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Powering AI in the Global South

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Executive Summary

The twin transitions of artificial intelligence and clean energy are reshaping the global economy, driving innovation, transforming industries and addressing urgent environmental challenges. These trends are deeply interconnected and mutually reinforcing: AI is accelerating energy efficiency and renewables adoption, while clean-energy investments are providing the power for AI's increasing computational demands, as we previously discussed in *Greening AI: A Policy Agenda for the Artificial Intelligence and Energy Revolutions*. Countries in the Global South can strategically harness the opportunities of the intertwined AI revolution and energy transition to lead inclusive green-AI development and use – but they must do this collaboratively to prevent a race to the bottom.

Currently, the benefits of these transitions are concentrated in the Global North. The United States and China dominate AI infrastructure, hosting nearly half of the world's most advanced AI chips (known a graphic processing units, or GPUs) that are essential for AI development.[1] Meanwhile, much of the Global South remains underserved, creating vast "compute deserts".[2] However, countries in the Global South have a unique opportunity to align AI and energy investments to drive inclusive growth and development, provided they implement strategic policies to seize these opportunities.

Tech giants are pouring billions into AI infrastructure and renewable energy. Microsoft's $10 billion commitment to renewable-energy projects[3] and Google's leadership in renewable-energy purchasing[4] exemplify the investments reshaping the global AI landscape. Through their ambitious sustainability commitments, hyperscalers are also driving efficiencies at data-centre level, both in their own and in third-party facilities, transforming the industry. These efforts offer countries in the Global South a chance to attract significant investments that align with clean-energy and broader sustainability goals, providing co-benefits such as job creation and infrastructure development.

At the same time, AI is resource intensive, consuming huge amounts of energy, which can strain national grids and impact delivery to local communities. Some countries, competing to attract AI investments, may end up being caught in a race to the bottom, offering increasing tax breaks, governmental guarantees and more lenient environmental regulations. If not planned carefully, data centres can end up benefiting the countries where AI revenues are realised, not where infrastructure is hosted and vast energy and water resources are consumed.

To harness the opportunities associated with these transitions, countries in the Global South need to design clear short- and medium-term strategies rooted in their specific national contexts. These strategies must ensure that the twin transitions are leveraged in a way that is sustainable – both environmentally and in terms of longevity – providing economic benefits to communities and countries. Different approaches may be needed to align with each country's specific energy system, compute capacity and AI-ecosystem maturity. These differences are categorised into three profiles, with each subsequent profile building upon the characteristics and opportunities of the preceding one:

1. **Emerging foundations**: Countries such as Cambodia, Myanmar, Sudan and Chad, with underdeveloped energy and AI infrastructure, should focus on building foundational energy and connectivity capabilities, leveraging regional partnerships for shared compute access and AI application to advance energy planning.
2. **Energy-rich AI explorers**: Countries such as Chile, Uruguay, Mexico and Egypt, with reliable energy systems but limited AI ecosystems, can attract AI investments by leveraging existing renewable energy while ensuring that they provide local economic and development benefits.
3. **Tech-powered and energy-hungry**: Countries such as India, Brazil, Malaysia and Thailand, with advanced AI ecosystems but existing energy constraints due to rapidly growing demand, should prioritise investments in frontier clean-energy technologies, align energy and AI planning, and lead innovation at the intersection of AI and energy in the Global South.

Despite these varying capacities, there are key recommendations that span each profile:

- **Develop an integrated twin-transition policy agenda** that links AI and energy planning with broader national goals, tailored to each country's context.
- **Strengthen data and talent ecosystems** through open data policies and investments in education and skills development to build a workforce capable of advancing AI and energy transitions.
- **Collaborate across the Global South to mitigate the risks of a race to the bottom**, collectively demanding win-win agreements for AI investments and ensuring that projects contribute to local energy, talent and economic goals.
- **Partner with the Global North and tech leaders** to attract investments in compute infrastructure, clean energy and research, ensuring mutual benefits and sustainable outcomes.

Some countries – such as Brazil, India and other emerging AI leaders in the Global South – are particularly well positioned to drive inclusive action on the twin transitions by facilitating collaboration with and across developing countries and amplifying their voice in global discussions. By leveraging their strengths and aligning efforts, countries in the Global South can shape a more equitable digital and energy future.

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The Opportunity of the Twin Transitions – and the Risks of a Race to the Bottom

The convergence of the AI revolution and the energy transition is transforming global economies. These two powerful trends are deeply interconnected and mutually reinforcing, each driving the other's success: AI has the potential to accelerate the energy transition, while investments in clean tech can help expand and accelerate the development and application of AI.

This digital boom is driving unprecedented levels of investment in AI, which brings multiple opportunities as well as challenges. Tech companies, corporations and utilities are projected to spend nearly $1 trillion on capital expenditures in the coming years to support AI growth.[5] Investments are also being shaped by strong sustainability commitments from hyperscalers, which are driving investments into energy-efficient AI infrastructure.

