



Bridging the Gap: Energy Transition Plans vs. Reality

This presentation examines the disconnect between idealistic energy transition goals and the practical realities faced by countries worldwide. We'll analyze the challenges in infrastructure, financing, and technology that create this gap, explore case studies of idealistic versus realistic approaches, and propose strategies to bridge these differences.

Our analysis will provide insights into how countries can develop more effective energy transition roadmaps that balance ambitious climate goals with practical implementation constraints.



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Recent Blackout Cases

Iberian Peninsula Blackout (April 28, 2025)

A sudden blackout disrupted power to millions, triggered by instability when solar PV accounted for 59% of supply.

Voltage oscillations and lack of system inertia caused cascading failures across the Iberian Peninsula.

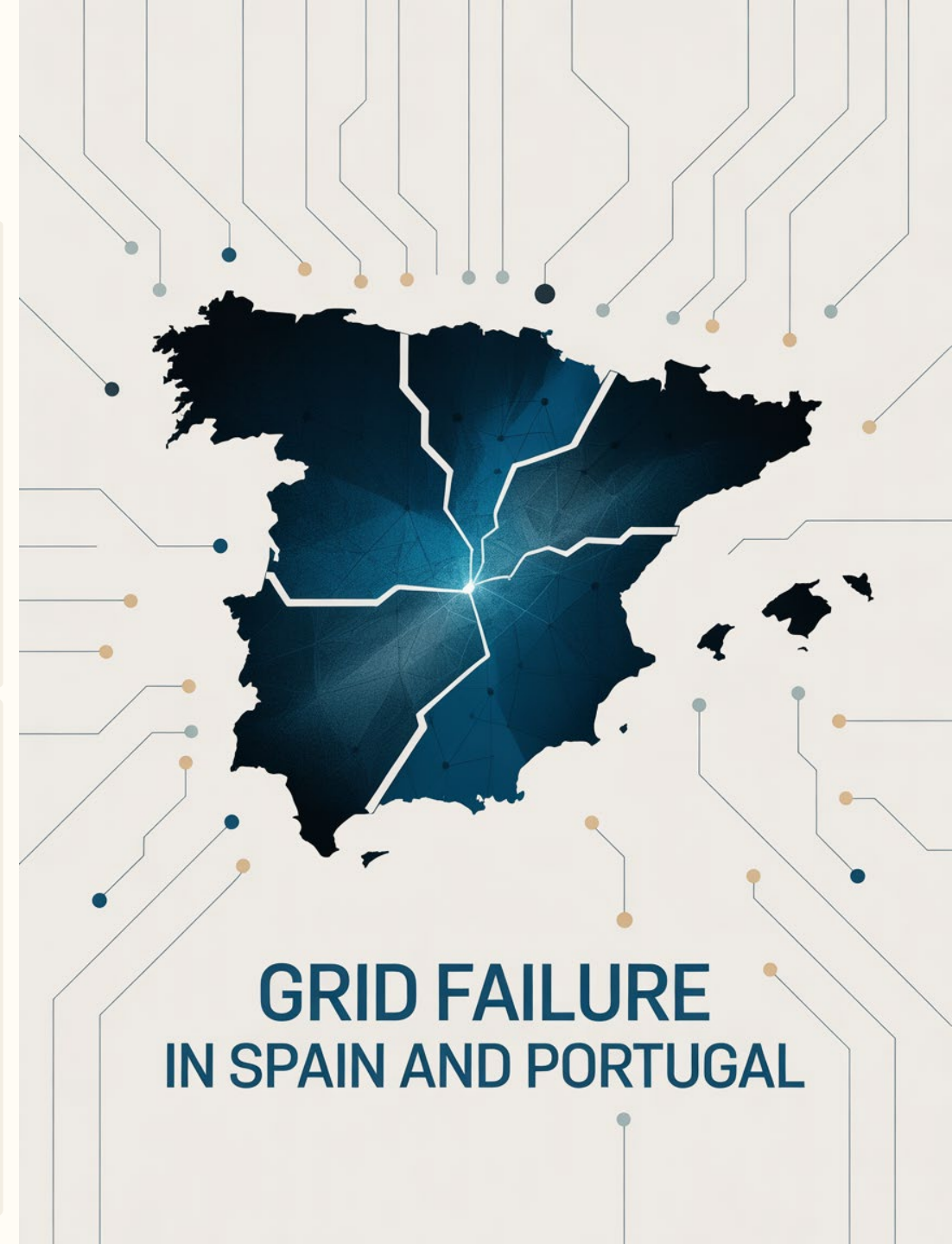
The blackout underscores how high variable renewable energy (vRE) shares, when unmatched by adequate grid flexibility and system reserves, can lead to widespread instability.

