POLICY BRIEF

Making the Leap

The need for Just Energy Transition Partnerships to support leapfrogging fossil gas to a clean renewable energy future

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Just Energy Transition Partnerships (JETPs) are a new funding model created to help South Africa, Indonesia, India, Vietnam, and Senegal transition away from fossil energy and toward clean energy in a way that also addresses social issues associated with such an energy transition. They are also expected to leverage parallel investments in the energy systems of the JETP countries. While there is pressure from some of the JETP countries to make a bridging transition to gas, this is technically unnecessary, economically disadvantageous, and dangerous for the climate. Each of the JETP countries has significant solar and wind resources they should be supported to develop. JETPs need to support a direct transition to clean energy that provides signals to the wider investment community that participating governments are committed to a global clean energy transition.

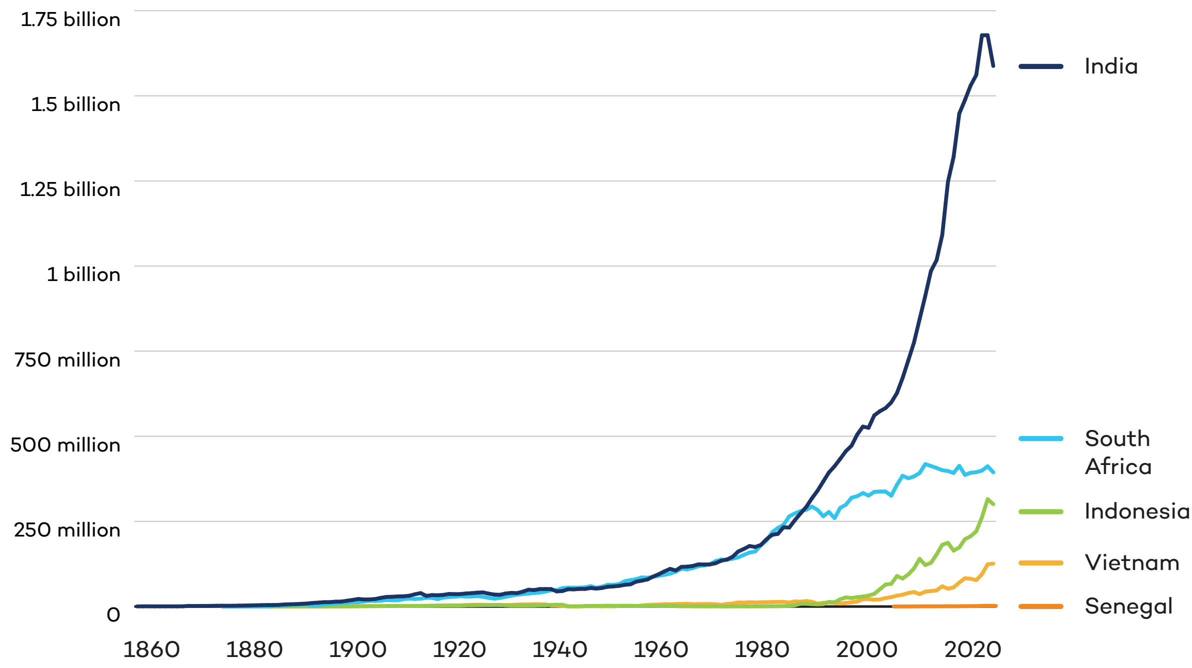
Introduction

Just Energy Transition Partnerships (JETPs) are a recently launched financing cooperation mechanism that was originally conceived to help heavily coal-dependent emerging economies make a just energy transition away from coal that also addresses the social consequences of the transition, including training and alternative job creation for affected workers and new economic opportunities for affected communities.

The first such partnership was announced in 2021 at the 26th United Nations Climate Conference (COP 26) in Glasgow, when South Africa was promised USD 8.5 billion in financing by the governments of the United Kingdom, the United States, France, Germany, and the European Union (United Kingdom et al., 2021). The *G7 Leaders' Communiqué* (2022) announced a second tranche of JETPs, with India, Indonesia, Senegal, and Vietnam named as the next beneficiaries of the approach. Multilateral development banks, national development banks, and development finance agencies are now actively engaged in the International Partnership Group (IPG),[1] the JETP donor coordination group.

Although it was initially thought that JETPs would facilitate the transition away from coal specifically, the inclusion of Senegal, which is not a significant coal user[2] compared to the other JETP countries (Figure 1), has broadened the scope of the JETPs so that they now have the potential to apply to all fossil fuel-dependent countries.

