

## EXPLANATORY STATEMENT

### *Renewable Energy (Method for Solar Water Heaters) Determination 2016*

This determination is made by the Clean Energy Regulator (the Regulator) under subregulation 19B(1) of the *Renewable Energy (Electricity) Regulations 2001* (the Regulations).

#### **Legislative provisions**

The *Renewable Energy (Electricity) Act 2000* (the Act) grants a right to create small-scale technology certificates ('certificates') in relation to the installation of a solar water heater. Subsection 22(1) of the Act provides that the number of certificates that may be created for a particular installation of a solar water heater is to be determined in accordance with the regulations. Subsection 22(2) of the Act permits regulations to be made for the purposes of subsection 22(1) that may, among other things, provide for the Regulator to determine the number of certificates that may be created for a particular installation in accordance with a legislative instrument made by the Regulator.

Regulation 19A of the Regulations provides that the number of certificates that may be created for a particular model of solar water heater in a particular zone and installation period is the number set out in the Register of solar water heaters applicable to the model, zone and period. The Register of solar water heaters is established and kept by the Regulator under regulation 19C of the Regulations.

For the purposes of subsection 22(1) of the Act, subregulation 19B(1) of the Regulations permits the Regulator to determine the method to be used to determine the number of certificates that may be created for a particular model of solar water heater. In making the determination, the Regulator must have regard to the methods set out in the Australian Standards, as in force at the time, listed in Schedule 4 of the Regulations.

Regulation 19BA provides that when an instrument under subregulation 19B(1) of the Regulations is in force, the Regulator must determine the number of certificates that may be created for a solar water heater in each of the zone mentioned in paragraph 19C(3)(b) in accordance with the determination.

#### **Purpose and operation of the instrument**

The purpose of the determination is to determine a new method for calculating the number of certificates that may be created for a particular model of solar water heater and to revoke all previous determinations made for that purpose, including the *Renewable Energy (Electricity) Regulations 2001 - STC Calculation Methodology for Solar Water Heaters and Air Source Heat Pump Water Heaters - Determination March 2012* (the 2012 determination).

Section 6 specifies two methods that are to be used to determine the number of certificates that may be created for a model of solar water heater, depending on the type and volumetric capacity of the model.

The first method, contained in Part 1 of Schedule 1, is to be used for a model of solar water heater that has a volumetric capacity of 700 litres or less (a ‘small solar water heater’) or an air source heat pump water heater with a volumetric capacity of 425 litres or less (an ‘air source heat pump’).

The second method, contained in Part 2 of Schedule 1, is to be used for a model of solar water heater that has a volumetric capacity of more than 700 litres (a ‘large solar water heater’).

Subsection 6(3) provides that both methods are to be used in accordance with the TRNSYS Modelling Guidelines set out in Part 3 of Schedule 1.

Each method involves, in simple terms, the use of a computer program (the TRNSYS computer modelling package) to determine displaced energy by calculating the annual energy to be used by solar water heater other than from solar energy and the latent and sensible heat of the atmosphere (‘total annual auxiliary energy’) and subtracting this amount from the annual energy use of an equivalent electric hot water system (an ‘electric reference water heater’). The calculated displaced energy is multiplied by 10 to determine the 10 year MWh savings. The amount of 10 year MWh savings rounded down to the nearest lower integer is the number of certificates that can be created for a model of solar water heater in a particular zone. (Different results are obtained depending on the climatic zone in which the solar water heater is to be installed.)

In practice, after the determination takes effect the Regulator will invite persons under regulation 19BD of the Regulations to request that the Regulator makes a determination under regulation 19BA of the Regulations that a number of certificates may be created for a particular model of solar water heater in a particular zone. The Regulations require requests to be made in writing, in the format specified and during the timeframe set out by the Regulator. Persons seeking to list models on the Register of solar water heaters apply the methodology contained in the determination themselves and provide the Regulator with the results and the calculations used in their request.

The Register of solar water heaters will be updated to reflect any determinations made by the Regulator. The Register of solar water heaters is kept on the Regulator’s website and in December 2016 could be viewed at <http://www.cleanenergyregulator.gov.au/RET/Scheme-participants-and-industry/Agents-and-installers/Small-scale-systems-eligible-for-certificates/Register-of-solar-water-heaters>.

The determination is a legislative instrument for the purposes of the *Legislation Act 2003*.

The instrument commences on 20 February 2017.

A statement of compatibility with human rights for the purposes of Part 3 of the *Human Rights (Parliamentary Scrutiny) Act 2011* is at [Attachment A](#).

### **New features of the determination**

The determination updates the calculations in the 2012 determination to reflect changes to industry practice, industry standards and the transfer of regulatory responsibility for the administration of the determination from the Renewable Energy Regulator to the Clean Energy Regulator.