Bali, Indonesia

On Friday, April 26, 2025, a massive blackout began around 3:00 p.m. local time and was caused by a failure in the undersea power cable connecting Java and Bali, according to PLN.

The failure led to a complete shutdown of all power plants on the island, exposing the vulnerability of relying heavily on inter-island transmission without adequate on-site backup or autonomous grid capabilities.

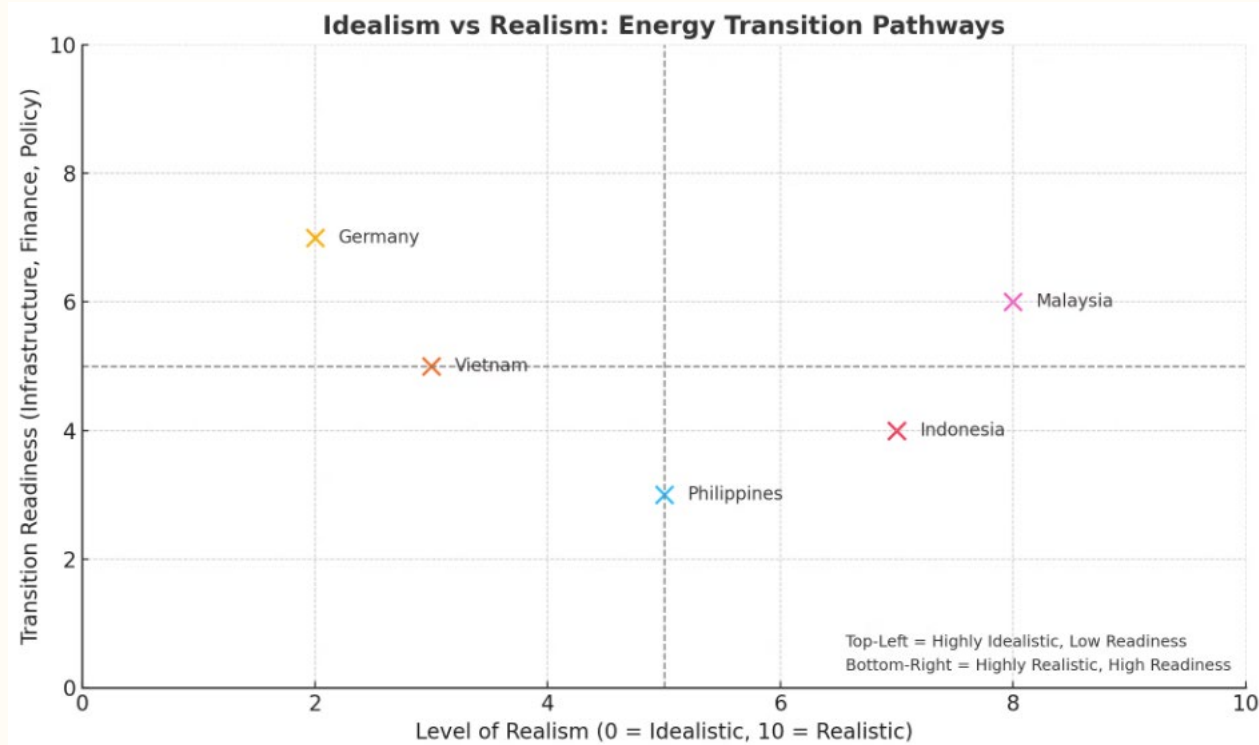
Although unrelated to renewable over-generation, the incident highlights infrastructure dependency and the need for resilience planning in transition scenarios.



Idealistic and Realistic

Germany: Set aggressive coal and nuclear exit deadlines, now facing industrial decline and high-power prices.

Vietnam: Rapidly installed 17 GW of solar within two years but curtailed significant generation due to grid constraints.



Malaysia: Gradually expanding its solar fleet while enhancing grid codes, carbon pricing readiness, and financial instruments to scale investments sustainably.

Indonesia: Plans to reach net zero by 2060, with a pragmatic blend of renewables, CCS, hydrogen, and continued fossil use in the near term.

Y-axis (Transition Readiness):

- Low (0–4): Poor grid, limited private sector engagement, unclear policy frameworks.
- High (7–10): Strong infrastructure, clear financing mechanisms, mature governance.

