Notice to all Registered Participants under the National Gas Rules (NGR)

This notice is to advise Participants on AEMO's decision to approve amendments to the:

- Retail Market Procedures (RMP) (SA).

- Register of Weather Related Information.

This notice advises Gas Market Registered Participants that consultation under the ordinary Procedure change consultative process prescribed under Rule 135EE of the NGR concluded on 2 May 2019 for:

- IN004/18 (Change of Adelaide weather station and change of actual to forecast sunshine hours)

Prior to commencing the ordinary consultation process, this proposal was considered by the Gas Retail Consultative Forum (GRCF) in accordance with the "Approved Process" under Rule 135EC of the NGR.

As required under Rule 135EE of the NGR, Gas Market Registered Participants and other interested parties were invited to submit comments to AEMO on the Impact and Implementation Report (IIR).

There was one submission on the IIR, which came from AGL. AGL's submission supported the broad principle of this proposal. Attachment C of this notice sets out AGL's feedback in full and AEMO's responses.

Having considered this proposal and the issues raised in the consultation, AEMO has decided to amend the RMP (SA) and Register of Weather Related Information in the forms published in this notice (See Attachments A and B). The effective date for these amendments is 28 June 2019.

Updated versions pertaining to the changes described in Attachments A and B will be published on the AEMO website prior to the effective date.

Should you require any further information please contact Arjun Pathy on (03) 9609 8983 or at arjun.pathy@aemo.com.au.

Calculation of heating degree day

(1) In performing the calculations under this clause 177, AEMO must use the values set out in Appendix 11 for the following coefficients:

   (a) C_1;

   (b) C_2;

   (c) C_3;

   (d) C_4;

   (e) C_5;

   (f) C_6;

   (g) C_7; and

   (h) C_8.

(2) AEMO must, at least once every five years or following a change in the source of weather data used, recalculate the value for each coefficient listed in clause 177(1) using linear regression of historic weather data, and as soon as practicable after the recalculation, AEMO must publish to *participants* an update to Appendix 11 specifying the recalculated values.

(3) In performing the calculations under this clause 177, unless otherwise specified, AEMO must use the most recent available weather data prior to the time of calculation, which it must obtain from the Australian Bureau of Meteorology or another external agency, determined by AEMO as a *reasonable and prudent person* to be a suitable supplier of weather data for each of the following weather data items:

   (a) the maximum air temperature for a *HDD zone* for a *gas day*, or forecast for a *gas day*, in degrees Celsius (*"T_{max}"*);

   (b) the minimum air temperature for a *HDD zone* for a *gas day*, or forecast for a *gas day*, in degrees Celsius (*"T_{min}"*); and

   (c) the hours of sun forecast for a *HDD zone* for a *gas day*, or forecast for a *gas day* (*"H_{sun}"*).

(4) For each *gas day D* for each *HDD zone*, AEMO must:

   (a) by 17 hours before the end of *gas day D*, calculate the *forecast heating degree day* under clause 1(5)(j) for *gas day D+1* for use in clause 204;

   (b) within 30 minutes before the end of the third, sixth, ninth and twelfth hours of *gas day D*, recalculate the *forecast heating degree day* under clause 1(5)(j) for *gas day D* for use in clause 216(1); and

(c)   by 4 hours after the end of *gas day D*, calculate the *actual heating degree day* for *gas day D* under clause 177(5)(h) for use in clause 224.

(5)   In this clause 177, for each *HDD zone* for each *gas* day *D*:

(a)   the *EDD* for *gas day D* ("**E(D)**") is calculated as follows:

$$E_{(D)} = \max\left[\, 0,\, 18 - \left(\frac{T_{\max(D)} + T_{\min(D)}}{2}\right) - \left(C_8 \times H_{sun(D)}\right)\right]$$

where:

