Tasmanian Renewable Energy Alliance

Fact Sheet – metering of solar customers in Tasmania

This fact sheet was prepared by TREA to assist solar installers and customers to understand the background to the current meter replacement program being undertaken by TasNetworks. We thank TasNetworks for their assistance in the preparation of this fact sheet however it is not an official document and is provided for general information only. If we become aware of mistakes or additional relevant information this document will be updated. Check for the latest version at http://tasrenew.org.au/metering/

What is the problem and who is affected?

TasNetworks has identified that some meters are not displaying a correct total for the amount of energy fed back into the grid by solar owners. As a result solar owners have been underpaid for this energy.

Of the approximately 22,700 solar installations in Tasmania, TasNetworks say that 8,200 have a software problem and the meter will be replaced. An additional 1,800 meters are being checked but are believed not to have the problem.

The current problem affects only customers who have solar metered with an EDMI Mk7A meter installed after 30 March 2011. TasNetworks has a limited number of AMPY 1210 meters installed in this configuration with no issue.

The current problem only affects only customers who have use tariff 31 and tariff 41 or 42.

The problem only arises while power is being used on tariff 41/42 at the same time as solar power is being fed back into to the grid.

How do Tasmanian solar meters work?

When solar panels are installed on a house or business the existing mechanical meter is replaced with an electronic meter. For a standard domestic installation TasNetworks normally installs the EDMI Mk7A meter which is a single phase, two element electronic meter. These meters are capable of being fitted with additional hardware to allow detailed consumption and generation data to be transmitted via a telecommunications network but this is not normally implemented in Tasmania. These meters are sometimes described as 'smart meter ready'.

EDMI Mk7A meter

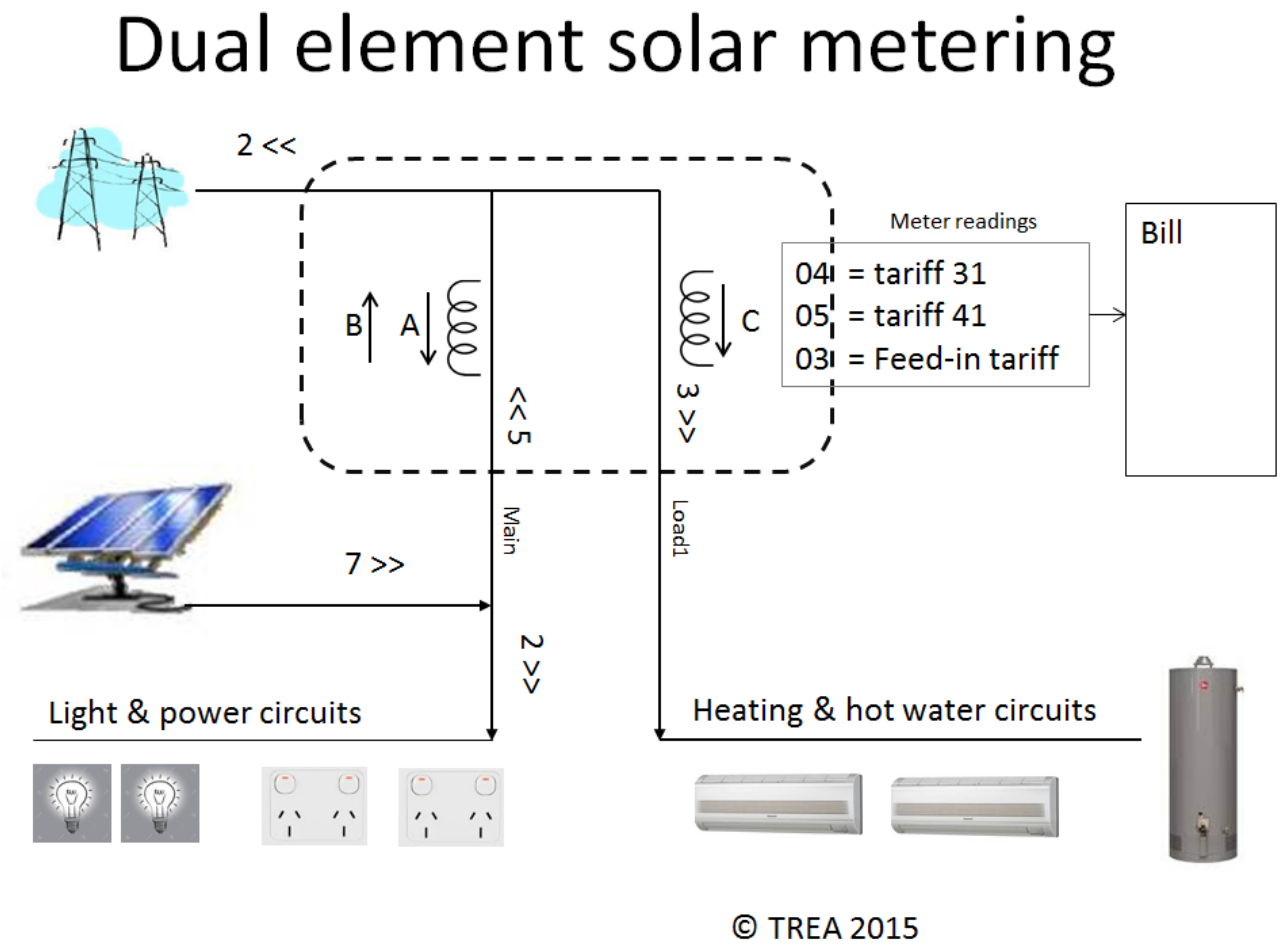
The meter measures two power flows many times a second and averages this data and stores totals for each 15 minute interval. This data is stored in the meter for 100 days however this data is not normally accessed by TasNetworks.