X-axis (Realism Level):

- Far left (0–3): Highly idealistic, fast-transition goals without full infrastructure or financing.
- Center (4–6): Balanced or mixed strategy — ambitious but grounded on real capabilities.
- Far right (7–10): Very realistic, phased approaches based on available finance, technology, and social acceptance.

Contrasting Energy Transition Approaches



Idealistic Approach (Germany, Vietnam)

- Very rapid transition speed with aggressive fossil fuel shutdowns
- Infrastructure development often lagging behind ambitious targets
- Heavy public spending, sometimes with private investment lag
- Risks include grid instability and energy price shocks



Realistic Approach (Indonesia, Malaysia)

- Gradual, phased transition aligned with actual capabilities
- Managed decline of fossil fuels with partial retention (e.g., with CCS)
- Blended finance focus, public-private partnerships, international support
- Slower gains but more stable progress

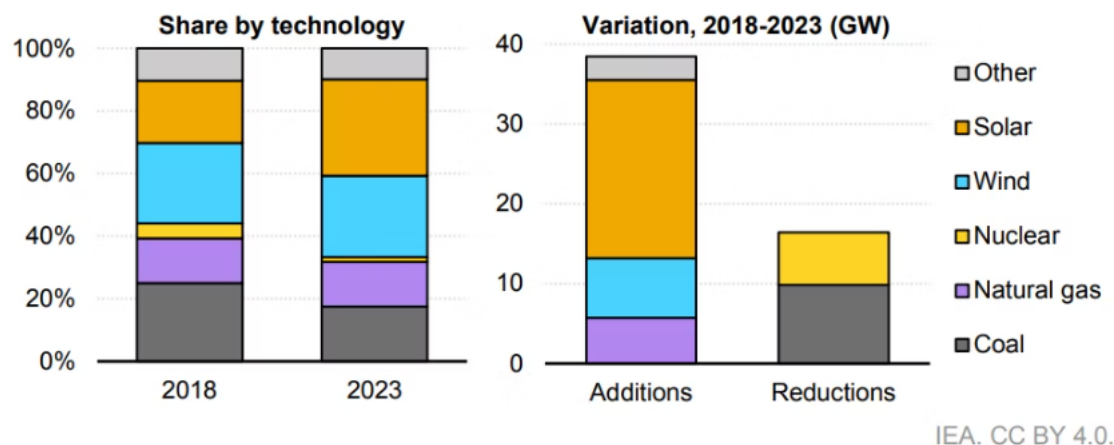
Idealistic Approach: The German Case

Ambitious Targets

Germany aims for GHG neutrality by 2045, with 80% renewable energy in power consumption by 2030 and 100% by 2035. Renewables already account for 54% of gross electricity consumption in 2024.

The country has invested heavily in solar and wind capacity to compensate for the phase-out of coal and nuclear energy, supported by strong policy incentives.

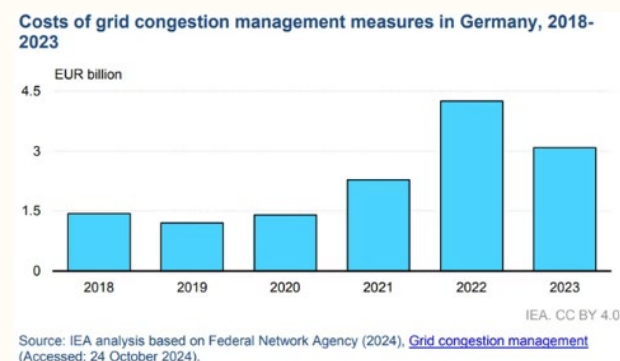
Electricity capacity additions by technology in Germany, 2018-2023



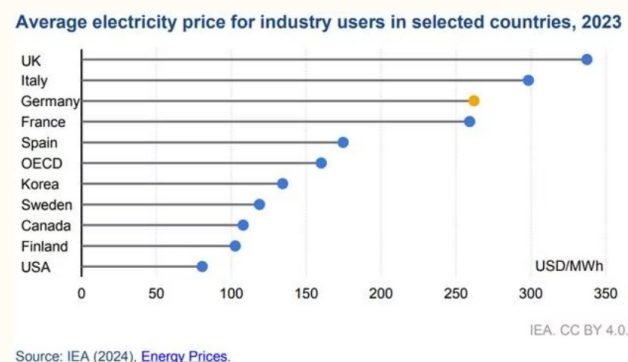
Source: IEA (2025), [Electricity Information](#).

