

## Windy Wellington, strategies to achieve low-carbon resilience

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### Summary

Wellington should pilot low-carbon technologies for resilience, affordability  
Government supports a strategy of “100% renewable electricity” – actually, unachievable  
Instead we want “energy-efficiency-first” + wood burning which adds resilience to solar  
“Big Electricity” aims for “economic efficiency”, Community Energy aims for technical efficiency  
The two strategies now compete against each other within the ecosystem of the NZ economy.  
Residential sector could instead integrate the two strategies, but competition now dominates.

### Wellington is special. We have

a low-carbon council policy  
extra need for resilience, seismic, storm, floods.  
little smog so opportunity to pilot clean wood burning  
land suitable for firewood (pine, eucalypt, also landscaping waste)  
and a strong active Sustainability Trust to implement Community Energy

### Government supports “Big Electricity’s” low-carbon strategy via 100% renewable electricity,

Transpower would double today’s generation capacity<sup>1</sup> - new wind farms, some geothermal.  
But need new gas peaking stations - the only way they can supply winter peaks on coldest days  
Requiring more than eight new gas peaking stations (the first already under construction, \$100m)  
**Capital cost - \$13 billion/30 years for MBIE’s scenarios<sup>2</sup> that increase today’s generation by half**  
Sapere<sup>3</sup> estimates MBIE’s scenarios would increase residential prices by 25-50% - or 75%, or more

### Much better: small-scale energy development - Energy-Efficiency-First plus end-use renewables

Invest capital resources to restore Warm UP NZ (WUNZ) programmes as priority  
Government WUNZ funding<sup>4</sup> was cut in half, then by further three quarters  
300,000 homes retrofitted to date , **600,000 to go**  
**WUNZ will have received only 0.6 billion gov’t funding over 12 years, 2009- 2021**  
Residential wood burning – suggest aim for three levels of use -  
for hard-to-heat houses or rural houses with free firewood – use all winter  
most efficient solution – use heat pump at outdoor temp >~10 deg, use fire when colder  
highest value solution – use fire on “critical peak days” say 12/ year, heat pump otherwise  
rooftop solar (summer maximum) goes hand in glove with wood heat (winter maximum)  
dual-fuel biomass/electric boilers for healthcare and institutions (schools, maraes) – resilience!  
And for industry – dual-fuel biomass/ electric boiler to absorb electricity surpluses

### How the numbers stack up – how much electricity do we need for zero-carbon in 2050?

Electricity for Transport, as calculated by MBIE and Transpower:  
MBIE’s high-vehicle scenario commits 4.6 TWh (less than smelter’s 5.1 TWh contract)  
Transpower’s scenario commits 13.0 TWh (why the huge difference?)  
Electricity for industry in 2050: MBIE would commit 21 TWh, Transpower, 32 TWh  
Instead, for industrial process heat, the promised billion trees offers almost unlimited wood-fuel.  
Energy loss, forest to industrial site: = 10% [Scion] - same as transmission+ distribution losses.  
Efficiencies of new industrial biomass boilers are better than today’s fossil-fuel ones.  
**WUNZ could stabilise or even reduce household electricity demand** -no need for power price rises  
**Requires true cost-reflective pricing**

<sup>1</sup> [Transpower] <https://www.transpower.co.nz/resources/te-mauri-hiko-energy-futures>

<sup>2</sup> <https://www.mbie.govt.nz/info-services/sectors-industries/energy/energy-data-modelling/modelling/electricity-demand-and-generation-scenarios/documents-image-library/edgs-2016/scenario-summary-update.xlsm> on the sheet “system cost”

<sup>3</sup> [https://www.productivity.govt.nz/sites/default/files/Transitioning%20to%20zero%20net%20emissions%20by%202050\\_Sapere.pdf](https://www.productivity.govt.nz/sites/default/files/Transitioning%20to%20zero%20net%20emissions%20by%202050_Sapere.pdf) page 119

<sup>4</sup> <http://www.mbie.govt.nz/info-services/sectors-industries/energy/energy-efficiency-environment/energy-efficiency/documents-images/final-review-warm-up-new-zealand.pdf>

