

## **a green light\***

Sustainable, Responsible Business Development and Communications

Telephone 0414416500

Skype agreenlight7

ABN 43405047937

# **Community Renewable Energy Seminars**

## **Introduction**

### **1. [Catch the wind of change. CENREC Sustainable community owned power]**

## **Overcoming barriers**

Our objective is to overcome barriers to and create opportunities for community renewable energy in central NSW, with particular reference to wind power, which attracts an inordinate amount of negative attention which is truly baffling to Europeans who have been harnessing and living with wind power for generations.

What we are endeavouring with our project is to use facts to inform the broader population that the perceived barriers to CRE are just that: perceptions, misinformed by half truths and incomplete context. We wish to make that context more inclusive by providing some comparisons, so that a better informed population can draw their own conclusions regarding the relative benefits of what we currently have, and what we might enjoy.

I propose 3 central tenets:

### **2. [3 tenets]**

1. that the transition to 100% renewable energy is inevitable, not just because the reserves of fossil fuel are finite, but because the economic, political and social benefits will be acknowledged long before the reserves run out. As Al Gore once quipped, the Stone Age didn't end because they ran out of stone
2. Renewable energy technologies possess flexibility and speed in their installation which supports a decentralised or distributed energy model, generating power where it is to be used, with the potential for ownership by the user, in an industrial example, or by a community of users, such as the people in this room.
3. Investment shapes the future. Where we choose to invest our money determines what sort of future we have. If we choose to have shares in the fossil fuel industry, they'll continue to dig the stuff up and burn it. If we choose to invest in our community, it will grow and strengthen. If there are sound economic arguments as well as social and environmental benefits to invest in your community, you can choose to have a financial return on your investment which satisfies a triple bottom line.

We identified 6 major perceived barriers to the further proliferation of wind power in Australia which we address in the banners you see around you and invite you to read after our session but I shall treat each in turn.

- What are the economic benefits of renewable energy?
- Do wind turbines affect our health?
- What about the visual impact?

Blue sky your green thinking

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- Do wind farms affect property prices?
- Are wind turbines noisy?
- Is there public support for wind energy?

I would like to start with this good news. If you are actively or even silently supportive of wind energy, you are not alone, you are not in the minority, you are, in fact one of the overwhelming majority of Australians who support not only wind power but the construction of wind farms to supply it.

### **3. [Support slide: heading, graphic, sub-heading]**

The key here is the blue fella represents NSW residents and the white fella represents the central tablelands. That's nearly 9 out of 10 people in NSW in general, and a similar number for our local region, with only a slight easing of support for turbines within 10 kms. But even within 2,000m, more than 6 in 10 are supportive.

One of the pieces of research which informs this fact was undertaken by the CSIRO.

### **4. [Snapshot slide]**

The report entitled [Exploring community acceptance of rural wind farms in Australia: a snapshot](#) says

“There is strong community support for the development of wind farms, including support from rural residents who do not seek media attention or political engagement to express their views. This finding contrasts with the level of opposition that may be assumed from the typically ‘conflict-oriented’ portrayal of wind farm proposals in the popular media. This media coverage frequently gives significant attention to legal challenges, political protests, and vocal opponents including ‘Landscape Guardian’ and high profile individuals, but fails to balance this with coverage of middle ground views, or with equivalent attention to the potential benefits of wind farms.”

Another piece of research commissioned by The Climate Institute, [Climate of the Nation 2013](#),

### **5. [Climate of the Nation slide]**

draws on research from June using focus groups and nationally representative polling. I'd like to ask one of CENREC's board of directors, to tell us what it finds:

“What gets lost in the climate change debate is the economic opportunity.

Most Australians agree that tackling climate change creates new jobs and investment in clean energy, and most agree that tackling climate change presents a unique economic opportunity for the development and sale of renewable energy technology.

Importantly, an appreciation of the economic benefits, including job creation, associated with a strong renewable energy industry is not contingent on belief in climate change – or even a belief that humans are responsible; even sceptics can appreciate the opportunity to make a buck.”

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So leaving climate change aside for the moment, let's take a look at some of the economic benefits of renewable energy for the community.

### **6. [Benefits slide: heading, infographic, sub-heading]**

This information reflects roughly half of the proposed installation at Flyers Creek.