Emerging Challenges

Grid congestion has rapidly increased due to insufficient transmission capacity from northern renewable supply centers to southern consumption areas, closure of southern power plants, and maintaining a single price zone while increasing cross-zonal trade.



Following the 2022 energy crisis and resulting price increases, Germany faces declining industrial activity, with firms considering cutting output or relocating abroad. Manufacturing output has decreased, and numerous companies to either reduce production or relocate their operations to countries with more favorable energy costs.



Realistic Approach: The Indonesian Case Case



Long-Term Vision

Carbon neutrality by 2060



Gradual Coal Phase-Out

Plan to eliminate coal by 2056



Balanced Portfolio

Incorporating hydrogen, CCS, and nuclear



Pragmatic Implementation

Incremental approach prioritizing stability

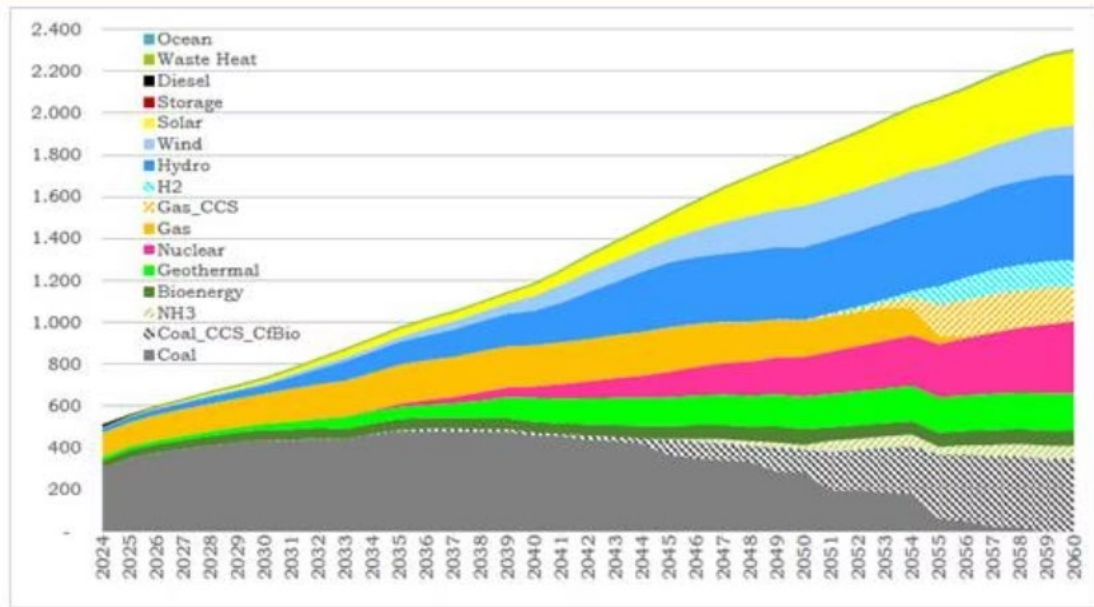
Indonesia's National Electricity General Plan (RNKN) published in November 2024 demonstrates a pragmatic approach to energy transition. Rather than abruptly shifting to renewables, Indonesia is pursuing a balanced electricity supply portfolio that recognizes infrastructure limitations and economic constraints.

Indonesian Energy Transition Landscape





Indonesia's Pragmatic Energy Transition



Gambar 45. Hasil Proyeksi Produksi Tenaga Listrik (dalam TWh) dengan Tambahan Produksi *Green Hydrogen*

Source: Ministry of Energy and Mineral Resources of Indonesia (2024), Rencana Umum Ketenagalistrikan Nasional

Indonesia's National Electricity Plan demonstrates a pragmatic approach to energy transition, balancing a gradual phase-out of fossil fuels with the need for economic stability and infrastructure limitations.

Unlike some countries that have adopted more idealistic energy transition strategies, Indonesia's plan recognizes the realities on the ground. The country must navigate the complex challenges of meeting growing energy demands, upgrading aging infrastructure, and ensuring affordable and reliable electricity supply for its population and industries.

This balanced approach allows Indonesia to make steady progress towards its long-term climate goals, while also addressing the immediate economic and practical concerns that come with a rapid energy transformation. By taking a measured and well-considered path, Indonesia aims to achieve a just and equitable transition that supports its development priorities.

Strategies to Bridge the Gap between Ideals and Reality



Integrated Transition Roadmaps

Develop pragmatic, phased approaches



Align Financing with Transition Stages

Deploy transition finance: green bonds, blended finance for coal retirement and renewables.



