

Future Outlook of Solar potential in New Zealand

BY NICHOLAS DOBSON

EGEE 497- SUSTAINABLE ENERGY IN NEW ZEALAND

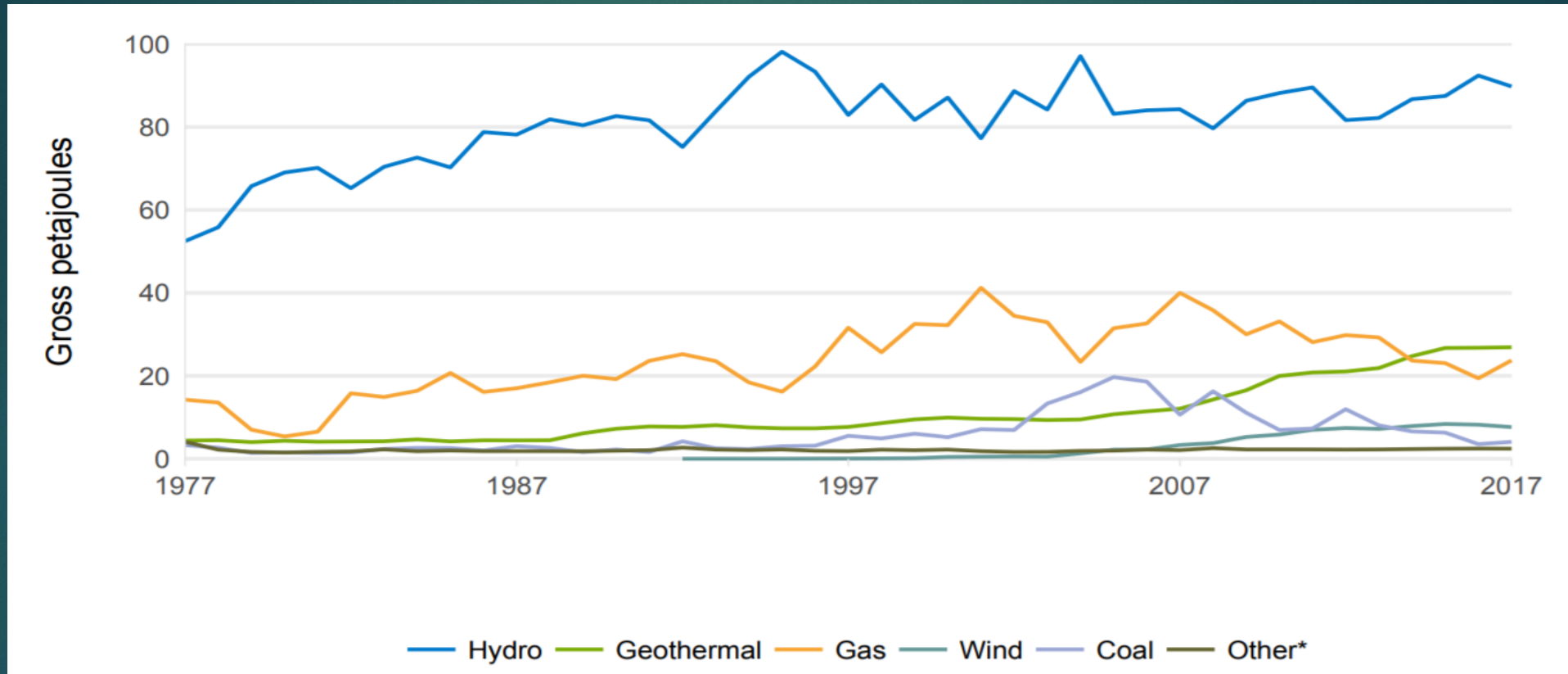


Outline



- SOLAR ENERGY USAGE IN NEW ZEALAND
- ECONOMICS ASSOCIATED WITH SOLAR ENERGY IN NEW ZEALAND
- CONSTRAINTS FOR SOLAR ENERGY IN NEW ZEALAND
- SHOULD NEW ZEALAND INVEST IN MORE SOLAR?