Figure 1. Annual CO_2 emissions from coal in the five JETP countries (in tonnes)



Source: Andrew et al., 2021; Our World in Data, 2021a.

JETPs are a potentially promising approach if their implementation follows the right principles. They are meant to be country-led, allowing each country's expert knowledge about its own circumstances to guide investment planning (Box 1). The South Africa Declaration (United Kingdom et al., 2021) is also explicit in placing the JETP at the service of achieving "the most ambitious target possible within South Africa's Nationally Determined Contribution," placing it firmly in the context of the fulfilment of the United Nations Framework Convention on Climate Change (UNFCCC) and the Paris Agreement. They also require effective coordination between the donor partners to deliver packages of measures that successfully facilitate a just energy transition. Another factor that makes JETPs interesting beyond traditional climate finance is the explicit focus on a **just** transition, an explicitly social

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[1] The November 2, 2021 *Joint Statement: International Just Energy Transition Partnerships* acknowledged "that sustainable financing from developed countries, multilateral institutions and investors is required to enhance support for South Africa's transition" (United Kingdom et al., 2021).

[2] In 2020, Senegal produced 1.93 million tonnes of carbon dioxide ($MtCO_2$) emissions from coal compared to India's 1.59 $BtCO_2$, Indonesia's 300.52 $MtCO_2$, South Africa's 394.05 $MtCO_2$, and Vietnam's 126.08 $MtCO_2$ (Our World in Data, 2021a).

and forward-looking concept that needs to be understood in terms of wider metrics than the "tonnes of CO_2 equivalent" that serve to measure progress on mitigation alone.

Box 1. Reference to JETPs in the G7 Climate, Energy and Environment Ministers' Communiqué

The G7 Climate, Energy and Environment Ministers' Communiqué referenced the JETPs, stating,

> …in line with the concept of just transition, we will collaborate with partners to advance ambitious Just Energy Transition Partnerships with developing countries and emerging economies that seek to significantly raise their climate ambition and accelerate their transition to a net zero pathway, in a manner that is consistent with keeping a limit of 1.5 °C temperature rise within reach… developing and implementing a country-led, accelerated, sustainable and socially just energy transition that contributes to net zero emissions, strengthened NDCs, and sustainable societies and economies that are aligned with the Paris Agreement and support the 2030 Agenda, considering each country's specific situation… The partnerships will act as a catalyst to encourage and facilitate relevant regulatory reforms, mobilise finance and achieve tangible mitigation outcomes at scale. They will promote the alignment of finance with the long-term goal of the Paris Agreement while ensuring the conditions for affected workers and communities to thrive in a net zero carbon economy.

JETPs are a new approach and are still very much in the process of evolving; they are being created through ongoing experience rather than having been designed upfront. This means it is still uncertain how the process will work in each country, including how to meaningfully engage with external audiences and stakeholders that have a critical role in helping the JETPs be successfully accepted and effectively implemented. Civil society groups have criticized the lack of transparency of the first-ever JETP, in South Africa (Halsey, 2022; Wemanya & Adow, 2022). There is uncertainty, too, about the scope of actions the JETPs will support, although it seems likely to be different for each country. From the South Africa Declaration (United Kingdom et al., 2021), it is clear that South Africa seeks "new economic opportunities such as green hydrogen and electric vehicles amongst other interventions."

Some have suggested that JETP finance might be used to support investments in gas power as an alternative to coal. For example, the first stated objective of South Africa's electricity utility Eskom's vision of the just energy transition is to accelerate "natural gas options as an enabling fuel" (Eskom, 2021).

This briefing argues that shifting from coal to gas power, or indeed any other fossil investment, does not constitute a sustainable transition and would prevent the JETPs from achieving political, economic, technological, and environmental goals. Investments in gas now would simply delay the transition to clean energy in JETP countries and would, in turn, necessitate a second round of JETPs to achieve what could—and should—have been achieved the first time around. JETPs also have the opportunity to send clear signals to the wider investment community about partnership governments' commitment to a clean energy future. Arguments related to gas price volatility, the availability of cost-effective clean energy alternatives, the high renewables potential in JETP countries, the risk of fossil investments leading to stranded assets, and the climate risks associated with CO_2 and methane emissions associated with gas use all favour the JETP coal phase-out being seen as an opportunity to leapfrog gas power and facilitate a transition to using sustainable renewable energy. This will need to be done in a way that addresses the social aspects of the transition at the national, community, and individual levels so that JETPs (and indeed all public financing for energy) are indeed a bridge to a near-zero-carbon, resilient, and socially just future.

