META WISDOM
GROUP

WHITE PAPER

HORIZON GRID

The Worldwide Solar Energy Network

CONTENT

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WHITE PAPER

GENESIA – THE METAWISDOM NEXUS

FOUNDING DECLARATION OF THE DOCTRINE

This White Paper presents, for the first time, ***the doctrine of the Worldwide Solar Energy Network – Horizon Grid****, founded by Tran The Cong in 2025.*

All concepts, philosophies, models, and systemic structures presented in this White Paper are to be regarded as a unified intellectual whole, constituting intellectual property owned by the author and protected under copyright, moral rights, and exploitation rights in accordance with applicable intellectual property law and regulations.

This doctrine is part of the System of Seven Civilizational Doctrines, publicly announced by the author through seven White Papers: Unified Science, Metawisdom Economics, Metawisdom Civilization, The Metawisdom Group, Genesia – The Metawisdom Nexus, Athera – The Metawisdom Companion AI, and Horizon Grid – The Worldwide Solar Energy Network.

The seven doctrines constitute a unified whole that serves as the guiding axis for a civilizational transformation. Any reception, research, application, or practical implementation must adhere to the spirit of this system, following the principle of understanding the whole before implementing any part.

Any restructuring, reinterpretation, translation, dissemination, integration into policies, operational models, or educational programs may only be undertaken if the system's integrity, coherence, and ultimate purpose – as defined by the entire doctrinal system – are preserved.

PREFACE

We must not allow ourselves to remain shackled by parochial interests, leaving future generations to inhabit a planet burdened by a hellish climate. We must not bequeath a broken world to those who have not yet had the chance to raise their voices and have done nothing to deserve such a burden. The responsibility of our generation is not to evade, but to act with the clarity and dignity of those who fully grasp the perils of delay.

We must not calculate and shift responsibility for the future onto one another, for we are citizens of mature nations and civilizations. Mature people do not assign blame; they shoulder burdens together. The world no longer has time to become mired in disputes over narrow interests. What humanity requires at this moment is a shared vision – bold enough, inclusive enough, and strong enough – to unite all parties.

Nor should we require the poor of our own time to sacrifice their opportunity for prosperity merely to secure the quality of life of generations yet to be born. A comprehensive solution for the future cannot be built upon injustice in the present. Climate justice must not be a privilege of any particular group; it must be the universal right of those who have been born, those who live today, and those who will one day be born on this planet.

We now stand at a threshold of history, where the decisions we make today will shape the world and the model of civilization for many generations to come. This is not merely a matter of technology or policy. This is a test of maturity for the whole of human civilization. Humanity does not lack technology, resources, or dedication and intelligence. What is missing is a sufficiently expansive shared vision – one capable of enabling us to act as a unified civilization. Such a vision can guide nations, enterprises, and communities beyond the vortex of narrow interests, toward the co-creation of a future that is just, sustainable, and better for all.

Guided by this conviction, the Horizon Grid – the Global Solar Energy Network – was born. This is an ultra-large-scale global renewable energy infrastructure system, built on the spirit of open cooperation, where the sun's power becomes the shared resource of humankind. Within this network, solar farms are built between the Tropic of Cancer and the Tropic of Capricorn, distributed across multiple time zones to ensure that humanity has continuous access to energy, regardless of where the sun is positioned at any given moment.

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By sharing solar energy rather than solely seeking to store it locally, the greatest bottleneck in the quest for cheap, clean energy will be resolved.

This project will serve as the infrastructural foundation of global civilization, helping us achieve genuine climate balance, safeguarding social equity, and opening a new era of cooperation and development at an unprecedented scale.

This is not a distant dream. This is an achievable reality. The question is no longer *"Is it possible?"* but rather: **"Do we have the collective will to realize it?"**

I. VISION OVERVIEW

The world is entering a pivotal moment in which energy and climate challenges can no longer be addressed through isolated national-interest models. The transition to renewable energy demands not only technology, but also a global cooperative infrastructure – one in which the planet's resources are connected and shared efficiently, reliably, and equitably.

