

TAIWAN INTELLIGENS — 漂蕩世界的
臺灣智慧 — OF PRECARITY

NON-Belief [無]信仰

Organizer



Co-organizer



Supported by



Executor



以能源為核心的建築思考



Edge Computing Center
and Energy System

運算熱島：運算時代下臺灣建築的能源革命

Computational Heat Island: Energy Revolution in the Computility Era

隨著 AI 模型逐漸從雲端推向邊緣，微型運算中心進入了一般建築物之內，普遍存在而成為新型態的建築類型。其核心價值脫離傳統的關注，轉移到了能源之下的各項關鍵數據：能耗，算力，碳排，餘熱等。如此的設計邏輯，涉及能源流動的根本重構。我們可以思考諸多面向，例如：

- 再生能源的來源及其與都市/建築的共構關係
- 以能源為核心的新建築類型邏輯
- 建築空間如何回應科技設備的動態更迭
- 高密度運算產生的餘熱如何轉化循環
- 運算設施如何與周邊社區形成能源網絡

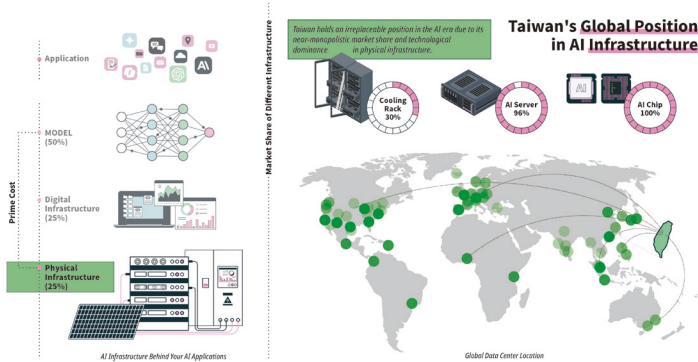
亦即，促使我們突破以往依賴中央電網的單向能源流動模式，轉而構建一個動態的能源轉換系統，並將其體現在建築及都市空間中。從臺灣優勢、人工智慧、物聯網趨勢、能源形式發展等多面向的整合性思考。

As AI shifts from cloud to edge computing, micro computing centers are becoming integrated into buildings as a new architectural typology. Their core value shifts to energy-related metrics: power consumption, computing power, carbon emissions, and waste heat. This design logic involves fundamental restructuring of energy flows. Key considerations include:

- Integration of renewable energy with urban structures
- Energy-centered architectural typology
- Space adaptation for evolving technology
- Waste heat recycling systems
- Community energy networks

This pushes us beyond traditional one-way grid power flow, toward dynamic energy systems in architectural spaces, integrating Taiwan's tech advantages, AI development, IoT trends, and energy innovations.

Energy-Centric Architectural Thinking



過去建築橫跨千年的探索，始終聚焦於空間的尺度，形式，構築，材料等價值。然而，在全球碳中和的目標下，建築師面臨了一個更為迫切的挑戰：如何在短短數十年內，徹底重構建築與能源的關係，使其在能耗及碳排上與不同領域關注相同的價值對齊。此時建築師的角色已然超越了傳統的空間創造者，能源知識、機電系統、熱力學原理、與數據化演算等專業，相形更加重要。這變革及對應，這正也我們雙年展所探討的核心議題。

臺灣匯聚了從 TSMC 晶圓廠到 NVIDIA 等科技巨擘。基礎建設自然成為這個新建築類型的發展建構場域。在地的實踐經驗，具有示範並引領「運算建築」新紀元的潛力。將臺灣在半導體產業的專業知識，於建構空間環境的過程中，探索各項環節中轉化為建築創新的契機，為全球永續發展提供解決方案。從建築思潮的追隨者，成為運算建築新典範的締造者，建立“以能源為核心的建築思考”之下提出融合運算效能與低碳發展的新建築類型。

For millennia, architecture focused on spatial scale, form, tectonics, and materials. Now, under global carbon neutrality goals, architects face an urgent challenge: fundamentally restructuring building-energy relationships within decades to align with carbon reduction targets. The architect's role extends beyond spatial design - energy knowledge, MEP systems, thermodynamics, and data analytics become crucial. This transformation is the core issue of our Biennale exhibition.

Taiwan hosts tech giants from TSMC to NVIDIA. Infrastructure naturally becomes the development field for this new architectural typology. Local practical experience has the potential to pioneer a new era of "computing architecture." By transforming Taiwan's semiconductor expertise into architectural innovation during spatial construction, we can provide global sustainability solutions. From following architectural trends, we become creators of new computing architecture paradigms, establishing energy-centric architectural thinking that integrates computational performance with low-carbon development.