Renewables in NZ



SOLAR ENERGY MAKES UP LESS THAN 0.2% OF THE ELECTRICITY GENERATION

Current Generation

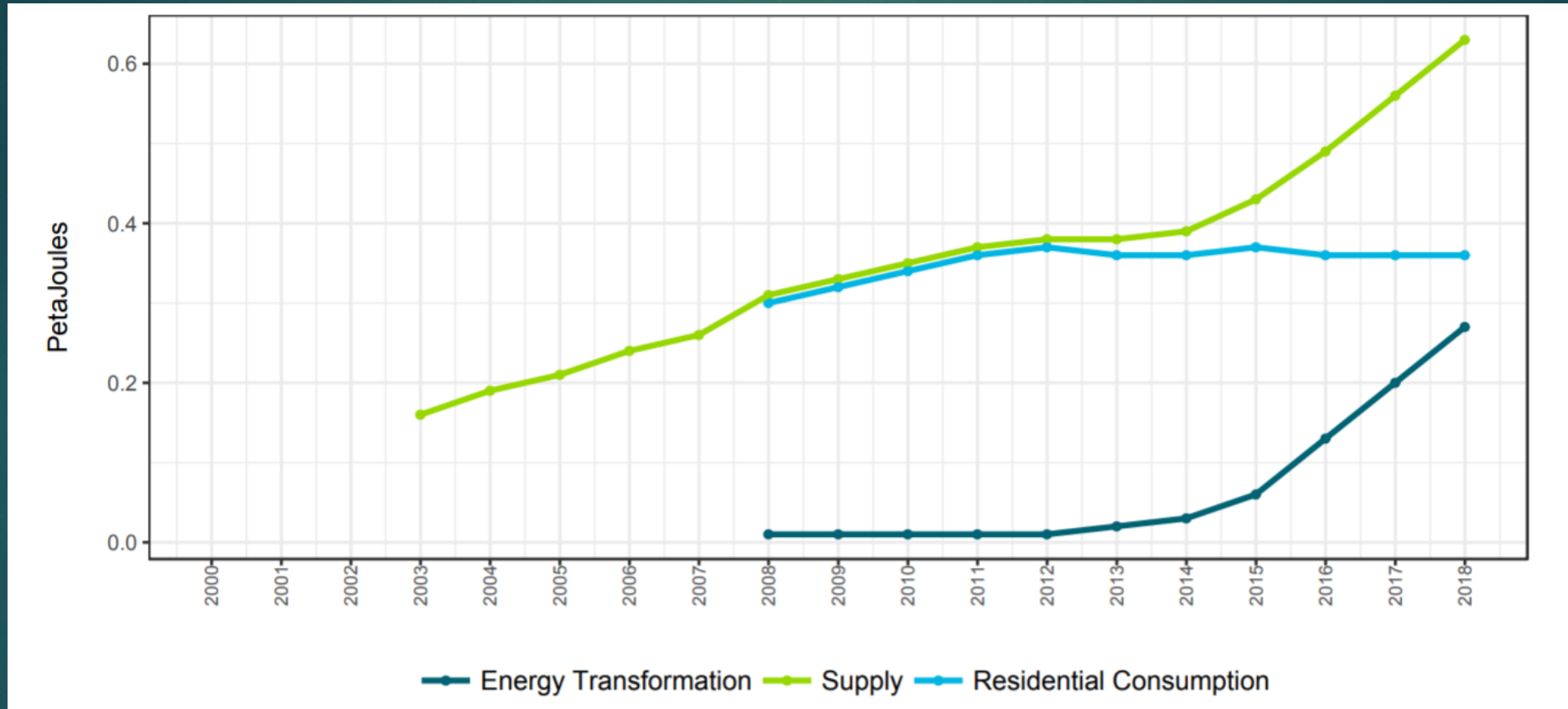
- ▶ Currently New Zealand has 90 MW installed PV solar power
- ▶ Over 15 of the 90 MW have been installed in the past year
- ▶ Largest single solar array in New Zealand is at Yealands Estate winery in Marlborough which has a 412 kW capacity
- ▶ The array offsets 362 tonnes of Co2 per annum



