

Future-proofing transmission: Why the five-year plan needs a reboot

With no transmission, there will be no transition

Key takeaways:

- Transmission companies have been swimming against the tide, facing pressures to supply growing demand, connect renewables at scale, manage intermittency and reliability—all without sufficient capital to upgrade networks
- Events in the U.K., Spain and Portugal cast a spotlight on failures, but transmission remains a profitable risk for insurers who are keen to write risks into their portfolios
- Controlling insurance costs, showcasing risk information to insurers and investing in data and analytics are three key ways transmission companies can build resilience into five-year plans







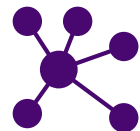

















While investment in renewables has been increasing rapidly – nearly doubling since 2010 – global investment in grids has barely changed, remaining static at around [\\$300 billion per year](#). In a scenario consistent with meeting national climate goals, grid investment needs to nearly double by 2030 to over \$600 billion per year after over a decade of stagnation at the [global level](#).

The need to invest in upgrading transmission networks is clear.

Transmission companies are caught in a paradox: tasked with enabling the energy transition, but underfunded and overburdened.



Top challenges in key regions:

	Investment opportunities ↗			Key challenges ⚠		
North America	<div></div> <div>Digitalization</div>	<div></div> <div>Grid modernization</div>	<div></div> <div>Resilience</div>	<div></div> <div>Climate resilience</div>	<div></div> <div>Renewables integration</div>	<div></div> <div>Aging infrastructure</div>
Europe	<div></div> <div>DER integration</div>	<div></div> <div>Cross-border expansion</div>	<div></div> <div>Smart grids</div>	<div></div> <div>Climate change</div>	<div></div> <div>Decentralization</div>	<div></div> <div>Permitting delays</div>
Asia-Pacific	<div></div> <div>Renewables integration</div>	<div></div> <div>Automation</div>	<div></div> <div>Capacity expansion</div>	<div></div> <div>Urbanization</div>	<div></div> <div>Supply chain bottlenecks</div>	<div></div> <div>Rapid demand growth</div>
Africa/Middle East	<div></div> <div>Resilience</div>	<div></div> <div>Renewable deployment</div>	<div></div> <div>Grid access</div>	<div></div> <div>Climate vulnerability</div>	<div></div> <div>Infrastructure gaps</div>	<div></div> <div>Access & reliability</div>

Transmission companies are in the eye of the storm

Regulation is struggling to balance investments and costs: Post energy crisis, regulators are capping charges and setting tight budgets. This is directly limiting transmission companies' five-year plans.

Capital is largely tied up in repairing and maintaining existing networks and there's little left to invest in new infrastructure.

Capital for investment in new infrastructure is limited: In the U.S., 70% of transformers are [over 25 years old](#), and in Europe, 25–35% of low-voltage lines are [over 40 years old](#). These aging systems were designed for one-way electricity flow and are ill-equipped for modern, decentralized, and bidirectional energy systems.

Existing transmission infrastructure has been operational beyond the original lifespan and capital available to upgrade networks is scarce. This is increasing the risk of plant failure.

Failures of transmission infrastructure hit the headlines this year, increasing the scrutiny on power, utilities and transmission companies.

Lessons learned from outages

After oscillations in power and frequency were felt on the Spanish and Portuguese power systems, three generators tripped, amounting to a loss of 2.2 gigawatts ([approximately equivalent to two million homes](#)). The sharp increase in voltage then set a cascade of other power stations tripping across Spain and Portugal, leaving systems out of step with the rest of the European grid. Automated measures to stabilize the situation kick in, but these are [“unable to prevent the collapse of the Iberian power system”](#). While a surge in voltage has been identified as the first domino to fall, the force that pushed it remains a question. Automated systems failed to prevent collapse, raising questions about preparedness and resilience.

Moving forward, countries are renewing focus on contingency plans. [A failure in Chile in September 2024](#) is a lesson of how an entire grid can recover with a simple transmission loop.

Lead times are exposing fragile infrastructure to interrupted supply: Transmission networks span entire countries and connect across regions. The infrastructure is major. And planned maintenance and upgrades come with long lead times that are out of transmission companies' control. Transformer waiting periods are reaching 36 months, leaving aging assets exposed to failures and

networks exposed to interrupted supply, often without available spares.

