How do we successfully scale community and participatory energy in Australia?
Lessons from Europe, UK and USA.

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Signed

Dated 27/1/2016
**Abstract**

*How do we successfully scale community and participatory energy in Australia?*

*Lessons from Europe, UK and USA.*

We are in the early stages of a fifty year transformation to a cleaner, more participatory energy system. My fellowship allowed me to meet the visionaries, entrepreneurs and change makers who are the seeds of this transformation - those building citizen energy movements or new people-centric energy business models across the Western world. This report tries to disseminate some factors which make them successful, and what lessons we can apply in the Australian context.

By Chris Cooper

**Acknowledgements**

I would like to thank the Churchill Trust for this amazing opportunity. I’d also like to sincerely thank the many people that contributed to this journey be it by offering a place to stay, a shared meal, your time, and most importantly for sharing their story.
Executive Summary
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The Winston Churchill Fellowship gave me the opportunity to meet the visionaries, entrepreneurs and change makers who are a key part of the transformation towards a cleaner, people-centric energy system. This report tries to disseminate some factors which make them successful, and what lessons we can apply in the Australian context when building community energy movements and new energy business models.

Fellowship Highlights
I had an amazing Churchill Fellowship experience. Some of the personal highlights include:

- Visiting the world's pioneering community energy organisation, EWS, Prokon, Energy4All, Abundance Generation, and Clean Energy Collective
- Learning about exciting new business models such as Open Utility, Vandebron, Next Kraftwerke, Buergerwerke, HEVO Power and Yeloha.
- Learning about what makes an energy innovation ecosystem with Danny Kennedy and Minh Le.
- Dining with Amory Lovins, Founder of RMI, one of Time’s 100 most influential people
- Driving a Tesla, scaling a 100m wind turbine, attending a Harvard energy networking event, the 2015 German Energy Awards, and riding a bike through New York with HEVO Power’s CEO.
- making countless new friends, business connections, potential partnerships around the world.

Lessons for Australia
On a personal level, I learned a lot about community energy, innovation, and the process of scaling a start-up - lessons which I plan to take home and incorporate into Repower Shoalhaven, and any start-ups that I pursue.

I have already been disseminating information to the energy sector in Australia via my blog, which is republished in Renew Economy, a widely read energy journal. My writing has been generous in offering clear opportunities for the Australian energy sector, such as market gap identification, partnership opportunities and an insiders account of the inner workings of many an energy start-up. I have already fostered connections between Australian businesses and those that I’ve met overseas as a means to bringing useful technology and software to Australia. In particular, my blog post calling to set-up an energy incubator and accommodate start-ups in Australian Renewable Energy Agency (ARENA) funding has garnered a positive response and it looks hopeful that both of these requests may be fulfilled in 2016.

For community energy organisations and entrepreneurs, some lessons:

- use networks and partnerships to scale swiftly and cheaply
- use software appropriately to drive down marginal costs
- entity type (i.e. for-profit, non-profit, co-op) is less important than being transparent and open
- branding and storytelling is key to inspiring movement participants
- get the financial structures right to avoid a Prokon disaster

I do think that there are limits to how far innovation can get us within the current regulatory regime of electricity markets. Governments and regulators need to move much quicker to reform electricity markets to more accurately reflect the values offered by distributed energy solutions. This will spur more rapid innovation towards a low carbon, people-centric energy system. This fellowship stops short of reform proposals but I recommend policy makers look to New York ‘Reinventing the Energy Vision’ for best practice reform process.
Programme

Germany
EWS
Craig Morris
Buergerwerke
Metropol Solar
Next Kraftwerke
Institute for Sustainability, Potsdam
Prokon + Amperax
SunRide
CrowdEner.gy
Lumenaza
Buerger Energie Berlin
2015 German Energy Awards

Schoenau, (Black Forest)
Freiburg
Heidelberg
Mannheim
Cologne
Potsdam
Itzehoe
Berlin
Berlin
Berlin
Berlin
Tanja Gaudian
Craig Morris
Felix Schaefer and Kai Hoch
Daniel Bannasch
Helen Steiniger
Boris Gotchev
Bernhard Müller
Marco Peise
Peer Piske
Bernhard Boehmer
Luise Neumann-Costel
Various
Pioneering community energy organisation
Energy transition journalist and analyst
Co-operative energy retailer
Solar Advocacy
Virtual power plant aggregator and innovative retailer
World's biggest energy co-operative/Wind Company
PPA/Microgrid Management Platform
Citizen crowdfunding platform
Local energy platform for small retailers
Grid buy-back movement

Netherlands
Vandebron
We Share Solar
Local Energy Network Services

Amsterdam
Amsterdam
Jaap Grolleman and Chiel van Leeuwen
Sven Plutt and Edwin Res
Christiaan Brester
P2P energy retailer
Citizen energy crowd-funding platform
Apartment solar via hardware/software innovation

United Kingdom
Open Utility
Oxford Solar (Perovskyte)
Energy4All
Community Solar Edinburgh
10:10
Abundance Generation

London
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Edinburgh
Edinburgh
London
London
London
Various
James Johnston
Henry Snaith
Paul Phare
Paul Phare
Jesse Scharf
Tom Harwood
Various
Peer2Peer local energy trading software start-up
R+D firm for advance solar efficiency
Community energy developer
Community energy project with the City of Edinburgh
Community energy comms and donation crowdfunding
Community energy crowdfunding company
Renewable energy finance conference
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<td>Leading US household solar company</td>
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<td>Silicon Valley based solar incubator</td>
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<td>Revolving loan fund for solar projects, donation sourced</td>
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<td>Solar Financing Company</td>
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<td>Customer procurement platform for community solar</td>
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Introduction

The Winston Churchill Fellowship gave me the opportunity to meet the visionaries, entrepreneurs and change makers who are a key part of the transformation towards a cleaner, people-centric energy system. This report tries to disseminate some factors that make them successful, and what lessons we can apply in the Australian context when building community energy movements and new energy business models.

Research Question: How do we successfully scale community and participatory energy?

This report attempts to answer the main research question by showcases some case-studies and sharing some themed discussions from my journey lessons. As we are dealing with many different organisation types in different contexts, there are no ‘one-size fits all’ answer how to scale a community energy organisation, but rather many different ‘micro-lessons’ which can be adapted for the Australian context.

To set the context, I’d like to share with you my first blog post¹ to highlight why I believe my chosen subject is relevant at this point in time - a time where the convergence of megatrends such as global warming, the digital information age and the disruption of traditional power hierarchies presents a major opportunity for communities and innovators to change our energy system.

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¹ While I was travelling on my Fellowship I published stories on my blog, Citizen Power, and each article was republished in Renew Economy, a widely-read renewable energy news journal. I plan to continue to disseminate blog articles through to mid-2016 about the lessons I learned on my journey.
The rise of New Power + why I’m travelling the world (edited excerpt).
Citizen Power blog post #1 @ www.citizenpower.com.au

The Energy System is ripe for disruption, but will it serve the people? Join me as I explore the world to find out.

In the 30 years since I was born, a number of technologies have transformed our lives. The grand-daddy revolution of them all was the Internet. This changed everything. It brought us Google, Facebook, eBay, Wikipedia, YouTube and AirBnB, among others and well as millions of smaller sites, businesses and marketplaces. What is common in all of these examples?

Old Power versus New Power
They all see incumbents - Old Power - which are characterised by centralised control and profits – being replaced by New Power, small, distributed peer-driven and nimble. Consumers become actors in New Power. We have flexibility, control and can economically participate and benefit. Think AirBnB for accommodation. eBay for commerce. The Internet for information. New Power is distributed, participatory, peer2peer, technological, empowering. New Power enhances democracy, personal liberty and really gives power to the people. Jeremy Heimans (Co-founder of GetUp!) summarises New Power here with this awesome TED Talk.

Depending on the market, New Power may partially or fully replace Old Power. Old power may change colours and try and look like New Power. It’s a tug-of-war. But New Power usually always wins because they give people what they want!

Why Energy is next in line for disruption
The Energy System is ripe for disruption. With energy, everyone feels ‘powerless’. Everybody hates utilities. People are sick of inaction on climate change. Power bills keep rising and there is little one can do. Old Power comprises of the generators, networks operators, energy retailers and governments. All these parties have a deep-vested interest in us continuing on the same path, consuming more and more dirty energy. Government royalties and shareholder returns depend on it. The loser in this system is the customer. We have very little say where it comes from or who gets our money.

