

Renewable Uptake in Wellington region - visions and barriers

Tena Koutou, Tena Koutou, Tena Koutou katoa

Special greetings to Dr Eric Martinot, Philippa Howden-Chapman, Mayor Marshall, colleagues and Council officers. Chris Laidlaw, chair Regional Sustainability Committee, and Wellington City Councillor Celia Wade-Brown send their apologies.

Dr Eric Martinot has just shown how much more is being accomplished in many other cities around the globe. It is clear that Wellington's cities can do much more.

The International Scientific Congress on Climate Change confirms that serious climate change impacts are already happening, and significant climate tipping points have already been passed.

Greenhouse emissions must peak now, and then we must return them to their pre-industrial level of 280ppm.

Fran Wilde, Chair of Greater Wellington, acknowledges in the foreword to our Regional Policy Statement, that "...our planet has reached a tipping point in terms of sustainability of life..... there is clear evidence that boundless consumption has depleted or damaged physical resources to the extent that we must fundamentally change our approach to the environment"

In the natural world, waste from one process provides nutrients for another. A whole of life cycle. Nothing is wasted. This is our vision. Uptake of renewable energy forms will play a crucial part.

We have the mandate... New Zealanders are looking for change.....And local Government has the levers and resources. And moving away from fossil fuels, will also improve safety, employment, social justice and resiliency.

Government under National is set on a course of local government reform, starting with the creation of a Auckland super city.

However, we need to take a step back, and rephrase the question as one of resiliency and sustainability. What are cities doing well now? What shared services are done better on a regional (super city) basis? How can we increase participation of our communities as we move into a post-carbon age?

Greater Wellington Regional Council already takes on some rolls of a super city. Greater Wellington runs the region's public transport system, and rightly or wrongly, determines what new roads and/or cycle ways will be built. That consultation is occurring right now, though the outcomes may be altered by the Government's shifting of \$1 billion allocated spending from public transport and active modes to roads.

Wellington region has enormous renewable energy potential. Wellington city itself, hums with a vibrancy that comes from a denser inner core. Thirty one percent of inner city residents no longer own a car. Thirteen per cent of commuting trips were by foot or cycle at the last census, with cycling numbers doubling and tripling in

recent years. 48,000 CBD workers (17%) commute by public transport daily, amounting to 17million rides a year. We use less fossil fuels in Wellington than elsewhere in New Zealand, with seventy five percent of regional public transport passenger-kilometers electrically powered. About two per cent of national electricity production is used in the transport sector, most of that probably coming from local trains and trolley buses.

We, of course, can still do better. Thirty six percent of Greater Wellington greenhouse emissions come from petrol, diesel and aviation fuel, and seventy per cent of car journeys are non work related visits to the super market, sport and recreation, and for social occasions, running on diesel or petrol. And up to thirty five per cent of Wellington's electricity will be generated from thermal power stations from outside the region. This is about to change as new wind farms are commissioned.

We also supply bulk water to most of the region.. but are not able to determine how it is used, ensure that a water conservation strategy is implemented, or incentivise rain water collection. Capacity, a Council Controlled profit making business run the retail part for Hutt Valley and Wellington city. Storm and waste water are also controlled by local Councils.

Renewable energy options in Wellington region.

Cost effectiveness should be balanced against contribution to low carbon footprint resilient living.

1: Marine.

Tidal energy through Cook Strait is regarded as the premier world class resource alongside Oakley Islands. It is important to note that tidal power is at this stage in a development phase, and much more expensive than other options available. It is also likely to be regarded as a national rather than local resource.

On the plus side, there is a difference of 6 hours in phase in tides from one side of Cook Strait to the other, giving the possibility of a balanced energy supply.

ECCA is looking at whether we should be allocating this resource, what is legally possible, and then how and what sort of criteria should be used to allocate rights. A report is expected in July this year. Seabed issues will need to be worked through with IWI. At this stage, Neptune has been granted resource consent by GW for an investigation of a tidal prototype model. The resource consent requires them to report on effects on the environment and marine life. NIWA has been giving advice. Grow Wellington is working with European Marine Energy Centre on marine technologies and potential environmental impacts.

2: Wind

Electricity from wind turbines is competitively produced near the average wholesale price, and does not appear to need any form of subsidy.

