On behalf of

Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection

of the Federal Republic of Germany

CASE for Southeast Asia

CASE Insights:

Germany's Coal Phase-Out and Australia's Practical Implementation to Support Energy Transition in Indonesia

Overview

The ever-changing climate and the compelling evidence that it has negatively affected the ecosystem has pushed the global community to rapidly accelerate emissions reduction to mitigate the adverse effects of climate change. Consequently, the global commitment to combat climate change was strengthened at the 26th Conference of the Parties (COP 26), where world leaders agreed to phase down the use of coal, after agreeing to keep the global temperature rise below 1.5-2^{0}C at COP 21. Coal phase-down remains the most imperative strategy to combat climate change due to the high global emissions from fuel combustion (reaching 34.2 gigatonnes in 2019), mostly driven by power generation.[2]

Indonesia, as an archipelagic nation with a tropical climate, is blessed with ample renewable energy (RE) resources, including geothermal, hydro, solar, biomass, and wind energy. At the same time, it is the largest thermal coal-exporting country (400 million tonnes in 2020[3]), with an annual average of coal production reaching as high as 600 million tonnes[4]. Around a quarter of the total coal production is utilized for domestic use in coal-fired power plants, translating to at least 32.9 Gigawatts (GW) of installed capacity or around 50% of Indonesia's total installed capacity.[5] At the same time, the RE share in the power mix is stagnating around 11%[6]. Consequently, the energy sector emitted around 638 million tonnes of carbon dioxide equivalent (CO_2e) in 2019, contributing to 34% of Indonesia's total greenhouse gas (GHG) emissions.[7] The need to reduce GHG emissions from the energy sector, particularly by reducing coal use, thus becomes more urgent than ever considering the newly announced national goal to reach net zero emissions by 2060 on top of the nation's commitment to reduce its GHG emissions by 29% below the business-as-usual scenario by 2030.[8]

In order to support the attainment of Indonesia's climate and energy goals, the Indonesian chapter of the Clean, Affordable, and Secure Energy for Southeast Asia (CASE) programme held a virtual webinar to share the lessons learned concerning coal phase-out strategies and processes in other coal-reliant countries, namely Germany and

[1] The content for this factsheet has been derived from **Germany's Coal Phase-Out and Australia's Practical Implementation to support Energy Transition in Indonesia** dialogue held on 26 October 2021 with speakers Phillip Litz (Agora Energiewende), Jan-Kristof Wellershoff (Germany's Federal Ministry of Economics and Energy), Kerstin Maria Rippel (50Hertz), and Karen Cain (Latrobe Valley Authority).

Australia. This dialogue serves as a platform for Indonesia's government officials, business leaders, and the public alike to understand what a coal phase-out entails — from policies, socioeconomic concerns, financial needs, institutional readiness, to technical capacity.

Country Overview: Indonesia, Germany, and Australia

Energy transitions are complex and specific to individual national circumstances. Countries differ in energy resource availabilities, energy import and export dependencies, as well as existing energy infrastructure and power grid interconnectivity. The political landscapes, power market set-ups, and regulations provide different starting positions for a coal phase-down, with further important factors including the availability of financial resources and social considerations related to job security and energy affordability.

However, there are also commonalities that can be shared across countries. These include the strategies to ensure electricity security, to establish a just workforce transition, and to maximize socio-economic benefits of the energy transition. Thus, Indonesia can learn from the coal phase-down experiences of other countries, including Germany and Australia, and use this evidence to develop its own set of solutions that suit Indonesia's specific challenges.

Table 1 Climate targets and the coal commodity landscapes in Indonesia, Germany, and Australia