Yet a significant portion of this investment is concentrated in the Global North, as is the training of AI models and the development of new AI solutions by qualified talent. The US and China together host nearly half of the world's cloud regions enabled by GPUs, and the US alone hosts multiple regions equipped with NVIDIA's advanced Hopper 100 (H100) GPUs, essential for training state-of-the-art AI models. In contrast, most of the Global South lacks this infrastructure, resulting in "compute deserts" where countries have limited or no public cloud AI compute access, which hinders local innovation and AI governance.[6] This new AI and compute divide can limit countries' access to the compute power needed to unlock the economic-development potential of AI, with ripple effects for developing the skills and capacity needed in an increasingly AI-driven economy.

At the same time, due to its rapid growth, AI development is also facing real-world, physical constraints. AI is resource intensive, consuming huge amounts of energy, straining national grids and impacting delivery to local communities. In the US, data-centre power demands are expected to triple by 2030, rising from 3 to 4 per cent of total US power demand today to 11 to 12 per cent by the end of the decade.[7] In countries with significantly less resilient power-generation and distribution capacity, this demand curve presents a potentially ominous trend.

The major AI companies that are committed to sustainability are investing heavily in clean tech and energy advancements to overcome these constraints. Hyperscalers are among the largest corporate purchasers of renewable-energy contracts. Amazon, Google, Meta, Microsoft and Apple account for more than 45 gigawatts (GW) of corporate renewable purchases worldwide,[8] which is more than half of the global corporate renewables market. For instance, Microsoft has agreed to back $10 billion in renewable-electricity projects with Brookfield Asset Management over five years, marking the world's largest corporate purchase of renewable energy.[9]

Hyperscaler commitments are also accelerating the wider adoption of clean-energy technologies. They are not only helping scale existing, established technologies, but investments are also helping to de-risk projects for institutional capital, helping to transform new and early commercial clean-energy technologies, such as small modular reactors (SMRs), and advanced geothermal and novel tidal power, into more traditional infrastructure assets that are easier for debt and equity to invest in.

Countries across the Global South can harness this intertwined relationship between the twin energy and AI transitions to not only accelerate their participation in AI advancements and propel the energy transition but also to ensure these advancements are carried out sustainably, driving co-benefits domestically.

But competing for AI investments can have its pitfalls. While the scale of investment flowing into AI-driven energy capacity is impressive, these investments often only serve to satisfy the energy demand of data centres. These arrangements generally do not include provisions for local energy offtake by other consumers, meaning there is no guarantee of broader benefit to local communities or the wider local economy. To attract these investments, many countries are offering increasingly favourable conditions for data-centre expansion, such as reduced tax rates, governmental guarantees or relaxed environmental requirements, which can lead to unsustainable practices.

Data centres are highly resource intensive, often putting significant pressure on local energy utility systems that are not familiar with technological disruption. As it is customary to forecast demand according to incremental historical growth and not exponential demand, few countries fully understand how different the current moment is with the growth of high-density computing. As a result, utility capital allocation, asset upgrades and operational procedures significantly lag market requirements, and the situation is particularly dire in light of the need to upgrade transmission facilities to accommodate the increased compute load.[10]

Furthermore, without the consolidation of computing tasks, data centres will have an inherently short lifespan. With ever-increasing demand and power requirements, data-centre design and operations can quickly become obsolete, ultimately adding little value to the local host community. This has the potential to exacerbate inequalities, environmental degradation and resource strain – preventing countries from tapping into the opportunities of the twin transitions.

But this pathway is not pre-determined. With the right strategies and policies in place, countries can ensure that AI investments drive national objectives and mitigate the potential risks. These policies should be rooted in both individual country capacity and context and draw on partnerships across the Global South and with the Global North. Countries that set this out now will be able to attract investment into these sectors, build the skillsets needed to harness AI's potential economic-development opportunities, and enable wider climate action and government vision domestically while raising their international profile.

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Embracing the Twin Transitions: Strategic Profiles for the Global South

While there has already been much thinking about how the Global South should approach AI-related opportunities, a more nuanced approach is needed to navigate them. A particular challenge is that countries in the Global South are often grouped in a single bloc in the analysis of AI-related opportunities and strategies when in fact the countries that comprise it are not uniform. At the same time, AI opportunities (and risks) are decoupled from those of the energy transition and wider societal co-benefits, which may result in missed opportunities and strategic blind spots.

To aid with this thinking, this analysis provides three strategic profiles. While not exhaustive, they intend to capture some of the most relevant patterns and considerations across country-income levels – ultimately helping countries in the Global South think about how they can benefit from the global AI and energy transitions. While distinct, each profile builds upon the characteristics and opportunities of the preceding one. These profiles are:

- **Profile 1. Emerging foundations:** Countries with underdeveloped energy systems and nascent AI ecosystems.
- **Profile 2. Energy-rich AI explorers:** Countries with reasonable energy availability and reliability but underdeveloped AI and tech sectors.
- **Profile 3. Tech-powered and energy-hungry:** Countries with advancing AI ecosystems and energy systems but facing growing energy-demand challenges.