$E_{(D)}$	= the *EDD* for the *HDD zone* for *gas day D*;
$T_{\max(D)}$	= the maximum air temperature forecast for the *HDD zone* for *gas day D* in degrees Celsius;
$T_{\min(D)}$	= the minimum air temperature forecast for the *HDD zone* for *gas day D* in degrees Celsius; and
$H_{sun(D)}$	= the hours of sun forecast for the *HDD zone* for *gas day D*,

(b)   the *EDD* for *gas day D-1* ("**E(D-1)**") is calculated as follows:

$$E_{(D-1)} = \max\left[\, 0,\, 18 - \left(\frac{T_{\max(D-1)} + T_{\min(D-1)}}{2}\right) - \left(C_8 \times H_{sun(D-1)}\right)\right]$$

where:

$E_{(D-1)}$	= the *EDD* for the *HDD zone* for *gas day D-1*;
$T_{\max(D-1)}$	= the maximum air temperature for the *HDD zone* for *gas day D-1* in degrees Celsius;
$T_{\min(D-1)}$	= the minimum air temperature for the *HDD zone* for *gas day D-1* in degrees Celsius; and
$H_{sun(D-1)}$	= the hours of sun forecast for the *HDD zone* for *gas day D-1*,

(c)   the *EDD* for *gas day D-2* ("**E(D-2)**") is calculated as follows:

$$E_{(D-2)} = \max\left[\, 0,\, 18 - \left(\frac{T_{\max(D-2)} + T_{\min(D-2)}}{2}\right) - \left(C_8 \times H_{sun(D-2)}\right)\right]$$

where:

$E_{(D-2)}$	= the *EDD* for the *HDD zone* for *gas day D-2*;
$T_{\max(D-2)}$	= the maximum air temperature for the *HDD zone* for *gas day D-2* in degrees Celsius;
$T_{\min(D-2)}$	= the minimum air temperature for the *HDD zone* for *gas day D-2* in degrees Celsius; and
$H_{sun(D-2)}$	= the hours of sun forecast for the *HDD zone* for *gas day D-2*, and

(d)   the *EDD* for *gas day D-3* ("**E(D-3)**") is calculated as follows:

$$E_{(D-3)} = \max\left[\, 0,\, 18 - \left(\frac{T_{\max(D-3)} + T_{\min(D-3)}}{2}\right) - \left(C_8 \times H_{sun(D-3)}\right)\right]$$

where:

$E_{(D-3)}$	= the *EDD* for the *HDD zone* for *gas day D-3*;

$T_{max(D-3)}$ = the maximum air temperature for the *HDD zone* for *gas day D-3* in degrees Celsius;

$T_{min(D-3)}$ = the minimum air temperature for the *HDD zone* for *gas day D-3* in degrees Celsius; and

$H_{sun(D-3)}$ = the hours of sun forecast for the *HDD zone* for *gas day D-3*.

(e) the **"average temperature"** for the period of 30 *gas days* between *gas day D-30* and *gas day D-1* is calculated as follows:

$$T_{30} = \frac{\sum_{i=d-1}^{d-30}\left(T_{max\ i} + T_{min\ i}\right)}{60}$$

where:

T_{30} = the *average temperature* for the *HDD zone* for the period of 30 *gas days* between *gas day D-30* and *gas day D-1* in degrees Celsius;

$T_{max\ i}$ = the maximum air temperature for the *HDD zone* in degrees Celsius for *gas day i*;

$T_{min\ i}$ = the minimum air temperature for the *HDD zone* in degrees Celsius for a *gas day i*; and

i = a *gas day i* in the range of 30 *gas days* between *gas day D-30* and *gas day D-1*.

(f) the **"total sun hours"** for the period of 7 *gas days* between *gas day D-7* and *gas day D-1* is calculated as follows:

$$SSH_{sun7} = \frac{\sum_{i=d-1}^{d-7} H_{sum\ i}}{7}$$

where:

SSH_{sun7} = the *total sun hours* for the *HDD zone* for the period of 7 *gas days* between *gas day D-7* and *gas day D-1*;

$H_{sun\ i}$ = the hours of sun forecast for the *HDD zone* for a *gas day; and*

i = a *gas day i* in the range of 7 *gas days* between *gas day D-7* and *gas day D-1*.