Innovative Financial Mechanisms

bridging the gap between energy transition ambitions
and implementation realities

Develop pragmatic, phased roadmaps tailored to local contexts, considering infrastructure readiness, financial capacity, and socio-economic impacts.

Balance idealism with actionable interim targets, allowing continuous progress evaluation and adaptation.

Integrated Transition Roadmaps



Context Assessment

Evaluate infrastructure readiness, financial capacity, and socio-economic impacts specific to each country or region.



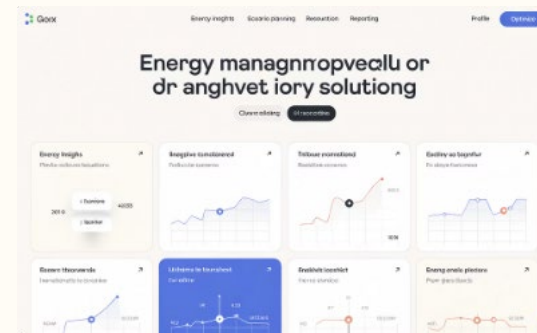
Phased Target Setting

Establish realistic interim milestones that build toward ambitious long-term goals, allowing for continuous progress evaluation.



Stakeholder Engagement

Involve industry, communities, and experts in roadmap development to ensure buy-in and practical implementation strategies.



Adaptive Management

Build flexibility into plans to accommodate technological advancements, economic shifts, and changing energy demands.

Pragmatic roadmaps must balance idealism with actionable targets, recognizing that energy transitions are not one-size-fits-all. Success requires tailoring approaches to local contexts while maintaining alignment with global climate objectives.

Financial Constraints and Investment Gaps

382GW

Required capacity

Projections suggest that to align with global climate goals, ASEAN's renewable capacity needs to increase 3–5 times by 2035

\$56B

Annually

ASEAN requires approximately from 2023 to 2030 to meet its power sector investment needs.

\$ 43B

In 2022

only ASEAN attracted clean energy investments, highlighting a significant shortfall.



Public Funding Shortfall

Indonesia's PLN faces financial strain while Vietnam halted its feed-in-tariff program due to budget limitations

Mobilizing private capital remains challenging due to currency fluctuation risks, inconsistent policy signals, and limited project bankability. Most ASEAN countries still struggle to create attractive investment opportunities that meet international standards for green financing.

Innovative Financial Mechanisms

Blended Finance

Combine public, private, and international funding sources to distribute risk and maximize investment impact. This approach can leverage limited public funds to attract larger private capital flows.

Green Financial Instruments

Develop specialized green bonds, transition bonds, and carbon markets tailored to energy transition projects. These instruments can help monetize environmental benefits and attract ESG-focused investors.

Risk Mitigation Tools

Implement guarantees, insurance products, and currency hedging mechanisms to address investor concerns about political, regulatory, and market risks in emerging economies.

Financial innovation is essential to close the substantial funding gap for energy transitions, particularly in developing regions. By creating investment vehicles that align with both profit motives and sustainability goals, countries can accelerate capital flows toward clean energy infrastructure.

Bridging ASEAN's Energy Transition Finance Gaps

To realistically transition ASEAN's energy systems toward cleaner infrastructure while ensuring affordability and security, we must address key financing challenges:



Early-Stage Finance

Critical funding needed for feasibility studies, technology pilots, and new grid models that lay the groundwork for successful projects.



Risk Mitigation

Tools to address political risks, off-taker risk, and currency risks that often prevent investment in emerging markets.



Local Bank Readiness

Addressing limited knowledge on renewable energy and project finance among local financial institutions.



Private Sector Engagement

Transparent PPAs and long-term offtake contracts are essential to attract private investment and scale solutions.



Transition Finance Solutions

Blended finance, policy clarity, carbon pricing, and regional cooperation will enable both green projects and help grey sectors evolve.

Leveraging Technology and Innovation



Technological advancement is crucial for bridging the gap between energy transition ambitions and implementation realities. Priority areas include:

Grid Modernization

Invest in smart grids and advanced management systems to enhance renewable integration capacity and improve system flexibility.

Emerging Technologies

Scale up promising innovations like green hydrogen, advanced battery storage, and carbon capture to complement variable renewables.

R&D Support

Fund research initiatives focused on reducing costs and improving performance of clean energy technologies to accelerate commercial viability.



Our Aspiration

Empowering Asia's Sustainable Future:
Collaborate, Innovate, and Lead the
Pathways to Zero Emissions



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