Navigating the Energy Transition in *Brazil*, *Indonesia* and *South Africa*

A POLITICAL ECONOMY SNAPSHOT OF ENERGY SECURITY INSIGHTS

Jeongha Ju, Genevieve Marsh, Sebastian Kiecker

Brazil, Indonesia and South Africa – three pivotal emerging economies – are increasingly focusing on clean energy to enhance national and local energy security alongside the historic reliance on fossil fuels.

National conditions mean that for each of them a different aspect of energy security prevails when evaluating clean energy options: diversification for Brazil, economic development for Indonesia and distributional aspects for South Africa. Still, this is balanced with other complex structural and political economy constraints around energy security. Understanding this balance can unlock pathways for a faster energy transition that delivers upon national energy security priorities.

In this briefing, we provide a snapshot of political economy insights relating to dynamics around energy security in Brazil, Indonesia, and South Africa, all high-emitting growing economies with significant geopolitical influence. Each of these countries has a complex relationship with the energy transition, at a crossroads of fossil fuel expansion and exploring clean energy for economic growth and future competitiveness.

While our findings do not constitute a comprehensive assessment of each country's energy security landscape, nor a complete comparative analysis, they demonstrate the importance of understanding country dynamics to identify opportunities and barriers for climate action. The differences across these countries highlight the need to embed and tailor climate action to local political, economic and social contexts. Conversely, the similarities between them suggest there is potential for applying recommendations across other similar emerging economies.

Energy dynamics in Brazil, Indonesia and South Africa

COMMON THEMES, DIFFERENT CONTEXTS

	BRAZIL	INDONESIA	SOUTH AFRICA
One dominant energy source for electricity generation exposes countries to energy security vulnerability	Hydropower. Increasingly risky as climate change impacts rainfall patterns.	Coal. Remote regions lack access to the centralised infrastructure though, and must rely on expensive oil imports.	Coal, with current system highly vulnerable to load-shedding. Coal is also a major export, but domestic issues make this uncompetitive.
Energy security is a prominent narrative that is politically important for the transition.	Defined in terms of diversification. Brazil is poised to expand both renewables and domestic fossil fuel exploration to increase its energy security.	Energy security linked to economic security. Threats include energy access, affordability, and exposure to international market fluctuations.	Politically defined by a socio-economically divided transition. Poor energy reliability more drastically impacts disadvantaged communities, but also affects the growing middle class as industrial competitiveness and thus economic development are stymied.
Clean energy presents an opportunity for **economic development** by growing the potential for new industry.	Political focus on expanding new low-carbon industries and shifting exports more upstream in the value chain in line with the energy transition.	As well as clean power ambition, expanding into new industries that are clean energy adjacent, such as the EV industry, presents an opportunity for Indonesia's economic development.	Diversifying to clean energy presents an opportunity to reduce South Africa's domestic fossil fuel consumption and would further diversify and stabilise the economy.
Powerful fossil-fuel-related interests have political influence, reinforce existing power structures and often work to slow the transition.	A dominant fossil fuel lobby advocates expanding infrastructure, preserving subsidies, and slowing regulatory reforms. The agribusiness and biofuels lobbies also reinforce current land use patterns.	Significant actors in the business sector have fossil fuel interests and connections to government. Diversification towards renewables and clean technology supply chains is happening, but slowly.	A coalition of government, state-owned utilities, local business leaders and unions protects the status quo. Many are entrenched in post-apartheid power structures that connected fossil fuels to socio-economic improvement.
High-emitting sectors are **socially entrenched** as they provide social stability and are connected to country identity and historic job security.	Wealthy landowners and agribusiness groups benefit from technologies and policies that maintain the economic returns of existing land-use patterns. Prominent oil and gas company Petrobras contributes royalties to fund social policies.	State-owned power utilities are intertwined with government power. The abundance of domestic coal has made coal foundational to energy security and independence, reinforced by subsidies and policy structures that further entrench coal as critical.	Despite the power crisis, state-owned Eskom retains trust among some groups. Coal is seen as vital for livelihoods – especially in coal-dependent regions, where the transition is perceived as a threat to economic security and inclusion.

Recommendations

Understanding the political economy of transition dynamics can lead to a faster transition and better policy design

- A low-carbon transition can be accelerated through tailored narratives of **economic development** that align with key economic growth priorities. Policymaking should also align with a country's specific short and long-term energy security priorities to make the economy more resilient to future climate and economic risks.
- A **just transition** approach for the whole economy is necessary to drive greater public support. This needs to be carefully framed around local understandings of "just" and to address existing social inequalities as well as those that the transition may exacerbate.
- Building a **domestic clean technology industry** (supported by institutional reform), that positions key sectors to remain competitive in a decarbonising global economy, is critical to unpicking fossil fuel embeddedness across a country's political economy. Policies that build resilience and incentivise the transition can also align with broader economic development ambitions.
- Capitalising on **Asian investment** (mostly China and Japan) and trade opportunities will be critical to financing the transition and realising clean technology potential in emerging economies. However, vested fossil fuel interests in external partners could also slow the transition.
- Adopting renewable energy will need to be coupled with addressing **structural issues** in the power sector (e.g. infrastructure and market model, demand management). Renewables will also need to align with government preferences for transmission and distribution (e.g. fit with models of centralisation), as there is an inherent tension between Indonesia's centralised model and ideal renewables infrastructure.

