A data centre for Portmore? Jobs, water, storm exposure and the cost of firm power

Adrian Dunkley
Maestro AI Labs
ceo@maestrosai.com

Nicholas Dunkley
Maestro AI Labs
ai@maestrosai.com

Abstract

On 17 November 2026, Member of Parliament Alando Terrelonge proposed Portmore as the location for a technology park and data centres. The following day, the Government said its national exploration would exclude drawing power from the grid or adding pressure to public water systems. No parcel, investor commitment or utility agreement has been disclosed in the cited announcements. We combine Portmore rainfall and flood records, national generation statistics and a 15-year project model to test a 1 MW mixed-use facility. The reference facility needs 1.50 MW of hot-day firm power. In a normal, mature operating year it uses about 7.46 GWh and 477 m^3 of water. At a 70% resident hiring share, it supports about 7.2 resident full-time-equivalent positions. Investor NPV at a 10% real discount rate is minus US$6.10 million in the point case. Only 0.51% of 10,000 scenarios both clear the investment hurdle and support at least ten resident positions. Dry cooling reduces the volume of water a sponsor must secure but leaves demand for cooling, staff and plant operations. We recommend testing existing capacity and contracted demand before reserving public land or financing construction.
Keywords Portmore, Jamaica, data centres, flood exposure, direct employment

1 The proposal and the site

Portmore entered the discussion through a constituency debate. Terrelonge asked government to locate the technology park and AI data centres there. Prime Minister Andrew Holness had announced approval to sign a national exploratory memorandum on 15 November. On 18 November Information Minister Dana Morris Dixon set out Cabinet's position on grid use and water systems [1, 2]. These reports provide no survey boundary, construction schedule, committed computing load, electricity supplier or approved water allocation. The facility in this study represents a decision a sponsor could take. All references to its operation and staffing describe model outputs.

The local government ministry describes a municipality of over 170,000 people; its profile gives no census year for the figure [3]. STATIN's preliminary 2022 return lists 57,927 people and 18,715 dwellings in the *Greater Portmore community* [4]. That community is one part of the wider urban area. Neither figure measures the number of qualified workers, residents seeking a data-centre job or households connected to any single water main. A sponsor must specify the hiring catchment and source a current labour survey to answer those questions.

Portmore has already attracted service operations that employ residents. The industry ministry reported more than 900 employees at Centerfield's Portmore offices in 2024 [5]. Customer-service offices require many people to deliver the product. A facility that rents racks, power and computing time can operate with fewer people on a shift. In Virginia an official study found that construction employment peaks could be much larger than steady operating employment

[6]. We count operating positions and temporary construction job-years separately. Jobs in a proposed technology park would require separate tenants and funding.

2 The physical evidence

2.1 Water follows roads and drains as well as rivers

The Portmore Hazard Risk Assessment, a joint Mines and Geology Division and disaster-management project begun in 2006, used aerial interpretation, interviews, site information and mapped evidence. It documents several routes by which water reaches neighbourhoods. A dyke along the Rio Cobre changes river flood exposure. It does not drain water that falls inside a built-up catchment. During Ivan it records coastal surge of 3.3 m at Hellshire Beach and 4 m at Port Henderson–Fort Augusta, with horizontal run-up of about 80 m and 90 m respectively. Those measurements apply to the reported coastal sites. The report also records road flooding in Westmeade and Bridgeport during Ivan and access problems associated with Dennis [7]. A building on an elevated pad can lose service if both access routes cross the same low area or fuel deliveries cannot reach the generator.

During Hurricane Melissa, the Greater Portmore station recorded 8.84 inches (224.5 mm) of storm-total rain and a 51-knot gust [8]. This measures a storm at one location. It gives neither a parcel's flood depth nor a design wind speed. Damage assessments also record a prolonged disruption mechanism beyond Portmore: the Paradise Park solar plant in Westmoreland shut down after the storm [9]. That case warrants testing an interruption to local solar production while fuel transport is constrained. Transferring a Westmoreland damage ratio to Portmore would give unjustified precision.