	Indonesia	Germany	Australia
Net Zero Emissions target	By 2060	By 2045	By 2050
Climate target	Reduce GHG emissions by 29% below the business-as- usual scenario by 2030	Reduce GHG emissions by 65% below 1990 levels by 2030	Reduce GHG emissions by 11-15% below 2005 levels by 2030
Coal phase - down commitments	• Committed to cease accepting new CFPP proposals beyond existing contracts in the 2021-2030 RUPTL (additional 13.8 GW planned for CFPP until 2027). • Signed the Global Coal to Clean Power Transition Statement at COP26[a]	• Coal phase-out by 2030 through the Coal Commission. • Signed the Global Coal to Clean Power Transition Statement	• No coal phase-out targets, but CFPP closures are accelerated • The Australian subnational government, the Federal Capital Territory, signed the Global Coal to Clean Power Transition Statement
Coal production and consumption	• Coal comprised around 64% of the power mix in 2020. • Largest global thermal coal exporter (400 million tonnes in 2020).	• Coal contributed to 24% of the national power mix in 2020.	• Coal use had been decreasing but it accounted for 54% of the national power mix in 2020. • The second largest thermal coal exporter (199 million tons in 2020).
Mining sector	Over 100,000 people directly employed in the coal mining sector in 2019.	Employment in the coal mining industry was reduced by 75% between 2000 and 2020. In 2020, about 20,000 people remained employed in this sector.	Employment in the coal mining industry in Australia has seen a decline in recent times, standing at nearly 39,000 as of June 2020.

Notes: [a] Indonesia endorsed clauses 1, 2, and 4 of the Statement, excluding clause 3 to cease issuing new permits and construction of unabated coal-fired power plants, but will consider accelerating coal phase-out by the 2040s, conditional to international assistance.

Lessons-learned from Germany's Coal Phase-Out Process

Germany has been the largest lignite ("brown coal") producer in the world since the beginning of industrial lignite mining.[9] With its lower calorific value, brown coal is considered low grade compared to hard coal since it is also more carbon intensive, resulting in higher emissions when burned. Germany further imports hard coal to meet the demand of its coal-fired power plants (CFPP). Coal production in and imports to Germany have been kept steady at around 400,000 tonnes between 2000 and 2020. Both lignite and hard coal contributed to around 20% of Germany's installed net power generation capacity in 2021.[10]

Despite the continuous use of coal in Germany, coal mining employment, both for brown coal (lignite) and hard coal, has decreased from 80,000 people to 20,000 over the same period.[11] Some workers who were employed in the hard coal mining sector have even fully transitioned to other sectors since 2018[12] following hard coal mines closures. On the other hand, Germany is still in the process of shifting from lignite due to its high level of availability in Germany's remaining mines, resulting in lower operation costs. Despite their poor environmental credentials, a few lignite plants have been designated as 'security reserves' to be utilized in case of electricity shortages.

Overall, moving away from brown coal mining has a significant impact on three main mining regions Lusatia, Rhineland, and Central German district due to its long history in Germany. Consequently, the coal phase-out discussion in Germany focused substantially on social and economic considerations and solutions for people living in the regions and working in the mines. Adding to the complexities, Germany is currently still concluding its nuclear phase-out, which was originally decided in 2001 (phase out by 2036), with a new phase-out target set after the Fukushima accident in 2011. By the end of 2022, all of its nuclear power capacity (17 plants) will be phased out, thereby removing reliable baseload power from the power system.

Despite the challenges, Germany initiated a discussion on a coal phase-out which led to the announcement of a target to phase out coal by 2038 and to have RE contributing to 65% of the power mix. This target was adjusted in November 2021, where the coal phase-out target was accelerated for achievement in 2030 with the RE share of 80%.[13] The roles and perspectives of various stakeholders leading up to this announcement are detailed below.

Roles and Perspectives of Germany's Stakeholders

Decision-making process for the Coal Phase-Out

Germany started its coal phase-out process in 2017 when the new coalition decided to introduce a coal commission, which was established a year later. The coal commission (officially the Commission on Growth, Structural Change and Employment) entails a society-wide process, which includes representatives from the parliament, ministries, states, environmental organizations, businesses, labour unions, and the science community. It is important to note that although members of the parliament are involved in the discussion, they do not have voting rights in the decision-making process. The commission's goal is to give input to the parliament on coal phase-out strategies through plenary meetings, expert hearings, and visits to the regions impacted by the phase-out. Ultimately, the Commission recommended to incrementally decrease Germany's coal capacity from 42 GW in 2018 to 0 GW by 2038. The newly-appointed government is aiming to accelerate this process to 2030 by incentivizing a fossil fuel phase-out, supporting green hydrogen, and ensuring bolder carbon pricing.

