NEW ZEALAND AND PACIFIC
Solar and Storage Council

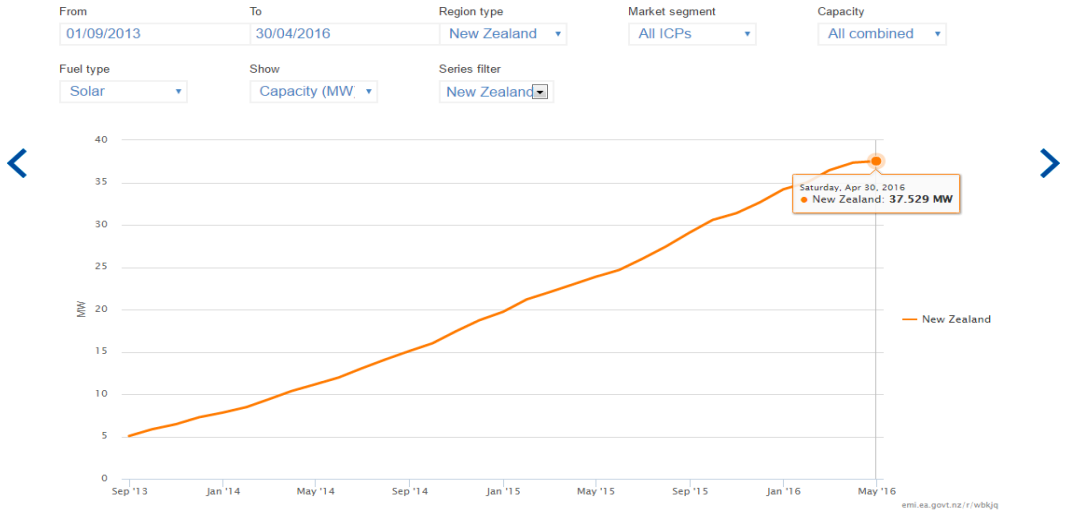
"Yes We Can" Symposium
Solar and Storage Perspective

1. Background

At the COP21 meeting in Paris, the New Zealand government agreed to reduce its greenhouse gas emission as part of a new global agreement. The proposed target is to reduce emissions by 30% below 2005 levels by 2030. There is an expectation that NZ's target is likely to be met mostly by emitting businesses buying surplus carbon emissions units from forest-owners or from other businesses that have gained units by reducing global emissions. This symposium proposes that with appropriate policy assistance, domestic mitigation could be cheaper than the Government purchasing international units.

2. Solar and storage snapshot

a. Within current policy settings, solar installed capacity is experiencing a compound growth rate of over 110% p.a. currently, based on Electricity Authority data (measured from 31 Aug 2013 to 30 Apr 2016):



Source:
http://www.emi.ea.govt.nz/Reports/VisualChart?reportName=GUEHMT&categoryName=Retail&reportGroupIndex=4&eventMode=Async&reportDisplayContext=Gallery#RegionType=NZ&MarketSegment=All&Capacity=All_Total&FuelType=solar&Show=Capacity&DateFrom=1/9/2013&DateTo=30/04/2016&reportName=GUEHMT&condensedView=false

b. **Solar customers are able to access "low user" line charges, and at the same time reduce their energy costs once they go solar, by the two fold benefit of purchasing less energy, as well as getting paid a nominal buyback price for any exported electricity;**

c. **Any registered electrician is legally allowed to install solar power systems, resulting in potentially a large pool of tradesman able to undertake solar installations, without any mandatory additional competence training;**

d. **New battery technologies are entering the market, resulting in significant price reductions on a "$/kWh storage capacity" basis. The speculation of when these figures will achieve grid parity dominate utility sector commentary;**

e. **The introduction of harmonised AS/NZS standards for solar and storage hardware and installation allow New Zealand to leverage the experienced labour resources as well as volume pricing enjoyed by Australia, a perceived major market for solar and battery storage suppliers;**

f. **No consents are required for solar and storage systems, and connection to networks may or may not be required depending on the topography sought by customers.**

This snapshot paints a picture of easy to install systems with falling costs structures, unconstrained access to products, supported by a readily available pool of labour.