A national assessment reports 0.39–0.40 m of mid-century sea-level rise under its upper scenario [10]. The section gives no baseline year or named emissions pathway for that range. It provides context for a sensitivity study. It cannot be added to a road elevation without matching the reference datum, tide, surge and hydraulic response. For a candidate site, survey the low points on both access routes, downstream drain capacity, water levels at the outfall, past high-water marks and the elevations of fibre entries, switchgear, pumps, cooling plant and fuel stores. Include settlement and differential movement in the geotechnical review. Record the effect of off-site drainage works on neighbouring streets. A parcel should be removed from the shortlist if it depends on transferring its floodwater into an already constrained community drain.

2.2 Which water is available during a dry spell?

The National Water Commission's 2025/26 plan targeted a reduction in non-revenue water in Portmore from 21,000 to 10,500 m^3/day [11]. Losses targeted for reduction do not constitute a project allocation. A planned Rio Cobre treatment plant was still described as a future source [12]. Neither proposal answers the Cabinet condition. An independently contracted source requires a documented water balance, quality treatment, seasonal storage and assurance on other users' supply. A tanker contract whose operator simply draws from a public main would leave the original problem unresolved.

Historic monthly observations at nearby Bernard Lodge illustrate the seasonal constraint. The hospital environmental assessment reports a 1931–1985 monthly climatology totalling 820 mm per year [13]. At an assumed 80% net collection efficiency a 1,000 m^2 roof would collect 656 m^3 in such a year. January contributes 16.8 m^3, October 149.6 m^3. At a uniform 1.5 m^3/day demand (547.5 m^3/year), a cyclic monthly balance still needs approximately 106.5 m^3 usable storage to cover the cumulative dry-season deficit. The calculation assumes a repeated mean year and no storage loss. An empty first-year tank, rejected first flush, evaporation, leaks and

longer drought can change both the tank size and the independent backup requirement. These are nearby observations and an example demand; they do not measure the project roof or a parcel's rainfall. Norman Manley station recorded about half its normal January–July rainfall in 2025, a reminder that a mean year does not test drought [14].

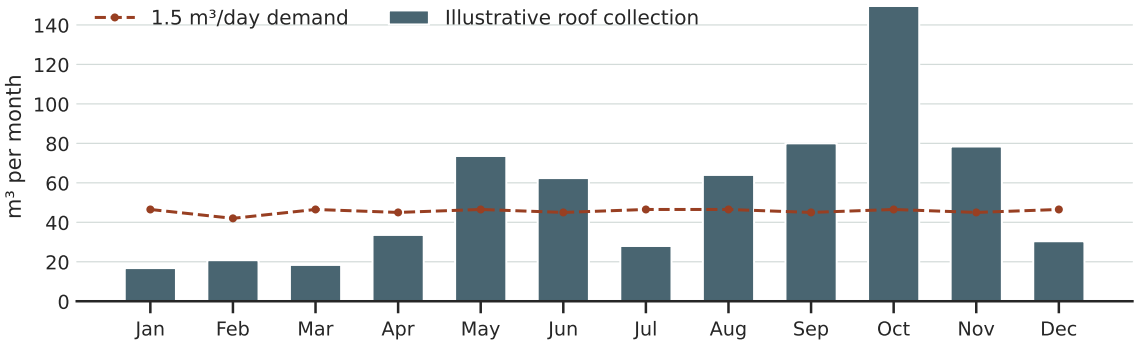


Figure 1: Monthly roof yield at Bernard Lodge climatological rainfall, compared with constant demand. Collection assumes a 1,000 m^2 roof at 80% net recovery. This illustration uses neither an identified parcel nor a measured project water requirement.

3 Reference design and cost boundary

We use the investment model from the companion national paper with 1 MW of IT capacity. Tenants bring their own servers to the colocation space. The operator buys eight-GPU nodes for the remaining 25% of allocated IT power and sells GPU-hours. A tenant reserves kW by the month. Both services start below mature occupancy. No customer is assumed to have signed a contract. Domestic scientific computing and government backup are plausible uses because Jamaica has an existing university computing platform and a public hosting market [15, 16, 17]. eGov's completed upgrade cost about J$600 million across primary and recovery infrastructure [18]; that retrofit cost cannot price an independent Portmore plant.