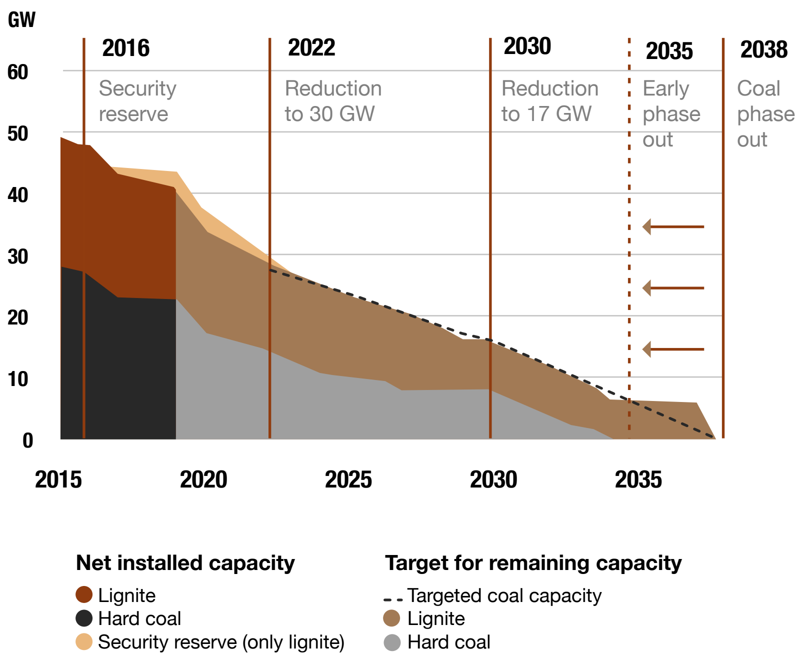


Figure 1
Germany's coal reduction trajectory
Source: Guldehouse. 2020. based on BMU, 2020 and DIW/Wuppertal Institut/Ecologic, 2018

The implementation of the coal phase-out: Decommissioning Mechanism

The government adopted the recommendations from the Commission in 2019 and began to implement the measures needed to reduce hard coal and lignite power capacities. To reduce hard coal, the government initiated an auction process for decommissioning starting in 2020 and ending in 2026. The auction process is carried out by the Federal Network Agency. At the start of the auction process, the government calculated the annual need for coal reduction and asked utility operators to place their bids to decommission their hard coal fired power plant(s). The bids with the lowest price per tonne of CO_2-e would be compensated to offset some of the losses caused by the power plant shut down. Hard coal fired power plants that fail to participate in the auction process by 2026 will be shut down, starting from the oldest plant, without any compensation.

A total of 317 million euros (approximately US$ 345 million) was awarded to eleven hard coal plants to retire an aggregate capacity of around 4.8 GW in 2021 from the first coal phase-out auction mechanism.[14,15] As such, the mechanism was considered successful in its ability to drive an economic phase out of coal. However, the auction mechanism was not deemed viable for reducing lignite-fired power plants since there are only two operators in Germany. Consequently, the government conducted several negotiations with both operators and agreed to provide compensation totalling 4.3 billion euros.

Transmission System Operator's Perspective

Germany's four Transmission System Operators (TSOs) are responsible for the security of power supply in their respective grid area by regulating grid operation. With increasing RE resources added to the grid, and continuous phase out of coal-fired power plants, the role of TSOs is crucial in preparing the grid for a power mix with a larger portion of variable power sources. The regulations and plans stipulated by the government apply to TSOs that directly support the successful attainment of the coal phase-down target. One of these TSOs is 50Hertz, covering 7 regions in the North-Eastern part of Germany, including Berlin and Hamburg. It is the pioneer in integrating renewable energies in Germany. In 2020, 62% of the annual average consumption (36.1 GW) in the grid was covered by RE, up from 25% in 2010.

Challenges and Key Measures to Integrate RES Share

How does 50Hertz address the challenges of phasing out baseload power plants (coal and nuclear) and compensating the massive expansion of REs on a large scale?

