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Data Center Briefing

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Global

Key themes:
Transformer deficits and procurement lead times; SMR momentum (Sweden Ringhals; India private nuclear); Data-centre PPAs and power contracting (Google Ohio); Malaysia renewables tenders vs 7 GW load pipeline; DERs/microgrids and BESS scaling for resilience; Water and environmental permitting tightening (Ohio, Michigan); Transmission and supply-chain investment to meet AI load growth

Market overview (Global | 2026-01-03 UTC)

Power and grid constraints are tightening around the data-centre buildout, with equipment availability (notably transformers), interconnection/transmission spend, and local environmental permitting emerging as practical gating items. At the same time, several jurisdictions are explicitly aligning generation and policy tools—ranging from large-scale solar tenders to SMR frameworks—to support AI-driven load growth.

Risks and watchpoints (near-term)

- **Transformer availability and lead times remain a binding bottleneck**: U.S. deficits are still being cited at **~30% for power transformers** and **~10% for distribution units (2025)** despite **~$1.8–$2.0bn** in announced North American factory investments (Hitachi Energy, Siemens Energy, Eaton) (U.S. transformer shortage persists despite major factory investments). Execution risk sits in procurement timing, specification/engineering capacity, and delivery schedules.
- **Procurement/pricing uncertainty**: Some market participants dispute the severity of the shortage, claiming **standard-unit delivery in 12–14 months** and **12%–15% service margins**—highlighting the risk of overpaying or mis-timing orders depending on scope and spec (U.S. transformer shortage persists despite major factory investments).

- **Interconnection and transmission build risk**: Sector commentary points to large planned grid spend (e.g., **Dominion: $2.1bn transmission spend last year**; **National Grid: £35bn supply-chain investment**) but delivery pace, permitting, and supply-chain constraints remain key uncertainties (Industry leaders map power sector challenges and opportunities 2026).
- **Local environmental permitting and water regulation are becoming more material**: Ohio is debating a general permit for data-centre wastewater discharge with extended comment deadlines, and Michigan lawmakers are urging closer review of new facilities after state approvals—raising timeline and reputational risk (Ohio EPA Considers Permit Allowing Data Center Wastewater Discharge; Michigan lawmaker on data centers, water affordability and pollution).
- **Upside risk: accelerated "regulatory relief" pathways** could reduce cycle times for data-centre and chip-fab construction, though the approach is contested and could shift with politics or legal challenge (EPA clears regulatory path for AI infrastructure, snubs AI for protection).

Key deals and projects (data centres, generation, and nuclear)

- **Sweden – Ringhals SMR development steps forward (conditional on state risk-sharing)**: Vattenfall and Industrikraft i Sverige AB agreed to co-invest in SMRs at Ringhals. Industrikraft will take a **20% stake in Videberg Kraft AB** and invest **SEK 400m (~$42.2m)** to advance a **1,500 MW** SMR project, **pending state risk-sharing** (Vattenfall and Industrikraft advance SMRs at Ringhals site).
- **U.S. – Data-centre load underpinned by corporate PPA**: TotalEnergies signed a **15-year PPA** to supply **1.5 TWh** to **Google's Ohio data centers** (Vattenfall and Industrikraft advance SMRs at Ringhals site).
- **India – Nuclear policy opening for private build; SMRs positioned for AI data centres**: India's Union Minister Ashwini Vaishnaw highlighted **containerized SMR designs** with **15–30 MW** unit sizes and **~14 acres** footprint as a power solution for AI-focused data centres and railways. The **SHANTI Bill** has passed both houses and received presidential assent, enabling **private companies to build nuclear plants** (India promotes small modular reactors for data centres and railways).
- **Malaysia – Renewables and load pipeline scaling together**: Government preparation for **LSS6 solar tenders** could add **up to 2 GW** (Kenanga) with an estimated **RM6bn** in construction jobs. Tenaga Nasional Bhd reportedly has agreements for **49 data centre projects** that could require **up to 7 GW** of electricity; **CRESS committed capacity** reached **1.3 GW (as of June 2025)** (Malaysia ramps up LSS6 solar and CRESS for data centres).
- **Pennsylvania – Brownfield/thermal + data-centre redevelopment sensitivity**: Plans discussed to convert the retired **Homer City coal plant**

site into a **gas-fired power plant and data center**, with expressed concerns on grid and community impacts (Pennsylvania 2025: Mineland Reforestation, Coal Plant Data Center).

