATE ACTION IN VIETNAM

FINAL RESULTS 2019 (Executive Briefing)

The power sector has become the highest source of GHG emission in Vietnam and must be considered for necessary mitigation actions



Source: GIZ 2018

- **The government has shown commitment** towards emission reduction and a shift towards low-carbon generation sources in the power sector as evidenced by the Vietnamese Green Growth Strategy (VGGS), and initial plans in the revised power development plan (PDP 7 (rev)), amongst others.
- **Changing the structure of power generation mix** in the country must be accompanied by an understanding of the broad employment impacts of this shift (especially with the use of renewable energy sources) in the power sector and also across the country

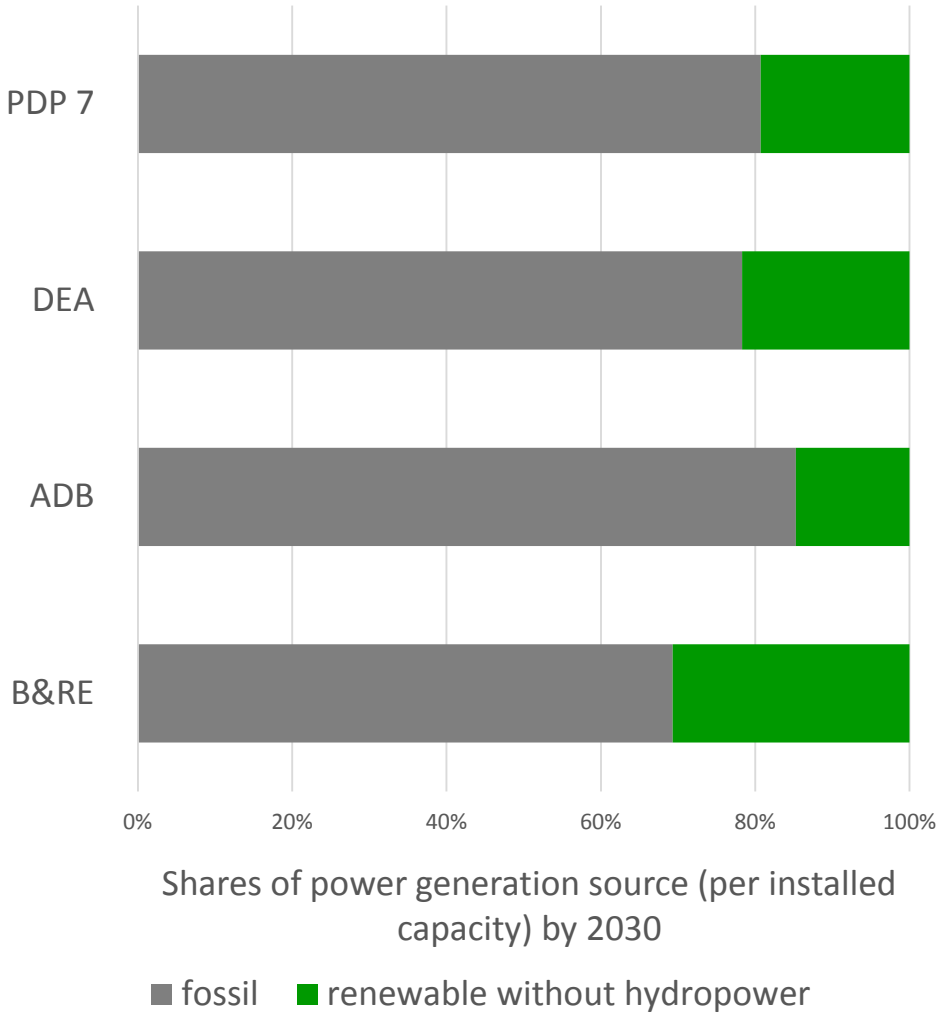
STUDY APPROACH

This study analysed the **gross employment impacts** of different power generation pathways in Vietnam using an extended Input–Output (IO) model to identify the benefits of a low-carbon transition path.

For the analysis, **four relevant scenarios** have been selected to compare the impacts of different power generation capacity additions and different power generation sources:

- **Power Development Plan 7 revised, by MOIT** (PDP 7 (rev))
- **Danish Energy Agency Stated Policy scenario** (DEA Stated Policies)
- **Asian Development Bank "Pathways to low-carbon development for Vietnam" low carbon scenario** (ADB low carbon)**,**
- **The Base & Renewable Energy scenarios by GreenID**

POWER GENERATION MIX OF THE DIFFERENT SCENARIOS ANALYSED



PDP 7 scenario:

- Highest total MW capacities
- Highest coal share

DEA scenario:

- Similar to PDP 7 with lower shares of renewable energy

ADB scenario:

- Lowest total MW capacities due to energy efficiency component but higher shares of fossil generation sources.