Each profile outlines practical, context-specific recommendations designed to address unique challenges faced by different countries in the Global South. However, these profiles should be seen as complementary to each other, with recommendations for Profile 1 forming the foundations for Profiles 2 and 3, and those from Profile 2 extending to Profile 3. The resulting strategic agenda will help countries attract investment in compute, leverage compute to attract investment in energy infrastructure, and utilise AI to advance energy and climate goals.

Profile 1. Emerging Foundations

Countries that fit the "emerging foundations" profile have limited and often unreliable energy infrastructure, with very nascent AI ecosystems. Many less-developed countries fit this profile.

These countries are still working to get the foundations in place – both for their energy grids and digital capabilities, with the linkage to compute a secondary factor. While this group faces challenges in leveraging investments from the twin transitions, they should prioritise foundational investments in energy infrastructure and basic digital infrastructure.

Countries that have characteristics of this profile include Cambodia, Myanmar, Sudan and Chad

USING AI TO ADVANCE ENERGY PLANNING AND RESILIENCE

AI offers transformative potential to optimise energy systems for Profile 1 countries, supporting strategic decision-making and resource allocation. Within existing energy infrastructure, AI applications can strengthen grid resilience and improve the integration of clean energy. For instance, AI-driven tools can forecast energy demand, manage loads and automate grid maintenance, making energy systems more adaptable to demand fluctuations and energy disruptions. Similarly, AI can be used in this context to help drive climate adaptation and predict natural disasters, which can influence wider long-term development plans for these countries and inform siting of infrastructure.

Predictive analytics and real-time monitoring can also be used to help leaders create energy networks prepared for future advancements. For instance, AI can help project electricity-access trends and identify the opportunities for and urgency of providing energy access for different areas, through the lens of equity and a just transition. Governments should actively participate in the development and application of such models, ensuring these tools are adapted to local contexts and priorities, helping build more agile, resilient and future-proof grids from the outset.

CREATING A COMPUTE-ACCESS STRATEGY

Developing national compute infrastructure may not be feasible for Profile 1 countries in the short term due to digital-infrastructure and energy-system limitations; they might also deprioritise this if investing in other industries can better support their current goals of industrialisation and job creation. Nonetheless, these countries need to ensure access to compute to be able to develop their digital sector and support wider economic growth.

To do this, they need to develop a strategy to access shared compute. As laid out in TBI's report on the *State of Compute Access 2024*, they can do this either through shared regional compute, where compute resources are developed and shared across a group of neighbouring countries, enabling cost-sharing and resource optimisation, or via international organisations, where access to compute infrastructure and resources is facilitated by global organisations, often through grants, partnerships or cloud-based services. While some countries in the Global North facing the same challenge may use their diplomatic and economic influence to secure access to shared compute, it may be more challenging for the countries in the Global South to leverage these channels. Therefore, regional partnerships with more advanced countries in the Global South may be essential to enable their compute access.

These countries could also use the emerging opportunities of the wider digital transformation to start laying and strengthening digital foundations that will also contribute to unlocking wider access to compute. These include the expansion of internet coverage and quality of connectivity; access to cloud infrastructure; implementation of cyber-security measures (including digital literacy); and strengthening of the data ecosystem, while incentivising service providers to lower costs.[11]

Profile 2. Energy-Rich AI Explorers

Countries that fit the “energy-rich AI explorer” profile have reasonably developed energy grids but lack compute infrastructure and robust AI ecosystems. They are well positioned to harness both sides of the positive loop: by leveraging their energy resources they can increase investment in compute and strengthen their clean-energy availability and reliability.

Although compute-investment opportunities represent significant potential, the limited development of the national AI sectors in these countries means that data centres here could become an extractive sector, generating limited national employment and economic benefits while absorbing substantial natural resources. A targeted strategy is required to ensure the positive impacts of such investments.

While recommendations made in Profile 1 remain applicable, the priority for Profile 2 countries should be to stay ahead of the curve, ensuring investments in compute become a positive loop rather than a negative one. They should look to secure co-benefits of compute investment, particularly where they can offer reliable and large-scale green-energy projects.

Countries that fit this profile include Uruguay, Chile, Mexico and Egypt.

CREATING WIN-WIN CONTRACTUAL REQUIREMENTS

For the Global South to achieve the benefits of AI investment, the governments of Profile 2 countries would benefit from a collectively agreed upon set of contractual requirements to avoid a race to the bottom. Currently, some countries are actively competing for data-centre investments by offering generous tax incentives and imposing minimal requirements on energy and water use. While this strategy may attract investments that boost demand for local infrastructure and generate tax revenue, its overall benefit to the local economy is often limited. This is because the primary economic value of data centres comes from the AI applications they support, which typically generate returns in the regions where they are used rather than where the centres are physically hosted. Meanwhile, the resource demands of data centres, such as energy and water, can place significant burdens on local communities.

