ENERGY EFFICIENCY & CONSERVATION AUTHORITY
TE TARI TIAKI PŪNGAO

9(2)(a) [redacted]

14 September 2026

Dear [redacted]

Re: Official Information Act Request: Data Centres

Thank you for your email to the Ministry of Business, Innovation and Employment (MBIE) on 28 July 2026 requesting information under the Official Information Act 1982. The following part of your request was transferred from MBIE to EECA on 25 August 2026:

"Under the Official Information Act 1982, I request the following information relating to data centres operating in New Zealand.

6) ***Any environmental assessments or analyses held relating to the*** carbon emissions, ***energy efficiency, cooling technologies,*** *or water efficiency of data centres."*

In response to your request:

EECA recently released a Request for Proposal (RfP) to examine data centre efficiency. This project has not yet begun. The RfP is attached as **Appendix One**.

Also attached is a Board paper on *New Zealand's Expanding Data Centre Sector and Managing Energy Demand*. This is attached as **Appendix Two**.

This work informed a later Board paper on *Data Centre Cooling and Heat Reuse* which is attached as **Appendix Three**.

Some information is being withheld or refused pursuant to the following sections of the Act:

- 9(2)(f)(iv) - maintain the constitutional conventions for the time being which protect the confidentiality of advice tendered by Ministers of the Crown and officials

You have the right to seek an investigation and review by the Ombudsman of this decision. Information about how to make a complaint is available at www.ombudsman.parliament.nz or freephone 0800 802 602.

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Please note that it is our policy to proactively release our responses to official information requests where possible. Our response to your request will be published shortly at https://www.eeca.govt.nz/about/news-and-corporate/official-information/ with your personal information removed.

Yours sincerely

Murray Bell
Group Manager, Policy and Regulation

JUNE 2026

Request for Proposal (RFP)

By:	EECA (Energy Efficiency and Conservation Authority)
For:	Data Centre Research NZ
RFP released:	Friday 12 June 2026
Deadline for questions:	Monday 6 July 2026, 5pm
Deadline for proposals:	Sunday 12 July 2026, 5pm

ENERGY EFFICIENCY & CONSERVATION AUTHORITY
TE TARI TIAKI PŪNGAO

The opportunity

This Request for Proposal (RFP) is issued by Energy Efficiency and Conservation Authority (EECA), referred to below as "the Buyer" or "we" or "us."

EECA is seeking a suitably qualified supplier, or consortium of suppliers, to undertake strategic research and analytical work relating to the future growth of data centres in New Zealand and the associated implications for the electricity system, renewable energy development, distributed flexibility, infrastructure planning, and future policy or regulatory settings.

The research forms part of EECA's emerging work programme focused on efficient and flexible energy use, electrification, distributed flexibility and long-term energy system resilience. The work also aligns with EECA's broader Horizon Plan and wider government interests relating to infrastructure development, digital capability, renewable energy integration and economic growth.

What we need

Global demand for data centres is accelerating rapidly due to the continued expansion of cloud computing, AI deployment, streaming services, digitalisation and high-performance computing. Internationally, governments and infrastructure investors are increasingly assessing the implications of large-scale data centre growth on electricity systems, renewable generation investment, network infrastructure and energy security.

New Zealand is considered to have a number of advantages that may support future data centre growth, including:

- a highly renewable electricity system
- access to renewable generation opportunities
- strong telecommunications and fibre connectivity
- a stable political and regulatory environment
- growing international interest in sustainable digital infrastructure.

At the same time, international experience has demonstrated that rapid growth in data centre infrastructure can create significant pressures on electricity systems where growth is not appropriately aligned with generation investment, transmission capability, flexibility mechanisms and infrastructure planning.

EECA therefore wishes to commission research that will provide:

- a robust understanding of the potential scale and characteristics of future data centre growth in New Zealand
- analysis of electricity system and infrastructure impacts
- assessment of flexibility and grid support opportunities
- international benchmarking and policy analysis

- practical recommendations that can support future EECA work programmes, policy development, guidance development and strategic planning activities.

The successful Respondent will be expected to undertake a combination of:

- technical analysis
- electricity market and infrastructure analysis
- scenario modelling
- stakeholder engagement
- policy and regulatory assessment
- strategic recommendations.

The work should be evidence based, practical, forward looking and relevant to the New Zealand context.

What we don’t want

EECA is not seeking:

- purely theoretical or speculative research that does not produce practical recommendations
- generic international analysis without meaningful applicability to New Zealand
- narrow technical assessments that fail to consider electricity system, infrastructure, policy and economic interactions together
- proposals that do not demonstrate stakeholder engagement capability
- proposals that do not demonstrate experience across electricity systems, infrastructure, flexibility, digital infrastructure or related sectors EECA is seeking integrated and multidisciplinary responses that can combine technical expertise, modelling capability, strategic analysis and practical delivery.

What’s important to us?

EECA is looking for suppliers that can demonstrate:

- strong technical capability across electricity systems, infrastructure, distributed flexibility and digital infrastructure
- credible analytical and modelling capability
- strong understanding of the New Zealand electricity market and regulatory environment
- experience delivering complex strategic or technical research projects
- the ability to convert analysis into practical and implementable recommendations
- effective stakeholder engagement capability across government, electricity sector, infrastructure and digital sector organisations.

EECA is particularly interested in approaches that:

- consider how data centre growth can align with renewable generation development
- assess opportunities for flexibility participation, demand response and Battery Energy Storage System (BESS) integration
- identify opportunities for improved efficiency and sustainability outcomes
- support long term electricity system resilience and infrastructure planning.

Economic benefits to New Zealand are also important to this procurement. Respondents should demonstrate how they will contribute to:

- development of local capability and expertise
- knowledge transfer
- use of New Zealand-based resources where appropriate
- long-term sustainable digital infrastructure capability.

Why should you bid?

This project represents a significant opportunity to contribute to a strategically important and rapidly evolving area of work relating to New Zealand's future energy system and digital infrastructure capability and economic development opportunities.