Meridian Energy will have commissioned the West Wind Farm by the end of the year, with 64 2.4mw turbines supplying enough energy for 100,000 Wellington homes. Project Mill Creek has now also been consented with another 29 wind

turbines. GW is proposing wind farms for Puketiro in the Akatarawa forest (about 50 turbines) and Stoney Creek in the Wairarapa. Wind Flow Technologies are seeking consent for 28 smaller 500kW turbines for Long Gully behind Brooklyn.

There is some controversy over whether wind farms should be sited in Regional Parks.

However, schemes consented or about to be consented, will supply most of the region's electrical needs.

3: Hydro

No major schemes are available in the region. However, a number of small schemes are planned, including a min-hydro generator at the Wainuiomata Water Treatment Plant.

4: Wood

There are reasonable sized pine forests in the region, some of that on GW land. Most dwellings contain trees and waste wood that could be utilised in wood burners. A national project to shift schools to pellet burners instead of gas and coal began last year. Modern pellet burners are extremely efficient and could also be used in regen units to produce electricity and heat water. Molly Melhuish believes that are sufficient sources of public land and road reserve that could supply most households with waste wood. Wood stoves for heating are especially beneficial for off setting peak loads during cold snaps, eliminating the need for new capacity. Modern burners run efficiently with very low emissions. The GW Regional Sustainability Committee will look at possible actions to support uptake.

5: Biofuels

Wellington city council collects landfill gas from its Happy Valley landfill, which then runs a one Mwh generator. WCC is planning for zero waste city. Green matter and food waste is also converted to compost. We can go one better, and build a biogas digester for energy and crop fertilizer for community gardens, as happens with Christchurch city.

Aquaflow in Blenheim has a prototype sewage to algae plant. This algae can be used in power plants as fuel or converted into bioethanol, biodiesel, or biogas and provide high-protein feed for livestock, aquaculture or trees.

Plantation forestry in the region, some of it on GW land, could also used as a feed stock for bio-fuels using an enzymic process. However, there are no commercial projects in sight.

6: Solar water heaters, heat pump water heater, Insulation, domestic air tightness

Solar water heaters, heat pump water heater are economical over a period of 8 to 15 years. Subsidies of \$1000 are available through EECA. A Green fund of \$1billion dollars over 10 years is currently being repackaged as a Blue fund of \$100m per year.

A new building code went into effect last year, which places 900,000 houses in New Zealand without adequate insulation. Anything built before 2000 will be less than best practice, while homes built before 1978 may have no insulation at all. BRANZ figures show about a third of Wellington city's households have inadequate insulation.

The Sustainability Trust, a Wellington based non-profit charitable trust which supports local communities in addressing sustainability related issues, is currently focused on energy efficiency, with free and subsidised insulation retrofits.

GW would like to see greater clarity of information supplied to households on efficiencies of various models alongside available subsidies.

7: Photovoltaics (PVs)

Cost effective in isolated environments. European countries are integrating PVs into rooftops and even building facades, where they are sometimes cheaper than traditional sidings. However, the cost is at least double conventional sources of electricity in NZ, and is not being actively supported by Government.

8: Human body

The conversion of high quality nutritious food into calories available to run our legs for walking and cycling is the most under rated renewable energy about. Our bodies need at least an hour of moderate exercise a day to remain healthy and this can easily substitute for 6km car ride, with consequent reduction in fossil fuel use (Substituting car trips with walking and cycling of up to one hour, would reduce US oil consumption by 28%, Higgins & Hlggins 2005)

All TAs and GW have written cycle plans, which specify the need to arrange safe cycling routes. However, change is slow and some times non-existent. Riddiford Street was upgraded in January this year, with absolutely no provision for cyclists.

A Petone to Ngauranga cycle/walk way, has the potential to take 10,000 cars off the road, and would cost a fraction of the cost of a new road lane.

Everybody now has the opportunity to comment on Greater Wellington's ten year plan.

Barriers/options for reduction of fossil fuel use

It is important to remember that moving towards biofuels and a electric vehicle support infrastructure should be part of a larger process of moving toward a sustainable transportation system, including light rail or tram-train, promotion of better urban design, walking, cycling, electric scooters, car share with less driving...a more efficient transit system, including better utilisation of rail and shipping for freight.