To address these challenges, countries should adopt requirements that ensure AI investments are sustainable and mutually beneficial for the investor and the host country.

Contracts for data-centre development should include provisions for investment in additional renewable-energy capacity or grid upgrades. A supportive regulatory and economic environment should complement these requirements, encouraging broader renewable-energy growth and reducing the risk of resource constraints and subsequent public opposition.

To ensure that investments in compute zones deliver wider domestic economic benefits, governments should reserve a portion of compute capacity dedicated to increasing national compute access by backing local startups, research institutions and academic initiatives – thereby supporting the development of domestic research and innovation ecosystems.

Governments should mandate transparency in data centres' energy and water consumption to encourage compliance with robust environmental performance standards. Currently, such data is often not disclosed, but when it becomes public, it can provoke backlash. For instance, public protests in Uruguay and the Mexican state of Querétaro[12] arose due to the strain data centres placed on local resources, including power grids in blackout-prone areas and water resources in drought-affected regions. With higher transparency requirements in place, governments can influence hyperscalers to move away from environmental degradation and make commitments towards providing wider national co-benefits.

Data-centre investments should include requirements for local hiring and training to build domestic AI skills. This can be further supported by national incentive programmes. For instance, South Africa's Youth Employment Service (YES)[13] provides tax incentives for companies creating employment and training opportunities for the local population. Given that data centres run with minimal staff, countries should request that hyperscalers contribute to governments' AI-talent-building strategies. For instance, by creating academies and research institutes focused on upskilling local talent in AI training and application developments rather than just data-centre maintenance. Microsoft has combined its infrastructure investments in East and West Africa with the launch of the Africa Development Center, to train, equip and hire engineering talent, and with the Microsoft Africa Research Institute, to collaborate with local academia and universities to conduct cutting-edge AI research and encourage AI innovation locally.[14]

Finally, to turn data centres into a development stimulus, their projects should be designed to support local communities through:

- Developing adjacent infrastructure, which may often be missing around data-centre development sites
- Developing larger-scale local clean-power generating capacity that would also benefit local communities and other emerging industries through opportunities to co-invest in generating capacity
- Developing data centres on degraded land to minimise disruption to productive agricultural land
- Using excess heat for agriculture (for example, "tunnel agriculture") or district cooling or heating
- Stimulating associated value-chain industry development

STRATEGIC SITING OF DATA CENTRES

Compute investors are drawn to locations with a reliable energy supply, but realising this requires deliberate coordination between energy and compute-planning efforts. The expansion of compute infrastructure must be carefully managed to balance its energy demands with broader national energy needs and green-transition priorities, resulting in strategic data-centre siting.

AI and digital twins can assist in determining these kinds of sites, identifying the most suitable locations for data centres and "green compute zones", considering factors such as proximity to clean-energy sources, grid capacity, land availability, risk of natural disasters, environmental impact and local economic-development potential. This can help governments and planners make smarter and more informed decisions – helping tackle increasing pushback to new data-centre builds from local communities expressing concerns about AI's high resource demands. This can also help them optimise the grid's work with solutions like the company Soluna[15], which places data centres near wind and solar farms to utilise excess energy that would otherwise go to waste, reducing curtailment costs and supporting grid stability.

DEVELOPMENT OF GREEN COMPUTE ZONES

The most attractive data-centre sites can be further developed as green compute zones. These would be designated compute areas with data centres powered fully by clean energy. Governments could offer economic incentives, such as planning reforms, tax breaks or other forms of subsidies, for green energy in these areas to couple investment in energy and AI.

For example, in Brazil, the sustainable data-centre developer Scala and the southern state of Rio Grande do Sul announced plans to build "Scala AI City" in September 2024. An initial $500 million, and a potential $90 billion, will be invested in a "data-centre city", with an initial capacity larger than that of the entire Argentine and Uruguayan market at 54 megawatts.[16] With a potential capacity of 4.75 GW, if fully realised, the AI City would be the largest data-centre campus in the world. Having signed a memorandum of understanding with clean-energy provider Serena, Scala's data centres will run on renewable energy alone, specifically on wind generators located in the northern state of Bahia. The data centres themselves will also be energy efficient, achieving the lowest power usage effectiveness (PUE) in Latin America at 1.2 and water usage effectiveness of zero through the implementation of innovative cooling systems. Interestingly, having one of its earlier data centres suffer from the devastating floods in the Rio Grande do Sul, Scala included the elevation as a crucial criterion in the site selection for this project, alongside green-energy availability and internet connectivity. While it is still to be seen how this project will develop, it could play an important role in reviving the local economy after natural disasters – committing to contract local workers, engaging local supply chains and allowing Rio Grande do Sul to attract Brazilian AI companies. Further co-operation between the local government and Scala could bring additional benefits.

Joined-up planning efforts like this can help this group of countries not only attract investment from leading tech companies, but also international climate and technology funds for dual purpose. For example, the African Union's $200 million AI Investment[17] Fund could be expanded beyond support for startups and research to support renewable-energy projects tied to digital and compute infrastructure needs.