Until now.

Social and technological developments in the last 10 years have laid the framework for disruption. Technologies such as solar power, batteries and electric vehicles have the potential to transform our entire energy system. People have begun organising themselves in social-cultural movements, such as energy co-operatives and investing in the future they want. Innovative energy companies are beginning to sell the people the services that they actually want. Thousands of entrepreneurs are searching for technological and business model breakthroughs. Silicon Valley is shifting from Info Tech to Clean Tech, and preparing itself for scale up. Who will be the AirBnB of energy? Who will cash in on this trillion-dollar opportunity?

Over the next 8 weeks, I will travel the world (courtesy of a Winston Churchill Fellowship) to meet these visionaries, movements and companies who are creating a new energy system. They are innovating to attempt to deliver people what they want – a clean, resilient, affordable and participatory energy system. We are at the start of a 50 year power struggle between Old Power and New Power. But one thing is for sure. If we are to succeed in complete transformation to a clean energy system – masses and masses of people will need to be willing and active participants in this shift. My journey hopes to uncover some of the seeds of this transformation – seeds which may grow into movements – movements which may become mainstream – and ultimately change the world.
What is a ‘community energy’ or a ‘participatory energy’ business?

I define a community energy organisation as a business or organisation that develops sustainable energy project(s) with the community as a key stakeholder. Community is not necessary a geographic community, but a collection of people who act together to achieve a common goal. I have categorised the main types of community energy as follows:

- Investment style community energy
- Subscription style community energy

**Investment-style community energy** is where project financed is sourced from the community, as opposed to institutional finance sources. The degree of community involvement varies. For example, in additional to financing the project, community members may have key role in developing, owning and operating the energy projects, or a community fund may be established from project revenues. This is the prevalent form of community energy in Australia and European contexts.

**Subscription-style community energy** is where a community of people collectively subscribe to receive some financial benefits from a renewable energy generator, typically credited to their power bill; however, the people are not the owner or investors. This form of community energy is common in USA. It is also known as ‘community net metering’ or ‘shared solar.’

In addition to the above community energy business types defined above, I have expanded my brief to include visits to organisations deploying emerging ‘participatory energy business models.’

**Participatory energy business models** enable traditional energy customers to actively participate in the market as generators and energy service providers. The simplest example of such an activity is a household who owns a solar generator who earns money by selling exported energy to the market. This type of customer is now referred to as a *prosumer* (i.e. a consumer who also produces). New business models are emerging which are attempting to scale up such activities, particularly in Europe, USA and Australia, which allow consumers to participate and benefit from energy markets in ways they previously could not.

**Defining the start-up lifecycle**

The organisations I’m visiting are deploying relatively new business models and are mostly all less than 5 years of age. It doesn’t matter whether the organisation is a not-profit or a for-profit organisation, the same start-up life-cycle will typically apply if the organisation aims for impact through growth (Note: they do however, typically have different funding structures during the growth phase).

The chart below is my tweaked interpretation of a chart featuring in Leba et al. (2015) which demonstrates a common growth life-cycle of a start-up.² It makes sense to use the life-cycle categories as a way of determining a start-up’s level of maturity and therefore where they are along the road to ‘success’. If an organisation has grown their idea to the point where the growth rate has peaked as they head towards mass adoption, then that organisation has ‘succeeded in reaching operational ‘maturity. Most of the organisations I met on my journey were only part way along their journey and have successfully navigated through at least some of the start-up life-cycle steps. Despite being in ‘Validation’, ‘Build’ or ‘Growth’ mode, these

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organisations are successful (otherwise I wouldn’t meet them!) with many lessons to offer, but it remains to be seen whether they will meet the start-up definition of successful.

Chart 1 – The Start-up lifecycle stages

Transferability to the Australian context
In the above chart, I have plotted the start-up life-cycle stage of the organisations I met against the transferability of their business model to the Australian context. This reports places more emphasis on the lessons that are highly transferable to our energy market context.

**Theme 1 – Which environment gives an energy start-up the best chance of success?**

*Showcased: Powerhouse incubator (CA) and SunShot Initiative (US Department of Energy)*

The following chapter was a blog post featured on [citizenpower.com.au](http://citizenpower.com.au)

**2 simple ideas to unlock Australia’s clean energy start-ups**

*Turnbull’s Innovation Statement is a great first step, but it takes more than that to build a true innovation ecosystem. Here’s how we can boost clean energy start-ups at no additional cost to the taxpayer.*

I’ve just been lucky enough to travel the world on a Winston Churchill Fellowship, where I met hundreds of energy entrepreneurs taking a chance on an unproven idea. Why were there seemingly so many of these entrepreneurs elsewhere, but barely any I knew back home in Sydney? After some deduction – I’ve distilled it down to two ideas which we desperately need if we are to create an innovation and start-up culture to spark a clean energy revolution. And the best thing – they can both come from existing government funding streams and therefore have no additional cost to the tax-payer.

**Innovation Idea #1 – Create spaces for clean-energy entrepreneurs**

On my travels, the first thing I did upon arrival in each destination was seek out the local energy and clean-tech start-up hub. These included PowerHouse in Silicon Valley, Green Town Labs in Boston, Urban Future Lab in New York, EurefCampus in Berlin, or New Energy Docks in Amsterdam. Visiting these spaces was always a highlight – their atmosphere alone empowering and the connections I made inspiring. These spaces provide potential change-makers with the mentoring, camaraderie and confidence to take calculated gamble on bringing an unproven idea to life.

Danny Kennedy, a mentor at PowerHouse solar incubator and co-founder of Sungevity discusses benefits of the incubator:

“As much as anything, confidence is what Powerhouse inspires. The main benefit is the social piece...sharing with one another the struggle.”

Through-out Australian capital cities, start-up incubators and chic co-working hubs are popping up left, right and centre, but we still do not have a dedicated space for clean-energy entrepreneurs. This is despite the obvious advantages this would bring in terms of collaboration, industry and research partnerships and building investor relationships.

Danny Kennedy:
“Having an anchor institution in Australia is obvious to me because we have such a mature solar market, skillset and talent pool... We need it, you need it, we all need it.”

In fact, perhaps with a prod from Turnbull himself, the federally-funded Australian Renewable Energy Agency (ARENA) funding could help pay for clean energy start-up spaces in capital cities around Australia. A thought which segue-ways nicely to Idea #2....

**Innovation Idea #2 – ARENA should place emphasis on energy start-up funding**

There are two general types of clean-tech public funding:

- The ‘Bill Gates approach’ is that current technology is in general not good enough for an energy revolution, due to cost, inefficiencies and variability. This approach tends to focus on funding new early stage research and development in high-risk hardware solutions. Whilst his beliefs on this have softened over last couple of years, this approach still underpins Gates’s announcement in Paris last week.

- The other train of thought I will call the ‘Jigar Shah approach’. Jigar is the inventor of the power purchase agreement (PPA) and co-founder of SunEdison. His approach goes more like “Dear Bill Gates: we already have the technology to solve climate change.” Jigar tends to think we need to focus heavily on deployment and innovation should focus on software, soft-costs, finance costs, customer acquisition and any other innovative business model which overcomes barriers to uptake.

ARENA is a federal public funding body which has $2.5 billion in funding out to 2022. They have focused mostly on Bill Gates style hardware investments until now (however they did give a remarkable $166m to AGL for the Broken Hill solar farm with the aim that it would reduce deployment costs for later utility scale projects). You can view a list of ARENA projects here.

In my view, the timing is right to instill a fundamental shift in ARENA funding towards the Jigar Shah approach. For Australia, with declining manufacturing and one of the most attractive distributed energy markets in the world, it makes much more sense to fund innovative business models which overcome adoption barriers to already mature technologies. These solutions are much lower risk, are scaleable, and have a faster payoff for public funding relative to early stage R&D. What’s more, they create economic activity and jobs in Australia. This is important – so many highly talented UNSW solar research graduates have sought work overseas because that is where manufacturing is – and they’ve made some Chinese solar companies very rich (not to take anything away from this amazing research institute).

