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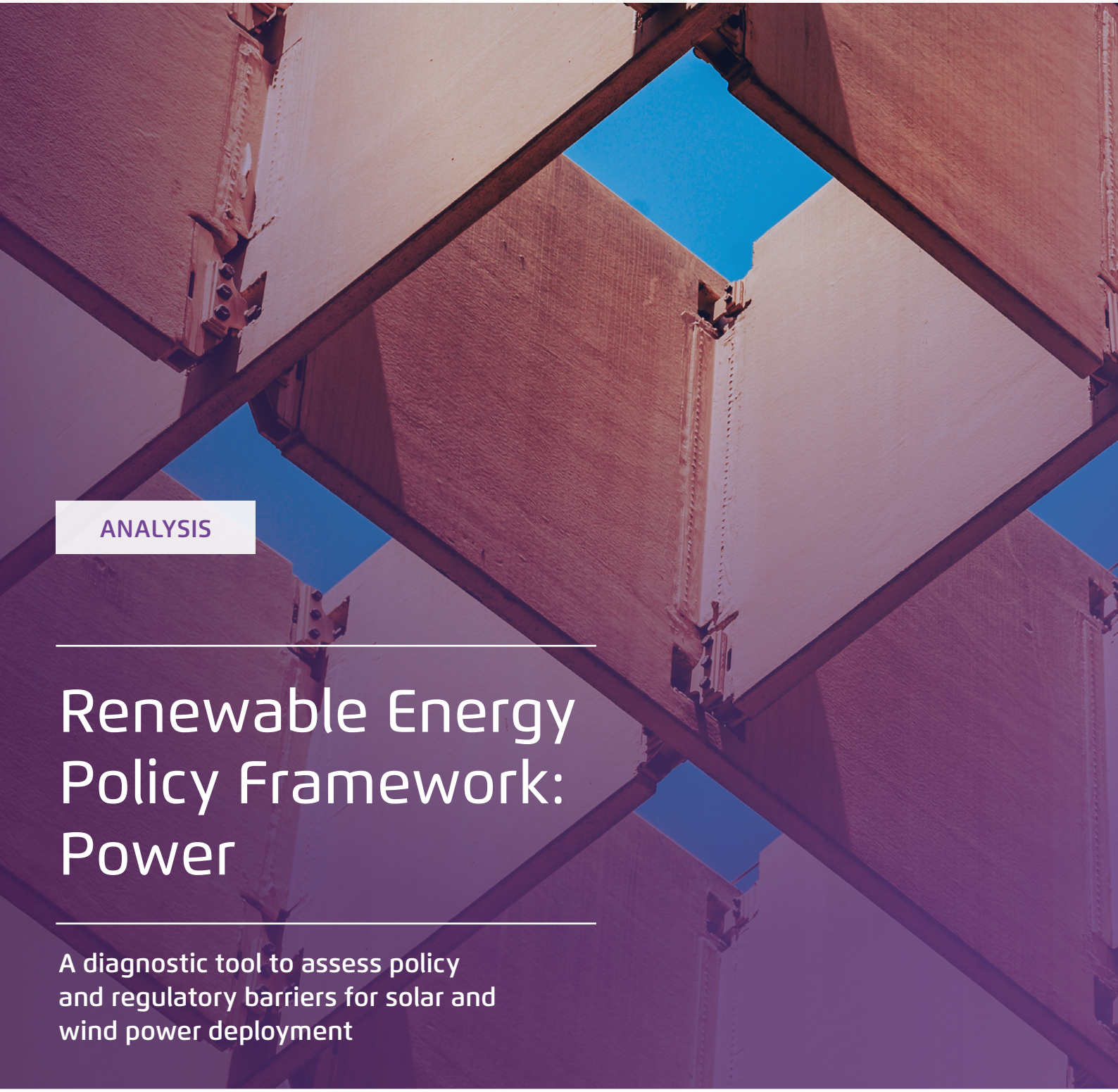
INETTT International Network of Energy Transition Think Tanks



ANALYSIS

Renewable Energy Policy Framework: Power

A diagnostic tool to assess policy and regulatory barriers for solar and wind power deployment

Please cite as:

Agora Energiewende and International Network of Energy Transition Think Tanks (INETTT) (2026): Renewable Energy Policy Framework: Power. A diagnostic tool to assess policy and regulatory barriers for solar and wind power deployment. URL: https://www.agora-energiewende.org/publications/renewable-energy-policy-framework-power

Analysis
Renewable Energy Policy Framework: Power.
A diagnostic tool to assess policy and regulatory barriers for solar and wind power deployment.

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Acknowledgements
The authors would like to thank David Jacobs (IET – International Energy Transition GmbH) and Christine Juta (formerly Agora Energiewende), whose input significantly shaped the conceptual development of the framework, its structure and underlying logic. They would also like to thank the following people for their valuable contributions to this work, in particular the country assessments: Arne Van Stiphout, Dimitri Pescia, Karin Kritzinger, Kwanghee Yeom, Long Nguyen, Maia Haru Hall, Mentari Pujantoro, Muhammad Hamza Naeem, Naila Saleh and Tisha Nok-Krecke (all Agora Energiewende); Deon Arinaldo (Institute for Essential Services Reform); Ibrahim Ariffin (Alvarez & Marsal); Erik Goto (Renewable Energy Institute); Phimsupha Kokchang and Siripha Junlakarn (Energy Research Institute, Chulalongkorn University); Rachel Eun Ko (NEXT group); Ubaid ur Rehman Zia (The Sustainable Development Policy Institute); Jephraim Manansala and Angelika Marie Camacho David (Institute for Climate and Sustainable Cities); and Laura El-Katiri, Rabia Ferroukhi, Ranisha Basnet and Sarah Bittner (all Secretariat of the International Network of Energy Transition Think Tanks).

Preface

Dear reader,

The energy supply disruptions following escalations around the Strait of Hormuz have again exposed the systemic risks of fossil dependence, driving price volatility across global markets. Cost-competitive solar and wind power offer a structural alternative to strengthen energy security, protect consumers and decarbonise electricity systems.

Calls for "new policy frameworks" to accelerate renewable deployment are common but rarely specific enough to guide action. Scaling solar and wind depends on the interaction of procurement design, permitting, institutional arrangements, power system operation, equity and other factors that vary across contexts.

The Renewable Energy Policy Framework (REPF) provides a transferable, qualitative assessment methodology to diagnose barriers to solar and wind deployment, identify opportunities and move from aspirations to targeted interventions. Designed as a community tool, it has been applied across eight Asian countries, will be updated with new evidence and can expand to additional countries. We encourage policymakers, civil society and researchers to use the REPF to inform renewable energy strategies.

I wish you an insightful read!

Dimitri Pescia
Director Power System Transformation
Agora Energiewende

Key findings at a glance

1 **Solar and wind power offer a major opportunity to reduce fossil fuel import dependence and lower consumer costs, yet many countries still lack the policy frameworks needed to scale them rapidly.** Persistent systemic and institutional barriers – such as fragmented governance, slow permitting and weak grid planning – slow development, despite mature technologies, strong investor appetite and available capital. Integrated policy design is essential to unlock large-scale deployment while safeguarding affordability, energy security, resilience and decarbonisation.

2 **The "Renewable Energy Policy Framework" is a systematic tool to identify regulatory gaps and manage the policy trade-offs that shape solar and wind deployment.** Organised across seven policy areas and twenty four qualitative indicators, it helps stakeholders – from government representatives to civil society – diagnose bottlenecks and track reform impacts over time. Applied to eight Asian countries, the framework is designed to be scalable, supporting more coherent and evidence-based policymaking tailored to diverse national contexts.

3 **Investment-friendly policy reforms – such as transparent procurement, streamlined permitting, better spatial planning and faster grid connection – are essential to improve project bankability.** Scaling up these measures strengthens investor confidence, mobilises capital at pace and builds a robust pipeline of bankable solar and wind projects aligned with national and international energy and climate objectives.

4 **Baseload, top-down, centralised power generation is quickly becoming obsolete, as modern power systems prioritise flexibility and distributed resources in grid planning, development and operation to enable reliable and cost-effective renewables integration.** Well-designed regulations – such as flexible contracts with fossil fuel generators, short-term price signals with clear balancing responsibilities and cost-reflective grid charges – can unlock flexible responses from generators, storage operators and consumers, driving system-friendly infrastructure investments and strengthening overall resilience.

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Introduction

Over the past 15 years, the costs of solar photovoltaics and wind power have declined dramatically. The levelised cost of electricity from utility-scale solar has fallen by roughly 90 percent, while onshore wind costs have dropped by more than 70 percent (IRENA, n.d.R). These cost reductions have fundamentally transformed the economics of the power system: solar and wind are now the cheapest sources of electricity generation in the vast majority of global markets and are often cheaper than running existing coal or gas power plants, even in the absence of renewable energy (RE) subsidies.

However, this technological revolution has not automatically translated into deployment at the pace or scale required to meet ambitious climate targets and national priorities of energy security and affordability. Across both developed and developing economies, the binding constraints on solar and wind expansion have become less and less about technology costs or the availability of finance. While cost and finance barriers have not yet disappeared, particularly in developing economies with high sovereign or currency risks, the binding constraints in most markets are centred around regulatory, institutional, grid-related and system integration barriers. Where it was once sufficient for policymakers to focus on setting RE targets and providing financial support mechanisms such as feed-in tariffs (FITs) and auctions, accelerating deployment now requires a much wider set of systemic conditions to be addressed. These range from complex permitting procedures and outdated grid operations to absences of flexibility mechanisms or misaligned procurement frameworks.

This paper introduces a policy and regulatory assessment framework that responds to this challenge by providing a structured, transferable methodology for diagnosing policy and regulatory gaps that impede solar and wind deployment, and for identifying opportunities to close them. It is designed to be applicable across diverse national contexts and power system and electricity market structures.

The framework is applied here, in its first iteration, to eight countries in South, Southeast and East Asia, namely Thailand, Viet Nam, Pakistan, South Korea, Japan, Malaysia, the Philippines and Indonesia. The region presents a compelling test case: studies have shown that economies in these subregions will need to scale up their solar and wind capacities more than fivefold by 2030 to align with domestic net-zero targets (Agora Energiewende, 2024), increasing the share of solar and wind to approximately 30 percent of total electricity generation on average across the region by 2030, up from less than six percent in 2024. Several countries have demonstrated that "first-generation" support policies can catalyse rapid growth: the Philippines scaled up its RE deployment using Green Energy Auctions (GEA) (Department of Energy, n.d.), while generous feed-in-tariffs in Viet Nam led to a solar and wind power boom until 2023 (IISD, 2025). However, systemic constraints around grid integration, procurement or institutional capacity have since emerged as barriers in both cases.

Deployment is lagging across economies at very different stages of energy system development, market liberalisation and institutional capacity. These offer a rich and varied evidence base against which to test the framework's diagnostic value. The barriers and opportunities that emerge from these assessments, while nationally specific, have the potential to carry lessons that are relevant beyond the region.

Calls for "new policy and regulatory frameworks" to accelerate RE deployment have become commonplace, but such appeals often remain at a level of generality that gives policymakers little to act on. In practice, unlocking solar and wind deployment depends not on any single policy but on a complex interplay of procurement design, permitting procedures, institutional arrangements, power system operations and social equity considerations – not all of which are explicitly renewable energy policies. The **renewable energy** policy framework (REPF) set out in this report is designed to make that complexity

legible: it provides a structured, qualitative assessment that allows stakeholders to move from broad aspirations to specific diagnoses of where the binding constraints lie and to prioritise interventions accordingly.