Long-term renewable-energy agreements in these zones could also offer price stability and predictability, critical for other energy-intensive industries looking for reliable operational costs. To support the development of these zones, governments will need to exercise leadership. They will need to streamline permitting processes to accelerate project timelines and reduce bureaucratic hurdles as well as create favourable data regulatory environments to ensure compliance with industry standards. This is not just essential for harnessing the twin transitions, but for attracting broader industrial investments.[18]

GRID-USE OPTIMISATION

Beyond the emerging applications of AI for grid-use optimisation relevant across all profiles, tech companies are exploring how data centres can play a role in grid-use optimisation. While efforts are still nascent, flexible compute tasks could potentially adjust to price and carbon-intensity signals, optimising renewable-energy use. Companies such as Google are trialling non-urgent operations at times or in locations where renewable-energy output is highest, maximising the use of clean energy.[19]

While there are likely high capital expenditures associated with this, particularly for retrofitting existing data centres, this group of countries should explore how new data-centre builds could help promote flexible compute operations, including cross-border data policies that allow compute tasks to be shifted virtually to locations with abundant renewable energy.

Profile 3. Tech-Powered and Energy-Hungry

Tech-powered, energy-hungry countries have reasonably developed energy grids and rapidly advancing AI ecosystems, but they face grid limitations and infrastructure constraints, partly due to the growth of domestic compute demands. These constraints restrict the expansion of compute – a challenge familiar in some countries in the Global North. While they are not yet able to compete with AI leaders, they are nevertheless driving AI application in the Global South, redefining the benefits AI can bring.

While Profile 3 countries should pursue a similar policy agenda to those in Profile 2, they are equally well positioned to prioritise less conventional energy sources like SMRs and, if available, geothermal energy and tidal power. These countries should position themselves as:

- **Markets for investment in frontier low-carbon energy solutions,** by creating the groundwork to integrate more modular, advanced technologies as they come online to serve both local populations and burgeoning digital sectors.
- **Global South leaders in innovation at the intersection of AI and energy,** by enhancing the efficiency of data-centre operations and fostering access to compute infrastructure for other countries in the Global South through collaborative initiatives.

Countries that have characteristics of this profile include India, Brazil, Malaysia and Thailand.

INTEGRATED FORWARD PLANNING AND INFRASTRUCTURE DEVELOPMENT FOR FRONTIER LOW-CARBON ENERGY TECH

As with Profile 2 countries, investments made into advanced clean tech need to be strategically linked to the development of compute infrastructure, ensuring that clean-energy deployment aligns with broader economic and technological goals. This will ensure that projected development of frontier clean tech is strategically located with key compute infrastructure, such as green compute zones, which can serve as innovation clusters. For example, because of their ability to provide consistent, localised power, SMRs are particularly suited to powering data centres and AI clusters in remote or underserved regions. Governments will need to prioritise the modernisation of energy grids to support the seamless integration of diverse energy sources, including intermittent renewables such as wind and solar as well as stable, reliable baseload options such as SMRs and geothermal systems. AI applications will also play an increasingly important role in enabling integration of the growing renewable-energy capacity and building grid resilience.

DEVELOPING A FORWARD-LOOKING REGULATORY ENVIRONMENT IN THE ENERGY SECTOR

A clear and transparent regulatory framework is essential for attracting investment in advanced clean tech, especially when aligning these investments with the growth of compute-intensive industries.

Governments should establish specialised regulatory bodies capable of addressing the unique requirements of frontier energy solutions. For this, safety and licensing standards should be updated, and licensing processes must be streamlined to reduce delays. For instance, Kenya established a clear regulatory framework for geothermal projects,[20] provided incentives through favourable tariffs for geothermal energy and partnered with development-finance institutions to fund exploratory drilling. As a result, Microsoft and United Arab Emirates-based AI firm G42 are currently building a geothermal-powered data centre there as part of a $1 billion investment aiming to increase cloud-computing capacity in East Africa.[21]

Direct power purchase agreements (DPPAs) can also play a pivotal role in scaling investments at the nexus of clean energy and compute infrastructure. Governments should encourage DPPAs that bring together energy providers and digital-infrastructure developers enabling the development of, for example, green compute zones or technology parks powered by advanced clean-energy systems. Malaysia's Corporate Renewable Energy Supply Scheme (CRESS) is a prime example. CRESS will allow corporates, including data-centre developers, to access clean energy directly from a renewable provider.[22] Following the scheme's introduction in

September 2024, Google and Oracle announced investments in Malaysia, which are expected to contribute more than $9.5 billion to the economy by 2030.[23]

BUILDING GLOBAL SOUTH-SPECIFIC AI AND ENERGY R&D LEADERSHIP

Profile 3 countries have the potential to become leaders in developing data-centre innovations tailored to warm and tropical climates and resource-constrained environments. Currently, AI models and compute infrastructure are largely designed for the Global North, with data centres optimised for colder climates, which naturally reduces cooling demands. However, warm-climate countries face unique challenges, including increased energy demands for cooling and water scarcity, requiring solutions adapted to their needs. For example, Singapore's "tropical green data centres"[24] offer a promising model, but more research and innovation specific to the Global South is essential.

