

Submission to IPART

Dear Sir/Madam

My submission is about the effect of solar systems on 3 phase power.

Current billing currently significantly disadvantages 3 phase powered houses with solar as compared to 1 phase with a significant financial advantage to the power company as a result. This is for the same power generated/used.

For single phase power to the home, with a single inverter then all power is used in the home first, then exported and sold to the grid at the to be agreed rate. Ie perhaps 8-10c. Of course if there is a net importation of power it is charged at time of use at 20-45c. All fine!

For 3 phase power, with a single inverter, then only one phase can be offset, ie home is buying power at full rate 20-45c on 2 phases, and excess is sold back on the solar connected phase. Hence, unfair economic benefit to power company.

For 3 phase power, with 2 inverters similar happening to the single inverter situation to advantage of power company.

For 3 phase power, with 3 inverters fairer, but if 1 power phase is drawing more than solar production and the other 2 are selling back to the grid, then there is net buy from power company at 20-45c (at one exact moment in time) and sell to power company at 8-10c at the same exact time. Unfair economic benefit to the power company.

For 3 phase powered home, requiring 3 inverters of solar to achieve benefit, and 3 power meters then is unnecessary cost to home which is wasted money.

Note economic value of kwh to power company is 8-10c (IPART), but economic value of kwh to home is 20-45c (what home would otherwise pay). Hence, best for all parties for home to use all power that it generates prior to export, irrespective to which phase the power goes into. This is of course what happens with single phase power.

## SOLUTION

The solution is in the metering/billing from the power company. The prevents added cost for extra invertors/reversible meters to the home. For 3 phase installs, either with 1,2or3 invertors for solar the following is fair to all parties.

"The net power that is used over each phase is added together. If there is a total net power importation across all phases combined it is charged at the net import rate (ie often 20-45c per kwh). If there is a total net exportation of power across all phases combined it is credited at the agreed feed in rate (ie possibly 8-10c per kwh)."

(the current billing systems is charge or credit each phase net usage individually, which provides unfair economic advantage to the power company)

example below

Note P1 = phase 1, P2 = phase 2, P3 = phase 3, s = solar connected phase, nurt = net usage in real time, kwh = kwh. (ie nurtP1kwh = net usage in real time in for phase 1 in kwh)

Net KWH usage across all phases in kwh = (nurtP1kwh + nurtP2kwh + nurtP3kwh)

If total net usage, charge = (nurtP1kwh + nurtP2kwh + nurtP3kwh) x (20 to 45c)

If total net generation, credit = (nurtP1kwh + nurtP2kwh + nurtP3kwh) x (8 to 10c)

\*\*\*the current model is Charge = nurtP1kwh x (20-45c or – 8to10c if credit) + nurtP2kwh x (20-45c or – 8to10c if credit) + nurtP3kwh x (20-45c or – 8to10c if credit)

Scenario 1: solar phase produce 5wh, use 3 kwh, other 2 phases use 3 kwh

Current Billiing System

P1s      P2      P3

Net usage =  $(-5 + 3) + 3 + 3$  all in KWH

Charge =  $(-2 \times 8 - 10c) + (3 \times 20 - 45c) + (3 \times 20 - 45c)$

=  $-16c - 20c + (60c - 135c) + (60c - 135c)$

= \$1.00 - \$2.50

(middle \$1.75)

Proposed Billing System

Eg Net usage =  $(-5 \text{ kwh} + 3) + 3 \text{ kwh} + 3 \text{ kwh}$

= 4 kwh usage

Charge =  $4 \text{ kwh} \times 20 - 45c$

= \$0.80 - \$1.80

(middle \$1.30)

This USAGE if single phase (ie 5 kwh generated, 9 kwh used)

Net usage =  $-5 + 9 \text{ kwh}$

= 4 kwh

Net charge =  $4 \text{ kwh} \times 20 - 45c$

= \$0.80 - \$1.80

(middle = \$1.30)

\*\*\*\*\* ie same net charge for 3 phases as for single phase for same generation and usage

Scenario 2: solar produces 5 kwh, each of the 3 phases uses 1 kwh

P1s

P2

P3

Net usage =  $(-5 + 1) + 1 + 1$  all in KWH

Charge =  $(-4 \times 8-10c) + (1 \times 20-45c) + (1 \times 20-45c)$

=  $-32c - 40c + (20c-45c) + (20-45c)$

=  $0 - 58c$

(middle charge = 29c) \*\*\*\* despite net generation, home is paying for power

Proposed Billing System

Eg Net usage =  $(-5kwh + 1) + 1kwh + 1kwh$

=  $-2kwh$  usage (ie 2 kwh generated)

Charge =  $-2kwh \times (8-10c)$

=  $-16c - 20c$

(middle  $-18c$ , ie CREDIT 18c)

This USAGE if single phase (ie 5 kwh generated, 3 kwh used)

Net usage =  $-5 + 3kwh$

=  $-2kwh$

Net charge =  $-2kwh \times 8-10c$

=  $-16c - 20c$

(middle =  $-18c$ , ie 18c CREDIT)

\*\*\*\*\* note this model makes the 3 phase and 1 phase the same

The net position of this change in billing is

1. still feed in power paid at 8 -10 c

2. The unfair economic benefit to the power company of having 3 phase electricity in the home is removed.

3. Still the power companies are able to charge 20-45c per kwh for power which is provided to the consumer at peak times.

I think this is a most important issue that needs to be legislated to correct.

I have happy to discuss.

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