The reference design allocates capacity to three independently serviceable engines. Any two can supply the assumed hot-day peak. The project pays a private supplier a fixed fee and a variable energy price. Figure 2 shows the boundary. The annual model does not certify a fuel supply, black-start path or performance guarantee. A reliable design also needs functioning controls, switchgear, spare parts, water and working access routes. Congestion on the public network, private ownership of a generator or a large electricity bill elsewhere in Jamaica provides no evidence about these dependencies.

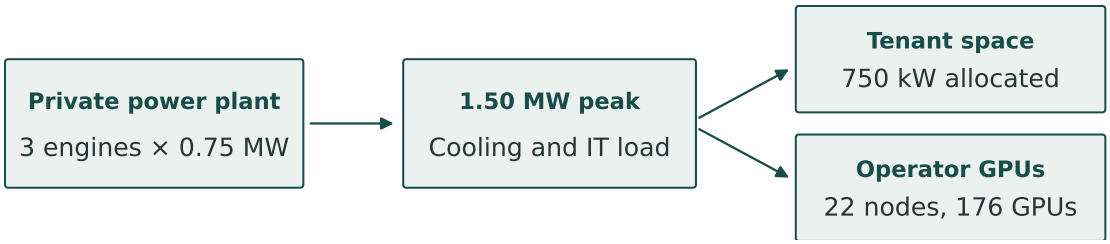


Figure 2: Reference supply and consumption boundaries. "Direct" refers to the operation of the facility and its dedicated plant. Tenant IT purchases and the upstream footprint of fuel and equipment fall outside the investor cash account.

The operator's US$18.80 million initial outlay comprises US$13.52 million for the site and facility and US$5.28 million for servers. A separate supplier spends US$3.71 million to install

2.25 MW of generator nameplate for 1.50 MW of firm peak service after one engine fails. The capacity fee is about US$566,000 per year; variable power costs US$0.15/kWh. At 75% mature occupancy, a normal year immediately after refresh yields 1.16 million GPU-hours, 562.5 kW of leased space, US$5.83 million of revenue and US$2.87 million of operating expense. The investor pays for replacements at the end of operating years 5 and 10. A positive operating margin therefore leaves unanswered whether the investment recovers its initial capital and the time value of money.

4 Dry heat rejection, solar and operating exposure

A liquid loop at a high-density server carries heat to another piece of equipment. That equipment can reject heat to outside air, use evaporation or switch between the two. A specification that merely says "liquid cooled" leaves the decisive water and power assumptions unresolved. The dry case spends more electricity on heat rejection. The evaporative case saves electricity but requires a larger reliable water source; its modelled volume excludes vendor-specific blowdown beyond the assumed WUE and treatment losses. The indirect water footprint of fuel production and hardware manufacture is outside all three comparisons [19].

Cooling choices for the same 1 MW design and service volumes

Heat rejection	PUE	WUE	GWh/year	m^3/year	30-day m^3	NPV, US$m
Dry	1.40	0.04	7.46	477	71	-6.10
Hybrid	1.30	0.40	6.93	2,379	394	-6.26
Evaporative	1.22	1.60	6.51	8,745	1,473	-5.56

Annual water includes staff, cooling and dry-engine plant makeup. WUE (L/IT kWh) applies to the cooling component. The stock column assumes continuous full load and a 25% cooling-intensity increase. It excludes fire reserve and treatment losses. Annual energy reflects normal mature operation at 75% occupancy. All intensities and prices require supplier guarantees.

The gas-fired reference consumes 7.46 GWh in a normal mature year and releases about 4,158 tonnes of CO_2 from on-site combustion. The alternative adds 1.6 MWp of solar and 3.2 MWh of batteries; the operators keep full firm engine capacity. At the prescribed solar yield it displaces 2.07 GWh of engine generation per year. Operational CO_2 falls to 3,006 tonnes, while the power supplier's initial outlay rises to US$7.15 million. The operator's point NPV moves from minus US$6.10 million to minus US$6.75 million. The emissions estimate covers fuel combustion using 10,500 Btu/kWh and 53.06 kg CO_2/MMBtu; it excludes gas leakage, fuel transport, construction and the manufacturing footprint of servers, panels and batteries.

