

Notes from Renewable Energy Think Tank

24 July 2012

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Introduction / summary of existing Council projects

Jane Lofthouse

Natural Resource Management Coordinator

Extraction and utilisation of landfill gas, Stott's Creek Landfill

Landfill Management Services Pty Ltd (LMS) harvests landfill gas from Stott's Creek Landfill and reduces the environmental impact of the gas by flaring or producing electricity by combusting the gas through a renewable energy facility.

The project provides environmental benefits by reducing landfill gas (and therefore carbon equivalents) emissions from the operating landfill, operational benefits by reducing odour, and future economic benefits by reducing Council's liabilities under clean energy legislation (carbon tax).

Tweed Shire Solar Community program

More than 400 1.5-kilowatt systems were installed on domestic dwellings in Tweed Shire as part of the Solar Community program, along with the donation of 20 two-kilowatt solar photovoltaic systems, which were installed on community-managed facilities such as community halls, pre-schools and sporting clubhouses.

Condong Mill Co-generation Facility

The co-generation facility was designed to export electricity to the NSW grid year round as renewable energy and provide process steam and electricity to the sugar mill during the sugar cane 'crush season' from June to December. The facility is capable of producing up to 30 megawatts (MW) of electricity for use at the sugar mill and for export to the regional grid.

The plant is operating but is restricted to running for six months of the year, during the cane crush season, because the scheme is not financially viable to date and the companies who own and operate the co-generation plant have been placed into voluntary administration.

Presentations

Paul Cruickshank

Office of Environment and Heritage

Energy is the key discussion point in Australia at the moment. It's a very good time for a body such as a Council to be proactive in this area; so congratulations, you are about to seize the moment.

Renewable energy and energy efficiency debate is being driven by a States agreement for a target of '20 by 2020' (20 per cent of energy demands to be met by renewable energy by the year 2020). Tweed Shire's current level is about four per cent.

NSW and Victoria are the Australian States with the lowest levels of demand met by renewable energy.

NSW Government has made a commitment to focus on local government, particularly in regional groups.

More than \$12b in funding available for groups and innovative technologies.

Paul's job is to provide incentives, particularly for organisations prepared to become part of regional groups.

Sustain Northern Rivers seems to be the smartest way to go as a regional body but can deal directly with a council.

2008 was a tipping point, when world-wide investment in renewable energy overtook investment in fossil fuels - a major change in investment strategy.

Costs of production for renewable energy will fall over the next three years, bringing them closer to production costs for energy from coal.

The more Council can assist by reducing network costs and therefore cut power bills, the more it will be seen as a white knight by its residents.

Tweed Shire Council is located in a good electricity distribution grid, situated close to the Gold Coast.

Northern Rivers region not consistently windy enough to support large scale wind-powered operation; falls below the commercial level of 7m/sec.

In Germany, all operations such as piggeries and shade houses have cogeneration plants attached.

Kirsty Howton

Sustain Northern Rivers

Southern Cross University

Sustain Northern Rivers is developing a four-year action plan to meet future energy needs in the region and reach '20 by 2020' target.

Action plan divided into three phases:

- Research (underway)
- Strategy development
- Implementation

Working with Institute of Sustainable Futures in Sydney to identify gaps in skills and training required for the renewable energy industry in the region in the future.

Investigating production and consumption levels and behaviours in the community.

Bio-energy is a priority for the region. Fabulous opportunities for biomass projects, particularly with predicated increase in rainfall levels in the Northern Rivers.

Very high level of solar power uptake by households in the region.

Over the past three years, the Northern Rivers community has consistently said it is very interested in renewable energy and they want renewable energy sources.

Potential for bulk purchase of energy supply from another location.

Action plan includes initiatives which can be undertaken by individual organisations and others that will rely on external funding.

Robyn Fitzroy

Sustain Northern Rivers

Regional Development Australia

Sustain Northern Rivers on hand to provide support and maximise the uptake of renewable energy.

Has been a recurring theme at previous renewable energy forums that local government is seen as the saviour.

One of the biggest problems with renewable energy production is how to sell it and there is potential for local government to be involved as a retailer.

If Tweed Shire Council wants to take a leadership role, there would be a lot of support available from Sustain Northern Rivers.

James Sturch

Si Clean Energy

Germany at times has created enough solar power to meet 50 per cent of national demand, even though the country has half the amount of solar strength as Australia.

The cost of solar power production much lower than national estimates; Government using out-of-date figures.

Government gross feed-in tariffs actually had a negative overall impact on solar industry. Led people to view photo voltaic systems as a way to make money, rather than save power.

10kW was the cut-off for the gross feed-in tariff, so customers were not installing larger units.

Council has a role to help residents and business understand what their consumption is, how to reduce that consumption and, if they have the resources, how they can produce renewable energy.

The topic is overwhelming for many people; they don't know where to start, so they don't do anything. Not much incentive because electricity has been so cheap.

Can educate people about systems - combinations of renewable energy generation and greater efficiency - to cut their power consumption.

If Council is looking at a sizeable project, could look at some retail entity.

