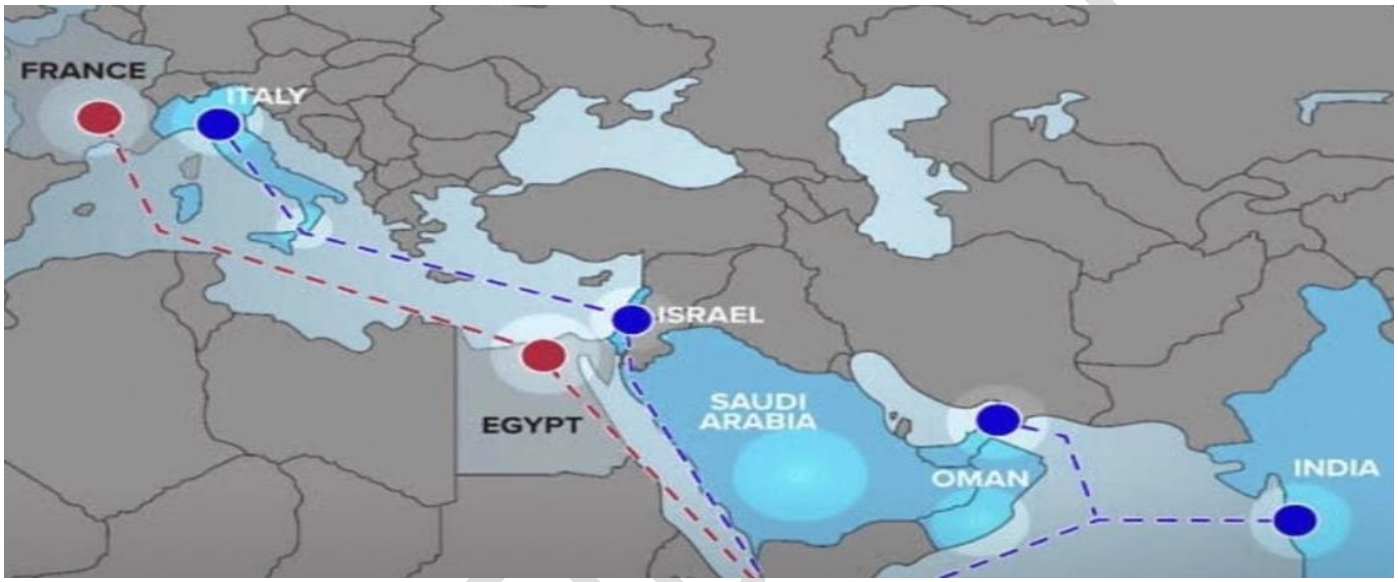
Strategic Analysis of the Blue-Raman System The silk Digital Road and the Transition to Sustainable Digital Infrastructure in 2026



The global architecture of communication and information infrastructure is currently undergoing its most significant reconfiguration since the first deployment of transoceanic fiber-optic cables in the late 20th century. This shift represents a multidimensional response to three existential threats to the modern digital economy: geopolitical instability in traditional maritime corridors, the unprecedented energy and resource demands of artificial intelligence (AI), and the non-negotiable need for sustainable infrastructure that meets strict Environmental, Social, and Governance (ESG) standards. At the center of this revolution is the Blue-Raman project, a Google-led initiative that breaks the historical monopoly of congested maritime routes by offering a secure terrestrial alternative through Israel and Jordan. With Renewable Green Data Centers Global (GDCG) along the Fiber Optic Silk Road .

Breaking the Geographical Monopoly: From the Suez Canal Chokepoint to the New Digital Silk Road

Historically, the global internet has relied on a near-absolute dependency on Egypt as the central digital bridge between East and West. This model is characterized by extreme centralization in the

Suez Canal; an area now defined as a "Single Point of Failure" for global digital traffic. While the world focused on virtual redundancy for decades, physical redundancy was neglected, leaving global infrastructure extremely vulnerable to physical and geopolitical threats in the Red Sea. Events between 2024 and 2025 proved that the existing model is not resilient against geostrategic shifts; Yaman Hotis maritime attacks and sabotage in the Red Sea disrupted roughly 25% of intercontinental traffic between Asia and Europe, leading to operational delays, skyrocketing insurance costs, and an urgent need for hyperscale's to find alternative paths.The Blue-Raman system offers this alternative as a decentralized model based on a secure land passage through Israel and Jordan, effectively neutralizing the reliance on the Egyptian route. This project is a critical component of the India-Middle East-Europe Economic Corridor (IMEC), a strategic initiative designed to link the Indian subcontinent to Europe via the Gulf states and Israel. Beyond its value for goods transport, IMEC creates an information superhighway that reduces latency on Middle East-Europe routes by up to 50%. Specifically, the system enables connectivity of approximately 160 milliseconds between Frankfurt and Singapore, a metric critical for financial applications, real-time trading, and distributed data processing. While traditional models were dominated by an Egyptian state monopoly, the Blue-Raman system is operated by an international consortium including Google, Sparkle (TIM Group), Oman telecom, GDCG and Sify Technologies, which operates the Mumbai landing station.