A separate 168-hour replay tests the limit of the power design. One engine is unavailable, solar output is zero, and fuel cannot arrive. With seven days of fuel measured at the normal 0.852 MW mean load, the other engines cover that mean throughout the event. At a sustained hot design load of 1.50 MW, the same opening stock leaves 108.9 MWh of 252 MWh unserved and interrupts 73 hourly intervals, including one partial interval. Fourteen days of fuel at the mean load cover this particular stress. A full 3.2 MWh battery with 80% usable capacity and 95% discharge efficiency reduces the shortage to 106.4 MWh. The replay says how much service this set of conditions loses. It cannot predict an annual outage rate.

The ministry's preliminary 2025 electricity statistics give 4.413 TWh net generation and 3.250 TWh of billed sales nationally [20]. These denominators describe the size of Jamaica's system and its recorded sales. Even a small fraction of national generation could exceed a local feeder's spare firm capacity. The rules reported on 18 November also exclude drawing from the public grid, so no comparison to national totals can establish eligibility [2]. Outages, fuel queues, solar panel damage and failed water treatment can occur in the same storm. A supplier bid

should test simultaneous failures, state responsibility for restarts and provide backup access to fuel and treatment consumables.

5 Financial risk, jobs and municipal choice

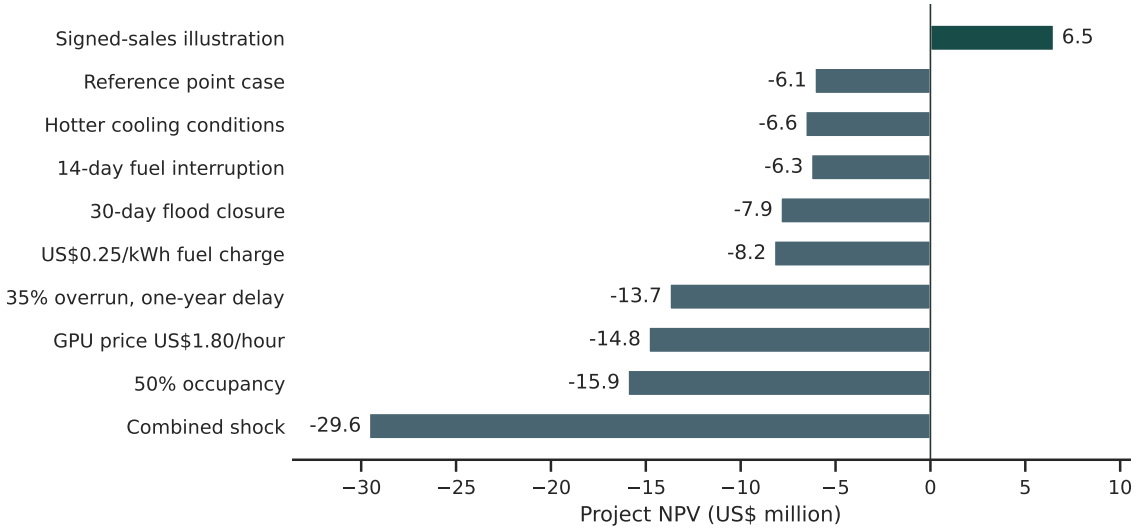


Figure 3: Change in the deterministic 15-year investment case under specified stresses. The horizontal axis measures NPV in millions of constant US dollars; zero is the investment hurdle. Scenarios are constructed tests and carry no estimated likelihood.

The mixed facility's point NPV is minus US$6.10 million at a 10% real discount rate. The simulated median is minus US$6.27 million. Its central 80% interval runs from minus US$19.33 million to plus US$9.73 million. Of 10,000 simulated projects, 30.58% reach positive NPV. An investor can earn a positive undiscounted 15-year return (29.75% in the point case) while missing that discount-rate hurdle. Cost and price offers can change the result. At fixed assumptions, positive NPV requires more than 90.58% mature occupancy at today's scenario prices, or a GPU-hour price above US$3.84 at 75% occupancy.

The staffing model assigns 10.25 operating full-time equivalents (FTEs), including 7.2 resident FTEs at a 70% local share. Ten resident jobs would require about 97.6% local hiring if staffing remained exactly at that point estimate. The simulated resident count spans 5.6–8.9 FTEs between its 10th and 90th percentiles. Only 1.78% of draws meet the ten-resident target; 0.51% meet it and clear the NPV hurdle. Separate construction wages support about 37.4 local job-years, which could be spread across a larger crew for a shorter period.