Massive potential for battery back-up to help with peak demand issues.

Council could make a lot of money by selling power into spot market. Could use hydro to store energy - pumping water up a slope during the day using solar power and generating flow at night when needed - rather than batteries.

Paul Cruickshank comment:

Predicted increases in rainfall would give Northern Rivers an advantage with using hydro.

Paul Taylor

Tweed Climate Action Now

High level of solar power in Germany means electricity prices are now cheaper during the day than at night. Solar power input to the grid pushed down daytime tariffs.

Can use heat pumps to store power in the ground, then sell it back into the grid during peak periods.

Opportunities to produce electricity from methane, which is often done in Europe.

If Council opts to increase the height of Clarrie Hall Dam to boost Tweed Shire's water supply, there's potential to produce hydro electricity.

98 per cent of people surveyed in the region support the use of renewable energy.

Should aim for renewable energy to meet 100 per cent of demand in Tweed Shire.

"As a scientist, I know that's what we need to aim for, and as a community we should embrace becoming the first community to achieve this - maybe not immediately, but we can move there step by step."

Tweed Shire could become a clean energy hub. Need to start by picking a project and showcasing it - then work with universities and attract people who can support it.

Would support the Tweed's emphasis on eco-tourism, arts and culture.

Need to chase a big target to generate community excitement.

Biggest tool to achieve 100 per cent renewable energy is through greater efficiency. That alone could achieve 30 per cent of the 100 per cent target.

US company now operating in Australia leasing residential rooftops, so households get electricity at a pegged rate without any installation costs. Company aiming for 5000 households during the next 12 months.

James Sturch comment:

Very different structure in Australia compared to the US. Comes down to the financing model.

Should do a rooftop audit to know how much energy could be produced (assess area of rooftops which have potential to be utilised for solar).

Strong community interest in forming a local electricity retailer that can enter into price agreements for a mutually beneficial arrangement.

Paul Cruickshank comment:

Guyra Shire Council entering into agreement to become energy retailer. It's happening but not as much as the US.

[Post think tank comment by Paul Taylor:](#)

[This would encourage companies such as Boral to use their available assets to make more renewable energy and keep more of our dollars circulating within our community.](#)

Peter Robson

Boral

Boral's Murwillumbah sawmill uses 5000 megawatt per year and has an annual electricity bill of \$1m.

Used to send 1600 tonnes of wood residue to the Condong cogeneration plant each year.

Now creating its own cogeneration plant. Will take about four months to establish.

"We have the fuel, the infrastructure and the demand but it's a hard process."

Will take two years to recoup costs.

Boral CEO has given a mandate to look at any method of energy production.

People move home every seven years on average. Should introduce a requirement that homes must have solar hot water and a solar electricity system before they can be sold, otherwise the vendor must pay an amount equivalent of those systems. Would be less than an agent's fee for selling the property.

Low cost of electricity for businesses means it's not economically viable to install large solar power systems. No incentive to produce any electricity above the cut-off for the feed-in tariff or above what can be used on-site.

Cogeneration plant will produce 160kVA. Could create 250kVA but no point unless someone else buys the extra electricity.

James Sturch comment:

An energy audit and tapping into the power supply cycle could achieve a 100 per cent return on investment in two years.

Nathan Gudsall

SAE Group

Greatest inroads could be achieved by maximising efficiency of existing solar power systems and an organisation's operations, such as energy efficient lighting and air-conditioning.

Need to get buildings operating as efficiently as possible.

Utilise large onsite battery systems to store power for peak demand times; keep prices steady. Will assist households after 60-cent gross feed-in tariff ends.

Tom Andrew

Entire Network Solutions

Need to look at solar street lights and battery systems.

Could follow Europe's example of generating power from methane gas in sewage.

Potential for hydro, particularly with waste water flowing down from elevated areas of Tweed.

Council needs to be visibly embracing renewable energy sources and show what it is doing, to capture the community's imagination and change community behaviour.

John Griffin

Retired engineer and former local government CEO

Condong cogeneration plant will go the same way as Rocky Point and will be mothballed.

Mt Nullum is one location where a Tweed wind farm would work.

Small domestic solar power systems creating problems with electricity distribution network, increasing costs for distributors. Would be best not connected to the grid.

Caldera seems to be the type of area where geothermal operations would be successful.

Paul Cruickshank comment:

Looked at Australian map and there was no reference.

Plenty of opportunity to store energy. Scandinavian countries use storage to great advantage.

Could push heat down into the soil to store it.

Sam Dawson

Caldera Environment Centre

More emphasis needed on natural lighting and ventilation for greater power efficiency. Best measures are to reduce power consumption.

Hybrid vehicle fleet for Council.

Better manage parks and roadside vegetation, stop excessive clearing of roadside vegetation.

Strongly object to wind turbines on Mt Nullum and expects considerable community opposition.

Don't support Condong cogeneration plant because of the ecological effect of harvesting camphor laurel trees, which have served as a replacement for rainforest.