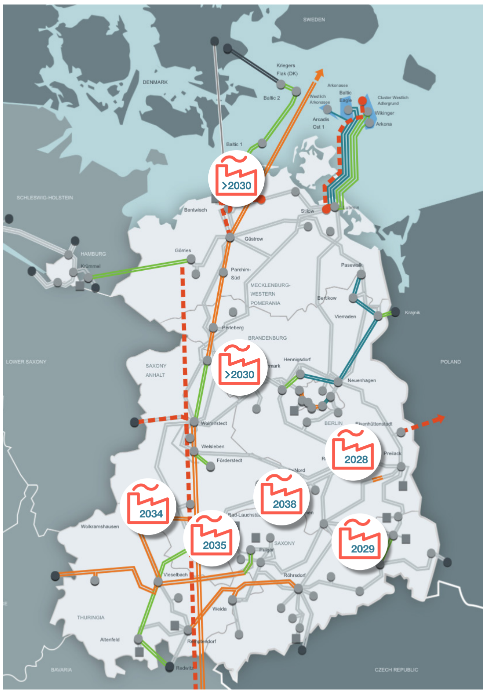


Figure 2
Coal Exit in 50Hertz Control Area
Source: 50Hertz's presentation. 26 October 2021.

There are major challenges faced by 50Hertz in this coal phase-out as they operate in the northern and eastern region of Germany, where seven coal-fired power plants are slated for decommissioning as early as 2028. The company thus devised an ambitious strategy to ensure that RE provides 100% of the electricity by 2032. By doing so, it would become a unique champion as a green electricity provider, attracting foreign investments in Germany.

Baseload power, or the amount of electricity that must be supplied to the grid to meet the minimum level of demand, is usually generated by nuclear or coal-fired power plants. However, with Germany's goal to phase out both nuclear and coal-fired power plants, its TSOs need to devise a strategy to address the challenges associated with the baseload power. 50Hertz foresees that baseload power will come from RE sources in the future, while grid stability can be maintained through increased flexibility, digitalization, and demand side management. Germany's transmission system also benefits from its interconnections with neighbouring grids, enabling TSOs to import electricity when needed.

In addition, controllable capacities that can be dispatched from gas-fired power plants will be needed when solar PV or wind are not available on the grid. Voltage stabilization is commonly mitigated by reactive power generated by coal and remains a challenge when transitioning to 100% renewables, hence the investments 50Hertz made in reactive power compensation units as stabilizing technologies. These units can substitute thermal power plants and are essential due to the high utilization of the transmission grid and high demand caused by short term power flow changes.

Table 2 Analyzed impacts on system operation

Analyzed impacts on system operation	
Line loading	Analysis shows a reduction of costs for redispatch and wind curtailment.
Voltage stability	Higher grid loading requires more reactive power. Reactive power from power plants must be substituted. Results indicate a significant demand for voltage regulating assets.
Dynamic stability	Higher grid loading and fluctuating infeed require more dynamic stability assessment and more studies regarding stability phenomena.
Grid restoration	Without traditional thermal power plants the grid restoration schemes need to be fully revised. Study on black start capabilities of RES is ongoing.
Adequacy	General decisions on adequacy are on policymakers, yet TSOs (and DSOs) are constantly revisiting and improving existing procedures to handle deficit situations.

Source: 50Hertz's presentation. 26 October 2021.

Solutions on the way to safety integrate 100% RES

Grid expansion and improved interconnectivity
- Demand-based grid expansion on land and sea
- Reliable connections with neighbouring countries
- Modernisation and optimisation of the existing grid

We plan and build the electricity infrastructure of the future

European market integration
- Market coupling
- Harmonisation of procedures and guidelines
- European-wide cooperation among TSOs

We contribute to developing a European electricity market

RES integration in the electricity market and ancillary services
- Development of products for efficient grid use and operation
- RES marketing via power exchange
- Security of supply on a constant high level

We ensure a secure and efficient RES integration

Figure 3
Solutions to safely integrate 100% renewable energy
Source: 50Hertz's presentation. 26 October 2021.

Figure 2 summarizes major challenges and solutions in integrating a high proportion of variable RE into the 50Hertz grid area.

To shift away from a fossil fuel-based power system, plans have been made for the substitution of gas peakers by green hydrogen through fuel switching. It has been determined that green hydrogen, which is produced using renewable power, will play a strategic role in securing Germany's energy supply, and discussions are ongoing about its utilization in gas-fired power plants (in addition to other application areas in industry, transportation, or the residential sector). The production of green hydrogen, essentially a splitting of hydrogen and oxygen through electrolysis using RE, is currently more expensive than other forms of hydrogen production.[16] New water-splitting technology to produce green hydrogen remains under research and development and has not yet become commercially viable. However, pilot projects, for example converting wind power to green hydrogen through electrolysis, already exist.