For every 50 megawatts of capacity, a wind farm in Australia generates:

- annual land rental income for farmers up to \$250,000, and \$80,000 pa on community projects
- up to 48 construction jobs, with each worker spending an approximate \$25,000 in the local area in shops, restaurants, hotels and other services – a total of up to \$1.2m
- Direct employment of around five staff – creating \$125,000 in personal expenditure locally
- indirect employment during construction of around 160 people locally, 500 state jobs and just under 800 jobs nationwide

Speaking of jobs, let's hear from Capital Wind Farm's site 'techie', Phil Lewis, who was one of the 120 workers who constructed the farm and now services the turbines with 14 others:

### **7. [Phil Lewis slide]**

"After 25 years shearing I was looking for a career change but I wasn't trained for anything other than shearing. I'd never even sent an email before I had this job. It was great to be involved from the beginning and to watch the project grow. Since the start Suzlon (now REpower Australia) has given us training in things like first aid, height training, climbing, forklift license and turbine operations and maintenance training. I've gained a lot of experience, learnt about computers and servicing wind turbines. Servicing of the turbines is ongoing as the 90 turbines are serviced at six month intervals. Although the wind chill in winter can be a bit challenging when you're up that high. It's a great crew and we have a good laugh. [and here's my favourite bit] We've got people who used to work as a butcher, fitters, mechanics, a shearer, and electricians."

Does that sound like a great job transition opportunity?

Phil said he hasn't experienced any ill health effects from working on a wind farm, and added:

"When you look at countries like Japan our options could be a whole lot worse – we could have a nuclear plant in our backyard."

On that note, let's talk about health. I'd like to introduce another CENREC director to speak.

### **8. [Health slide: heading, infographic, sub-heading]**

Most recently, the Bodangara wind farm was approved by NSW Planning, following an extensive consultation process which included seeking counsel from NSW Health. In its [report](#), the Planning Assessment Commission writes:

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"NSW Health was very clear in its advice, which is consistent with that of the National Health and Medical Research Council - that there is no published scientific evidence to link wind turbines with adverse health effects."

This means an extensive assessment of everything in the draft NSW wind farm guidelines, one of the most stringent set of considerations for any development in the world, including noise, blade glint, shadow flicker, electromagnetic interference, night lighting, electromagnetic fields and other health issues.

Moreover, this means no carbon dioxide, no carbon monoxide, no nitrous oxides, no mercury, no arsenic, no lead, no radioactive waste, no particulates nor any other type of air pollution, unlike coal-fired and nuclear power sources. Can we go so far as to call these improvements health benefits of wind power?

### **9. [Simon Chapman slide]**

Simon Chapman, Professor of Public health at the University of Sydney, maintains a compendium of [Symptoms, Diseases and Aberrant Behaviours Attributed to Wind Turbine Exposure](#) which, at last count lists 234 maladies, including claims that infrasound and low frequency noise can make people's lips vibrate "as from a distance of 10km away", and "at times with sufficient energy to perceptibly rock stationary cars even further than a kilometre away from the nearest turbine." Here is just a smattering of the ailments reported through anti-wind websites. To be honest, my heart goes out to anyone suffering any obviously real ailments. There is just no evidence linking them with wind turbines.

Talking about the now infamous Wind Turbine Syndrome, which is a rather all-encompassing villain, again I quote from the Planning Assessment Commission's report:

"NSW Health noted that the symptoms reported by residents concerned by wind farms are also reported by those living near other new developments of various kinds. Studies suggest these symptoms are suggestible, ie. if individuals are expecting to be impacted they will be more likely to report symptoms. It was also suggested that the visibility of the turbines influenced the likelihood of complaints from a neighbour."

So let's turn our attention to the visibility of the turbines.

### **10. [Visual slide]**

The facts are simple. Jonathan Upson from Infigen Energy wrote to me, simply stating:

"All forms of electricity generation have some sort of amenity impact on the community, for wind it's primarily visual."

Now beauty is in the eye of the beholder, so not everyone finds these aerodynamic structures aesthetically pleasing, although descriptions of majestic, graceful, hypnotic and calming are abundant; but they do serve as a reminder of our insatiable demand for electrical power. So if the

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choice were between a wind farm and an open cut coal mine or a nuclear power station in your back yard, which would you choose?

While we're on the subject of comparison, let's take a look at property prices.

### **11. [Property slide]**

I again quote from the [CSIRO report](#):

"An assessment of 78 property sales around the Crookwell wind farm over the period 1990-2006 found no reductions in property values. A more recent assessment prepared for the NSW Valuer General in 2009 analysed property sales transaction data for 45 properties near six wind farms in Australia. No reductions in sale price were evident for properties located in townships with views of the wind farm."

Comparative evidence, however, comes from one of Australia's largest wind farms, that of Waubra in Western Victoria. A land evaluation report presented to the Pyrenees Shire Council in August 2012 showed residential properties in the Waubra area increased in value by 10.1 per cent from 2010 to 2012. This was the largest increase of any town in the shire.