Reducing water consumption in data centres is particularly critical. Many countries in the Global South face severe water scarcity, and data centres risk exacerbating these challenges. In Uruguay, public protests against a planned Microsoft data centre – which initially required up to 7.6 million litres of potable water daily – led to a redesign using air-flow cooling and reducing water usage by 95 per cent.[25] However, the shift also increased energy demands, highlighting the need for integrated solutions that balance water and energy efficiency.

Governments can support pilot projects, promote partnerships between local institutions and global tech firms, and create regulatory environments that reward resource-efficient designs. By pioneering solutions for energy-efficient cooling and low-water operations, these countries can lead the way in creating sustainable data-centre models for similar climates globally, turning local challenges into global opportunities. To do this, countries in the Global South could consider joint R&D programmes or challenge funds, specifically designed to drive data-centre innovation.

Another critical role for Profile 3 countries lies in helping other countries in the Global South gain equitable access to compute infrastructure. As leaders in AI technology and digital industries, they can facilitate compute-sharing arrangements, where underutilised compute capacity in one region is shared with countries facing infrastructure gaps. This collaborative model will ensure that developing countries and emerging economies are not left behind in the global digital economy, though it is important to recognise that stringent data-sovereign policies can be an obstacle to transborder compute sharing. The SIJORI Growth Triangle, comprising the city-state of Singapore, Johor state in Malaysia and Indonesia's Riau Islands, is one such example of a collaborative model. Born out of a 1994 agreement between the three nations to boost regional and international investment, SIJORI is now emerging as a regional cloud market.

Additionally, Profile 3 countries can help other countries in the Global South structure AI-energy collaborations that balance the growing energy demands of AI development with clean-energy solutions. By transferring knowledge and expertise, they can guide these nations in aligning AI-driven growth with renewable-energy adoption, thereby fostering a more sustainable and equitable digital transformation. Such partnerships can also help close the mounting global digital divide, ensuring that AI and compute advancements benefit a wider range of economies and populations. The Brazilian government has included the importance of this cross-country collaboration in its draft AI Bill, highlighting the need to: "Promote cooperative actions with authorities focused on the protection, development and use of artificial-intelligence systems from other countries, whether international or transnational in nature", and recognising the important link between AI and the environment by establishing that the "development, implementation and use of artificial-intelligence systems in Brazil are based on the following principles [...] the protection of the environment and sustainable development."[26]

04 Creating the Enabling Environment: Data & Talent

Countries across each of these three profiles, regardless of capacity or country-level income, need to invest in the foundations of data and talent. Both underpin the ability to move beyond solely hosting the compute capacity to benefiting from the wider AI development, including building local AI models and applications.

Building Open Data Ecosystems for AI-Driven Green Solutions

Data openness, availability, portability, interoperability and quality are key for any country seeking to tap into the twin transitions. Countries are often tempted to implement strict data localisation and data-sovereignty policies, increasing the perception of control over data privacy and security. However, restricting the transfer of data beyond borders hampers innovation by forcing entrepreneurs to set up specialised infrastructure to be able to operate in-country. Further, AI systems are only as good as the data they are trained on. Today's dominant AI models and applications have been developed using data almost exclusively from the Global North. AI applications employed to power the green transition will be effective in doing so at a global level only if they include data from the Global South. Closed data ecosystems only reduce the availability of quality, context-specific data, which is essential to reflect the specific circumstances faced by these countries.

Similarly, countries with limited data portability – the ability to transfer data between two systems – will struggle to access state-of-the-art compute infrastructure abroad or move towards compute environments that include GPUs better suited for AI-specific tasks. Countries also won't be able to generate the economies of scale enjoyed by big-tech players with the capacity to collect and process masses of data. However, data globalisation, the other extreme, is also unlikely to benefit countries in the Global South.

Without any restrictions on data generated by their populations, countries risk becoming data mines and only further enriching the tech giants of the Global North.

Countries should implement nuanced data-protection policies and build open data sets to drive AI innovations accelerating the green transition. In favouring cross-border data exchange, examples like Chile's Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), New Zealand and Singapore's Digital Economy Partnership Agreement (DEPA), and the East African Community's (EAC) regulatory initiative each expand access to international compute and increase the attractiveness of these destinations as potential innovation hubs.

