Grid Supply and Solar PV Electricity Generation

Are we there yet?

SEANZ May 2012

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Notes and Assumptions

- This document details the cost position of grid supply versus solar PV generation
- Solar PV system based on typical domestic/residential 2 kW system
- System life of 25 years
- Assumes all PV power generated is used and not sold back to the grid
- Solar PV generation rate calculated by total generated output over 25 years for the specified location divided by total system cost (Installation plus 6% finance and interest cost factored for borrowed funds to implement system or opportunity cost of non borrowed funds invested)
- Retail electricity pricing (purchased from the grid) is average across all retailers by location and factors both fixed and variable costs
- The solar PV system installed meets technical requirements orientation, north facing at recommended pitch for location, site specific factors addressed and system completed to industry standards

Acknowledgements

SEANZ acknowledges NIWA for use of the SolarView calculator to validate solar capture figures and MED for use of the data contained in their Quarterly Survey of Domestic Electricity Prices – Feb. 2012



Electricity retail rates by location (cents/kWh unit)

Source: MED Quarterly Survey of Domestic Electricity Prices Feb. 2012

Hokitika	3 6.54	<mark>○</mark> 32.149	<mark>○</mark> 29.243			
Queenstown	3 6.45	<mark>○</mark> 29.189	O22.921			
Gisborne	○34.82	○31.591	O 29.449			
Kaitaia	◯32.60	<mark>○</mark> 30.863	<mark>O</mark> 28.332			
Hawera	<mark>○</mark> 32.50	O 28.660	0 26.888			
Masterton	O31.87	<u></u> 29.062	O 27.452			
Whakatane	○31.82	O28.744	0 26.887			
Blenheim	○31.67	O29.119	O27.005			
Thames	○31.48	O 27.911	O 25.753			
New Plymouth	○30.55	<mark>○</mark> 26.138	<mark>○</mark> 23.603			
Palmerston North	○30.55	○26.686	O24.251			
Stratford	○30.55	O 26.241	<mark>O</mark> 23.603			
Wanganui	○30.55	O 26.741	O24.251			
Dunedin	○30.45	O 25.405	<mark>O</mark> 20.862			
Rotorua	○30.32	0 27.078	O 24.372			
Te Kuiti	○30.16	027.242	○ 26.128			
Nelson	0 29.95	O 27.223	<mark>○</mark> 25.459			
Turangi	O 29.54	<mark>O</mark> 26.481	<mark>O</mark> 23.673			
Tauranga	○29.47	O 26.214	O23.156			
Napier	O 29.36	O 27.067	O23.521			
Auckland	0 29.25	○26.425	<mark>○</mark> 23.551			
Whangarei	<mark>○</mark> 28.99	○ 26.988	O 24.230			
Wellington	○28.86	O 25.083	O23.130			
Christchurch	O 28.76	O 24.185	O 21.591			
Invercargill	<u></u> 28.15	0 24.728	O21.931			
Paraparaumu	027.98	0 24.868	022.111			
Hamilton	O 27.43	0 24.958	O23.316			
Takaka	O 27.33	○25.236	○24.077			
Ashburton	○26.93	<u></u> 24.588	○23.146			
Dannevirke	○26.81	O 25.041	○22.993			
Oamaru	○25.93	<mark>O</mark> 23.953	○21.800			
Te Awamutu	○25.91	○23.233	O 21.347			
Kaikoura	025.74	024.104	021.699			
	0 20 40 0	 20 40	 0 20 40			
	Highest retail rate (cents)	Average Retail rate (cents)	Lowest Retail rate (cents)			



Solar PV generation by location larger/darker = more

generation capability

Source NIWA Solarview and SEANZ PV calculator





Solar PV generation rates by location larger/darker =

lower rate

Source SEANZ PV calculator Rates to be treated as comparison between locations







Difference between solar PV generation rates and existing average retail rates by location

larger/darker = greater difference = more savings

Source MED Quarterly Survey of Domestic Electricity Prices Feb. 2012



Difference by location (cents per kWh) between solar PV generation rate and average retail rate

Hokitika														
Kaitaia														
Queenstown														
Nelson														- 1
Masterton														
Napier														
New Plymouth														
Turangi														
Auckland														
Pukekohe														
Rotorua														
Tauranga														
Wellington														
Hamilton														
Paraparaumu														
Christchurch														
Dunedin														
Invercargill														
	0.00	0.01	0.02	0.03	 0.04	0.05	 0.06	0.07	 0.08	0.09	0.10	0.11	0.12	0.13
	Difference (cents per kWh) - 25 year PV rate vs avg current retail rate													

So are we there yet? We arrived there 8 months ago!!

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Explanatory Notes

The MED Quarterly Survey of Domestic Electricity Prices monitors changes in:

- Line charges and retail charges for a domestic consumer using 8,000 kWh a year
- Lines charges and retail charges in general
- The line charge figures represent the total (fixed and variable) cost of electricity transmission and distribution
- The retail figures show the total cost of electricity to a residential consumer and include the line charge component
- GST and discounts
- GST and prompt payment discounts are included in the prices. Electronic payment, direct debit, or fixed term contract discounts are not included. For example, a retailer may charge a consumer 100 cents/day and 22c/kWh of electricity used. This would cost an 8,000 kWh a year customer \$2,125 for the year