Executive Summary

Stirling Infrastructure
PARTNERS LTD

Energy Outlook

Trends, Transitions, and Turning Points

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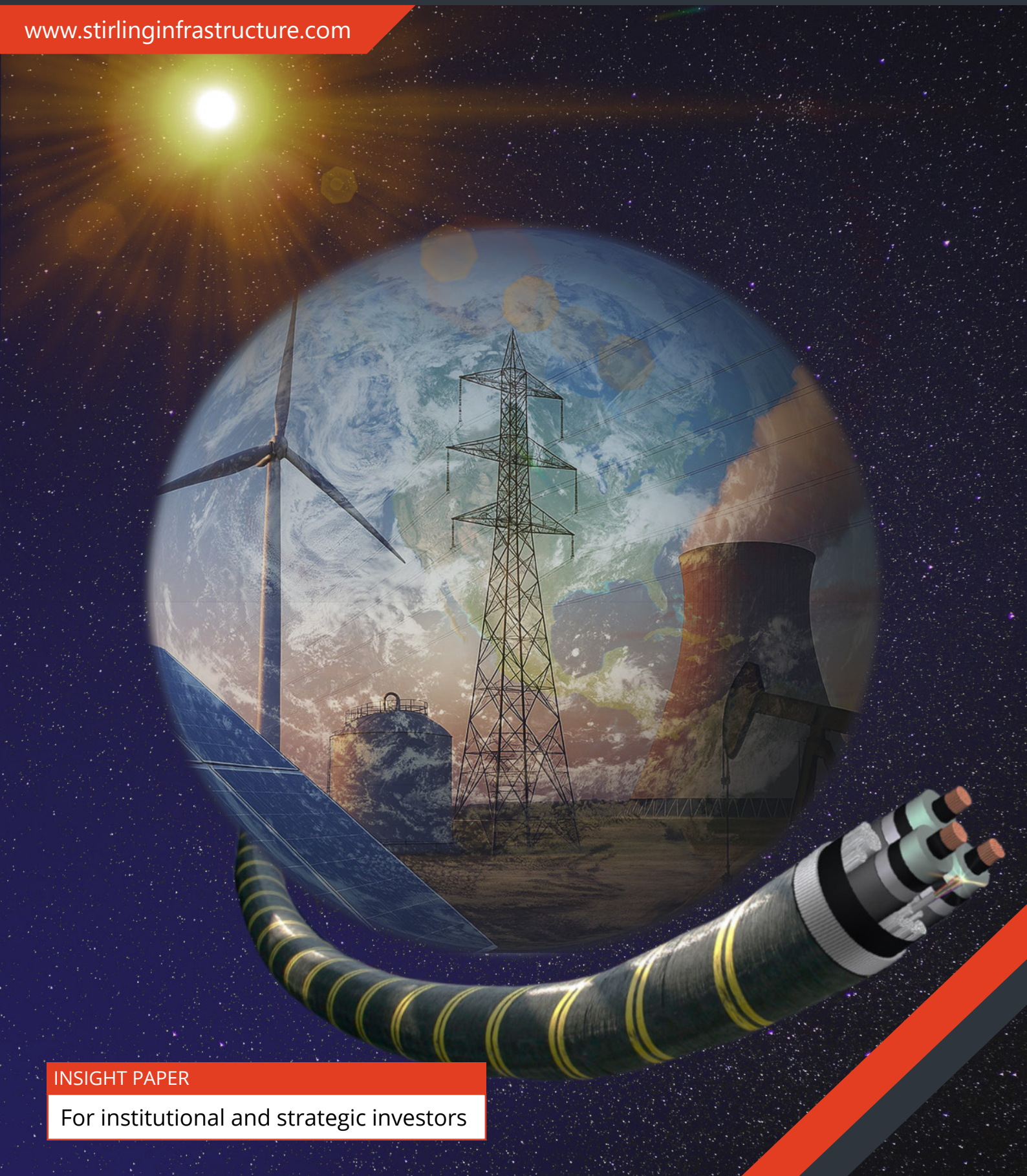

INSIGHT PAPER

For institutional and strategic investors

INTRODUCTION

In 2025, the global energy landscape is defined by a core paradox: while record capital flows into renewables, persistent reliance on fossil fuels and systemic misalignments in policy and infrastructure undermine long-term resilience. The challenge is no longer technological but one of incoherence, where investment flows, geopolitical incentives, and grid readiness are dangerously out of sync with stated transition targets. This has created a fragmented and volatile market where the pathway to decarbonisation is clear, but the investment strategy required to navigate it is increasingly complex.

