GOVERNMENT OF WESTERN AUSTRALIA

Department of **Water and Environmental Regulation**

Energy Policy WA

Clean Energy Future Fund – Applicant Guidelines

Round 4 – 2025

January 2026 v4

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This publication is available at our website wa.gov.au/ceff or for those with special needs it can be made available in alternative formats such as audio, large print, or Braille.

Contents

1 Overview

These guidelines outline the operational and administrative arrangements for the Clean Energy Future Fund (CEFF/the Fund). This document provides information for applicants regarding eligibility and merit criteria for the Fund, and the application and assessment process.

The Fund is administered by the Department of Water and Environmental Regulation (the Department) on behalf of the Government of Western Australia (State Government). The Minister for Energy and Decarbonisation is the decision-maker for the Fund.

1.1 Key information

Parameter	**Value**
Minimum and maximum grant size	$100,000 to $4 million (excluding GST)
Total funds available	Around $9 million is expected to be available for this round
Maximum percentage of eligible project costs that can be funded	25%
Maximum time to complete the project	5 years
Funding mechanism	Paid in arrears on evidence that the milestone is complete and eligible costs have been spent
Fund opens for applications	6 January 2026
Grant application workshops/webinars	About the grant – Thursday 29 January 2026 at 10:00 AWST Completing the financial model – Tuesday 3 February 2026 10:00 AWST
Application closing date	8 am AWST, Monday 20 April 2026
Applicants notified of outcome and successful projects announced	Estimated late 2026
How to apply	Email your completed application form (this document) along with required attachments to ceff@dwer.wa.gov.au before the closing date

CEFF contact details	08 6364 6988 ceff@dwer.wa.gov.au www.wa.gov.au/ceff

1.2 Funding objectives

The objective of the Fund is to provide a source of funding for the implementation of innovative, clean energy projects in Western Australia (WA) that offer high public value through contributing to one or more of the following outcomes:

- significant, cost-effective reduction in greenhouse gas emissions below projected (or baseline) emissions as a direct result of the clean energy project
- design, deployment, testing or demonstration of innovative clean energy projects likely to deliver community benefits or lead to broad adoption and significant reductions in greenhouse gas emissions.

1.3 Ministerial priorities

Priorities for Round 4, determined by the Minister for Energy and Decarbonisation, are to:

1. demonstrate meaningful participation of Aboriginal and Torres Strait Islander peoples across land access, decision-making, benefit-sharing, employment and governance
2. use clean energy to add value to WA minerals and support green exports
3. be at the fringe of, or not connected to, the South West Interconnected System or the North West Interconnected System
4. significantly increase the supply, security and resilience of networked electricity supply in line with the Distributed Energy Resources Roadmap
5. support decarbonisation and electrification of heavy industry and the development of new, low-emissions industries in WA
6. enhance energy productivity, electrification and materially reduce emissions from the built environment or manufacturing
7. support the replacement of diesel electricity generation with renewable energy
8. deliver long-duration energy storage (systems that can deliver power of 10 hours or more) by 2030
9. support WA manufacturing and maximise local content in project delivery.

Ministerial priorities identify areas of strategic importance to the state. The extent to which a proposal aligns with Ministerial priorities will be assessed and included in recommendations to guide Ministerial decision-making.

Projects do not need to align with Ministerial priorities to be assessed or to be recommended for funding.

2 Eligibility criteria

Applications must meet both applicant and project eligibility criteria. Applications that do not meet all the eligibility criteria will generally not proceed to merit assessment.

2.1 Applicant eligibility

To be eligible for funding, an applicant must meet the criteria below.

Applicant eligibility criteria	**Requirements**
1. Eligible entity types	At the time of entering a funding agreement, the applicant must be an Australian entity incorporated under the *Corporations Act 2001* (Commonwealth) or the *Corporations (Aboriginal and Torres Strait Islander) Act 2006* (Commonwealth) or a local government entity or government research organisation, or a consortium with an eligible entity as lead applicant. Entities that cannot be the lead applicant include a school, a trust, a federal or state government department, a sole trader or individual, an overseas organisation[1] or an unincorporated association.
2. ABN and GST	The applicant must have an Australian Business Number (ABN) and be GST registered.
3. Sanctions	The applicant must not be listed in the Australian trade sanctions consolidated list.
4. Fit and proper persons	The members of the management team must be fit and proper persons to perform their duties. They must have: • no disqualification by law from performing their role • no conflict of interest or other conflict that may create a material risk that they will fail to properly perform in their management role • the legal right to carry out and control the project under consideration.