The outputs of this work are expected to inform future EECA initiatives and contribute to broader stakeholder understanding of:

- data centre efficiency and flexibility opportunities
- electricity system impacts and infrastructure considerations
- renewable generation alignment and integration opportunities
- regional development and infrastructure investment considerations
- future guidance, standards, programmes and policy options relating to sustainable data centre development.

The successful Respondent will have the opportunity to work closely with EECA and engage with stakeholders across the electricity, infrastructure, telecommunications, digital infrastructure and government sectors.

The research is expected to become an important evidence base for future discussions relating to how New Zealand can support sustainable growth in digital infrastructure while maintaining a reliable, affordable and increasingly renewable electricity system.

A bit about us

EECA is a Crown entity and our purpose is to mobilise New Zealanders to be world leaders in clean and clever
energy use. Our desired outcome is a sustainable energy system that supports the prosperity and wellb eing of current and future generations.

Our objectives are:

- Energy efficiency first –efficient energy use is the first option users adopt; and proven energy efficient technologies are identified and widely available;
- Empower energy users – people and businesses actively manage their energy use;
- Accelerate renewable energy – users plan for and adopt low-emission energy and technology.

Our key levers are regulation, information and motivation, and targeted investment and support. EECA has designed this offer to support energy efficiency initiatives through adoption of proven technologies. The purpose of this offer is to reduce the technology risks associated with specific use cases by New Ze aland businesses.

EECA's general business funding principles include:

- Funding is targeted at opportunities in alignment with EECA's strategic focus areas.
- Funding is directed to areas with demonstrable market barriers preventing uptake.
- Funding levels and approaches are right sized to the barriers and generate the greatest value of Government investment.
- Government co-investment is creating an enabling environment for innovation while promoting market led solutions.

SECTION 1: Key Information

1.1 Context

a. This Request for Proposals (RFP) is an invitation to submit a Proposal for Data Centre Research New Zealand contract opportunity.

b. This RFP is a single stage, open procurement process.

1.2 Our timeline

Here is our estimated timeline for this RFP (all are New Zealand times and dates):

RFP Released	12/06/2026
Deadline for Questions	06/07/2026
Deadline for EECA to answer questions	08/07/2026
Deadline Submissions	**5:00PM, 12/07/2026**
Successful Respondent notified (indicative)	August 2026
Expected start date of Contract (indicative)	August 2026

1.3 How to contact us

a. All contact to be made solely through the Government Electronic Tendering System (GETS)

b. Our Point of Contact:

Name: Brad McMeekin
Title/role: Lead Procurement Advisor
Email: applications@eeca.govt.nz

c. To submit questions, please use the Government Electronic Tendering System (GETS) https://www.gets.govt.nz/

d. To provide a response to this opportunity please use the Government Electronic Tendering System https://www.gets.govt.nz/

1.4 Developing and submitting your Proposal

a. This is an open competitive tender process.

b. Take time to read and understand the RFP.

c. Take time to understand our Requirements. These are in SECTION 2: of this document.

d. Take time to understand how your Proposal will be evaluated. See SECTION 3: of this document.

e. For resources on tendering visit: https://www.procurement.govt.nz/suppliers-2/

f. If you have questions, please raise these through the Government Electronic Tendering System (GETS) (see Section 1.2 above).

g. Use the Response Forms A and B provided alongside this tender to submit your response.

h. Response Forms A and B must be submitted as separate documents

i. Complete and sign the declaration at the end of the Response Form.

j. Check you have provided all the necessary information in the correct format and order.

k. Submit your written proposal before the communicated deadlines

1.5 Address for submitting your Proposal

You must submit your proposal via: Government Electronic Tendering System (GETS)

We will not accept proposals sent by post, delivered to our office or submitted outside of GETS

1.6 Our RFP Terms

a. Offer Validity Period
By submitting a Proposal, the Respondent agrees that their offer will remain open for three calendar months from the Deadline for Proposals.

b. RFP Terms
By submitting a proposal, the Respondent agrees to the RFP-Terms attached to the RFP.

If a Respondent commits a non-trivial breach of the RFP-Terms, we may exclude them from further participation in the RFP process, whether that requirement is contractually binding.

1.7 Later changes to the RFP or RFP process

a. After publishing the RFP, if we need to change anything or provide additional information, we will let all Respondents know by placing a notice on GETS.

b. If you downloaded the RFP from GETS you will automatically receive notifications of any changes through GETS.

1.8 Defined terms

These are shown using capitals. You can find all definitions at te back of the RFP-Terms.

SECTION 2: Our Requirements

The requirements of this procurement are described in this Section and Appendix A – Specification of Requirements, which forms part of this RFP.

2.1 Background

This procurement relates to EECA's emerging work programme relating to efficient and flexible data centre deployment in New Zealand. The research aligns with EECA's Horizon Plan, distributed flexibility work programme, and wider work relating to electrification, renewable energy integration, energy productivity and energy system resilience.

Globally, demand for data centres is accelerating due to increased digitalisation, artificial intelligence deployment, cloud computing, high-performance computing and digital service delivery. As a result, governments and infrastructure planners internationally are increasingly examining the impacts of data centre growth on electricity systems, renewable generation investment, transmission and distribution infrastructure, and energy security.

New Zealand is considered well positioned to support future data centre growth due to its high proportion of renewable electricity generation, strong telecommunications infrastructure, stable political environment and growing renewable energy development pipeline.

EECA is seeking specialist research services to better understand the potential growth of data centres in New Zealand and the implications for electricity demand, renewable generation development, distributed flexibility, infrastructure planning and future policy or regulatory settings.

Historically, this type of work has been undertaken through a combination of sector research, industry reports, stakeholder engagement and targeted technical studies. Going forward, EECA wishes to develop a more comprehensive and evidence-based understanding of the opportunities, risks and system impacts associated with data centre growth in New Zealand to support future programme development, policy advice, standards development and stakeholder engagement activities.

2.2 Key Outcomes

This RFP relates to the procurement of specialist research, analytical and modelling services relating to the future growth of data centres in New Zealand and the associated implications for the electricity system, renewable energy development, distributed flexibility, infrastructure planning and future policy or regulatory settings.

