

Biocoal Elevator pitch

Did you know that New Zealand's forest harvest waste contains enough energy to replace all of New Zealand's coal use and run Huntly at 100% capacity?

Did you know there is a process that is self powered that can convert this waste wood into a carbon neutral coal substitute called 'BIOCOAL'?

Currently harvest residue is free for the taking or at a nominal fee of \$1 per tonne.

Some say a Climate Crisis is knocking at our door, maybe, maybe not.

But the Paris Agreement is an international treaty that will override the 'laissez faire' of apathetic and the use of fraudulent carbon credits.

There is a perfect storm coming in the year 2023;

- a \$100 per tonne CO2 tax, or more?
- a coal ban, maybe sooner?
- natural gas in limited supply and is not carbon neutral.
- Fonterra panicking and trying to reserve 'green electrical power'.
- 30% of kms driven by cars on the road are by EVs.
- No more cheap (fraudulent) carbon credits available.
- Huntly needs to run at 100% output to prevent power shedding due to EVs and electrical process heat.
- Threat of needing nuclear power

Biocoal will be produced by mobile plant in the forest, it is comparable to coal in all necessary aspects.

“Trees are energy, Stupid”

That post modern man, as a society, have forgotten that trees are the primeval controllable heat energy source of mankind is incredible. Trees are a solar energy collector and storage unit combo. Their economic disadvantage in comparison with fossil fuels are:

1. the distributed nature of trees (100s of tonnes per hectare as opposed to 1,000s or 1,000,000s of tonnes per hectare) thus difficult to accumulate.
2. trees are bulky and awkward (of low energy density, one or two orders of magnitude less energy dense than fossil fuel) thus difficult to transport and store
3. trees are not durable (dead pine trees in NZ only last 1-5 years before complete decomposition, where as fossil fuels are already “millions and millions of years old”)

The combinatorial effect of these 3 points led to the explosion of advancement that was the industrial revolution when fossil fuels were adopted as an energy source on a large scale.

So why, if fossil fuels are so much better, are we looking to return to wood as energy? (And is it economically feasible?)

We are no longer in a laissez-fair economy hence the introduction of tax on the emissions of CO₂ derived from fossil fuel use will skew the economics of energy use to favour bioenergy.

At which CO₂ tax point wood as energy becomes economically viable is a moot point as the CO₂ tax will be raised until that threshold is passed.

Nevertheless, the minimizing of the 3 issues above need to be addressed.

1. Harvesting trees by virtue of fossil fuels has become rapid and efficient in comparison with the days of human and animal energy used to fell trees and transport the logs. (However this harvesting energy is still very high when compared to coal mining or fossil oil and gas extraction). Electrification of equipment could reduce the fossil fuel use in this process and enhance the carbon neutrality. Harvesting is by definition the collection of a crop to a central point where storage/processing/enduse may happen. The most economic spacing of these central points is a study in itself with many relevant factors. We will assume that the landing/skid is the end point of harvest (accumulation point) and the beginning of processing and transportation. A harvest crew will process 100's of tonnes a day at a skid (400-1000 tonnes).
2. Unlike many harvested crops, trees can have a multitude of uses. Some of these traditional uses are high value (sawn and veneer lumber) and some are lower value for example pulp for kraft paper production. The concept that a tree is (ets) sequestered atmospheric carbon gives a tree a value without harvesting. The conversion of trees into carbon neutral fuel to be used as a replacement for fossil fuel gives trees a value above their basic energy content. THE POINT being made here is that viable harvesting and in-forest processing activities depend on the enduse, once carbon tax exceeds \$50NZD per tonne then most trees (unpruned, crooked, dead) and most parts (branches, limbs) of a tree have harvestable value if the end product is biofuel that replaces fossil fuel. The correct in-forest processing is the essential make-or-break activity for the viability of tree based biofuel. Trees and harvest residue **must** be converted into a medium that is easy to handle, store and transport using a process that suitable to be transported to the skid site and is self powered. This biofuel medium is “Torrefied wood briquettes” aka biocoal. This energy and mass densification in the forest is imperative for financial feasibility. Biocoal is volume and energy dense to the extent that a hectare of harvested pine can be transported on 10 or so truck (unit) loads.
3. The storage of fossil fuel (particularly coal) is easy. **Untorrefied** wood biofuel has many problems and dangers linked to its storage and use. Torrefied wood briquettes (biocoal) are more comparable to coal for ease of storage handling and use.

A BIOCOAL industry is what NZ forestry needs to complement its other forestry activities and is a carbon neutral, bioeconomy, circular economy, solution to the energy needs of the nation as fossil fuels are phased out.

