Proposal Form
for Standards Development Projects

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STANDARDS Australia

GUIDANCE

How do I use this form?

- Use the Tab key to move to the next field and Shift+Tab to go back to the previous field.
- Guidance has been provided within free text fields - delete this information before typing your input.
- Additional documents (such as Net Benefit case or details of program of work) can be attached to the completed proposal on submission.

What information do I need to provide?

Section & Title	Requirement
1. Proponent Details	All proposals need to be submitted by an individual. Provide contact details to be used in any correspondence regarding the proposal.
2. Proposal Details	Specify the title, type, relevant sector(s) and type of work being proposed. If a program of work, further information can be provided in the appendix or attachments.
3. Summary and Demonstration of Net Benefit	Outline the need for, and Net Benefit impact of, the proposed work on the Australian community.
4. Harmonisation and Alignment	List existing related documents and alignment of proposed work to these.
5. Pathways for Standards Development	State the desired development pathway and who will fund the proposed work.
6. Requests for Standards Australia resourcing	Provide justification for requesting resource support from Standards Australia for this proposed work.
7. Stakeholder Support	Provide details of relevant stakeholders across interest groups, the consultation process undertaken and whether they support the proposal.
8. Risks and Dependencies	Highlight known risks and any dependencies that may impact successful completion of the proposed project/program.
9. Additional Information	Provide any additional information which may assist in consideration of the proposal.
10. Declaration	Confirm that all information within the proposal form is true and accurate.
Appendix A: Details of projects within a proposed program of work	Where appropriate, provide details of projects in order of priority for development where multiple projects or a program of work is being proposed.

How do I submit a completed proposal?

1. Complete a pre-submission check to ensure that:
    - ✓ All sections of the form are complete.
    - ✓ The Net Benefit case is fully articulated and, where possible, quantified.
    - ✓ Full stakeholder consultation has been conducted with evidence provided.
    - ✓ The declaration is complete.
    - ✓ All supporting documentation is attached to the proposal.
2. Submit completed proposal along with all supporting documentation by email to mail@standards.org.au
3. If for any reason, you are unable to submit this form by email, please contact Standards Australia (1800 035 822).

NOTE: *Standards Australia reserves the right to make public information relating to Standards development projects, including information contained within submitted proposal forms and the attached Net Benefit Case in part or in full.*

PROPOSAL FORM FOR STANDARDS DEVELOPMENT PROJECTS

Proposal Reference Number	*Standards Australia to Complete*

1. Proponent Details

Your name	Phil Wilkinson
Position	Engineering Manager and Business Development
Name of employer	Australian Institute of Refrigeration Airconditioning and heating (AIRAH)
Name of nominating organisation	Australian Institute of Refrigeration Airconditioning and heating (AIRAH)
Address	Level 3 / 1 Elizabeth Street
Suburb	Melbourne
State	VIC
Postcode	3000
Phone number	03 8623 3010
Fax number	03 9614 8949
Mobile number	NA
Email address	phil@airah.org.au
Web address	www.airah.org.au

2. Proposal Details

Proposal title	**Development of new standard "Solar thermal cooling systems – Energy rating and testing for performance"**	
Proposal summary	This proposal relates to the creation of an Australian Standard for the performance assessment and rating of Solar Cooling systems. The purpose of the standard is to evaluate the electrical consumption and thermal energy performance of solar thermal cooling systems under defined operating conditions. This standardised data can then be used for the purposes of estimating the energy offset applicable to solar cooling systems for the calculation of renewable energy credits.	
Project or program	Project	*If program, include details in Appendix A.*
Project type	New	
Product type	Standard	
Scale of proposed work	Medium	This project is considered to be medium in size as it proposes to develop a new standard along similar lines to existing rating standards that have been developed for other technologies and use existing standards and methods for component rating.
Sector	5 Electrotechnology and Energy	Also building and construction
Existing Standard or	NA	

other SA product		
Application	Australia Only	
Performance-based or prescriptive	Prescriptive. The proposed standard will specify a prescriptive rating system and performance test regime to determin system/equipment performance capabilities under defined operating conditions.	
Relationship to legislation	*Is/will this Standard be referenced in legislation?*	Maybe in future
	If yes, is this as a primary or secondary reference?	Please Select
Details of legislation	This Standard may be referenced in energy efficiency legislation in the future and could also be referenced in legislation or regulations regarding emissions trading and carbon pollution reduction.	