1. An organisation that does not hold an ABN or Australian Company Number.

2.2 Project eligibility

Project eligibility criteria	Requirements
Clean energy project	The proposal must be a clean energy project. That is, it must deploy or apply a technology that reduces greenhouse gas emissions from the production or use of stationary energy. This could include energy control or management systems, renewable energy, energy storage and/or energy efficiency.
Funding amount	The proposal should seek funding within specified funding limits ($100,000 to $4 million). Applications requesting more than $4 million (GST exclusive) will be considered on merit and will not be excluded on this basis. However, the State Government may offer less funding than the amount sought by an applicant and may attach conditions or requirements to any funding offer.
Grant percentage of costs	This CEFF grant request plus any existing WA State Government grants cannot be more than 25% of the project's eligible costs.
WA	The project must take place primarily in WA.
Permissible by law	The project must be permissible by law.
Timing	A funding agreement must be signed within six months of receiving written notification of funding award. The proposal as set out within the milestone table (in the financial model spreadsheet) of the application must propose to commence within six months of signing the funding agreement and be completed within five years

2.3 Ineligible projects

Ineligible project types include but are not limited to:

- projects that are already underway
- the cessation of the operation of a business to reduce emissions
- business-as-usual activities (i.e. normal operation of an existing business or venture)
- early-stage research (i.e. technical readiness level 1 to 5 [see section 10])
- projects not involving specific sites/locations in WA.

2.4 Eligible costs

Applicants must declare whether the project will leverage any Australian Government or other State Government funding in the business case and application form. State Government funding may comprise a maximum of 25 per cent of total project costs.

2.4.1 Examples of eligible costs

Eligible costs include:

a) capital costs associated with:
    - renewable energy generation equipment
    - energy efficiency equipment
    - electrification of equipment or processes
    - decarbonisation with associated energy efficiency improvements
    - other emissions and energy related projects

b) essential enabling equipment including batteries, other forms of energy storage, system control equipment, system power or energy conversion equipment, monitoring or communications equipment and structures used for housing power-system equipment

c) essential non-equipment expenditure including design, professional services, transport, installation and commissioning related to the attainment of a project objective or milestone

d) project management costs and grant administration costs.

2.4.2 Examples of ineligible costs

Activities and elements that will generally not be considered eligible include:

a) land acquisition

b) venture capital extended to third parties

c) purchase of carbon credits

d) legal costs such as those associated with preparing grant applications, finalising, or managing compliance with, a funding agreement

e) costs associated with core business or business-as-usual activities

f) ongoing administrative and operational costs including rent, electricity and salaries of existing staff working their usual hours and duties

g) works already financially committed, underway or completed when the funding round closes (including but not limited to contracts already in place to construct infrastructure or buy equipment or where construction has commenced)

h) ongoing maintenance of projects to which organisations have committed as part of a previous grant

i) costs of preparing applications, reports or associated supporting material for the purposes of applying for the funding or entering the funding agreement.

An in-kind contribution is any non-monetary contribution of goods or services for the project by the applicant. Eligible in-kind contributions from the applicant can cover any of the listed types of eligible project costs.

Applicants must provide sufficient detail of proposed in-kind contributions to enable assessment of whether the valuation is reasonable. This is elaborated further in the financial model template.

The above lists identify the most common examples of eligible and ineligible costs and are not intended to be comprehensive. Assessment of eligible costs may depend on a project's specific circumstances. For further advice on eligibility of costs, please contact ceff@dwer.wa.gov.au.

3 Merit criteria

The assessment process is designed to identify projects with the highest expected value for each dollar of funding requested. This is done by evaluating the:

- benefits of the project if successful
- likelihood of the project succeeding
- demonstrated need for the grant.

To be competitive, projects will need to demonstrate high value (such as emissions reduction), a high likelihood of success, and a clear need for the grant funding.

A financial model spreadsheet is provided to applicants to assist with provision of information on the proposal. Three versions are available from the Clean Energy Future Fund – Downloads webpage:

- a worked example version to demonstrate how the model works
- a blank version for use in preparing applications.
- a larger version with space for 20 modules.