The determination includes the following substantive updates to the 2012 determination:

- Modifies the definitions of small solar water heater and air source heat pump to no longer deal with combined solar and heat pump water heaters. The Regulator has published guidance on whether a combined system is to be considered an air source heat pump or a small solar water heater. The guidance could in December 2016 be viewed on the Regulator's website (<http://www.cleanenergyregulator.gov.au/RET/Pages/Forms-and-resources/Forms-and-resources-for-manufacturers.aspx>). (definition of 'ASHP' and 'small SWH' in section 5 and the note to Division B of Schedule 1, Part 1)
- Inserts a new definition of 'interpolation' to clarify that the term is used in its mathematical sense to describe the method used to estimate a value between values that are already known or determined. (definition of 'interpolation' in section 5)
- Clarifies that a number of certificates may be calculated for solar water heaters and air source heat pump water heaters that utilise photovoltaic/thermal hybrid solar collectors that generate electricity from the same collector if the testing regime set out in the determination is documented for the system. (Item 3 of Schedule 1, Part 1, Division C and Item 3 of Schedule 1, Part 2, Division C)
- Clarifies that storage tank heat loss for large solar water heaters is to be determined in accordance with the Regulations. (Item 2.f. of Schedule 1, Part 2, Division B)
- Specifies the modelled length of piping for large solar water heater systems with a solar preheat and finishing tank where the finishing tank is heated by a recirculating instantaneous auxiliary booster. (Item 2.g. of Schedule 1, Part 2, Division B)
- Requires individual hot water load draw-offs for large solar water heaters to be applied over a period of one hour in selecting the peak daily winter load for a system. (Item 3 of Schedule 1, Part 2, Division B)
- Prescribes different steps to be taken for electrically and gas boosted large solar water heaters. (Item 4 and 5 of Schedule 1, Part 2, Division B)
- Provides that for large solar water heaters that have a tank with a bottom element fitted, the bottom element is to be used for rating purposes. For large solar water heaters, this no longer applies where a bottom element could be fitted after installation. (Item 1 of Schedule 1, Part 2, Division C)
- Clarifies the circumstances in which an interpolation approach or a sub-unit approach may be used in relation to large solar water heaters that meet the definition of a 'family of products'. (Item 4 of Schedule 1, Part 2, Division C)
- Changes to the TRNSYS Modelling Guidelines, including:

- New ‘CER template decks’ that include new decks for commercial solar water heaters. (Division B of Schedule 1, Part 3)
- New instructions in relation to solar water heaters with an inline instantaneous gas booster and large solar water heaters where the water temperature is boosted with a separate pumped circulation loop. (Division B of Schedule 1, Part 3)
- Different measurement and documentation of pump flow rate and power consumption for large and small solar water heaters. Pump flow rate and power consumption for large solar water heaters are able to be calculated, rather than directly measured. This recognises that large solar water heaters are often too large to test before installation. The Regulator has published an optional procedure that may be used to calculate pump flow rate and power consumption. The procedure could in December 2016 be viewed on the Regulator’s website (<http://www.cleanenergyregulator.gov.au/RET/Pages/Forms-and-resources/Forms-and-resources-for-manufacturers.aspx>). (Division C of Schedule 1, Part 3)

### **Matters to which the Regulator had regard in making the instrument**

Subregulation 19B(4) of the Regulations provides that in making the determination, the Regulator must have regard to the method set out in the Australian Standard, set out in Schedule 4 of the Regulations, as in force at the time the determination is made that applies to the solar water heater.

At the time the determination was made, there were three Australian Standards set out in Schedule 4 of the Regulations. The Regulator had regard to each.

1. AS/NZS 2535.1:2007, ‘Test methods for solar collectors – Thermal performance of glazed liquid heating collectors including pressure drop’
2. AS/NZS 4234:2008, *Heated Water systems -- Calculation of energy consumption*
3. AS/NZS 4692.1:2005, ‘Electrical water heaters -- Energy consumption, performance and general requirements’

### **Documents incorporated by reference**

The determination refers to a number of Australian Standards, as listed below:

Standard No.	Name
AS 3498-2009	Authorization requirements for plumbing products – Water heaters and hot-water storage tanks
AS 4552-2005 (as in force immediately before it was superseded)	Gas fired water heaters for hot water supply and/or central heating
AS/NZS 2535.1:2007	Test methods for solar collectors – Part 1: Thermal

	performance of glazed liquid heating collectors including pressure drop
AS/NZS 2712:2007	Solar and heat pump water heaters – design and construction
AS/NZS 4234:2008 (as in force at the time it was made)	Heated water systems – Calculation of energy consumption
AS/NZS 4234:2008 Amendment 1	Amendment No. 1 to AS/NZS 4234:2008 Heated water systems—Calculation of energy consumption made in March 2011
AS/NZS 4234:2008 Amendment 2	Amendment No. 2 to AS/NZS 4234:2008 Heated water systems—Calculation of energy consumption made in November 2011
AS/NZS 5125.1:2010 (as in force immediately before it was superseded)	Heat pump water heaters – Performance assessment – Part 1: Air source heat pump water heaters

Australian Standards are available for purchase from Standards Australia Limited.

