



National Centre of
Excellence in Desalination
AUSTRALIA

**FUNDING ROUND 4, 2012:
GUIDELINES FOR RESEARCH PROJECT APPLICANTS**

Deadline for submission of Expressions of Interest (EOI) is midday WST on **Monday January 23, 2012**
Submit EOIs electronically in **Word format** to proposals@desalination.edu.au
Enquiries to Dr Misty-Lee Palmer: (08) 9360 7174 or info@desalination.edu.au

The National Centre of Excellence in Desalination Australia (the Centre) has a mandate to optimise and adapt desalination technology for Australia, develop solutions for inland areas, and reduce the carbon footprint of desalination through investment in a portfolio of research projects. This fourth funding round will primarily be seeking project proposals that are targeted at gaps in the Centre's project portfolio in relation to the [Australian Desalination Research Roadmap 2010 \(Roadmap\)](#) (see Scope below for details). However, all project proposals that fit within one of the Centre's research areas will also be considered:

1. Pre-treatment,
2. RO desalting,
3. Novel desalting,
4. Concentrate management, and
5. Social, economic and environmental issues.

Timeframe

Milestones for Funding Round 4 are shown in the table below. Deadlines for applicants are in **bold**.

Date	Milestone
Monday November 28, 2011	Call for Expressions of Interest (EOIs) opens to Centre <i>Participating Organisations</i> (members)
Monday January 23, 2012	Deadline for EOI submission
Monday February 13, 2012	EOI evaluation completed Shortlisted applicants invited to submit proposals
Monday March 26, 2012	Deadline for proposal submission
Monday April 30, 2012	Approved projects announced
Monday June 25, 2012	Deadline for execution of Project Agreements

Eligibility

Only *Participating Organisations* (POs) who are signatories to the Collaboration Agreement will be eligible for participation in the funding round as Project Leaders. These POs comprise:

- Murdoch University
- Commonwealth Scientific and Industrial Research Organisation
- Curtin University of Technology
- Deakin University
- Edith Cowan University
- Flinders University
- Monash University
- The University of New South Wales
- The University of Queensland
- University of South Australia
- University of Technology, Sydney
- Victoria University
- The University of Western Australia
- University of Wollongong

Any organisation is eligible to participate in a project as a Research Participant, however only the POs listed above are eligible to lead projects and submit Expressions of Interest. Other organisations are encouraged to contact either the Centre or POs listed above to explore collaborative research opportunities.

Scope

Unlike earlier open Funding Rounds that sought research on any Roadmap topic, this fourth funding round is primarily seeking projects targeted at gaps in the Roadmap topics. Roadmap topics under-represented in the Centre's research portfolio comprise:

- **2.6 Operational optimisation**; e.g. long-term improvement of desalination performance
- **3.1 Novel technologies including those for direct agricultural use**; e.g. reverse osmosis in novel food production applications such as grains and horticulture with consideration of the food-energy-water nexus; and treatment of difficult water in a mining or industrial context
- **3.3 Coupling water production with renewable energy**
- **3.4 Piloting breakthrough near-commercial desalination technologies in real-world situations**; e.g. novel and disruptive applied technologies
- **4.1 Novel zero liquid discharge processes**; e.g. concentrate minimisation
- **5.2 Total life cycle analysis and sustainability assessment of desalination against other water sources**; e.g. economic analysis of SWRO operation and integration with traditional water supply

The Centre will also be engaging with and inviting EOIs and Proposals from researchers that address these and other topics. Some funding in this round has been set aside by the Board to progress future stages of existing projects based on successful project outcomes.

Industry needs

The Centre invites industry to propose projects that address their needs and which could be solved through collaborative research. Some suggested projects related to seawater reverse osmosis (SWRO) plants include:

1. **SWRO CONCENTRATE RETURN - Collation of performance data**
To assess existing performance data and to provide a more consistent approach to toxicity testing of concentrate, with the view to developing a national guideline.
2. **SWRO CONCENTRATE RETURN - Develop improved methods for toxicological assessment**
To build on existing studies and assess the approach to toxicity testing of brine, both at the laboratory and field scales in order to assess acute and long term impacts, respectively.
3. **SWRO CONCENTRATE RETURN - Validation of hydrodynamic models within and outside the mixing zone**
To build on previous work by reviewing hydrodynamic models, incorporating an assessment of diffuser design of both predicted (modelled) and observed dilution performance.
4. **CORROSION AND MATERIALS - Improved understanding of construction materials and coatings to resist corrosion**
To develop a better understanding of what materials and coatings should be selected for construction, with a view to also optimising operations and maintenance to maintain the integrity of the materials and surfaces.