In collecting, structuring and providing access to their data, governments equip researchers and innovators with the material to design AI applications tailored to national contexts. India's AI Datasets Platform offers a model for other nations seeking to harness their data as an asset. To be launched in 2025, the initiative is a national open-source platform facilitating access to anonymised personal data from central and state government.[27] Expanding access to national cadastral and geospatial data enables the design of environmentally relevant applications by local innovators. For instance, researchers have built an AI model that can predict how Ghana could achieve the best mix of wind, solar and hydropower energy sources in the future by incorporating AI into an existing computer model of the country's natural and human systems that includes the river systems, the power systems, and the accounting of the benefits that come from water and energy use.[28]

Countries in the Global South can also export their domain-specific data sets to the rest of the Global South, thus elevating their profiles as AI innovators on the global stage. As put by Jibu Elias, creator of IndiaAI: "[...] if you can build tools that address some of the decade-long socio-economic challenges in India, they can be adopted across the globe."[29]

Developing a Talent Pipeline With Fungible Skills

To leverage data as a driver of the green transition, countries need to develop the next generation of AI talent. Without the ability to innovate locally, the climate and energy concerns of the Global South will go untreated by the dominant tech firms of the Global North.

By failing to develop a pipeline of talent, many countries in the Global South are forfeiting the potential of the medium- to long-term economic gains presented by the twin transitions. Despite concerns around job losses, the AI boom is already generating new employment opportunities for many in the Global South. For example, since well-curated data centres are foundational to AI tools, the demand for data annotators or labellers is soaring. Though critical, annotating big data sets is time intensive and of low economic value. As such, labour markets in developing economies risk being confined to resource-intensive, low-value sections of the global AI value chain. Further, labelling and annotation do not advance national economic or environmental priorities.

To secure real, long-term value from these twin transitions, countries in the Global South can start by designing national curriculums and funding higher-education programmes that develop fungible skills. Despite the promise of AI to supercharge learning on any subject, governments and academia globally have been slow to link tech skills with so-called green skills. Institutions that have made the link are, again, concentrated in the Global North's Ivy League and Russell Group. While some countries plan to integrate AI skills into compulsory education, as seen in Kenya's Digital Economy Blueprint, future AI professionals need to be able to build applications that advance the green transition, and energy experts need to be able to design and plan the infrastructure needed to power AI.

Countries looking for immediate solutions, or with constrained education budgets, have a range of options. Partnering with leading tech firms is particularly viable, with Google, Amazon, Microsoft and others increasingly investing in training and education opportunities for populations in their countries of operation.[30] Introducing technology- transfer agreements into trade and procurement policy is another route to fungible skill acquisition, ensuring wider value from infrastructural procurement from dominant tech firms of the Global North. Another option is to introduce talent-return programmes that target diaspora populations with transferable expertise. Financial incentives and research grants attempt to attract overseas Indian scientists and academics through the Visting Advanced Joint Research (VAJRA) Faculty Scheme,[31] for example.

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Partnership and Collaboration: Reducing the Divide

As AI transforms the global economy, many countries in the Global South face the risk of being left behind without strategic partnerships. Collaboration is essential to share resources, drive innovation and address common challenges, creating opportunities for mutual benefit. To ensure a more equitable and sustainable AI future, cooperation is needed both within the Global South and with the Global North.

Boosting Global South Collaboration to Support Delivery

Collaboration among countries in the Global South is crucial for addressing AI development and preventing a race to the bottom. As AI advances are led mainly by the Global North, it is essential to consider the Global South's needs, such as boosting development, creating jobs and building resilience. Not only that, but partnerships between Global South leaders can influence the global debate on sustainable AI – helping to define its guiding vision and principles in a way that reflects the uniqueness of the Global South. Countries such as Brazil, India and other emerging AI leaders are particularly well positioned to amplify the voices of other Global South peers in global forums and can increase South-South collaboration by driving several initiatives such as:

- **A joint position on sustainable data-centre development:** Countries in the Global South need to jointly agree on key principles to attract sustainable data-centre investments that do not compromise the rights of local communities and support wider economic growth. Only by doing so will they be able to tap into the twin transitions without encouraging a race to the bottom that would further increase the digital and economic divide.

- **Regional compute and energy-sharing arrangements:** Establishing regional compute and energy-sharing agreements can help overcome resource constraints and enable compute access for those countries that will not be able to access it domestically in the near future, while also being critical for disaster recovery. Some agreements like this have begun to be made and can serve as a model for future efforts.[32]
- **Regional data-governance frameworks:** Developing regional data-governance frameworks facilitates cross-border data flows while maintaining the sovereignty and security of data. These frameworks create trust among countries, enabling data sharing and collaboration on AI projects that require diverse data sets – for example to help develop more tailored solutions for the Global South. However, it is important to recognise that these regional frameworks rely on national data-protection authorities for implementation and are not always enforceable at a regional level. They also rely on each country's varying levels of digital infrastructure and cyber-security, which can create barriers to a unified implementation approach.[33]
- **Centres for Excellence for AI in the Global South:** The establishment of Centres for Excellence can lead the charge in AI development specific to the needs and context of the Global South. These centres can become hubs for research, talent development and technological advancement, honing the engineering solutions for more Global South-focused AI development, such as tropical data centres, tailoring AI solutions for the Global South, and helping address the brain drain faced by many countries in the grouping.[34]
- **Collaboration between academia, government and the private sector**: Connecting research institutions and facilitating collaboration between academia, the government and the private sector – following a "triple-helix" approach – is vital for fostering innovation in AI. By bridging the gap between theoretical research and practical application, countries can tailor AI solutions to the unique challenges faced by the Global South, addressing key developmental needs and enabling local commercialisation efforts.[35]