The NSW Valuer General has recently announced a [study](#) into how coal seam gas projects have struck land values, using sale prices to determine whether the industry is having a "material impact" on surrounding land. We await the outcome of this study with interest.

The sixth perceived barrier we address is the loudest. Or is it?

### **12. [Noise slide]**

The first thing to point out is that audible wind turbine noise only affects host farmers and nearby residents and that the sound is never above the level of annoyance. In Australia, wind turbines are very rarely as close as 300 metres to houses but at 100 metres, the sound level from a wind turbine will be about the same as a nearby air conditioner. Best thing you can do is go to a wind farm and judge for yourself. Then go to Mount Piper power station near Portland and hear the difference.

In January this year, the South Australian Environmental Protection Authority released a report entitled [Infrasound levels near windfarms and in other environments](#), comparing wind farm environments to urban and rural environments away from wind farms. Measurements were undertaken over a period of approximately one week at seven locations in urban areas and four locations in rural areas including two residences approximately 1.5 kilometres away from the wind turbines. Both indoor and outdoor measurements were undertaken.

Some interesting results include:

- Infrasound levels at houses adjacent to wind farms are no higher than those at houses located a considerable distance from wind farms. Indeed, the outdoor infrasound levels at one house 1.5km from the turbines are significantly lower than those at another house 30 km away.

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- Infrasound levels in the rural environment appear to be controlled by localised wind conditions. During low wind periods, levels as low as 40dB(G) were measured at locations both near to and away from wind turbines. At higher wind speeds, infrasound levels of 50 to 70dB(G) were common at both wind farm and non-wind farm sites.
- Organised shutdowns of the wind farms adjacent to the 2 near houses demonstrated no noticeable contribution from the wind farm to the infrasound level measured at either house.

When I spoke to one of the Carcoar wind farmers, he put things into perspective:

“You can hear them sometimes, depending on which way the wind's blowing, but you can hear the neighbours across the road if the wind's blowing the right way too! If you had a radio or TV going you wouldn't hear anything.”

## **Generating opportunities**

### **13. [Catch the wind of change slide]**

We've addressed the major perceived barriers, so let's examine some less obvious ones.

#### **Technology.**

There are not only misconceptions regarding renewable energy technologies, but largely an ignorance regarding how [fossil fuel energy technology is wasteful](#). Roughly two-thirds of the fuel burned to generate electricity is lost to heat in generation and delivery, so our national electricity grid operates at approximately 33 per cent efficiency, which remains unchanged since the 1960s.

The technology supplying energy from renewable resources, however, is cutting edge. Additionally, in order to compete with heavily subsidised fossil fuel energy which externalises significant costs, renewable energy technology demonstrates both rising efficiency and falling prices. A [2012 United Nations Environment Program report](#) states solar panel prices fell by close to 50%, and onshore wind turbine prices by between 5% and 10%.

Since 2008, wind turbine prices have fallen 29%. Best of all, the cost is mostly upfront with only modest maintenance costs thereafter. The fuel is free! Electricity generated locally reduces peak demands on the wider network. Distributed energy technology means every kWh we generate locally replaces the need for an estimated 1.1 kWh to be generated elsewhere. That's a 10% efficiency improvement.

#### **Investment**

We are told renewable energy will lead to losses in jobs in the fossil fuel industry. But as Phil Lewis suggested before, this should be seen as an opportunity, not a threat. Truth is, old energy is in decline, and job opportunities were eclipsed by those in non-fossil fuel technologies a decade ago. A

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[2004 study from the University of Berkeley, California](#) reports 'all non-fossil fuel technologies (renewable energy, energy efficiency, low carbon) create more jobs per unit energy than coal and natural gas.'

As global economic investment in renewable energy escalates, employment and training opportunities increase locally and internationally. [In 2012, developing nations spent \\$112 billion, including \\$67 billion in China \(the world's biggest investor\), while industrialised nations spent \\$132 billion, including \\$4.2 billion in Australia. Nationally, there are 24,300 people employed in the clean energy industry.](#)

NSW Government Office of Environment and Heritage are advised The Climate Institute estimates strong policy and economic investment will create over 1,700 new clean energy jobs in the [Central Tablelands](#) in the next 15 years, including 200 permanent positions in wind energy.

### **Landscape, water, farming**

We've noted how wind turbines have a visual amenity impact but it pales into insignificance in comparison to the way fossil fuels and nuclear power massively degrade the natural landscape while also competing for water resources and farming land.