5. **INTAKE STRUCTURES - Impact of intake structures on non-motile biota**
To develop a better understanding of the impact of intake structures on the trophic food web.
6. **WASTE MATERIAL FROM SWRO PROCESS - Disposal of waste material from desalination treatment other than to landfill**
To investigate the treatment and discharge of waste material into the marine environment, with a view to reducing the need for landfill disposal.

For further information on these projects, please contact the CEO, [Mr Neil Palmer](#).

Applicants seeking further information about targeted Roadmap topics should in the first instance contact the Chief Scientific Officer, [Professor David Furukawa](#), to obtain further information on these opportunities.

Other topics

Applicants are welcome to submit an EOI for any project that aligns with the Roadmap, however projects addressing the targeted areas or addressing specific needs raised by industry will be weighted significantly higher.

Alignment with Roadmap

All EOIs and proposals will be expected to address specific needs or opportunities identified in the *Roadmap*. Priority research themes span five technology areas, and in summary, comprise:

Pre-treatment:

- 1.1 Preheating using waste heat or renewable energy and the use of lower-pressure membranes
- 1.2 Optimal use of chemicals
- 1.3 Specific issues for pre-treatment in rural and remote areas relating to seasonal and location variability in feedwater composition
- 1.4 Characterisation of groundwater and seawater sources and mapping those to best fit desalination technologies

Reverse osmosis desalting:

- 2.1 Anti-fouling technologies and membranes and oxidant-resistant membranes
- 2.2 New membrane materials that reduce operating pressure while maintaining or increasing flux rates and maintaining ion rejection
- 2.3 Contaminant removal without the need for second-pass RO
- 2.4 Direct use of renewable energy via kinetic, electrical, or thermal means
- 2.5 Real-time monitoring and classification of potential foulants
- 2.6 Operational optimisation

Novel desalting:

- 3.1 Novel technologies including those for direct agricultural use
- 3.2 Low-maintenance, reliable evaporative technologies using waste heat or renewable energy
- 3.3 Coupling water production with renewable energy
- 3.4 Piloting in real-world situations breakthrough near-commercial desalination technology

Concentrate management:

- 4.1 Novel zero liquid discharge processes
- 4.2 Waste minimisation based on value adding
- 4.3 New materials for lower-cost corrosion management
- 4.4 Extraction of desalted water at source or concentrate injection

Social, economic and environmental issues:

- 5.1 Appropriate disposal or reuse of spent membrane cartridges
- 5.2 Total life cycle analysis and sustainability assessment of desalination against other water sources
- 5.3 Public perception analysis and improvement through education and communication
- 5.4 Policy development to better understand energy-water interdependence
- 5.5 Centralised understanding of national desalination deployment, performance, and lessons learnt
- 5.6 Detailed understanding of the salinity and toxin tolerance of marine species in the vicinity of SWRO outflows
- 5.7 Management of entrainment of small marine organisms in SWRO intakes

Refer to Tables 13 and 14 in section 4 of the *Roadmap* for details of these Priority Research Themes.

Research funding principles

The Centre is seeking fundamental and applied research aligned with the *Roadmap* with the greatest expected improvement in desalination capability that is collaborative, develops national research capacity and capability, provides research training, and produces commercialisation opportunities. The following principles will be followed.

Investment is subject to Board approval. Applicants should note that all Centre research investment decisions will be subject to approval of the Centre’s Board. The Board may choose to approve projects for strategic investment outside the funding round process. Continued funding for Centre research projects is conditional on researchers meeting Centre requirements, including execution of a satisfactory project agreement, satisfactory completion of agreed project milestones and stages, acceptance of progress reports, satisfactory reports from any third party reviews, and acceptance of any requested variations.

Alignment with Research Roadmap. The *Roadmap* sets out the research strategy for the Centre. EOIs and proposals will be expected to address specific needs or opportunities identified as key priorities in the *Roadmap*.

Advancement in Desalination Capability. The Centre encourages projects that develop national capacity and capability in desalination research and therefore promote effective collaboration and research training. Central to the *Roadmap* is the necessity of getting the largest gain in improving desalination capability for the research funds expended. Evaluation criteria will include a relative ranking of possible improvement as well as a likelihood of success.

Open call for Expressions of Interest from Participating Organisations. The Centre recognises that preparing full proposals requires considerable investment in resources and time and therefore invites, in the first instance, brief and concise EOIs from POs. These will be assessed against evaluation criteria; the highest ranked EOIs will be shortlisted and a full proposal invited from successful applicants. Feedback to applicants of shortlisted EOIs may comprise suggestions such as to include or exclude certain objectives, to restructure the project, to adjust the funding requirements, to consider or build on results of previous projects, to consider collaborating with other organisations, or to combine similar or complementary EOIs. For strategic or budget reasons, the Centre may also request the full proposal to be submitted at a later date.