Enhancing Collaboration Between the Global North and Global South

The Global North is leading AI development, but it often looks for opportunities in the Global South. To ensure fair partnerships, this relationship must be structured in a way that does not treat countries of the Global South in an extractive manner – neither for their resources to support the global growth of compute capacity nor their data. For this purpose, countries in the Global South should take proactive steps to establish and pioneer collaborations with key AI players in the Global North, to ensure mutual benefits and encourage sustainable growth. Such partnerships can include:

- **Compute investment opportunities**: Partnerships with hyperscalers and other major technology firms from the Global North offer significant opportunities for countries in the Global South to accelerate the twin transitions and unlock wider development co-benefits. These partnerships can be structured in such a way that tech companies looking to develop compute capacity in the countries of the Global South are also required to invest in new and additional renewable-energy capacity, help develop adjacent infrastructure and support wider talent-development programmes in the host countries.
- **Global advocacy for transparency and accountability:** Advocacy for transparent reporting of AI's environmental footprint, including emissions from data centres and model development, is crucial for attracting investment that aligns with sustainability goals. Currently such reporting is not mandatory, which hides the impact of AI development and reduces the advantage of using green power and more efficient and sustainable practices in the AI sector. The united voice of countries in the Global South together with dialogue with the tech leaders in the Global North can help advance these practices.
- **Joint Global North-Global South research and collaboration frameworks:** Creating joint research organisations and collaboration frameworks that bring together expertise from both the Global North and Global South is a powerful way to spur mutual growth. Good examples of such initiatives include The Alan Turing Institute's research stream on

“leaner, greener, cheaper AI” and Singapore’s Infocomm Media Development Authority (IMDA) collaboration with Rwanda on the “AI Playbook for Small States”.[36] These collaborations provide a blueprint for how different regions can work together to address common challenges, tailor AI solutions to local needs and ensure that technology is accessible and beneficial for all.

06

Conclusion

The intertwined transitions of AI and clean energy present a unique opportunity for countries in the Global South to drive green and inclusive AI development. By aligning their national AI and energy strategies and leveraging growing AI investments, these countries can advance their AI capabilities and their use of renewable energy – both of which will contribute to meeting their national development goals. However, realising this potential requires a collective approach: collaboration within the Global South and with global stakeholders is essential to ensure sustainable outcomes and to prevent a harmful race to the bottom that could result in further inequalities and environmental degradation.

This risk, together with the widening gap in technological and AI capacities between the Global North and Global South, highlights an urgent need for strategic South-South collaboration to ensure a more equitable digital future. Some countries, such as Brazil, India and other emerging Global South AI leaders, are uniquely positioned to help forge a sustainable AI path towards development that reflects the unique needs and voices of the Global South. Excitingly, there is also important potential for South-North learning – leveraging the unique environmental heritage, conservation skills and indigenous knowledge of these countries and communities, and grounding this in the AI era.

Nevertheless, expecting countries in the Global South to independently bridge this divide is both unrealistic and counterproductive, as they often face structural, technological and financial constraints that hinder their progress. Instead, a dual approach of South-South cooperation, coupled with meaningful partnerships with tech leaders in the Global North, can create a more balanced landscape, unlocking the transformative potential of the twin transitions across diverse economies. Through this shared commitment, nations can work towards a global sustainable digital ecosystem that promotes inclusivity, resilience and shared prosperity.

Endnotes

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32 On the energy side, these include the Southern African Power Pool, the Association of Southeast Asian Nations (ASEAN) Power Grid and the Central American Electrical Interconnection System. In terms of compute, the European High-Performance Computing Joint Undertaking currently serves as the blueprint, establishing a fund for investing in supercomputers in Europe, with similar partnerships yet to be developed across the Global South.

33 The African Union's Data Policy Framework is a prime example in effectively establishing a "free data-transfer zone", similar to a free-trade zone, between member states. It is important to recognise that these regional frameworks rely on national data-protection authorities for implementation and are not always enforceable at a regional level. They also rely on each country's varying levels of digital infrastructure and cyber-security, which can create barriers to a unified implementation approach.

34 A good example of this is the Africa Higher Education Centers of Excellence (ACE) Project which is a World Bank initiative with African governments that aims to strengthen specialised higher education in fields including science, technology, engineering and mathematics, environment, agriculture, health, and social sciences.

35 The Indonesian e-commerce platforms Tokopedia and Bukalapak have launched AI centres with the University of Indonesia and the Bandung Institute of Technology, respectively. The former was also equipped with NVIDIA's DGX-1 super-compute technology in 2019.

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