The outcomes we want to achieve include:

- improved understanding of the opportunities and risks associated with future data centre growth in New Zealand
- improved understanding of electricity system impacts including electricity demand, peak demand, generation requirements, transmission and distribution infrastructure implications, and electricity market impacts
- identification of opportunities for flexibility participation including demand response, load shifting, renewable alignment and battery energy storage integration

- identification of international best practice relating to data centre efficiency, sustainability and grid integration
- development of regional and national scenario modelling capability to assess future development pathways
- practical recommendations to support future policy, programme, standards, guidance and market development activities
- identification of regional opportunities for future data centre development
- development of local capability and knowledge relating to sustainable digital infrastructure and electricity system planning.

Proposed Solution

We are seeking a solution that delivers:

- an assessment of the current and emerging New Zealand data centre landscape
- electricity system impact analysis
- regional-to-national scenario modelling
- flexibility and grid integration assessments
- policy and regulatory analysis
- international benchmarking
- regional opportunity mapping
- recommendations relating to future data centre efficiency and flexibility best practice
- recommendations relating to future standards, guidance, regulatory activities or policy approaches
- supporting reports, presentation material and stakeholder engagement outputs.

Respondents should clearly describe how these benefits will be delivered and measured

Capability

We are seeking Respondents that can demonstrate capability across:

- electricity system analysis and modelling
- energy market analysis
- distributed flexibility and demand response assessment
- infrastructure and regional planning analysis
- policy and regulatory analysis
- data centre infrastructure analysis
- stakeholder engagement and facilitation
- strategic research and reporting.

Respondents need to provide at least two examples of projects of a similar size, complexity or subject matter that demonstrate relevant capability and experience. Respondents may propose consortium or partnership arrangements where this strengthens overall capability.

Capacity

We are seeking Respondents that can:

- commence work as soon as August 2026 (or as close as possible to this date)
- provide appropriately qualified personnel throughout the engagement
- undertake stakeholder engagement activities across multiple sectors
- deliver high-quality outputs within agreed timeframes
- manage multiple workstreams and technical disciplines simultaneously
- provide appropriate project governance, quality assurance and reporting.

Economic Benefits

Respondents need to demonstrate how they will contribute to economic benefits for New Zealand through:

- development of local capability and expertise
- use of New Zealand-based resources where appropriate
- knowledge transfer and capability building
- collaboration with New Zealand organisations and specialists
- contribution to future sustainable digital infrastructure capability
- support for future electricity system capability and resilience.

Respondents should clearly describe how these benefits will be delivered and measured

Supplier Code of Conduct

The Government is committed to sustainable and inclusive government procurement that delivers for New Zealand and New Zealanders. This Supplier Code of Conduct outlines the expectations the Government have of Government suppliers. As part of the tender process the Respondent is required to confirm that if they are successfully appointed, they will comply with the Code of Conduct and will also require must make their subcontractors/ subconsultants aware of this code.

2.3 Research Programme Scope and Expected Outputs

a. We estimate the quantity to be delivered is one complete research programme comprising:

- market analysis
- stakeholder engagement
- electricity system assessment
- flexibility assessment
- regional opportunity analysis
- policy and regulatory analysis

- scenario modelling
- draft and final reporting
- supporting presentation material and stakeholder engagement outputs.
- The services must be delivered to EECA, Wellington, New Zealand.

b. All deliverables may be provided electronically and the successful Respondent may undertake the majority of work remotely, subject to any agreed stakeholder engagement requirements.

c. Payment will be made on successful completion and acceptance of agreed project milestones and deliverables as specified under 2.6 Key deliverables.

2.4 Contract term

We expect that the Contract will commence 1 August 2026, the anticipated contract term and options to extend are:

Description	Term
Term of the Contract	6 Months
Maximum term of the Contract	6 Months
Additional Periods	None

2.5 Contract value

We estimate the value of this contract to be $250,000.00 (NZD, excluding GST) over the maximum term of the contract.

2.6 Key Deliverables

Description	Indicative Timeframe
Project initiation, methodology confirmation and stakeholder engagement plan	September 2026
Draft report including modelling, analysis, findings and recommendations	December 2026
Final report, modelling outputs, recommendations, presentation material and supporting deliverables	March 2027

2.7 Other tender documents

The following documents form part of this RFP and have been uploaded on GETS and are available to Respondents:

01. Request for Proposals (RFP)

02. RFP Terms and Conditions
03. RFP Response Form A: Non-price criteria
04. RFP Response Form B: Price
05. Supplier Code of Conduct
06. Supplier Code of Conduct Question and Answers
07. Contract Template – Government Model Contract 2- Services (non-crown)
08. Standard terms and Conditions – Government Model Contract 2- Services (non- crown)

SECTION 3: Our Evaluation Approach

This section sets out the Evaluation Approach that will be used to assess Proposals.

3.1 Evaluation model

The evaluation model is **weighted attribute**. **Price is a weighted criterion.**

On the close of the tender response period the Evaluation Panel Chair will download all responses received and conduct compliance checks; ensuring the responses received are complete, meet all pre-conditions, address the requirements of the tender and are able to be evaluated. Once compliance checks are completed they will be released to the evaluation panel for individual evaluation.

Evaluation Panel members will score individually using a scoring scale of 1-10 against the assessment criteria set out below. The Evaluation panel members will evaluate each region separately with the individual scores then collated by the Evaluation Panel Chair. The evaluation panel will meet to moderate the scores at the conclusion of the individual evaluation.

Moderated scoring will be conducted where scores are +/- 2 points between an individual score and the average score, these variances will be reviewed and debated. Either a consensus will be arrived at, or team members will be asked to conduct a second evaluation, considering panel discussions. Each region will be moderated individually.

Following the moderation meeting any further questions or clarifications will be sent to the providers for their response.

Once the non-price scoring has concluded, the Evaluation Panel will be presented the pricing information and the weighting applied. This score will be consolidated with the non-price scoring to give a final weighted score out of 100%, the response that scores the highest against the requirements for an individual region will likely be the preferred supplier.

3.2 Evaluation criteria

We will evaluate Proposals according to the following criteria and weightings.