Proposals by invitation only. Research project proposals seeking Centre funding are to be submitted by invitation only based on short listed EOIs. Unsolicited proposals will not be considered.

Collaborative proposal development. The purpose of first seeking EOIs is to allow the Centre to guide applicants in developing plans to capture the best possible research opportunities. The Centre will therefore assist proponents of short listed EOIs in identifying possible synergies where multiple applicants submit similar or complementary EOIs, and encouraging widespread collaboration. With the permission of proponents, the Centre will use the information contained in the EOI to confidentially explore collaboration opportunities with other POs and industry partners. The Centre will seek proponents’ approval in writing before approaching any other organisation.

Leveraged cash investment from industry in Applied projects. The Centre seeks a contribution from research participants towards project costs. All cash and in-kind contributions to project budgets will be favourably considered. In addition, the intention is for Applied projects to be highly focused on industry needs, and the Centre requires matching cash funding from industry in order to validate strong alignment of the project objectives with industry need. Recognising industry budgetary approval constraints, the timing for industry investment in a project is flexible (i.e. the Centre will accept a committed phased or later investment in a project from an industry partner) and industry involvement can be expanded over the duration of the project. Leveraged funding must be applied to project activities and will be held in trust by the Centre.

Progress towards technology readiness. The Centre seeks projects that, in the case of Applied research and some Fundamental research, provide tangible, measurable progress in the maturity of a technology or methodology.¹ Projects that can clearly provide potential commercialisation outcomes and support the mission of the Centre will be favourably considered. Technology readiness levels are described in Figure 1.

Payment on milestones and deliverables. Project funding will be provided in arrears in a phased or gated manner strictly to acceptable milestone and deliverable progress. Agreed milestones and deliverables will be incorporated into the Project Agreement based on those proposed.

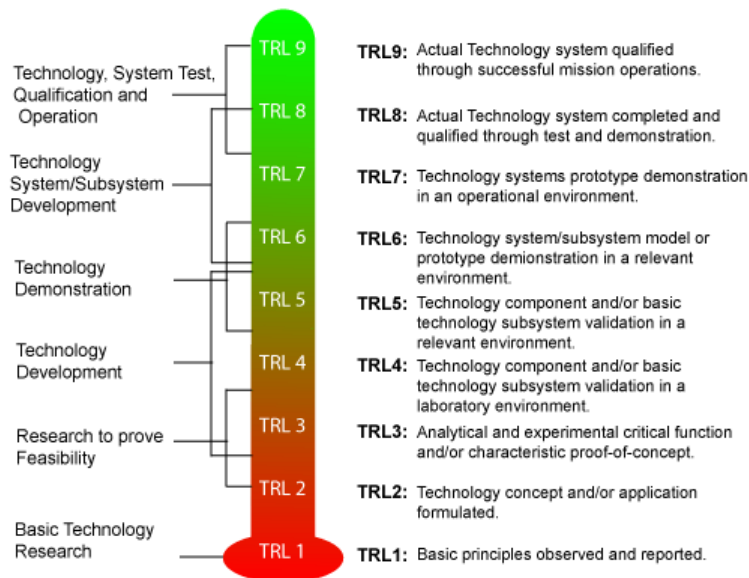


Figure 1: Technology readiness levels²

Pilot-scale research carried out at NCEDA Rockingham. The Centre will favourably assess projects that perform pilot-scale research at its Rockingham Desalination Research Facility. The NCEDA Rockingham facility will be opened in early September 2011 to coincide with the International Desalination Association’s World Congress being held in Perth. Should you require more information about the capabilities and resources offered to researchers, please email info@desalination.edu.au.

Centre funding available

For Funding Round 4, up to \$5 million of Centre funding is available. Project selection is subject to Board funding approval. Funds applied for from this Funding Round 4 will be required to cover the entire project’s budget, not just the first year’s budget.

Project budget guidelines

The funding guidelines in the table below represent expectations for project budget inclusions and are subject to change at the discretion of the Centre’s Board.

Cash contributions are defined as monies that flow through the Centre for the purposes of the project. All other direct contributions to the project are considered in-kind.

Funding for Applied projects will be provided up to the level of industry cash leverage secured by the proponent. No industry cash leverage is expected for Fundamental research. All cash or in-kind leverage will be assessed favourably.

¹ John C. Mankins (1995). [Technology Readiness Levels](#), AdvaCentre Concepts Office, Office of Space Access and Technology, NASA.