Technical Architecture and the Terrestrial Land Bridge

The Blue-Raman project is a complex engineering solution composed of two distinct but synchronized subsystems connected by a unique terrestrial bridge. The entire system is built upon 16 fiber-optic pairs utilizing Google's Space-Division Multiplexing (SDM) technology. This technology allows for a much more efficient use of the electrical power transmitted along the cable to transfer data, with **Green Data centers enabling a design capacity that currently stands at 218 Tbps with a future potential of reaching 400 Tbps.**The "Blue" segment establishes a Mediterranean corridor originating in Genoa, Italy, with strategic landing points in France, Greece, and Cyprus before reaching Israel. Sparkle has developed the Blue Med cable on this infrastructure, featuring four dedicated fiber pairs with a capacity exceeding **25 Tbps per pair**. The Blue segment offers a unique northbound route through the Strait of Messina, providing essential physical diversity compared to other cables in the Mediterranean basin.

The "Raman" segment, named after Nobel laureate Sir C.V. Raman, originates in Aqaba, Jordan, and traverses Saudi Arabia, Djibouti, and Oman before arriving in Mumbai, India. This segment is vital for the accelerated digitalization of South Asia, supported by Google's $10 billion investment in India's digital transformation. Technical innovation in this segment lies in the use of the Raman Effect for optical signal amplification over the **cable's 9,000 km span**.

Unlike traditional amplifiers that convert optical signals to electricity and back, Raman amplification uses the non-linear properties of the fiber itself to boost the signal in real-time, significantly improving reliability and reducing noise.

The most significant engineering feat of the project is the terrestrial link between Israel and Jordan. By running fiber optics overland from Israel's Mediterranean coast to Eilat and then to Aqaba, the system bypasses the Suez Canal entirely. The deployment of this land bridge in Israel was carried out by Bezeq, which laid approximately 800 km of fiber-optic cables adapted to the challenging terrain of the Negev and Arava regions.

The Green Data Center Revolution: Addressing the Energy and Water Crisis

While connectivity provides the nerves of the digital economy, data centers are the muscles processing the information. However, the processing requirements of large AI models are creating a combined crisis of energy and resources. Data center electricity consumption is projected to jump from 415 TWh in 2024 to over 1,000 TWh by 2026, representing roughly 3% of the world's total energy consumption today and 9% by 2030!. Alongside electricity, water consumption has become a critical challenge; a single AI query in models like Gemini or ChatGPT consumes approximately 0.26 ml of water for cooling—a figure that becomes significant when scaled to billions of queries per day.

In response to these trends, the initiative led by Engineer Ami Elazari MBA LLM and the Millennium Capital group proposes a Green Data Center model to be launched globally starting in 2026. The foundation of this initiative is the PVT Multi-Solar System (MSS) patent, which achieves a total system efficiency of 85%–88% through the dual harvesting of solar energy . While traditional PV solar panels achieve only 23% efficiency, Elazari's technology utilizes both visible and infrared spectrums. The breakthrough lies in combining a photovoltaic system with a thermal system (PVT), featuring a patented copper absorber that achieves 22% Electrical efficiency plus 65% thermal efficiency in synergy the water cool the PV increase the electrical efficiency and at the same time collected 65% thermal energy that is used to power solar air conditioning and immersion cooling technology—where IT equipment is submerged in non-conductive liquid—reducing the Power Usage Effectiveness (PUE) index by up to 40% to 1.1 compared to traditional air cooling.

This model transforms the data center from a passive consumer of the grid into a "Prosumer" that produces and consumes energy in a balanced way, helping to stabilize national power grids. Millennium Solar's data centers are designed for modular deployment near the Blue-Raman fiber routes, ensuring an optimal balance between minimum data latency and maximum energy efficiency.

Market Analysis and Institutional Resilience Toward 2030

The global market for green data centers is in a state of accelerated growth, valued at approximately $48.26 billion in 2026 and projected to reach $155.75 billion by 2030, representing a Compound Annual Growth Rate (CAGR) of 26.4%. Simultaneously, the market

for immersion cooling, essential for high-density AI processing, is expected to grow from $536 million in 2025 to $4.65 billion by 2035. Funding for these large-scale projects relies on

infrastructure debt models, offering stability and long-term returns for institutional investors seeking ESG-compliant assets. The Edmond de Rothschild Group currently manages approximately €6 billion in infrastructure debt with a strong focus on energy transition and digitalization. The Blue-Raman project itself received significant support from the European Investment Bank (EIB), which provided €153 million toward the project's total €600 million investment. This investment reflects the European

Union's commitment to the Global Gateway strategy, aiming to bridge the global digital divide with resilient and secure infrastructure.

In terms of security and regulation, digital infrastructure by 2026 will be required to meet strict operational resilience standards. The EU's Digital Operational Resilience Act (DORA) mandates that financial institutions and ICT service providers ensure rapid recovery from digital disruptions. In response, Presale1 launched the "Diamonds of Cybersecurity" initiative for 2026, applying the Diamond Model of intrusion analysis to examine the adversary, capability, infrastructure, and victim of every attack. This Secure by Design approach integrates Big Data analysis and physical resilience against state-sponsored threats. These solutions also include Zero Trust mandates and Memory Integrity Enforcement (MIE) to ensure that data processed within green facilities remains protected from sabotage and espionage.

Conclusion

The year 2026 marks the convergence of the digital nervous system (Blue-Raman) and the modern energy metabolism (Elazari's Green data centers). The combination of a secure data path with a capacity of hundreds of terabits and an energy efficiency of 85%–88% creates an ecosystem

that ensures the continuity of the global digital economy while adhering to the most stringent sustainability standards. For investors, this represents an opportunity to enter a growing market of critical infrastructure backed by institutions like the EIB and the Rothschild Group. For the global tech community, these infrastructures provide the foundation for responsible, efficient, and secure AI processing while reducing dependence on historical geopolitical failure points.