The five-year model is out of step: Working in five-year timelines does not match the pace of innovation and growth of an electrified natural resources industry. Major risks to power supply chains, such as natural catastrophes and geopolitical headwinds, are difficult to predict on the long-term horizon. Building this into a five-year forecast is a major challenge, but transmission companies have no option but to align with these timelines set by regulators. And as power companies are appealing to regulators for budget in years to come, it's difficult to make accurate forecasts which are leaving power and transmission companies undercapitalized.



The costs of five years ago do not match the costs of operating today. Even accommodating for standard inflation, in countries such as the U.S., the new tariffs are increasing the costs of importing raw materials. Global insured natural catastrophe losses surpassed [\\$140 billion in 2024](#), and damaged critical infrastructure, but these events are difficult to predict, and power and transmission companies budgets were not set up to accommodate for these issues.



Carlos Wilkinson, Head of Power and Utilities, Willis Natural Resources, U.K.

A spotlight on subsea cables

Renewable energy sources like wind and solar are often located far from demand centers, requiring new long-distance transmission lines. [Interconnection queues are growing, with more than 2.2 terawatts of interconnection queue capacity seeking to connect to the grid in the U.S. alone.](#)

Demand for subsea cables continues to remain strong, and rightly so. The bi-lateral trade of electricity offers consumers good value and security, something all transmission system operators (TSOs) aim to deliver. Major investments within the supply chain for subsea cables continues to be made with global manufacturing capacity increasing and more cable lay vessels built.

But uncertainty remains.

New projects are pushing the boundaries of technology, with longer cable lengths and deeper waters. Investors and governments are not yet willing to take a chance on new tech with X-Links being the [most recent high-profile casualty](#). Political volatility has also dampened investment appetite after the U.S. government issued a stop notice on the [Empire Wind project](#) after billions of dollars had been spent. Fortunately for stakeholders, this was later overturned. One major cable manufacturer has shelved plans for a [new factory in the U.S.](#) the moment that the

new administration gave an executive order reducing support to unreliable, foreign controlled energy sources. This instability does little for investor confidence.

These challenges are at odds with transmission risks for insurers

Despite the noise of this year's high-profile power failures in the [U.K.](#), [Spain and Portugal](#) which gained traction as news stories across international media, transmission remains a profitable risk for insurers.

Transmission networks rarely concentrate high-value assets in one place, which limits the financial loss of property damage in any single location. Underwriters maintain a strong appetite to write these risks into their portfolios. Pricing remains competitive for transmission risks, and there are opportunities to build the lowest possible total cost of risk, freeing up capital to invest in infrastructure and growth.

Building resilience into five-year plans: Three actions to take

As pressures on power grids and transmission companies intensify, risk leaders have a critical role in building resilience for the short- and long-term.

1. Control insurance costs

Insurance purchased by contractors during the construction phase becomes obsolete at the operational phase, and exposures can emerge in the transition from construction to operation insurance programs. Increasingly, project owners are taking responsibility for the insurance program for the entire project lifecycle — maintaining control over costs as prices rise. Meanwhile, retention strategies are a useful tool to enable transmission companies to lower their total cost of risk. Transmission companies have a strong track record of successfully retaining risks to reduce insurance costs.

2. Showcase risk controls to insurers

Surveys conducted as part of a robust risk engineering initiative will identify key risks and signpost risk controls to limit exposures. By implementing these controls, brokers can articulate the measures taken to proactively manage risk to underwriters. Backed by data, negotiations can establish an appropriate balance of cost and coverage.

3. Invest in data and analytics

Building certainty into risk programs is a critical component to a resilient five-year operating strategy for transmission companies. Sophisticated analytical tools such as [WTW's Global Peril Diagnostic](#) give you the

intelligence to better safeguard assets and prepare for losses with live-event tracking and notifications for natural catastrophes, supply chain disruption and geopolitical risks. By looking ahead and working to implement appropriate risk controls on that journey, transmission companies can better future proof their five-year horizon.

After modelling exposures, building the optimal risk strategy is a critical next step. Using an old and siloed risk strategy is unsustainable. A balance of risk retention and transfer is critical to protect assets in the short-term, while building a sustainable business model for the five-year horizon. Data and analytical models – such as [Connected Risk Intelligence](#) – can help clients build the most efficient risk strategy that balances risk retention and transfer for the entire portfolio of risk.

Market cycles change and pricing dynamics can swing, but making informed decisions, backed by data, can help transmission companies withstand volatility.

To find out how risk and insurance can help you build resilience, contact:



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