Whilst AGL got $166 million, sub $100k funding is rare for ARENA and that’s a big shame; it is at this scale where a little-bit of funding can go a long way – particularly for start-ups which focus on finance, soft-costs and customer acquisition and new business models like community energy, for example. Further making it harder for entrepreneurs, ARENA’s processes are too
cumbersome and do not specifically target early stage start-up companies with their language or approach.

And given the nature of yesterday’s Innovation Statement, the timing couldn’t be better for such a shift. It could be a savvy way for Prime Minister Turnbull to boost his clean energy credentials and satisfy the left on issues of climate change, without irritating the more conservative factions of his party.

**What ARENA can learn from the SunShot Initiative**

The US Department of Energy’s (DOE) SunShot program is an exemplary program which ARENA can look to for inspiration. The SunShot program has assisted approximately 400 US solar energy start-ups, established companies and non-profits in commercialising new innovative solar business models and solutions.

Danny Kennedy praises the program:

“I’ve got to give them credit. They came at this problem like the Moonshot initiative and they’ve achieved a lot…. they’ve done a lot of incentive programs and competitions which are very creative. The SunShot program has return value to the American Purse like you wouldn’t believe and and has dropped costs – both soft and hard – significantly”

Minh Le, former director of the DOE’s SunShot program is someone Kennedy says he “really admires”. I had the pleasure of interviewing Minh Le in New York. He explains how the SunShot’s Incubator Program, in operation since 2007, took a portfolio approach to their public start-up investments.

“In the SunShot Incubator program alone, we gestated about 100 small businesses and injected about US$138m taxpayer dollars. In aggregate, these companies have since raised over US$3 billion in follow on investment so it’s been resoundingly successful in getting these ideas to reach commercial maturity …and reached our ultimate goal of job creation.

One thing Sunshot has done well which ARENA has ignored is give out many small grants to early stage start-ups, via a competitive pitching process to a panel of experts.

Aaron Clay, founder of Oakland based SunSwarm – an early stage start-up aiming to match community solar customers with projects – received a $25,000 SunShot Catalyst grant to reach the proof-of-concept stage. To receive the grant, Aaron had to submit a short information statement and pitch to a panel of advisors in a pitching competition. Once successful, the money is released on reaching certain milestones, but there is minimal intrusion and no cumbersome reporting requirements – allowing the entrepreneur to get on with the job of delivery.

Le explains how this approach has brought countless innovators out of the woodwork:
“The competitive approach and talent we’ve unlocked has been exciting. The stats suggest it is easier to get into Stanford or Harvard than get SunShot funding. It’s about a 1 in 20 chance of getting funded.”

Businesses past the proof-of-concept phase and ready for commercialisation are eligible to receive more funding, with more stringent oversight. For example, Ty Jagerson of Palo Alto based Village Power received a US$500k Catalyst grant to develop their community solar investment platform, money essential to the development of the business.

Le highlights the important role through expert and research partnerships, which could be a great way to get universities more engaged with local start-ups here in Australia (a key feature of the Innovation Statement):

“Each incubatee is offered 5% in resources funding in addition to their grant funding, and we connect them to our government energy labs, NREL being the most prominent, for such support.”

“About 20-25% of companies are no longer in operation, which is not a bad rate of failure relative to the general start-up community, which I think comes down to the resources, expert mentoring and connections that we provide.”

Le again, on how the DOE itself innovated their approach to minimise bureaucratic processes to suit the approach of start-ups (notice how similar this sounds to Turnbull’s language yesterday):

“If we (the government) can’t innovate how do we expect the start-up community to innovate. The faster the government can get the funding out to the community – in a fast-changing space like solar – the faster we can get results. That mindset attracted some really entrepreneurial people to government. We took risks, made use of various prizes and awards, streamlined applications and roadblocks, and we were able to cut the time taken to get money out by half, and attract a really high calibre of talent to the program.”

**Update**: Since this article was written I have actively helped build a consortium between a number of industry and university contacts to open an energy incubator for Sydney, scheduled to open in the first half of 2016. At the same time, ARENA responded formally to this article. A presentation will be made to the ARENA board in early 2016 proposing a model for getting more money to start-up businesses, based upon the SunShot Initiative principals.
How to Make Energy Sexy - Part 1

“Energy is full of technicians. Whilst they are great at technical stuff, technical doesn’t sell. Technical stuff doesn’t create a movement, nor the revolution we need to stop global warming. We need to open their hearts”.

That nugget of wisdom is from McGowan Southworth. If you’ve ever heard Ben Lee’s Catch My Disease, then you have also heard McGowan. He’s the co-writer and guitar player. He’s also written with Missy Higgins, Matt Corby and Old Man River. Luckily for him, royalties mean he has time to focus on what he loves to do – and lately he’s been turning his attention to energy with Brooklyn Power Co in New York City.

Coming from a creative industry to energy, McGowan’s fresh ideas on storytelling and marketing of renewable energy really resonated with me and have inspired this thought-piece.

“There’s a big difference between a darn good song, and a magical song. A magical song takes off…it’s totally transcendent. The industry sells solar as a commodity, money in money out – and there is nothing magical about that.”

From analysis of emerging clean-tech companies around the world (via my Churchill Fellowship), I’ve managed to distil good energy communication down to six basic rules, which hopefully can provide our industry with some inspiration to make energy as magical as a hit song.

Rule #1 – Have a story to tell

Like mutton dressed as lamb, making fossil fuel exciting is very difficult. Remember Hector the lump of coal, speaking to kids in the Dalrymple Library? No further comment is required.

Energy retailers in the last year have resorted to using owls (Energy Australia), or guaranteeing that the lights will be on when moving to new house (AGL). The problem with these companies is that their value proposition is not interesting to consumers, hence the need to resort to price discounting or irrelevant gimmicks.

Hector educating a poor student on the merits of coal to humanity.
By selling renewables and clean-tech solutions, we come from a better starting point than the mainstream energy companies. But, despite this, electricity is still a homogeneous product at the wall socket. We need better stories to stand out and connect people with their energy in ways that we’ve never done before.

To highlight some positive examples, let’s separate the concept of the story (the underlying business model and its creation) from the story-telling (the delivery of the story to the audience).

In the following three examples, the story is strong enough to inspire participation and customer loyalty, despite often less than ‘sexy’ storytelling.

**EWS – Schoenau (click for link)**
The story of a humble and determined group of citizens buying back the grid has inspired 180,000 customers to join their clean energy movement throughout Germany. They have a no-frills, almost old-fashioned communication approach which plays on the negatives of the nuclear industry, but their positive community response is key story to their success.

**Prokon**
Similarly, Prokon, a German wind company and now a co-operative, grew their 1GW wind portfolio by inspiring a movement of almost 75,000 German citizen investors. The story-telling and branding looks like something that German engineer came up with in the 1990’s, but the participatory business model was compelling enough to turn it into the world’s biggest citizen-financed energy movement.

**Energy4All**
Energy4All are a UK co-operative who have raised the equivalent of A$60m in citizen investment in community-owned wind, solar and hydro projects for almost 20 co-operatives. With deep community benefits and strong investor returns of up near 10% per annum, the group routinely sell out their share offers in a matter of days. Their story combined with the value preposition is enough to succeed despite their rudimentary marketing.

**The story is a prerequisite, but alone it has limits**
These inspiring successes showcase some of the world’s leading citizen energy movements. They have built their organisation largely off the back of their story and the value preposition of the business model alone.

But how tangible are their successes in the scheme of whole of system change?

Take EWS for example. Their story is so inspiring and has been told far and wide the world over. Whilst their 180,000 customers may seem huge, it represents only a 3.6% market share of Germany’s green energy market, or a 0.45% gross market share of all German households.
Without taking anything away from their amazing achievements, given EWS’s large public profile, I’d argue that better branding and story telling in recent years would have seen them continue to grow beyond their current market share and therefore push their mission of a nuclear free world to a wider audience.

**How do we make ‘alternative energy’ mainstream?**

If all clean tech adoption was placed on Roger’s Bell Curve of Technological Adoption, most clean technologies and services are still in the ‘innovators’ life cycle stage.

![Innovation Adoption Lifecycle Diagram](image)

**INNOVATION ADOPTION LIFECYCLE**

Even if we look at two of the leading clean tech markets in the world, we have not yet reached the ‘early majority’ with clean energy uptake. For example, in Germany, Greenpower customers are 13% of the total even with very cheap Norwegian Hydropower. Similarly, Australia’s 1.4 million solar households equates to only 13% uptake, despite the fact it makes economic sense for much more.