The main objectives of this framework are to:

1. Provide an integrated diagnostic of policy and regulatory gaps and opportunities in each focus country.
2. Contribute to a shared understanding of the key areas of intervention to accelerate wind and solar power deployment in each focus country.
3. Track progress on the implementation and impact of policy and regulatory reforms over the next few years.
4. Support cross-learning and knowledge exchange between stakeholders in different countries on policies that have spurred RE deployment in the region.

We hope that the renewable energy policy framework becomes a living tool that empowers energy transition stakeholders, from policymakers to civil society, to address the policy and regulatory barriers holding back solar and wind deployment in their jurisdictions.

The renewable energy policy framework (REPF)

Structure and logic

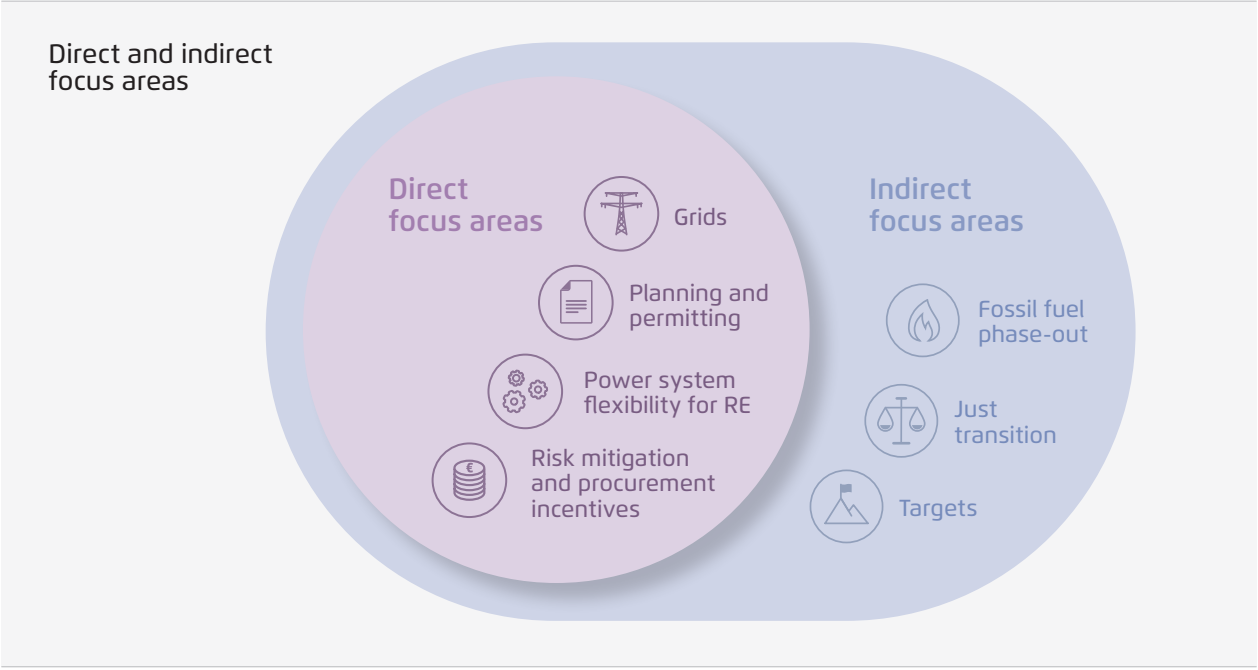
Scaling up solar and wind deployment is not a matter of implementing one particular policy instrument, but of aligning a broader enabling system of interacting policies, regulations, institutional arrangements and operations, many of which are not explicitly "renewable energy" policies. A grid code that delays connection, a take-or-pay contract with a fossil fuel plant that crowds out renewable generation or a permitting regime that adds years to project timelines can all be as decisive as the presence or absence of a feed-in-tariff. The REPF put forward in this report is designed to capture and explore this breadth.

The framework is organised around seven focus areas comprising 24 indicators in total (see Figure 1). Four **direct** focus areas; 1) risk mitigation and procurement; 2) planning and permitting; 3) power system flexibility for RE integration; 4) grids; cover the policy and regulatory conditions that directly determine whether a particular solar or wind project can be financed, licensed, connected and operated. Three **indirect** focus areas; A) fossil fuel phase-out; B) targets; C) just transition; address the broader and in some cases indirect conditions under which deployment happens, and whether such deployment can be sustained.

Focus areas

This section describes each focus area and the rationale for its inclusion in the framework. A detailed description and assessment questions are provided in Annex 1.

Overview of direct and indirect focus areas → Fig. 1



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Direct focus area 1: Risk mitigation and procurement incentives

This focus area covers everything that directly shapes the financial case for investing in a solar or wind project. It centres around the **design of power purchase agreements** (PPAs, Indicator 1.1), which is assessed not as a single instrument but rather as a bundle of risk allocation decisions about everything from offtaker creditworthiness, contract duration or inflation and currency risks to ascertaining whether curtailment compensation is available and a legal basis for private or foreign ownership exists. These factors collectively determine the cost of capital, which is often the single largest driver of wind and solar power deployment in developing economies.

In addition, the focus area also spotlights the mechanisms by which capacity is procured across different market segments. For example, do **competitive auctions, feed-in-tariffs or corporate PPAs** exist for large-scale projects (Indicator 1.2), or do the operators of distributed or rooftop solar have the **right to self-consume or receive compensation for excess electricity** generated by their systems (Indicator 1.3). The logic connecting these indicators is that a bankable project depends on an interlinked chain of contract terms and procurement certainty, often flanked by **additional fiscal support** (Indicator 1.4) such as tax credits, grants and concessional finance. A perfectly designed PPA is of limited value if the regulatory and tendering frameworks that facilitate it are unpredictable; furthermore, even generous fiscal incentives cannot compensate for a procurement framework that creates stop-and-go cycles. Unlike a decade ago, when these instruments were primarily needed to bridge a cost gap, today they function mainly as tools for risk allocation and procurement certainty.

Carbon pricing (Indicator 1.5) is included in this focus area because it directly affects the relative economics of solar and wind versus fossil fuel generation at the project level. Carbon pricing also supports the **phase-out of fossil fuels** (Indirect focus area A) but is included here because of its direct impact on the financial case for solar and wind investment.

Direct focus area 2: Planning and permitting

This focus area addresses the processes that determine where solar and wind projects can be built and how quickly they can move from conception to financial close and then to construction and operation. **Spatial planning** (Indicator 2.1) and **permitting and environmental and social impact assessments** (Indicator 2.2) are included in this focus area because they represent sequential stages of the same challenge: one needs to first identify suitable land and then obtain the necessary approvals to develop it. Typically, developers must also secure a grid connection offer (Indicator 4.3), often before or alongside permitting. As this is a technical and commercial process with the network operator, rather than a regulatory approval, it is addressed in Focus Area 4: Grids (Indicator 4.3).

Aligned and streamlined planning and permitting processes can significantly reduce project development risks and lower transaction costs. Spatial planning is becoming increasingly critical as land availability is often a constraint, particularly in densely populated economies or scenarios in which renewable projects may compete with other land uses such as agriculture, conservation or urban development. Permitting typically involves various and multiple actors at national and subnational level and can pose a significant barrier if coordination is poor, the number of permits is excessive or timelines are unpredictable.

Planning and permitting are also closely linked in practice. A lack of dedicated spatial planning for renewable energy, e.g. an absence of designated RE zones or unclear land-use classifications, makes permitting longer and more complex by forcing decisions to be taken on a case-by-case basis that could otherwise have been resolved systematically or via an integrated process.

Direct focus area 3: Power system flexibility and RE integration

This focus area encompasses the processes by which the electricity system can operate more flexibly to integrate increasing shares of renewables (wind and solar). **Dispatch regulation** (Indicator 3.1) and **RE forecasting** (Indicator 3.2) are included in this focus area given the need to accurately forecast solar and wind generation to meet demand and subsequently to dispatch flexible resources to address any short-term balancing needs and keep the system frequency within limits. Properly aligning power output forecasting and dispatch regulation can reduce the impact of solar and wind variability and ensure higher RE generation, thereby lowering system costs.

In order to support the dispatch of flexible resources to complement solar and wind generation, **regulatory measures for flexibility and system integration** (Indicator 3.3) and **market-based incentives in liberalised power markets** (Indicator 3.4) are vital, which is why they are included in this focus area. Ensuring that existing fossil fuel plants operate flexibly can create space for increased solar and wind generation, with flexible resources being used during periods of low renewables generation. Liberalised power markets can efficiently create incentives for the uptake of flexible resources (e.g. batteries) by rewarding ancillary services and shifting demand loads to periods of higher solar and wind generation through time-of-day pricing.

Direct focus area 4: Grids

Grid infrastructure is the physical and institutional backbone of the electricity system, and its design fundamentally determines where, when and whether solar and wind projects can deliver power. Without forward-looking grid planning, transparent access rules and streamlined connection procedures, even the most competitive renewable projects can be delayed, curtailed or stranded.

This focus area investigates grids as potential enablers or barriers, following the sequence of events that a renewable energy project is likely to encounter in practice. Proactive **grid development planning** (Indicator 4.1) comes first, as this ensures that transmission and distribution networks are upgraded in anticipation of electricity demand and renewables growth, for example by connecting solar and wind generation regions with demand centres. In addition, strengthening distribution grids can reduce outages, thereby ensuring grid availability for solar and wind generators. This can help lower grid congestion, and, by extension, the uncertainty faced by developers. Once the infrastructure is in place, **grid access and usage** (Indicator 4.2) determine whether generators (and offtakers) can use the grid on fair terms; this includes the way in which certain costs such as wheeling charges are allocated. **Grid connection procedures** (Indicator 4.3) dictate the practical steps a project will have to navigate to gain access to the grid. This includes establishing whether transparent and non-discriminatory access rules and connection procedures are in place to guarantee that solar and wind generators can connect and dispatch electricity fairly, thereby boosting investor confidence. Finally, **smart grids for renewables integration** (Indicator 4.4) addresses the operational capabilities required to manage a high-renewables system in practice: digitisation, advanced forecasting and control infrastructure to enable grid operators to proactively accommodate variability while maintaining reliability.

Indirect focus area A: Fossil phase-out policies

Achieving power systems with very high shares of renewable energy requires action on both sides of the electricity mix: phasing clean renewable energy in and phasing fossil fuels out. It is not sufficient to do the former well via risk mitigation and procurement incentives (Direct focus area 1), planning and permitting (Direct focus area 2), flexibility (Direct focus area 3) and grids (Direct focus area 4) if fossil fuel incumbents continue to hold protected positions in the power system.

This focus area assesses whether countries have the policy architecture in place to enable a managed exit from fossil fuels in the power sector. A **concrete phase-out plan** with defined shutdown dates establishes the direction and timeline, while regulatory interventions (e.g. investment bans on new fossil capacities) prevent assets being locked in in a way that could undermine the aforementioned timeline. Market-based interventions (e.g. emission standards or carbon pricing) shift the operating economics such that it no longer makes sense to continue generating electricity with fossil fuels, thereby reinforcing the investment logic for replacing it with clean alternatives (see also Indicator 1.5). These three dimensions are mutually reinforcing: a phase-out plan without regulatory bite or economic incentives remains merely aspirational, while market signals without a clear endpoint may not be sufficient in terms of timelines.

