

Missing out.

How current renewable energy policy in New Zealand is costing us money.

By Mike Bassett-Smith

Introduction

- **The international market for Distributed Generation (micro energy sources like solar power systems on homes and buildings) is booming with huge opportunities for economic growth and development.**
- **Many national governments have recognized that electricity markets contain a host of market and legislative failures that impede the uptake of Distributed Generation systems and have acted to correct them.**
- **The New Zealand Government does not provide these technologies any explicit, financial, or legislative support and is now obviously well behind global peers for technology uptake and industry development.**
- **Distributed Generation technologies make excellent contributions to NZ's energy infrastructure and have been proven to reduce electricity market price volatility, reduce fuel imports, reduce carbon emissions, and provide significant opportunities for product and service export.**
- **If the NZ Government does not act to support and enable Distributed Generation NZ companies will quickly fall much further behind their global peers. This will have a significant negative impact on our energy future and national economy.**
- **The best option for the current NZ Government is to legislate a Gross Feed in Tariff as this mechanism addresses the key failures of past NZ government policy and has been proven internationally to be highly effective in developing the industry for Distributed Generation systems.**
- **International experience demonstrates that a Feed in Tariff is an excellent investment with returns that far outweigh the costs. The NZ public needs to support this initiative and make it an issue for the current government. Contact info@powersmartsolar.com to provide your comments.**

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Having attended the Sustainable Electricity Association of New Zealand's (SEANZ – www.seanz.org.nz) annual conference one thing is very clear – the past New Zealand (NZ) Federal Government policy towards renewable electricity generation is incomplete and poorly considered. It has so far failed to curb the key problems facing our energy future, and left New Zealand businesses on the sidelines of one of the world's fastest growing industries.

Despite inheriting a relatively high quality and clean energy portfolio there is currently no clear vision for the future of renewable electricity generation in New Zealand. Despite stating a commitment to 90% renewable energy generation by 2025 the actions to achieve this goal have amounted to business as usual without in depth analysis and intelligent consideration of all the issues. Distributed generation (DG), micro sources like solar power systems, are given a weak high level treatment even though their ability to be lucrative investments is well established. Other obvious qualities like a perfect fit in the current NZ generation portfolio, impeccable environmental credentials, and tremendous opportunities for product and service export only make the absence of any actionable policy more astonishing. It is clearly time for change.

NZ is not missing out because of the talent present in this country, but because the past government failed to understand the national and international potential of this industry. Currently the NZ industry for designing and installing (DG) systems is stocked with professional firms whose products and services are consistent with worldwide quality standards. It is, in fact, very impressive the work that is being done by NZ firms both locally and worldwide when you consider that our competition in other countries has received substantial direct support from their respective governments. Those firms are in markets that are exploding as a result of a combination of both government and market based incentives like Feed in Tariffs (FITs), capital rebates, carbon trading, and tax incentives. This is providing those firms (our competition for both local and international projects) a platform for growth that leads to better capitalised businesses, the ability to attract and retain highly skilled staff, and the commercial relationships necessary for competing in larger and more lucrative projects. While this is happening at a rapid pace throughout many nations NZ consumers and companies receive effectively zero support.



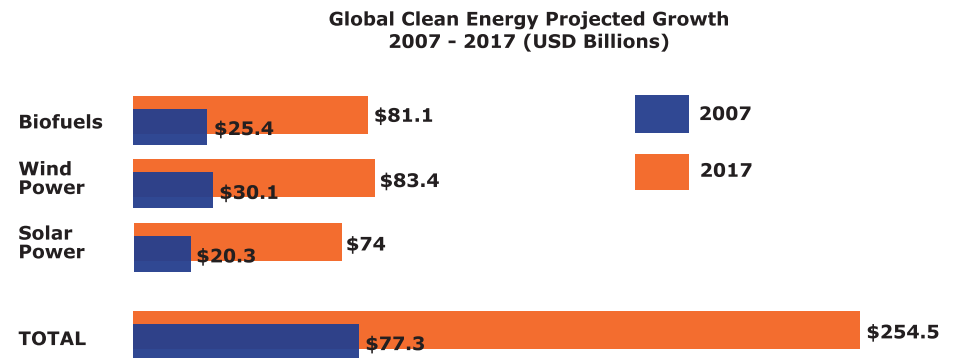
It is surely not the virtues of the technology holding back the NZ DG market, but quite clearly government and thus market failure. Solar power systems (shown left) are useful in many circumstances, have been widely proven to add significant long term value to both residential and commercial properties, and fit the current NZ portfolio perfectly. However, the relative strength of these qualities is quite dependent on the commercial and legislative structures that support the consumers who adopt the systems. It is here where NZ is fundamentally out of step with our global peers.