We are at a critical time in both these markets, at the edge of ‘early adopters’ and attempting to eat into the ‘early majority’. Geoffrey Moore, in his book *Crossing the Chasm* identifies this point along the adoption chain as the most difficult to cross owing to very different mindsets of the two market segments. To penetrate the majority, our goods and services not only need a solid story and value preposition, but also inspiring branding, storytelling and commitment. Today’s frenetic media noise demands it. We need to be technicians and master storytellers if we are to take ‘alternative energy’ mainstream.

The following Golden Rules #2-6, if layered over the prerequisite of Rule #1 of a solid story, could create the ‘magic song’ that McGowan says we need.

**Rule #2 – Win hearts, by making it about people**

“If you can win someone’s heart, money fades into the background.”

*McGowan quote #3*
Unlike what rational economists believe, humans don’t make decisions based on an optimum value trade-off. We often make decisions by a gut reaction or social norms. When deciding to purchase a new product, the odds of us doing so go up remarkably when our heart is engaged.

Policy-makers often talk about capital barriers and information barriers which prevent the uptake of new energy technologies. But these barriers – among others – often fall away if someone is serious motivated by their heart to take action.

**How EWS won hearts with a compelling people focused campaign**

Community energy pioneers EWS, from Black Forest, Germany, are best known as the community group famously buying back the electricity network from a corporate utility in the 90’s.

After gaining widespread media interest from their David v Goliath referendum victory which gave them the right to run the grid, EWS launched a savvy campaign to help raise the money to buy it. They contacted 100 marketing agencies in Germany to ask for free help in developing a marketing campaign. The winning entry was a poignant advert series, making people question the risks of nuclear energy directly, and also the power structures in the existing energy system. The campaign pictured local people from the community – children, father, mothers, the elderly – with the slogan ‘Ich bin ein Stoerfall’ which translates to ‘I am an accident’ or ‘I am a bother, referring to both the nuclear accident but also to the resistance of the people who are getting in the way of corporate profits. They asked newspapers around Germany for free advertising space, and the group raise over 2 million mark from the campaign in a matter of weeks. With this campaign, the community group reinforced their image as ‘Energy Rebels’ - a badge they wore with pride and leveraged to grow into a large, impactful anti-nuclear movement and community energy retailer.
In a lesser known story, the local church was also the site of one of the world’s first solar crowd-funding campaigns in the late 90’s via a mix of donation, investment and grant funding; you can read about this fascinating story here on my blog post here.

**Vandebron – connecting people through storytelling**

Vandebron is a start-up energy retailer who is nailing energy communication. The combination of a great story and even better storytelling has rewarded them with 50,000 new energy customers in their first 18 months of operation.

Vandebron have gotten a broad spectrum of people to care about energy, simply by making energy all about people. As a peer-to-peer energy retailer, Vandebron – which literally means ‘of-the-source’ – use people as their greatest storytelling asset. Their website features the carefully crafted personal stories of each owner-generator, allowing customers to select where their power comes from based on the ‘face behind the power’.

This promotional video effectively stimulates a customer connection with the owner-generators – who are clearly normal characters. Despite being in Dutch it’s still worth watching and appreciating. [https://www.youtube.com/watch?v=_AxFTxsxuyI](https://www.youtube.com/watch?v=_AxFTxsxuyI)

The staff are the second key pawn in Vandebron’s ‘making it personal’ communication game. Their social media feed regularly showcases their staff – who just happen to be young, good looking Dutch folk that we wish were friends with. Having visited their offices first hand, the youthful, positive energy in the room was so strong a feeling that it was hard to leave!

Below are some recent photos of staff from their Facebook wall:
The third group that Vandebron showcase are customers – photos and videos of which also regularly feature in their social media feeds.

Put it all together and you get hands down the highest quality social media presence I saw in my journey. The customer engagement speaks for itself. The table below compares engagement data from Vandebron’s last 10 Facebook posts, relative to the last 10 posts from the Clean Energy Collective (CEC), in November 2015.

Note: The CEC are the leading community solar provider in the US who claims to have more Facebook likes than any US energy company.
As you can see, Vandebron have 25 time the engagement of CEC, with very high rates of sharing and comments. Furthermore, 90% of Vandebron’s Facebook posts are about Vandebron itself, whereas 90% of CEC’s posts feature other solar energy related news not directly related to CEC.

Vandebron have not only a great story (Rule #1) but they focus exclusively on engaging with their customers hearts by personal storytelling using the a) the Owner-Generators, b) the Staff, and c) the Customers (Rule #2).

They’ve gotten a broad spectrum of people to care about energy, simply by making energy all about people. The result, in business terms is customer value, satisfaction, acquisition and retention. And importantly, if they keep going they will one day be converting the early majority to locally generated renewable energy.

<table>
<thead>
<tr>
<th></th>
<th>VANDEBRON (NL)</th>
<th>CLEAN ENERGY COLLECTIVE (USA)</th>
</tr>
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<tbody>
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<td>Type</td>
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<td>Community solar retailer</td>
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<td>Ave engagements per post</td>
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<tr>
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</tr>
<tr>
<td>Rate of engagement</td>
<td>3.2%</td>
<td>0.12%</td>
</tr>
<tr>
<td>Relative engagement rate</td>
<td>Vandebron has 25 times more post engagement than CEC, per follower</td>
<td></td>
</tr>
<tr>
<td>Post about the company</td>
<td>90%</td>
<td>10%</td>
</tr>
</tbody>
</table>

Theme 3 - Using partnerships to grow community energy

Energy4All (UK) and Revolv (San Francisco) are two organisations at different stages of scaling community via a networked growth model.

Revolv

Revolv are a start-up non-profit who have created a revolving fund for solar projects with underserved community organisations who are typically not eligible for solar leasing arrangements because they do not generate a tax credit for third party investors. The community groups who take out the financing pay it back with interest (via a power purchase agreement), which in turn funds other solar projects. The initial funding comes from community donations.

After proving their concept on three initial buildings in the San Francisco Bay areas, Revolv realised their growth potential was limited unless they could attract donation finance well beyond their own network. They are currently expanding by partnering with universities around the US and training volunteer university students to commit to doing a project over a 12-month period. The students are responsible for finding the sites and raising the funds, receiving
valuable work experience. If successful, Revolv will deploy to 5 projects in in 2016 using just one staff member, numbers which will be expanded upon in subsequent years. Such projects coordinated by Revolv generally raise US$50k+ which is substantially more than the small amounts that donation based platforms in Australia typically raise.

Forging network partnerships in this fashion could be leveraged in Australia by any community group looking to scale up - particularly CORENA (who have a similar financing model and already use a somewhat networked approach).

**Energy4All**
Energy4All are the UK’s leading community energy organisation, having developed £40m of community energy projects. They are a ‘co-operative of co-operatives’ who partner with empowered local communities to replicate their successful co-operative project model. They receive base funding from 50% of the profits from the Bayswind Community Wind farm – their first project developed in 1996 - and from the project fees associated with each additional new project. Their network growth model, whereby an empowered community brings the project opportunity to Energy4All and allows them to set-up the project and the share offer as well as sharing in the benefits has allowed them to develop robust, effective community energy projects throughout the UK via a centralised project team, without compromising on the local benefits.

Such a model would definitely work in the Australian context. Repower Shoalhaven has noticed an increase in expressions of interest from other community groups around Australia for a ‘off the shelf’ project development services so we have begun offering other groups the option to use such a service.

The Australian context, however, makes it hard to scale as successfully as Energy4All have done. The generous feed-in-tariffs on offer in the UK enabled projects to routinely offer a 10% investment return. This meant that Energy4All was able to raise project finance rapidly with little marketing effort or expense, as well as being able to adequately fund working capital costs from project set-up and management fees and ensure a portion of profits went to a community fund. Such project conditions are similar to what fostered the rapid rise of community energy co-operatives in Germany until Feed-in-tariffs were similarly dropped there in 2014. Now, both Germany and the UK community energy organisations will face potentially reduced investor and project fee margins as they move towards a similar market environment for community energy as we see in Australia. Positively, Energy4All is still securing projects; for example, a Edinburgh Community Solar aims to cover multiple City Council rooftops with solar offering investors a 5% investor return.
Theme 4 – For-profit community financed solar models that are successfully scaling community energy

Abundance Generation (UK) and We Share Solar (NL)

We Share Solar
We Share Solar (ZonnepanelenDelen in Dutch) is an Amsterdam-based solar crowdfunding site with the largest market share of all Dutch community solar organisations, doing 56% of all community solar projects in 2015.