Cargo Cult

New Zealand has the wealth, the intellect, the materials and the technology to build its own wood utilization industries. It has been suggested that [New Zealand Wood Fibres Future Project Phase One RFP](#) is being tendered so as to attract international expertise and investment. This is Cargo Cultism and is the reverse of what we should be doing. Where is the homegrown vision?

If New Zealand develops a strong wood fuel industry of its own with its own equipment manufacturing base then the world will beat a path to New Zealand for this KnowHow and equipment. It is unfortunate the innovation within SCION has become ineffective with the rise of institutionalized “funding junkie” culture, BUT there are people out there in New Zealand society that can put together a biocoal industry that can add \$billions to the national economy while at the same time eliminating \$billions in carbon tax.

Biocoal is not a “Show Pony” nor an exercise in “magical thinking”.

The only things wrong with New Zealand are the levels of aimlessness, apathy, ignorance and hopelessness amongst those who actually influence the financial decisions of governmental bodies, research institutions and larger corporations.

Let us sit down and crunch the \$numbers of this nascent industry. Then for a \$1million I will build a transportable plant capable of producing 10,000 tonnes of biocoal per annum (worth approx \$2,000,000) from 20,000 tonnes of valueless forest residue that will lead the way to a nationwide rural industry. Where 1,000 of these machines like points of light through the nation will illuminate the way to a brighter carbon neutral future.

“The uses of wood, there is nothing new under the sun”

It is unlikely that a million dollar report into new uses of wood will uncover a unique new use for wood. However a detailed study of previous uses of wood may find a process or product that will suit our post fossil carbon economy and could thrive. <https://northernwoodlands.org/articles/article/the-wood-chemical-industry-in-the-northeast>.

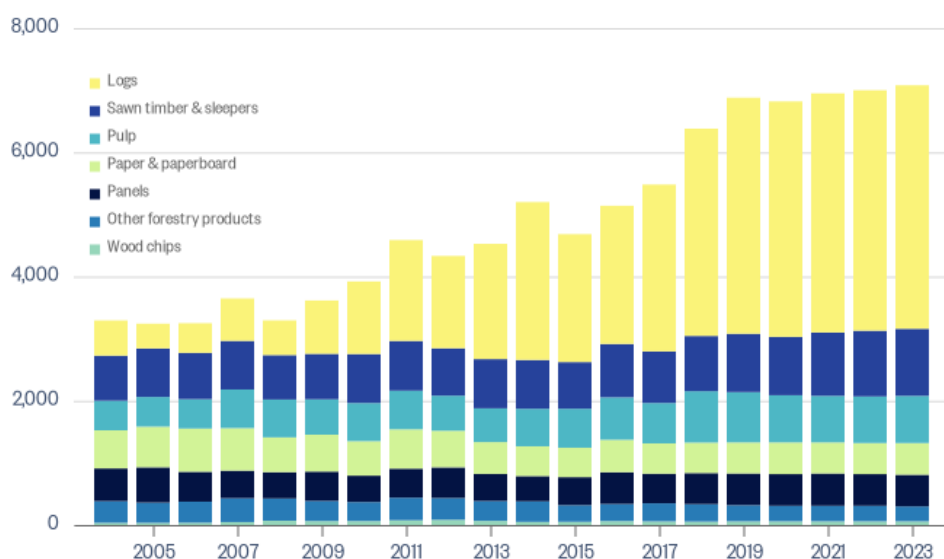
But we should look to the future and our elimination of plastics and fossil carbon as pointers to the utilization of trees.

For example the single used plastic bag ban allowed a resurgence in the use of paper carrier bags, but of course paper carrier bags are not a new invention. Currently the major paper manufacturers of New Zealand are rumouring that they are struggling to remain economic and certainly their contribution GDP has not increased in the last 30 years.

Export value of the New Zealand forestry industry by sub-sector

Year ended June 2004-2018, 2019-2023 forecast, NZD millions

Provider: Ministry for Primary Industries



High molecular weight components of torrefaction gas

Component	% mass of total semi-volatile compounds
1,3,3-trimethyl-bicyclo[2.2.1]heptane-one	3.5
4-methyl-1-1(methylethyl)-bicyclo[3.1.0]hexane-3-one	5.7
Thujone	4.8
Borneol	3.3
2-methoxy-4-methyl-phenol	9.6
2,6-dihydroxyacetophenone	4.2
4-hydroxy-2-methyl-acetophenone	3.1
2,6-dimethoxyphenol	19.0
Vanilin	2.9
4-hydroxy-3-methoxybenzoic acid	4.0
2-methoxy-4(1-propenyl)phenol	5.3
4-hydroxy-3-methoxybenzeneacetic acid	8.3
2,3,5,6 tetrafluoroanisole	1.6
2,6-dimethoxy-4(2-propenyl)phenol	4.2
1-(2,4,6-trihydroxyphenyl)-2pentanone	2.8
Tetradecanoic acid	7.4
4,4'-(1-methylethylidene)bisphenol	5.9