Base and Renewable Energies scenario:

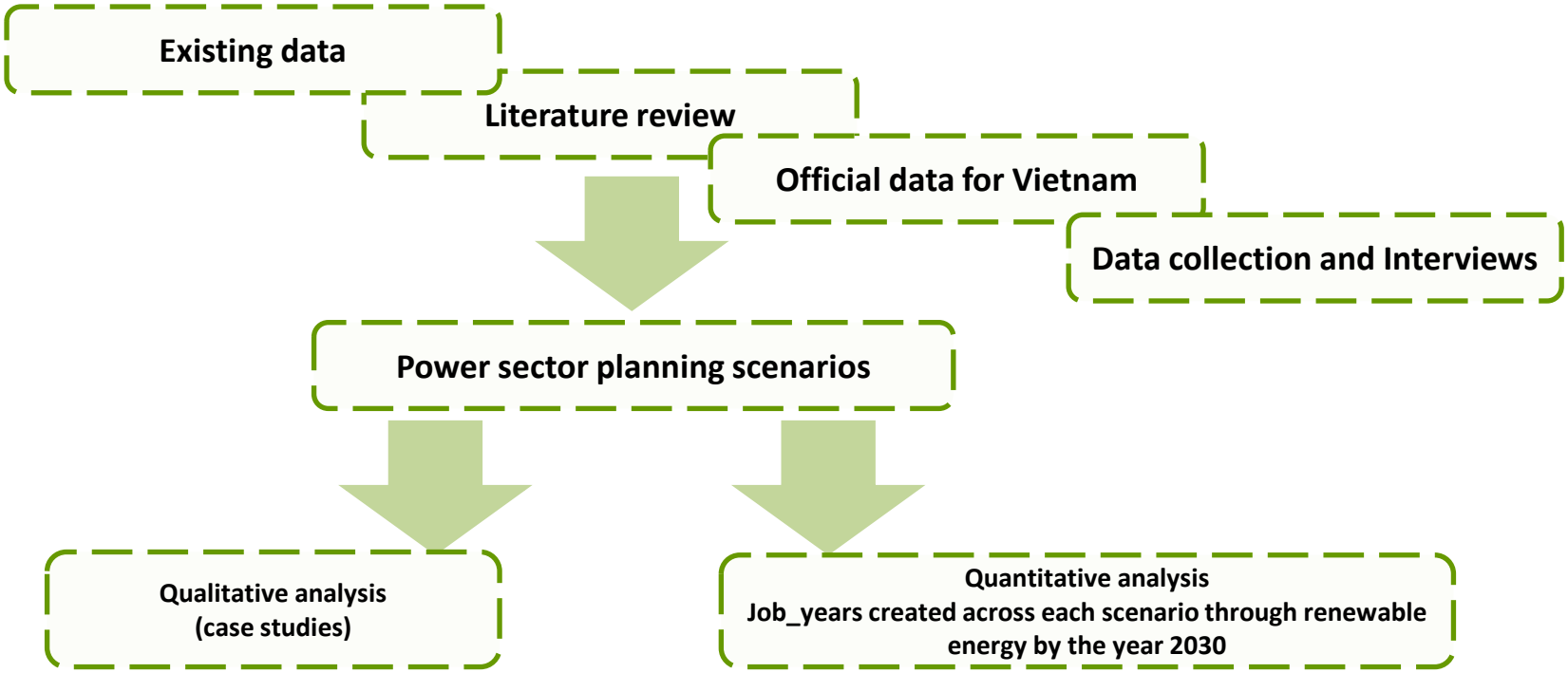
- Lowest fossil share (24% less coal than the PDP 7)
- Highest renewable share (63% more than the PDP 7)
- Lowest levels of GHG emission across all four scenarios

Increasing GHG reduction ambitions

IMPORTANT FINDINGS

- There are **positive employment effects** by increasing the share of renewable energy in Vietnam's power sector over the assessed time horizon. This is driven by new jobs created within the renewable energy value chain as well as the broader economy.
- Renewable energy sources, especially Solar PV and Wind, **have greater job creation potentials per average MW installed** than both coal and gas (fossil energy sources).
- **To maximise** this higher employment factor, the power sector transition process should be considered **as a pivotal part of a larger** country-wide decarbonisation strategy needed to mobilise the co-benefits of climate change mitigation in the country.

METHODOLOGICAL APPROACH



- What skills are required in the renewable energy sector?
- What are the required educational qualification levels for a low-carbon energy transition?
- How much of training or re-skilling will be required?
- What programs already exist and how can they be enhanced?