With 50% less sun than Australia and declining support incentives for solar, We Share Solar have been remarkably effective at deploying projects. In the last couple of years they have managed to raise more than the Australian community solar sector combined across 13 projects, despite offering an investment return averaging approximately half of what Australia’s community solar project offers, and taking a project commission of also approximately half of what Repower Shoalhaven takes per project. This is a remarkable achievement which I put down to a number of factors:

- They are serving a clear niche in the financing of projects which otherwise could not get long term finance
- They provide finance only and stay out of project development (saves on resources)
- They have built software to automate the crowdfunding process
- They have an excellent partnership model whereby they can work with any solar installer (and thereby receive jobs from that network) as long as they met their 30 point quality assurance checklist.
- They have created an excellent online investor experience by sleek website, live solar generation information, and lots of good online content and communications
- They follow the stringent Dutch investment regulations carefully (not all platforms have done this the Netherlands)
- have regular projects and do them often, following the same proven template each time.

Time will tell whether We Share Solar can be profitable earning such slim margins. The only way this could be achieved is by the scaling up of project volume beyond the current rate.

Abundance Generation
Abundance Generation in the UK have a similar business model, and have successfully raised £14,779,207 in citizen investment for community energy projects over the last 3 years. They employ much of the same principals as We Share Solar, and have gradually built up a robust community of thousands of citizen investors. Their scale is such that they now have a robust secondary classifieds market for the securities, should people wish to sell their shareholding. Whilst not yet profitable, Abundance Generation has intentionally chosen a revenue structure
which will build up locked-in long term profits from managing many of the long term projects as opposed to taking larger upfront fees.

Both We Share Solar and Abundance Generation have taken on substantial capital investment in order to fund initial growth. It remains to be seen whether such capital would have been available should they have had alternative structures. Neither have found that a for-profit structure was a hindrance when dealing with investors. In these cases, the traditional for-profit start-up model has lead to good outcomes for the community energy sector. These small, nimble teams have driven a lot of citizen investment in renewables in a very efficient manner. These learning are definitely transferable to the Australian context.

**Theme 5. Financial lessons from Prokon – the world’s largest citizen financed energy organisation**
Excerpt from unpublished blog post.

Prokon of Northern Germany built the world’s largest citizen financed renewable energy company, but then became the world’s largest community energy financial collapse in one of Modern Germany’s biggest corporate scandals.

I first learned about Prokon on the Berlin Underground in 2012, where advertisements promised a 7% return in what appeared to be something like a fixed-term deposit. The visuals grabbed the heartstrings on anyone seeking to actively help shift away from nuclear energy

“It is time to change something, and it’s worth it”. I was impressed. At the time, the German wind company was growing at a spectacular rate, raising capital at an astounding €700,000 per day (AUD$1.15m). By 2013, regular citizens had invested a cumulative €1.5Billion (AUD$2.5B), funding over 1GW of installed wind capacity through Germany and Poland. The windfarms generated the equivalent energy for 400,000 German households. People were getting their promised returns. Everyone seemed happy.

Now, back in Germany three years later, Prokon is one of Germany's greatest corporate scandals - and I’m keen to find out what happened. What emerges is a fascinating saga about the rise and fall of an investor movement, with important lessons for anyone working in community energy.

**From Visionary Hero to Corporate Villain**
The company’s meteoric rise was led by one charismatic founder Carsten Rodbertus, who, inspired by the events of Chernobyl, erected two wind-turbines on his own land in the mid-90's, affectionately naming them after his grandparents. Rodbertus would travel the country far and wide in his beat-up Dacia Duster, filling community halls night-after-night, up to 70 per year. There, he’d speaking to thousands of working and middle class Germans who believed in his mission and gave them his trust. Mums, dads, grandparents and retirees all invested their hard
earned savings. The money flowed quickly. Rodbertus connected almost single-handedly with the people, recruiting to his counter-movement right up until the end.

Rodbertus was a figure of almost cult-like status within and outside of the company. Having never attended university modest in his income and possessions, Rodbertus was not your typical CEO. He'd often conduct meetings barefoot, sporting his white-platted ponytail and casual clothing. Prokon staff, including Rodbertus, would accept below market wages to work at a place which was different to other companies – one with onsite childcare facilities, generous retirement packages and a Utopian mission. Like many successful leaders who come crashing down, he was a visionary with qualities of persuasion, determination and a hard work ethic. These traits were countered by elements of authoritarian decision making and control and the ability to be brutally unaccepting of ideas from co-workers.

In Itzehoe, a small town 60km North of Hamburg, the company grew to over 1000 employees and was one of the success stories of the EnergieWende (the Energy Transition). But then in 2014 - seemingly overnight - it came spectacularly crashing down. The hero had become a villain. Having never attended university and modest in his income and possessions, Rodbertus was not your typical CEO.

Sowing the seeds of collapse
As a citizen energy proponent in Australia, the story of Prokon offers both lessons in how to build a citizen energy movement and even more lessons in how to fail. This failure is worth unpacking in detail. After speaking with investors and former Prokon staff, it is clear that number of poor financial decisions opened the company up for collapse which was eventually triggered by mismanagement and a lack of trust in the company’s dealings.

Fatal error #1: Raising the capital first, finding the projects second. The Prokon model offered the investor 6% per annum return on capital (at times up to 8%). By 2011, according to a former employee, Prokon was scrambling to find projects to meet the surging investor demand. This led to a number of rather rushed investments in bioenergy forests and biofuel plants in Eastern Europe, which regardless of their worth, appeared risky from the outside looking in. Instead, Prokon should have controlled supply of investor funds via either

   a) a fluctuating investor return (based on supply and demand, like the stock market) or,

   b) restricting the intake of investor finance based on project availability.

Fatal error #2: Making renewable energy investments feel like a bank deposit
Originally, Profit Participation Right holders faced a maturity waiting period of 3 to 5 years to receive their capital back, after their initial request for release. This was intentional; given the relative low liquidity of capital tied up in wind turbines, such a rule upheld the stability of the company’s cashflow. In attempt to boost investment, Prokon, wanted to make investing as easy as putting your money in a bank account. To do so, Prokon reduced the maturity waiting period
to one month – even for existing investors who invested under the previous maturity period. This strategy was very effective at driving investment - it surged. The flip side however, was that the company had opened the gate for mass exit of capital and potential bankruptcy.

The downfall

With the structural seeds unknowingly sown for a collapse, cracks started to emerge in Prokon’s operations. Prokon took on all aspects of project development including project development, engineering, financing, investor communications, retailing (to 60,000 customers) and operations and maintenance. There was pride in this independent approach free of 'dirty' corporate partners. According to some former staff, the so called 'Of One Source' strategy led to inefficiencies and mismanagement, not helped by the centralised decision making of Rodbertus.

The final downward spiral however began in 2012. The company struggled to match the inflow of capital with new project flow. The quality of Prokon's bioenergy and biofuel acquisitions were questioned. Unconfirmed rumours of a pyramid scheme began to circulate – whereby new investors' capital was being used to pay the returns from existing investors. In 2013, a corruption case against Rodbertus put him in the spotlight for the wrong reasons. In the same year, the company’s financial statements were not audited by external accountants, raising more eyebrows and scrutiny on Prokon’s internal dealings. Trust was waning and investors started to pull out their money. Rodbertus pleaded with investors to stay and thereby avoid collapse. But the damage was done, and almost half of investors nominated their intention to leave. Almost overnight in January 2014, the company was forced to cease trading pending investigation into insolvency. The noble Rodbertus dream was sadly over.

Now, the World's largest energy co-operative

Prokon are now midway through restructuring as a co-operative after investors voted against a corporate takeover from EnBW. Once the transition is complete, Prokon will be the largest community energy co-operative in the world with assets worth approximately €600m (AU $1billion). Investors stand to lose up to 50% of their initial capital investment.