▶ Political economy analysis at E3G

Understanding the political economy of different transition dynamics can lead to more tailored and effective policy designs that align with local contexts, supporting better policy outcomes and a faster transition.

E3G conducts multidimensional political economy analysis within country contexts, using its unique Political Economy Mapping Methodology (PEMM). Through the PEMM, the climate community can identify locally specific insights, critical barriers and entry points for advancing climate action, grounded in local realities. It also allows comparative country analysis across key transition dynamics.

Full analysis of Brazil, Indonesia, South Africa and other selected countries is available through E3G's **Climate Transformation Hub**, **https://climatetransformationhub.org/**

Brazil: Diversification and domestic opportunity

Brazil's transition is finely balanced between strengthening its renewables base and pursuing longer-term economic diversification, while continuing oil and gas production that provides fiscal gains. This balance is ultimately shaped by Brazil's energy politics, with the influence of oil and gas and agribusiness lobbying groups, entrenched business interests, and political pressure to hedge across both fossil and clean energy pathways. There is significant opportunity for climate action by demonstrating how clean energy can benefit energy security and economic development.

Brazil's transition politics are driven by a focus on energy diversification, aligning with national priorities around competitiveness and energy stability. President Luiz Inácio Lula

da Silva (Lula) has brought climate action back to the centre of Brazil's developmental agenda, positioning the country as a future clean energy and neo-industrial powerhouse.[1]

The updated climate commitment sets a goal of achieving net zero emissions by 2050 and links emissions reduction to key objectives like "ensuring sustainable and affordable energy security". In practical terms, this means diversifying renewable resources in the power sector to reduce heavy reliance on hydropower, enhancing clean technology capacity, and reducing exposure to risks related to reliance on imported fossil fuel products.

As Brazil is a net exporter of oil and gas, fossil fuels play an important role in its fiscal and external balances. This creates opposing drivers: while renewables would be a pathway to reducing exposure to commodity price volatility and the structural vulnerabilities of a resource-dependent growth model, the near-term revenue and foreign currency benefits create strong incentives to sustain production. Electrification and improving grid infrastructure, and stimulating local demand for clean technology, are key in tipping the balance in favour of energy transition.

Diversification is critical but will not necessarily cement clean energy adoption

Hydroelectricity is critical to Brazil's current power mix, providing over 50% of electricity generation (Figure 1). This reliance is becoming increasingly unviable as climate change impacts rainfall patterns. Prolonged droughts have led to reduced hydroelectric outputs and elevated electricity bills, particularly in Rio de Janeiro, illustrating how energy security can be threatened by climate risk.[2] Increased demand due to expanding population and urban concentration adds urgency to the need for energy diversification and energy demand management in particular through efficient cooling.[3]

Despite intentions to increase the renewables base, Brazil faces structural challenges within its power system that constrain their adoption. Renewable generation, especially solar, is expanding faster than the grid infrastructure needed to integrate it.[4] The resulting curtailment has reduced revenues for power producers, while inadequate transmission lines and weak grid planning have compounded these bottlenecks.[5] If unaddressed, these constraints could deter future investment and limit the contribution of renewables to Brazil's energy security.

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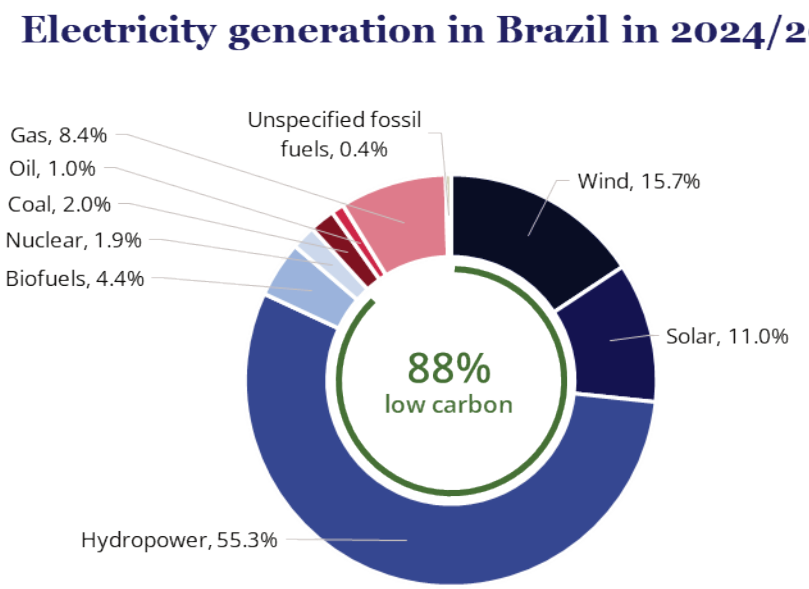
[1] Singh, A., May 2025, **Brazil: Environmental issues, policies and clean technology**, AZO cleantech

[2] GNPW Group, October 2024, **Energy crisis in Brazil: A challenge that persists until 2025**

[3] World Bank Group, August 2016, **Brazil may be the owner of 20% of the world's water supply but it is still very thirsty**

[4] Ember, September 2025, **Wind and solar generate over a third of Brazil's electricity for the first month on record**

[5] pv magazine, September 2025, **Brazil solar curtailment hits 20% as renewables strain grid infrastructure**



Source: *LowCarbonPower,* ***https://lowcarbonpower.org/region/Brazil***

Figure 1: Low-carbon energy dominates Brazil's electricity generation, largely due to hydropower.