Gross Employment analysis

- Direct
- Indirect and
- Induced jobs

Extended IO model to derive

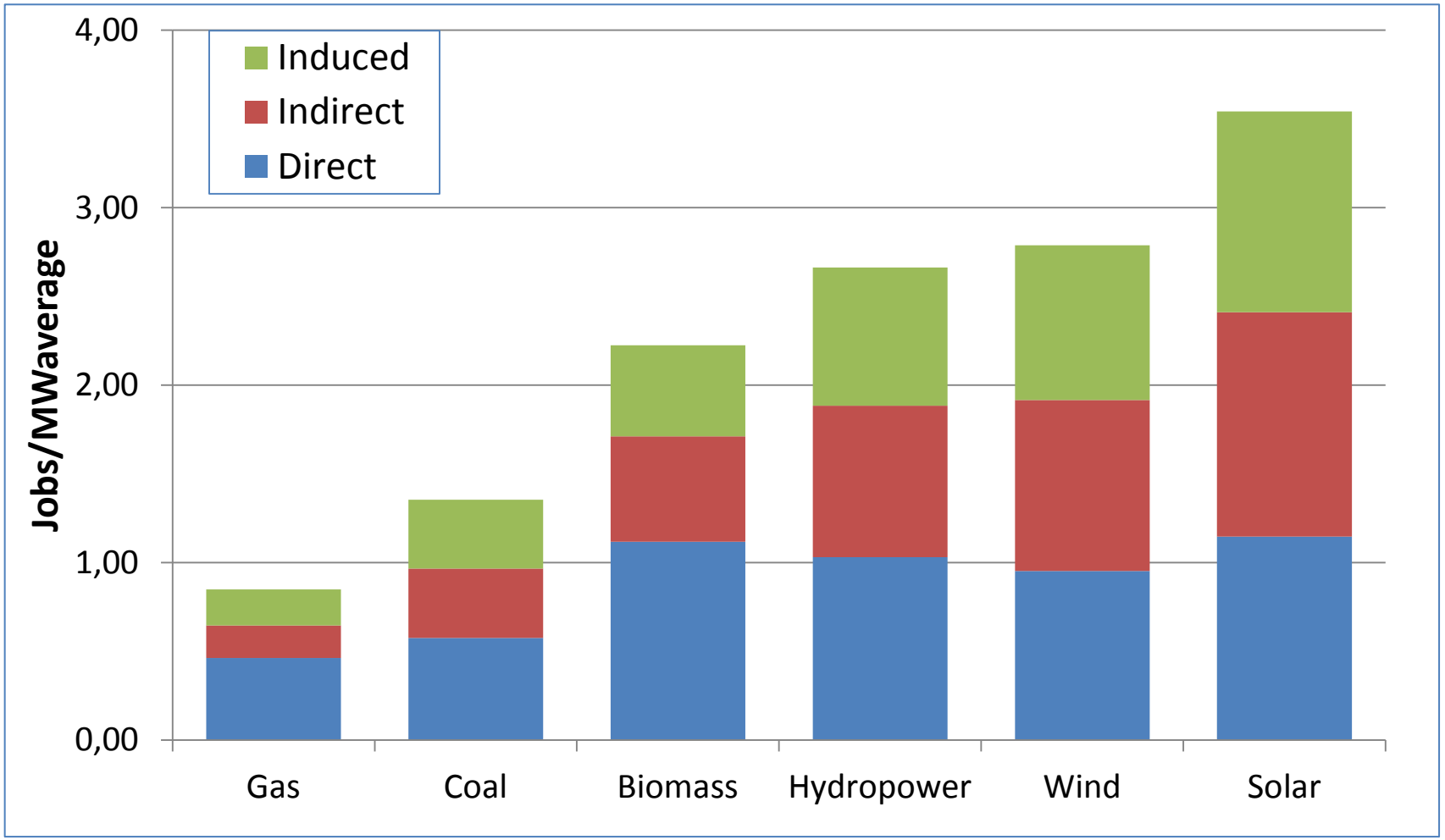
- Coefficients of income and employment
- Employment factors per technology

KEY STUDY TERMINOLOGIES

- **One job is defined as a full-time equivalent person-year**. The total number of jobs reported therefore reflects the total number of people employed for the specific year.
- The IRENA (2014) definition of direct, indirect, and induced employment effects is used for the reporting of gross employment impacts:
  - '**direct employment effect' (direct jobs)** is the result of the change in employment due to changes in production of the demanded sector, which adjusts to meet the change in demand for a good or service
  - '**indirect employment effect' (indirect jobs)** is the change in employment in sectors linked to the demanded sector through its intermediate consumption of goods and services
  - '**induced employment effect' (induced jobs)** is the change in employment resulting from changes in demand due to the direct and indirect employment effects.

