What Makes a Good RACE Project?

Assessment Framework & Impact Calculation Guide v3.4

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This document guides both applicants and assessors. Part 1 explains what RACE looks for in a project and how proposals are assessed. Part 2 explains how to calculate and demonstrate impact.

Part 1: Assessment Framework

Research, Innovation, and Impact

RACE's assessment framework distinguishes three related but distinct concepts, drawing on OECD definitions (Frascati Manual for R&D; Oslo Manual for innovation):

Research generates new knowledge—work that is novel, creative, uncertain in outcome, systematic in method, and produces transferable findings.

Innovation implements newness—translating knowledge into changed practice, products, processes, or behaviours. Innovation is not a subset of research; it is a distinct activity that may or may not require new knowledge.

Impact is the effect of implementation—the emissions reduced, the savings achieved, the market transformed.

Research can produce knowledge that's never used. Innovation can implement ideas that don't achieve their intended effects. RACE funds projects where all three connect: genuine research contribution, credible innovation pathway, measurable impact.

Assessment Criteria

RACE assesses projects against six criteria. Four are assessed at Expression of Interest (Research, Industry-relevant, Innovation pathway, Impact). Two are assessed at Full Application (Deliverability, Knowledge sharing). The EoI criteria are revisited at FA to confirm the expanded proposal remains coherent.

1. Research (not consulting)

Core question: *Will this produce knowledge useful to people uninvolved in creating it?*

RACE funds research, not consulting. A project qualifies as research if it meets the Frascati criteria: the work must be novel, creative, uncertain in outcome, systematic in method, and produce transferable knowledge. The key discriminator is whether the outputs will contribute to scholarship—building on existing literature and being suitable for publication or presentation to peer audiences.

Evidence: What existing scholarship does this build on? Where might findings be published or presented?

2. Industry-relevant

Core question: *Is this a problem that matters beyond a single organisation?*

As a Cooperative Research Centre, RACE exists at the industry-university interface. Projects must address problems with sectoral relevance—issues faced by multiple organisations, not bespoke solutions for a single partner. Projects arriving fully-funded (with industry contribution confirmed) demonstrate market validation, but must still show broader applicability.

Evidence: What organisations beyond the immediate partner face this problem?

3. Innovation pathway

Core question: *Why would anyone change what they do based on this research?*

Research produces knowledge; innovation translates knowledge into changed practice. A project clears this threshold if it can articulate: (a) who would adopt the outputs, (b) what they would do differently, and (c) why this approach is sufficiently distinct from current practice that adoption is plausible.

This is not a commercialisation plan. It's a theory of behavioural change—the mechanism by which new knowledge becomes new practice. Projects that cannot articulate this are at high risk of producing knowledge that sits unused.

Evidence: Who are the intended adopters? What decision or practice would change? Why is this different enough from existing approaches to be adopted?

4. Impact

Core question (EoI): *Is there a credible path to impact at the required scale?*

RACE's mission is electrification of everything (with some biogas). At EoI, applicants define the counterfactual—what happens if this project doesn't proceed—and sketch the impact pathway. Assessors make a judgment: given this logic, could credible numbers plausibly meet the benchmarks? This isn't arithmetic—it's an informed sense of whether the market size, adoption rates, and mechanisms are in the right ballpark.

Core question (FA): *Do the calculations confirm the benchmarks are met?*

At FA, full impact calculations are required using the RACE Impact Calculation Template. Part 2 of this document explains how these calculations work.

Benchmarks: Emissions metric ≤$8/t$CO_2$e; financial metric >56 (both considered in 5 year increments from 2035 to 2050).

Impact exemption pathway: Some projects cannot plausibly meet these metrics due to scale constraints—particularly equity-focused work in small or disadvantaged communities. Applicants may flag this at EoI and briefly explain. The exemption is not automatic; assessors will consider whether the project's strategic value justifies proceeding despite lower quantified impact.

Evidence (EoI): Written counterfactual and impact logic (or exemption justification).

Evidence (FA): Completed Impact Calculation spreadsheet.

5. Deliverability

Projects that pass EoI are assessed at Full Application for execution risk. Deliverability combines team capability and feasibility into a single assessment of whether the project can realistically be delivered.

Is this team right for this project? We're not asking for generic academic CVs. We want to understand project-team fit: why this particular combination of people can deliver this particular work. For teams we've worked with before, a brief statement is sufficient. For new teams or where there's concentration risk (key person dependency), more detail is warranted.

Can this be done in time and budget? This is distinct from research uncertainty (which is expected). Feasibility concerns whether the project plan is realistic given the resources available—including access to data, equipment, sites, or participants needed for the work.