Electric vehicle support infrastructure

Greater Wellington has purchased 96 new electric "Matangi" trains, which will replace the present fleet. Our 10 year LTCCP includes the purchase of another 14 trains, allowing for 3% annual population growth. A major deterrent to public transport use, is the hassle of a congested change of mode at Wellington Railway Station. An extension of the rail system, using tram-train through the CBD to the southern and eastern suburbs, would resolve this.

Electric cars very definitely have a place in NZ... however, they are yet to be sold here on a commercial basis, and few may be able to afford the present \$50,000 price tag. According to the Boston Consulting group, electric cars in major US cities is only likely to reach 18% penetration cities by 2020. The study indicates that, unless adequate incentives are provided, electric cars might not take off. There is an urgent need for an infrastructure that would ensure that vehicles can be charged wherever they happen to be. Few households are wired for three phase power and/or 30 amp specifications. Public and private investment is also required to develop "smart" grid technologies, and to ensure the grid can handle the demands of these vehicles. This must be an important aspect of any Greater Wellington energy plan.

Smart grid

New Zealand urgently needs a smart grid, with two-way communication, balancing supply and demand in real time, smoothing out demand peaks, and making customers active participants in the production as well as consumption of electricity.

A smart grid will also allow electric vehicles to store power for later transport use, or to sell power back to the grid when needed.

Smart meters, automated control systems, and digital sensors, will provide consumers with real-time pricing and enable them to save money and power by setting appliances, entire building heating and cooling systems, or shut off industrial loads.

Smart meters will help shift loads to low demand periods, and other types of energy storage will become an option. Two way meters are available, but there is an urgent need for legislation that would require feed in tariffs, which will encourage home generation.

Access rather than mobility

Urban form is a key factor in reducing the need for fossil fuels.

All the territorial authorities except Upper Hutt are signatories to the Urban Protocol (March 2005), and Greater Wellington's Regional Policy Statement translates this into policy. The Regional Land Transport Programme 2007-16 has a vision that acknowledges the need for better land use, that people live closer to their main destinations for work and play, more vehicles run on renewable fuels, and that peoples choices recognise the risk and impact of climate change and diminishing non-renewable resources. WCC is encountering political problems in the implementation of a high priority transport corridor through the city, and the Adelaide road redesign has been linked to a contentious basin reserve flyover.

A vibrant city will facilitate compact development around transport hubs.

- Design walkability with trips less (70%?) than 6km replaced with active modes.
- Electric trolley buses and light rail replace fossil fuelled vehicles on longer trips
- Freight shifted onto shipping and rail powered by a combination of solar, wind and bio-fuels.

[Coastal shipping is the most energy efficient way to move freight around the country, producing only 14 grams of CO₂ per tonne-kilometre compared with road at 92–123 grams of CO₂]

- Moderate density apartments allowing regen heat, smart transport design, car share, passive solar aspects, savings in building design, community gardens
- connectedness through broad band, social access
- time share
- free cycle and swop of used goods
- clean air and good health
- Demand management programmes run through workplace and schools, encourages active modes, school walking buses etc.

Conclusion

Greater Wellington is developing a Genuine progress framework for a picture of well-being of the region. These include the following community outcomes: Prosperous community, Connected community, entrepreneurial and Innovative community, Healthy environment, Quality lifestyle, Sense of place, Regional Foundations , Healthy community, Strong and Tolerant Community.

Renewable energy and the replacement of fossil fuels play a key part in everyone of these indicators, and the Greenhouse gas emissions inventory is available as part of the milestone 2 and 3 of the CCP-NZ climate protection programme. A regional energy plan is also being developed.

Now is the time for both central and local government level to commit for rapid transformation of our basic structures and networks at the urban level.

Now is the time to assess our ecosphere resources, to redesign the economy to run with less. Now is the time to focus on those aspects of life that bring us, increasing satisfaction, without requiring excessive inputs of energy and materials. Now is the time to redesign our cities to reduce the need for cars, to develop renewable energy resources and educate a new generation of ecological farmers.

Paul Bruce, Greater Wellington Regional Councillor
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