At an assumed annual wage of US$32,000, resident payroll is US$229,600 in a normal year. We credit 35% as additional local earnings after workers' alternative earnings, and 30% of local non-wage purchases as supplier value added. The resulting local income gain is about US$153,300/year. With construction income included, its present value is US$1.49 million. At a hypothetical global carbon cost of US$50/tonne, the discounted combustion cost is US$1.46 million. The small balance (about US$33,500) is sensitive to both assumptions and is not municipal revenue or net welfare. Air quality, noise, land, tax concessions, public spending, customers' gains and the global or local incidence of carbon costs require separate accounts.

Before counting resident recruitment, request the proposed shift roster, worker qualifications, training dates, expected wages and the definition of a resident. Report open posts, hires and twelve-month retention separately; count temporary contractors by time worked. A research contract that trains apprentices can yield an additional benefit only if it has a budget and someone responsible for delivery. Ask existing employers and training providers whether expected

recruits are new to the labour market or moving between jobs. The present evidence supports paying for a feasibility and service-purchase comparison. It does not support construction finance or a public promise of ten resident operating jobs. Require price and volume commitments strong enough to clear the municipality's chosen downside tolerance. Compare the lease against the same workload: at US$3/GPU-hour and US$330/kW-month inclusive of power, the mixed-service purchase has a present cost of US$41.13 million, versus US$44.53 million to provide it in the modelled facility. A smaller two-year test at the 0.25 MW-equivalent service volumes would buy about 349,000 GPU-hours and 2,241 kW-months and cost US$2.39 million at those assumed terms, including buyer setup and operations. These are tender benchmarks, not supplier offers.

If those conditions cannot be met, Portmore can still test the proposed services. Buy an agreed quantity of hosting or GPU-hours from an existing provider, run a restoration exercise from an independent location and record power, latency and cost for the same workload. Invite at least one build offer and one service-equivalent lease offer. Compare both over the same horizon; assign the cost of independent power, water, resilience and replacement hardware to the party that bears it. This is a reversible way of learning whether customers will pay for local compute and which functions need to be on site.

A Decision record for a candidate parcel

Question	Evidence for the public record	Consequence if unresolved
Can the site run independently?	Witnessed transfer and black-start test, hourly energy balance, firm fuel deliveries, supplier price and ratings at site temperature.	Price only an exploratory option. Reopen the shortlist if either normal or backup operation requires the public grid.
Where does every litre come from?	Independent source and rights, dry-year yield, intake and treatment, tank at commissioning, drinking/fire water, discharge and waste plan.	No operational approval premised on unused capacity at NWC. Reprice all processes, including plant makeup.
Can people and services reach it?	Topographic and hydraulic surveys, joint wind/surge/rain study, dry access for crews and fuel, independent fibre routes, insurance terms.	Relocate or redesign before equipment purchase. Publish off-site drainage effects.
Who pays and who benefits?	Signed tenant and GPU contracts, lease comparator, transparent concessions, resident roster and wage records, grievance route.	Recalculate the public balance. Withhold unearned employment and revenue claims.

B Reproducing the screen

The national companion documents prices, ramp, refresh, equations and the full uncertainty design. Each of 10,000 draws uses a jointly sampled market and utilisation, construction and equipment pricing, and heat, fuel and project disruption. The common seed is 41926. Disruption starts at an assumed 8% in year one and rises by 2% of its starting value each year, before a heat multiplier. The scenario model assigns event days and repair cost together. It includes a premium and a separate allowance for retained repair costs; no parcel-specific insurance terms, claims, flood probability or vulnerability curve underpin either. A 400-resample bootstrap gives

a 95% numerical interval of minus US$6.55 million to minus US$5.89 million for the simulated median. This measures computational variability within the stated assumptions.

The model's cost lines exclude decommissioning, working capital, delay-year overhead, taxes and financing cash flows. Annual physical exhibits use operating year six with a newly refreshed server fleet, after ramp-up and with no outage. Construction job-years divide assumed local construction wages by US$25,000 per worker-year. If costs instead reflect imported switchgear, that labour assumption must fall. The independent numerical review rebuilt annual cash flows; BootLoops Emitall also detected three introduced errors across a selected 46-value reporting check. Neither checks the real-world probability of any future contract or storm.