1. A Unifying Vision

The Horizon Grid system is built upon a simple yet profound principle: all major renewable energy sources originate from the Sun.

Sunlight generates heat; heat drives wind; wind creates waves; and the water cycle produces hydroelectric power. This means that rather than treating individual energy sources as fragmented systems, we must recognize them as diverse manifestations of solar energy in different forms — each of which is inherently clean.

Solar energy is distributed cyclically and impartially across East and West, across oceans and continents, across forests and deserts. It is both a gift and a reminder of the unity, wholeness, and balance inherent in energy itself.

From this understanding, we can design a unified global energy architecture that operates as a continuous solar circulation system on Earth.

Horizon Grid is not a single power plant nor an isolated project. It is an integrated infrastructure system – the backbone network of the global clean energy economy for the twenty-first century and beyond.

2. Overall System Architecture

Horizon Grid is defined by:

- The Solar Energy Belt: A primary High-Voltage Direct Current (HVDC) transmission corridor running through Australia, East Asia, Central Asia, North Africa, Central America, and Kiribati, and returning to Australia to complete a closed energy loop. This transmission corridor connects large-scale solar farm clusters located in equatorial and sub-equatorial regions, where solar radiation remains consistent year-round. It constitutes a vast, low-cost energy production and transmission network.

• Global Extension Branches: From this solar belt, additional HVDC lines and bidirectional grid networks extend northward and southward, integrating with other existing renewable energy sources – including wind, hydro, wave, geothermal, and others – reaching major global energy consumption centers.

• Intelligent Global Energy Governance System: Horizon Grid is coordinated through advanced digital infrastructure, artificial intelligence systems, and neutral governance protocols, ensuring real-time flexible energy allocation across continents to minimize transmission losses, stabilize supply, and optimize costs.

• Open Architecture for Universal Participation: No single nation or corporation owns Horizon Grid. It operates as shared infrastructure much in the same way that the Internet has become the digital backbone of humanity.

3. Strategic Advantages

Horizon Grid offers strategic advantages that no other isolated energy solution can provide:

• 24/7 Energy Stability: At global scale, sunlight continuously illuminates one half of the planet at any given time, enabling stable, continuous energy delivery and reducing reliance on costly storage solutions that carry ecological and pollution impacts.

• Cost Reduction and Efficiency Gains: Prioritizing energy production in regions with optimal natural conditions lowers generation costs, allowing the entire world to benefit.

• Enhanced Cooperation and Energy Security: A globally interconnected system reduces geopolitical risk and enables cross-border energy sharing during regional crises.

• Climate Equity and Inclusive Development: Horizon Grid enables developing countries to participate in the global energy value chain, ensuring they are not marginalized in the green transition.

• A Non-Political Driver: The core infrastructure of Horizon Grid is located primarily in equatorial and sub-equatorial nations – the very countries that will bear the earliest and most severe consequences of climate change and global warming.

4. A Shared Civilizational Infrastructure

Horizon Grid is not designed as a program of power projection or geopolitical competition. It is conceived as a foundation for human cooperation – where nations, corporations, and communities build together and benefit together.

Just as the Internet shaped the civilization of the information age, Horizon Grid can become the physical and energetic infrastructure of a clean civilization.

This is not the challenge or the solution of a single generation. It is the energy framework for many generations – a gift that we offer to those who will come after us.

II. SYSTEM ARCHITECTURE DESIGN

Horizon Grid is designed as a global renewable energy system capable of producing, transmitting, coordinating, and distributing clean energy at a planetary level. The system architecture comprises three primary layers: (1) energy production and generation, (2) transmission and coordination, and (3) distribution and utilization. These three layers are interconnected to form an open, flexible, and sustainable energy circulation loop.

1. Energy Production and Generation

a. The Equatorial Solar Energy Belt:

• Strategic focus: Developing ultra-large-scale photovoltaic farm clusters in regions near the Earth's equator where solar radiation remains stable year-round.

• Natural advantages: High-intensity sunlight with minimal seasonal or climatic interference. When interconnected as a network, these clusters generate near-continuous energy output, significantly reducing storage requirements and lowering production costs.