Trees have 3 areas of value,

1. physical (with increasing levels of processing, (complete logs for export), round poles, sawn lumber, veneer & laminated products, pulp products, fibre products, paper tissue etc).
2. Chemical, from sequestered carbon to all the organic chemistry possibilities
3. Energy

The only uses where it makes economic sense to haul complete logs on public roads are the round log export, quality logs for round poles, sawn lumber veneer and laminated products.

The transport of logs for; pulp, chemical feedstock and energy, from the forest to centralized processing plant is the prohibitive factor in the cost benefits of processing these logs and the development of supporting industries.

The answer to this conundrum is self powered preprocessing in the forest that will halve the mass by eliminating the moisture and increase the bulk handling options by comminuting and liquefying the wood feed stock.

Having noted this, it must be emphasized that the economic feasibility of using trees as energy or chemical feedstock is governed by the availability and permissibility of using fossil sources as an alternative and the public desire to use more expensive renewable bio based products. (banning of fossil products, fossil carbon tax, public opinion)

Personally I am convinced that onsite in the forest comminution, torrefaction and briquetting is one of the most feasible activities to make future tree use viable. The volatiles produced during torrefaction can be used in various ways. Directly as fuel to produce heat and power to run the comminution and torrefaction process. Alternatively or additionally the condensing of the (non water volatiles) produced during torrefaction can provide an 'organic chemistry soup' that can be handled, stored and transported efficiently to be used as chemical feedstock. Hydrogen gas is also driven off during torrefaction which may have a role in a hydrogen economy.

Torrefied wood briquettes aka "biocoal" has as its simplest use, a role as a carbon neutral coal substitute for process heat and Rankine thermal electricity generation.

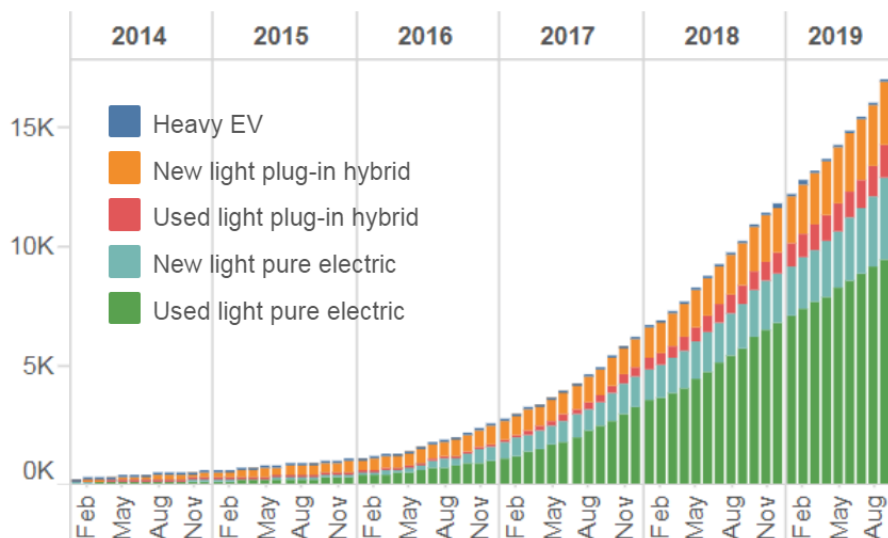
Biocoal could be described as an intermediate stage (with transport and storage benefits) for other end uses;

- Steam reforming for the production of carbon neutral Hydrogen
- Graphite production for metallurgic electrodes (steel and aluminium)
- BioChar
- Carbon fibre
- Metallurgic charcoal iron/steel production

EV Tsunami in New Zealand

Using information from <https://www.transport.govt.nz/mot-resources/vehicle-fleet-statistics/monthly-electric-and-hybrid-light-vehicle-registrations/>

EV fleet size



Over the last 80 or so months, the average monthly increase in Light Vehicle EV registrations has increased by 6% on the previous month. Using this small data set by mid 2025 the national EV fleet will be 1,000,000 EVs.

How much energy will 1,000,000 EVs need?