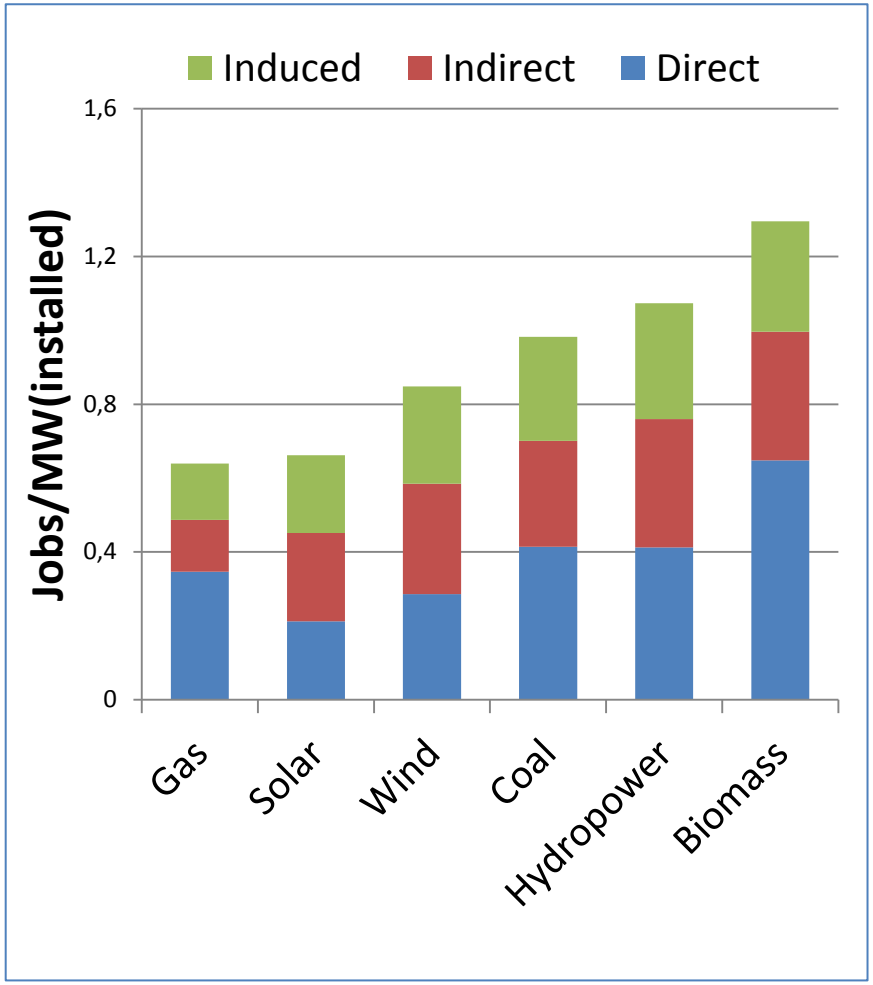
KEY RESULTS ON IDENTIFIED POTENTIAL JOB CREATION IMPACTS FOR ANALYSED POWER SECTOR PLANNING SCENARIOS

EMPLOYMENT EFFECTS FOR DIFFERENT ENERGY GENERATION SOURCES



HOW DID WE CALCULATE AVERAGE JOBS?

Job coefficients assuming 24 hour operation



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Source	Capacity Factor
Gas	75%
Solar	19%
Wind	30%
Coal	72%
Hydropower	40%
Biomass	58%