Evidence: Brief statement on team-project fit; if relevant, who is critical and what happens if they leave? Realistic work plan with milestones.

6. Knowledge sharing

Core question: *How will findings reach those who can act on them?*

Beyond academic publication (which establishes research credibility), how will the project ensure its findings reach practitioners, policymakers, or industry actors who can translate knowledge into action? This is about dissemination pathways, not adoption—adoption is addressed under Innovation pathway.

Evidence: Knowledge sharing plan identifying audiences, channels, and activities beyond academic publication.

The Discriminating Question

"If the industry partner disappeared tomorrow, would this work still matter?"

A good RACE project sits at the intersection of genuine research contribution and real-world impact. If the answer to this question is 'no', the proposal may be better characterised as consulting. If 'yes', we're likely looking at research that happens to be useful—exactly what a CRC should fund.

Summary

Criterion	Core Question	Stage
1. Research	Will this produce transferable knowledge?	EoI (threshold)
2. Industry-relevant	Does this matter beyond one organisation?	EoI (threshold)
3. Innovation pathway	Why would anyone change practice based on this?	EoI (threshold)
4. Impact	Is there a credible path to impact at scale?	EoI (threshold)
	Do calculations meet benchmarks (≤$8/t$CO_2$e, ratio >56)?	FA (verified)
5. Deliverability	Is this team right? Can this be done in time and budget?	FA (assessment)
6. Knowledge sharing	How will findings reach practitioners?	FA (assessment)

Part 2: Impact Calculation Guide

Every RACE proposal must include an impact calculation that estimates the emissions reduction and financial value the project could deliver. This section explains how these calculations work and what you need to provide.

When Calculations Happen

At Expression of Interest

You do not need a full impact calculation at EoI. Instead, you need to clearly define your counterfactual: what happens without this project?

The EoI asks you to describe, in approximately 200 words, the baseline scenario against which your project's impact should be measured. This is the foundation of any impact calculation—if you cannot clearly articulate what happens without your project, the calculation cannot proceed.

Good counterfactual: *"Without this project, small and medium landfills in NSW will continue to be excluded from the ACCU framework. Regional councils will have no financial incentive to pursue methane abatement. These ~200 sites will continue emitting an estimated 1.68 $MtCO_2e$/year collectively."*

Weak counterfactual: *"Without this project, emissions will continue."* (Too vague—what emissions? How much? Who is affected?)

Borderline Outcome

EoI assessment produces one of three outcomes: No (does not proceed), Yes (proceed to FA), or Borderline. A Borderline outcome typically means the research and industry relevance look sound, but the impact case is unclear.

If you receive a Borderline outcome, you may be asked to complete impact calculations before proceeding to Full Application. This puts the burden of proof on you—if you can demonstrate the impact case with a completed calculation, you proceed; if not, the EoI does not advance.

At Full Application

Full Applications require a complete impact calculation. The FA template includes:

- A Counterfactual & Assumptions summary (200 words)—confirm and expand on your EoI counterfactual, state key assumptions clearly
- An Impact Metrics table showing $/$tCO_2e$ and financial metric at 2035, 2040, 2045, and 2050
- The completed Impact Calculation Template spreadsheet as a required attachment

Direct vs Enabling Projects

Impact calculations fall into two types. The approach differs significantly between them.

Direct Impact Projects

A direct impact project itself produces emissions reductions. The counterfactual is clear: without the project, specific emissions would occur; with the project, they are reduced or avoided.

Examples:

- Building insulation that reduces heating/cooling energy demand
- Industrial process changes that reduce direct emissions
- Fuel switching from gas to renewable electricity

Enabling Impact Projects

An enabling impact project creates conditions for other projects to reduce emissions. The project itself doesn't directly avoid emissions—it accelerates or facilitates system-wide change.

Examples:

- Regulatory reform that removes barriers to renewable deployment
- Community engagement research that increases social licence
- Workforce development that addresses skills bottlenecks

Which Approach Applies?

Ask yourself: If this project succeeds completely, does it directly reduce emissions—or does it make it easier for other things to reduce emissions?

- If the project itself reduces emissions → Direct (use template)
- If the project enables others to reduce emissions → Enabling (contact CRO)

Note 1 — Uncertainty vs mechanism: High uncertainty is not the same as enabling. A risky R&D project that, if successful, would directly reduce emissions is still a direct project—it just has low Impact confidence. The distinction is about mechanism, not certainty.