• Core technologies: Photovoltaic (PV) systems, Concentrated Solar Power (CSP), and real-time AI-based coordination.

b. Wind and Hydropower Networks: Providing diversified energy supply to enhance the stability and resilience of the overall system.

c. Regional Supplemental Sources: Geothermal, tidal, green hydrogen, fuel cells, and distributed community energy models enable nations to leverage their unique geographic advantages and participate in Horizon Grid at multiple tiers of integration.

2. Transmission and Coordination

a. Long-Distance Transmission Network (Global HVDC Backbone):

• Deploying High-Voltage Direct Current (HVDC) technology to transport energy with minimal losses across thousands of kilometers, both overland and undersea.

• Forming a closed primary transmission loop running between the Tropic of Cancer and the Tropic of Capricorn, connecting major energy clusters and extending outward through branch corridors to continents in both hemispheres.

b. Bidirectional Interconnection System:

• Horizon Grid does not operate as a one-directional system from a "center" to a "periphery." All regions can flexibly export and import energy according to real-time supply and demand conditions.

• Sub-branches connect regions with strong renewable energy potential, including Europe, Southern Africa, North America, South America, Northern Asia, Australia, and others.

c. Intelligent Global Coordination and Forecasting:

• Applying AI and supercomputing to forecast weather, power output, and demand in real time.

• Adjusting global energy flows according to system optimization principles, minimizing transmission losses and price volatility.

3. Distribution and Utilization

• Open Energy Infrastructure: All nations may connect to Horizon Grid through regional "energy gateways", enabling energy sharing, cross-border electricity trading, or localized storage depending on national needs.

• Energy Decentralization and Sovereignty: Participating nations retain sovereignty over domestic infrastructure while integrating into a shared global network.

• Support for a Just Transition: Developing and lower-income countries can export clean energy derived from natural advantages (equatorial positioning, desert terrain, strong wind corridors, and others), generating new revenue streams while gaining access to cheaper, cleaner energy for economic development without carbon-intensive burdens.

4. Neutral and Transparent Governance Design

Multilateral Governance Mechanism:

• Horizon Grid does not belong to any single nation, corporation, or power bloc.

• It is governed by a multilateral council composed of governmental, corporate, academic, and civil society representatives.

• Technical, financial, and legal decisions must adhere to principles of transparency, equity, and consensus.

Open Global Energy Protocol: The development of shared connection and operational standards ensures universal participation without requiring authorization from any centralized authority.

Security, Resilience, and Crisis Resistance: A decentralized, multi-node architecture ensures that should any region experience disruption, the global system as a whole remains stable. The design integrates layered physical, digital, and political security frameworks to safeguard continuity and system integrity.

III. STRATEGIC ADVANTAGES OF HORIZON GRID

1. A Planetary-Scale Solution with Minimal Environmental Impact

While many renewable energy solutions involve significant ecological trade-offs — including large hydropower dams, pumped storage reservoirs, rare mineral extraction, and extensive land occupation — Horizon Grid requires only:

• Linear transmission corridors, which may be underground or overhead and designed to avoid ecologically sensitive zones.

• No environmental destruction for electricity storage.

• Long infrastructure lifespans (40–80 years), with the capacity for restructuring or decommissioning at low cost.

This represents a decisive advantage: Horizon Grid enables the expansion of clean energy at scale without paying the price in ecosystems.

2. Near-Unlimited Scalability

Once the Horizon Grid backbone is established:

• Each additional 1 GW solar farm can connect to the system without requiring major new long-distance transmission infrastructure investment.

• There is no need to construct long-duration storage facilities, which are extraordinarily costly, geographically constrained, and ecologically impactful.

• HVDC transmission lines can continuously carry tens of gigawatts, with marginal infrastructure expansion costs approaching zero.

This is an irreplaceable advantage: No other solution currently available allows global renewable energy to scale as rapidly and as affordably.

3. A Foundational Driver for Transport and Industrial Transformation

Transport and industry are currently the two largest emitting sectors, accounting for nearly 60% of global CO_2 emissions. For decades, decarbonization in these sectors has been constrained by the lack of a stable supply of clean energy and the high cost of energy storage.