Section 7 of the determination specifies that any reference to a document is a reference to that document as in force at the time the determination was made, unless there is a contrary intention.

Computer programs referred to in the instrument:

Transient Energy System Simulation Tool (TRNSYS) computer modelling package (versions 15 and 16. This package was produced by the University of Wisconsin-Madison (Klein, S.A. et al, TRNSYS 16: A Transient System Simulation Program, Solar Energy Laboratory, University of Wisconsin, Madison, USA and Klein, S.A. et al, TRNSYS 15: A Transient System Simulation Program, Solar Energy Laboratory, University of Wisconsin, Madison, USA). Information about the package, including its distributors, could in December 2016 be viewed on the University of Wisconsin-Madison’s website (<http://sel.me.wisc.edu/trnsys/index.html>).

TRNSYS Extensions for Australian Solar Products (extension package TRNAUS). The package was prepared in February 2014 by Graham L. Morrison, School of Mechanical Engineering, University of New South Wales. The package could in December 2016 be viewed on Thermal Design Pty Ltd’s website ([http://users.tpg.com.au/t\\_design](http://users.tpg.com.au/t_design)).

Clean Energy Regulator template TRNSYS deck and weather files. This zip file contains template deck and weather files to be used as the basis of the TRNSYS modelling for the STC methodology to support an application for manufacturers to have their solar water heater models added to the Register of solar water heaters. The document ‘CER template decks’ could in December 2016 be viewed on the Clean Energy Regulator’s website

([http://www.cleanenergyregulator.gov.au/RET/Pages/Forms and resources/Forms-and-resources-for-manufacturers.aspx](http://www.cleanenergyregulator.gov.au/RET/Pages/Forms%20and%20resources/Forms-and-resources-for-manufacturers.aspx)).

## **Regulatory Impact**

The Office of Best Practice Regulation conducted a preliminary assessment in regards to the proposed amendments to the instrument and advised that a Regulatory Impact Statement was not required (OBPR ID: 20996).

## **Consultation on the legislative instrument**

In November 2013 and February 2016 the Regulator provided an exposure draft of the template files to the solar water heater industry to consult on the proposed approach and to resolve any technical issues.

The Regulator targeted consultation to solar water heater manufacturers and technical experts. The Regulator received feedback from eleven stakeholders in the first 2013 three-week consultation period and from four in the second 2016 consultation period. Feedback was received from technical experts and large and small scale Australian solar water heater manufacturers during both consultation processes.

The industry was broadly supportive of the changes and identified that the proposed template files would reduce administrative burden and streamline their application process. The feedback and changes proposed were reviewed by a technical panel that advises the Regulator and incorporated into the proposed template input files.

## Statement of Compatibility with Human Rights

*Prepared in accordance with Part 3 of the Human Rights (Parliamentary Scrutiny) Act 2011*

### ***Renewable Energy (Method for Solar Water Heaters) Determination 2016***

This Legislative Instrument is compatible with the human rights and freedoms recognised or declared in the international instruments listed in section 3 of the *Human Rights (Parliamentary Scrutiny) Act 2011*.

#### **Overview of the Legislative Instrument**

The *Renewable Energy (Electricity) Act 2000* grants a right to create small-scale technology certificates in relation to the installation of a solar water heater. The right to create certificates vests in the owner of the solar water heater at the time it is installed and may be assigned to another person.

A certificate is ‘currency’ for the purposes of the Small-scale Renewable Energy Scheme and may be traded or used to meet a liability arising under the scheme. In practice, certificates or the right to create certificates, are generally traded to recoup a portion of the cost of purchasing or installing a solar water heater.

The *Renewable Energy (Method for Solar Water Heaters) Determination 2016* (the determination) sets out a method to be used to determine the number of certificates that may be created for a particular model of solar water heaters. The method in the determination seeks to ensure that the number of certificates that may be created reflect the amount of electricity a model of solar water heater displaces.

#### **Human rights implications**

This Legislative Instrument does not engage any of the applicable rights or freedoms.

#### **Conclusion**

This Legislative Instrument is compatible with human rights as it does not raise any human rights issues.