An initial review of responses will be undertaken by the Procurement Lead to confirm that they are compliant and complete responses. EECA reserves the right, at its sole discretion, to put aside responses from further consideration due to being non-compliant or materially incomplete.

Criteria	Weighting
1. Proposed Solution	35%
2. Capability	25%
3. Capacity	15%
4. Value for Money	15%
5. Economic Benefits	10%

6. Supplier Code of Conduct	Agree/Disagree

3.3 Scoring

Rating	Definition	Score
EXCELLENT	Respondent demonstrates exceptional ability, understanding, experience and skills. The Proposal identifies factors that will offer potential added value, with supporting evidence.	9-10
GOOD	Respondent demonstrates above average ability, understanding, experience and skills. The Proposal identifies minor additional benefits, with supporting evidence.	7-8
ACCEPTABLE	Respondent demonstrates the ability to meet the criteria, with supporting evidence.	5-6
RESERVATIONS	Satisfies only a minimum of the criteria but not all. Reservations about the Respondent to adequately meet the criteria. Little supporting evidence.	3-4
SERIOUS RESERVATIONS	Extremely limited or no supporting evidence to meet the criteria. Minimum effort made to meet the criteria.	1-2
UNACCEPTABLE	Does not comply or meet the criteria at all. Insufficient information to demonstrate the criteria.	0

3.4 Price

If a Respondent offers a substantially lower price than other Proposals, we may make enquiries or require additional evidence to verify that the Respondent can meet all the Requirements and conditions of the Proposed Contract for the price quoted. Note: Any claims made about price must be clear, accurate and unambiguous. Prices must include or be clear about Goods and Services Tax (GST).

3.5 Due diligence

For all Respondents, EECA may:

a. reference check the Respondent and any named personnel
b. make further checks against the Respondent e.g. a search of the Companies Office or NZBN
c. interview Respondents
d. request Respondents make a presentation
e. inspect audited accounts for the last 3 financial years
f. undertake a credit check

SECTION 4: Pricing information

4.1 Pricing information to be provided by Respondents

a) Respondents must use the Pricing Schedule provided.

b) The Pricing Schedule must show a breakdown of all costs, fees, expenses and charges associated with delivery of the proposed services.

   This should include, where applicable:

   - project management and governance costs
   - research and analytical activities
   - modelling and technical analysis activities
   - stakeholder engagement activities
   - reporting and presentation preparation
   - subcontractor or specialist partner costs
   - travel and accommodation costs (if applicable)
   - any other expenses associated with delivery of the Requirements.

c) Where the price is based on fee rates, specify all rates, either hourly or daily or both as required.

d) Respondents must show how they will manage risks and contingencies related to the delivery of the Requirements.

e) Respondents must document all assumptions and dependencies that affect its pricing and/or the total cost to us. In other words, if the Respondent would expect us to pay more than the quoted price or estimate if particular assumptions or dependencies are not satisfied, the Respondent must call out those assumptions and dependencies.

f) Respondents must tender prices in NZ$. Unless otherwise agreed, we will arrange contractual payments in NZ$.

g) Respondents may submit a pricing approach that is different to the Pricing Schedule, however, the Respondent must also submit a Pricing Schedule that conforms with the one requested.

h) If two or more Respondents intend to submit a joint Proposal the Pricing Schedule must include all costs, fees, expenses and charges chargeable by all Respondents.

SECTION 5: Our Proposed Contract

5.1 Proposed Contract

The Proposed Contract that we intend to use for this procurement is **Government Model Contract 2 – Services (non-crown)** attached to this RFP.

In submitting your Proposal, you must let us know if you wish to question or negotiate any of the terms or conditions in the Proposed Contract or wish to negotiate new terms or conditions.

The RFP Response Form contains a section for you to state your position. If you do not state your position you will be deemed to have accepted the terms and conditions in the Proposed Contract in full.

Appendix A – Specification of requirements

This Appendix forms part of this RFP and provides additional detail regarding the scope, deliverables, stakeholder engagement activities and expected outcomes of the research programme.

EECA is seeking specialist research and analytical services relating to data centre growth in New Zealand and the associated electricity system, infrastructure, flexibility, policy and regulatory considerations.

The research will support future policy, programme and guidance development relating to efficient and flexible data centre deployment in New Zealand.

Research objectives

The research is intended to:

- Improve understanding of the opportunities, risks and electricity system implications associated with data centre growth in New Zealand.
- Assess how data centre deployment may interact with renewable electricity generation, transmission and distribution infrastructure, distributed flexibility and wider electrification objectives.
- Identify international best practice relating to data centre efficiency, sustainability, flexibility, grid integration and policy approaches.
- Provide practical recommendations to support future programme development, market guidance and potential policy or regulatory approaches for New Zealand.

1. Current state and market analysis

Provide an overview of the current and emerging New Zealand data centre landscape, including:

- current and planned data centre developments
- regional distribution of data centres
- projected growth scenarios for cloud and AI workloads
- electricity demand and infrastructure implications
- international trends and comparator markets including Ireland, Singapore, Australia, the Nordics and the United States
- New Zealand's competitiveness as a potential regional data centre hub.

2. Electricity system impacts

Assess the potential electricity system impacts of data centre deployment scenarios, including:

- total MW demand and annual electricity consumption (TWh)
- peak demand impacts
- implications for generation, transmission and distribution investment
- impacts on wholesale electricity pricing and system resilience
- interaction with dry year risk and wider electrification demand
- implications for renewable generation development and electricity infrastructure planning.

The assessment should consider both latency-sensitive and non-latency-sensitive workloads and how these may influence site selection, electricity demand and regional infrastructure requirements.

The assessment should include development of a scenario model capable of testing regional and national electricity system impacts under different deployment scenarios.

3. Flexibility and grid integration

Evaluate opportunities for data centres to support distributed flexibility and grid integration, including:

- demand response capability
- load shifting potential
- ability to reduce or shift load when required
- alignment with renewable generation
- self-generation, battery energy storage systems (BESS) and on-site storage opportunities
- potential grid-support services
- flexibility value to the wider electricity system
- international approaches to grid integration and flexibility participation
- opportunities to design flexibility capability into data centres at planning stage.