Fossil energy is subject to price volatility while renewables provide greater security against external shocks.

Fossil gas prices are volatile, affected by such factors as political tensions, weather changes, supply (whether that means a state's own production levels or the availability of imports), gas storage availability, technical bottlenecks related to infrastructure failures, and market information (U.S. Energy Information Administration, 2003).

The recent unprovoked invasion of Ukraine by Russia has shown that geopolitical events beyond a country's control can also cause significant global fossil gas price volatility. On February 25, 2022, European gas prices surged by 50% day-on-day in response to the invasion, which in turn supported a 30% rise in Asian liquefied natural gas (LNG) spot prices (International Energy Agency [IEA], 2022a). The IEA (2022a) further noted that "natural gas prices are expected to remain extremely volatile in the current context of market uncertainty." Although the European Union's (EU's) 27 member states consume only 9.8% of global gas—3966 TWh in 2021 (BP, 2022)—about 40% of that supply comes from Russia (European Commission, 2022), and its dash to divest from Russian supplies has resulted in rises in gas prices globally.

A country's reliance on internationally sourced energy therefore means that it is subject to the vagaries of international political and market impacts on fossil gas prices in a way that it would not be if it were using its own renewable energy resources. Even if a country has access to its own fossil gas reserves, unless it is a supplier on a scale significant enough to impact the global price of gas, this does not buffer it from the volatility of the global markets (UK Climate Change Committee & National Infrastructure Commission, 2022).

In contrast to international gas markets, coal markets operate mostly at the national level. South Africa, Indonesia, India, and Vietnam source a large proportion of their coal domestically (BP, 2022). As a result, their economies are currently less exposed to the price volatility of the international gas markets than EU countries. However, an energy transition using gas would expose their economies to the types of volatility and high prices currently being experienced by European countries, which has led to a cost-of-living crisis. Such exposure in JETP countries could undermine the 'just' part of the transition. Instead, a transition directly to clean energy would forestall this, providing an economically secure source of energy, as well as avoiding a two-step transition to the climatically imperative clean sources of energy.

Because of the high global gas prices resulting from the Ukraine crisis, the International Renewable Energy Agency (IRENA, 2022) estimated that the renewable power added in 2021 alone saved around USD 55 billion in global energy generation costs in 2022. In developing countries, such as the JETP countries, cost savings on energy are important to further facilitate sustainable development, both in providing scope for enhancing energy access and for other essential development priorities, such as education and health care.

Renewable alternatives are cost-competitive, create jobs, and can be deployed at scale.

Renewable energy systems are a credible alternative to gas.

In 2021, global solar photovoltaic (PV) generation increased by 22% to 179 TWh to exceed a total of 1,000 TWh (IEA, 2022b). Similarly, global wind energy generation saw a rapid expansion of 17% to 273 TWh in 2021 (IEA, 2022b), but 7,900 TWh by 2030 is needed to achieve the IEA net-zero scenario, requiring much greater deployment of capacity (IEA 2021a). Clean renewable technologies are available; the challenge for meeting climate goals is deploying them at the scale needed, and JETPs can support this.

Renewable energy is already cost-competitive compared to gas in many places (Forster et al., 2022). IRENA (2021) found that 62% of new renewables added in 2020 had lower costs than the cheapest new fossil option. The rapid rise of fossil gas prices as a result of Russia's invasion of Ukraine, precipitating users seeking alternative sources of gas, has made renewables an even more economically attractive proposition.

IRENA (2022) noted that in 2021, onshore wind costs fell by 15% and costs for solar PV and offshore wind both fell by 13%. It also noted that "2/3 of newly installed renewable power in 2021 has lower costs than the cheapest fossil-fuel fired option in the G20."

Recent research by Way et al. (2022) concluded that "compared to continuing with a fossil fuel-based system, a rapid green energy transition will likely result in overall net savings of many trillions of dollars—even without accounting for climate damages or co-benefits of climate policy."