In addition, selected data is accumulated into registers. There are six measurements that can be derived in the meter from the power flow through the two elements but only four of these are recorded in registers. Software in the meter determines which of the six measurements are recorded. Software also determines which three of the four registers are displayed and read by the meter reader.

The three registers read by the meter reader are typed into a hand held device. The data from all the meters read by that meter reader

is downloaded by TasNetworks. Data is forwarded to each customer's retailer – normally Aurora Energy for domestic customers.

What does the software in the meter do?



Terminology

The two circuits are referred to by EDMI as Main and Load1. For Tasmanian customers with solar and both a light & power tariff and a heating/hot water tariff, Main corresponds to Tariff 31 and Load1 corresponds to Tariff 41 or 42.

Electricity networks view power flows from the perspective of the network. In this case consumption by the customer is regards as 'export' from the grid, and the proportion of solar generation that flows back into the grid is called 'import'. We have used this terminology in this document but this is the reverse of how the customer would normally view the situation (they will see themselves as exporting excess generation to the grid).

What does the meter measure and record?

The two elements can measure power flow in both directions, but power can only flow in one direction at a time in a circuit. Measurements in each direction are treated as separate measurements and flows in the opposite direction are recorded as zero at the time. For example for the main element in the diagram above, at any one instant, only A or B is a positive measurement and the other is zero.

Six measurements are theoretically available but only four are actually measured, these are the four selected load channels.

Load channel	Meter terminology	Label on diagram	Register
Channel 1	Export Wh Main = ExMain	A	04
Channel 2	Export Wh Load1 = ExLoad1	C	05
Channel 3	Export Wh Total = (ExMain+ExLoad1)-(ImMain+ImLoad1)	(A+C)-(B+0)	Recorded but not displayed.
	Import Wh Main = ImMain	B	Fixed 03
Channel 4 can be set to one of these three	Import Wh Load1 = ImLoad1	This is zero unless embedded generation is connected to the Load1 element.	
	Import Wh Total = (ImMain+ImLoad1)-(ExMain+ExLoad1)	(B+0)-(A+C)	Currently 03

The incorrect meters have the register that displays power sent to the grid (register 03) set to the last option in this table (Import Wh Total). Corrected meters will have register 03 set to Import Wh Main (B on the diagram above).

Ofsetting solar generation against both tariffs

TasNetworks will replace meters with new meters programmed to correctly offset solar generation against consumption on tariff 31. This will still not offset generation surplus to tariff 31 consumption against simultaneous consumption on tariff 41/42.

In August 2013 the state government instructed Aurora to implement “as soon as practical” a “technical metering solution that provides small customers who connect a distributed generation system from 31 August with the option of off-setting their on-site electricity consumption for hot water and heating – in addition to light and power – before electricity is exported to the grid.” TasNetworks have requested software to implement this from EDMI and estimate that this will be available to customers in August or September 2015.

	Explanation	Formulas
Current (incorrect) metering	Tariff 41 consumption (if any) is deducted from surplus generation sent to the grid	04=A 05=C 03=B minus A+C
TasNetworks proposed fix	Solar generation offsets only tariff 31	04=A 05=C 03=B

Government instructed fix	Solar generation offsets tariff 31 and 42	04=A
		If B > C
		  05=0
		  03=B minus C
		Else
		  05=C minus B
		  03=0
		Endif

What is the cost impact for customers?

The cost impact of the different metering options will depend on whether the customer is on the legacy feed-in tariff (28.283 ¢/kWh) or the current feed-in tariff and the extent to which they use power for heating and hot water at the same time as they are generating solar.

The following table shows the impact of various software configurations in this scenario using current Aurora tariffs (T31= 24.717 ¢/kWh, T41/42=14.907 ¢/kWh) and the current solar feed-in tariff (6.106 ¢/kWh). This example only applies at times when the customer is sending more power to the grid than they are consuming on tariff 41/42.

		Current situation		**TasNetworks proposed fix**		**Government instructed fix**	
element	**tariff**	**Meter reading**	**Cost/refund**	**Meter reading**	**Cost/refund**	**Meter reading**	**Cost/refund**
A=0	T31=24.717	04 = 0	0.000	04 = 0	0.000	04 = 0	0.000
B=5	T41=14.907	05 = 3	-44.721	05 = 3	= -44.721	05 = 0	0.000
C=3	Export=6.106	03 = 2	+12.212	03 = 5	=30.530	03 = 2	+12.212
			-32.509		-14.191		+12.212

Why are meters being swapped?

The replacement meters are physically identical to the meters being removed. While it is theoretically possible to read all the registers and reprogram the meter at the customer's premises, TasNetworks have decided that this is not a viable solution for a change-over of this scale. Meters will be replaced with a new Mk7A meter with the correct software. The register data will be recorded on-site before the meter is removed (in effect a final reading for this meter). This will also allow the full data from the removed meter to be read in the workshop by TasNetworks for checking. Meters will then be returned to EDMI to be reprogrammed and re-used.

Is this only a problem in Tasmania?

Tasmania is the only Australian jurisdiction where customers routinely have two different tariffs that can both be used at any time during the day. In other places the second circuit is typically used for off-peak consumption and it is assumed that solar power will not be generated at the same as off-peak power is being used.

For more information

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