In stark contrast, harnessing renewable energy does not need water. Wind farm construction has negligible impact on the landscape and supports improvements to surrounding roads. At Flyers Creek, the proposed wind farm will supplement current farming practices.

### **Costs**

Shock jocks and some newspaper media will have you believe the cost of renewable technologies is outrageous. Truth is, NSW Independent Pricing and Regulatory Tribunal (IPART) [estimates large-scale renewable energy target costs of \\$40 for 2013/14](#), or \$10 a quarter, for the typical residential electricity bill. That represents a rise from 1.3% to 2% of your bill.

For the sake of an inclusive context, the cost to taxpayers globally for renewable energy technologies in 2011 was [\\$88 billion](#), but this is less than 17% of subsidies paid to the fossil fuel industry which was [\\$523 billion](#) globally. In Australia, it's [\\$10 billion](#). Despite this, the fossil fuel industry pays for just a small fraction of its own pollution, and only since the introduction of emissions trading.

Yet arguments regarding subsidies can stall renewable energy projects which have the capacity to save over 5 million tonnes of CO<sub>2</sub> each year in Australia alone. In 2010, carbon intensive economy and climate change related losses worldwide have been [estimated at over 1.2 trillion dollars](#).

Additional costs to human health from fossil-fuel fired electricity in the US alone have recently been estimated at [USD \\$886 billion](#) annually.

### **Greenhouse gases**

Science tells us greenhouse gases now make up 400 parts per million in our atmosphere. The [threshold to stay below 2 degrees of global warming is 565 ppm. Burning fossil fuels at current rates](#)

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[we will reach this limit by 2028](#). Even now, chemical and physical changes to the atmosphere are profoundly affecting fundamental food resources from both sea and land.

Clearly, power generated without greenhouse gases dramatically reduces further global warming potential. All renewable energy resources are low carbon.

Yes, there are associated greenhouse gas emissions from manufacturing a wind turbine generator. But they are all offset within the first nine months of operation. Another barrier overcome.

### **Community**

The final barrier to be overcome is seemingly a tough one. The energy utilities are large and rich and have vested interests in fossil fuel sources. Current power system politics puts control in the hands of the few and leaves the community dependent, insecure and out of pocket.

But the Flyers Creek Wind Farm has potential to benefit our community in many ways. Employment will be created in the construction phase and then for ongoing maintenance. Local roads will enjoy improvement that may not otherwise happen for some time. A community enhancement fund will be established and contribute significant funding to local community groups.

#### **14. [Catch the wind of change pt.2 slide]**

But here's the rub. Through CENREC, one turbine is to be community owned. This means local people will have a financial stake and the **profits** stay in the region. This benefits local businesses and local investment.

Now, centralised energy projects are large by nature, require large amounts of capital, come with large ongoing costs which are borne by customers and generally can only be developed by large utilities or corporations. Alternately, a community energy system supplies local energy requirements from locally situated renewable energy or high efficiency co-generation sources and is connected to consumers by infrastructure which complements or replaces the traditional power grid. A community energy project allows the people to **secure** their own energy future and drive greater efficiency and reliability.

It also offers people the chance to make a meaningful, collective contribution to mitigating **climate change**, materially more than they can ever achieve with purchasing appliances, light bulbs, improving insulation, using public transport or other noble energy saving measures. To borrow a phrase, we can take direct action transitioning to a clean energy future.

As we have seen, there are still considerable misconceptions about wind farms and other renewable technologies and a lack of **education** as to their benefits. Community projects will have a role in allowing local people to see for themselves how they work and the benefits they offer.

And as such they will create interest in renewable energy as well as being a **tourist** drawcard.

Across the world thousands of communities have established their own renewable energy projects. In Denmark, the home of community renewable energy, the Danish Wind Turbine Owners' Association was formed in 1978. Critical to the success of the wind industry, it works with wind co-

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ops, scientists, technicians, manufacturers and politicians. Here in Australia, we have organisations like the Community Power Agency and Embark providing similar support, linking 40 community renewable energy projects throughout the country.

If wind farms and other forms of renewable energy are to meet the federal government's renewable energy target of 20% by 2020, local communities can take decisions and reap the benefits. It provides an opportunity for **self determination** in the face of government inaction – creating real changes at a community level to manage our own destiny and get off the fossil-fuel roundabout.

Community renewable energy champions democracy, regional energy security, and local leadership, as well as offering a sound financial, social and environmental investment. Community owned power says it all. Get informed. Get involved. Get behind it.

### **15. Catch the wind of change. Invest in our future.**