Theme 6 – The risk of relying on the 'empowered communities'

A number of organisations had set-up ‘platform style’ business models which rely on empowered communities or individuals to self-develop their own projects with partial assistance from the software platform provider. An empowered community who self-develops can get a much richer set of benefits from community energy than if they're using an off-the shelf provider or commercial partner. The risk is that not many communities are ‘empowered’ or capable to delivering such projects, potentially limiting the ability to scale up.

CrowdEnergy
CrowdEner.gy, based out of Berlin, is a solar investment crowd-funding platform not dissimilar to We Share Solar and Abundance Generation, with the key difference that they are partnering with volunteer based community energy groups to develop projects. In light of the reduced Feed-in-tariffs in 2014, community groups are struggling to find appropriate sites, and have largely stopped trying. Furthermore, CrowdEner.gy were expecting volunteers to be interested in taking up administrative board positions on the co-operatives once established, but unfortunately they have been having trouble holding interest. The result is that CrowdEner.gy has stopped adding new projects to their platform and are currently seeking other opportunities in emerging renewable energy markets.

The German context in 2015 is very similar now to the Australian context, hence the lessons are highly transferable. It seems that, although the German community energy sector have deeply establish legal and financial toolkits to enable easy project establishment, as well as substantial experience in grass-roots project development (over 1000 community energy co-operatives currently exist in Germany), they are still struggling to find people with both the skills and energy to develop new projects in the more challenging market environment. The Australian community energy sector is also dominated by volunteer community groups and is unsurprisingly experiencing similar challenges. What this shows is that volunteer groups, despite some outliers, will struggle to be able to scale up for impact in a more challenging solar market environment.

**Village Power**
Village Power is a company from Palo Alto in the US who enables anybody to self-develop, and run a community investment-style solar project, entirely online anywhere in the US. A solar champion can log-in create a profile and upload a project, size the solar power system on the roof, run a financial model, generate the solar contract and investment legal documents, and finally raise the capital via an online campaign before Village Power installs and manages the system.

Village Power appears to be a fairly mature software tool but it is too early to tell if the demand is there to validate the concept. A reason being is that investment-style community solar style is still a fledgling concept in the US solar market. One of the challenges I see is that a solar champion still requires a high level of ‘community energy literacy’ and therefore there is still ongoing training, support and mentoring required from Village Power in order to get a project fully uploaded, negating some of the labour saving benefits of a software platform.

Village Power’s approach differs from that of the other community energy organisations discussed in this report as they have attempted to create a true online ‘platform’ which externalises the development work involved in developing a community energy project, as opposed to doing it offline and ‘in-house’. I have not seen such sophisticated software in Australia or through-out Europe, however such a platform would be of great use to Australian community energy groups. Perhaps it is no surprise that this is how a company from Silicon
Valley would go about community solar – i.e. a capital intensive software development with the expectation that the market is big enough to grow toward profitability. Indeed, the US is 15 times bigger than Australia in population but currently has less solar installed. The forecast is that the market will boom over the next 5-10 years, and Village Power is ready and waiting.

**Theme 7. Subscription-style community solar in the USA**

With a few exceptions such as Village Power and Mosaic Solar\(^3\) the US version Community solar is completely different to the investment style community energy we see in Europe and Australia. Instead it is a subscription style model, whereby solar farms – typically between 500kW and 2MW in size - are built on greenfield sites, with electricity customers subscribing to use the energy from a household-sized portion of the system. In most cases, the capital to pay for the system is raised from third party institutional investors, meaning that households receive only a small proportion of the benefits (which are split between the financier and the developer and the household). The result for the subscribing household is typically a 10-15% reduction in their power bill. This comes at zero risk because the have not made an investment nor have they committed to a long term purchase of the electricity for anything beyond their subscription term.

This sort of community solar is in most cases legislation driven. State Governments, on the grounds of accessibility and fairness have extended the benefits of household solar ownership to those that cannot access solar due to living in an apartment or renting. States with community solar legislation also have Net Metering policies, which in many cases is simply extended with similar benefits to the ‘Community Net Metering’ policy. This means that US companies such as Clean Energy Collective and profitably build community solar projects proved they can sign up households in the appropriate area.

Boston based start-up Yeloha is now extending this model to individual households and businesses, essentially crediting householders for electricity generated from someone-elses roof, who also receives a share of the benefits. Again, the assets themselves are third-party owned by a corporate trust. The result with both these models is virtually no citizen control over decision-making and little corporate transparency, meaning they are a very weak type of community energy.

Both these models are relying on generous community energy legislation and subsequent retailer participation to be profitable for now. Interesting (and something I'd not expect to see in Australia) the household must not use electricity at the same time as generation. These models will need to improve their efficiency as Community Net Metering and Net Metering

\(^3\) Note: Mosaic Solar started off as an investment-style community solar company a number of years ago but pivoted their entire business model away from retail investment solar projects due to regulatory and cashflow challenges.
incentives are gradually wound-back as the costs of those programs become prohibitive due to increased solar uptake. This means that these companies will need to become more competitive in the long term if they are to survive.

ZolarGo is a San Francisco based start-up who is aiming to make the Clean Energy Collective model stack up without the generous Community Net Metering tariffs. They do this by reaching better economies of scale from 10MW+ plants and providing utility value from long-term customer relationships which might come with the subscriptions.

**Could this model be transferred to Australia?**

These models do not provide immediate transferability to Australia, however, the economics of solar are improving to the point where it is nearly viable for similar models to be deployed in Australia with the support of the Renewable Energy Target. Households could potentially subscribe to or invest in a solar farm and have the benefits credited on their electricity bill. A community energy retailer such as Enova Energy may see value in such a model to consider piloting it in coming years. The lack of excessive policy support means that this sort of model, if deployed in Australia, will not be privelidge to the same level of super-normal profits that US community solar companies are likely to be enjoying, and therefore proponents will likely motivated by community outcomes, and have stronger principles of transparency and community benefit. Of particular value to Australia are the nuances around creating value for the energy retailer via a community solar partnership, as well as the marketing and customer acquisition examples forged by the US community solar companies.

**Start-up profiles – Participatory Energy business models**

**Case Study - BuergerWerke**

*BürgerWerke* is an innovative energy retailer start-up aiming to ‘close-the-loop’ on citizen energy in Germany.

Kai Hock and Felix Schäfer are two friends who happen to be some of Germany’s leading community energy entrepreneurs. At just 20, they started the *Heidelberg Energy Co-operative* whose achievements earned them the 2014 German Solar Prize. Now, their latest project *BürgerWerke* is one of Europe’s most innovative electricity retail start-ups (and not a burger joint).
The Bürgerwerke team: "We are the Energy Transition". Kai (left) and Felix (centre).

What does Bürgerwerke do?

*Bürger (citizen); Werke (power plants/utility)*

They sell the generated energy from community energy projects directly to customers, most of which are also community group members. This provides existing projects with price certainty and means their customers can be sure that most of their power is coming from citizen-owned renewable energy sources.

Put differently, it ‘closes the loop’ for community energy projects, allowing investors to consume the energy they own.

Why is this important?

Felix explains, “the guaranteed feed-in tariff for electricity is now virtually gone. The plant operators are now supposed to market their electricity directly on the market, however prices are increasingly uncertain.”

“The aim” he says, “is that Bürgerwerke will provide the price certainty required for new citizen energy projects to be built, well after state support falls away”. They currently buy energy from the co-operative projects for between €0.07 - 0.10/kWh.

In theory, if Bürgerwerke can continue to grow its customer base, it should create a market for future community energy projects which otherwise would not have been constructed.

How it works?

Bürgerwerke match forecast customer load profiles with real time interval data from their generator fleet. If there is surplus generation, the energy is pooled and sold on the spot
exchange. If there is surplus demand, they balance using a Bavarian hydroelectricity generator. Currently five community owned generators totalling 6MW of solar and wind sell their power to Burgerwerke. However, together the 38 member co-operatives own 250 plants across the country, totalling 20MW capacity, meaning there is room to expand the generator fleet as the customer base increases.

**Using software to prepare for scale up**

Felix, Kai and co are doing a good job of running a lean ship. The highly dis-aggregated electricity retail market in Germany (thanks to the hundreds of municipal energy utilities) means there are many third-party ‘off-the-shelf’ software solutions for electricity retailers to buy to quickly scale up a retail organisation.