Indirect focus area B: Targets

Setting ambitious, transparent and credible short- and long-term targets provides an important signal to stakeholders who are navigating the complex energy transition process.

Targets for renewable energy (Indicator B2) are typically embedded in a larger framework of targets based on economy-wide **long-term net-zero targets** (Indicator B3). They should include targets for solar and wind power in the electricity sector and ideally be defined for the short, medium and long terms to create accountability and provide predictability for investors.

Aside from setting targets, it is vital to establish a **monitoring and governance framework** (Indicator B1) to track progress over time and identify corrective actions where outcomes are lagging behind targets. This framework should include several indicators and be backed up by clearly assigning responsibilities to different agencies for collecting data and identifying corrective actions.

Indirect focus area C: Just transition

The shift from fossil fuels to renewable energy is not merely a technological or economic transformation. It also presents an opportunity to address longstanding inequities in how energy systems distribute costs, benefits and decision-making power. Justice and equity are therefore not simply the prerequisites for project deployment but represent at their core the objectives that the energy transition itself seeks to advance. Nonetheless, this imperative is also practical in nature: where communities are excluded from decision-making or bear disproportionate costs from infrastructure projects, their resulting resistance can delay or even block projects entirely. Ensuring that wind and solar projects are deployed in a just and equitable manner is essential for sustaining the public and political support on which broader deployment ultimately depends.

This focus area addresses three interconnected dimensions. The first is procedural: ensuring that local communities have meaningful input into the **siting of renewable energy infrastructure** at an early stage (Indicator C1) rather than consulting them as an afterthought or not at all (see also Indicator 2.2). The second is distributive: creating mechanisms for communities to share the economic value that renewable energy projects create, including **community financial participation and local ownership** (Indicator C2), as well as policies to harness the **socioeconomic co-benefits such as job creation and local development** (Indicator C3). The third concerns the managed transition away from fossil fuels for directly affected communities and workers. This includes **reskilling and upskilling programmes for workers** (Indicator C4) and regional transition plans for areas with high fossil fuel value creation.

Tensions and trade-offs between policies and regulations

Solar and wind power policies interact significantly with broader economic, social and environmental dynamics, which can sometimes result in trade-offs when pursuing faster solar and wind power deployment. It is vital for policymakers to recognise and manage these trade-offs so that they can weigh the urgent need to expand renewable energy against their responsibility to safeguard ecosystems and local communities while ensuring grid stability and reliability.

These tensions are not design flaws in the framework or in the policies themselves; rather they are inherent features of a complex system in which technical, economic, social and institutional dimensions are profoundly interlinked. If policies or regulations are planned and pursued in isolation, they risk setting in motion reforms that appear beneficial within a single focus area but prove counterproductive when their wider system impacts are considered. However, many of the tensions identified below can be mitigated through deliberate coordination and forward planning. Interactions between different policies and regulations also depend on system structures and institutions, on the stage of solar and wind deployment and on national energy and non-energy related priorities.

1. Cost and risk allocation between RE developers, utilities and consumers

This cluster of tensions centres on how the costs and risks of integrating renewables into the power system are distributed. Policies that lower the risks for renewable energy developers could shift the burdens onto grid operators, utilities and, ultimately, consumers.

Developers, independent power producers (IPPs) and corporate buyers generally support non-discriminatory third-party grid access and usage (Indicator 4.2) to ensure that renewables can reach customers at the lowest delivered cost. By contrast, regulators and grid operators sometimes defend wheeling charges and tighter control over grid access due to concerns that third-party grid access and usage can pull away high-paying customers, leaving the utility with a shrinking customer base and rising costs for those that remain. Similar considerations apply to corporate or direct PPA frameworks (Indicator 1.2) that allow large consumers to procure RE outside regulated tariff structures. In single-buyer systems, such frameworks must be carefully designed to ensure that all users contribute equitably to grid costs since failing to do so risks undermining the utility's ability to finance essential grid investments.

Another related dimension concerns incentives for distributed generation and rooftop solar (Indicator 1.3). While net metering and attractive buyback rates can accelerate adoption, grid operators often resist these schemes when compensation doesn't reflect the fixed network costs or because they are concerned that the time of distributed renewable generation doesn't align with periods of high demand.

A separate set of tensions centres around carbon pricing (Indicator 1.5) and its potential impact on generators and consumers. Incumbent fossil fuel generators tend to resist carbon pricing due to concerns about how it will impact their project economics. Policymakers may also oppose it due to concerns that an increase in electricity tariffs could spark a public backlash. However, well-designed carbon pricing schemes can often incentivise efficient emission reductions by improving the economics of solar and wind generation.

2. Deployment speed, social legitimacy and equity

Another persistent source of tension is the need to strike a balance between the desire to accelerate solar and wind deployment, maintaining social and

political legitimacy, and protecting the environment. Developers tend to favour streamlined siting, permitting, and environmental and social impact assessments (Indicator 2.2) to reduce uncertainty and shorten administrative timelines. Local communities may have substantive concerns about land use, visual impact and inadequate benefit sharing, and opposition is often driven by gaps in procedural fairness. Developing transparent and predictable permitting procedures, anchored in proactive spatial planning (Indicator 2.1) that steers renewable energy infrastructure away from densely populated areas, high-biodiversity zones, and land critical to local livelihoods. can help address these concerns and mitigate risks for both sets of stakeholders. This includes ensuring that local communities have meaningful input into the siting decisions of renewable energy infrastructure from an early stage (Indicator C1). Creating mechanisms for community financial participation and/or local ownership (Indicator C2) can further enhance public and political support.

Competitive auction designs (Direct focus area 1) can serve as a powerful tool for minimising procurement costs, and when well-designed, can also actively advance broader energy transition goals. By incorporating non-price criteria into tender design, such as community ownership (Indicator C2), local job creation or regional value creation (Indicator C3), auctions can be structured to reward projects that deliver socioeconomic benefits alongside cost efficiency. This is particularly relevant in contexts where community and locally-owned renewable energy projects are of a scale that allows them to participate meaningfully in competitive processes. Without such design considerations, auctions risk defaulting to a framework that favours large corporate developers, often international firms, over smaller local projects.

Fossil fuel phase-out plans (Indirect focus area A) can increase certainty for solar and wind power developers but risk alienating affected communities and workers in the absence of just transition (Indirect focus area C) plans that include reskilling and upskilling programmes for workers (Indicator C4) and regional economic diversification plans.

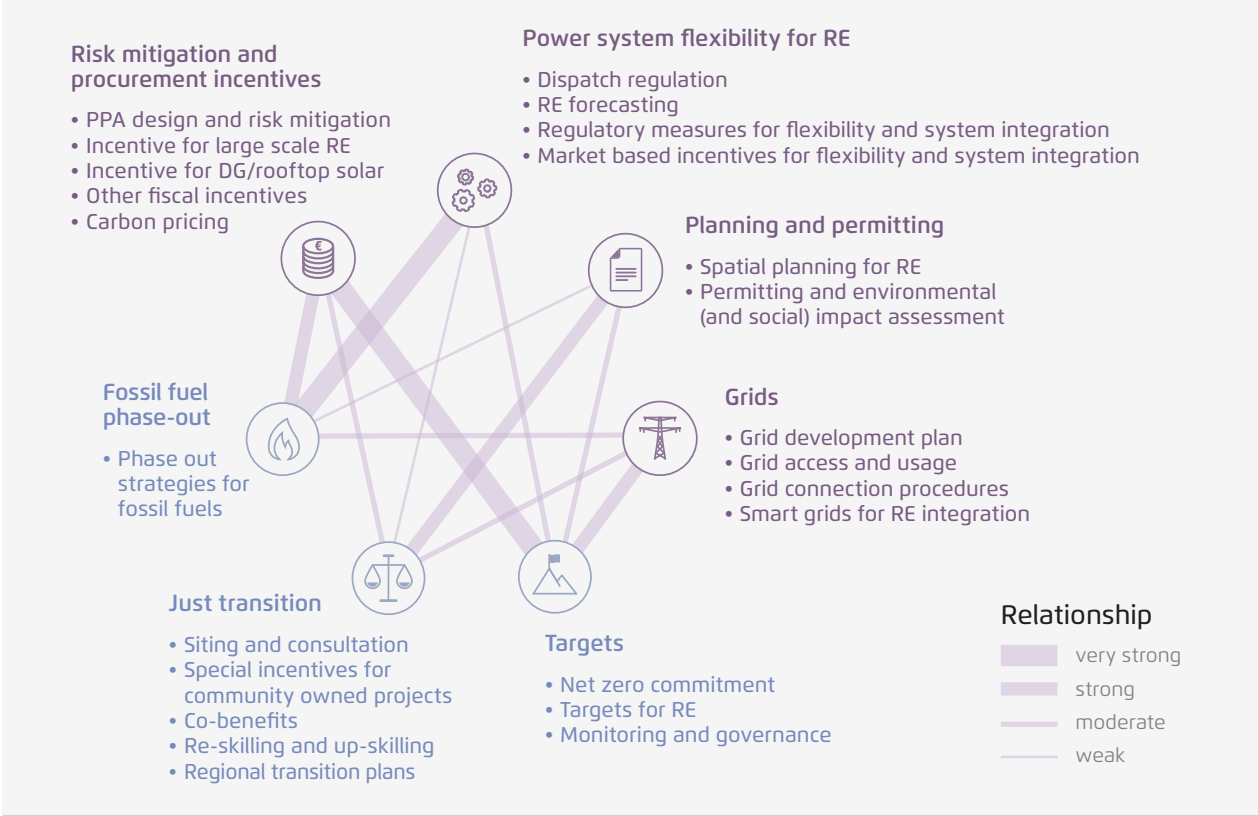
3. Deployment speed and system readiness

System operations add further complexity in the form of curtailment, dispatch regulation (Indicator 3.1) and integration cost allocation. Renewable generators typically want dispatch priority, non-discriminatory grid connection procedures (Indicator 4.3) and protections against curtailment to secure revenues and reduce merchant risk. Grid operators, on the other hand, need to maintain operational flexibility to manage congestion and maintain stability. Some grid operators favour long-term inflexible PPAs with fossil fuel generators as a means of ensuring dispatchability, which can crowd out solar and wind generation and decreases bankability for developers.

Other tensions also exist, such as around the local content requirements that are often favoured by policymakers and manufacturers to boost local manufacturing and jobs but tend to be resisted by developers due to concerns over escalating costs and timelines. In addition, foreign ownership of solar and wind projects can contribute to new sources of capital but is opposed by local industry bodies and some system operators concerned about the grid's resilience.

Taken together, these tensions reflect a complex policy challenge: solar and wind expansion depends on lowering the costs and risk for investors, yet power systems also need stable grid support, fair cost allocation, operational flexibility, streamlined permitting processes with adequate consultation and political support in the form of jobs and community benefits. The "right" balance differs according to the system context and country, and needs to integrate these considerations to ensure lasting public and political support for the energy transition.

Interactions between direct and indirect focus areas → Fig. 2



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Approach and scope of the REPF and how to use it

The REPF can be leveraged by policymakers, civil society organisations (CSOs) and financial institutions to identify priority barriers impeding the deployment of solar and wind power at a regional and national level, thereby supporting strategic planning. It also includes qualitative RAG (red-amber-green) ratings for different indicators, which can help monitoring and evaluation teams track changes in indicators and sub-indicators over time. At a national level, the REPF can be used as a tool for discussions among think-tanks, CSOs and the private sector to target interventions and programmes at key barriers.