3. Summary and Demonstration of Net Benefit

All Australian Standards developed by Standards Australia must demonstrate a Net Benefit, i.e. the Standard must have an overall positive benefit to the Australian community. All proposals for new work must describe a clear need for a Standards solution and the anticipated Net Benefit in the form of a Net Benefit case. Further guidance is available within the SA Guide to Net Benefit.

Need for the proposed work	Solar airconditioning is an emerging renewable (or hybrid-renewable) energy technology that is technically proven and suitable for wide scale deployment. Wiemken E. (ed), ("SOLAIR Best Practice Catalogue on Successful Running Solar Air-Conditioning Appliances", June 2008) describes the design of 21 commercial installations in some detail, and there are purported to be over 400 installations worldwide, growing at a rate of around 90% per year over the last four years. Solar airconditioning uses solar energy to displace carbon intensive fossil fuel derived electricity that would otherwise be consumed by conventional airconditioners. Avoided electricity consumption is comparable with electricity displaced by the use of solar photovoltaic cells (on the customer side of the meter), and the economics of solar airconditioning appears to be comparable with that of solar photovoltaics (Kohlenbach P. and Dennis M., "Solar Cooling in Australia: The future of air-conditioning?", Proc 9th Int. Gustav Lorentzen Conference, Int. Institute of Refrigeration, Sydney, April 2010). Given the high carbon intensity of Australian electricity, the warm climate and excellent solar resource, Australia would appear to be an ideal place for implementing solar airconditioning. Indeed, based on true (unsubsidised) economic comparisons, solar airconditioning could be expected to have a similar share of the renewable energy market to solar photovoltaics. Unfortunately, solar airconditioning cannot compete on a level playing field with other renewable energy technologies because it is not eligible for renewable energy certificates (RECs). To address this market entry barrier, a process is required to enable solar airconditioning to access the RECs system.

	The goal of the proposed standard is to document a method for evaluating the electrical and thermal energy consumption of solar thermal cooling systems for the purposes of estimating the energy offset for calculation of RECs. Knowing the amount of carbon saved will then allow the correct amount of RECs to be allocated to solar cooling and airconditioning projects. The specific objectives of the standard are: • To provide a standardized procedure for comparing the performance of solar cooling products and determining their thermal performance and energy use. • To provide a realistic estimate of the expected energy savings of a solar cooling product relative to conventional airconditioning products and to renewable electricity. • To provide data which can be used to support claims for government rebate schemes; specifically for the calculation of RECs. • To support the increase of the uptake of solar cooling technologies in Australia. Creation of a new Australian Standard for rating Solar Cooling technology is a key step in the future development of the solar cooling industry in Australia and one for which there is clear justification. The successful and rapid spread of low emissions solar hot water systems into the domestic hot water market has been, to a large part, the result of government rebate schemes made practical by the establishment of a standard rating procedure to evaluate RECs (AS4234:2008). This has also lead to improvements in energy efficiency through increased consumer choice and manufacturer competition. To support growth in solar cooling, and to ensure that this growth is based on products which deliver on their reputed performance, a solar cooling system rating standard is required.
Summary scope of proposed work	*Scope of Standard(s)* • The standard would apply to residential and commercial scale solar airconditioning equipment and systems. These would include: • o Open cycle systems (liquid desiccant, solid desiccant), and • o Closed cycle systems (absorption cycle, adsorption cycle). • A theoretical rating procedure would be described based on a computer program such as TRNSYS. The system performance would be calculated for standardized climate zones, sensible and latent cooling loads. Relevant data files would be supplied as part of the standard. • The rating procedure would employ component performance data tested according to other standards. Typical system components may include solar collectors, storage tanks, desiccant dehumidifiers, absorption and adsorption chillers.