Another benefit of transitioning to renewable energy is the job creation potential, an important element of the "just" part of the JETPs, especially if current coal workers can be trained for new renewables jobs and new industries can provide new economic opportunities in coal communities. India and Vietnam are already in the top 10 countries worldwide for employment in the renewables industry. India's on-grid solar provides an estimated 137,000 jobs, up 47% from 2020, and off-grid provides another 80,600 (IRENA & International Labour Organization, 2022). In addition, South Africa has doubled its cumulative direct employment from 31,207 job-years in 2016/2017 to 63,291 by Q3 of 2021 through its Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) (IRENA & International Labour Organization, 2022). A Global Wind and Energy Council (2022) study found that under a green development scenario, South Africa had the potential to create 37,000 full-time-equivalent jobs in wind energy.

Comparing fossil fuel employment creation with that of renewables and energy efficiency, the United Nations Industrial Development Organization and the Global Green Growth Institute (2015) found that for Indonesia and South Africa, an investment of USD 1 million in fossil fuels generates 22 and 33 jobs, respectively. In contrast, investing the same amount in clean energy generates 103 and 66 jobs, respectively.

Concerns about the security of supply from renewable sources may become more significant as renewable use increases—what can be done if the sun is not shining or the wind is not blowing? Gas is often cited as an option to cope with intermittence; however, clean technologies combined with storage are more affordable than peaking gas power plants, and more efficient combined cycle gas turbine plants are designed for fairly constant use, making them unsuitable for playing a balancing role on the grid (Lazard, 2020). Integration of up to 10% variable renewable energy, such as wind and solar, into existing grid management is reasonably straightforward (IEA 2019, 2020d), though none of the JETP countries has so far reached this level of penetration with these technologies.

Variability can further be addressed by energy storage and temporal demand management. In some mountainous geographies, pump storage may offer means of energy storage, but battery storage is currently the most rapidly innovating and widely applicable option. This technology has benefitted from much research and innovation in recent years. On-grid, batteries can respond more rapidly to demand shifts than other storage or generation technologies, as they can be turned on or off in fractions of a second (Australian Renewables Energy Agency, 2022). Batteries have the flexibility to be deployed in small-scale energy systems on a building or community level or at the state level. Managing demand can be achieved by pricing incentives to increase or decrease demand as required at known times: this is increasingly common for large electricity users, and some countries are extending this to smaller-scale consumers (Muttitt et al., 2021).

The JETP countries each have considerable wind and solar potential, and developing this, alongside energy storage, can contribute to a truly clean energy transformation that contributes to net-zero emissions, unlike investments in fossil gas. The case is made even stronger as battery prices fall rapidly year on year: they have fallen 97% since 1991, when they were first commercially introduced (Ziegler & Trancik, 2021).

JETP countries have high renewable energy potential.

The first tranche of JETP countries all have significant potential for wind and solar PV power. This is important as, at a global level, the addition of wind and solar capacity needs to increase by an average of 18% and 19%, respectively, annually between 2020 and 2030 to align with 1.5°C Paris Agreement goals (Bois von Kursk & Muttitt 2022). Growing renewable capacity also creates a clear, practical opportunity for investment in leapfrogging straight to clean energy.

South Africa has abundant wind and solar resources, which, in addition to all the arguments against using gas as a bridging fuel, make a strong positive case for donors to support the country in leapfrogging to a sustainable renewable energy future. Analysis by IRENA (2020) found that South Africa could “realistically, and cost-effectively, supply 49% of its electricity mix from renewables by 2030, nearly a third higher than the share to be expected from current plans and policies." Factoring in heating and fuels, wind and solar could supply 23% of South Africa's total energy needs by 2030, broadly consistent with the goal in the country's Integrated Resource Plan (2019) of wind and solar contributing 24.1% of its energy annually (Department of Mineral Resources and Energy, 2019). Currently, however, renewables make up 5.5% of the energy mix, with wind accounting for only 2% and solar PV accounting for 1% (Akinbami et al., 2021). A transition from coal to gas, as advocated by South Africa's public utility Eskom (2021), which supplies 95% of the country's electricity (Department of Public Enterprises, 2022), should not be considered as part of any just energy transition.

IRENA (2017) similarly found considerable potential for renewable resources in Indonesia and an opportunity to exceed both its 23% by 2025 and 31% by 2050 renewable energy use goals. In fact, the report found that the 2050 target could be realistically met by 2030 but would need USD 16 billion in investments through to 2030. Indonesia's non-fossil fuel electricity is dominated by hydro (6.8% of generation in 2020), geothermal (5.4%), and biofuels[3] (4.7%); wind provided only 0.16%, and solar's contribution was statistically negligible (IEA, 2020a). The energy transition challenge for the JETPs in this country is expanding the scale of sustainable renewables.