ENERGY-CENTRIC ARCHITECTURAL THINKING



ENERGY-CENTRIC ARCHITECTURAL THINKING

以能源為核心的建築思考

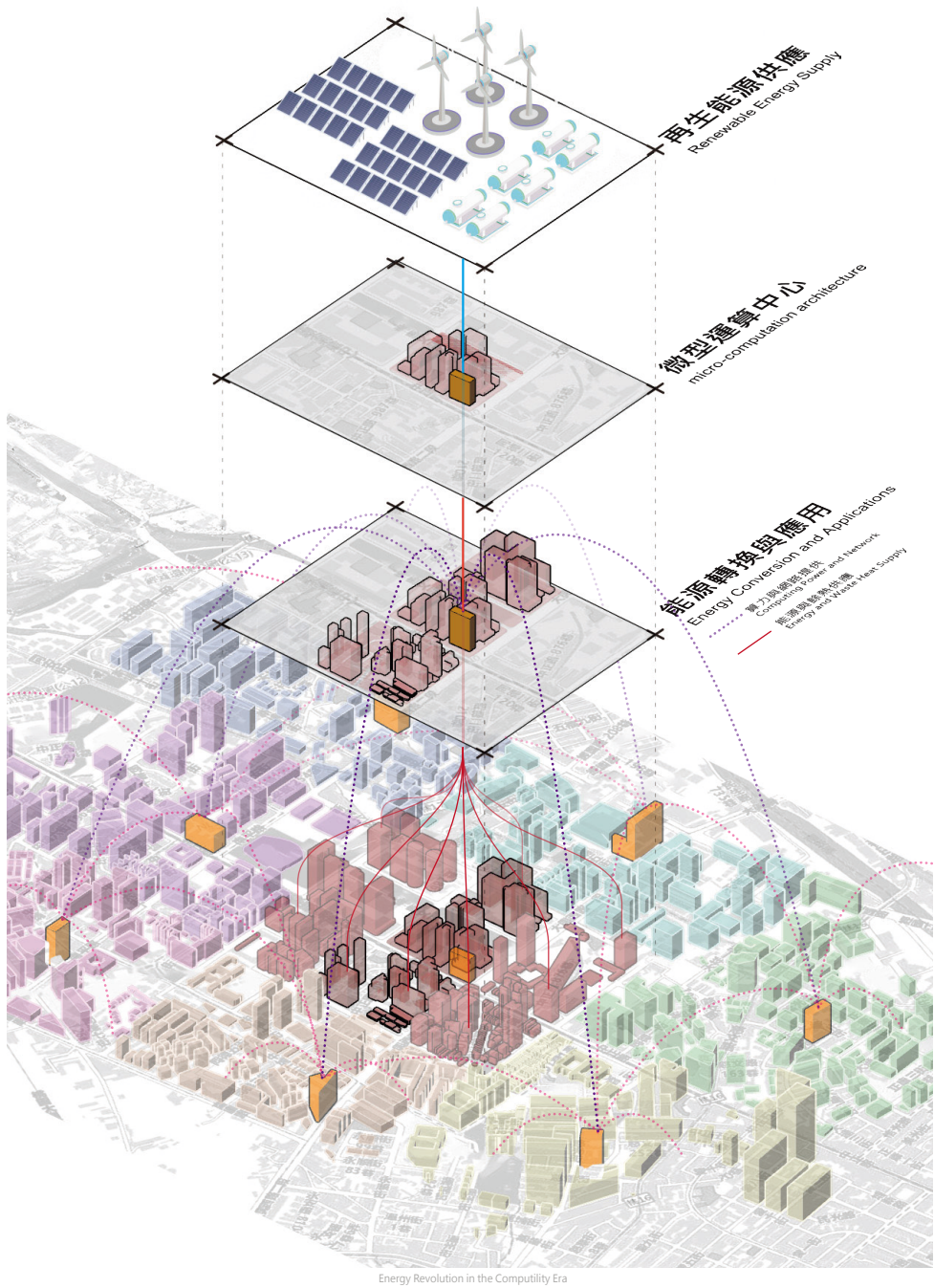
在這個運算需求劇增的時代，隨著人工智慧（AI）技術的普及，文明發展的能源消耗更達到前所未有的規模，這同時為建築界提供了重大的轉型挑戰，促使我們重新思考建築應如何對應。與此同時，AI 邊緣運算（AI Edge Compute）的建置需求，將運算設施模組化融入一般建築物中，創建分散式的運算節點網絡。這一新建築形式不僅是大型運算中心的微型化趨勢，更代表了一種革命性的建築思維：「微型運算建築」可能成為當代建築的全新類型。

臺灣，憑藉著從晶片代工、電源、散熱、伺服器代工等等，位居全球 AI 基礎建設的核心地位，具備獨特的機會，引導全球進行一場以能源為核心的新建築嘗試。建築發展歷程上的重要轉折，往往是由科學技術的先行突破所引發。隨著碳排放與能源消耗成為全球議題，而 AI 使用方興未艾的當代碳中和與高效運算的雙重壓力下，建築師是否仍將延續其傳統的空間營造者角色？

The widespread adoption of AI has driven energy consumption to unprecedented levels, compelling us to reimagine architectural approaches. The rise of edge computing signals more than just the miniaturization of data centers - it represents a revolutionary architectural shift where computing facilities are modularly integrated into buildings, creating distributed computing networks. "Micro-computing architecture" emerges as a new building typology.

Taiwan's strong position in tech manufacturing and AI infrastructure presents a unique opportunity to pioneer energy-centric architectural innovation. Historically, architectural evolution has been driven by technological breakthroughs. As carbon emissions and energy concerns intensify, architects must reconsider their traditional role as spatial designers.

This architectural transformation, embodied in "micro-computing architecture," must balance computational needs while inspiring sustainable development. It marks a shift from pure aesthetics to integrated energy systems, redefining architecture for a new era.



ENERGY-CENTRIC ARCHITECTURAL THINKING

以能源為核心的建築思考

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