(g) the **"proxy ground temperature"** (**"T_{gnd}"**) for *gas day D* is calculated as follows:

$$T_{gnd} = \frac{\left[C_4 \times \max\left(0, 18 - T_{30}\right)\right] + \left[C_5 \times \left(18 - T_{30}\right)\right]}{\left(C_4 + C_5\right)} + \left(C_6 \times SSH_{sun7}\right)$$

where:

T_{gnd} = the *proxy ground temperature* for the *HDD zone* for *gas day D* in degrees Celsius;

T_{30} = the *average temperature* for the *HDD zone* for the period of 30 *gas days* between *gas day D-30* and *gas day D-1* in degrees Celsius calculated under clause 1(5)(e); and

SSH_{sun7} = the *total sun hours* for the *HDD zone* for the period of 7 *gas days* between *gas day D-7* and *gas day D-1* calculated under clause 1(5)(f).

(h) the **"actual heating degree day"** (**"HDD$_A$"**) for *gas day D-1* is calculated as follows:

$$HDD_A = \left(C_1 \times E_{(D-1)}\right) + \left(C_2 \times E_{(D-2)}\right) + \left(C_3 \times E_{(D-3)}\right) + \left(C_7 \times T_{gnd}\right)$$

where:

HDD_A = the *actual heating degree day* for the *HDD zone* for *gas day D-1,* provided that for each *positive HDD zone*, if that value is less than zero, HDD$_A$ shall be treated as zero;

$E_{(D-1)}$ = the *EDD* for *gas day D-1* calculated under clause 1(5)(b);

$E_{(D-2)}$ = the *EDD* for *gas day D-2* calculated under clause 1(5)(c);

$E_{(D-3)}$ = the *EDD* for *gas day D-3* calculated under clause 1(5)(d); and

T_{gnd} = the *ground temperature* for the *HDD zone* for *gas day D-1* in degrees Celsius calculated under clause 1(5)(g).

(i) the **"forecast EDD"** for *gas day D+1* is calculated as follows:

$$F_{(D+1)} = \max\left(0,\, 18 - \left(\frac{T_{\max(D+1)} + T_{\min(D+1)}}{2}\right) - \left(C_8 \times H_{sun(D+1)}\right)\right)$$

where:

$F_{(D+1)}$ = the f*orecast EDD* for the *HDD zone* for *gas day D+1* in degrees Celsius;

$T_{\max(D+1)}$ = the maximum air temperature forecast for the *HDD zone* for *gas day D+1* in degrees Celsius;

$T_{\min(D+1)}$ = the minimum air temperature forecast for the *HDD zone* for *gas day D+1* in degrees Celsius; and

$H_{sun(D+1)}$ = the hours of sun forecast for the *HDD zone* for *gas day D+1* at 0900 hours CST on *gas day D*.

(j) the *forecast heating degree day* (**"HDD$_F$"**) for *gas day D+1* is calculated as follows:

$$HDD_F = \left(C_1 \times F_{(D+1)}\right) + \left(C_2 \times E_{(D)}\right) + \left(C_3 \times HDD_A\right) + \left(C_7 \times T_{gnd}\right)$$

where:

HDD_F = the *forecast heating degree day* for the *HDD zone* for *gas day D+1*, provided that for each *positive HDD zone*, if that value is less than zero, HDD$_F$ shall be treated as zero;

$F_{(D+1)}$ = the *forecast EDD* for the *HDD zone* for *gas day D+1* in degrees Celsius calculated under clause 1(5)(i);

$E(D)$ = the *EDD* for *gas day D* calculated under clause 1(5)(a)*;*

HDD_A = the *actual heating degree day* for the *HDD zone* for *gas day D-1* calculated under clause 1(5)(h); and

T_{gnd} = the *proxy ground temperature* in degrees Celsius for the *HDD zone* for *gas day D-1* calculated under clause 1(5)(g).