The financial model spreadsheet calculates some of the answers to questions below. It is important to complete the financial model.

Support using the financial model is available from ceff@dwer.wa.gov.au or phone 08 6364 6988.

3.1 Benefits if successful

Applications should demonstrate value to the state if successful. Expected benefits are measured against three weighted criteria related to the Fund's objectives:

- emissions reduction (50 per cent)
- potential for wider adoption (35 per cent)
- other benefits (15 per cent).

More detail on the elements assessed for each component is given below.

3.1.1 Emissions reduction

This considers the emissions reduction potential of the project.

1. **Quantity:** Assesses the quantity in tonnes of carbon dioxide equivalent avoided or reduced by the project, per year, over the life of the project and by 2030 and 2050. These figures are calculated in the financial model.
2. **Price:** Assesses the project cost and grant cost per tonne of lifetime emissions savings. This can be calculated using the financial model template.
3. **Completeness:** Assesses the completeness of the emissions reduction. That is, the percentage of emissions that are removed from the process. For

example, if the proposal would increase the efficiency of an industrial chiller by 25 per cent, then the completeness is 25 per cent.

4. **Path to net zero**: If any emissions remain after implementation, the application should describe plans or options to achieve net zero by 2050 or sooner.
5. **Hard-to-abate industries**: Assesses the extent to which the emissions reduction benefits a hard-to-abate industry. Hard-to-abate industries could include steelmaking, mining, the aluminium supply chain, chemicals (such as fertilisers and plastics), cement, oil and gas, among others. The applicant should justify why a target industry is hard to abate.

3.1.2 Potential for wider adoption

This considers the potential for other copies of the project to be developed by the Fund applicant and others, multiplying the benefits to the environment and the state.

1. **Knowledge sharing:** Assesses knowledge-sharing benefits of the project, such as the knowledge that will be freely shared and in what way. Examples could include presentations at conferences and information published on websites. The application should include the type of information and, if publishing operational data, details of the frequency and parameters planned to be published.
2. **Intellectual property management:** Assesses whether intellectual property developed in the proposal could realise greater benefits if others could license the technology, and whether the applicant has any plans to offer licences or distribute the intellectual property.
3. **Innovation:** Assesses the degree of innovation and/or the extension of the project beyond common practice in WA for the sector.
4. **Potential for cost reduction:** Assesses the potential for cost reductions for future projects through the demonstration of the technology.
5. **Potential for the project to be replicated:** Assesses the likelihood that the project would result in similar projects being implemented by the applicant or by others in WA and elsewhere, multiplying the emissions reduction potential.
6. **Ongoing commitment:** Assesses the applicant's ongoing commitment to and investment in the project, future projects and the technology.
7. **Technical and financial competitiveness:** Assesses whether the proposal is likely to be competitive in the market against technologies achieving a similar outcome.

3.1.3 Other benefits

This considers benefits other than greenhouse gas emissions reduction, such as:

1. **Environmental benefits** such as reduced pollution (other than carbon dioxide or other greenhouse gases as these are measured elsewhere).

2. **Benefits to the electricity network** such as grid stability or the provision of long-duration energy storage or ancillary services.
3. **Economic development** such as jobs or new export industries created, or increased supply chain resilience.
4. **Aboriginal and Torres Strait Islander benefits** such as employment, economic empowerment or other benefits.
5. **Value chain benefits to customers**: Assesses the potential of a proposal to reduce embedded carbon in high-value WA products and services, enabling them to earn a green price premium or certification or to avoid carbon border adjustment mechanisms in customer countries.
6. **Value chain benefits to suppliers:** Assesses the benefits from procurement of inputs made in, or value added in, WA.
7. **Any other benefits** to the WA economy.

Applications do not need to address all the examples listed above.

3.2 Likelihood of success with funding

This criterion considers the likelihood of the project succeeding and the likely extent of its success. It has three components:

- technical feasibility
- applicant capability
- financial viability.

3.2.1 Technical feasibility

This considers the likelihood the project will succeed given its technical complexity.

The assessment process will consider the following elements for technical feasibility:

1. project complexity
2. technology maturity including technology readiness level (TRL) rating, (see section 10) – generally, the technology should have been proved at laboratory scale (TRL 5 or higher)
3. realistic timeframe
4. clarity of scope
5. level of risk.