Lessons learned from Coal Worker Transition Services in Latrobe Valley, Australia

Latrobe Valley is situated in the State of Victoria, Australia, which has an estimated reserve of brown coal amounting to 65 billion tonnes or 25% of the global supply.[17] Brown coal reserves is widely available, as reflected in Victoria's energy mix, where it contributes to 34.1% in 2019.[18] Latrobe Valley has three coal mines, the Hazelwood, Loy Yang, and Yallourn. Adjoining the Hazelwood coal mine, its power station began to operate in 1971 with a capacity of 16 GW. The CFPP was one of the most emissions-intensive power plants worldwide, with 1,520 grams of CO_2-e per kWh generated in 2016[19] or 35% higher than the global average CFPP emissions

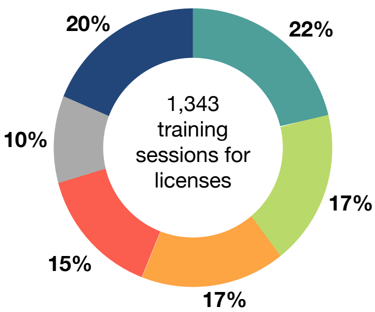
[16] Black/brown hydrogen is produced using coal; grey hydrogen is produced using natural gas; blue hydrogen is produced if natural gas is used and CO_2 emissions are captured.

Figure 4
Latrobe Valley, Australia
Source: Latrobe Valley Authority's presentation. 26 October 2021.

intensity. Up until its decommissioning in 2017, it had supplied up to 25% of Victoria's base load electricity and more than 5% of Australia's total electricity demand.

Approximately 1,000 people were employed at the Hazelwood mine and power plant[21], and with only four months' notice, the abrupt termination of the mine and CFPP operation would clearly have a significant impact on the local community. To mitigate the socioeconomic impacts of closing this local industry, the State Government of Victoria established the Latrobe Valley Authority (LVA), with the objective of supporting workers, businesses, and communities impacted by the energy transition and creating enabling conditions for economic diversification.

The role of the institution: Latrobe Valley Authority (LVA)



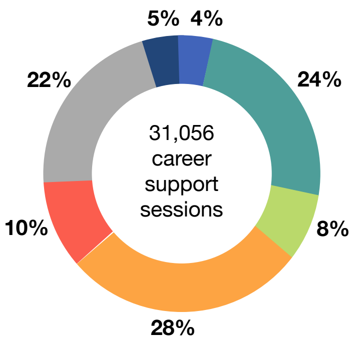


Figure 5
Training and pre-employment support sessions
Source: Latrobe Valley Authority's presentation. 26 October 2021.

Established in November 2016, the LVA was given the mandate to work collaboratively with the communities to address the effects of the Hazelwood Power Station closure. With a $266 million investment from the state government and another $40 million from the federal government, LVA and four other local organizations (Gippsland Trades and Labour Council, Gippsland Employment Skills and Training, Workways, and TAFE Gippsland Skills and Jobs Centre Morwell) in the Worker Transition Service (WTS) conducted trainings and provided pre-employment support on top of the economic stimulus to be provided to 854 affected workers and family members (Figure 5). Both the state government and LVA expected the program to create a sense of community ownership built on their collective effort, thus strengthening the community's long-term resilience and averting a situation where they become dependent on subsidies.

Transition Stages

In order to create community ownership, the LVA worked together with the locals throughout the transition period, which proceeded with multiple stages. The **immediate response** stage consisted of providing personalized support for workers and economic stimulus for businesses and individuals. During this stage, the LVA initiated a co-design approach with the employees to gain a deeper understanding of their needs and to enable an employee-led transition (Figure 6). After ensuring the closure does not heavily disrupt the local economy and their livelihoods**, the recovery and**

capacity building stage came into play. In this stage, the LVA was able to identify capacity needs from workers and better understand the job market in the area, enabling them to improve the workers' skills and match the labour supply with demand. Furthermore, the LVA worked closely with 150 community associations to increase their participation in the transition. Lastly, the **regional growth and transformation** stage aimed to establish a sustainable collaborative system that could maximize the area's competitive advantage beyond coal-fired power plants. This goal is made possible by conducting training and establishing an education system that is focused on skills that will be required in future growth industries, i.e., energy, food and fibre, health and wellbeing, and tourism.[22]