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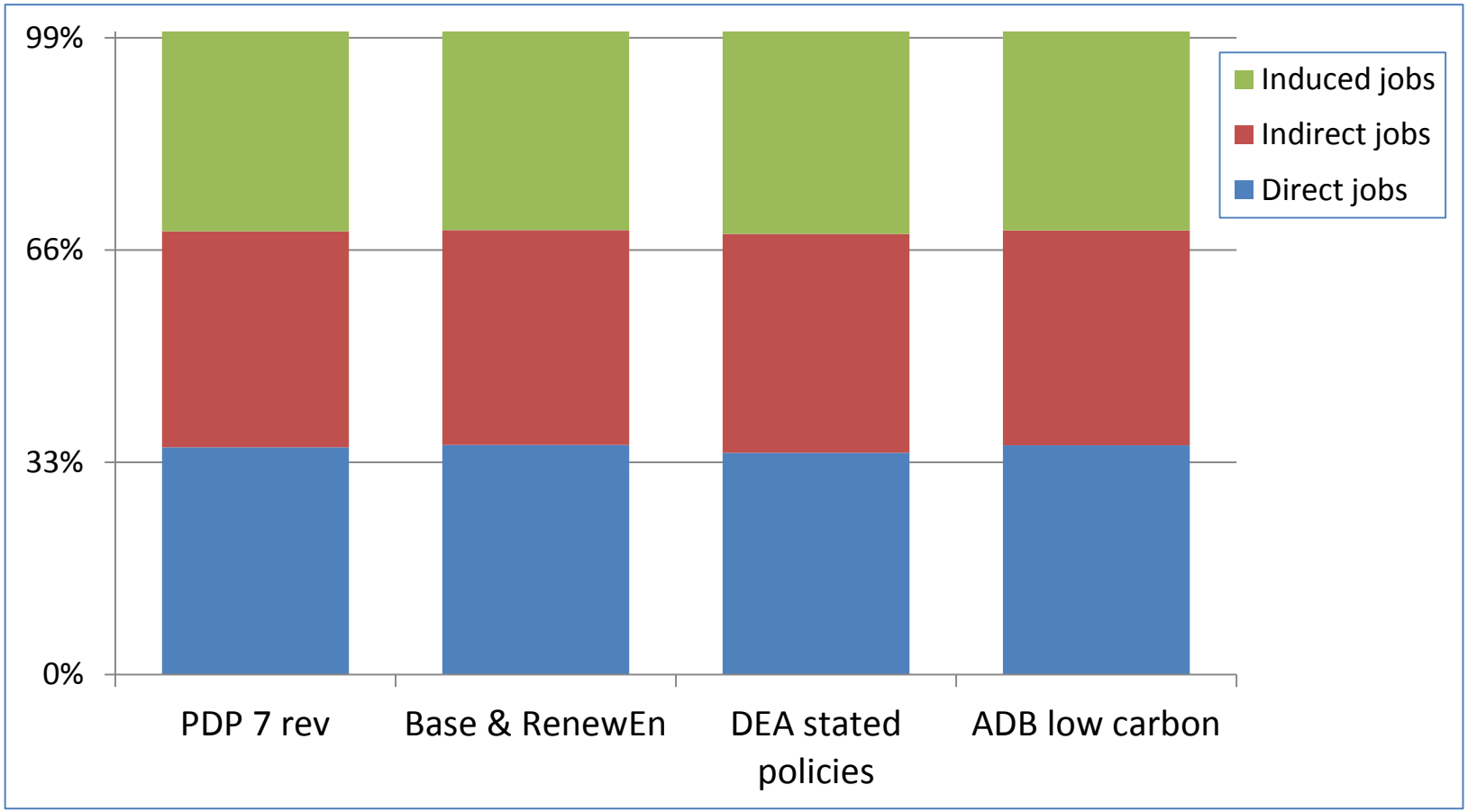
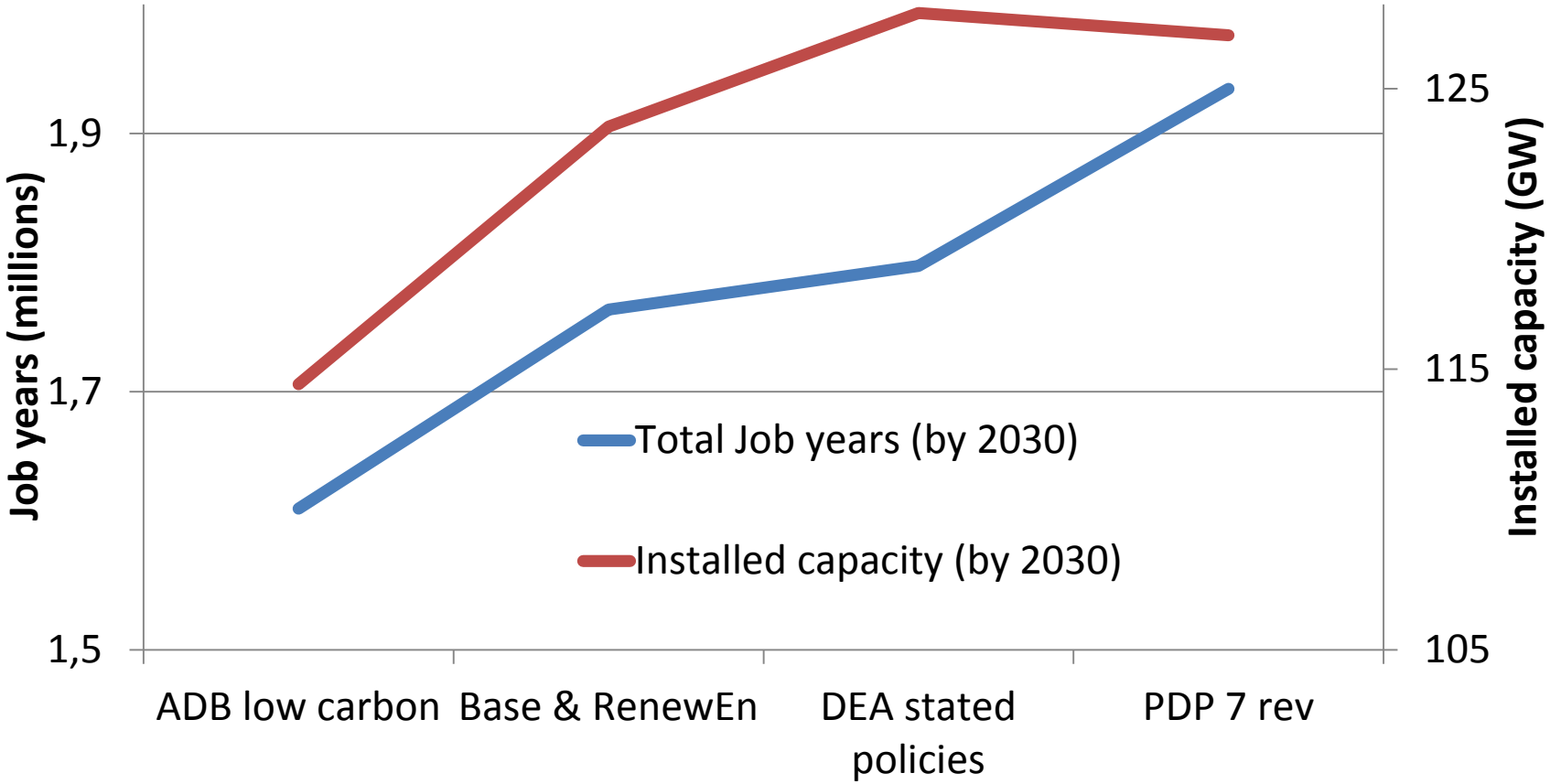
Average Jobs