Data and authorship

The source bundle includes the research data, figure inputs and code used to generate the financial cases. This paper shares a model and results with the national companion. The authors are affiliated with Maestro AI Labs. Language-model tools and research software assisted evidence retrieval, drafting and numerical checking. The authors did not conduct a parcel inspection, survey households or audit a supplier. This preprint has not undergone external peer review.

References

[1] L. Simpson. Terrelonge bats for AI data centres to be built in Portmore. Jamaica Observer, 18 November 2026. Parliamentary proposal and national MOU announcement.

[2] Radio Jamaica News. Gov't says no AI infrastructure will draw on Jamaica's power grid, water systems. 18 November 2026. Report of the post-Cabinet briefing by Dana Morris Dixon.

[3] Ministry of Local Government and Community Development. Municipality of Portmore. Local government profile. The population estimate has no census reference year.

[4] Statistical Institute of Jamaica. 2022 Census: Population and Dwelling Counts by Community. Preliminary results. Greater Portmore community row, St Catherine.

[5] Ministry of Industry, Investment and Commerce. BPO Employees Urged to Strive for Excellence. 25 October 2024. Employment at Centerfield's Portmore location.

[6] Virginia Joint Legislative Audit and Review Commission. Data Centers in Virginia. Report 598, December 2024, summary and Chapter 2. Industry interviews and state records.

[7] Mines and Geology Division and Office of Disaster Preparedness and Emergency Management. Portmore Hazard Risk Assessment Project. Municipal report, project begun 2006. Sections 1.4 and 3.3, Figure 13 and pp. 35–36.

[8] National Hurricane Center. Tropical Cyclone Report: Hurricane Melissa (AL132025). Table 3. Selected surface observations, Greater Portmore station, 17.93°N, 76.90°W.

[9] Government of Jamaica and Economic Commission for Latin America and the Caribbean et al.. Assessment of the effects and impacts of Hurricane Melissa in Jamaica. 2026. Electricity sector, p. 192 ff. Report documents the Paradise Park solar plant interruption in Westmoreland.

[10] World Bank. Jamaica's Long-Term Climate Change Strategy Recommendations. Sections 6.3.1–6.3.2. National and sector-level hazards under future scenarios.

[11] Ministry of Finance and the Public Service. Public Bodies: Approved Estimates of Revenue and Expenditure, 2025/26. National Water Commission, Portmore co-management programme; published loss-reduction target.

[12] Jamaica Information Service. NWC Undertaking Major Capital Projects to Strengthen Water Supply. NWC programme and projected commissioning of the Rio Cobre water treatment plant.

[13] Portmore International Hospital and Medical Center. Environmental Impact Assessment. Table 15, p. 34. Historic monthly climatology, Bernard Lodge. National Environment and Planning Agency archive.

[14] Japan Meteorological Agency, Tokyo Climate Center. ClimatView: Kingston/Norman Manley, Jamaica. WMO 78397. Monthly precipitation and normals for January–July 2025, accessed November 2026.

[15] UNESCO. Jamaica: Artificial Intelligence Readiness Assessment Report. 2025. Computing capabilities and SPARKS case, pp. 34–36.

[16] Government of Jamaica Electronic Procurement. Procurement of Data Centre Colocation Services for a Period of Eighteen Months. PICA-DRS-RSS-08-2025, retender. Opened bid details, 20 August 2025.

[17] eGov Jamaica Limited. Annual Report 2024–2025. Chief Executive Officer's Report, p. 17. Organisation-reported hosting performance.

[18] Jamaica Information Service. J$600 Million eGov Data Centre Upgrades Completed. 1 March 2024. Two-site upgrade announced by the Government.

[19] A. Shehabi et al.. 2024 United States Data Center Energy Usage Report. Lawrence Berkeley National Laboratory, 2024. Figure 5.9 and accompanying discussion, pp. 55–56. DOI 10.71468/P1WC7Q.

[20] Ministry of Energy, Transport and Telecommunications. Jamaica Energy Statistics 2025. Energy Economics and Planning Unit, July 2026. Table 8, pp. 14–18. Figures for 2025 are preliminary.