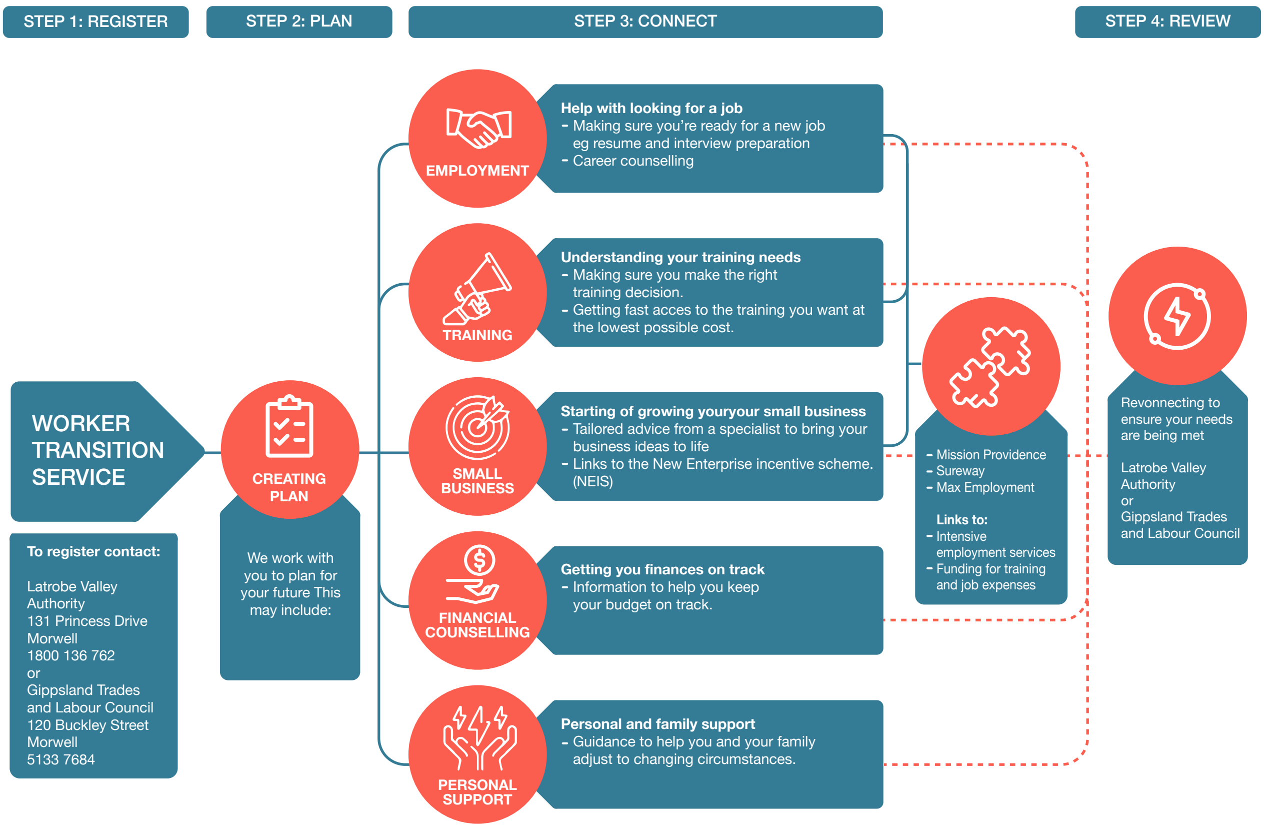


Figure 6
Worker transition service co-design approach
Source: Latrobe Valley Authority's presentation. 26 October 2021.

Since the Hazelwood mine and power plant closure, the LVA has contributed to the creation of more than 4,000 jobs in the region through the WTS. These workers were supported by the LVA to obtain work-related qualifications in various job sectors, such as engineering and manufacturing, sports, and healthcare.[23] The LVA also facilitated employees in their efforts to obtain other employment in the energy and utilities sector through the Worker Transfer Scheme. This scheme is designed to assist former Hazelwood workers who are already skilled in the energy sector to be recruited by

other power generator companies in the Latrobe Valley. Approximately 75% of former Hazelwood employees were already re-employed or retired. Using the $266m support package, the LVA successfully provided support to businesses, workers, and the community. Some of these achievements include benefits for:

Workers

- 90 workers transferred to other power stations
- The Access New Industries Program was launched to help workers with customized training for entry into jobs in growth industries
- 51 participants in Ladder Step-Up program
- 1,485 clients supported by the Worker Transition Service
- 1,368 loans provided through Good Money on no or low-interest

Businesses

- 900 jobs supported by the Economic Facilitation Fund ($10 m)
- 1,263 businesses receiving incentives under the Economic Growth Zone
- 1,436 jobs supported by Back to Work program
- 1,040 businesses signed up to Gippsland Business Connect

Community

- $20 million for community funding supporting 232 projects
- 1,000 home energy upgrades
- 350 participants in 13 Youth Space programs

Figure 7
Benefits for workers, businesses, and the community from LVA's programs
Source: Latrobe Valley Authority's presentation. 26 October 2021.

Key Takeaways

The energy transition is like snowflakes: there is no 'one-size fits all' solution. The two cases of energy transition in Germany and Australia provide insights on the major challenges and solutions to implement a just coal phase-out process.

Germany was driven by its commitment to reducing the carbon-footprint of its energy systems and reducing dependence on coal, while pushing ahead with upscaling RE. To secure clean and safe energy supplies, Germany has decided to phase out nuclear energy and coal. With that, Germany has become one of the global pioneers in restructuring its electricity supply from fossil fuels towards renewable energy sources. The restructuring is not merely due to their Paris Agreement commitment to limit global warming to 2° Celsius by 2100, but also to reduce their dependence on energy imports as well as strengthen the domestic economy and local value creation through renewable energy.

Australia demonstrated the importance of working with affected communities to counterbalance negative socio-economic consequences. The role of the LVA is crucial to ensuring there is no disconnect between the Victorian government and the local communities. The transition from the Hazelwood decommissioning might not have been as successful if the Australian government had provided the economic stimulus directly to the affected community without any programs aimed at strengthening the Latrobe Valley workers, businesses, and community for long term resilience, such as those implemented by the LVA. The LVA's cooperation with other local organizations in the WTS also proved to be imperative in increasing the community's sense of ownership.

In summary, the following elements have been identified as crucial to the success of a coal phase-out:

Strong political will and financing instruments to accelerate coal phase-out

Germany's Coal Commission involved various stakeholders to deliver an action plan to phase out coal-fired power plants and to develop a proposal for structural change. Their 9 months of intensive work included plenary meetings, expert-hearings on various topics, and visits to the affected regions. In addition to that, the Federal Ministry allocated 40 billion euro for the period until 2038 to support structural change efforts in the affected regions. However, these figures may be adjusted in the coming years since the new government recently accelerated the coal exit target to 2030.

Suitable market design and phase-out mechanism

During the coal phase out process, the government should incentivize the deployment of renewable energy to increase its competitiveness, thereby driving the coal phase-out process and prompting RE innovations. These market forces may lead to accelerated coal phase-out targets. The auction for hard coal and the negotiations for lignite power plants, such as those observed in Germany, provided an important lesson for the government to design a phase-out mechanism that is suitable for the country's power sector landscape.

Smart technological solutions

Continuous technological innovations are a basic requirement to address technical challenges pertaining to flexibility and stability during the coal phase-out process and the parallel shift towards RE comprising an 80% share by 2030. To do so, TSOs and utility providers need to be proactive in devising a roadmap and strategies to support the government's target. As coal-fired power plants in Germany are phased out, the electricity generation from gas will become more important in the provision of more baseload power, increasing the need to shift to cleaner fuel sources such as green hydrogen.

Community Dialogue and "Just" Transition

Within Australia, the Victorian government became a champion of a just energy transition by establishing the Latrobe Valley Authority. Despite having the second largest lignite reserve in the world, the Victorian government invested approximately a quarter of a billion dollars to ensure the former coal mine and power plant workers undergo an equitable and sustainable transition. The transition is made possible by the LVA's consistent engagement with the community to co-design a sustained life beyond coal. The localized and personalized approach is a unique strategy that Indonesia can adopt from the Latrobe Valley. Economic diversification and transition toward expanding job sectors need to be undertaken based on the strengths and opportunities in the local context. Only then will the local community develop the resilience to support the national goal of a just energy transition.