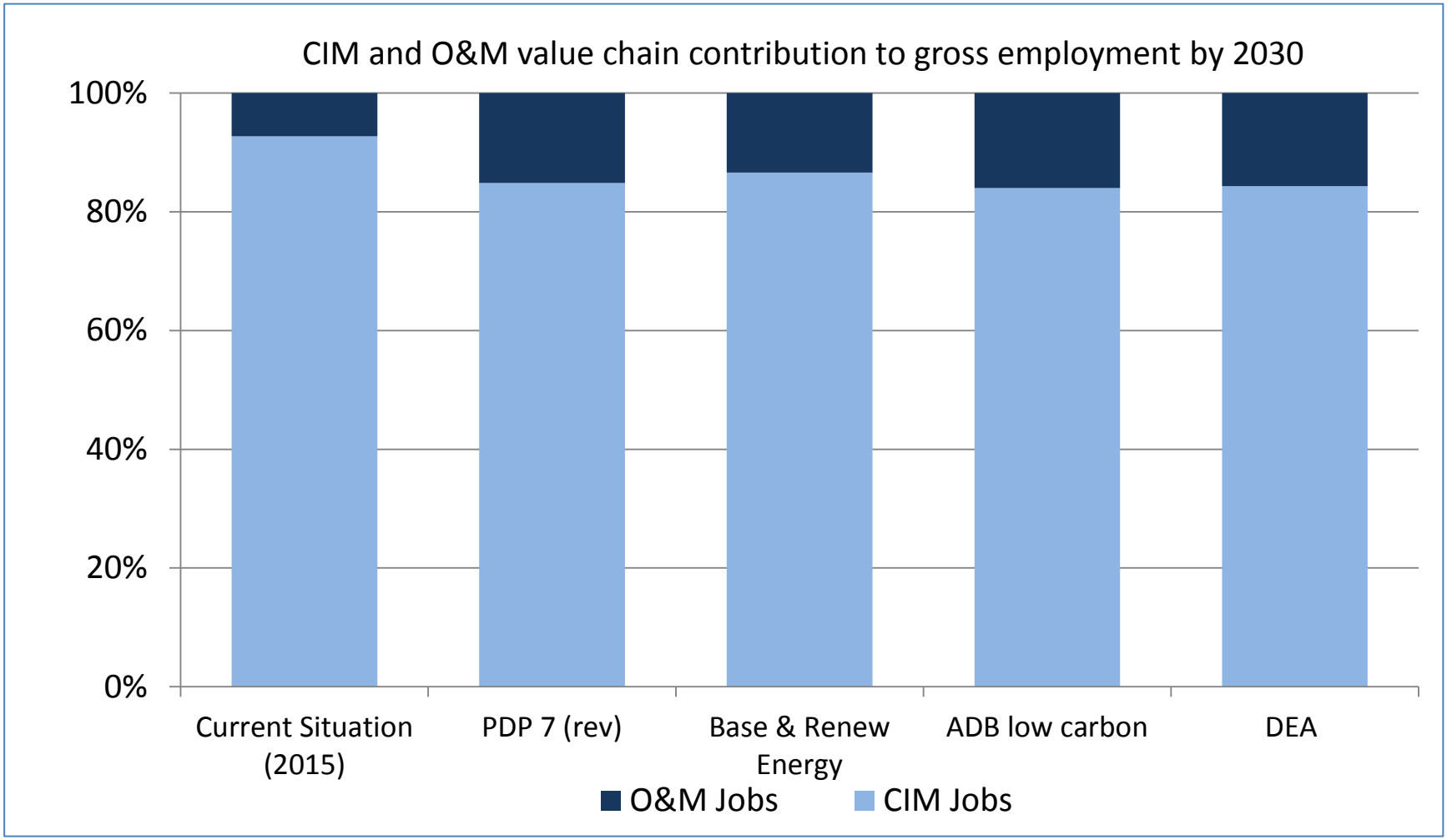
Employment effects in Vietnam's power sector: For each direct job in Vietnam 2 additional jobs (indirect & induced) are being created