While fossil fuels do not account for a large proportion of electricity generation, crude oil is significant to Brazil both for internal industrial usage, and as an export commodity (as the ninth largest oil producer globally in 2024).[6] Oil, along with other mineral fuels and distillation products, also accounted for 17% of Brazil's GDP in 2024.[7] Brazil's status as a major exporter strengthens its external position but also reinforces the vulnerabilities of a resource-dependent growth model and exposure to global price volatility. At the same time, Brazil depends on imports of fossil gas and refined oil products, especially in the industry and transport sectors where fossil fuels remain central. This means that, despite its exporter status, Brazil is sensitive to supply disruptions and global price swings.

In response, Brazil has long promoted domestic biofuels, particularly ethanol and biodiesel. However, this strategy cannot fully insulate the country from global price volatility or meet rising demand over time. Expanding electrification in the transport sector where possible is therefore becoming increasingly important as a complementary pathway to reduce exposure to imported fuels, strengthen energy security, and support the broader goal of economic diversification beyond commodity dependence.

Meanwhile, Brazil is still expanding fossil fuel production. Petrobras, the state oil firm, is investing heavily in new oil fields. The government claims that this revenue is essential for financing social initiatives and the green transition itself, yet only 0.16% of the national oil

[6] World Population Review, **Oil producing countries 2026** (webpage, accessed January 2026)
[7] Trading Economics, **Brazil exports by category** (webpage, accessed January 2026)

revenue was directed to the environmental and climate agenda in 2024.[8] In fact, in 2024, Brazil's fossil fuel subsidies at the federal level (production and consumption) were approximately three times larger than oil rents captured, with subsidies of ~R$47.1bn (US$8.93bn) exceeding direct oil revenues of ~R$17bn (US$3.2bn).[9]

For the moment, Lula's administration asserts that it can manage both priorities, hoping that strong climate policies and a thriving renewables sector will compensate for the emissions from any immediate oil expansion. However, expanding fossil fuel production will likely weaken incentives to develop higher-value industries and risks locking the country into a path that limits future competitiveness as global oil demand decreases due to decarbonisation. As a result, the strategic case for accelerating clean energy and expanding clean technology value-added industrial capabilities becomes even more central to Brazil's long-term economic resilience.

Incumbent interests reinforce the continuation of high-emitting activities

The dominant fossil fuel lobby further plays a significant role in nudging Brazil's focus on domestic energy supply towards furthering extractive practices. The economic weight of the oil and gas sector, combined with its importance for fiscal and external balances, gives industry actors outsized structural and political leverage. This is reinforced by well-coordinated lobbying networks concentrated around Petrobras, the national Congress, and key regulatory institutions. These networks consistently advocate for expanding pipeline capacity and LNG infrastructure, slowing regulatory reforms that would accelerate renewables deployment, and preserving subsidies and tax advantages that favour fossil production.

Agricultural interests further play a significant role. Wealthy landowners and agribusiness groups benefit from technologies and policies that maintain the economic returns of existing land-use patterns, reinforcing long-standing political influence through organisations such as the agribusiness caucus. For example, the emphasis on biofuels in the transport sector as a tool to reduce costly fuel imports and promote rural development is closely intertwined with Brazil's land-ownership patterns and resource-rent structures.

These dynamics overshadow potential progress in cleaner energy alternatives and reinforce continued reliance on fossil fuels and extractive practices. Understanding and strategically engaging with these power structures, rather than treating them as diffuse "interests", is essential for reducing fossil fuel embeddedness and supporting Brazil's broader goals of economic diversification and long-term resilience.

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[8] INESC, April 2025, **Apenas 0,16% da renda nacional do petróleo foi direcionada à agenda Ambiental e climática em 2024**

[9] INESC, 2024, **Subsídios Às Fontes Fósseis E Renováveis** and INESC, April 2025, **Renda do petróleo no Brasil**

Clean energy presents opportunities for industrial growth

Brazil recognises the potential to expand industrial growth by leveraging its clean energy advantage. Policymakers increasingly view industrial diversification and the development of higher-value sectors as essential for reducing vulnerability to global commodity cycles and achieving more stable, sustainable economic development by strengthening competitiveness and creating jobs.

Brazil is showing confidence in the ability of its renewable resources to support both its economic ambitions and energy needs. The 2024 National Energy Transition Plan reflects an effort to align energy security, industrial policy, and social objectives, with the federal government seeking to anchor job creation, industrial revival, and energy affordability within a green development strategy. Lula emphasised that this "green transition" must create jobs, spur industrial revival, and ensure energy security for Brazilians.[10]

The vision for a value-added economy centred on clean (or greener) technology includes expanding bio-based industries, scaling domestic manufacturing of renewable energy equipment such as wind turbine components, and exploring emerging sectors like green hydrogen and sustainable aviation fuels. However, many of Brazil's economic and export diversification strategies do not yet fully address the demand side of the equation. While green hydrogen and ammonia pilots at Pecém port signal industrial ambition, domestic demand remains limited, and alignment with international markets, particularly Europe, remains uncertain. For these pilots to translate into sustained industrial growth, Brazil may need to focus more explicitly on cultivating domestic demand and integrating new technologies into broader industrial strategies.