Policy frameworks for clean energy investment have also been developed by other institutions and experts. Among the most comprehensive analyses is the World Bank's "Regulatory Indicators for Sustainable Energy (RISE)" project, which developed eight categories/focus areas and more than 30 indicators, tracking 111 countries (World Bank, n.d.). Other institutions have likewise assessed RE policy frameworks; examples include an IEA-RETD report on the "RE Transition – Transitioning to policy frameworks for cost-competitive renewables" (IEA and RETD, 2016) and an Agora Energiewende study that analysed categories for the low-cost deployment of renewables (Agora Energiewende, 2018).

The REPF differs from these frameworks by focusing mainly on qualitative indicators related to solar and wind power deployment. It does not include indicators related to energy efficiency, hydropower, geothermal energy and nuclear power, which are commonly included in broader studies on energy policies. Instead, it focuses on the two aforementioned technologies, given their relative ease of deployment and potential for scalability in different national contexts. In addition, the REPF covers a broader range of challenges related to solar and wind power deployment than other tools, including system flexibility and grid integration. The REPF is not an assessment framework for energy policy in general; other technologies (e.g. batteries, dispatchable renewables) are only considered to the extent that they are needed to provide the right framework conditions for a rapid uptake of wind and solar.

The REPF highlights the technical and social barriers associated with RE deployment and does not cover political economy challenges, which could play an important role in shaping RE investments. The focus of the REPF is on national-level policies; variances in sub-national RE policies are not covered. Furthermore, not all indicators and sub-indicators apply to each country due to variances in the structure of electricity systems. For example, some countries rely on vertically integrated utilities, while others depend on wholesale markets.

The framework could be further enhanced in the future by integrating quantitative metrics to build a data-driven evidence base relating to the impact of different policies on outcomes in the solar and wind power sectors in different countries. In addition, the framework could be enhanced by incorporating policies on renewable energy manufacturing and energy security, thereby providing an integrated perspective on renewable energy considerations for decision-makers.

Narrative summaries

The REPF platform provides a comprehensive overview of the current barriers to and opportunities for solar and wind power deployment in eight focus countries (Thailand, Viet Nam, Pakistan, South Korea, Japan, Malaysia, the Philippines and Indonesia) in the Asia-Pacific region. The REPF has been applied to these countries by integrating feedback from local independent institutions and country experts, drawing on their deep understanding of local policy contexts and of the challenges and opportunities associated with solar and wind deployment in their respective countries.

The narrative summaries below provide a snapshot of the key barriers and solutions highlighted in the platform, as well as of any major recent policy developments in these countries (current as of 2025).

East Asia

Japan

Overview

Japan's energy transition started with the implementation of **solar policies in the 1990s,** making Japan the world's lead market at the time (Japan for Sustainability, 2008). Later, the establishment of **FITs** in 2012 triggered a new wave of deployments, especially for solar (Wen et al., 2021). Other renewable energy technologies, namely onshore wind, geothermal and biomass, have very low deployment levels (Renewable Energy Institute, 2023). Over the past decades, a complex policy framework to promote wind, solar and other renewables has been established. Today, the **Green Transformation (GX) Policy** serves as Japan's flagship policy package aimed at climate neutrality and includes carbon pricing and green investments (IEA, 2024). However, RE deployment levels and RE targets are still much lower than in other industrialised countries. In order to bring wind and solar deployment to levels consistent with the **target of net zero by 2050,** the following barriers need to be overcome.

Key barriers and solutions

The **lack of economic dispatch** and **available grid capacity** leads to high curtailment rates for solar (and wind power), reducing the bankability of these projects. Key solutions involve modifying dispatch regulations to more quickly **establish economic dispatch** by implementing electricity market reforms and curtailing solar and wind power only after nuclear and other technologies have been reduced/curtailed. In order to increase the incentive to expand the distribution and transmission grid more rapidly, the grid connection charging methodology could be changed from a deep to a **shallow connection charging approach,** meaning that the Transmission System Operator (TSO) or Distribution System Operator (DSO) would have to pay for all costs related to grid upgrades. This is compounded by Japan's **grid cost framework** which creates a disproportionate burden on renewable energy developers and regions, in the absence of national cost-sharing reforms (IEEFA, 2025).

Complex and costly land acquisition, land-use conflicts and complicated permitting processes lead to long project planning periods and renewable energy being produced at **relatively high costs** (compared with other countries). **Prioritising RE projects in spatial planning** at the national level and **streamlining permitting processes** (based on one-stop-shop agencies) could bring about significant cost reductions and faster uptake of RE projects. Japan's government recently passed the EEZ law in June 2025, which increases the territorial limits for offshore wind projects by enabling their installation in Japan's exclusive economic zone (EEZ) (Renewable Energy Institute, 2025).

The Japanese net-zero strategy has **relatively unambitious targets for renewable** energies. The government is targeting 40–50 percent of renewables in the electricity sector by 2040 (a share that most European countries have already achieved) (Renewable Energy Institute, 2025). Targets could be increased considerably, **acknowledging the falling costs of solar** and system integration solutions via continued investments in **low cost (battery) storage.**

The role that hydrogen and ammonia are expected to play in Japan's net-zero strategy appears overstated, given their **high costs and limited economic viability at scale;** these commodities should be prioritized for hard-to-abate sectors such as heavy industry where few alternative decarbonization options exist, **with direct electrification powered by renewables** better placed to drive decarbonization in the power sector. At the same time, **concrete phase-out dates for unabated coal and gas** need to be established. As of 2026, the government is in favour of **restarting existing nuclear power plants** and even extending their lifespans (Renewable Energy Institute, 2026).

Indicator Assessment

Japan – Overview of assessment framework

→ Table 1

Risk mitigation and procurement incentives		Planning and permitting		Power system flexibility for RE integration		Grids	
PPA design and risk mitigation	○ ● ○	Spatial Planning for RE	○ ● ○	Dispatch regulation	● ○ ○	Grid development plan	○ ● ○
Incentive for large scale RE	○ ○ ●	Permitting and ESIAs	● ○ ○	RE forecasting	○ ○ ●	Grid access and usage	○ ● ○
Incentive for DG/rooftop solar	○ ● ○			Regulatory measures for flexibility and system integration	○ ● ○	Grid connection procedures	○ ● ○
Other fiscal incentives	○ ○ ●			Market based incentives for flexibility and system integration	○ ○ ●	Smart grids for RE integration	○ ○ ●
Carbon pricing	● ○ ○						

Fossil fuel phase-out		Targets		Just transition	
Phase out strategies for fossil fuels	● ○ ○	Net zero commitment	○ ● ○	Siting and consultation	○ ○ ●
		Targets for RE	○ ● ○	Special incentives for community owned projects	● ○ ○
		Monitoring and governance	○ ● ○	Co-Benefits	○ ○ ●
				Re-Skilling and up-Skilling	○ ● ○
				Regional transition plans	○ ○ ○

Size of barrier to RE deployment

- ● big
- ● medium
- ● low

South Korea

Overview

South Korea has pledged to achieve net zero by 2050 and targeted 100 GW RE deployment by 2030 (IEEFA, 2026). Although South Korea has been one of the leaders among Southeast and East Asian countries in terms of adding wind and solar capacity, the share of wind and solar in actual power generation remains low at 7 percent in 2025 (Ember, 2026). This reflects limited incentives, weak carbon pricing, grid delays and insufficient local engagement. To realign with its national goals, South Korea could strengthen its regulatory framework with fiscal incentives, improve land-use coordination, enhance community participation and provide concrete support for affected workers and residents, driven by the ambitious policy to phase-out coal power plants by 2040.

Key barriers and solutions

Following the introduction of the Renewable Portfolio Standard (RPS) in 2012, large utilities have been required to meet annual **renewable energy quotas,** currently set at 15 percent for 2026. However, this obligation level is not only insufficient to meaningfully accelerate renewable energy deployment, but also represents a step back from the previously more ambitious 25 percent target, revised downward due to lacklustre implementation (IEEFA, 2026). With South Korea's 2030 renewable energy goals fast approaching, the current trajectory falls short of the ambition seen in other leading industrialised markets and highlights a need to accelerate deployment.

South Korea's renewable energy expansion faces structural challenges related to **grid capacity and curtailment** because transmission infrastructure has not kept pace with the rapid expansion of large-scale generation. South Korea is seeking to mitigate this challenge with the passage of the Special Act on Expansion of the National Power Grid (National Power Grid Act), in 2025 (Kim & Chang, 2025), which aims to accelerate transmission infrastructure construction by streamlining permitting, simplifying environmental assessments, and providing legal grounds for higher compensation to residents. While the effective implementation of the act could address some of these challenges, **grid development planning** has traditionally been hindered by both **technical and social barriers,** including public opposition, land-acquisition difficulties and slow permitting, often delaying projects by up to a decade. At the same time, **smart grid technology** in South Korea is well established and can help alleviate grid congestion through smart metering, real-time data and forecasting.

In addition, the country's carbon pricing and **Emissions Trading System (ETS) remain relatively weak.** The implementation of the 4th phase of the ETS from 2026–2030, which institutes a stricter emissions cap and a gradual reduction in free allocations is unlikely to fundamentally alter the economics of the power given the large structural cost gap between gas and coal fired generation. Consequently, coal remains cost-competitive despite national climate commitments.

Spatial planning poses another significant obstacle. Renewable energy siting is not systematically integrated into municipal land-use plans, leading to ad-hoc approvals and **frequent resident opposition.** This fragmentation complicates project development and slows deployment.

Social acceptance remains a pervasive challenge across Korea's energy transition. Public input often enters the process too late, and socioeconomic impacts on local communities are not consistently assessed. Although the government has been offering **economic incentives for community-owned projects since 2010,** local involvement in siting, consultation and co-benefit schemes is still not sufficiently reflected in renewable energy projects.

The new Korean government, which took charge in June 2025, has outlined a strong commitment to renewable power, by announcing solutions to address these barriers. While these solutions are not implemented yet, they hint at growing momentum towards renewables deployment in the future.

Indicator Assessment

South Korea – Overview of assessment framework → Table 2

Risk mitigation and procurement incentives		Planning and permitting		Power system flexibility for RE integration		Grids	
PPA design and risk mitigation	medium	Spatial Planning for RE	big	Dispatch regulation	medium	Grid development plan	medium
Incentive for large scale RE	medium	Permitting and ESIAs	medium	RE forecasting	big	Grid access and usage	big
Incentive for DG/rooftop solar	medium			Regulatory measures for flexibility and system integration	medium	Grid connection procedures	medium
Other fiscal incentives	big			Market based incentives for flexibility and system integration	medium	Smart grids for RE integration	low
Carbon pricing	big						

Fossil fuel phase-out		Targets		Just transition	
Phase out strategies for fossil fuels	low	Net zero commitment	medium	Siting and consultation	big
		Targets for RE	medium	Special incentives for community owned projects	low
		Monitoring and governance	big	Co-Benefits	big
				Re-Skilling and up-Skilling	big
				Regional transition plans	big

Size of barrier to RE deployment

- big
- medium
- low

Southeast Asia

Indonesia

Overview

The passage of the Energy Law of 2007 (Law No. 30/2007) outlined Indonesia's energy policy priorities and laid the basis for renewable energy deployment in the country (IEA, 2017). In 2021, Indonesia announced a target of reaching net zero emissions by 2060 or sooner, bolstering its commitment to the energy transition (Climate Action Tracker, n.d.). In recent years, energy self-sufficiency has emerged as a key objective for the Indonesian government, resulting in a renewed focus on coal power given the country's vast endowment. At the same time, the government has also focused on advancing decentralized renewable energy and announced a program in 2025 to develop 100 GW of solar power capacity along with battery energy storage systems (BESS), which will be anchored by 80,000 village cooperatives (Institute for Essential Services Reform, 2025). While the program signals the government's commitment to accelerate renewable energy deployment, several regulatory and institutional barriers must be addressed to effectively scale-up solar and wind energy in the country.