² Defence Acquisition (2010), [‘What are Technology Readiness Levels?’](#), UK Ministry of Defence.

	Guidelines for Fundamental projects	Guidelines for Applied projects
Centre funding		
Funding limits	\$500,000 across the life of project. Higher requests may be considered for multi-party projects. Funding request must cover entire project budget from current funding round.	
Project length	1–3 years	1–2 years
Matching contributions	No minimum. Cash and in-kind contributions will be assessed favourably in leverage selection criterion.	Industry-contributed cash funding must at least match Centre funding request. Cash and in-kind contributions (beyond this minimum) will be assessed favourably.
Eligible cash expenditure	<p>Personnel: Salaries, fellowships, scholarships, stipends, teaching relief (plus direct on-costs up to 28%).</p> <p>Commercialisation: Patent costs, IP protection, third-party licensing, technology adoption or transfer</p> <p>Equipment: Minor equipment (up to \$30,000).</p> <p>Materials: Direct research costs including materials, consumables, and operational expenses.</p> <p>Publications: Conference presentations and journal articles.</p> <p>Reporting: Progress reports and auditing.</p> <p>Subcontract: Services, access to Centre equipment and facilities, and access to other equipment and facilities.</p> <p>Travel: Domestic and international travel costs for directly related fieldwork, collaboration, and conferences.</p> <p>Other: Directly related, justifiable costs not considered above.</p>	
Ineligible cash expenditure	<p>Activities already funded by other Australian Government schemes.</p> <p>Capital works, major equipment (over \$30,000), or infrastructure.</p> <p>Basic facilities (accommodation, library, IT, telecommunications).</p> <p>International activities (or sub-contracts) above 15% of the total project budget.</p>	
In-kind contribution		
Eligible contributions	<p>Personnel: Three times actual salary (representing on-costs and indirect costs) for personnel.</p> <p>Facilities: Access to capital items or services based on proportional internal running costs and depreciation by usage.</p> <p>Indirect costs: Indirect research costs at 77–99% of the subtotal of cash-funded eligible costs³.</p>	
Ineligible contributions	<p>Development costs for existing equipment, facilities, materials, or systems.</p> <p>Commercial or charge-out rates for access to facilities or services.</p>	

³ **Eligible indirect research contributions of cash-funded items** (comprising institutional overheads, administrative charges, infrastructure charges) will be capped at 99%, 93%, 79%, or 77% for ACG Research Intensity Group One, Two, Three, and Four respectively, per Table 5.4, p52, Allen Consulting Group (2009), [Indirect Costs of University Research Funded Through Australian Competitive Grants](#). The inclusion of indirect costs as an eligible in-kind contribution recognises that the full cost of research at a university is higher than the direct cost. Although eligible expenditure for NCEDA projects is limited to direct costs (plus salary on costs of 28%), the indirect costs of cash-funded research activity at universities or CSIRO (e.g. institutional overheads, administrative charges, infrastructure charges) will be recognised by the Centre as an eligible in-kind contribution by that institution; this is without regard to the source of the funding, whether NCEDA grant funds, industry cash contribution, or institution cash contribution. Applicants should calculate the indirect cost in-kind contribution for a university involved in a project by multiplying the relevant factor for a university by the total eligible project cash expenditure at that university (excluding travel and subcontracting). For example, if a project budget includes a \$100,000 salary plus \$28,000 on-costs and \$10,000 of consumables, all funded by cash, to be carried out at a Group Two university, an in-kind contribution of \$128,000 (being \$138,000 * 0.93) can be included to represent the indirect cost.

Intellectual property

The Centre has a robust intellectual property (IP) management framework governed by its funding agreement with the Australian Government and its Collaboration Agreement between POs. IP generated in a project (including improvements to background IP contributed to the project) is referred to as Centre IP and vests in the Administering Organisation on behalf of the Centre and its POs.

The Centre expects to pursue commercialisation opportunities for Centre IP. Any revenue arising from the commercialisation of IP developed in a project will be split equally between the Centre and each Research Participant; contributors of Background IP licensed to the project will receive an additional share.

The Commonwealth and POs have limited rights to use Centre IP for internal research purposes. Each PO must ensure any student involved in a project enters into a deed of assignment prior to the commencement of the project. Subject to confidentiality and commercial considerations, the Centre will not unreasonably restrict the publication of project outcomes by project participants.

Project agreement template

Due to the structure of the Centre's established governance framework under its funding agreement with the Australian Government, and its Collaboration Agreement between Participating Organisations, amendments to the NCEDA Project Agreement template are unlikely. Therefore, it is important for prospective Research Participants to understand all the terms of the Project Agreement including the key terms outlined below.