Asia–LATAM relationships can also be explored as a tool to support green industrialisation, as a surge in investments suggests that Asia-led financing will likely play a bigger role in Brazil.[11] For example, BYD is setting up a large EV and battery manufacturing facility at the site of a former Ford factory in Bahia, reflecting an investment of nearly a billion dollars that Lula significantly contributed to securing.[12] This is expected to help increase the price competitiveness of EVs on the consumer side, stimulating domestic demand. Additionally, Toyota invested 11 billion reais ($2.2 billion) to produce compact hybrid-flex vehicles developed specifically for Brazil. Batteries are to be assembled at the Toyota factory in Sorocaba starting in 2026 to equip hybrid vehicles already produced locally.[13] A further example is the Japan Bank for International Cooperation's (JBIC) $190 million loan for promoting Brazil's green hydrogen industry.

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[10] Brazilian government, August 2024, **President Lula and Alexandre Silveira launch National Energy Transition Policy, with potential R$2 trillion in investments**

[11] Japan Bank for International Cooperation, March 2025, **Sixth Credit Line for BNDES under GREEN Operations**

[12] Independent, April 2025, **As legacy of Ford fades in Brazil, China's BYD looks to extend global lead in EV sales**

[13] Bloomberg, March 2025, **Toyota Ups Its Bet on Hybrids in Brazil With $2.2 Billion Plan**

Indonesia: Energy access and affordability

Much like Brazil, Indonesia's transition priorities are closely tied to its goal of ensuring energy security and economic development, visible for example in its strategic focus on electric vehicles. Fossil fuels are entrenched in its energy matrix and critical to its political economy, including a dependence on imported oil products. Energy security and stability is highly exposed to international markets as shown by huge spending for energy-import commodity. This means that renewable energy offers more direct macroeconomic benefits than to fossil-fuel-exporting countries. Energy access and affordability are central to sustaining public support for the transition.

Indonesia, despite being one of the world's largest carbon emitters and Southeast Asia's largest economy, has assumed a regional leadership role in climate diplomacy. President Prabowo Subianto has committed to maintaining his predecessor Joko Widodo's policies and aims to expand the country's ambitions, with the country's new absolute emissions targets presenting a more ambitious goal and better transparency.[14]

While Indonesia relies on domestically produced coal for most of its electricity, it is heavily dependent on imported oil products (mostly for transportation), as well as imported gas and LPG (for domestic cooking), leaving the economy exposed to international price volatility and foreign-exchange pressures.[15] Expanding renewables and electrifying demand (e.g. through transportation and cooking) brings economic benefits including reduced import bills, improved balance-of-payments stability, and greater price resilience, and is a government priority. It is also crucial to securing affordable energy access for the country's remote regions.

However, legacy economic structures and infrastructure mean the centralised coal-based system remains entrenched. Indonesia's business sector is similarly open to clean energy investments, while maintaining its fossil fuel interests. The country's energy strategy requires alignment with critical actors – renewable energy developers, financiers, subnational governments, and other social interest groups. Attention will focus on whether Prabowo can manage the interests of coal miners and oil and gas lobbies while fulfilling the promise that green growth can also ensure inclusive growth.

[14] E3G, December 2025, **Indonesia's power sector decarbonisation post COP30**

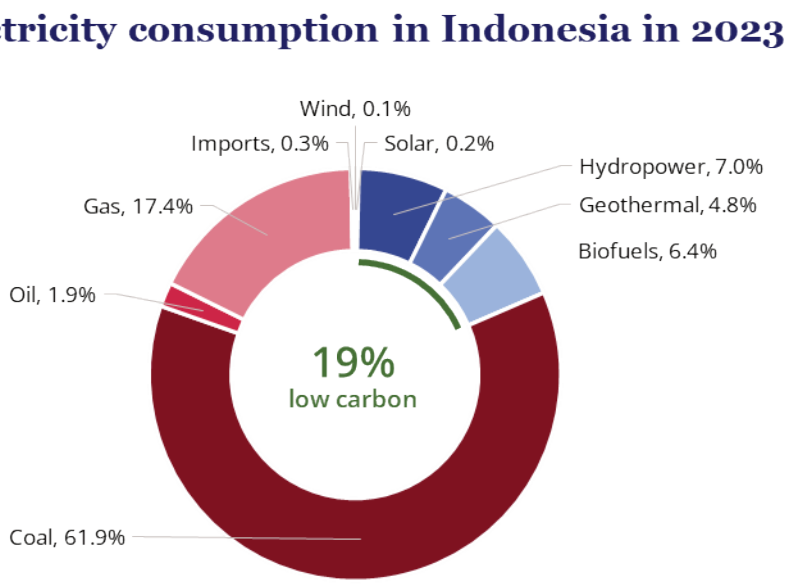
[15] IEA, **Indonesia – Energy mix** (webpage, accessed December 2025)

Infrastructure challenges present an opportunity to shift away from embedded fossil fuels

Indonesia is rich in coal, which has long been its primary energy source – still accounting for over 60% of the country's electricity consumption in 2023 (Figure 2). Subsidised coal power has driven Indonesia's growth across the country over the past few decades.