Residential Solar

- ▶ Average residential PV system is around 3 kW
- ▶ Passive solar heating is used by most homes to some extent
- ▶ Average cost of a PV system was \$40,000 in 2009 and now it only costs about \$9,000.
- ▶ Cost – effective

Residential Consumption



Taken from the Ministry of Business, Innovation and Employment in NZ

Economics

- ▶ Currently retailers offer between \$0.07 and \$0.16 per kWh for excess solar power
- ▶ Home owners should get a solar power system that matches their daily energy consumption. Aiming to use over 50% of their solar power will allow for a good return on investment

Energy Retailer	Solar Power Buy Back Rate	Max. System Size: : :
Contact Energy	8:¢ / kWh, + GST	Up to 10kW
Mercury	8:¢ / kWh (With the exception of a couple of networks) or 12:¢ / kWh (Only for newly supplied Mercury Solar customers that enter in a 3yr contract)	Up to 10kW
Trust Power	7:¢ / kWh, + GST (Or peer to peer rates you negotiate via Trust Power's Solar Buddies Scheme - view details here)	Up to 10kW
Meridian	8:¢ / kWh +GST	Up to 10kW
Genesis	8:¢ / kWh excl. GST:	Up to 50kW
Ecotricity	7 - 8:¢ / kWh + GST	-
Nova Energy	7.4 :¢ / kWh: + GST	Up to 10kW
P2 Power	16:¢ / kWh excl GST (Only for the first 50kWh exported each fortnight) 8:¢ / kWh excl: GST (Thereafter) (You may be put on a waiting list to receive the 16:¢ / kWh rate)	Any size
Powershop	7.5 :¢ / kWh: + GST (Residential customers only)	-

Current buy-back rates from different companies. Taken from mysolarquotes.co.nz

Economics

EXAMPLE OF GOOD ROI FOR RESIDENTIAL HOMES IN NEW ZEALAND

A typical 3kW solar power system in Auckland generates about 3,700 kWh/yr and the purchase of this system is \$9,000

Need to take half the solar generation which is 1850kWh because half is for the value gained in offsetting your normal electrical use and the other half is exported to the grid-paid