4. Efficiency and sustainability

Review international best practice relating to data centre efficiency and sustainability, including:

- Power Usage Effectiveness (PUE) and limitations of existing efficiency metrics
- opportunities to improve efficiency through data centre and server design at planning stage

- compute efficiency and performance per watt
- cooling systems and technologies
- water usage effectiveness
- renewable energy integration
- AI workload optimisation and efficiency considerations
- emerging efficiency and sustainability metrics
- approaches to reporting and performance standards.

The assessment should consider both existing international standards and potential approaches suitable for the New Zealand context.

5. Policy and regulatory analysis

Examine international policy, regulatory and market approaches used to support sustainable data centre deployment and manage electricity system impacts, including:

- consenting frameworks
- energy supply requirements
- grid connection approaches
- demand-side flexibility mechanisms
- pricing structures and tariffs
- reporting and efficiency standards
- voluntary and mandatory frameworks
- flexibility participation requirements
- lessons learned from international markets experiencing rapid data centre growth and electricity system constraints
- applicability to the New Zealand context, including opportunities, trade-offs and implementation considerations.

6. Regional opportunity analysis

Identify regions within New Zealand with potential for future data centre development, considering:

- electricity infrastructure capability
- renewable energy availability and proximity to planned or future renewable generation developments
- fibre and telecommunications connectivity
- proximity to demand
- regional economic development opportunities
- potential "priority zones" for future development.

7. Deliverables

Provide the following deliverables:

- an overview report describing the New Zealand data centre opportunity and associated electricity system considerations
- a scenario model and supporting analysis capable of assessing regional and national electricity system impacts under different data centre deployment scenarios
- regional opportunity mapping
- flexibility and electricity system assessments
- policy and regulatory recommendations
- recommendations for potential future standards, data centre efficiency best-practice guidance and flexibility best-practice guidance
- supporting presentation material and stakeholder workshop outputs where appropriate.

Final deliverables should be suitable for use in future policy, programme development, stakeholder engagement and strategic planning activities.

8. Stakeholder engagement

Undertake engagement with relevant stakeholders throughout the project, including:

- electricity sector participants
- government agencies
- data centre operators
- infrastructure providers

- renewable energy developers
- telecommunications providers
- industry organisations and technical experts.

Stakeholder engagement activities should support information gathering, testing of findings and development of practical recommendations.

9. Reporting requirements

The supplier will be expected to:

- provide regular progress updates
- provide draft findings and outputs at agreed milestones
- participate in review and feedback processes during the project

provide final reports, presentation material and any supporting analysis or documentation developed as part of the project.

Background Paper

ENERGY EFFICIENCY & CONSERVATION AUTHORITY
TE TARI TIAKI PŪNGAO

Meeting Date	25/08/2026
Subject	Update: Data Centre Cooling and Heat Reuse – Opportunities, Constraints and Relevance for New Zealand.

Purpose

1. This paper builds on the earlier update on New Zealand's expanding data-centre sector by focusing specifically on cooling technologies and the potential recovery and reuse of data-centre heat.

2. It examines the energy, water, reliability and infrastructure implications of conventional and liquid-cooling systems and identifies the technical and commercial conditions required for recovered heat to provide a useful energy source.

3. 9(2)(f)(iv) [redacted]

Background and Context

4. The earlier paper on New Zealand's expanding data-centre sector addressed sector growth, electricity demand, network impacts and EECA's wider strategic role. This paper does not repeat that analysis. It focuses on how heat is removed from data centres and whether that heat can be used productively.

5. Cooling is becoming increasingly important as artificial intelligence and high-performance computing increase the amount of electricity consumed and heat generated within each server rack. High-density AI racks can exceed the practical limits of conventional air cooling, making cooling architecture a core infrastructure decision rather than a supporting building service.

6. Almost all electricity consumed by data-centre IT equipment ultimately becomes heat. Additional electricity is used by server fans, pumps, chillers, air handlers and final heat-rejection equipment. Cooling can account for a relatively small share of total electricity demand in an efficient facility but more than 30% in less-efficient enterprise facilities.

7. Data-centre cooling therefore affects more than equipment temperature. It influences total electricity consumption, peak demand, water use, equipment density, facility resilience and the temperature and quantity of heat potentially available for reuse.

8. Cooling and heat reuse are closely linked but remain separate design decisions. A cooling system must first capture and transport heat reliably. That heat can then either be rejected to the environment or supplied to a compatible user. Even where heat is reused, alternative heat-rejection capacity will normally still be required.

Data Centre Cooling Technologies

9. Conventional air cooling uses conditioned air to remove heat from servers. Heat is generally transferred through computer-room air-conditioning equipment into chilled-water or refrigerant systems before being rejected through dry coolers, condensers or cooling towers.

10. Air cooling is mature, well understood and suitable for many existing and lower-density facilities. However, the volume of air and fan power required increases as rack density rises. Air systems also generally produce a dispersed, comparatively low-temperature heat stream that is difficult to reuse.

11. Liquid cooling positions a liquid coolant closer to the rack or the components producing the greatest amount of heat. Because liquids transport heat more effectively than air, these systems can support higher rack densities while reducing reliance on server fans and large-volume airflow.

12. The principal liquid-cooling approaches are:

    a. **rear-door heat exchangers**, which cool the hot air leaving a server rack;

    b. **direct-to-chip cooling**, which uses cold plates to remove heat directly from processors and graphics processing units; and

    c. **immersion cooling**, in which specialised computing equipment is submerged in an electrically non-conductive fluid.

13. These approaches differ in their suitability for existing facilities, the proportion of equipment heat captured, equipment compatibility, maintenance requirements, coolant management and the temperature at which heat becomes available. Annex 1 provides a comparison.

14. An IEA 4E EDNA assessment identifies indicative total energy-saving potential of approximately 10–21% from liquid cooling, depending on the starting point and overall system design. These

figures represent potential rather than guaranteed savings. Actual performance depends on the complete cooling chain and how the facility is operated.

15. Most current liquid-cooled data centres remain hybrid facilities. Direct-to-chip systems, for example, may remove most processor heat through liquid while memory, storage, power supplies and networking equipment continue to require air cooling.