3. **Policy settings for encouraged growth and accelerated growth**

Current annual electricity demand is approximately 43,000GWh, of which renewable generation represent 80.7% (34,643GWh). Of this 43,000GWh, approximately 32% is consumed at residential level in 2015 (12,500 GWh), and 24% at commercial level (9,472 GWh). Source: http://www.mbie.govt.nz/info-services/sectors-industries/energy/energy-data-modelling/statistics/electricity

On its own, without storage, a characteristic of solar power is that it has highest production during daylight hours in summer, tapering off in autumn and lowest in winter, rising again in spring. In terms of getting more "renewable electricity", solar arrays generate electricity in the time and seasonal band where it is more likely to offset hydro than thermal plant. Where the need for thermal generation is highest, during winter evening power system peaks, solar systems are not generating at any significant level. In the New Zealand context, the prospect of solar power to reduce the power generation carbon footprint is therefore limited in this narrative, while there is no energy storage.

Energy storage is rapidly approaching economic viability, both in terms of stationary batteries as well as "mobile" batteries in electric vehicles.

The scenario then becomes the deployment of much larger solar arrays with capability to store excess generation in the home and to charge EV's, significantly reducing transport fuel purchases and their commensurate annual carbon footprint, as well as to reduce winter thermal power generation at peak times.

For example, at 1kWh travelling between 5km and 8km depending on vehicle chosen, a daily commute of 30km can be easily provided by a solar array on the home consisting of 8 modules, for almost all year.

Policy settings that will encourage and accelerate growth are required to be put in place now, in order not to stifle solar and storage technologies as they rapidly approach economic mass deployment.

The policy settings required include providing:

a. **Clarity and certainty in distribution line charge recovery:**

   Changes are expected in the way distribution companies will charge for network connection and line charge recovery. The current uncertainty in what is likely to apply going forward is preventing new and existing service providers from offering new and innovative products. A rigorous and sustainable line charge regime will provide the certainty needed to both new entrants and existing players alike, who are waiting in the wings to offer solar/storage products into the market today.

b. **Support for industry training initiatives:**

   Solar and battery storage introduce new competencies required for installers and inspectors. The solar and storage industry has the capacity to provide training and ongoing professional development. Support for industry led training needs to be put in place, allowing the industry to keep practitioners up to date with safety issues as well as the rapidly changing technology landscape.

c. **Continue harmonisation of standards and more urgency in the adoption of standards:**

   The promulgation of joint AS/NZS standards will allow New Zealand to benefit from significant savings in regulatory oversight by sharing the costs of establishing safe, industry best practice deployment of solar and storage technologies. Once established, these standards need more certainty of when they will apply. The current practices in this area are sluggish and creates uncertainty and confusion for both installers and electrical safety inspectors alike.

4. Summary

Solar array installations are experiencing significant rates of growth, albeit from a low base. On a business-as-usual basis, falling equipment prices are likely to continue, resulting in ongoing high rates of growth in the numbers of installs. The

fall in prices of batteries will make these systems economic in the short to medium term also. Solar plus battery storage are expected to be the game-changer leading to households being able to provide a significantly larger proportion of household energy requirements, both in terms of electricity and transport fuels.

The challenges for New Zealand are to ensure regulatory oversight and training in competency keeps pace with the introduction of new technologies. Expected changes in distribution line charging regimes need to be bedded down as soon as possible, to provide certainty for commercial decision-making, and to not hinder rapid provision and uptake of these technologies.

As the prices of solar and storage falls, households will find it more economic to invest in these technologies. For the government, policy settings that allow households to have confidence to invest in solar and battery storage represent very low-hanging fruit to achieve a significant reduction in household greenhouse gas emissions. These reductions come from directly reducing the fossil fuels used in vehicles, and by directly reducing the amount of power a household requires during winter power system peaks provided by thermal power stations.

About the New Zealand & Pacific Solar and Storage Council Inc (NZPSSC):

The NZPSSC exists to promote scientific, social and economic development through the environmentally sound use of solar energy.

This includes:

- **promoting research, development and adoption of solar energy and other complementary low emissions technologies;**
- **dissemination of information on solar and complementary low-emissions technologies and their utilisation;**
- **promoting public understanding and adoption of practices, technologies and systems for the use of solar energy and energy efficiency; and**
- **advocacy for the adoption by all levels of government of appropriate policies and programs to promote use of solar energy.**

Our priority workstreams are:

- **To encourage the development of common standards and installation best practice across the New Zealand and Pacific region and providing policy advocacy and advice on best practice on solar and storage solutions, to regional utilities, national governments, regulators and planners**
- **To provide training to increase local skills and expertise, encompassing design through to deployment and maintenance.**