A risk register template has been developed to support assessment of the level of risk in a proposal. It can be downloaded via the downloads webpage; otherwise, a comparable existing risk register can be submitted. Insurances planned for the project should be listed.

The impact of climate change on the project over its life should be assessed. For example, consider the adequate heat rating for equipment and protection from floods and fires where necessary. The Western Australian Climate Change Risk Management Guide provides practical guidance on this matter.

3.2.2 Applicant capability

This considers the likelihood the project will succeed, or the extent to which it is likely to succeed, given the applicant's capability. The following elements contribute to assessment of applicant capability:

1. expertise and track record of the organisation, key staff and project partners. An applicant's history of compliance with environmental and other regulatory requirements may be considered when assessing their capability
2. governance
3. quality of the project delivery planning.

3.2.3 Financial feasibility

This considers the likelihood of the project securing sufficient funds to implement the project, and its financial viability after implementation.

The following elements contribute to the assessment of financial feasibility:

1. the likelihood of securing other sources of funding needed to complete the project (aside from the requested grant)
2. whether the assumptions in the financial model are supported and credible
3. whether the grant is sufficient – that is, if the project's internal rate of return with the grant is greater than the applicant's investment threshold.

3.3 Need for the grant

This considers the need for the grant, and the extent to which the grant would contribute to the success of the project.

The following elements contribute to the assessment:

1. whether the grant is necessary – that is, if the project's internal rate of return without the grant is greater than the applicant's investment threshold (if so, is there a reason that commercial investors can't be found?)
2. whether the project has already started, or significant capital has been committed
3. whether there are any existing legal or regulatory requirements for emissions reduction that apply to the applicant's operations.

4 How to apply for funding

Review these applicant guidelines to determine eligibility and alignment with the Fund objectives and priorities.

Prepare the application and accompanying documents (including the financial model and risk register) and submit via email to ceff@dwer.wa.gov.au.

Applicants should ensure that they allow enough time to prepare and submit applications, noting that large attachments may take time to send.

Note that emails larger than 20 Mb may not be delivered. If your submission is getting large, please check that all attachments are necessary. If you must send more than 20 Mb, split the attachments over two or more emails, indicating e.g. ‘1 of 2’ in the subject line.

The person submitting an application must declare that they are authorised to submit it by the chief executive officer or an authorised officer of the organisation applying for funding.

Applications must be received before the cut-off time. Applicants will be notified by email that their applications have been received.

Late applications will not be accepted.

5 How the application will be assessed

Each application will be assessed against the eligibility and merit criteria outlined in sections 2 and 3 of these funding guidelines, and the Ministerial priorities outlined in section 1.3.

The Department may seek advice from government agencies and independent technical experts, as required, to assist in determining which applications best meet the criteria. Applicants may be requested to provide clarifying information.

At any time during the assessment process, the Department may undertake due diligence activities considering the value, size and complexity of the application.

Ineligible applications will generally not proceed to merit assessment and thus will be deemed to be unsuccessful.

Recommendations on the projects that are determined to best meet the criteria, and Ministerial priorities will be provided to the Minister for Energy and Decarbonisation for approval. The decision of the Minister on whether to offer funding is final.

Applicants will be advised in writing of the outcome of their application at the conclusion of the assessment process. Applicants may request feedback from the Department.

The assessment of applications will be supported by an independent probity adviser who will observe the assessment process and provide advice to ensure fairness and equity.

6 Award and payment of funding

6.1 Payment of funding

Funding to successful proponents will be by way of a grant, or grants, under a funding agreement.

Applicants are required to propose a milestone payment schedule with their application which, if the application is successful, will be finalised in the funding agreement process. The financial model spreadsheet contains a template for the milestone table. Milestones must represent concrete progress towards the delivery of the project and include strong supporting evidence of work completed and associated financial expenditure.

Successful applicants will be required to agree to the terms of the funding agreement, including that:

- payment of approved funds is made in arrears
- applicants must submit evidence of milestone completion before milestone payments are made
- milestone payments must be no more than the permitted percentage of the eligible project costs incurred for the milestone
- funding will be apportioned to each eligible milestone, including the final milestone (a performance report after an agreed period of operation)
- the grant cannot be frontloaded and fully expended prior to the final milestone.

6.2 Funding offer and recognition

Following approval by the Minister for Energy and Decarbonisation to allocate funding to a project, the Department will send a formal funding offer to the applicant.