Sceptical of hydro harvesting because CEC has a no dams policy. Would support hydro generation from Clarrie Hall Dam at its current size.

Financial returns to Council from a Clarrie Hall hydro scheme could create incentive to keep using dam water for electricity generation.

Potential for tree planting and carbon sequestration to provide income to Council.

Onsite water storage would reduce cost of pumping water around Tweed Shire.

Key issues

Biomass energy

Cr Barry Longland: Need to explore other sources of biomass for Condong cogeneration plant. Has been a lot of money invested into it.

Council sends treated waste water to the co-generation plant.

Peter Robson: Plant no longer takes Boral waste wood.

Plant capable of producing enough electricity to meet one third of energy demand for Tweed Shire.

James Sturch: Would create a completely different context for the plant's viability if the generated electricity could be consumed locally.

Should be a local community retailer which has a local purchase agreement.

Adam Falkner - Tweed Shire Council Waste Management Coordinator:

250,000 tonnes of municipal waste collected annually as curb-side on the Far North Coast from Clarence Valley to Queensland border.

Northern Rivers Regional Organisation of Councils is investigating what to do with that waste. Could use anaerobic digestion.

It is a biomass fuel already coming to councils.

Ballina Shire Council has committed to the process.

Biomass processing plant must be located on land for waste treatment facilities.

Paul Taylor: Using pyrolysis - the thermochemical decomposition of organic material at elevated temperatures and without oxygen - to create biochar is the only carbon-negative way to create energy.

It's a reinvention of fire.

Condong cogeneration plant should be considered a key asset. If it can meet 30 per cent of the Tweed electricity needs and another 30 per cent could be met through improved efficiency, the remainder could be achieved with roof-top photo voltaic solar systems.

Plant could be a real asset if set up more effectively.

If Council creates and implements a biomass centre, should be showcased as a shining example.

Post think tank comment by Paul Taylor:

To fully capitalise on Tweed Shire's agricultural and biomass assets in the context of renewable energy requires localised education. Interest has been expressed by colleagues in

having a biomass or management institute or centre in the Northern Rivers. Council and community could collaborate to facilitate this. It will be created somewhere – why not here?

Not viable to transport unprocessed biomass further than 25km. Can be viable to transport further if biomass has been dried.

Could use new types of heat energies to convert biomass into electricity on a smaller scale. Existing plants are using old technology.

Post think tank comment by Paul Taylor:

Food can also be a source of renewable energy by spearheading natural-based food growing systems. Renewable energy initiatives could be complemented by a sustainability push for non-fossil fuel based growing systems to produce food, instead of the current industrial systems that can consume 10 fossil fuel calories for every nutritional calorie. Tweed could spearhead this push, with its agricultural heritage and assets. The community would strongly support such a vision.

Paul Cruickshank: Council needs to get data about the state of the Condong sugar mill.

Use of municipal waste as a biomass fuel is a perfect option for regional funding. Would create a whole cycle that ends with pyrolysis.

It is a perfect option for a large-scale, shovel-ready project and could be a really good thing for Council to do.

Sam Dawson: Community would strongly support a more sustainable source of energy.

Kirsty Howton: Transportation and processing of biomass would have to support a triple bottom line.

Waste is already being transported around the region without being used for any processing advantage.

Where should a biomass plant be located?

Must look at best ways to capture various waste streams.

Have not really examined agricultural waste.

Post think tank comments by Robyn Fitzroy:

New techniques to convert putrescible waste into energy may be worthwhile but we need to ensure this doesn't discourage reduction in waste, just like we don't want food crops turned into crops for biomass. There is a danger that if we can change waste into energy, there is no incentive to reduce.

Council roles

Sam Dawson: Council should put photo voltaic panels on structures such as barbecue shelters and the swimming pools.

If Council can get power from renewable energy sources, would be seen by the community as tangible progress.

Start by striving for energy efficiency and take a long-term vision.

Help carbon sequesters to tap into opportunities created by the carbon tax.

Robyn Fitzroy: Potential for Council to become an energy retailer.

David Keenan comment:

Council could make tentative enquiries about how it could get a better deal and whether there were other people prepared to enter into a tender.

Council probably not quite ready to become a retailer. Sometimes the most innovative people go bankrupt.

Council would probably be expected to enter into a long contract.

Would be great for Council to get a clear direction on street lighting.

Post think tank comment by Robyn Fitzroy:

*When considering reduced energy consumption options, **lot layout** can have a profound effect, especially when combined with additional passive solar designs of building. Having north-facing buildings is the first principle.*

Kirsty Howton: Could be powerful community education stories to come from it. It's about going for tried and tested technologies and telling the stories.

Paul Taylor: Look around the world for the best practices. See which communities and councils that have implemented these practices successfully and see which models will work here.

Peter Robson: Not asking for assistance from government, just the removal of impediments.

Nathan Goodsall: Identify tried and tested technology and do it. Australia will get left behind the rest of the world if it just keeps talking about renewable energy practices.

Tom Andrew: Council should lead by example and educate.

John Griffin: Community education must be the start and Council must bring the community along for the journey.



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