	• These other standards would be used to generate a data file or equation describing the performance of the particular device for use in the system simulation. Each of these components would appear as a 'black box' to the performance simulation procedure. • Where a particular component falls outside the desired scope of the solar system to be tested, (for example if a proprietary storage tank is not supplied with the solar cooling system), then a generic component performance would be employed. *Exclusions* • Issues such as system design and construction, maintenance, reliability and safety are outside the initial scope of the standard, although they may be considered in the future.
Alignment with national public policy	Reducing GHG emissions is identified as one of the key national research areas in Australia. The Australian Government committed to a conditional reduction in emissions of 25% by 2020 (relative to year 2000 levels) and has proposed a long term emissions reduction target of 60% by 2050. (Carbon Pollution Reduction Scheme Bill 2010). The proposed standard will significantly increase the uptake of effective solar cooling technologies in Australia by: i) enabling reliable and trusted estimates of the solar cooling energy and emissions savings to be calculated, and ii) facilitating fair comparisons of the performance of conventional cooling systems and competing renewable energy technologies. This enhanced uptake of solar cooling will in turn lead to significantly reduced greenhouse gas (GHG) emissions for airconditioning use. Reducing the energy use of residential cooling systems is also consistent with the Council of Australian Government (COAG) National Strategy on Energy Efficiency.
Net Benefit	The following impacts, costs and benefits have been identified; • *Public Health and Safety* The solar cooling standard is unlikely to have any clear impact on public health or safety apart from the flow on benefits from the positive environmental impacts of reduced energy use. • *Social and Community Impact* The standard will support a new alternative environmentally friendly cooling technology giving more choice for consumers. The successful spread of low emissions, energy saving, solar cooling technology is likely to have a postive impact on communities and society into the long term. As well as reducing system operating energy costs for the consumer the demands on social infrastructure funds are reduced. In the absence of a solar cooling standard, poorly performing solar cooling

products may have a widespread and significantly detrimental effect on public opinion regarding acceptance of renewable energy and low emission alternatives in general.
Growing community expectations for low emission options for residential cooling systems may be impacted if quality sustainable solutions are not fully supported.

- *Environmental Impact*

Solar cooling systems use less energy and create fewer emissions than conventional airconditioning systems. The proposed standard addresses the need to reduce consumer-based greenhouse gas (GHG) emissions by facilitating the substitution of conventional vapour compression airconditioners with low emissions solar cooling alternatives.
The creation of a solar cooling standard is expected to significantly increase the uptake of effective solar cooling technologies in Australia. For example replacing 10% of existing airconditioners with low-energy consumption solar systems would result in CO2 emission reductions of approximately 100,000 tons CO2/year. Furthermore, since widespread airconditioning use often coincides with peak electricity demand times, the resultant peak load reduction would have a substantial beneficial impact on the electricity market and reduce current and future energy infrastructure demands and costs.

- *Competition*

The proposed standard will greatly enhance competition in the airconditioning and renewable energy industries by enabling fair and accurate comparison of competing systems and more technology choices for consumers.
The proposed standard will be extremely important to identify potentially poorly performing products which may result in widespread damage to the uptake of the solar cooling technology. Insofar as the standard will enable a fair comparison of competing solar cooling technologies, it may yield greater performance results for any one particular technology or system than another.
Practical experience gained from larger scale commerical solar cooling installations in Europe has demonstrated the importance of reliable estimates of system performance prior to installation. This proposed standard will enable reliable estimates of energy savings to be obtained, thus allowing comparisons of solar cooling technologies with competing non-thermal technologies, including those based on renewable energy sources (for example photo-voltaic vapour-compression systems), as well as conventional systems.