Horizon Grid directly addresses this bottleneck:

• Providing planetary-scale renewable electricity with 24/7 stability, through time-zone and latitude-based energy shifting.

• Transport: Enabling large-scale electrification of mobility without increasing domestic environmental burdens, reducing operational emissions to near zero.

• Industry: Supplying stable, affordable, and clean electricity to hard-to-abate sectors such as steel, cement, chemicals, metallurgy, battery manufacturing, green hydrogen production, and others.

• Enabling developing nations to leapfrog the fossil fuel stage, moving directly into green infrastructure without massive storage investments.

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This constitutes Horizon Grid's most powerful strategic leverage: Transforming the two largest energy-consuming and carbon-emitting sectors of human civilization to renewable energy — at low cost, with technical feasibility, and with equitable opportunity for development.

4. The Most Viable Pathway to Net Zero Before 2050

At present, total global solar electricity generation stands at approximately 2,000 TWh annually, constrained primarily by storage capacity and domestic consumption limitations.

With the support of Horizon Grid, this output could surge to 120,000 TWh by 2050, enabling renewable electricity to exceed total planetary energy demand.

When clean, affordable, stable, and large-scale energy can circulate freely across the globe, the greatest technical and economic barriers to decarbonization will collapse. Surplus renewable energy from Horizon Grid can be deployed for large-scale atmospheric carbon removal, offsetting emissions from sectors such as agriculture or from natural disasters.

With Horizon Grid, Net Zero is no longer a distant aspiration. It becomes a fully attainable scenario within the first half of this century.

5. Reconnecting Humanity

The challenge of clean energy and climate change is fueling tensions between groups of nations and between generations within the same societies. These tensions will intensify as the global climate crosses new thresholds of instability and loss of control.

Horizon Grid opens a clear and transparent pathway through which the interests of every nation and every generation can be secured. A sense of shared responsibility and commitment to the common good can be awakened, expressed, and affirmed at the scale of generations, of corporations, and of nations. Humanity can be redefined through maturity rather than deflection of responsibility.

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6. Laying the Foundation for a New Civilization

Unlike traditional energy infrastructures, which are often built upon competition for scarce resources, Horizon Grid is founded on the principle of shared global benefit.
• Connecting solar-rich regions with major consumption centers, fostering positive interdependence rather than conflict over interests.
• Reducing reliance on fossil fuels, limiting risks of energy instability, geopolitical conflict, and supply chain crises.
• Transforming solar energy into a shared asset of humanity through a global transmission network — much as the Internet transformed information into a shared global resource.

This is not merely a technical advancement; it represents a civilizational shift. A transition from competition over scarcity to cooperation around abundance; from energy as a weapon to energy as a connective force for humanity. Horizon Grid does not only bring energy to every corner of the world. It illuminates a new model of global cooperation.

IV. PROJECTED SCALE AND COST OUTLINE

To generate 120 PWh of solar electricity annually, humanity would need to install approximately 46–55 TW of photovoltaic (PV) capacity, depending on a capacity factor of 0.25–0.30 achievable in equatorial and sub-equatorial regions. At an installation density of 1–2 hectares per MW, the total required land area would range between 460,000 and 1,100,000 km². Taking a midpoint estimate of approximately 800,000 km², this corresponds to roughly 0.54% of the Earth's total land surface. Such an area can realistically be allocated within the world's deserts and semi-arid regions where solar radiation is strongest.

The majority of this area can be deployed within Solar Energy Golden Zones — desert regions with the highest solar radiation on Earth, situated between 10° and 30° latitude in both hemispheres. In these zones, capacity factors can reach 28–32%, reducing both land requirements and generation costs compared with temperate regions.

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A smaller portion of this area — approximately 100,000 km² — would need to be deployed around Kiribati to ensure a continuous global electricity supply during hours when much of the world's major continents have not yet reached peak solar generation. Kiribati possesses an Exclusive Economic Zone (EEZ) exceeding 4.5 million km², lies close to the equator, and rarely experiences severe storm activity. For these reasons, Kiribati holds the potential to become a technological and clean energy wonder of the world.