Note 2 — Market scope: Some projects influence a defined, capped market (e.g., a specific housing stock, a finite number of industrial facilities, a particular geographic region) rather than accelerating system-wide change. If the project's maximum addressable impact is smaller than a reasonable attribution fraction (2-5%) of the system-wide scenario differential, direct methodology with appropriate confidence discounting may be more suitable than enabling methodology. This avoids penalising sector-specific projects for their narrow scope when the real uncertainty is about *whether* impact occurs, not *what fraction of the system* it touches. Contact CRO if uncertain.

Direct Impact Calculations

For direct impact projects, use the RACE Impact Calculation Template (Excel). The template handles the mathematics; your job is to provide accurate inputs and defensible assumptions.

How the Calculation Works

1. Define the unit of adoption—What gets deployed? (dwelling, system, site, vehicle)
2. Estimate impact per unit—How much energy saved/generated or emissions avoided per unit per year?
3. Define the market—How many units could adopt this at full market saturation?
4. Model adoption—Template uses Fisher-Pry S-curve; you specify when 10% and 90% adoption occur and at what level adoption saturates.
5. Apply confidence factors—Output × Usage × Impact confidence scales the raw estimates (see below for details)
6. Calculate metrics—Template produces $/t$CO_2$e and financial metric at milestone years

What You Need to Provide

- Project cost—Total RACE funding requested
- Energy/emissions per unit (both factual and counterfactual)—With source/methodology for the estimate
- Market size and saturation—Addressable market and realistic penetration ceiling
- Adoption timing—When 10% and 90% adoption; justify based on deployment barriers
- Confidence factors—Output (technical certainty), Usage (supply chain readiness), Impact (adoption likelihood)

Enabling Impact Calculations

Enabling projects require CEO involvement because the calculation uses AEMO Integrated System Plan (ISP) scenarios and requires judgment about attribution—what fraction of system-wide change can this project claim?

The Core Insight

AEMO's ISP models multiple scenarios for Australia's energy future. Two are particularly relevant: Step Change (faster transition) and Slower Growth (slower transition, formerly called Progressive Change). Both reach net zero by 2050—the difference is how fast we get there, and therefore how much cumulative emissions occur along the way.

The gap between Slower Growth and Step Change represents emissions that could be avoided by accelerating the transition. A project that improves social licence, removes regulatory barriers, develops workforce capacity, or enables consumer resource coordination is pushing us from Progressive Change toward Step Change—claiming a share of that emissions differential.

How the Calculation Works

1. **Quantify the scenario differential**—Emissions difference between Slower Growth and Step Change by year
2. **Assign an attribution factor**—What fraction (typically 1-10%) can this project claim?
3. **Apply a scale factor shape**—How quickly does the enabling effect ramp up?
4. **Apply confidence factors**—Same three factors as direct calculations.

What You Need to Provide

Even though the CEO performs the final calculation, you provide the raw material:

- **Theory of change**—How does your project accelerate the energy transition? Be specific about causal mechanisms.
- **Scope of influence**—What part of the system does your project affect? (geographic, sectoral, technological)
- **Evidence for attribution**—Why should we believe this project will have the claimed enabling effect?
- **Project cost**—Total RACE funding requested

Confidence Factors

Both direct and enabling calculations apply three confidence factors (measured as percentages from 0-100%):

Output confidence: Will the project deliver its intended outputs?

Usage confidence: Will those outputs be adopted/implemented by the industry partners?

Impact confidence: Will the outputs, and usage by the industry partners, lead to the broader modelled impact?

Combined Confidence = *Output* × *Usage* × *Impact*

These factors substantially discount raw estimates to reflect real-world risk. A project with 80% Output, 70% Usage, and 15% Impact confidence has a combined confidence of 8.4%—meaning only about one-tenth of the theoretical impact is credited.

What Assessment Looks For

By the time a project reaches Full Application, the impact case has already been established—either cleared at EoI, or demonstrated through calculations required after a Borderline outcome. So assessors are not simply asking "do the numbers meet the benchmarks?"

Instead, FA assessment evaluates the robustness of the impact case:

- Is the counterfactual well-defined and defensible?
- Are the assumptions clearly stated and reasonable?
- How sensitive are the projections to changes in key assumptions?
- Is the adoption curve realistic given deployment barriers?
- Are the confidence factors justified, not just asserted?

A project can meet the numeric benchmarks but still have a weak impact case if it's built on heroic assumptions or an unclear counterfactual. Conversely, a project with modest numbers but a well-reasoned, defensible impact case may be viewed more favourably.

Failure to meet impact benchmarks is the most common failure for unsuccessful funding applications. It is important to ensure all inputs are defensible and that the calculation is fully understood.