In NZ there are 4 million vehicles doing 40 billion km

But the average km for light vehicles is 11,700km, I think it is safe to assume that initially most EVs will be high use, like the uptake of Prius's by taxi drivers. So possibly 40,000km for 80% of EVs.

If by mid 2022 there are 120,000 Evs doing 11,000km

Or 100,000 doing 40,000km (4billion km) and 20,000 doing 14,000km (0.28billion km)

The leaf does approx 15KWhr per 100km (0.15KWhr per km)

So it is perfectly plausible that by mid 2022 Light Vehicles will need 645,000MWhr of electricity which is equivalent to 92,000 households (7000KWhr per normal household).

The average household size in New Zealand is 2.7 people thus 92,000 households is equivalent to a region of nearly 250,000 people. (That is more than Hamilton).

So could the Electricity Sector of New Zealand cope with adding a Hamilton equivalent of EV power consumption by mid 2022?

And then the same increase by mid 2023?

And then again by the end of 2023? By end of 2027 this could be the monthly predicament.

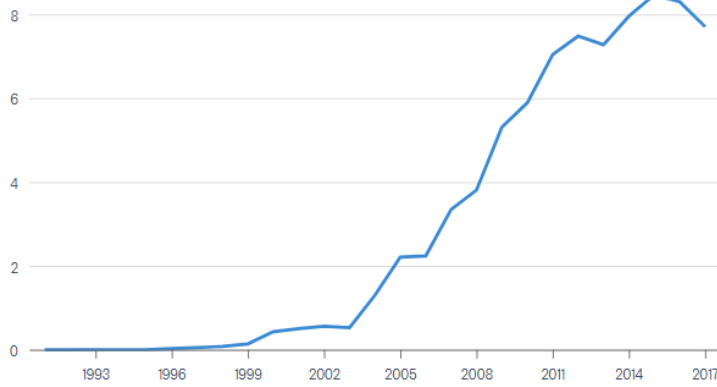
All based on the current monthly 6% compounding increase of EV registrations

Wind power used to generate electricity in New Zealand

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1991-2017, petajoules

Provider: Ministry of Business, Innovation, and Employment

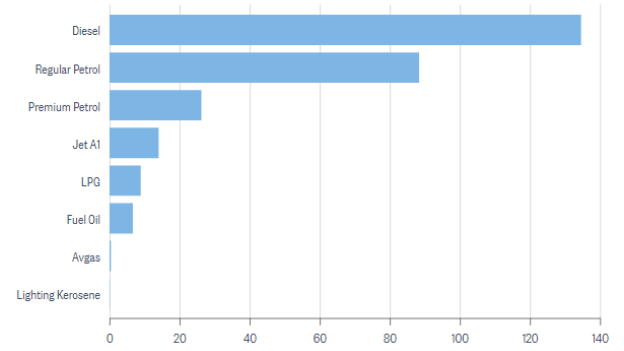


Consumption of oil in New Zealand

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By fuel type, 2017, gross petajoules

Provider: Ministry of Business, Innovation, and Employment

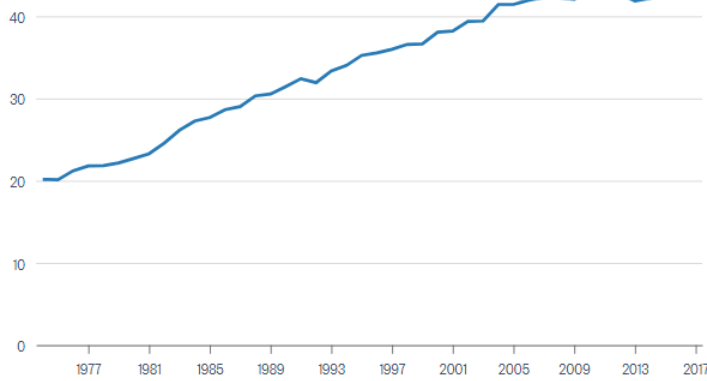


Net electricity generation in New Zealand

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1974-2017, thousands of Gigawatt Hours

Provider: Ministry of Business, Innovation, and Employment



Month of Period	Year of Period	Count	Monthly % increase in total ev registration
May	2029	7,293,275	6
April	2028	6,880,449	6
March	2028	6,490,989	6
February	2028	6,123,575	6
January	2028	5,776,957	6
December	2028	5,449,960	6
November	2028	5,141,471	6
October	2028	4,850,445	6
September	2028	4,575,891	6
August	2027	4,316,879	6
July	2027	4,072,527	6
June	2027	3,842,007	6
May	2027	3,624,534	6
April	2027	3,419,372	6
March	2027	3,225,823	6
February	2027	3,043,229	6
January	2027	2,870,971	6
December	2026	2,708,463	6
November	2026	2,555,154	6