Key barriers and solutions

The key barriers to wind and solar power deployment in Indonesia relate to the **limited support policies for renewables** and the lack of a level playing field with existing fossil fuel plants. This also reflects the path dependencies related to the coal industry. The current development pipeline for utility-scale renewables is limited, with development being mostly hampered by the **complex system of procurement via the single buyer, PLN.** Project developers have traditionally needed to conduct lengthy bilateral PPA negotiations and enter into complex joint ventures with PLN. Recognising this challenge, the Ministry of Energy and Mineral Resources introduced a Regulation No.5/2025 in 2025 which outlines new PPA guidelines between renewable energy developers (IPPs) and PLN, creating **a standard contractual framework for RE projects** (ASEAN Centre for Energy, 2025). If implemented effectively, this could improve project bankability and reduce delays in procurement and PPA negotiations.

At the same time, **tariffs below the FIT level are often too low** and selection criteria for auctions are **not transparent.** Despite this challenge, Indonesia has announced a **strong price signal for battery storage,** with the PPA ceiling price for solar plus battery about two-thirds higher than that of solar, indicating the government's intention to **expand storage capacity** (Ember, 2025). However, in practice, utilities and developers will still need to negotiate the PPA price, which might be lower than the ceiling price.

Futhermore, there is a limited **policy framework for direct PPAs (DPPAs),** which could hinder corporate RE procurement. When it comes to solar self-consumption, recent policy modifications disadvantage customers by **abolishing the net metering system** and imposing **cumbersome local content requirements.** Achieving the ambitious 100GW solar target will require clear policies and a comprehensive implementation framework, such as **enshrining the program's targets** into a government or Presidential Regulation. With provinces being delegated the **authority to plan and allocate budgets** for the implementation of the100 GW solar PV program, this presents a policy window to set ambitious energy transition plans at the provincial level.

Regarding the **planning and permitting regime,** the lengthy process for acquiring all the necessary permits for renewable energy projects is seen as a barrier by project developers. Streamlined permitting procedures could help improve project bankability and provide certainty to developers. As far as **power system flexibility** is concerned, **existing "take-or-pay" contracts for fossil fuel plants** and the **lack of policies for battery procurement and demand-side flexibility** could pose a barrier to renewables once the share of wind and solar increases further in the electricity mix. These challenges could be addressed by **phasing**

out take-or-pay contracts and **introduce flexibility provisions in remaining contracts** to facilitate the integration of renewables.

The relatively **weak electricity grid infrastructure** and lack of interconnections between various islands are another barrier. **Substantial financial resources** will be required for transmission grid investments, which could be unlocked by adopting third-party business models, such as the Independent Transmission Project (ITP) model and leveraging blended finance instruments. In addition, the absence of regulatory clarity concerning **non-discriminatory (third-party) access for generators** to the grid is another major barrier to renewable energy investment. Limited public information is provided about grid operation practices and available grid capacity hindering transparency and creating uncertainty for developers.

While Indonesia has set long-term decarbonisation objectives as part of its plan to achieve net zero emissions by 2060, the country still **lacks a credible strategy for phasing out coal power,** while captive coal plants used by industrial parks continue to be built. Adopting "just transition" policies to cushion the negative effect on coal workers will be crucial once more concrete plans to phase out coal have been defined.

Indicator Assessment

Indonesia – Overview of assessment framework

→ Table 3

Risk mitigation and procurement incentives		Planning and permitting		Power system flexibility for RE integration		Grids	
PPA design and risk mitigation	○ ● ○	Spatial Planning for RE	○ ● ○	Dispatch regulation	● ○ ○	Grid development plan	○ ● ○
Incentive for large scale RE	● ○ ○	Permitting and ESIAs	○ ● ○	RE forecasting	● ○ ○	Grid access and usage	● ○ ○
Incentive for DG/rooftop solar	● ○ ○			Regulatory measures for flexibility and system integration	● ○ ○	Grid connection procedures	○ ● ○
Other fiscal incentives	○ ● ○			Market based incentives for flexibility and system integration	● ○ ○	Smart grids for RE integration	○ ● ○
Carbon pricing	○ ● ○						

Fossil fuel phase-out		Targets		Just transition	
Phase out strategies for fossil fuels	○ ● ○	Net zero commitment	○ ● ○	Siting and consultation	○ ● ○
		Targets for RE	● ○ ○	Special incentives for community owned projects	○ ● ○
		Monitoring and governance	● ○ ○	Co-Benefits	○ ○ ●
				Re-Skilling and up-Skilling	○ ○ ●
				Regional transition plans	○ ● ○

Size of barrier to RE deployment

- ● big
- ● medium
- ● low

Malaysia

Overview

Malaysia has significantly strengthened its renewable energy policy in recent years, guided by the National Energy Transition Roadmap (NETR) and long-term commitments to achieve net zero by 2050 (IEA, 2026). The country is targeting 31 percent RE in installed capacity by 2025, 40 percent by 2035 and 70 percent by 2050. Despite strong procurement frameworks, planning procedures and fiscal support, Malaysia continues to face major structural barriers, most notably in terms of grid access, grid connection and the development of carbon pricing mechanisms. Overcoming these issues is essential to meet rising solar penetration and align with long-term decarbonisation ambitions. While Malaysia has recently launched many support programmes for solar power, concerns around policy certainty and tariff design continue to hinder the bankability of projects.

Key barriers and solutions

Malaysia's procurement framework is relatively mature, with long-term PPAs between IPPs and the state-owned utility in peninsular Malaysia, Tenaga Nasional Berhad (TNB) (IRENA, 2023). However, **ownership restrictions** in large-scale solar (LSS) projects limit foreign participation. **Currency risks** remain a challenge because when PPAs are denominated in Malaysian ringgit, foreign developers are exposed to exchange-rate volatility.

Grid access and connection procedures are significant structural obstacles. Third-party access to the grid has been permitted through The Corporate Renewable Energy Supply Scheme (CRESS) to encourage corporate PPAs, but implementation has been mixed due to concerns over cost-escalation related to the System Access Charge (SAC) incurred by renewable power developers (Argus Media, 2025). Developers are required to cover nearly all the grid connection costs, including grid upgrades and long-distance interconnection lines. This cost burden makes remote solar projects economically unfeasible.

Limited regional interconnections and uneven distribution system planning further restrict large-scale RE integration. While Malaysia has adopted strict annual quotas for awarding renewable projects, this is intended to balance RE penetration with grid readiness, creating space for grid enhancement and operational improvement to take place. Despite these measures being perceived as restricting solar development, the country is witnessing over high project completion rates, which could bolster bankability and investor confidence in the long-term.

While renewables receive priority dispatch under the Renewable Energy Act 2011, fossil fuel plants continue to operate on the basis of "take-or-pay" PPAs with guaranteed capacity payments, reducing the scope for solar output (Sustainable Energy Development Authority, n.d.). Battery energy storage is still in early stages of deployment but is gaining momentum following the conclusion of Malaysia's first BESS stand-alone auctions (400MW / 1600MWh) (Aurora Energy Research, 2025).

Malaysia lacks formal forecasting requirements, aggregation frameworks and penalties for inaccurate RE forecasts. Market-based tools such as intra-day markets and ancillary services markets have not yet been implemented (IRENA, 2023). These gaps will become increasingly critical as Malaysia approaches higher solar penetration.

Permitting processes for solar are well structured, but environmental and social assessments remain lengthy and complex. Spatial planning mechanisms such as renewable energy zones (RE zones) help identify suitable sites, yet public engagement is not consistently integrated into project development (Malaysia Renewable Energy Roadmap [MyRER], 2021). Although Malaysia's transition plans assess socioeconomic co-benefits and outline reskilling programmes, **incentives for community ownership of renewable projects are still absent.**

In terms of its fossil phase-out strategy, TNB is aiming to achieve net zero by 2050 and halve coal capacity by 2035 (Asia Investor Group on Climate Change, n.d.). However, no strong market-based disincentives are in place yet to accelerate the transition.

Cross-sectoral RE targets remain uneven: though solar targets are well developed, wind is absent and heating/cooling and industrial RE targets remain underdefined.

Indicator Assessment

Malaysia – Overview of assessment framework → Table 4

Risk mitigation and procurement incentives		Planning and permitting		Power system flexibility for RE integration		Grids	
PPA design and risk mitigation	○ ○ ●	Spatial Planning for RE	○ ○ ●	Dispatch regulation	○ ● ○	Grid development plan	○ ● ○
Incentive for large scale RE	○ ○ ●	Permitting and ESIAs	○ ● ○	RE forecasting	○ ○ ○	Grid access and usage	● ○ ○
Incentive for DG/rooftop solar	○ ○ ●			Regulatory measures for flexibility and system integration	○ ● ○	Grid connection procedures	● ○ ○
Other fiscal incentives	○ ○ ●			Market based incentives for flexibility and system integration	○ ● ○	Smart grids for RE integration	○ ● ○
Carbon pricing	● ○ ○						

Fossil fuel phase-out		Targets		Just transition	
Phase out strategies for fossil fuels	○ ● ○	Net zero commitment	○ ● ○	Siting and consultation	○ ● ○
		Targets for RE	○ ● ○	Special incentives for community owned projects	○ ○ ○
		Monitoring and governance	○ ○ ●	Co-Benefits	○ ○ ●
				Re-Skilling and up-Skilling	○ ● ○
				Regional transition plans	○ ● ○

Size of barrier to RE deployment

● big
● medium
● low

Thailand

Overview

Thailand's energy transition gained momentum when a 5 GW Power Purchase Agreement (PPA) and Feed-in Tariff (FiT) scheme were introduced in 2022 to accelerate renewable energy deployment (OECD, 2024). However, progress is being hampered by curtailment risks, limited regulatory incentives, a lack of grid planning and a clear long-term RE roadmap aligned with climate goals. This stems from an absence of integrated planning across the energy, renewables and climate domains, with a need for more institutional coordination. To fully unlock its renewable energy potential, Thailand needs to adopt a systemic approach that includes supportive policies for deploying renewables, strengthened grid infrastructure and a clear national RE roadmap, positioning the country as a regional leader in harnessing clean, affordable and secure energy.

Key barriers and solutions

One major challenge is the limited scale, continuity, and effectiveness of **incentives for distributed generation,** particularly rooftop solar. Despite Thailand's strong solar potential, uptake remains low due to **insufficient financial incentives** and a regulatory environment that does not actively support small-scale or household generation. This represents a missed opportunity for a rapid, low-cost expansion of solar capacity, although it is seen as an area with high potential for positive change.

A **carbon pricing mechanism** such as a carbon tax could play a pivotal role in Thailand by shifting the relative costs of fossil fuels and renewables. Though policy frameworks for carbon tax, ETS, and carbon credit emerged with the **proposal of a Climate Change Act,** no such policies have yet been finalised or implemented.