SOUTH AUSTRALIAN WEATHER RELATED INFORMATION.

4.1   Weather Observation Stations

The following is a list of the weather observation stations applicable to Appendix 11 (Heating Degree Day for South Australia) of the Retail Market Procedures (RMP) (SA) (Ref#1).

Weather Observation Stations

Heating Degree Day (HDD) zone	Service Provider	Observation station
Northern	Australian Government Bureau of Meteorology	Ceduna
Adelaide Region	Australian Government Bureau of Meteorology	Adelaide (West Terrace Kent Town / ngayirdapira)
Riverland	Australian Government Bureau of Meteorology	Mildura
Mount Gambier	Australian Government Bureau of Meteorology	Mount Gambier
Adelaide Metropolitan	Australian Government Bureau of Meteorology	Adelaide (West Terrace Kent Town / ngayirdapira)

4.2 HDD Coefficients

The following is a list of HDD Coefficients applicable to Appendix 11 (Heating Degree Day for South Australia) of the RMP (SA) (Ref #1)

> **The numbering has been corrected below. This amendment has been confirmed by SA instructions of 30/01/09.**

(a) $C_1 = 0.62$;
(b) $C_2 = 0.2$;
(c) $C_3 = 0.18$;
(d) $C_4 = 1$;
(e) $C_5 = 0.44$;
(f) $C_6 = -0.385$;
(g) $C_7 = 0.38$; and
(h) $C_8 = 0.11$.

ATTACHMENT C
SUBMISSIONS RECEIVED FOR IN004/18 IIR

Section 1 – General comments on the proposed procedure change

Topic	Item#	Who	Response Received	AEMO response
Sections 1 to 4 of the IIR set out *AEMO's critical examination of the proposal.* Does your organisation support AEMO's examination of the proposal? If no, please specify areas in which your organisation disputes AEMO's critical examination of the proposal and include information that supports your organisation's reasons for not supporting AEMO's examination.	1	AGL	AGL notes AEMO's response to the AGL PPC submission and suggests that the clause be reviewed and amended as part of the SA Harmonisation to remove the non-compliance with Clause 177(2).	AEMO acknowledges AGL's responses to the IIR and acknowledges AGL's concerns about AEMO's compliance with clause 177(2). The issues raised in IN004/18 are time-sensitive in that the Register of Weather Related Information must list "Adelaide (West Terrace / ngayirdapira)" as the weather observation station for the Adelaide Region and Adelaide Metropolitan HDD zones before the BoM ceases publication of Kent Town weather observation data. Given that any concerns about clause 177(2) are less time-pressing than are the issues identified by AEMO in the IN004/18 IIR, AEMO commits to reviewing AEMO's compliance with and potential amendments to clause 177(2) as part of IN006/17 (Harmonising RMP (SA) with the other jurisdictions), as suggested by AGL.
Sections 5 to 9 of the IIR set out *AEMO's assessment of likely effect of proposal*.	2	AGL	AGL agrees that the proposed changes will remove the non-compliances with Cl 177(3) –	See response above.

Does your organisation support AEMO's assessment of the likely effects of the proposal.? If no, please specify areas in which your organisation disputes AEMO's assessment of the likely effect of the proposal and include information that supports your organisation reasons for not support AEMO's assessment.			177(5), but AEMO is expected to still be non-compliant with Cl 177(2) when the weather station is amended.	
Sections 10 and 11 of the IIR set out _AEMO's recommendation_. Does your organisation support AEMO's position to recommend the procedures changes? If no, please provide details why your organisation does not supports AEMO's recommendation.	3	AGL	AGL supports the proposed changes to the procedures.	AEMO acknowledges AGL's support.

Section 2 - Feedback on the documentation changes described in Attachment A to C of the IIR.

Ref 1 – Retail Market Procedures (South Australia)					
#	Participant	Clause #	Issue / Comment	Proposed text Red strikeout means delete and blue underline means insert	AEMO Response
4	AGL	N/A	No further comment.		AEMO notes that AGL has no further comment.