What NZ is missing out on is gigantic. The world market in 2007 for just solar photovoltaics was approximately \$37 billion NZD. By 2017 it is forecast to more than triple, and then multiply a further 155 times by 2050. Few markets today compare with the scale of the opportunity these technologies present.

Consider NZ's closest neighbour, and home to firms that are all but dominating the Australasian small energy market. Total Australian installed capacity of solar systems is now approximately 85MW, almost \$1b AUD, and growing quickly. In 2007 to 2008 the Australian Federal Government directly funded the bulk of 26 MW of industry work (approximately \$260m AUD), and has recently announced another \$200m in funding for renewable DG systems for schools. Several State governments already have, or are working towards, implementing FITs for residential and commercial renewable DG systems. Australian domiciled programs fund renewable energy systems in the Outback, Asia, and the South Pacific Islands. And, Australia has constructed an excellent market based system for providing cash rebates to system owners for the carbon offsets that result from their DG investments. Despite all this, they are still miniscule by international standards.

NZ can currently claim no comparable programs and when NZ leaders are questioned on this obvious disparity they consistently point out that Australia is supporting renewable DG systems to replace an energy portfolio dominated by dirty coal fired power stations, which use huge amounts of scarce water and belch airborne pollutants into the atmosphere. They insist that NZ does not have this problem and can easily achieve our 90% renewable by 2025 goal more cheaply by sticking to plans to build large power plants. On the surface these statements can appear logical but are actually quite flawed and in any case missing the point.

Solar Photovoltaics (including modules, system components, and installation) will grow from a \$20.3 billion USD industry in 2007 to \$74 billion USD by 2017. Annual installations were just shy of 3GW worldwide, up nearly 500% from just four years earlier.



Source - Clean Edge, 2008

The International Energy Agency has estimated that \$16 trillion USD needs to be invested by 2030 (about \$600 billion per year) to meet the growth in projected demand for new electricity and fuel sources worldwide. Most expect an increasing percentage of that investment will focus on renewables with solar clearly a favourite.

US Top 7 Disclosed Energy-Tech Venture Deals (2007)

Company	Primary Sector	Total Invested USD Millions
HelioVolt Company	Solar	\$100.5
GreatPoint Energy	Efficiency - Supply Side	\$100.0
Arcadian Networks	Efficiency - Supply Side	\$90.5
Solyndra Inc	Solar	\$79.2
SolFocus Inc	Solar	\$63.6
Calera Corporation	CCS	\$58.5
Miasole Inc	Solar	\$50.0

Source - New Energy Finance, 2008

First, it is simply not valid to compare the financial qualities of large scale power plants directly to small scale distributed generation systems. The financial implications are for purely separate interests. You simply cannot compare power plants which rely on rising wholesale electricity prices to pay investors directly to a system which saves the owner retail electricity expenses on site. There is a fundamental economic separation here that is not being addressed at the government level. The costs associated with distribution of electricity from more far flung sources is not included, and only recently has the government modelled the impact electric vehicles will have on demand growth scenarios. Second, from both the public and government perspective the simple fact that we are largely renewable already should reinforce (not reduce) our commitment to supporting small scale renewable energy generation in New Zealand. These technologies are perfectly suited to our current electricity generation portfolio and make material gains on all the key issues identified in the NZ Energy Efficiency and Conservation Strategy. Third, and by far the most important, the worldwide industry for small energy systems is growing exponentially. By not supporting these technologies in NZ the government is severely curtailing our ability to compete in not just our own emerging market, but our neighbouring markets as well. This means that NZ firms are so far hardly participating in what has been termed "the greatest opportunity for wealth creation in a generation." While their green credentials are lauded and fundamental, their potential economic impact is even greater.