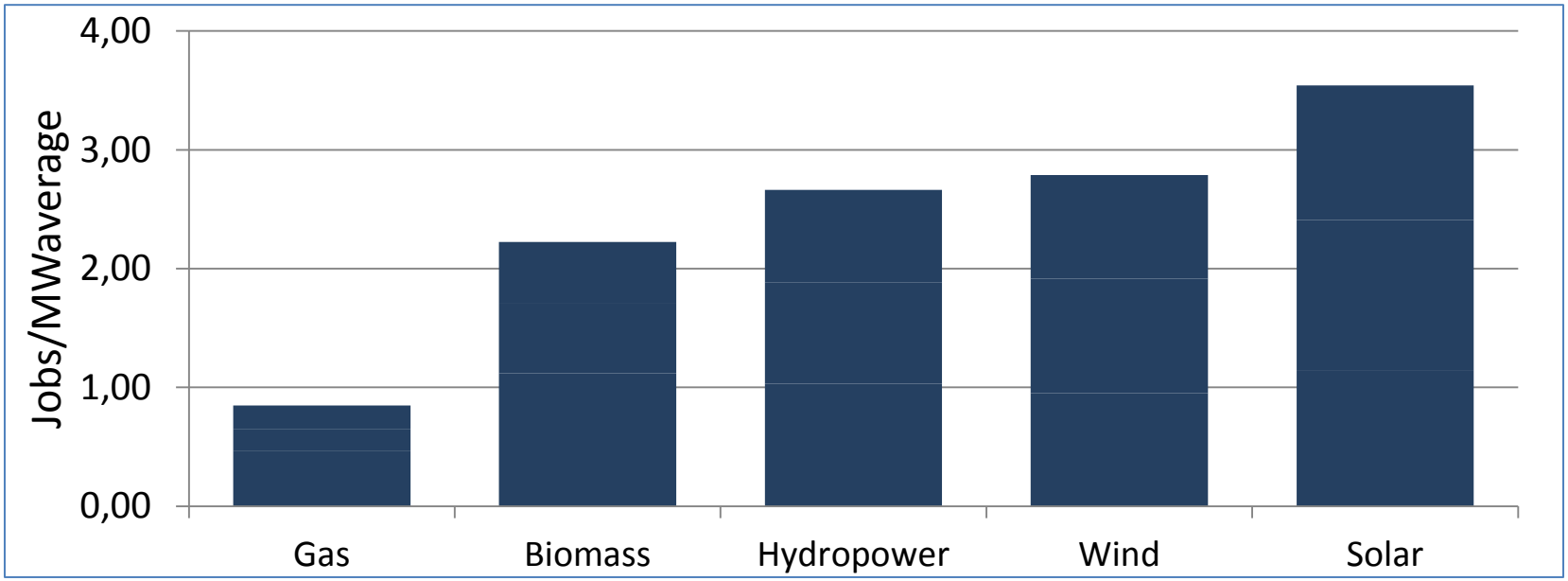
Employment effect, to a certain extent depends on the generation capacity addition



Most of the jobs are created during the construction, installation and manufacturing phase