India is already moving rapidly to make use of its solar potential: in fiscal year (FY) 2021/2022, a record high of 15.5 GW of new renewable capacity was added, including 13.9 GW of solar. India has installed renewable capacity of 110 GW, but with more than 1.2 billion people to provide for (World Bank 2021a), more supply will be needed. Support will be essential to retrain and find new jobs for the 272,445 employees of Coal India Ltd (2022), other informally employed people in the coal sector, and communities affected by the transition in order to achieve a just energy transition.

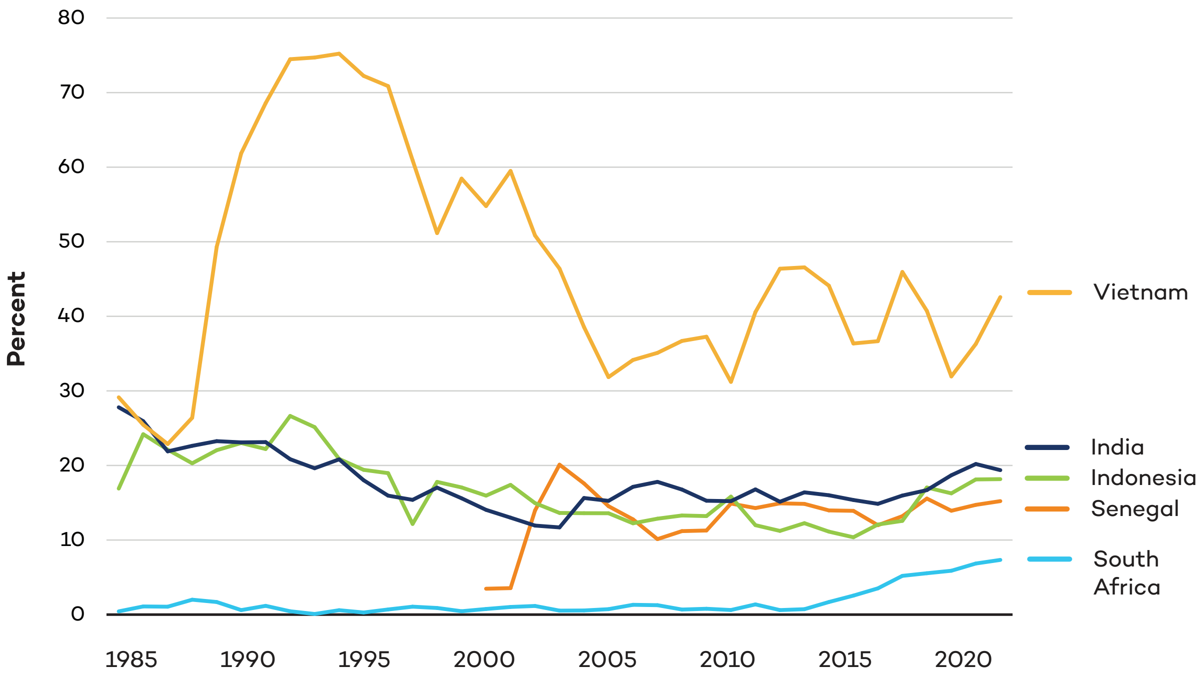
Vietnam also has rapid energy demand growth: it increased at an average rate of 10% per annum in the period 2014-2019. It also has considerable potential for renewable energy: 4–5 kWh per m^2 of solar and 3,000 km of coastlines with consistent winds in the range 5.5–7.3 m/s (McKinsey, 2019). Vietnam has been investing in renewables, with a notable power generation growth rate in 2021 of 137% for solar and 123% for wind (BP, 2022). The electricity mix remains dominated by coal (50.1%), fossil gas (17.9%), and hydro (27.9%) (IEA 2020b).

Senegal's energy transition will require transitioning away from 75.1% of electricity generation from oil. Financial support from the JETP and other sources will be needed to instead deploy sustainable renewable sources of energy (IEA, 2020c).

Figure 2 outlines the levels of penetration of renewable electricity in the JETP countries, showing both the scale of the different transition challenges and the mismatch between potential and realization. This data is not limited to wind and solar but also includes other sources that are not the focus of this briefing; it still shows that there is a major transition needed in each JETP country away from non-renewable energy sources.