16. The ability to operate with warmer coolant is an important potential advantage. Warmer coolant can reduce compressor-based chilling, increase the hours during which dry or free cooling is available, and provide a higher-temperature heat stream for reuse.

17. However, the benefit depends on the final heat-rejection system. Heat captured efficiently at the chip can still be rejected inefficiently if the wider facility relies on low-temperature chilled water or poorly controlled pumps, fans and cooling towers.

18. Whole-of-system assessment should therefore follow heat from the computing equipment through the internal coolant circuit, facility water loop and final heat-rejection or heat-reuse system.

Energy and Water Considerations

19. Liquid cooling can reduce electricity consumption by decreasing the need for server fans, air movement and compressor-based cooling. Variable-speed pumps and the optimisation of coolant temperature, flow and pressure can provide further savings.

20. New Zealand’s relatively cool climate may allow suitably designed facilities to use dry or free cooling for a substantial proportion of the year. The opportunity will nevertheless depend on equipment temperature requirements, local summer conditions and the level of resilience required.

21. Liquid cooling is sometimes described as closed-loop or waterless. A closed internal loop recirculates coolant and can avoid routine water replacement within that circuit, but it does not necessarily make the complete facility waterless.

22. A facility may still transfer heat from the closed loop into an evaporative cooling tower or an adiabatic heat-rejection system. These arrangements may reduce electricity consumption but can require significant water use, particularly during warm conditions.

23. Dry coolers can avoid routine evaporative water consumption but become less effective as outdoor temperatures rise. Chillers provide reliable temperature control but increase electricity

demand. The preferred design will therefore depend on the relative value and local availability of electricity and water, rather than on a single efficiency measure.

24. Cooling claims should consequently be assessed across the complete facility boundary. Power usage effectiveness should be considered alongside water use, cooling-system demand, operating temperatures, heat reuse and performance during peak summer conditions.

Heat Recovery and Reuse

25. Liquid cooling can produce a more concentrated and higher-temperature heat stream than conventional air cooling. This improves the potential to transfer the heat to another building, business or process.

26. Direct-to-chip and immersion systems may provide useful heat at approximately 45–70°C, depending on equipment and system design. Rear-door systems generally produce lower-temperature heat because air remains the first heat-transfer medium. These ranges are indicative and should be confirmed for each facility.

27. Recovered heat could potentially be used for:
    a. water heating in hospitals, accommodation and tertiary campuses;
    b. public or commercial swimming pools;
    c. greenhouse heating and suitable aquaculture operations;
    d. food-processing wash water and other industrial pre-heating;
    e. space heating for nearby buildings; or
    f. local heat networks serving several compatible users.

28. Lower-temperature heat can be upgraded using a heat pump. This expands the range of possible applications but adds capital cost and electricity consumption. The overall benefit should be assessed against the fuel or electricity displaced by the receiving heat user.

29. Heat reuse is most attractive where recovered heat displaces fossil-fuel use, avoids additional electric peak demand or supplies a steady low-temperature requirement. Supplying heat simply because it is available does not necessarily produce a cost-effective or material energy benefit.

30. The most important condition is proximity. Heat distribution pipes are expensive and lose energy over distance. A compatible heat user should therefore be identified before the data-centre location and cooling architecture are substantially committed.

31. Demand matching is also important. Data centres generally produce heat continuously, while space-heating demand is seasonal and weather dependent. Hospitals, swimming pools, accommodation, greenhouses, aquaculture and some industrial processes may provide steadier demand.

32. Thermal storage can help manage hourly differences between heat production and demand. It is less able to resolve a major seasonal mismatch unless storage is provided at a scale that may be commercially impractical.

33. Heat users will require confidence in temperature, volume, availability and price. Commercial arrangements will need to define ownership of the heat exchangers and pipelines, metering, maintenance responsibilities, backup supply, outage management and the allocation of performance risk.

34. Data-centre operators may be reluctant to guarantee heat supply because computing equipment and cooling requirements can change over time. Conversely, operators cannot rely on a heat user always being available to accept heat.

35. A heat-reuse project will therefore normally need both backup heating for the heat user and alternative heat-rejection capacity for the data centre. These duplicated systems can materially affect project economics. Annex 2 provides a screening framework for assessing these conditions.

36. Overseas policy is placing greater emphasis on heat recovery. Germany has introduced waste-heat requirements for new data centres, while the United Kingdom is using heat-network planning to identify areas where recovered heat could supply nearby users. These approaches demonstrate the value of spatial planning but may not transfer directly to New Zealand.

Key Challenges and Uncertainties

37. Liquid-cooling systems can require specialised servers, cold plates, manifolds, coolant distribution units, heat exchangers, controls and pipework. Retrofit costs can be significant where an existing facility was designed around air cooling.

38. Reliability requirements are demanding. High-density equipment can overheat quickly following a loss of coolant flow. Redundant pumps, power supplies, controls and heat-rejection equipment may therefore be required, reducing some of the apparent capital and efficiency advantages.

39. Rapid changes in processor and rack power can make cooling infrastructure undersized after a hardware upgrade or leave expensive capacity underutilised. Multi-vendor systems must also

maintain compatibility between fluids, materials, pressures, temperatures, connections and maintenance requirements.

40. Heat-reuse economics are highly site-specific. A technically recoverable quantity of heat does not establish a viable project unless there is a sufficiently large and enduring user nearby.

41. Split incentives can also prevent investment. The data-centre operator may bear the cost and operational risk of heat recovery, while most of the energy savings accrue to the receiving user.

42. Performance can be difficult to compare where facilities use different operating boundaries and assumptions. Design estimates should be distinguished from verified performance after commissioning, particularly for cooling electricity, water consumption and heat exported.

43. Power usage effectiveness alone is insufficient because it does not show water consumption, heat reuse, electricity carbon intensity or the additional electricity used by a heat pump outside the data-centre boundary.

Relevance for New Zealand

44. Liquid cooling is likely to become increasingly relevant as AI and high-performance computing increase rack densities. Its value in New Zealand will be greatest where it enables warmer coolant operation, efficient dry heat rejection and measurable reductions in cooling electricity or water use.