All funding offers will be conditional on the execution of a funding agreement with the Department within six months and any other conditions precedent as contained in the funding agreement. Failure to execute a funding agreement within this period, or failure to meet the conditions precedent, may result in withdrawal of the funding offer.

Any request from the applicant to extend the negotiating period must be made in writing.

6.3 Funding agreements

Applicants offered funding are required to enter into a legally binding funding agreement with the Department before any funding can be paid.

The funding agreement provides the legal framework for the obligations of each party and terms for milestone payments. The funding agreement will be provided to successful applicants.

Funds will not be provided until the funding agreement has been finalised, has legally commenced and any conditions precedent have been met. At a minimum, this will include:

- evidence of confirmed funding arrangements for the balance of project costs
- evidence of ownership of, access to, or the beneficial use of, any intellectual property necessary to carry out the project or evidence of the ability to acquire use of this intellectual property by the applicant.

6.4 Disbursement of funds

The funding agreement template contains a milestone table. For each milestone, the milestone table sets out the:

- milestone description
- evidence required to demonstrate the milestone has been completed
- due date
- expected eligible milestone costs
- grant payment amount
- maximum grant-to-expenditure ratio as a percentage.

The Fund has an overall limit of 25 per cent of eligible project costs; however, larger projects may have a lower limit agreed in the funding agreement.

When a milestone is complete, the grant recipient must submit evidence of completion and of eligible costs on that milestone. If the evidence of completion is sufficient, the eligible costs will be assessed.

Where eligible milestone costs are insufficient to remain within the permitted grant-to-expenditure ratio, the grant payment will be reduced proportionally.

6.5 Variations to funding agreements

Requests to vary a funding agreement (for example, changes to project milestone dates or changes in scope) must be made in writing to the Department.

The Department will assess requests for substantive modifications and may consider the impacts the variation would have on the basis for which the project was initially offered funding.

All variations will be by written agreement of the parties.

The Department may engage relevant expertise to assist with the assessment of requests to vary a funding agreement.

7 Monitoring and reporting

Monitoring and reporting requirements, including knowledge sharing, will be specified in the funding agreement's milestone table, and will be tailored to individual projects.

Projects are expected to progress at a rate consistent with the milestones for the project specified in the funding agreement. Funding recipients will be required to provide reports as specified in the funding agreement to demonstrate the performance of their project against the agreed performance milestones. Reports may include:

a) milestone completion reports

b) annual audited financial reports

c) reporting on progress, management of risk and knowledge sharing as agreed in the milestone table

d) a final report showing project performance over a specified period since commissioning.

7.1 Milestone reports

Funding recipients must submit appropriate evidence to the Department once milestones have been achieved and reported (e.g. receipted tax invoices or other formal documentation that provides evidence of the activity and related expenditure).

The Department will assess whether the relevant milestone has been met and adequately reported before authorising a milestone payment.

7.2 Final report

By the project end date specified in the funding agreement, the recipient must submit a project evaluation report and a financial report in the format prescribed in the funding agreement.

Project acquittal will not be completed until the final report has been approved by the Department.

Other reports may be agreed in the funding agreement.

Reporting requirements will be listed as milestones in the funding agreement's milestone table.

8 Other matters

8.1 Alignment with other State Government policies

Applicants are encouraged to consider in their applications how their projects will contribute to the objectives of State Government policies to deliver new jobs, enhance local content and regional development outcomes, support economic diversification and provide economic opportunities for Aboriginal and Torres Strait Islander people in WA.

8.2 Recognition requirements

In all publications, promotional and advertising materials, public announcements and activities in relation to a project, a successful recipient must acknowledge the financial support that it has received from the State Government through the Fund (as specified in the funding agreement).

The State Government reserves the right to publicise and report on the funding awarded to funding recipients. This may be done by including the funding recipient's name, amount of funding approved, and the title and a brief description of the project in media releases, general announcements about funding and annual reports.

8.3 Personal information and disclosure of information in application

State Government agencies are subject to the *Freedom of Information Act 1992* (WA), which provides a general right of access to records held by State Government agencies and local governments.

Applications identified as confidential in the application form will be treated as commercial-in-confidence; however, applicants should be aware that their applications may potentially be subject to Freedom of Information and other government disclosure requirements.