This reliance, however, creates a paradoxical energy security challenge. While coal provides national-level "affordability" and supply stability, centralised coal-based infrastructure does not extend to remote regions, which must rely on expensive oil imports. This raises electricity prices in those areas and exposes them to global price volatility, leading to significant regional disparities. Indonesia therefore has a clear need to improve energy access and affordability.

This situation is further complicated by economic structures that maintain coal's dominance, including subsidies and domestic market obligations for coal producers.[16] The centralised grid infrastructure gives the government greater control and coordination, whereas a flexible supply system of renewables could pose a risk to incumbent power dynamics. This artificially increases Indonesia's reliance on fossil fuels.



Source: *LowCarbonPower,* ***https://lowcarbonpower.org/region/Indonesia***

Figure 2: Indonesia is still highly reliant on fossil fuels, with coal providing almost two-thirds of its electricity.

[16] The Diplomat, February 2024, **Indonesia's Fossil Fuel Subsidies Threaten its Energy Transition**

The linkage between social conditions and energy security has become clearer to the public as Indonesians have experienced the impact of oil price fluctuations in their daily lives. This was seen clearly in 2022, when fuel subsidies surged to maintain affordability.[17] As a result, renewable resources are increasingly understood by governments as an alternative that can enhance energy security by reducing import dependence and stabilising domestic energy costs, including through options such as electric vehicles and distributed renewable systems.[18]

These dynamics underline why renewables, particularly distributed renewable energy sources align naturally with Indonesia's geography and the government's affordability and stability priorities. The current energy strategy aims to utilise Indonesia's abundant resources (such as sunlight, geothermal energy, nickel, and palm oil) to overcome the shortcomings of access to affordable, clean energy.

And change is underway. Energy planners are expanding the definition of "energy security" to encompass renewables and energy efficiency.[19] Jisman Hutajulu, the Director General of Electricity at the Ministry of Energy and Mineral Resources (ESDM), recently inaugurated Indonesia's largest ground-mounted solar power plant (PLTS) in West Java, with 100 MWp capacity. Notably, Indonesia's state power utility (PLN) is also now considering the early retirement of coal plants, while international investors are exploring financing options for renewable replacements. Achieving targets will require a quicker pace of progress.

Indonesia is exploring industrial investment to expand energy security options. The present strategy for energy security necessitates significant investments in renewable energy sources and infrastructure, alongside a focus on fostering local industries. To facilitate this, the Indonesian government enacts policies that connect industrial growth with a decreased dependence on energy imports.

The electrification of transportation, in particular, is a strategic focus, amplified by growing interest and opportunities for foreign investment. The industrial park along Sulawesi's coast is a prominent example: a once quiet area now hosts immense smelters and factories converting nickel ore into battery chemicals.[20] As former president Jokowi noted during the inauguration of Hyundai's EV plant in 2022, Indonesia aims to do more than sell raw minerals; its aim is to become a global EV automobile hub, providing cars and batteries to the global market.[21] The Prabowo administration is poised to continue this initiative, anticipating foreign investment for new factories along with green industrial policies like potential carbon pricing to encourage industries.

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[17] Barnes, C. and Teguh, R., October 2022, **Fuel subsidy cuts won't scratch Jokowi**, East Asia Forum

[18] IEA, September 2022, **An Energy Sector Roadmap to Net Zero Emissions in Indonesia**

[19] Indonesia's '4A+1S' approach under the National Energy Policy (Law No. 79/2014) will include a target in 2025 for 23% of the nation's energy needs to be met by new and renewable energy.

[20] AP, July 2024, **Indonesia's massive metals build-out is felling the forest for batteries**

[21] Reuters, March 2022, **Hyundai launches plant to produce Indonesia's first electric car**

Many significant actors in Indonesia's business sector have interests across both fossil fuels and renewables. The business community has close ties with the government, and so is open to clean energy expansion if it supports key government priorities, such as industrial growth and increased job opportunities. Many of Indonesia's wealthy elite, currently invested in coal, are turning to clean energy investment, seeing this as a business opportunity while investment in coal mining is increasingly seen as risky. Additionally, coal mining companies have the capital needed to invest in renewable energy and publicly acknowledge that profits from fossil fuels will decrease. For example, the largest coal mining companies, such as Adaro and Indika, have begun discussing the energy transition and are slowly aligning their assets with the Paris Agreement.[22] While these efforts can be critiqued as greenwashing, others see them as genuine, with many organisations valuing the investment and business opportunity offered by the transition.

Increased foreign financing is a key to reinforcing private sector interest in clean energy and may also project external impetus for the transition. In Indonesia, EV industry operations are already financed by companies from Asia, such as China ($3.9 billion), South Korea ($1.3 billion), and Japan ($800 million).[23] For example, Singapore is pushing strongly towards better net zero representation across its private sector and actively invests in organisations driving the energy transition.[24] This can have a large impact, particularly as many Indonesian companies are also listed on the Singapore stock exchange. Singapore is looking to invest in and import renewable energy from Indonesia, and five consortia have won this project.[25]