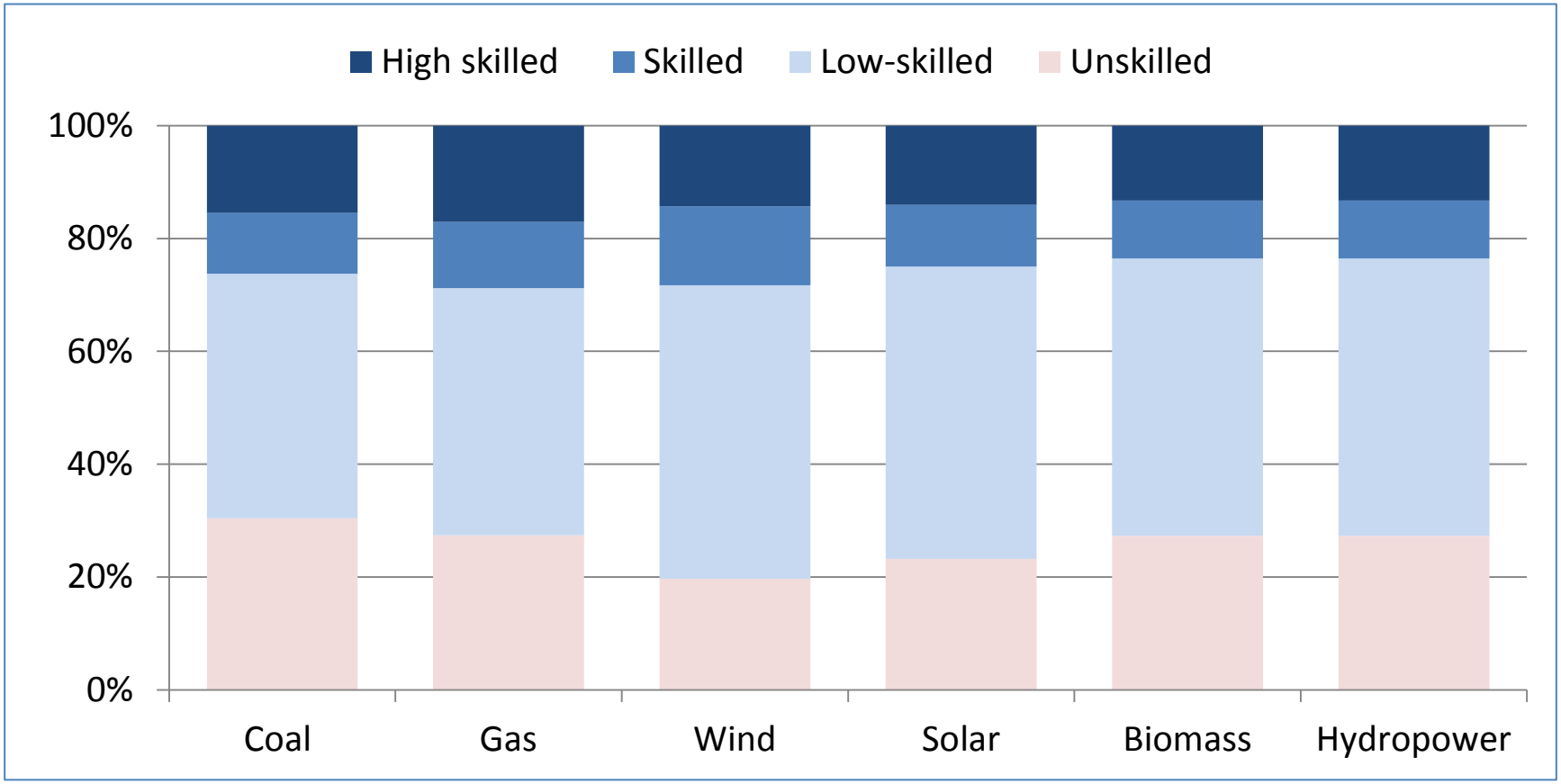


What generation source provides the best replacement for coal in terms of job creation?



- Replacing coal with solar either PV or wind creates at least three more jobs per average MW installed in the country.
- When coal is replaced with renewable energy, the employment effects are more evident during the equipment manufacture, construction and installation phase (62% of the replacement effects occur).
- Biomass technology's employment effect is highest during the O&M phase; this occurs as a result of it's high linkage to the agriculture & extraction sectors in Vietnam.

Across all energy generation sources, around 25% of employment are skilled or high skilled jobs in Vietnam



Qualitative Assessment Summary: Information presented shows a distribution of direct skill groups across various power generation technologies in Vietnam. They provide a comprehensive view of educational attainment levels for each technology type through the value chain.

KEY POLICY RECOMMENDATIONS

- **Future energy policy measures** in the country should focus on the question how to best unleash the job creation potential of renewables and to substitute as much coal power generation as quickly as possible.
- **Education and vocational training** in Vietnam for key jobs in technical areas of electrical engineering and mechatronics should be further developed. For this purpose, demand and supply side institutions need to foster increased collaboration.
- **The power sector transition** forms part of a larger decarbonisation process in the country. Planning for this transition should involve an identification of 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.**

MODELLING LIMITATIONS

- The job creation for each scenario is highly dependent on its energy mix or technology shares and insufficient to analyse the future development of employment of a low-carbon energy pathway in Vietnam. Hence, further analysis of the employment factors/coefficients for each power generation technology is shown in this study to ensures a fair comparison.

- Other positive impacts associated with lower emissions, such as improved air and health quality, among others are not accounted for in this analysis.

- This study is based on economic assumptions, technology cost and other parameters that could change over the assessment horizon; this could affect approximation and should be considered for decision making.

Suggestion for reference:

COBENEFITS Vietnam 2019. The future development of employment in Vietnam's power sector: Executive briefing. Prepared by: ILSSA (Vietnam). Revised & Edited by: IASS (Germany).

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Institute for Advanced Sustainability Studies e.V. (IASS)
Berliner Strasse 130
14467 Potsdam
Tel. +49 (0)331-28822-300
www.iass-potsdam.de

To contact the Project Director:
sebastian.helgenberger@iass-potsdam.de
www.cobenefits.info
IKI_COBENEFITS

PARTNERS

COBENEFITS

COBENEFITS Focal Point Vietnam

GreenID

Study research team

ILSSA
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