Thailand's lack of **power system flexibility** is another significant barrier to scaling up renewables. While wind and solar are nominally designated as "must-take" sources, they are still subject to **curtailment without compensation** due to existing take-or-pay contracts with gas generators. This creates a structural incentive for the system operator, EGAT, to prioritise fossil-based generation over renewables. Furthermore, there are currently **limited regulatory or market-based measures** to incentivise system flexibility or RE integration. Despite Thailand's technical capacity, the lack of policy focus and awareness around flexibility options hinders progress. In order to address these challenges, Thailand could adopt economic dispatch based on short-run marginal costs, which could reduce overall system costs and support the integration of renewables. **Phasing out long-term "take-or-pay" contracts for fossil fuel power plants** and **introducing flexibility provisions in remaining contracts** can also reduce fossil-fuel lock-in effects and enable dispatch decisions to better reflect evolving system needs and decarbonisation objectives.

In terms of **grid development,** while there are plans to expand the transmission network and develop a Smart Grid, these are largely centred on supporting large fossil fuel and hydropower projects. A comprehensive and long-term **grid expansion roadmap to 2050** that aligns with RE targets and carbon neutrality ambitions is required. In 2024, Thailand's National Energy Policy Council approved a 2 GW Direct PPA pilot program to enable foreign investors, particularly data centres of at least 50 MW capacity, to purchase renewable energy directly from generators (Ember, 2025). This is the first time that the country is easing the single buyer model over electricity trading and transmission access and could facilitate greater RE deployment in the future to meet the evolving demands of large industrial users.

Thailand has announced carbon neutrality and net-zero targets, but **not yet articulated targets for phasing out fossil fuels,** with its latest Power Development Plan projecting a 41 percent share of gas and 7 percent share of coal in the electricity mix by 2037 (CASE for Southeast Asia, 2025). The absence of clear fossil fuel transition pathway creates uncertainty around the role of renewables and hinders investor confidence in the long-term energy transition.

On the **target-setting and governance side,** Thailand's revised 2037 target is for renewables to account for **51 percent of electricity generation,** including all RE sources (Ember, 2025). While this is a step forward, the level of ambition may still fall short of what is necessary to achieve carbon neutrality by 2050. Moreover, while efforts are being made to improve **monitoring and reporting** under the new National Energy Plan, current indicators are fragmented and do not provide a clear, consolidated view of progress towards climate and RE goals. Tracking mechanisms specific to the transition pathway still need to be developed.

Indicator Assessment

Thailand – Overview of assessment framework

→ Table 5

Risk mitigation and procurement incentives		Planning and permitting		Power system flexibility for RE integration		Grids	
PPA design and risk mitigation	low	Spatial Planning for RE	medium	Dispatch regulation	big	Grid development plan	big
Incentive for large scale RE	medium	Permitting and ESIAs	medium	RE forecasting	low	Grid access and usage	medium
Incentive for DG/rooftop solar	big			Regulatory measures for flexibility and system integration	big	Grid connection procedures	medium
Other fiscal incentives	low			Market based incentives for flexibility and system integration	big	Smart grids for RE integration	medium
Carbon pricing	big						

Fossil fuel phase-out		Targets		Just transition	
Phase out strategies for fossil fuels	big	Net zero commitment	medium	Siting and consultation	medium
		Targets for RE	big	Special incentives for community owned projects	medium
		Monitoring and governance	big	Co-Benefits	medium
				Re-Skilling and up-Skilling	medium
				Regional transition plans	medium

Size of barrier to RE deployment

- big
- medium
- low

The Philippines

Overview

Renewable energy development in the Philippines takes place in the context of one of Southeast Asia's only liberalised electricity markets. The country's government has launched several initiatives to promote RE development, from its Green Energy Auction Program and Renewable Portfolio Standards to the net-metering scheme for smaller distributed generation projects (Department of Energy Philippines, 2026). To accelerate these trends such that they align with net-zero ambitions, several barriers need to be overcome. These relate to grid planning and development to accommodate new and planned RE plants, due to the legacy of historical over-procurement of fossil-fuel generation by Electric Cooperatives (ECs) and Distribution Utilities (DUs) (IEEFA, 2017). While this has created stranded capacity obligations and crowded out new RE generation, it also reflects the need for institutional capacity building given the dual role these entities play in managing both generation contracts and distribution networks.

Key barriers and solutions

The first key barrier to renewable energy development in the Philippines relates to **integrating new and planned RE plants into the grid.** Large-scale RE projects regularly **face long connection delays,** both during the permitting stage (up to 18 months) and before and during the grid construction stage (if needed). While these barriers continue to persist, the Philippines has been taking measures to **address financial barriers associated with RE deployment.** For example, Green Energy Auction-5 incorporated price indexation and reduced the performance bond for offshore wind, thereby improving the bankability of offshore wind projects (Department of Energy, 2026). In addition, the Department of Energy removed the one-year rollover cap and separate REC net metering requirements, which were previously hindering the economics of rooftop solar projects (Cruz Marcelo & Tenefrancia, 2024).

At the transmission level, **the National Grid Corporation of the Philippines (NGCP) is not planning and developing its transmission grid infrastructure quickly enough to keep pace with RE development,** which points to even worse bottlenecks as the latter picks up speed. At the distribution level, **many distribution utilities and energy cooperatives are not prepared** for – and sometimes actively resist – the scaling up of decentralised RE development. Some of these legacy capacity issues faced by cooperatives are being addressed through standardised billing and testing procedures.

Another key barrier to renewable energy development relates to the **large fleet of coal-fired power plants.** The way these plants are currently contracted and dispatched results in **a lack of flexibility to integrate RE.** This is partly a result of the way in which the wholesale spot market interacts with the plants' power supply agreements (PSAs); more importantly, however, it is due to several **PSA clauses that disincentivise flexible behaviour** (e.g. minimum offtake and capacity payments). There are also signs that **unscheduled outages have increased when coal-fired power plants have been required to operate more flexibly.** Working with distribution utilities to revise existing PSAs and procurement practices (which often still support baseload plants to the detriment of RE, resulting in over-contracting) could be a key lever for change.

Indicator Assessment

The Philippines – Overview of assessment framework → Table 6

Risk mitigation and procurement incentives		Planning and permitting		Power system flexibility for RE integration		Grids	
PPA design and risk mitigation	big	Spatial Planning for RE	big	Dispatch regulation	low	Grid development plan	big
Incentive for large scale RE	low	Permitting and ESIAs	medium	RE forecasting	low	Grid access and usage	medium
Incentive for DG/rooftop solar	low			Regulatory measures for flexibility and system integration	big	Grid connection procedures	big
Other fiscal incentives	medium			Market based incentives for flexibility and system integration	medium	Smart grids for RE integration	medium
Carbon pricing	medium						

Fossil fuel phase-out		Targets		Just transition	
Phase out strategies for fossil fuels	big	Net zero commitment	big	Siting and consultation	medium
		Targets for RE	medium	Special incentives for community owned projects	low
		Monitoring and governance	medium	Co-Benefits	medium
				Re-Skilling and up-Skilling	medium
				Regional transition plans	medium

Size of barrier to RE deployment

- big
- medium
- low

Viet Nam

Overview

The government of Viet Nam has pledged to achieve net-zero emissions by 2050 and targeted a 28–36 percent share of renewable energy in its electricity generation mix by 2030 (IKI, 2025). This builds on Viet Nam's progress as one of the leading countries in Southeast Asia when it comes to adding wind and solar capacity, with wind and solar accounting for a 13 percent share of power generation in 2024 (Ember, 2025). Strong public support, thanks in part to feed-in tariff policies, has driven this deployment to date. However, gaps remain in the country's regulatory framework in terms of grid integration, system flexibility and monitoring and governance. To better align with its national goals, Viet Nam could strengthen its regulatory framework to safeguard project developers from curtailment risk, improve policy consistency, develop a clear and predictable procurement schedule and enhance community participation.

Key barriers and solutions

Viet Nam's renewable energy **expansion faces structural challenges related to grid congestion and curtailment** given that RE deployment is concentrated at a considerable distance from load centres. Indeed, around 364 GWh of solar power was curtailed in 2020, "resulting in significant financial losses and wasted power resources" (Energy Transition Partnership, 2023). A significant risk for RE projects in Viet Nam is **the lack of a curtailment regulation** capable of compensating investors and developers in the event of curtailment.

Viet Nam's government has recognised **the need to bolster transmission planning** by permitting private investment in transmission infrastructure, strengthening physical grid infrastructure and pursuing digitisation, for example by implementing a smart grid roadmap that could improve flexibility planning via policy frameworks. In 2024, Viet Nam introduced a policy, Direct Power Purchase Agreements (DPPAs) (IEEFA, 2024), which grants permission for privately developed, owned, and operated transmission lines for specific projects, potentially allowing large-scale solar or wind farms at remote sites to supply industrial consumers directly.

In addition, there is a need to develop a **predictable procurement schedule for renewable energy.** The Vietnamese procurement framework for large-scale renewables has been **characterised by stop-and-go policies over the past few years,** significantly putting the brakes on deployment after the feed-in tariff regulation expired in 2023. Even though the Power Development Plan (PDP8) prescribes a clear framework for RE procurement until 2050, this has not yet translated into a clear procurement schedule based on an auction mechanism (TransitionZero, 2025). At the same time, the Vietnamese government is incentivising the development of rooftop solar, such as through Decree No. 58/2025/ND-CP which include incentives for rooftop solar development and storage (Than Trong Ly, 2025). It is also developing a regulatory framework for offshore wind projects, by clarifying processes for site surveys and offtake agreements, which could accelerate deployment in the future.

Moreover, there are several areas at the institutional level where Viet Nam could **improve the way the renewable energy sector functions.** No national one-stop-shop agency exists to help project developers acquire all the necessary permits, nor is there any dedicated institution to track the progress of the energy transition in the country. Furthermore, there is no national register containing detailed information on all installed RE plants; only limited real-time operational data of power plants is made available.

Public consultation processes do not appear to be common practice in the energy sector. In particular, there is little community involvement in new power generation projects included in the Provincial Power Development Plan (PPDP) or in the national PDP. Moreover, no special financial incentives are provided for locally owned RE projects.

Indicator Assessment

Viet Nam – Overview of assessment framework

→ Table 7

Risk mitigation and procurement incentives		Planning and permitting		Power system flexibility for RE integration		Grids	
PPA design and risk mitigation	big	Spatial Planning for RE	medium	Dispatch regulation	medium	Grid development plan	medium
Incentive for large scale RE	medium	Permitting and ESIAs	big	RE forecasting	medium	Grid access and usage	big
Incentive for DG/rooftop solar	big			Regulatory measures for flexibility and system integration	big	Grid connection procedures	low
Other fiscal incentives	medium			Market based incentives for flexibility and system integration	big	Smart grids for RE integration	medium
Carbon pricing	medium						

Fossil fuel phase-out		Targets		Just transition	
Phase out strategies for fossil fuels	medium	Net zero commitment	medium	Siting and consultation	big
		Targets for RE	low	Special incentives for community owned projects	big
		Monitoring and governance	big	Co-Benefits	medium
				Re-Skilling and up-Skilling	medium
				Regional transition plans	big

Size of barrier to RE deployment

- big
- medium
- low

South Asia

Pakistan

Overview

Pakistan's energy transition was kick-started in 2003 when the Alternative Energy Development Board (AEDB) was established with the aim of scaling up renewable energy resources in the country (IEA, 2026). However, several roadblocks such as inconsistent policies, delayed payments due to circular debt, currency volatility and grid limitations are hindering progress. At the same time, fiscal constraints and high energy prices have resulted in a rapid uptake of distributed solar with 17 GW of solar PV installed in the country in 2024 (IEA PVPS, 2025). While this decentralised solar boom has reduced costs and curtailed fossil imports, Pakistan still needs a balanced approach that includes consistent policies, strengthened grid infrastructure and risk-mitigation measures to meet its ambitious target for achieving 30 percent of its power generation from non-hydro renewable energy sources by 2030 (Enerdata, 2030).