However, a balanced and cautious approach to foreign finance is essential, as it does not come without strings attached. China, for instance, has a huge mineral extraction and processing footprint in Indonesia, predominantly in nickel and bauxite (aluminium ore). This involves establishing and operating mines, funding and building towns around these mines, and flying in Chinese nationals to work (interview source). This mining activity is powered by captive or "off-grid" coal-fired power plants. Additionally, Japan offers Indonesia, the largest automotive market in the ASEAN region, competitive financing and a range of grants and focuses on bilateral investments. Although this has the potential to translate into opportunities for a large EV market, Japan has a vested interest as an ICE vehicle exporter and is actively resisting a shift towards EVs, using already well-established support systems and infrastructure. Despite this, Indonesia's public commitment to renewable energy remains strong, with President Prabowo's stated ambition for achieving 100 GW of solar capacity and 100% renewable energy by 2035.[26]

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[22] IEEFA, November 2024, **Spin-off or just spin? Adaro's bold plan to achieve net-zero**

[23] Asia News Network, July 2024, **South Korea overtakes US, Japan in FDI to Indonesia**

[24] Business Times, July 2024, **Over 70% of large Singapore listcos aiming for net-zero emissions by 2050: study**

[25] Pinsent Masons, October 2023, **Singapore conditionally approves electricity import from Indonesia**

[26] IESR, October 2025, **Towards COP30: Indonesia's SNDC fails to reflect President Prabowo's 100% renewable energy ambition**

South Africa: Energy crisis and complex socio-economic landscape

Renewable energy projects in South Africa are seen as a solution to its deep reliance on fossil fuels, and the ongoing electricity crisis that dominates public discourse and colours all debates around the transition. But energy security is not only a technical challenge; it is a deeply political one, shaped by long-standing socio-economic divides. The transition will need to bring benefits to communities to whom coal signifies economic inclusion.

South Africa has experienced years of load shedding due to decline of its state-owned electricity utility, Eskom, with severe consequences for the economy, public services, and everyday life. Renewable energy presents a solution to South Africa's electricity challenges, as they are to South Africa's reliance on external fossil fuel markets.

As a major coal producer, South Africa's electricity system is less directly exposed to international fossil fuel price shocks and foreign exchange pressures than systems dependent on imported coal or gas. Instead, rising electricity prices are driven primarily by domestic factors, including outdated infrastructure, operational inefficiency (both causing chronic load shedding), and reliance on expensive emergency power, particularly diesel generation during periods of system stress.[27] As a net importer of oil, oil products, and natural gas, South Africa faces high exposure to international price volatility and foreign-exchange pressures as key parts of its economy are structurally dependent on international energy markets. This import dependence heightens the macroeconomic stakes of the transition and shapes how energy security is understood: reducing reliance on external fossil fuel markets is not only a climate priority, but a central economic and fiscal imperative.

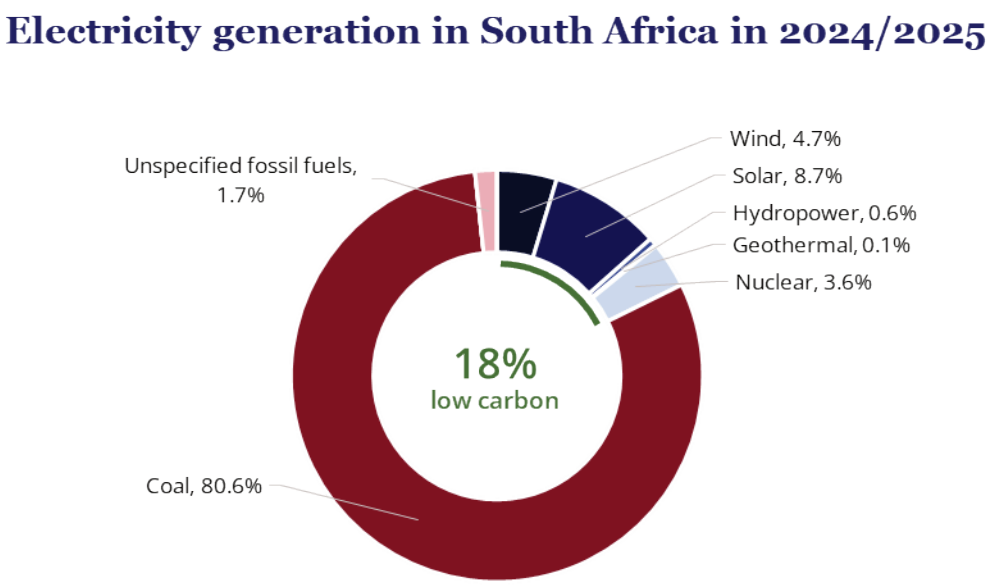
At the same time, deep-seated historical inequalities, rooted in apartheid-era structures, create a two-tiered energy system that conditions access to electricity and therefore who gains and losses from the energy transition. Political cleavages around the transition are sharpened by powerful actors such as labour unions, coal-dependent regions, and factions within the governing party, all of whom have significant influence over the pace and direction of change.

[27] Department of Mineral Resources and Energy (South Africa), 2025, **South African Energy Price Report 2024** (PDF)

The power crisis shapes transition politics

Although nearly 15 years have passed since South Africa initially adopted renewable energy, the nation still relies significantly on coal: ~72% for its installed power generation capacity,[28] and ~82% for its electricity generation (Figure 3). Power generation alone accounts for 45% of greenhouse gas emissions.[29]

Power outages have persisted in South Africa since 2007. This crisis has its roots in a combination of factors: the decline of state-owned utility company Eskom; almost two decades of underinvestment in new capacity and maintenance; the mismanagement and cost overruns of Medupi and Kusile coal plants; years of electricity tariffs set below production costs; and difficulty in collecting payments from municipalities resulting in mounting debt and financial instability. As a result, load shedding, although now improved, was at one time a daily occurrence, and has hindered South Africa's economy and tested the resilience of citizens and businesses. In response, the government implemented emergency measures and sector reforms.[30]



Source: *LowCarbonPower,* ***https://lowcarbonpower.org/region/South_Africa***

Figure 3: Coal provides more than three-quarters of South Africa's electricity.