It then becomes obvious that current (or the lack of) NZ renewable energy policy for DG systems is in need of wholesale review and change. International experience provides a proven mechanism that supports the DG industry for the benefit of consumers, businesses, and government. Feed in Tariffs (FITs) specifically geared towards renewable DG technologies like solar photovoltaics are currently legislated in several countries and being considered in many others. Examples include Germany, France, Italy, Korea, Canada, the Netherlands, Portugal, Spain, and Australia.

Country	FIT	Rebates/ Subsidies	Tax Credits	CO ₂ Offset Trading	Legislated Metering & Billing
Australia	●	●		●	●
Austria	●	●		●	
Belgium		●	●	●	●
Canada	●	●	●		●
Croatia	●				
Czech Rep.	●	●	●	●	●
Denmark	●		●	●	●
USA		●	●		●
New Zealand	X	X	X	X	X

The vast majority of policy and energy experts will agree that rigorous government policy is needed to overcome the market barriers in front of renewable DG technologies. It is here where NZ is fundamentally out of step with the world.

The table left shows a small sample of countries and their government's commitments to renewable DG technologies. Note that ALL in this sample have some form of legislative support for metering and billing (either a specific policy or FIT). In addition, relatively simple incentives like tax credits and CO₂ offset trading are common.

Despite having a natural market and need for these technologies NZ has failed implement a single comparable item of government policy.

FITs are public policy mechanisms that provide qualifying grid connected DG systems a somewhat higher than retail price for the electricity they generate over a fixed contract period, usually around 20 years. They are typically structured to provide the system owner traditional 'payback' on the system investment within the FIT contract period. A common misconception is that FITs are a form of government subsidy. This is false. FITs marginally increase the price of electricity for all users in order to fund payments of higher prices for renewable DG systems. They are usually structured to regress over periods of time in order to kick start the industry and they immediately correct market failures that have placed barriers in front of DG systems while heavily favouring large scale power plants. A FIT is well suited to NZ because it is the one internationally proven mechanism that can address the key failures of past government policy and progress this industry for the economic benefit of NZ as a whole.

The first of these failures is the complete lack of a reliable platform for metering and billing a DG system that both supplies electricity to a property and feeds it back into the national grid. Currently, NZ energy generators/retailers offer a mix of agreements but none are obliged to contract for a specific term. Our peers around the world have legislated better arrangements so investors can rely on their ability to power themselves and feed the grid for the long term. Considering most solar systems are sold with 25 year product warranties this is a very key issue. Often called 'net metering' these arrangements provide property owners certainty over the value of their investment in a small scale power system for the life of the property. The fact that New Zealand lacks any form of comparable arrangement in 2009 is embarrassing. A legislated gross feed in tariff would address this key failure directly.

While the metering and billing issue is fundamental it is also important to address the financial hurdles present with distributed generation investments. Most of these technologies, like solar power systems, have a relatively high capital cost and little or no future operating cost. Traditionally, the financial value of these investments has been measured in terms of 'payback'. 'Payback' is a blunt instrument at best, and has hardly helped any investor understand the financial value of investing in distributed generation systems. Gross FITs worldwide have helped correct this failure and spur financial expertise and products to this industry.



It is certainly not by virtue of performance that solar power systems are totally unsupported by the NZ government, illustrated by the abundance of yellow, orange, and red on the map above.