Power and grid / interconnection highlights

- **Transformers: configuration choices intersect with harmonics and grounding requirements in data centres**: Technical guidance recommends **Delta-primary/Wye-secondary (D/y)** for many commercial/industrial/data-centre applications due to **harmonic noise suppression** and a **grounded neutral** (Selecting the Right Three-Phase Transformer Configuration for Distribution). This is relevant as facilities push higher power density and power quality becomes more critical.
- **Transformer types and voltage ranges (context for procurement strategy)**: The same piece contrasts **dry-type** (e.g., open-frame up to **1,000 V / 500 kVA**; cast-resin up to **36 kV / 40 MVA**) versus **liquid-filled** transformers (noted **6 kV–1,500 kV** and **>1,000 MVA**)—useful for aligning specs to utility interconnect and on-site distribution design (Selecting the Right Three-Phase Transformer Configuration for Distribution).
- **DERs, microgrids, and storage as resilience tools**: Utilities are expanding microgrid deployments (e.g., **SDG&E launched four microgrids**) and exploring VPPs/demand response. Analysts project the **global BESS market** at **$120–$150bn by 2030** (including **>$30bn in the U.S.**) (Distributed energy resources boost grid resilience and reliability). For data-centre investors, this supports the investment case for behind-the-meter resilience and grid-services optionality where market rules permit.
- **Storage penetration (California)**: Battery storage reached **16,942 MW** (headline statistic cited alongside other power-market updates) (Vattenfall and Industrikraft advance SMRs at Ringhals site).
- **Sector outlook and AI load uncertainty**: Power-sector leaders emphasize AI tools for grid efficiency and flag uncertain but potentially large incremental demand from AI-driven data centres; example project metrics cited include **Hale Kuawehi 30 MW PV + 30 MW / 120 MWh** and an **IEA projection of 3.68 TW solar by 2030** (Industry leaders map power sector challenges and opportunities 2026).

Policy and regulation

- **Ohio – wastewater permitting for new data centres**: Ohio EPA extended the public comment period to **Jan. 16** for a draft **general wastewater permit** allowing new data centres to discharge treated wastewater (with standard NPDES language referencing a potential "lowering of water quality"). Stakeholders have requested more time for review (Ohio EPA Considers Permit Allowing Data Center Wastewater Discharge).

- **Michigan – increased political scrutiny on ratepayer and water impacts**: A state representative urged closer review of new data centres after the Michigan Public Service Commission approved a **Saline Township** facility and required **DTE** to absorb potential rate impacts. The same commentary references revived water affordability proposals and "polluter-pay" discussions (Michigan lawmaker on data centers, water affordability and pollution).
- **U.S. federal – push for faster AI infrastructure build (contested)**: Commentary criticizes EPA leadership for prioritizing regulatory relief to accelerate construction of data centres and chip factories, while not using AI tools to enhance environmental enforcement; it calls for a Project XL-style pilot approach for AI-enabled inspections (EPA clears regulatory path for AI infrastructure, snubs AI for protection).
- **India – enabling private nuclear builds**: Presidential assent for the **SHANTI Bill** enabling private companies to build nuclear plants may alter long-term power contracting options for data-centre platforms seeking firm low-carbon supply (India promotes small modular reactors for data centres and railways).

What to watch

- Transformer lead times and pricing discipline as North American factory capex ramps, versus continued cited **2025 deficits** (U.S. transformer shortage persists despite major factory investments).
- Whether **state risk-sharing** materializes for the **1,500 MW Ringhals SMR** development pathway (Vattenfall and Industrikraft advance SMRs at Ringhals site).
- Follow-through from Malaysia's **LSS6 (up to 2 GW)** tenders alongside the **49-project / up to 7 GW** data-centre demand pipeline (Malaysia ramps up LSS6 solar and CRESS for data centres).
- Ohio EPA's final position on the data-centre **general wastewater permit** after the **Jan. 16** comment deadline (Ohio EPA Considers Permit Allowing Data Center Wastewater Discharge).
- Early projects and commercial structures enabled by India's private nuclear build framework; practical deployment of **15–30 MW** SMR units for AI load (India promotes small modular reactors for data centres and railways).
- Uptake of microgrids/VPPs and the investable pipeline implied by the **$120–$150bn BESS by 2030** forecast (Distributed energy resources boost grid resilience and reliability).