[NCEDA Project Agreement template](#) (0.5 MB PDF)

Project-generated IP is owned by the NCED

The Centre has a robust intellectual property (IP) management framework governed by its funding agreement with the Australian Government and its Collaboration Agreement between Participating Organisations. IP generated in a project (*Project IP*), and improvements to *Background IP* contributed to the project, is referred to as *Centre IP* and vests in the Administering Organisation on behalf of the Centre and its Participating Organisations (see Project Agreement cl. 9).

The Commonwealth and Centre Participating Organisations will have limited rights to use *Centre IP* for internal research purposes (see cl. 8(b) (ii) and (iii), and 9(d)).

A non-exclusive licence will be required for all Background IP contributed to the project

The Centre requires a non-exclusive licence for all *Background IP* necessary to undertake the project and to commercialise *Project IP* (see cl. 8). Research Participants will retain ownership of *Background IP*. In Schedule 1.4D, list the details of your *Background IP* required to complete the project and any prior licences or encumbrances.

Student participation requires a deed of assignment

Each Participating Organisation must ensure any student involved in a project enters into a deed of assignment prior to the commencement of the project (see cl. 9(b)).

Research Participants and industry support agreements

Organisations making significant contributions or providing Background IP must be parties to the Project Agreement, and are referred to as *Research Participants*. Other organisations may be engaged through industry support agreements with the Centre.

Cash contributions must flow through the Centre

Any cash contributions from Research Participants that do not flow through the NCEDA for the purposes of the project will be treated as in-kind contributions.

Pre-publication review

Research Participants will have the opportunity to review publications before they are submitted for publication. Drafts must be provided to Research Participants and the Centre's CEO at least 30 days before the submission date.

and amendments or a delay may be requested. Subject to confidentiality and commercial considerations, the Centre will not unreasonably restrict the publication of project outcomes by project participants (see cl. 13).

Commercialisation process

Through the Centre’s Commercialisation Advisory Committee, the Centre will work with Research Participants to explore and realise appropriate commercial opportunities. Ultimately, all decisions related to commercialisation will be made by the Centre under advice from the Committee and in consultation with Research Participants (see Collaboration Agreement cl. 16).

Revenue shares from commercialisation

Any revenue arising from the commercialisation of IP developed in a project will be split equally between the Centre and each Research Participant. Contributors of *Background IP* licensed to the project will receive an additional share (see Project Agreement cl. 10).

More information

Should you have any questions about the terms of the Project Agreement please feel free to email commercialisation@desalination.edu.au.

Evaluation criteria

EOIs and proposals will be evaluated by the Centre’s Research Advisory Committee on technical, resources, commercial, economic, and strategic criteria (where appropriate) as detailed in the table below.

Criteria	Factors
Technical	Intrinsic merit of the research Progress towards achieving critical success factors Probability of technical success
Resources	Investigators’ track records Competence in the required disciplines Provision of sufficient resources
Commercial (for Applied projects)	Size or importance of market Anticipated product effectiveness Competition Probability of market success through proposed commercialisation pathway
Economic	Leveraged funding In-kind support contributed Research training Funding requested
Strategic	Alignment with <i>Roadmap</i> and/or mission of the Centre Promotion of collaboration Pilot-scale research carried out at NCEDA Rockingham Development of national desalination research capabilities Other strategic benefits to the Centre and Australia

The value of a project will be determined on a benefit/cost basis: the value of positive benefits denominated by the Centre funding sought, taking into account any uncertainty and risk.

Proposal development assistance

Each PO may apply for reimbursement of up to a maximum of \$20,000 (including GST if applicable) to assist with the development of a collaborative multi-party proposal for shortlisted EOI(s) for which they are Project Leader.

Allowable expenditure may include:

- Reasonable travel expenses (according to the PO's travel policy), for face to face meetings with proposed collaborators and research partners suggested by the Centre's CEO; and
- Engagement of Centre approved consultants to assist with project planning and strategy development, proposal writing, market research, or competitive IP intelligence.

Reimbursement will be made at the discretion of the Centre's CEO on receipt of an itemised tax invoice with supporting receipts, subsequent to the submission of the associated proposal(s). Only one claim per shortlisted EOI is eligible for reimbursement. All claims for reimbursement will be subject to the record keeping and audit requirements of both the Australian Government Funding Agreement and the Centre Collaboration Agreement.

Feedback on research investment process

The Centre aims to efficiently and effectively manage the research investment process and would welcome feedback on the funding round process in order to improve future rounds. Please email info@desalination.edu.au with your comments or suggestions.