References

[2] International Energy Agency. 2021. Greenhouse Gas Emissions from Energy: Overview.

[3] International Energy Agency. 2021. *Coal 2021: Analysis and forecast to 2024.*

[4] Ministry of Energy and Mineral Resources. 2021. *Handbook of Energy & Economic Statistics of Indonesia 2020.*

[5] Central Bureau of Statistics. (n.d.) *Kapasitas Terpasang PLN menurut Jenis Pembangkit Listrik (MW)*, 2018-2020.

[6] Widodo, G., Agnevia, R., Jasa P., W., Setyadi, K., Harnass, R., Yoga P., Nicko, Pramono, R.,Murdiati, S., Sintawati, F., Mustika, H. Wardah, M., Candrikawati, M., Wulandari, F., Perdana, G., Hasanah, A., Wirawan, H., Kurnianingsih, A., Stevi P., A., Duantito, R., Setyanda, Y. 2021. *Lakin Triwulan III Ditjen EBTKE 2021*. Ministry of Energy and Mineral Resources, Directorate General of New & Renewable Energy and Energy Conservation.

[7] Ministry of Environment and Forestry. 2021. *Laporan Inventarisasi Gas Rumah Kaca (GRK) dan Monitoring, Pelaporan, Verifikasi (MPV) 2020*.

[8] Government of Indonesia. 2021. *Updated Nationally Determined Contribution for the Republic of Indonesia.*

[9] Appunn, K. 2018. *Germany's three lignite mining regions. Clean Energy Wire.*

[10] Appunn, K., Haas, Y., & Wettengel, J. 2021. *Germany's energy consumption and power mix in charts. Clean Energy Wire.*

[11] Statistik Der Kohlenwirtschaft e.V. 2021. *Data overviews on hard coal and lignite in Germany.*

[12] ibid.

[13] Eckert & Nasr. 24 November 2021. Germany hits renewable accelerator, targets coal exit by 2030. Reuters.

[14] Brown, S. 8 December 2020. *German State Awards 317 Million to Loss-Making Coal Plants. Ember.*

[15] Zähringer, M. 1 December 2020. *Result of the first German coal phase-out auction are in.* Frontier Economics.

[17] State Government of Victoria. 2 June 2021. *Coal*. Earth Resources. Retrieved 25 March 2022

[18] Department of Industry, Science, Energy and Resources, Australia. 14 September 2021. *Australian energy mix, state and territory.* Australian Energy Update 2021.

[19] Parliament of Australia. 28 November 2016. *Retirement of coal fired power stations.* Environmental and Communications References Committee

[20] International Energy Agency. 2020. *Average CO^2 intensity of power generation from coal power plants, 2000-2020*. IEA, Paris.

[21] Cain, K. (n.d.) *Redefining the role of government in community transition.* Chief Executive Officer, Latrobe Valley Authority.

[22] State Government of Victoria. 2022. *Latrobe Valley Authority – About.* Retrieved 25 March 2022.

[23] State Government of Victoria. 9 December 2021. *New Latrobe Valley Authority CEO appointed* [Press Release].

About CASE

The programme “Clean, Affordable and Secure Energy for Southeast Asia” (CASE) is jointly implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH and international and local expert organisations in the area of sustainable energy transformation and climate change: Agora Energiewende and NewClimate Institute (regional level), the Institute for Essential Services Reform (IESR) in Indonesia, the Institute for Climate and Sustainable Cities (ICSC) in the Philippines, the Energy Research Institute (ERI) and Thailand Development Research Institute (TDRI) in Thailand, and Vietnam Initiative for Energy Transition (VIET) in Vietnam.

Funded by the German Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV), CASE aims to support a narrative change in the region’s power sector towards an evidence-based energy transition, in the pursuit of the Paris Agreement goals. The programme makes use of available research initiatives while generating new evidence grounded in local realities that can influence economic managers, power sector decision makers, industry leaders and electricity consumers to support early, speedy, and responsive strategic reforms in the power sector. To reach this objective, the programme applies a joint fact-finding approach involving expert analysis and dialogue to work towards consensus by converging areas of disagreement.

Furthermore, CASE is an aligned programme of the Energy Transition Partnership (ETP), an alliance of international donors, philanthropies, and partner governments established to accelerate energy transition and to support sustainable development goals in Southeast Asia.

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