- *Economic Impact*

In recent years, the growth of the solar cooling industry has been rapid. In Europe, approximately 50 systems were installed in 2004; by 2007 this number had grown to 200 and in 2008, 400 units were installed. (Jakob, U. Green chiller association, In Proceedings of the 3rd International Solar Cooling Conferences, Palermo OTTI

	(2008).) At the same time, the worldwide sales of conventional split system air-conditioning units less than 5kW has grown from 44million/year in 2002 to 82million/year in 2008. These figures suggest that the solar cooling industry is poised to expand rapidly. The development of an Australian Solar Cooling standard presents an opportunity to ensure that this growth is captured by the Australian market and is based on successful solar cooling technologies which lead to real-world energy and greenhouse gas emissions savings. The economic benefit to Australia would be the creation of more business in the Australian market and hence new jobs in the airconditioning industry and the solar industry. The technology export to other countries (either as a product or a licensed technology) would benefit Australia's export turnover. Most of the equipment and technology for solar airconditioning comes from within Australia and if a standard is established and the market increases this will represent an economic boost to the local renewable enrgy industry. The Australian residential air-conditioning market has a total annual turnover of approximately AUD$3.8 Billion, and industry estimates that the number of new airconditioners purchased is in the region of 1,300,000 units per year. The proposed standard addresses the need to reduce consumer-based GHG emissions by facilitating the substitution of electricity driven airconditioners with low emissions solar cooling alternatives. The reduction in peak electrical demand associated with the uptake of solar cooling technology has the potential to produce enormous national economic benefits in terms of reduced energy infrastructure and energy distribution demand and reduced associated costs.
Market Failure	Solar airconditioning is an emerging renewable energy technology that is technically proven and is suitable for wide scale deployment. Avoided electricity consumption is comparable with electricity displaced by the use of solar photovoltaic cells (on the customer side of the meter), and the economics of solar airconditioning appears to be comparable with that of solar photovoltaics. Given the high carbon intensity of Australian electricity, the warm climate and excellent solar resource, Australia would appear to be an ideal place for implementing solar airconditioning. This potential is validated by the growth of an Australian Solar Cooling Interest Group which now has over 180 members, across a wide range of stakeholder groups. Unfortunately, solar airconditioning cannot compete on a level playing field with other renewable energy technologies because it is not eligible for renewable energy certificates (RECs). To address this market entry barrier, a process is required to enable solar airconditioning to access RECs. One part of this process will need to be the establishment of a standardised procedure for predicting the

	amount of carbon that a given solar airconditioning system will save. Knowing the amount of carbon saved will then allow the correct amount of RECs to be allocated to solar airconditioning projects. Due to the small size and relatively young age of the solar cooling industry in Australia (compared to the conventional airconditioning industry) investment costs for this industry are higher due to the higher perceived risks. This is a market failure that would be addressed by the development of the new standard and the introduction of RECs for this technology which would remove much of the uncertainty and improve the investment potential.
Summary and conclusion	The development of a new standard for the performance testing and rating of solar cooling systems will support the increased uptake of this rapidly developing renewable energy technology providing consumers and regulators with an alternative low emission option for residential cooling, assisting national efforts to reduce energy use and greenhouse gas emissions and supporting the development and expansion of a solar cooling design and manufacturing industry in Australia.

Note: Where a more detailed Net Benefit case is required this may be attached separately.

4. Harmonisation and Alignment

Related documentation	No Standards for solar cooling available nationally or Internationally. Related standards include AS 4234-2008, AS/NZS 2535.1-2007, AS/NZS 4692-2005, AS/NZS 4552-2005, AS/NZS 3823 series, AS/NZS 4776-2008, ASHRAE 174-2009, ASHRAE 139-2007. See attached standards list for full list and explanation.
Alignment and avoidance of duplication	The new standard will draw on existing test methods and rating methodologies where possible. There will be no duplication of requirements.

5. Pathway for Standards Development

Preferred development pathway	Standards Australia driven*	
To be funded by	Standards Australia*	

**Note: The Standards Australia driven pathway is only open for those proposals seeking prioritisation by SA for project resources.*