Now, the day-to-day retail back-end is run almost entirely by Felix himself, a handy programmer. Most importantly, this allows the organisation to put nearly all their resources on customer acquisition via marketing, partnership building and customer relationships. **This is a critical lesson for scale up any service based energy start-up – once the demand is proven for your service, use software to automate.**

250 community owned generators are in the Burgerwerke co-operative network

**Slower customer response than hoped**

Kai admits uptake has been a slower than they had hoped.

“Co-op members who invest tend to be older, and therefore less inclined to switch provider,” explains Kai.

“Germany has very low churn rates of about 8% per annum. Despite liking our story, it takes time to get people to change utility”. The initial target market for Bürgerwerke is the members of their co-operatives, of which about 20% have switched from the total 8000 members.

“Our target for viability is about 7000 customers,” says Felix.
With their seed-funding running out in the coming months, the boys seem battle-hardened, but relaxed.

“You have to be relaxed, don’t you”. Felix says, literally oozing a sense of calm.

I leave their offices sensing they will work these challenges out. I can tell that Felix and Kai are genuine entrepreneurs who will figure out solutions through intelligence, perseverance and adaptability.

**Could this model be successfully replicated in Australia?**

This sort of retailer is sorely lacking Australia. Now with the successful capital raise of Northern Rivers community energy retailer, Enova Energy, there is an obvious candidate for such a model - where communities looking to set-up solar farms can sell their energy profitably to a retailer, or conversely can have the retailer credit their generation on their own bill. Initially, Enova could look to BuergerWerke for inspiration by buying electricity from existing renewable generators, as opposed to directly from the spot market. Enova has two advantages that BuergerWerke don’t have:

- Australia has much less competition in the ethical retailer market compared to Germany, which has multiple green energy retailers and community owned retailers (such as EWS).
- Australia has a much higher churn rate of between 14 and 30%, according to the AEMO, compared to that in Germany (8%)  

**Start-up profile – Open Utility (UK)**


In 2012, James Johnston watched a video where by Bob Metcalfe talks about the the rise of the ‘Enernet’. As a PhD student looking at microgrids, this provocative idea was a revelation.

“I realised the energy system, like the internet, would one day be a mere platform where customers and generators could upload their energy and have choice in what type of energy they consume.”

Despite seeing no regulatory path through, James imagined a piece of software which would allow this to take place. A peer-to-peer energy platform. The idea of Open Utility was born!

[Note: For a summary of the Metcalfe’s idea read my previous post here]
Is this the world’s first real-time Peer-to-Peer energy platform?

Fast forward three years, Open Utility is 9 staff strong and conducting their first real-life trial of their software, dubbed Piclo. Partnering with Good Energy – a UK utility – 24 renewable energy generators and 14 large commercial customers are participating in the trial, which is possibly a world first for such a concept.

Via the Piclo website, a customer selects their generators in order of preference. Then, with matching based on 30 minute intervals, the customer can log-on to see exactly which generator is supplying them at any given moment. At the end of the month their electricity bill tells them exactly how much energy came from each generator. At the same time the generator can decide who to sell power to and whether to offer discounts or premiums to certain customers. Genius!

A customer’s daily load profile and generation mix (Photo: Open Utility)
A Rollercoaster Start-up Journey

Whilst the idea seems on the surface pretty straightforward, James’s journey with Open Utility was far from smooth. Knowing there was no way to simply buy and sell power without becoming a energy retailer, the team spent all of 2013 trying to find a utility partner. Whilst 16 electricity retailers agreed to meet, their risk aversion meant that none were willing to do a trial with no immediate financial reward.

In the meantime, with cash low, the small start-up team of four decided to pivot to attempt to keep the business afloat. They built a price comparison service for solar power purchase agreements – a serious detour in order to buy some time. Persevering, James held faith in his original concept and was finally rewarded with £310,000 (AU$620,000) in government grant funding, alongside £190,000 (AU$380,000) in matching investor funding. The money had rescued the idea at the 11th hour.

Armed with new confidence and the cash to build the software, Open Utility re-approached the energy retailers and found six who were keen. They chose Good Energy for the trial as they are mission driven, 100% renewable and have 100,000 customers who are likely to see lots of value in such a service.

Now with the trial underway, the momentum is clear; just last week, Open Utility was awarded Startup of the Year at European Utility Week in Vienna.

The Nuts and Bolts – how the trial works

The generators in the Piclo trial include 7 wind generators, 7 micro-hydro plants and 10 solar systems ranging from 25kW to 5MW. The generators were selected in order to roughly match the customer load profiles. This minimises reliance on Good Energy, who agreed to buy surplus electricity and sell in times of shortfall. All transactions are conducted via Good Energy.

A customer might be motivated by knowing exactly who and from where their power is coming from. Generators sign a fixed PPA with Good Energy, and are motivated to join the trial due to the free data visibility, local publicity and outreach with local customers.

The Potential Value and Applications

Piclo has the potential to grow into a vibrant, open marketplace where buyers and sellers meet and trade – like the eBay, or AirBnB for energy.

It’s no surprise that many of the customers favoured local generators in the trial. According to James, the next trial will hopefully incorporate the value to the grid from local energy trading to create more financial incentives for both generator and consumer to participate.

“The regulator signed off on the pilot so are clearly interested in the potential applications.” Open Utility’s software is the first step towards making local energy trading not only possible, but also more economic than the alternatives.

Australian opportunities?

Such software could have global application. In Australia, this software could easily feed into the ARENA-funded trials of local energy trading currently taking place led by the Institute for Sustainable Futures at UTS, who are leading researchers in this field globally. In an environment
where consumers want to buy local and put a face to their power, it’s super exciting. Australian utilities should take note – give the people choice and value, via services such as this, otherwise brace yourselves for defection!

Start-up profile – Next Kraftwerke
Blog post at http://www.citizenpower.com.au

Aussie start-up Reposit Power have an exciting vision, whereby households can store their solar energy and collectively sell it on the wholesale spot market. But like a lot of things in the energy world, a German company called Next Kraftwerke has been doing this sort of thing for six years already, with astounding results.

Next Kraftwerke provide commercial energy customers with the opportunity to buy and sell their electricity, allowing them to benefit from the price fluctuations in the energy spot market. They do this via two mechanisms –

- a Virtual Power Plant (VPP) which aggregates small generators and sells their power on the spot market when the price is high enough.
- b) selling retail electricity to customers at a cost which reflects the true wholesale spot rate, up to a fixed price ceiling

Next Kraftwerke show that when consumers, generators and pro-sumers are given the chance to opt-in to a more cost-reflective market structure – everyone wins, including the greater good.

Electricity is a dumb market
As a one-time student of economics, I’m fascinated by anything that optimises market efficiency. More efficient markets can lead to better outcomes for participants, and ultimately less wasteful use of resources. Electricity is one highly inefficient market – plagued by overcapacity, over-investment and over-pollution. In Australia, the energy regulators failed the people to the tune of $16 billion dollars between 2010 and 2015. This was the amount of network capacity upgrades which could have been avoided via distributed energy solutions, according to the Institute for Sustainable Futures. But the bigger network got built, and the prices went up.

One key regulatory failure of our electricity market is that energy users are not exposed to the true cost of electricity, which can fluctuate wildly on the wholesale spot market. The relatively fixed energy retail price – designed to protect consumers – creates a market distortion which removes the incentive for demand-side participation. It could be argued that flat pricing has not protected – but actually hurt consumers – and been a key contributing factor to Australia’s very high delivered energy costs.
Smart business fixing a dumb market

Germany, 2009. Hendrik Sämisch (economist) and Jochen Schwill (engineer) were postgraduate students at the University of Cologne researching the potential of standby generators to provide grid services via an aggregated Virtual Power Plant (VPP). The opportunity they found got them so excited that they quit their PhD’s and started Next Kraftwerke.

In the beginning, Jochen and Hendrik cold-called hospitals and factories all over Germany to see if they wanted to use their idle emergency generators to earn extra cash. The customers said yes. Soon, they developed the software and control devices to build their first Virtual Power Plant (VPP).

Now, Next Kraftwerke have grown into one of the success stories of the German Energy Transition and are paving the way for the future of the electricity market.