Information pertaining to the receipt of State Government financial assistance will be tabled in the Western Australian Parliament. This information could include the name of the recipient, the amount of the assistance, the name of the project and a brief description thereof. This could result in requests for more details to be released publicly and any commercial-in-confidence information should be clearly marked as such to assist in any assessments of confidentiality.

Successful applicants should be aware that their organisation's name, project name and amount of funding approved may appear on State Government websites.

8.4 Confidentiality

Information that is provided by an applicant as part of, or in connection with, an application for funding and that is identified by the applicant as being commercially sensitive will be treated as commercial-in-confidence and will only be disclosed with the consent of the applicant or in accordance with section 8.3 above.

The Department may disclose any information, including commercial-in-confidence information:

- to the Minister for Energy and Decarbonisation and his office
- to members of the Fund's assessment panel
- to independent technical experts where required
- to Department staff, consultants, advisers and auditors
- as required by law.

These parties will be required to observe appropriate confidentiality in accordance with the State Government's general confidentiality requirements for its employees and contractors.

Applicants must keep funding offers confidential until the Minister either:

(i) announces the funding offer

(ii) consents to the release of the information.

8.5 Complaints

Any complaints must be submitted in writing and will be registered with the Department and reviewed. If the Department cannot resolve the complaint within 30 business days of receiving it, the complaint will be escalated to the Fund's Executive Group.

Independent technical, financial and legal advice may be sought by the Department or the Executive Group to assist in the resolution of complaints or disputes.

8.6 Conflicts of interest

Members of the Fund's assessment panel, secretariat and administrative staff for the Fund, and technical experts engaged to provide advice will also be required to disclose any conflicts of interest (actual, perceived or potential) they have in relation to applications and may be excluded from the assessment of an application because of any conflict of interest.

8.7 Tax information

Funding provided to recipients is regarded as payment for a supply. GST-registered grant recipients will therefore be liable for GST in connection with the grant.

The grant will be increased by the amount of GST payable. Recipients must provide a tax invoice for the GST inclusive value of the grant.

Funding provided by the Fund may be treated as taxable income for taxation purposes.

8.8 Frequently asked questions (FAQs)

Frequently asked questions can be accessed on the CEFF website during a funding round.

9 Glossary

Term	Definition
Applicant	The applicant/s identified in the application, including project partners.
Applicant Guidelines	This document setting out the guidance and information necessary for applicants to apply to the Fund.
Application	An application made to the State Government for funding under the Fund, which includes a project proposal, a completed application form and any other supporting or additional information provided by the applicant in relation to the application.
Assessment panel	The Fund's Executive Group (see below) in its capacity of assessing applications to the Fund and finalising a recommendations report, supported by non-voting administrative members and probity advisory members.
Clean energy project	A project that deploys or applies a technology that reduces greenhouse gas emissions from the production or use of stationary energy. This could include energy control or management systems, renewable energy, energy storage and/or energy efficiency.
Eligible costs	Refer to section 2.4 of these applicant guidelines.
EPWA	Energy Policy WA, a group within the Department of Energy, Mines, Industry Regulation and Safety.
Executive Group	Nominated representatives from the Department of Water and Environmental Regulation and Energy Policy WA who oversee and approve key aspects of Fund administration and provide advice and recommendations to the Minister for Energy and Decarbonisation.
Fund	The Clean Energy Future Fund established under section 16 of the *Financial Management Act 2006*.
Funding agreement	The agreement for funding entered into between a successful applicant and the State Government.
Ministerial Statement of Priorities	The priority areas for funding, as determined from time to time by the Minister for Energy and Decarbonisation. Also referred to as Ministerial Priorities.

Project	The clean energy project that is the subject of the application to the Fund.
Stationary energy	Stationary energy excludes projects that use energy for transport purposes. The Fund defines 'energy use for transport purposes' as any of the following: • transport by vehicles registered for road use • rail transport • waterborne transport • air transport. This aligns with Subsection 2.41(2) of the *Federal Register of Legislation - National Greenhouse and Energy Reporting (Measurement) Determination 2008*
The Department	The Department of Water and Environmental Regulation.