MACROECONOMIC OUTLOOK

- The global energy landscape presents a fundamental paradox: record capital deployment into renewables is coinciding with systemic misalignments that undermine resilience and reinforce reliance on fossil fuels.
- A profound capital divergence is evident, with the Asia-Pacific region now absorbing over 60% of global infrastructure capital, overwhelmingly driven by China's industrial scale.
- Mainland China's dominance is acute, accounting for 76% of new clean technology factory investment and over half of the global increase in electricity demand in 2024.
- The global power grid has become the primary bottleneck to the energy transition, with interconnection queues exceeding 2,000 GW in the US and 750 GW in the UK.
- Surging electricity demand, which grew 4% in 2024 and outpaced global GDP growth, has placed the grid supply chain under severe strain, extending lead times for critical components like power transformers.
- The oil demand growth narrative is increasingly complex; while growth slowed to 1% in 2024, OPEC projects demand will continue to increase through 2050, driven by petrochemicals and developing nations.
- Natural gas is now a source of systemic constraint, with strong 3% demand growth in 2024, primarily from EMDEs, outpacing the scaling of physical infrastructure.

ENERGY TRANSITION TECHNOLOGIES

- The global wind market is bifurcated, with a resilient onshore segment contrasting sharply with an offshore sector facing a systemic financial crisis due to poor projected IRRs of 6-8%.
- A manufacturing oversupply crisis in the solar industry, more severe than in wind, has caused a historic collapse in module prices, which fell by over 50% in 2024 alone.
- Protectionist policies in the West are causing a great trade redirection, funnelling a flood of low-cost Chinese solar modules to EMDEs, making them the primary global growth area for deployment.
- Nuclear power is re-emerging as a critical source of 24/7 baseload power, driven by energy security needs and new demand from AI data centres.
- A viable infrastructure strategy for hydrogen involves repurposing existing gas pipelines, which costs only 10-35% of a new build, and utilising ammonia for seaborne trade.
- The US Inflation Reduction Act provides a tax credit of up to $3.00/kg for clean hydrogen, a subsidy substantial enough to make green hydrogen cost-competitive with grey hydrogen.

FOSSIL FUEL INFRASTRUCTURE OUTLOOK

- Emerging Asian markets are the exclusive engine for LNG demand growth, creating significant asset stranding risk for new greenfield import terminals in Europe, where strategy is focused on renewables.
- A major wave of new LNG export capacity from the U.S. and Qatar strongly indicates a high probability of global oversupply and associated margin compression extending into 2030.
- With global oil demand projected to peak just after 2030, the investment outlook is shifting away from long-cycle upstream projects and towards midstream infrastructure serving hard-to-abate sectors.

SUSTAINABLE AVIATION FUEL (SAF) OUTLOOK

- Sustainable Aviation Fuel (SAF) has emerged as the leading near-term decarbonisation solution for aviation, a sector where fuel consumption is projected to rise 75% by 2050.
- SAF demand is structurally secured by a dual-track framework of binding government mandates, such as the EU's 2% blend from 2025, and corporate off-take agreements from over 40 airlines.
- The core investment opportunity in SAF is financing new production infrastructure, with an estimated 300-400 new biorefineries required to meet even a 10% global share by 2035.

CONCLUSION

Today the investment landscape is increasingly defined by a structural misalignment between generation capacity and the enabling infrastructure required to support it. Consequently, the most compelling long-term, risk-adjusted returns are now found not in pure-play generation, but in the critical infrastructure that underpins the entire system, particularly the power grid. Successful capital deployment will therefore necessitate a sophisticated portfolio approach, balancing opportunistic investments in generation with strategic, long-term allocations to transmission, storage, and the firm baseload power essential to monetise the growing pipeline of intermittent assets.

FOR FURTHER INFORMATION

At Stirling Infrastructure, we aim to provide advice on growth strategies to, and help raise capital for, companies enabling the energy transition. This would involve analysis of clients' business models, in order to advise on how to raise capital and form strategic partnerships.

Full report is available to clients of the firm upon request.

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