[28] Centre for Renewable & Sustainable Energy Studies, **SA Electricity Made Visual**

[29] South Africa's Just Energy Transition, **https://justenergytransition.co.za/**

[30] Bloomberg UK, October 2023, **Floating Tankers Line Up Off South Africa to Ensure Diesel Power**

The largest opportunity to resolve these issues, as South Africa recognises, lies in a significant expansion of renewable energy, storage, and grid infrastructure.[31] In an effort to ensure reliable access to electricity, the government has quickly enabled mines, factories, and private developers to construct large green power plants independently, and owned privately. This led to plans for over 100 projects (and a pipeline of ~70 GW of imminently connectable projects), primarily involving solar and wind energy, reflecting a robust commitment to addressing the crisis through green energy.

This shift towards diversification of ownership has led to greater decentralisation, a revolutionary departure from the centralised system that dominated Eskom's coal-driven operations for decades. However, challenges have arisen in what could become a two-tier electricity market, where privately owned, clean renewable energy projects are implemented by those who can financially afford them. These divided risks may perpetuate structural inequalities related to income and wealth accumulation. Another risk is Eskom using its power to stymie reform and delay critical processes for market launch (such as blocking traders from obtaining licenses). There is also a significant challenge with decoupling public perception of renewables from foreign investment, as they have a reputation linked to decentralisation and 'privatisation by stealth'. Despite these risks and the persistence of design issues, ownership diversification offers the most concrete pathway for building renewable energy and reducing price shocks.

Political polarisation and entrenched social inequality frame the transition debate

While the unreliability of supply can be a catalyst for change, energy security also has to be understood through an energy-justice lens that centres questions of equity, historical grievance, and the distribution of costs and benefits across society. In coal-dependent regions, clean energy is a polarising issue: the transition is perceived as a threat to jobs, local revenues, and existing patterns of economic inclusion through existing job stability. These reactions reflect deeper distributive conflicts within South Africa's resource-dependent political economy, where different groups stand to lose or gain unevenly from structural change. Historical legacies of exclusion further intensify these dynamics: energy policies during apartheid reinforced racial and spatial inequalities, shaping current debates around fairness, accountability, and trust in government.[32] This is further complicated by the influence of the coal industry and its relative success in redefining social power structures through Black Economic Empowerment (policy and legislative framework).

With the African National Congress facing historic decline, populist challengers are gaining ground. The Economic Freedom Fighters (EFF) and Jacob Zuma's new uMkhonto weSizwe

[31] The Economist, April 2019, **How to solve South Africa's energy crisis**

[32] Baker, L. and Phillips, J., 2018, **Tensions in the transition: The politics of electricity distribution in South Africa**, *Environment and Planning C: Politics and Space*, vol. 37, DOI: 10.1177/2399654418778590

(MK) party have seized on the anti-transition sentiment. Both defend coal and public ownership as symbols of sovereignty and economic justice while portraying the transition as an elite-driven project disconnected from the realities of black working-class communities. In addition, the significant levels of black ownership in the ecosystem post-apartheid have created a natural resistance to narratives that suggest closing this transformative sector. In this context, coal represents more than energy, it embodies resistance to foreign influence and a demand for autonomy.

South Africa's history shapes how communities experience and interpret the energy system. Despite its protracted crisis and low public support nationally, Eskom still has pockets of strong support across the community. Particularly in less economically advantaged communities, many see it as the institution that ensured electricity supply after apartheid, during which electricity infrastructure and power systems had been used to reinforce segregation and economic exclusion. The utility expanded access from around 40% in 1994 to over 90% by the mid-2010s.[33] (Though it should be noted that years of failure to deliver affordable and reliable energy has adversely impacted its general public perception). There also exists prominent distrust of donor-backed reforms, which is viewed as "green neoliberalism" aimed at dismantling a public utility to benefit private interests. This distrust is rooted in longstanding grievances over inequality, land dispossession, and unemployment. Policies that benefit foreign investment can be seen as perpetuating existing structures of inequality.

The transition must consider broad-based economic empowerment beyond a "just transition"

Given the dynamics set out above, it is critical to employ an approach that grapples with historical and social polarisation entrenched in South African society. South Africa's sustainable green transition requires a plan to maintain the job security and rents that coal has provided to workers and new owners . A case in point is the in the coal mining areas of Mpumalanga, which accounts for ~80% of the country's coal output and is the fifth largest economy in South Africa.[34] In this region, the government transition plans prioritise trade unions, small businesses linked to the coal supply chain, and civil society to keep the interests of workers and vulnerable communities at the heart of the energy transition.