[3] Many studies have questioned, however, the sustainability of biofuels; see, for example, Jeswani et al., 2020.

Figure 2. Share of electricity from all renewable sources for South Africa, Indonesia, India, Vietnam, and Senegal



Source: Our World in Data, 2021b.

Low-cost options for higher levels of penetration, such as for Vietnam, India, and Indonesia, include better forecasting for supply and demand, more sophisticated grid management, and improved power market design. As penetration increases, demand management and increasing the ramping responses of existing flexible power stations offer medium-cost options, and incentivizing consumer behaviour to reduce demand peaks can also aid in addressing the intermittency of supply (Muttitt et al., 2021).

Renewable energy is better suited to meeting energy access needs.

JETP countries still have significant numbers of people lacking access to electricity: even where access rates are high, the absolute numbers are still significant. In South Africa in 2020, 9.4 million people—or 16% of the population—lacked access to electricity. In Indonesia, the number is 8.6 million people—3.1% of the population. India's large population means that although electricity access penetration rates are high overall at 99%, 13.8 million people still lack access to electricity, and those with electricity access have poor supply quality. All of Vietnam's population has access to electricity, while 5.1 million people in Senegal (29.6% of the population) lack access to electricity (World Bank 2021a, 2021b).

To "ensure access to affordable, reliable, sustainable, and modern energy for all" (United Nations Department of Economic and Social Affairs, 2015), there are three main options: (i) extend the grid, (ii) install mini-grids at the community level, or (iii) install off-grid power at the household level. CAFOD (2016) notes that while grid extension is the cheapest option for urban households, 87% of those without electricity access globally are rural dwellers. It also estimates that for 70% of these households, either mini-grids or home systems are cheaper. Renewable energy is ideally suited to meet this unmet need, as it is modular and can be deployed at the scale required. It can also provide access where extending the grid would be a far more expensive proposition: exactly in the remote areas where the energy access need is greatest (Muttitt et al., 2021). This remote service is presently needed in all of the JETP countries but Vietnam.

Investment in fossil gas can lead to stranded assets, weakening economies.

As the world decarbonizes, gas infrastructure risks becoming a stranded asset by suffering from unanticipated or premature write-downs, devaluations, or conversion to liabilities (Caldecott et al., 2014), where investors or governments take losses on capital invested. As global gas demand decreases, the price will fall, potentially below the assets' breakeven point for production. As renewable energy continues to become ever cheaper and more competitive, fossil gas power stations, pipelines, and LNG terminals operate at lower utilization rates and are paid lower prices, reducing or negating returns on investment (Muttitt et al., 2021).

The energy transition is unlikely to be smooth, with infrastructure, technology, and behaviours creating tipping points or abrupt shifts from the fossil fuel status quo. These tipping points can feed off each other to create a paradigm shift in the energy system. For example, innovation and investment in new renewable-based energy systems, including mutually compatible technologies and grid management techniques, bring about the decline of fossil fuels through becoming increasingly obsolete. These assets will then need to be written down, marking the visible end of a process by which organizations have shifted strategies, prices have adjusted, and markets have adapted (Bond et al., 2020).

An analysis of South Africa found that with gas already being squeezed out by other technologies in other countries, the losses could be higher there, with stranding happening earlier in project lifetimes than in countries that already have gas power (Bos & Gupta, 2019). In 2021, gas accounted for 6% of India's total installed capacity (IEA, 2021c), but cheaper coal and renewables mean that in FY 2019/2020, gas power plants ran at only 23% of their capacity, effectively stranding 25 GW of generating capacity (Central Electricity Authority, 2020). Browning et al. (2021) found that for gas pipelines alone, India faces USD 103 billion in potentially stranded assets.

The partnerships need to work together to promote a paradigm shift into clean, renewable energy that serves the countries' populations and the global climate. Stranding of assets and the misuse of valuable economic capital through misplaced investments in fossil fuel infrastructure, including for fossil gas, can be avoided through investing in the technologies of the future to create energy systems that leapfrog fossil technology and put in place infrastructure that is better future-proofed.

There is no room for new gas infrastructure in 1.5°-consistent pathways.