Due to the extraordinary scale of deployment, manufacturing optimization and technological advances could reduce PV capital costs to approximately USD 250 per kW, corresponding to a total generation investment of USD 15 trillion. Approximately 30–40% of total electricity output would require intercontinental transmission, necessitating 18–24 TW of transmission capacity and an additional USD 2.2–3.0 trillion in transmission infrastructure investment. System integration, control infrastructure, and technical reserves are estimated to require an additional USD 0.5–1.0 trillion. Consequently, the total investment required for the entire system is estimated at approximately USD 20 trillion — a one-time investment to secure a clean energy future for humanity.

When combining generation and transmission costs, the delivered price of solar electricity at major consumption centers is estimated at 15–20 USD/MWh, inclusive of 20–30% transmission losses. This is a transformative price point for global society.

SUMMARY OF CORE TECHNICAL PARAMETERS

1. **Target annual generation:** 120 PWh — exceeding total global energy demand.
2. **Required PV capacity:** 46–55 TW — corresponding to CF = 0.25–0.30.
3. **Proposed Optimal Capacity:** ~60 TW — providing stability and growth margin.
4. **Total installation area:** ~800,000 km² — equivalent to 0.54% of global land area.
5. **Optimal geographic zones:** 10–30° North–South latitude, Solar Energy Golden Zones with highest radiation.
6. **Capacity factor (CF):** 0.25–0.32 depending on region (Sahel, Sahara, Australia, Arabia, etc.).
7. **PV Capital Cost:** ~250 USD/kW, optimized through ultra-large-scale manufacturing and deployment.

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8. Total generation investment: ~USD 15 trillion, comprising the majority of total system capital.
9. Long-distance transmission share: 30–40% of total electricity production, requiring 18–24 TW transmission capacity.
10. Total transmission investment: USD 2.2–3.0 trillion, using intercontinental HVDC systems.
11. Total system investment: ~USD 20 trillion — a one-time investment to establish a planetary-scale clean energy system.
12. Delivered electricity price: USD 15–20/MWh at consumption centers, inclusive of 20–30% transmission losses, with no storage systems required.

V. IMPLEMENTATION ROADMAP

1. Establishment of the Horizon Grid Metawisdom Node

• The Metawisdom Group establishes the Horizon Grid Metawisdom Node, bringing together individuals with genuine expertise, experience, and commitment to the Horizon Grid vision.

• The Horizon Grid Metawisdom Node assesses, evaluates, and develops optimal scientific, technical, economic, and political strategies, while remaining fully independent of any organization or government, including the Metawisdom Group.

• A Project Advancement Group is formed from within the Horizon Grid Metawisdom Node.

2. Advancing International Cooperation

• The Project Advancement Group, under the sponsorship of the Metawisdom Group, engages with governments, corporations, scientists, and technology specialists worldwide to establish a shared framework for cooperation and develop a preliminary implementation strategy for Horizon Grid.

• Representatives from participating countries, corporations, and scientific communities jointly establish the Horizon Grid Project Governing Council.

• Participating nations and corporations jointly agree on the final implementation plan and roadmap.

3. Official Implementation

• Deployment of 1% of total target PV area on land, along with initial testing of floating photovoltaic technologies in ocean environments.

• Deployment of 5% of total target PV area on land and 1% in ocean environments. Scaling up manufacturing and large-scale installation systems. Initiation of foundational intercontinental transmission infrastructure.

• Deployment of 40% of total target PV area on land and 20% in ocean environments. Completion of the core global energy transmission infrastructure. Transition of 30% of industrial and transportation energy consumption to renewable sources. Initiation of large-scale carbon capture infrastructure powered by surplus energy from Horizon Grid.

• Deployment of 80% of total target PV area on land and 70% in ocean environments. Transition of 60% of industrial and transportation energy consumption to renewable energy.

• Completion of 100% of total target PV area. Transition of 90% of industrial and transportation energy consumption to renewable energy. Full deployment of global carbon capture infrastructure utilizing surplus energy from Horizon Grid.