45. New Zealand’s cool climate may provide favourable conditions for dry and free cooling. However, local water availability, summer performance, equipment warranties and facility resilience must still be assessed.

46. Heat-reuse opportunities are likely to be selective rather than universal. New Zealand does not have extensive district-heating infrastructure, and relatively low urban density can increase the cost of distributing heat.

47. Residential space heating alone may provide an uncertain demand because it is seasonal. Hospitals, tertiary campuses, pools, accommodation, greenhouses, aquaculture and industrial hot-water or pre-heating loads may offer more consistent opportunities.

48. Site selection creates a strategic trade-off. Locations close to urban or industrial heat users may have higher land and infrastructure costs, while remote sites with favourable electricity or cooling conditions may have few practical users for the recovered heat.

49. The strongest New Zealand opportunities may arise in mixed-use campuses, industrial areas or developments where the data centre and heat user can be planned together. Retrofitting a heat user after the site, connection and cooling design have been fixed is likely to be more difficult and costly.

50. The energy and emissions value of reuse will depend on what the heat displaces. Projects replacing coal, gas or LPG process heat may provide stronger benefits than projects displacing already efficient renewable electricity, subject to the performance of any heat pump required.

51. Major data-centre proposals should therefore be assessed on the basis of total resource performance rather than claims about a particular cooling technology. This includes cooling electricity, water use, final heat rejection, recoverable temperature, heat delivered, reliability and displaced energy.

Implications for New Zealand

52. Cooling and heat reuse should be considered during site selection and initial infrastructure planning, rather than after the electricity connection, building design and commercial arrangements are established.

53. Early coordination may be required between developers, electricity network businesses, councils, water authorities, neighbouring land users and potential heat customers.

54. Planning and consenting information should distinguish between:

    a. an internal closed coolant loop and the facility's total water consumption;

    b. heat technically captured and heat supplied to a user;

    c. design efficiency and verified operating performance; and

    d. theoretical heat-reuse potential and a project supported by a credible customer and commercial agreement.

55. There is not yet a strong basis for a universal liquid-cooling or heat-reuse requirement in New Zealand. Technology and computing requirements are changing quickly, while the practicality of heat reuse varies significantly between sites.

56. A staged, technology-neutral approach focused on transparent performance, early feasibility assessment and replicable demonstrations would be more appropriate than prescribing a particular cooling architecture.

9(2)(f)(iv) [redacted]

Appendix One: Comparison of Data Centre Cooling Technologies

1. The most suitable cooling architecture depends on rack density, facility age, equipment compatibility, climate, water availability, resilience requirements and whether recovered heat has a practical use.

Approach	Typical fit	Potential benefits	Principal limitations	Heat-reuse potential
Conventional air cooling	Existing and lower-density facilities.	Mature technology; well-established maintenance and supply chains	Fan and chiller demand can rise sharply at high density; recovered heat is dispersed and relatively low temperature.	Generally low because heat is dispersed and comparatively low temperature
Rear-door heat exchanger	Retrofits and medium-density racks.	Removes heat at the rack exhaust; fewer server modifications than direct-to-chip systems	Air remains the first heat-transfer medium; server fans remain; heat-reuse temperature is generally lower.	Low to moderate; indicative return temperatures of approximately 25–45 °C
Direct-to-chip	High-density AI and high-performance computing.	Captures processor heat directly; supports high rack density and warmer coolant	Usually hybrid; requires cold plates, manifolds, distribution units, controls and compatible hardware.	Moderate to high; indicative return temperatures of approximately 45–70 °C
Immersion cooling	Very high-density or specialised deployments.	High heat-capture potential; reduced fan demand and compact equipment layout	Specialised equipment, fluids, maintenance practices and supply chains.	Moderate to high; indicative temperatures of approximately 50–60 °C

Sources: IEA 4E EDNA (2026a); U.S. Department of Energy (2024)

Appendix Two: Heat-Reuse Screening Framework

Screening factor	Evidence required	Decision relevance
Heat quality	Available temperature, flow and annual heat profile	Determines whether heat can be used directly or requires a heat pump
Proximity	Distance, elevation and practical pipe route to users	Distribution costs and heat losses increase with distance
Demand match	Daily and seasonal demand compared with data-centre heat output	Identifies the need for storage, backup heating or continued heat rejection
Scale and continuity	Minimum and peak demand, outages and maintenance periods	Determines how much heat can be reliably used
Displaced energy	Fuel or electricity that recovered heat would replace	Establishes energy, emissions and system benefits
Infrastructure	Heat exchangers, pipes, pumps, storage and heat-pump requirements	Determines capital cost and delivery complexity
Commercial model	Ownership, pricing, metering, maintenance and risk allocation	Addresses split incentives and long-term performance risk
Future adaptability	Ability to accommodate new equipment, temperatures or heat users	Reduces the risk of early infrastructure becoming unsuitable

Sources: IEA 4E EDNA (2026a); European Data Centre Association (2024); UK Department for Energy Security and Net Zero (2024).

Appendix Three: Suggested information for major data-centre proposals

Assessment area	Information to obtain	Why it matters
Scale and load	IT capacity, total connection capacity, annual demand, load profile, ramping and development stages.	Forecast generation and network requirements; distinguish committed from prospective load.
Energy efficiency	Design and operating PUE, server utilisation, cooling-system demand and metering boundaries.	Compare whole-site efficiency and verify performance after commissioning.
Cooling and water	Cooling architecture, coolant temperatures, final heat rejection, annual and peak water use, discharges and drought response.	Identify water-energy trade-offs and local resource constraints.

Electricity supply	Connection location, new generation arrangements, temporal matching, backup generation and emissions.	Assess additionality, system impact, resilience and operational emissions.
Demand flexibility	Movable workloads, batteries, UPS capability, thermal storage, response duration, notice and verification.	Separate technically possible flexibility from contractually deliverable flexibility.
Heat reuse	Recoverable temperature and volume, nearby users, infrastructure route, commercial model and backup arrangements.	Test whether heat reuse is practical before siting and design are fixed.
Community and environment	Land, water, noise, light, wastewater, construction, jobs, local benefits and consultation.	Support consenting, transparency and durable community acceptance.