10 Technology readiness levels (TRLs)

Relative level of technology development	TRL	TRL definition	Description
Systems operations	TRL 9	Actual system operated over the full range of expected mission conditions	The technology is in its final form and operated under the full range of operating mission conditions. Examples include using the actual system with the full range of wastes in hot operations.
System commissioning	TRL 8	Actual system completed and qualified through test and demonstration	The technology has been proven to work in its final form and under expected conditions. In almost all cases, this TRL represents the end of true system development. Examples include developmental testing and evaluation of the system with actual waste in hot commissioning. Supporting information includes operational procedures that are virtually complete. An Operational Readiness Review (ORR) has been successfully completed prior to the start of hot testing.
	TRL 7	Full-scale, similar (prototypical) system demonstrated in relevant environment	This represents a major step up from TRL 6, requiring demonstration of an actual system prototype in a relevant environment. Examples include testing full-scale prototype in the field with a range of stimulants in cold commissioning. Supporting information includes results from the full-scale testing and analysis of the differences between the test environment, and analysis of what the experimental results mean for the eventual operating system/environment. Final design is virtually complete.
Technology demonstration	TRL 6	Engineering/pilot-scale, similar (prototypical) system validation in relevant environment	Engineering-scale models or prototypes are tested in a relevant environment. This represents a major step up in a technology's demonstrated readiness. Examples include testing an engineering-scale prototypical system with a range of simulants. Supporting information includes results from the engineering-scale testing and analysis of the differences between the engineering scale, prototypical system/environment, and analysis of what the experimental results mean for the eventual operating system/environment. TRL 6 begins true engineering development of the technology as an operational system. The major difference between TRL 5 and 6 is the step up from laboratory scale to engineering scale and the determination of scaling factors that will enable design of the operating system. The prototype should be capable of performing all the functions that will be required of the operational system. The operating environment for the testing should closely represent the actual operating environment.

Technology development	TRL 5	Laboratory-scale, similar system validation in relevant environment	The basic technological components are integrated so that the system configuration is similar to (matches) the final application in almost all respects. Examples include testing a high-fidelity, laboratory-scale system in a simulated environment with a range of simulants and actual waste. Supporting information includes results from the laboratory-scale testing, analysis of the differences between the laboratory and eventual operating system/environment, and analysis of what the experimental results mean for the eventual operating system/environment. The major difference between TRL 4 and 5 is the increase in the fidelity of the system and environment to the actual application. The system tested is almost prototypical.
	TRL 4	Component and/or system validation in laboratory environment	The basic technological components are integrated to establish that the pieces will work together. This is relatively 'low fidelity' compared with the eventual system. Examples include integration of ad hoc hardware in a laboratory and testing with a range of stimulants and small-scale tests on actual waste. Supporting information includes the results of the integrated experiments and estimates of how the experimental components and experimental test results differ from the expected system performance goals. TRL 4–6 represent the bridge from scientific research to engineering. TRL 4 is the first step in determining whether the individual components will work together as a system. The laboratory system will probably be a mix of on-hand equipment and a few special purpose components that may require special handling, calibration, or alignment to get them to function.
Research to prove feasibility	TRL 3	Analytical and experimental critical function and/or characteristic proof of concept	Active research and development are initiated. This includes analytical studies and laboratory-scale studies to physically validate the analytical predictions of separate elements of the technology. Examples include components that are not yet integrated, or representative tested with simulants. Supporting information includes results of laboratory tests performed to measure parameters of interest and comparison to analytical predictions for critical subsystems. At TRL 3, the work has moved beyond the paper phase to experimental work that verifies that the concept works as expected on simulants. Components of the technology are validated, but there is no attempt to integrate the components into a complete system. Modelling and simulation may be used to complement physical experiments.

Basic technology research	TRL 2	Technology concept and/or application formulated	Once basic principles are observed, practical applications can be invented. Applications are speculative, and there may be no proof or detailed analysis to support the assumptions. Examples are still limited to analytic studies. Supporting information includes publications or other references that outline the application being considered and that provide analysis to support the concept. The step up from TRL 1 to TRL 2 moves the ideas from pure to applied research. Most of the work is analytical or paper studies with the emphasis on understanding the science better. Experimental work is designed to corroborate the basic scientific observations made during TRL 1 work.
	TRL 1	Basic principles observed and reported	This is the lowest level of technology readiness. Scientific research begins to be translated into applied research and development. Examples might include paper studies of a technology's basic properties or experimental work that consists mainly of observations of the physical world. Supporting information includes published research or other references that identify the principles that underlie the technology.