VI. CONCLUSION

This White Paper has been written as a roadmap, so that any nation, organization, or individual may realize that the path toward civilizational transformation is no longer a matter of imagination, but a path that can now truly begin.

With a global vision and a spirit of international cooperation, Horizon Grid is not merely a technical or economic solution. It is a new architecture for global collaboration, in which clean energy becomes a shared asset of humanity. By building a planetary-scale solar energy network, the cost of electricity can be dramatically reduced, laying the foundation for a broad corridor of economic development in which growth no longer implies rising emissions.

More importantly, Horizon Grid represents a profound ecological turning point:

- A deep reduction in CO_2 emissions, stabilizing the global climate;
- Reduced dependence on fossil fuel extraction, restoring space for the natural world to recover;
- Reduced air and water pollution, safeguarding human health;
- Productive use of desert regions while minimizing land-use conflicts;
- Opening pathways for large-scale ecosystem restoration.

Horizon Grid is not a trade-off between prosperity and climate. It represents a systemic transition: from a model of resource competition to a model of shared energy; from growth in opposition to ecology, to genuinely sustainable prosperity. When affordable, clean, and abundant energy becomes a common foundation, humanity can enter a new era of development — one in which economy, culture, and ecology advance together, and the goal of Net Zero becomes fully attainable.

Horizon Grid is a century-scale undertaking with approximately 800,000 km² of photovoltaic infrastructure spanning continents and oceans. It will stand as a new symbol of humanity's capacity for global cooperation, and collective scientific, technological, and political achievement. Beyond that, it will inspire generations to create, to contribute, to leave their mark upon the shared progress of human civilization.

With Horizon Grid, we will witness nations collaborating more deeply, opportunities for prosperity shared more widely, and young people who can face the future with confidence – knowing that their future has been secured. A future secured not by promises, but by the responsible actions of mature societies within a mature civilization.

VII. CONCLUSION OF THE SEVEN CIVILIZATIONAL DOCTRINES

The Horizon Grid White Paper is the seventh piece of the Seven Civilizational Doctrines, and also the final one that completes a unified body of knowledge dedicated to the future of humanity.

The seven doctrines emerge from a state of assimilation with Metabeing, where human beings no longer understand the world through fragmented knowledge, but through a profound interconnection between their thought, character, and their own Metabeing. From this foundation, the Seven Doctrines open a pathway through which every individual, every community, and an entire civilization may advance toward a more mature form of existence — one in which human beings are both the creators of the future and the bearers of responsibility for humanity's shared future.

This system establishes three great foundations of knowledge for a new era:

- Unified Science – enabling us to understand the world as an interconnected whole.
- Metawisdom Economics – enabling us to recognize and learn to balance the prosperity of each individual, the equity of society, and the sustainability of the planet.
- Metawisdom Civilization – enabling us to affirm the depth of value and dignity that humanity can — and now genuinely may — attain.

These three foundations are implemented through an organizational pillar: The Metawisdom Group. And that pillar lays the groundwork for three civilizational infrastructures:

- Genesia – The Metawisdom Nexus that connects individuals mature in Metabeing in order to shape the collective intelligence, character, and the shared Metabeing of humanity.
- Athera – The AI platform designed to accompany and support the collective Metawisdom of humanity.
- Horizon Grid – The clean energy circulation system for the entire world.

The entire system of the Seven Doctrines grants privilege to no individual or organization, and creates no inequality among nations. On the contrary, it opens an equal opportunity for all — an opportunity to participate, to co-create, and to become part of the civilizational transition that humanity has long awaited.

The Seven Doctrines make no promises, but they offer humanity a viable path: a structured roadmap with a solid foundation and a clear direction, through which we may together move beyond the old limitations, old conflicts, and old cycles of decline. Along that path, each human being may become more open, more profound, more noble, and more worthy of the potential of their own Metabeing.

With the emergence of this seventh piece, the Seven Civilizational Doctrines are now complete. From this moment forward, the transformation of civilization no longer belongs to any single individual or group, but to all who are willing to step into it.

The door has opened, and a wondrous future is no longer merely a prediction.

That wondrous future has become an invitation!