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Meeting Date	**25/03/2025**
Subject	Technology Brief: New Zealand's Expanding Data Centre Sector and Managing Energy Demand.
Purpose	This paper provides an update on Managing Energy Demand in New Zealand's Expanding Data Centre Sector and EECA's Role and Strategic Considerations
Action sought	For information & to discuss
Prepared by	Kanchana Marasinghe, Manager Innovation Portfolio Vince Smart, Lead Advisor Insights and Research Brian Fitzgerald, Technical Lead, Products & Systems

Purpose

1. This paper provides an update on the rapid growth of New Zealand's data centre sector, its implications for the energy system, and potential roles for EECA in supporting energy efficiency and flexibility within this sector.
2. The objectives of the update and discussion is to:
    a. Provide the Board with an overview of the current state of New Zealand's data centre sector.
    b. Seek the Board's guidance on EECA's potential interventions, including regulatory approaches, technology demonstration support, and engagement with industry stakeholders to mitigate the sector's impact on the energy system.

Background and context

3. New Zealand's data centre sector is expanding rapidly, driven by the rise of artificial intelligence (AI) technologies and increased adoption of cloud-based IT systems. While New Zealand's current data centre fleet is relatively small by global standards, growth projections indicate significant increases in energy demand.
    a. Current data centre load is estimated at approximately 200 MW[1] - New Zealand currently has a modest fleet of Data Centres, mostly supplying local customers and cloud services. Most local Data Centres are categorised as small/medium in a global context.

[1] https://www.rnz.co.nz/news/business/538417/growth-of-data-centres-expected-to-match-that-of-sydney

b. Vector alone has received applications to connect 700 MW of new data centres within its network region, potentially increasing peak network load by 40% in just a few years.

c. Microsoft recently commissioned[2] its first hyperscale data centre on Auckland's North Shore. In 2022, the company made a significant $300 million investment in partnership with Contact Energy to support the development of the Te Huka Unit 3 geothermal facility. This investment is part of a long-term agreement securing the purchase of renewable energy for the next decade.

Energy implications of Data Centres

4. Data centres are energy-intensive operations with large, continuous electricity demands for computing, cooling, and facility maintenance. Key considerations include,

    a. **High Energy Use**: A single hyperscale data centre can require 100 MW or more of electricity. Given the relatively low cost of energy services compared to hardware costs, efficiency has historically been a secondary priority.

    b. **Reliability Requirements**: Data centres require extremely high reliability (**99.999**% uptime), leading to redundancy measures such as diesel generators, multiple grid connections, and on-site energy storage.

    c. **Peak Load Impact**: The constant nature of data centre loads effectively increases peak demand, potentially leading to higher network build costs, which are passed on to all consumers.

    d. **Suboptimal Siting**: Data centres tend to cluster near urban centres for security, workforce access, and infrastructure reasons. In New Zealand, this results in data centre development in Auckland and Christchurch, regions already facing grid congestion.

EECA's potential role

5. EECA has a mandate to promote energy efficiency and renewable energy uptake. Addressing the energy impact of data centres aligns with EECA's strategic goals by,

    a. Encouraging efficient data centre design to reduce energy and peak demand per unit of computing capacity.

    b. Minimising socialised costs associated with grid reinforcement for data centre expansion.

    c. Supporting the transition from diesel backup generation to cleaner energy alternatives.

    d. Aligning with broader government objectives for energy security and emissions reduction.

[2] Microsoft opens first hyperscale data centre in New Zealand | RNZ News

Available Levers for EECA

6. To improve data centre performance, EECA could consider the following approaches.

Regulatory Tools,

a. **Energy-Using Product Regulations**: Setting minimum efficiency standards for cooling and IT hardware in data centres.
b. **System Efficiency Standards**: Implementing standards covering overall data centre energy performance, including load flexibility and peak demand contributions. The International Energy Agency (IEA) has recently released a report on Data Centre Energy Efficiency Labelling[3], highlighting potential requirements for energy efficiency and flexibility standards.

Funding & Demonstration Initiatives,

c. **Technology Demonstration Support**: Providing targeted funding to incentivise early adoption of advanced energy-efficient technologies and demand flexibility integration.
d. **Market Engagement and Collaboration**: Facilitating discussions between data centre operators, electricity suppliers, and regulators to promote best practices in energy management.

International Context

7. Other jurisdictions have taken varying approaches to managing data centre growth.
   a. **Ireland** has introduced regulations limiting data centre expansion unless specific energy security requirements are met.
   b. **Denmark** requires data centres to supply their own energy needs (Energy Islands concept) through renewable generation.
   c. **Singapore** imposed a temporary moratorium on new data centre developments due to high energy consumption, later lifting it with stringent energy efficiency requirements.
8. The cost of energy provision for a Data Centre typically represents only a small proportion of the overall project costs. As such, many developers have been willing to absorb the additional costs imposed by regulation. However, as the globalisation of the compute market continues, countries with stricter regulations may face challenges in attracting new Data Centres.

[3] DC4-Data-centre-labels-report-v1.pdf

9. When a Data Centre has installed or contracted sufficient standby, storage, or primary generating capacity to meet its own needs, it often results in excess capacity and over-capitalisation. This creates an incentive for Data Centres to engage with local energy markets, providing energy and flexibility services to generate additional revenue from their investments. Under these circumstances, the establishment of additional Data Centres can serve as a positive contributor to local and regional energy systems, rather than a burden.
10. These examples highlight the need for a proactive approach in New Zealand to ensure that data centre growth aligns with energy system sustainability and resilience.

Recommendations

1. New Zealand's data centre sector is poised for rapid expansion, with significant implications for energy infrastructure and security. EECA has a clear strategic role in ensuring that this growth occurs in an energy-efficient and sustainable manner. Through targeted regulation, funding support, and market collaboration, EECA can help mitigate the energy impact of data centres while supporting economic and digital sector growth.
2. It is recommended that the Board:
   a. **Review and discuss** the content provided in this technology update**.**
   b. **Provide feedback** on EECA's current activities and strategic direction, including potential opportunities to drive market adoption and promote innovation.

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