Analysis by Bois von Kursk et al. (2022) found that "global gas power generation capacity should decrease by more than 55% by 2035 compared with 2020 levels" and that the generation of electricity from all unabated gas power plants needs to decrease by about 95% by 2040 in order to try to limit global heating to 1.5°C. Their analysis found that current forecasts for new gas power infrastructure in operation, development, or planning would not be consistent with the 1.5°C Paris Agreement goal. This implies that any additional new plants would either lead to exceeding 1.5°C or result in stranded assets: gas plants typically have life spans of about 30 years. These stranded assets would be on top of the existing infrastructure that would have to be decommissioned for the 1.5°C goal to be kept within reach. Carbon capture and storage retrofitting might provide an alternative to stranding power plants, although this would require additional investment that could otherwise be directed into clean energy.

Instead, the JETPs represent an opportunity to contribute to funding the needed investments to keep the 1.5°C climate goal within reach. Investing in gas could have the opposite effect. Even though renewables are generally cost-competitive, additional fossil gas can displace renewable energy as well as coal (McJeon et al., 2014; Zhang et al., 2016). In Egypt, for example, even though renewables are cheaper, their development has been stalled as investment has instead flowed into gas.

Fossil gas production and transport contribute to methane emissions.

It is not just the use of fossil gas, which is mainly methane, that leads to emissions: its production and transportation, including through pipelines and at LNG terminals, inevitably lead to accidental fugitive emissions. The Intergovernmental Panel on Climate Change (2022) noted that "fugitive CH_4 emissions from oil, gas, and coal, accounted for 5.8% of GHG emissions in 2019." Methane is 82.5 times more potent than carbon dioxide over a 20-year time horizon (Forster et al., 2022).

Fossil gas emits 50%–60% less carbon dioxide if combusted in an efficient natural gas power plant compared to a typical new coal plant (Energy Information Administration, 2020), but this advantage is partly or fully offset by methane leakage throughout the gas supply chain. Methane losses must be lower than 3.2% for natural gas power plants to have lower life-cycle emissions than new coal plants over a 20-year time horizon (Alvarez et al., 2012). Using fossil gas as a bridging fuel therefore continues to exacerbate the climate crisis, even at a time when clean energy sources are available: 22% of global carbon dioxide emissions result from fossil gas (IEA, 2021b).

Additionally, methane emissions contribute to tropospheric air pollution by being involved in the creation of ozone, a pollutant that is responsible for hundreds of thousands of premature lung-related health problems and deaths every year (World Health Organization, 2021). Coal causes more air pollution than fossil gas; in addition to methane being released from coal mines, its combustion creates fine particulate matter that has additional health impacts.

Wind and solar power do not produce such health-harming emissions. The United Nations Environment Programme (2021b) found that reducing human-caused methane emissions by around 45%, or 180 million tonnes, per year by 2030 would "avoid nearly 0.3°C of global warming by the 2040s and complement all long-term climate change mitigation efforts. It would also, each year, prevent 255 000 premature deaths, 775 000 asthma-related hospital visits, 73 billion hours of lost labour from extreme heat, and 26 million tonnes of crop losses globally."

Conclusion

JETPs are a promising approach that have the potential to look more holistically at wider sustainability issues, including social and socio-environmental issues such as air pollution and quality job creation, around the truly just transition of a country's energy system. They also have the possibility of sending signals to the wider investment community that partnership governments are committed to creating clean energy systems.

JETPs can only be successful if they take the opportunity to help countries leapfrog from the fossil-fuelled era to an energy system that uses modern, clean, and renewable energy. A transition using gas would expose JETP countries to the volatility and insecurity of the global gas markets instead of providing an opportunity to develop their own domestic renewable resources and would require a second future transition to clean energy. This approach would create obvious risks for a country's sustainable development.

Renewables are already cost-competitive with fossil gas in many markets and have been so for many years for providing energy access to populations in more remote areas that are not on the grid—an important feature of a just energy transition. And the prices of key renewable technologies—especially solar PV and wind—continue to fall. Each of the JETP countries has significant demonstrable renewable potential—and this is a key element the JETPs should be helping to realize, not least to avoid stranded energy assets and more economy-wide strandings through maintaining or developing economic, political, social, or legal systems designed to be compatible with fossil fuels rather than renewables.

Climate change remains the greatest imperative for action. Building new gas infrastructure could put the 1.5°C Paris Agreement goal out of reach, leading to profound climate damage in JETP and other countries. New gas power would only make the global transition even more difficult and expensive than it already is.

The future needs to be fossil-free, and JETPs have the potential to contribute to achieving this vision, if JETP country leaders commit to realizing this vision for their countries and the donor countries use their taxpayers' money wisely.

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