Key barriers and solutions

Pakistan has locked itself into **expensive long-term conventional fuel contracts** which as a key barrier in limiting the effective space for VRE in planning models, such as the Indicative Generation Capacity Expansion Plan (IGCEP). It will be vital for Pakistan to consider **phasing out such contracts** and **introduce flexibility provisions in remaining contracts** to reduce lock-in effects and facilitate the integration of renewables. On the market design front, National Electric Power Regulatory Authority (NEPRA) and the Independent System Market Operator (ISMO) are working to adopt a Use-of-System Charge (UoSC) framework that is market-driven and explicitly supportive of renewable energy, ensuring that the evolving commercial architecture does not disadvantage renewable generators.

The lack of a well-structured and consistent procurement mechanism, and policy uncertainties – such as frequent changes to the upfront tariff regime and subsequently the sudden removal of the upfront tariff scheme entirely, followed by delays in initiating auctions – further complicate renewable deployment while contributing to an instable energy market, thereby undermining investors' confidence.

PPAs continue to show poor bankability due to delayed payments owing to circular debt and inadequate enforcement of regulations on the curtailment of wind and solar. As far as the **planning and permitting regime** is concerned, lengthy permitting processes and regulatory overlaps between provincial and federal agencies delay renewable project deployment. Establishing clear legal frameworks, improved spatial planning, meaningful community engagement and early integration of their perspectives in project planning can help address gaps in planning and permitting.

The relatively **weak electricity grid infrastructure** is another key barrier. The existing network lacks the capacity and flexibility needed to absorb large amounts of intermittent power generation, posing a major barrier to expanding renewable energy in the country. While Pakistan's people-rooftop solar boom is highlighted as a global success story, it has raised new operational challenges for the distribution sector. Although the Transmission System Expansion Plan (TSEP) was recently rolled out, it fails to focus on enhancing flexibility, faster grid expansion as well as adopting smart grid technologies and batteries capable of adapting to the variable output of renewable sources. Additionally, while the Competitive Trading Bilateral Contract Market (CTBCM) has laid the foundation to liberalise the market, its full implementation is yet to be realised. Pakistan's energy roadmap lacks a clear pathway to achieving net-zero emissions and a comprehensive fossil fuel phase-out strategy. Despite these barriers, the country's first Integrated System Plan (combining demand forecast, TSEP and IGCEP) projects a VRE share exceeding 27 percent, with net metering alone accounting for 8.2 percent, signalling a formal acknowledgment of distributed renewables as a core component of the

national energy mix (NEPRA, 2025). However, this ambition is yet to be matched by clear regulations or market-based interventions capable of translating ambition into implementation. At the same time, the Senate and National Assembly finance committees have rejected a proposed 18 percent GST levy on solar panels, which will help maintain the affordability and competitiveness of distributed solar energy (Arab News, 2025).

In terms of actively promoting a "just transition approach" – this is currently not a key priority for policymakers. Additionally, the co-benefits to be gained from renewable energy – such as reduced air pollution, job creation and energy independence – have not been fully explored.

Indicator Assessment

Pakistan – Overview of assessment framework → Table 8

Risk mitigation and procurement incentives		Planning and permitting		Power system flexibility for RE integration		Grids	
PPA design and risk mitigation	big	Spatial Planning for RE	medium	Dispatch regulation	medium	Grid development plan	big
Incentive for large scale RE	medium	Permitting and ESIAs	medium	RE forecasting	big	Grid access and usage	big
Incentive for DG/rooftop solar	low			Regulatory measures for flexibility and system integration	medium	Grid connection procedures	medium
Other fiscal incentives	medium			Market based incentives for flexibility and system integration	medium	Smart grids for RE integration	big
Carbon pricing	big						

Fossil fuel phase-out		Targets		Just transition	
Phase out strategies for fossil fuels	big	Net zero commitment	big	Siting and consultation	medium
		Targets for RE	medium	Special incentives for community owned projects	big
		Monitoring and governance	medium	Co-Benefits	medium
				Re-Skilling and up-Skilling	big
				Regional transition plans	big

Size of barrier to RE deployment

- big
- medium
- low

Recommendations

Across the different country assessments, there are a few cross-cutting findings from the REPF that could inform decision-making by regional actors and promote cross-learning between national stakeholders. These include:

1. The need to focus on system flexibility and grid integration

RE projects in the assessed countries have frequently been hindered by regulatory gaps relating to grid connection and access, contributing to challenges such as the curtailment of solar and wind power and reducing the bankability of these projects. It will be crucial for policymakers to address these barriers by upgrading the physical and digital grid infrastructure and adopting clear regulations and procedures to reduce curtailment and compensate developers. Furthermore, several countries could find that adopting regulatory or market-based measures to incentivise system flexibility would help attract RE investment and increase the grid's resilience.

2. The lack of a clear and well-defined procurement schedule

In some countries that are still at an early stage of solar and wind deployment, the lack of a clear and well-defined solar and wind power procurement schedule/mechanism creates significant policy uncertainty, thereby undermining investor confidence and impeding deployment. It will be crucial for governments to provide regulatory clarity to investors by implementing clear procurement schedules which are aligned with national clean energy and long-term net-zero targets. These procurement plans need to be supplemented with tariff certainty and measures to improve the bankability of RE projects.

3. The need to streamline permitting and land-acquisition processes

RE and grid development is often hindered by a combination of technical and social barriers, such as costly land-acquisition procedures and slow and complex permitting procedures, which can delay solar and wind power projects and increase the costs of renewable energy production. Prioritising solar and wind power projects in spatial planning and streamlining permitting processes, for example by using one-stop-shop agencies, could bring about important cost reductions and ensure faster uptake of projects. These must be balanced with mechanisms to ensure meaningful and inclusive community representation in decision-making processes.

4. The need for a fossil fuel phase-out roadmap that integrates just transition planning

Several of the assessed countries have established net-zero and renewable energy deployment targets but lack a credible plan with clear regulations or market-based interventions to guide or enforce a fossil fuel phase-out, which can disincentivise the shift towards clean energy. Policies to phase out fossil fuels with credible targets and milestones which are accompanied by just transition policies can provide an important long-term signal to institutional investors in solar and wind power deployment.

Annex 1

Direct focus area 1: Risk mitigation and procurement incentives

Indicator 1.1: PPA design and risk mitigation

Long-term PPAs: Does the country offer well-designed, long-term PPAs for renewables (e.g. via auctions, feed-in tariffs, PPAs etc.)? If so, what is the typical duration of the PPAs (e.g. 15 years)?

Counterparty/offtaker risk: Is the offtaker (buyer of the electricity) creditworthy? Are the offtaker's financial statements audited by an independent auditor? If the counterparty is a special purpose entity, is it underwritten by a government guarantee or are there other mechanisms to ensure creditworthiness (e.g. via a letter of credit, escrow account, payment guarantee or other)?

Inflation risk: What has been the country's average inflation rate (over the past five years)? Are PPAs indexed to inflation?

Currency risk: Are PPAs indexed to other currencies or remuneration paid in foreign currencies?

Curtailment risk: Sometimes RE producers are disconnected (curtailed) from the grid because of grid bottlenecks or other technical issues. Are there curtailment rules specifying whether producers are financially compensated for such issues beyond their control?

Ownership of generation assets: Does the legal framework allow private-sector ownership of wind or solar generation units? Is foreign ownership restricted in any way (e.g. percentage-wise, obligation to engage in joint ventures etc.).

Indicator 1.2: Incentive for large-scale renewable energy

Predictable procurement schedule: Does the country have a long-term procurement schedule for large-scale renewables (e.g. annual RE procurement targets for the next five years)?

Primary procurement mechanisms: Which type of support/procurement mechanisms does the country use to incentivise wind and solar (e.g. RPS, auctions, feed-in tariffs, net metering, other)? Are different procurement mechanisms in place for different market segments (e.g. auctions for large-scale RE, FITs for medium-scale RE and net metering for rooftop solar)? Is the country transitioning from one support/procurement mechanism to another?

Auctions: Does the country use auctions/competitive bidding to incentivise wind and solar deployment? Are technology-specific auctions held for onshore wind, offshore wind and solar? Are the auctions designed in line with international best practice? Is there scope for unsolicited bids alongside existing auction rounds?

Tariff-setting methodology: Are there administratively set tariffs for RE producers (feed-in tariffs)? Is a specific tariff-setting methodology used? To what extent are RE tariffs integrated into a wider framework of tariffs applied in the electricity sector?

Feed-in tariffs/contracts for difference: Does the country apply feed-in tariffs or contracts for difference (with administratively set remuneration levels)? Do technology-specific tariff levels apply to onshore wind, offshore wind and solar? Are feed-in tariffs only used for small-scale projects (e.g. up to one megawatt) or also for medium- and large-scale projects?

Corporate PPAs: Does the country allow corporate PPAs/direct PPAs (DPPAs), i.e. PPAs signed between two private actors (without the involvement of a single buyer)? Are standardised PPAs available for these types of corporate PPAs?

Indicator 1.3: Incentive for distributed generation/rooftop solar

Right to self-consume: Do consumers have the right to install rooftop solar and self-consume their locally produced electricity?

Export of excess electricity: Can prosumers export their electricity to the national grid or are there any technical or regulatory limitations (e.g. zero export rules)?

Payment for excess electricity: Do specific payment provisions apply to excess electricity, e.g. as part of feed-in tariff-type payments, net metering or net billing?

Indicator 1.4: Other fiscal incentives

Tax incentives: Are tax incentives available for RE projects, e.g. in the form of income tax credits?

Grants and rebates: Are additional grants or rebates available to lower the initial investment costs (e.g. subsidies per kilowatt installed)?

Low-cost capital: Are specific green credit lines or concessional finance available for RE projects?

Other financial or fiscal incentives: Are any other financial or fiscal incentives provided for wind or solar?

Indicator 1.5: Carbon pricing

Carbon tax: Does the country have a carbon tax? If so, which sectors/industries are subject to the tax?

Emission trading: Does the country have an emission trading scheme in place? If so, which sectors/industries are subject to the scheme?

Direct focus area 2: Planning and permitting

Indicator 2.1: Spatial planning for RE

Geospatial planning: Has the country carried out geospatial planning or issued zoning guidance to inform the commercial development of the RE resource?

Spatial planning regulation: Does the spatial planning regulation include renewable energy projects by default (i.e. specific zones that are reserved for potential future RE deployment)? Are regional or local spatial plans required to dedicate a certain proportion of land to renewables (e.g. two percent of the total land mass)? Does the country have specific renewable energy zones (REZ)? Are siting processes clear and transparent? How long do these processes usually take for each technology? Are renewable energies considered "strategic/priority infrastructure" in spatial planning laws, thus facilitating the planning process?

Marine planning regulation: Has the country established marine spatial planning, including specific sites for offshore wind power development? Are clear marine spatial planning processes in place, including coordination between all involved actors?

Land-use conflicts: Does the spatial planning regime take land-use conflicts into consideration? Which land-use conflicts typically arise?

Leasing of land: Is the availability of land a constraining factor for RE development? Are there any constraints related to the long-term leasing of land (e.g. public ownership of most land, small parcels of land in private ownership, speculative behaviour driving up property prices, restrictions on using agricultural land etc.)?