6. Requests for Standards Australia resourcing (Leave blank if not applicable)

Funding declaration	Not aware of direct or indirect funding for this work.
Validation for SA resourcing	The environmental and economic benefits of a strong Australian solar cooling industry are large. Replacing 10% of existing residential airconditioners with a low-energy consumption solar cooling system would result in CO2 emission reductions

	of approximately 100,000 tons CO2/year, while the residential airconditioning market has a total annual turnover of approximately AUD$3.8 Billion. Low emission cooling technologies have been studied in Australia for a number of decades; the relatively slow adoption of successful technologies may be attributed to two key factors; i) the low cost of energy and emissions, and ii) variations in testing methodologies which have lead to performance variations and a level of uncertainty and confusion surrounding solar cooling technologies. Recent increases in the cost of primary energy, and the heightened importance associated with reducing greenhouse gas emissions have created the economic conditions conducive to the growth of solar cooling. The development of an Australian Solar Cooling Standard, will dispel uncertainties regarding the performance of these systems, and will pave the way for a competitive, strong and successful solar cooling industry. Australian Standards have been developed to facilitate the rating and performance assessment of other cooling and heating technologies and it is fair and equitable that Australian Standards be developed to also address the rating and performance of solar cooling technologies.

8. Risks and Dependencies

Risks	The only risk to the development of this standard would be possible interference by vested interests associated with conventional airconditioner importation and sales. It is conceivable that certain industry interests may seek to delay the development of the standard in order to protect market share These risks would be mitigated by the Standards Australia open, transparent and consensus based best practice standards development procedures.
Dependencies	It is proposed that the new standard be based around a method of determining the energy savings of solar cooling systems. These savings could then be used as a basis for the calculation of renewable energy credit entitlements. At present, solar cooling products are not entitled to receive RECs for energy which is saved by displacing conventional air-conditioner use. As a result, the success of the standard is, in some part, tired to the continued use of the RECs scheme, or a similar scheme and to the illegibility of solar cooling technology for RECs entitlements. Nevertheless, it is reasonable to suggest that if a standardized method was available for the calculation of solar cooling RECs, then a strong argument could be made for solar cooling to be made eligible for the scheme. No impacts on other standards identified.
Indicative timelines	*Estimated time to complete draft for public comment* e.g. 12 months *Estimated time to publication* e.g. 18 months

Note: Identified risks should pertain to the proposed program/project and any threat to a successful outcome, not to the risk of the proposal not being approved. This should follow a risk assessment process that is consistent with AS/NZS ISO 31000:2009.

9. Additional Information

Comments	Just that the creation of an Australian Standard rating procedure for solar cooling technologies would be a world first for the international solar cooling industry and in the future could be put forward as the basis of an International standard on the topic, when developed.
Supporting documentation	Attached - List of relevant National and International standards relevant to this project. Full list of responses from the AIRAH Industry Survey for this project proposal is also attached.

10. Declaration

Please read and complete the declaration, then forward this proposal and your attached documents to Standards Australia at **mail@standards.org.au**. The named proponent is deemed to have approved the information contained within this proposal and constitutes this declaration. This is required prior to formal consideration of this proposal.

The information provided in this application is true and accurate to the best of my knowledge. I believe the

proposed Standard will result in Net Benefit* to Australia.	
Name of Proponent	Phil Wilkinson
Date	

** As defined in Standard Australia's Guide to Net Benefit.*

Appendix A: Details of activities within the proposed program of work

Where a program has been specified in Section 2, please provide details of projects in order of priority for development. If preferred, details can be provided in a separate file and attached to this proposal.

Priority	*Title*	*Committee*	*Pathway*	*Designation*	*Scale of project*	*Project type*	*Product type*	*Comment*
e.g.	*Revision of Standard for XXXXXX*	*AB-123*	*Collaborative*	*AS 1234:2009*	*Small*	*Revision*	*Standard*	*Updating 5-6 obsolete references in Standard.*
1			Please Select		Please Select	Please Select	Please Select	
2			Please Select		Please Select	Please Select	Please Select	
3			Please Select		Please Select	Please Select	Please Select	
4			Please Select		Please Select	Please Select	Please Select	
5			Please Select		Please Select	Please Select	Please Select	
6			Please Select		Please Select	Please Select	Please Select	
7			Please Select		Please Select	Please Select	Please Select	
8			Please Select		Please Select	Please Select	Please Select	
9			Please Select		Please Select	Please Select	Please Select	
10			Please Select		Please Select	Please Select	Please Select	
11			Please Select		Please Select	Please Select	Please Select	
12			Please Select		Please Select	Please Select	Please Select	
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14			Please Select		Please Select	Please Select	Please Select	
15			Please Select		Please Select	Please Select	Please Select	