### **Actions required from central government:**

Revise air quality regulations to European standard, don't regulate wood burner design  
Regulate cumulative exposure; occasional smoke exposure does less harm  
Fund WUNZ to include efficient heater (choice wood/ heat pump) as well as insulation  
Insist on electricity pricing options that reward householders who reduce peak demands

### **WN should pilot new-technology home wood burners – be prepared to override air quality rules**

Down-draft burner (Roger Best), fuel hopper dries wood as it falls towards incandescent charcoal, this easily burns poorly seasoned wood  
Pyrolysis burner (Ian Cave) has sealed fuel bin at 300- 500 degrees C, can burn green wood  
Both have no visible emissions, can yield excess charcoal (use in garden to sequester carbon!)  
Both are convenient to use – light it up, fill the hopper, adjust burning rate via controls.  
Both require extensive development to become idiot-proof - priority for R&D funding

### **Technology/market development also needed for firewood supply**

In recent cold winters, firewood merchants ran out of dry firewood,  
Now the market offers kiln-dried firewood on pallets - a year's supply can fit into a garage  
Need to develop a device and app to self-monitor chimney smoke, without going outdoors  
Develop machine for landscapers to bale firewood into ~5 kg packages which include kindling

### **Develop Owhiro landfill into an energy centre:**

Convert best landscaping wastes into firewood not mulch  
Grow firewood on nearby hills while restoring natives to protect landscape values  
Store landfill gas to use at peak times; run council-owned diesel generators during critical peaks

### **Analysis – Big Electricity and Community Energy occupy the same ecosystem, the NZ economy**

They compete for capital and labour, AND for market share , AND for government policy  
BigElectricity (BE) develops resources for economic growth; CommunityEnergy (CE) minimises costs  
BE driven by shareholder value, CE by customer and provider satisfaction at minimum env. impact  
BE values “economic efficiency”; the real need (for carbon reduction) is for technical efficiency  
BE decisions aim for economy of scale, CE driven by economies of scope counting multiple values  
BE privatises profits and socialises costs - \$5 billion profit in 6 years from spot-price market power<sup>1</sup>  
Efficient wood burning threatens electricity growth far more than solar, is sternly ignored . . .<sup>2</sup>

### **Electricity pricing is red in tooth and claw – predatory on local and community energy and low-income**

BE has generous direct access to gov't, CE is constrained by coalition agreements.  
BE “owns” the regulators that determine electricity pricing. CE excluded from advisory groups  
BE lobbying to eliminate Low Fixed Charges,  
Wants \$2.20/day for all, and reduced c/kWh, to make end-use investments uneconomic  
Network pricing (Comcom) guarantees revenues whether or not assets are used and useful  
Spot electricity prices reached \$1/kWh 17 times this year (market power); 4 times last year  
“Winback” discounting - a “loyalty tax” on non-switchers, cuts average prices = price discrimination

### **All the above creates the case for a Residential Energy Alliance, to lobby for affordable low-carbon**

Lobby to bring back WUNZ/Clean heat for 600,000 houses; to allow new-tech clean wood burners.  
Reject that electricity demand should increase 1.1%/yr (MBIE) or even faster (Transpower)  
Note, as 51% shareholders in gentailers, Gov't supports the corporate growth agenda  
Analyse costs, benefits of scenario of wood + solar to achieve 100% renewable household energy  
Assume 10 yr CleanHeat: 300,000 choose HPumps, 200,000 choose effic wood burners  
300,000 HPump @ \$2500, 200,000 wood b. @ \$4000 => **\$1.55 billion subsidy over 10 yr**  
(note **Winter Energy Payment costs \$2.1 billion over 5 yr**, and keeps elect demand high)  
Carry out a new HEEP study<sup>3</sup> to firm up on the above assumptions

<sup>1</sup> <https://www.stuff.co.nz/business/107083208/power-generators-made-54-billion-in-excess-profits>

<sup>2</sup> <http://www.voxy.co.nz/business/5/320938>

<sup>3</sup> [https://www.branz.co.nz/cms\\_show\\_download.php?id=b1ab61dd06f50e83e6a184b29b68a989472502ed](https://www.branz.co.nz/cms_show_download.php?id=b1ab61dd06f50e83e6a184b29b68a989472502ed)