Common Mistakes

- **Unclear counterfactual**—"Compared to what?" must have a specific answer
- **Unsupported market size**—"All Australian households" is rarely the real addressable market. Targeted adoption must be plausible.
- **Optimistic adoption timing**—Most technologies take longer to reach 90% than advocates expect
- **Unjustified confidence factors**—"We're confident" is not a justification
- **Counterfactual not developed from EoI**—The FA should confirm and expand, not simply repeat verbatim
- **Milestone years don't match**—Use the four standard years: 2035, 2040, 2045, 2050
- **Spreadsheet not attached**—The completed template is a required attachment, not optional

Getting Help

- **Template questions:** Contact CRO or Program Leader
- **Uncertain which approach applies:** Contact CRO or Program Leader—we'll help determine the right approach
- **Enabling calculation support:** Contact CRO—we'll guide you on what's needed for the calculation

Appendix: Compound Interventions — Worked Example

For single-intervention projects, the template handles calculations directly—this appendix is only needed when multiple interventions interact.

Some projects involve multiple simultaneous changes that interact with each other. The Impact Calculation Template's modules are designed for single-intervention projects; compound interventions require calculating net impacts externally before entering values into the template.

This appendix provides a worked example using housing retrofit, but the same logic applies to other compound cases (e.g., industrial process change + fuel switching + waste heat recovery).

The Pattern

Compound interventions have effects that don't simply add together:

- Electrification *adds* electricity demand (replacing gas appliances with heat pumps)
- Efficiency improvements *reduce* electricity demand (better insulation, sealing)
- Solar generation *offsets* some demand (but only the self-consumed portion)
- Gas elimination removes a fuel stream entirely

You must work through these interactions to determine the net impact before entering anything into the template.

Worked Example: Housing Retrofit

Project context: Upgrade social housing dwellings with insulation, electrification of gas appliances, and rooftop solar.

Step 1: Establish baseline (counterfactual)

Parameter	Value	Source
Baseline electricity consumption	5,237 kWh/year	Frontier Economics (2020), average Australian household
Baseline gas consumption	16,945 MJ/year	Frontier Economics (2020), NSW 2-person household

Step 2: Calculate each intervention effect

Intervention	Calculation	Result
Electrification load increase	Gas load (16,945 MJ = 4,707 kWh thermal) ÷ heat pump COP (3.0)	+1,569 kWh/year
Efficiency improvement	20% reduction in heating/cooling load (informed by Victorian Healthy Homes)	−20% of demand
Solar generation	3 kW system × 1,382 kWh/kW/year (CER zone average)	4,146 kWh/year

Intervention	Calculation	Result
Solar self-consumption	40% of generation consumed on-site	1,658 kWh/year

Step 3: Calculate net electricity position

Component	kWh/year
Baseline electricity	5,237
+ Electrification load	+1,569
= Underlying demand	6,806
– Efficiency savings (20%)	–1,361
= Net demand	5,445
– Solar self-consumption	–1,658
= Net grid imports	**3,787**
Change from baseline	**–1,450**

(*Note: Numbers may not sum exactly due to rounding in the source calculation.*)

Step 4: Determine what to enter in the template

Option A — Electricity only: Enter 1,450 kWh/year in Module A (Energy Savings), plus gas elimination in Fuel Savings.

Option B — Total primary energy: Convert gas to kWh-equivalent (16,945 MJ ÷ 3.6 = 4,707 kWh) and report combined energy impact (1,450 + 4,707 = 6,157 kWh/year).

Either approach is defensible if documented. The emissions calculation should capture both streams regardless—gas elimination contributes via the fuel emission factor, electricity savings via the grid emission factor. Do not double-count: if you include gas-as-kWh in Module A, do not also claim it in Fuel Savings.

Step 5: Document in Scenario Definition

The Scenario Definition sheet should show this working. Assessors need to see the logic, not just the final number. Include:

- Baseline assumptions and sources
- Each intervention effect with its basis
- The interaction calculation
- Which reporting approach you chose and why

Sanity Checks

Before submitting, verify that your net figures make physical sense:

- Efficiency savings should not exceed baseline consumption
- Net grid imports should not be negative unless you're claiming net export (which requires Module B)
- Electrification should increase electricity demand roughly in proportion to the thermal load being displaced, adjusted for heat pump efficiency
- Solar self-consumption rates above 50% are unusual without batteries

If something looks implausible, revisit your assumptions.

When to Seek Help

Contact your Program Leader if:

- You're unsure how to structure the interaction calculation
- The net result is sensitive to assumptions you're uncertain about
- You're combining more than three intervention types
- The template modules don't map cleanly to your project structure