President Cyril Ramaphosa is attempting to safeguard against further deepening social inequalities with the Just Energy Transition Investment Plan (JETIP), supported by Western governments, aiming to invest ZAR 1.5 trillion (USD 0.92 trillion) in clean energy production from wind and solar sources, electric vehicles, and hydrogen over the next five years.[35]

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[33] Creamer Media's Engineering News, September 2018, **Eskom expresses pride on its improved electricity access**

[34] Mining Review Africa, January 2025, **Coal mining: The backbone of Mpumalanga's economy**

[35] South Africa's Climate Commission, **South Africa's Just Energy Transition Investment Plan** (webpage, accessed December 2025)

Wind turbines and solar panels are emerging across the Northern Western and Eastern Cape provinces, financed by both foreign and local investors.[36]

These initiatives focus not only on clean energy but include conditions to hire local workers, locally manufactured source components, and support surrounding communities through initiatives like constructing schools or clinics through community benefit programmes. For example, in some coal towns, engineers and technicians who have maintained coal plants for 30 years are now undergoing retraining for roles in solar farms and wind turbine maintenance. A retired control-room operator from a coal plant may soon oversee a battery storage facility at the same site, exemplifying the repurposing of both infrastructure and skills.

Despite this, the current "just transition" approach suffers a public perception problem, with slow deployment of Just Energy Transition Partnership (JETP) finances, and increasing opposition from local communities. Failing to effectively link energy security and economic security with energy transition pledges jeopardises public support. This situation has sparked domestic debates about decarbonisation as a threat to jobs and economic competitiveness especially from the coal-related industrial lobby and coal-rich subnational governments. The approach should therefore be carefully framed and sensitive to local understandings of and demands for justice.

Incorporating green technologies into industry is also core to South Africa's understanding of just transition. For instance, the automotive industry, a critical component of South Africa's economy, realises they face a potential decline in exports if they do not transition to EV production.[37] To prevent factory closures amid changing global demands, the South African government is introducing incentives for EV manufacturing: starting in 2026, automotive companies investing in EV assembly receive tax breaks.[38]

This follows a trend of growing Asian trade and investment ties in the region, which presents both opportunities and challenges for clean technology potential. Investment from Asia is capitalising on the potential of clean energy in South Africa. For example, some Japanese companies are negotiating to invest in building green hydrogen supply chains along the Atlantic coast.[39] However, it should be noted that this investment may also represent ongoing efforts to support Japan's interests in promoting use of ammonia for co-firing in coal power stations.[40] Chinese companies have also shown interest in establishing battery manufacturing in South Africa, leveraging the country's abundant mineral

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[36] British International Investment, November 2023, **British International Investment aims to help tackle South Africa's energy crisis and accelerate economic growth**

[37] Clean Technica, January 2025, **South Africa's ICE Vehicle Exports Decline by 23% In 2024**

[38] Clean Technica, January 2025, **South Africa Introduces Tax Incentives to Encourage Local Production of Electric Vehicles**

[39] The Japan Times, June 2024, **South Africa's biggest green-hydrogen project woos Japanese investors**

[40] E3G, April 2023, **Challenging Japan's promotion of ammonia co-firing for coal power generation**

resources like manganese and vanadium essential for energy storage.[41] There are clear trends of strong bilateral investment, where mutual economic opportunities are being explored and being used to support soft power and influence. China sees the benefit in bolstering South Africa's energy security, with the China–Africa Development Fund recently bidding for independent projects on energy transition. These are aiming to use private sector investment to increase electricity capacity. However, as previously mentioned, a balanced and cautious approach to these investments is essential, as it presents a double-edged sword for South Africa's transition. A recent investment push has seen China continuing to push for financing in coal-related sectors, as well as energy and infrastructure.[42]

Conclusion

Brazil, Indonesia, and South Africa diverge in important ways: Brazil is a net crude oil exporter with a commodity-dependent growth model; Indonesia relies heavily on domestically produced coal but remains a major importer of oil products; and South Africa is a net importer of most fossil fuels and faces a protracted electricity crisis driven by the decline of its coal-based utility system. Their energy mixes, exposure to global price volatility, and domestic political coalitions shape distinct incentives and constraints around the transition.

Nonetheless, all three countries view the low-carbon transition as an opportunity to advance energy security while pursuing broader national priorities. Clean energy offers each country a pathway to reduce exposure to fuel price volatility, stabilise domestic energy costs, strengthen industrial competitiveness, and build more resilient economic models that are grounded in a just whole-of-economy approach. Realising this potential will require navigating entrenched interests, resolving distributional conflicts, and aligning transition strategies with domestic economic development priorities.

These challenges underscore the importance of country-specific political economy analysis for identifying credible entry points to accelerate climate action.

[41] Fullview, February 2025, **Megamillion to launch Africa's first battery gigafactory**

[42] Reuters, September 2023, **South Africa and China to push investment after jump in US import tariffs**

ABOUT E3G

E3G is an independent think tank working to deliver a safe climate for all.

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AUTHORS

Jeongha Ju authored this briefing as Senior Researcher in E3G's Political Economy and Governance team. She is now a Senior Researcher in the Public Banks and Development team.

Genevieve Marsh is a Senior Policy Advisor in E3G's Political Economy and Governance team, leading on political economy analysis and convenings. She led the political economy mapping for Indonesia and Brazil.

Sebastian Kiecker is an Associate with the Centre for Political Economy and Climate Change and has supported the team's political economy mapping methodology. He is also a PhD candidate at the University of Tartu's Johan Skytte Institute of Political Studies.

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