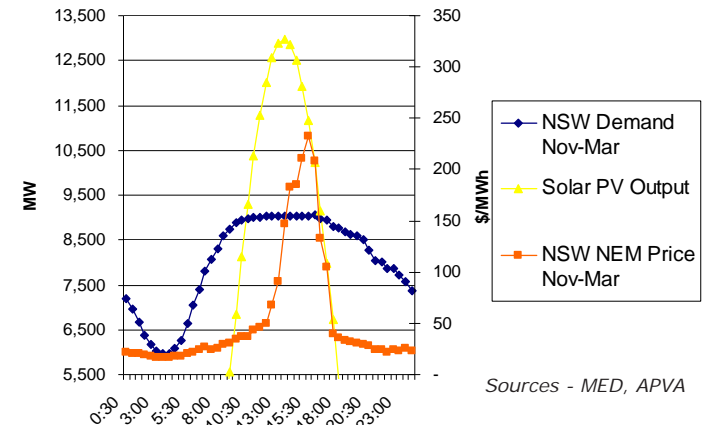
Solar power systems in NZ significantly outperform some of our international peers who are quickly adopting the technology.

Systems in Auckland, for example, will produce approximately 40% more energy per annum than the equivalent system in Germany. Even so, Germany accounted for over 50% of the world market for photovoltaics in 2007.

- Map provided courtesy of NIWA Science

Solar PV output typically supports network supply during periods of peak demand, shown below by comparing PV output to NSW demand and market prices.

*In NZ it is also well matched to typical summer hydro constraints and has been proven to reduce wholesale electricity price volatility. This is of particular importance for NZ considering that on Jan 25, 2008, for example, wholesale electricity prices were over \$0.50 per kWh (**2x normal retail prices**) for the entire working day.*



Sources - MED, APVA

The German Incentive Program: Cost versus Benefits

Additional Costs as compared with conventional electricity generation.	€ 3.2 billion	€ 5.0 billion	Reduction in Wholesale Electricity Prices.
Additional Costs, Regulation.	€ 0.1 billion	€ 3.4 billion	Avoided External Costs for Electricity Generation.
Transaction Costs.	€ 0.002 billion	€ 1.0 billion	Avoided Energy Imports
Total Costs: € 3.3 billion		Total Benefits: € 9.4 billion	

Source - Benjamin Sovacool, National University of Singapore, Lee Kwan Yew School of Public Policy, Presentation to SEANZ, Dec 2008

They have helped make the application of finance applicable to DG investments and a properly structured tariff can allow a homeowner to invest in an energy system inclusive of a home mortgage. If structured properly a FIT can make a solar power system the same monthly cost to the property owner as current electricity prices, only without the upward price pressure. This is now possible in many markets.

The overall benefit to NZ of instituting this type of mechanism could be huge, and the cost reasonable as demonstrated overseas. The cost of the German incentive program (including a FIT, tax incentives for companies and consumers, and small business support) is so far €3 billion EUR and the FIT has increased the average home's electricity bills by €6.30 EUR per year. This investment has so far generated over €9 billion EUR in earnings, supported the creation of 1500 businesses, and created approximately 250,000 jobs. As one of the first nations to understand the importance of supporting the DG industry it is now no surprise that much of the global solar industry is largely based out of Germany. The industry now earns Germany significant returns each year, and of course the future looks increasingly bright. For NZ the benefits would be similar

and would also include increasing the reliability of our entire grid, helping to stabilise volatile electricity prices, generating export earnings, creating local jobs, and providing significant opportunity for technology development and sale.

The sad fact that New Zealand is missing this opportunity remains a striking failure of the past government. It remains to be seen if the new government can make the corrections necessary and put us in the international playing field for this industry. What is needed first is a fundamental shift from presenting these technologies as simply 'green' solutions, to focusing on their individual, national, and regional economic value. Distributed generation systems are clearly no longer niche applications only for the green minded, but they will remain that way in NZ unless the new government can change the commercial and legislative structures that support and enable them. If you, like many of us, want to see New Zealand participate in this tremendously important opportunity please send comments of support to info@powersmartsolar.com.

Bio Mike Bassett-Smith : Mike is a founder and director of Powersmart NZ Ltd, who design and install solar power systems throughout NZ, Australia, and the South Pacific. He lives in the Bay of Islands and regularly presents to architecture firms, energy companies, and others. You can find more of his work on Powersmart's website as well as in a New Zealand sustainable design book entitled 'A Deeper Shade of Green'. Email comments to info@powersmartsolar.com.