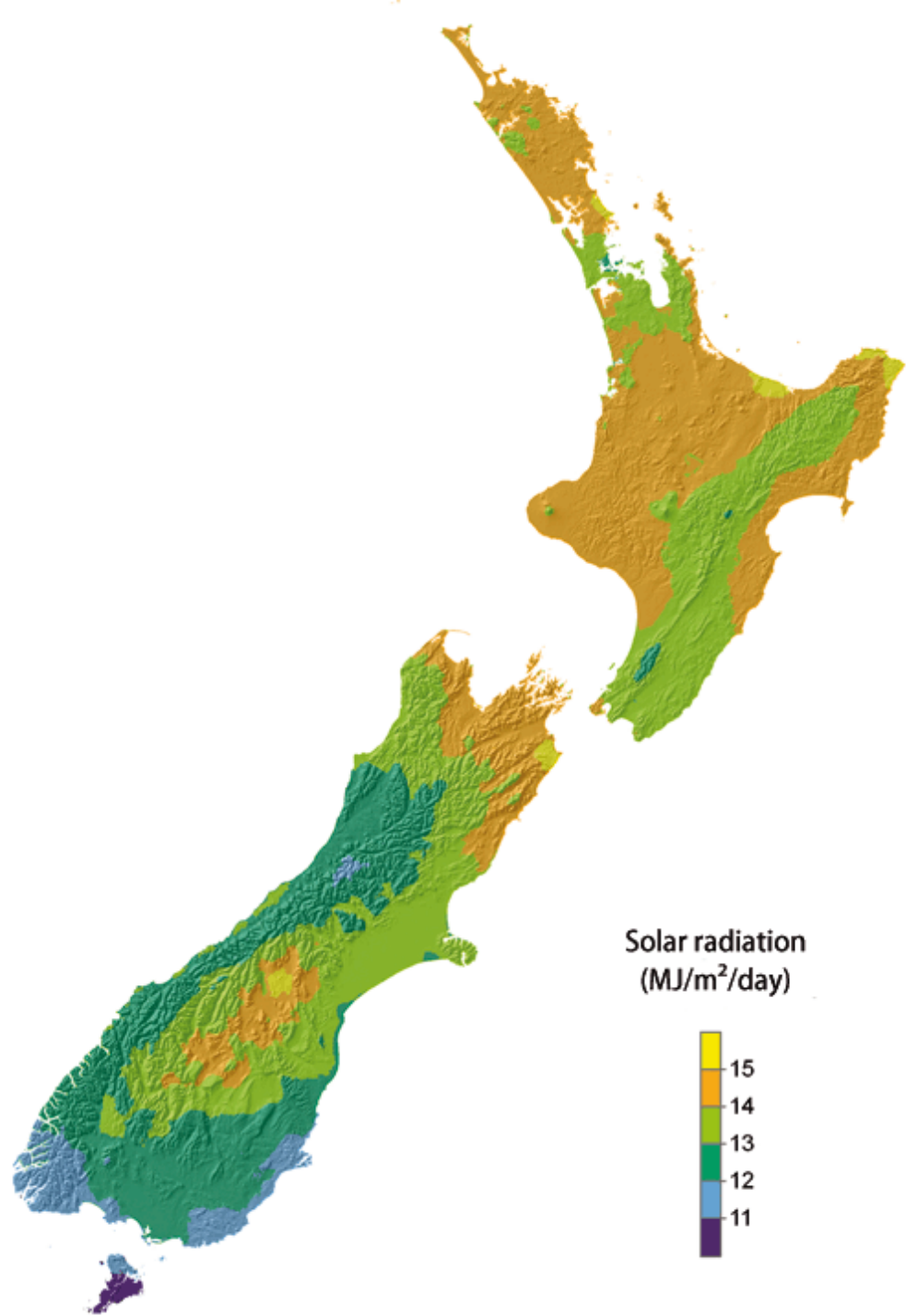
$$1850\text{kWh} * \$0.30 = \$555$$

$$1850\text{kWh} * \$0.08 = \$148$$

$$\text{Total Saved} = \$703/\text{year}$$

$$\text{ROI} = \$703/\$9,000 = 7.8\%$$

Constraints for Solar



- ▶ An increase of solar usage could cause the buy-back rates to decrease
- ▶ Independent of peak demand
- ▶ Areas of New Zealand are less effective for solar energy
 - ▶ North vs South island

Should New Zealand invest in more Solar?

- ▶ Yes but only in certain areas
 - North island has the greatest potential for solar energy
- ▶ Solar generation is costly on a large scale so it might be better for New Zealanders to stick to residential solar
- ▶ It is a good idea to have solar for dry summer's. Since New Zealand is heavily reliant on Hydro-electric power, dry summers can cause a decrease in energy generation. Solar energy can be a way to offset this.
- ▶ Solar technology is getting cheaper by the year
- ▶ Future government incentives for solar energy

Questions?

Sources

- ▶ <https://www.mbie.govt.nz/assets/d7c93162b8/energy-in-nz-18.pdf>
- ▶ <https://mysolarquotes.co.nz/about-solar-power/residential/solar-power-buy-back-rates-nz/>
- ▶ <https://www.thedrinksbusiness.com/2016/10/yealands-completes-new-zealands-largest-solar-panel-installation/>