Indicator 2.2: Permitting and environmental (and social) impact assessments

Permitting: Is practical guidance provided concerning the permits required to develop wind or free-standing solar projects? Is there coordination between national and provincial permit requirements?

Environmental and social impact assessments (ESIAs): Are ESIAs a binding requirement in the permitting process? Are there any exemptions from ESIAs (e.g. for RE projects in special development zones)? Are ESIAs effectively protecting the environment? Are the social impacts of RE projects sufficiently analysed?

Public acceptance of RE projects: Is public acceptance of RE projects generally high? Why is there a lack of public acceptance of specific technologies (e.g. wind power)? Are there policies in place to increase public acceptance (e.g. community-owned projects, see Indicator C2)?

Number of permits: How many permits are typically required at national and provincial level and how long does the permitting process take?

One-stop-shop agency: Is there a national one-stop-shop agency that helps project developers acquire all the necessary permits?

Direct focus area 3: Power system flexibility and RE integration

Indicator 3.1: Dispatch regulation

Priority dispatch: Dispatch regulation refers to the scheduling of power plants. It is the process by which it is decided which power plants will be deployed to meet current electricity demand. Does the country have priority dispatch for renewables (i.e. RE producers being dispatched and run prior to all fossil fuel units)? Conversely, does it have priority dispatch for fossil plants?

Economic dispatch: Does the country have economic dispatch (i.e. power plants being dispatched in line with their short-term marginal costs, i.e. their fuel costs)? In this case, wind and solar would still be dispatched first but renewable energy technologies with higher fuel costs (e.g. biomass) might be dispatched after fossil fuels to meet electricity demand.

Economic dispatch and "take-or-pay" contracts: Are "take-or-pay" contracts still in place with fossil fuel power plants, guaranteeing a certain number of full-load hours per year and thus guaranteed dispatch?

Indicator 3.2: Forecasting of solar and wind output

Forecasting approach: Is wind and solar generation forecast on a system-wide basis or individually for every power plant?

Aggregators for forecasting: If power producers are required to forecast their individual output, are there aggregators that offer such services and sell the power on the wholesale market? NB: applicable to countries with competitive wholesale markets.

Penalties for incorrect forecasting: If power producers are required to forecast their individual output, are they punished by (severe) penalties if output deviates from the forecast? NB: applicable to countries with competitive wholesale markets.

High-quality forecasting: Does the system operator/utility use high-quality forecasting for wind and solar output (either via a subscription service or provided by national agencies), based on weather observations, satellite data, numerical weather prediction models and statistical analysis?

Indicator 3.3: Regulatory measures for flexibility and system integration

Flexibility via battery storage: Are there plans to add battery energy storage systems (BESS) to the national grid? Are specific procurement programmes in place

for BESS or for combining renewables with battery storage (RE+BESS)?

Incentives for flexibility via dispatchable renewables: Are incentives provided for dispatchable renewables (biomass, biogas, concentrated solar power, hydro power, pumped hydro etc.)? Are there incentives to run these dispatchable power plants primarily when limited amounts of wind and solar power are available (e.g. time-differentiated remuneration rates rather than running these power plants on a "base-load" basis).

Flexibility via virtual power plants: Are there special incentives for "virtual power plants", i.e. virtually aggregated solar or wind power production combined with dispatchable sources (e.g. batteries, hydro power, biomass etc.)?

Flexibility of fossil fuel plants: Are market-based incentives in place to run fossil fuel-based power plants to provide residual power for wind and solar (e.g. economic dispatch)? Are there financial incentives to retrofit existing fossil fuel plants in order to run them in a more flexible manner (reducing must-run, increasing ramping rates etc)? Do plans exist to build more flexible gas-fired power plants?

Incentives for demand-side flexibility: Are consumers encouraged by price signals (e.g. time-of-use rates) to adapt their consumption to electricity supply variations? Are specific incentives provided for industrial consumers to reduce their consumption during periods of high demand/low supply (e.g. demand-side bidding, price signals etc.)?

Incentives for smart charging: Are incentives or price signals in place to encourage consumers to charge electric vehicles during off-peak periods?

Indicator 3.4: Market-based incentives for flexibility and system integration

Intraday markets for RE integration: Are there competitive wholesale markets, including intraday markets (e.g. hourly or 15-minute markets), to facilitate wind and solar integration?

Balancing/ancillary services markets: Can renewable energy projects sell into balancing/ancillary services markets?

Time-of-use rates/time-differentiated electricity pricing: Does the utility/supplier offer time-of-use rates to incentivise demand-side flexibility?

Direct focus area 4: Grids

Indicator 4.1: Long-term grid development planning

Grid expansion planning: Are long-term grid expansion plans in place?

Grid expansion planning and targets: Are grid expansion plans aligned with national renewable energy targets and long-term decarbonisation objectives?

Distribution system planning: Are there specific plans to upgrade distribution networks, taking increasing shares of distributed generation into account?

Regional grid integration: Are there plans for regional (cross-country) grid integration and trading?

Indicator 4.2: Grid access and usage

Non-discriminatory grid access: Third-party access allows non-discriminatory access to the electricity grid (as a natural monopoly). Is open and non-discriminatory access to the grid guaranteed?

Direct, private grid lines: Are rules in place to allow electricity customers to purchase power directly from a third party via private, direct grid lines?

Payment for using the electricity grid: Do the rules define the level and allocation of costs for using the transmission and distribution system (e.g. wheeling charges, locational pricing)? Wheeling allows privately generated power to be transmitted across the national grid. In order to use the grid, wheeling charges typically need to be paid to the grid operation/utility. Are wheeling charges in place? Do these wheeling charges facilitate or hinder the transport of renewable energy power via the public electricity grid?

Indicator 4.3: Grid connection

Grid connection procedures: Are streamlined grid connection procedures in place? Does the country in question have clear timelines for grid connection processes? Are RE producers financially compensated for delayed grid connection?

Simplified grid connection for DG: Do small-scale RE projects (e.g. rooftop solar) benefit from simplified grid connection procedures or do they have to comply with the same requirements and procedures as large-scale power plants?

Grid connection cost-sharing methodology: Are RE producers responsible for building the connection line to the nearest grid connection point (shallow connection charging approach) or are they also responsible for transmission grid upgrades (deep connection charging approach)?

Grid codes: Does the grid code include measures or standards to address renewable energy?

Indicator 4.4: Smart grids for RE integration

Incentives for smart grid deployment: Smart grid technologies can facilitate the integration of renewables such as solar and wind power. Such technologies include a large number of digital communication technologies, sensors and software. Are there specific incentives for rolling out smart grid technologies?

Control centre: Does the country have a national control centre to coordinate system operation?

Does the grid operator control the output of generation plants remotely?

Real-time data: Are renewable energy producers required to deliver real-time data to the grid operator to optimise grid operation?

Control equipment and grid operation practice: Does the grid operator use measures such as dynamic line rating, grid boosters, high-temperature low-sag conductors or power flow controllers to gather experience of new control equipment and operational practices?

Roll-out of smart meters: Are programmes or incentives in place to roll out smart advanced metering infrastructure (AMI)/smart meters?

Indirect focus area A: Fossil phase-out policies

Phase-out strategies for fossil fuels: Does the country in question have a phase-out plan for fossil fuels, along with regulatory measures and market-based incentives?

Regulatory incentives for phase-out: Are there investment bans on fossil fuel-based power plants?

Market-based interventions for phase-out: Are there emission standards for existing or new power plants (e.g., a CO_2-threshold of 450g/kW, practically excluding unabated coal)? Is carbon pricing in place, internalizing the negative externalities of fossil fuels?

Indirect focus area B: Targets

Indicator B1: Net-zero targets

Net-zero commitments: Has the country in question adopted a net-zero target in line with the objectives of the Paris Agreement?

Net-zero implementation: Does the net-zero strategy include sub-targets for the energy sector and the electricity sector? Are there tangible strategies for achieving the sub-targets in the energy sector?

Indicator B2: Targets for RE

RE targets (general): Have any national renewable energy targets been set? Are there sub-national targets?

Indicative versus binding targets: Are the targets for RE deployment legally binding (including financial penalties in case of non-compliance) or are they indicative?

Binding targets – RPS: Does the country in question have renewable portfolio standards (including binding targets)?

Short-, mid- and long-term targets: Has the country in question adopted short- and mid-term targets to ensure that long-term targets are achieved?

Overarching target for renewables in the energy sector: Has the country in question defined targets for renewable energies in the energy sector (including all sub-sectors, i.e. electricity, heating & cooling, transport, industry etc.)?

Targets for RE in the electricity sector: Have specific targets been set for RE deployment in the electricity sector?

Technology-specific targets for wind and solar: Are there technology-specific targets for solar deployment (e.g. five gigawatts by 2030) and wind deployment (e.g. two gigawatts by 2030)? Have specific targets been set for "distributed generation" or rooftop solar?

Targets for RE in the heating/cooling/industry sector: Do specific targets exist for renewables in the heating & cooling sector?

Targets for RE in the transport sector: Are there specific targets for renewables in the transport sector?

Targets for RE related to green hydrogen production: Have specific targets been set for RE related to green hydrogen production?

Indicator B3: Monitoring and governance

Monitoring and tracking: As the target framework becomes increasingly complex, target achievement should ideally be monitored and tracked. The monitoring process typically includes a specific institution that is responsible for tracking and reporting. What information is used as the basis for monitoring (e.g. information from other government agencies)? Is any mechanism in place to periodically report on RE progress (e.g. annual reports)?

Indirect focus area C: Just transition

Indicator C1: Siting and consultation

Siting and public consultation: Are local communities included in the decision-making process relating to the siting of the wind/solar plant, transmission lines or other energy infrastructure at an early stage? Which mechanisms are used to engage and consult the local community (e.g. planning processes, obligatory meetings in local communities etc.)?

Indicator C2: Special incentives for community-owned projects

Opportunities for community-owned projects: Are special incentives provided to encourage community-owned projects (e.g. feed-in tariffs, financial support for participating in auctions etc.)?

Requirements for regional financial participation: Are project developers required to source part of the finance from the local community (e.g. 20 percent of shares)?

Indicator C3: Co-benefits

Assessment of socioeconomic benefits: Are there studies and reports on the socioeconomic benefits of RE deployment (e.g. job creation, rural economic development, reduced water consumption etc.)?

Incentives for socioeconomic benefits: Are specific incentives for socioeconomic benefits, such as job creation or regional value creation, embedded in the national procurement mechanisms (e.g. selection criteria in auctions)?

Indicator C4: Reskilling and upskilling programmes for fossil fuel workers

Reskilling: Do dedicated reskilling or upskilling programmes exist for fossil fuel workers to transition to clean energy technologies or other parts of the economy?

Indicator C5: Transition plans for regions with high fossil fuel value creation

Regional transition plans: Are there transition plans for regions with high value creation related to fossil fuels? Are plans in place to move clean energy technologies (e.g. battery manufacturing) to such regions to create value regionally?

Regional clean energy procurement: Are there plans to deploy renewable energies in coal/gas phase-out regions?

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Agora Energiewende develops scientifically sound and politically feasible strategies for a successful pathway to climate neutrality – in Germany, Europe and internationally. The organisation which is part of the Agora Think Tanks works independently of economic and partisan interests. Its only commitment is to climate action.

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Proofreading: Chris Cave
Typesetting: Anja Werner
Title picture: annaleish | Adobe Stock

408/05-A-2026/EN
Version 1.0, September 2026

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