The Next Kraftwerke Virtual Power Plant (VPP)

Today their VPP comprises of 2600 distributed generators between 100kW and 20MW in size. The VPP includes variable generators such as wind and solar farms, as well as schedulable generators like cogeneration and biogas, and balancing plants such as emergency generators. The combined capacity of the virtual power plant is 1.5GW – the equivalent of large coal power station. In 2014 alone, the VPP sold A$300 million (€184m) worth of distributed energy onto the wholesale market.

Each schedulable plant is fitted with a control device (the ‘Next Box’) which can scale up or down the power plant via a software algorithm which optimises participation in two markets:

- Frequency regulation market – transmission network operator pays Next Kraftwerke on a minute-by-minute basis for ‘balancing services’ which help keep the grid frequency at 50Hz.
- The wholesale energy market – generators sell to the spot market when the price is optimal.

Check out the Virtual Power Plant game to get a feeling for how these markets operate.

A new way to sell energy

In recent years, Next Kraftwerke have allowed customers to buy energy as well. Commercial clients opt-in to buy electricity with full or partial exposure to the wholesale spot market, up to a fixed price ceiling. Next Kraftwerke analyse weather and market data to send each customer weekly and daily forecasts of markets prices so the customer can best manage their energy loads. In most cases, however, loads are turned off remotely using Next Kraftwerke’s control systems. They have found that commercial customers have a strong price elasticity of demand when the process is seamlessly automated and applied to technologies which can be turned off temporarily, such as cooling and heating systems, grinding processes and flexible pumps.
For example, the water coming in to the dykes in Northern Germany must be pumped out daily by huge pumping stations to avoid water seepage, resulting in monstrous power bills. Simply by shifting loads, the customer was able to reduce their electricity charges by 30%. This is great for the customer and for the common good – we all benefit through more stable wholesale prices.

What’s next for Next Kraftwerke?
In 2014 the company was recognised as the Energy Start-up of the Year, and also won the German Entrepreneur Award 2014 and the Harvard Clubs of Germany Innovation Prize. According to Hendrik, this is just the beginning. “We are adding new generators every week. Small, decentralised actors are the key to reaching 100% renewable energy”

Having already expanded to France, Belgium and Austria, I ask whether Australia is in their sights. “Not in the near future, but we’re always open to opportunities. Europe is a big market for us to expand into right now”. The company also has it’s sights set on residential customers in the long-term.

Lessons for Australia
Regulators need to speed up the shift to more liberal market mechanisms for electricity customers. The Next Kraftwerke experience shows that many commercial and industrial customers are gaining a greater understanding of their electricity and are more willing to engage with market forces.

To their credit, the AER changed the NEM rules in 2012 to allow the aggregation of small generators to form a Virtual Power Plant. After two years only 8 aggregators have registered (including Enernoc, GoEnergy, Diamond Energy and some biogas and hydro generators) however – as far as I’m aware – none are doing any serious aggregation like Next Kraftwerke.

So, a massive gap in the market? There is an opportunity!

Start-up Profile – UtilityAPI
Blog post at http://www.citizenpower.com.au
Today I had the pleasure of visiting PowerHouse – a solar incubator in Oakland California co-founded by Danny Kennedy of Sungevity fame. Whilst there I had the additional pleasure of sampling a bottle of UtilityIPA, a delicious beer made by the founders of emerging clean-tech start-up UtilityAPI.

The beer and its play-on-word branding (no doubt formulated over a beer itself) was delicious – summery, not too hoppy and very Californian in personality! But even more delicious is their software.

UtilityIPA – the homebrew of UtilityAPI
What is UtilityAPI?
UtilityAPI have developed software interface which connects with a utility’s customer data systems to immediately download their consumption and interval billing data. Imagine pressing a button and accessing customer billing data immediately (with their electronic permission). In the future the company hopes to able to access customer default rates to provide immediate credit checking as part of the same process.

This is of enormous value to solar developers as well as those working in energy efficiency and demand side response, as well as utilities.

Check out this two minute demo of what it can do!

Expect to see many more similar innovations become commonplace over the next 10-20 years in the drive to reduce the soft cost of solar towards zero.

The problem in UtilityAPI’s sights...
Energy efficiency and solar providers operating in the commercial and industrial sector deal with slow customer conversion times. In Australia, this can equate to an average lead time of 6 months (according to SolarWiz’s Warwick Johnston). The delays come from a number of factors, one of which is timely access to accurate meter data. From my experiences in Australia it can take up to 4 weeks to manually access interval meter data via an email request sent to the utility. Sometimes solar and energy efficiency companies will resort to physically installing data loggers on site in order to quickly access energy use data. Both these clunky and dated methods prevent on-the-spot quotations with most commercial clients, substantially slowing the sales process and losing crucial momentum.

UtilityAPI – the team at the Powerhouse offices

What’s in it for a solar developer or energy efficiency company?
Imagine being able to offer your customer an immediate proposal on your iPad whilst conducting your initial site tour! Imagine the momentum that would provide in the sales process, saving time, hassle and increasing project deal flow. Imagine the hassle avoided by not having to wait for the customer bills to be scanned and sent through, and then having to manually calculate energy consumption and tariffs.

The UtilityAPI pricing ranges from US$10-$15 per meter, which at the US average residential solar conversion rates (approximately 5% according to UtilityAPI) could equate to US$200 per conversion. From my Australian commercial solar market experience, conversion rates are higher, resulting in a much lower cost per conversion. The value preposition lies in much shorter lead times, more accurate proposals, better deal flow and therefore more projects!
**What’s in it for the utility?**
The utilities see value in partnering with UtilityAPI as it allows them to reduce labour time associated with manually responding to data requests. It also indirectly lowers the costs of energy efficiency and renewable energy solutions, allowing the utility to reach any renewable or efficiency mandates at lower cost.

**Will this come to Australian market in the near term?**
Naturally, UtilityAPI is targeting the US market in the short to medium term with international expansion planned later in the decade. However, according to Wes Brown, Director of Business Development, they’d be open to partnerships with Australian companies who are serious about bringing the software down-under via franchising or similar methods.

“If an empowered company or self-starter came to us, with some history in the sector and track record of delivery, we’d be open to considering some sort of partnership in Australia”.

*Is there anyone out there who wants to fast-track the expansion of UtilityAPI to Australia? As someone who works in solar, I certainly hope so! Email me and I can make an introduction!*
Conclusion and Recommendations
This report documents just some of the many learnings of my Winston Churchill Fellowship. Australia has a fledgling, but motivated community energy sector, which could definitely learn from the lessons from overseas community energy groups.

Moving forward, I personally am committed to implementing my learnings by directly building up the community energy sector. I have learned a lot about community energy, innovation, and the process of scaling a start-up - lessons which I plan to take home and incorporate into Repower Shoalhaven, and any start-ups that I pursue.

In many ways there have been a lot of positive outcomes which have come out of the Fellowship already. I have already fostered connections between Australian businesses and those that I've met overseas as a means to bringing useful technology and software to Australia. In particular, my blog post calling to set-up an energy incubator and accommodate start-ups in Australian Renewable Energy Agency (ARENA) funding has garnered a positive response and it looks hopeful that both of these requests may be fulfilled in 2016.

For community energy organisations and entrepreneurs, here is a summary of the lessons identified in the body of my report:

- use networks and partnerships to scale swiftly and cheaply
- use software appropriately to drive down marginal costs
- entity type is less important than being transparent and open
- branding and storytelling is key to inspiring movement participants
- get the financial structures right to avoid a Prokon disaster

I do think that there are limits to how far innovation can get us within the current regulatory regime of electricity markets. Governments and regulators need to move much quicker to reform electricity markets to more accurately reflect the values offered by distributed energy solutions. This will spur more rapid innovation towards a low carbon, people-centric energy system. (This fellowship stops short of reform proposals but I recommend policy makers look to New York for best practice reform process).

I feel very passionate about entrepreneurship as a vocation for impact and change. Like a sailing boat out on stormy seas, entrepreneurship is perhaps the most real, daunting, exciting, scary, and satisfying of human pursuits. The experience of a Winston Churchill Fellowship has given me the extra confidence I needed to fully commit to the pursuit this as a livelihood. Armed with this confidence, I hope that my actions and the stories of those I have met on my journey can inspire some more talented people to leave the safe harbour of their job and to set sail to new horizons.