October	2026	2,410,522	6
September	2026	2,274,078	6
August	2026	2,145,356	6
July	2026	2,023,921	6
June	2026	1,909,360	6
May	2026	1,801,283	6
April	2026	1,699,323	6
March	2026	1,603,135	6
February	2026	1,512,392	6
January	2026	1,426,785	6
December	2025	1,346,023	6
November	2025	1,269,833	6
October	2025	1,197,956	6
September	2025	1,130,147	6
August	2025	1,066,176	6
July	2025	1,005,827	6
June	2025	948,893	6
May	2025	895,182	6
April	2025	844,512	6
March	2025	796,709	6
February	2025	751,612	6
January	2025	709,068	6
December	2024	668,932	6
November	2024	631,068	6
October	2024	595,347	6
September	2024	561,648	6
August	2024	529,857	6
July	2024	499,865	6
June	2024	471,571	6
May	2024	444,878	6
April	2024	419,696	6
March	2024	395,940	6
February	2024	373,528	6
January	2024	352,385	6
December	2023	332,439	6
November	2023	313,622	6
October	2023	295,869	6
September	2023	279,122	6
August	2023	263,323	6
July	2023	248,418	6
June	2023	234,356	6
May	2023	221,091	6
April	2023	208,576	6
March	2023	196,770	6
February	2023	185,632	6
January	2023	175,125	6
December	2022	165,212	6
November	2022	155,860	6
October	2022	147,038	6
September	2022	138,715	6
August	2022	130,863	6
July	2022	123,456	6
June	2022	116,468	6

May	2022	109,875	6
April	2022	103,656	6
March	2022	97,789	6
February	2022	92,253	6
January	2022	87,032	6
December	2021	82,105	6
November	2021	77,458	6
October	2021	73,073	6
September	2021	68,937	6
August	2021	65,035	6
July	2021	61,354	6
June	2021	57,881	6
May	2021	54,605	6
April	2021	51,514	6
March	2021	48,598	6
February	2021	45,847	6
January	2021	43,252	6
December	2020	40,804	6
November	2020	38,494	6
October	2020	36,315	6
September	2020	34,260	6
August	2020	32,320	6
July	2020	30,491	6
June	2020	28,765	6
May	2020	27,137	6
April	2020	25,601	6
March	2020	24,152	6
February	2020	22,785	6
January	2020	21,495	6
December	2019	20,278	6
November	2019	19,130	6
October	2019	18,048	6
September	2019	17,026	6
August	2019	16,031	4
July	2019	15,426	4
June	2019	14,876	4
May	2019	14,237	4
April	2019	13,670	4
March	2019	13,195	4
February	2019	12,734	4
January	2019	12,207	4
December	2018	11,759	3
November	2018	11,386	5
October	2018	10,895	6
September	2018	10,259	5
August	2018	9,763	6
July	2018	9,253	6
June	2018	8,711	6
May	2018	8,204	7
April	2018	7,636	5
March	2018	7,259	5
February	2018	6,922	4
January	2018	6,634	7

December	2017	6,219	6
November	2017	5,843	9
October	2017	5,364	9
September	2017	4,929	7
August	2017	4,596	8
July	2017	4,261	7
June	2017	3,972	8
May	2017	3,664	8
April	2017	3,380	6
March	2017	3,196	7
February	2017	2,989	8
January	2017	2,761	8
December	2016	2,558	8
November	2016	2,377	10
October	2016	2,156	8
September	2016	1,992	6
August	2016	1,877	7
July	2016	1,753	9
June	2016	1,602	14
May	2016	1,408	7
April	2016	1,322	8
March	2016	1,229	6
February	2016	1,156	3
January	2016	1,120	6
December	2015	1,060	5
November	2015	1,006	5
October	2015	961	4
September	2015	921	5
August	2015	877	3
July	2015	848	6
June	2015	800	7
May	2015	749	4
April	2015	720	5
March	2015	687	9
February	2015	629	5
January	2015	599	7
December	2014	558	5
November	2014	531	7
October	2014	498	6
September	2014	471	6
August	2014	446	6
July	2014	422	7
June	2014	395	6
May	2014	371	12
April	2014	332	15
March	2014	289	16
February	2014	249	5
January	2014	238	2
December	2013	233	2
November	2013	229	2
October	2013	224	4
September	2013	216	1
August	2013	213	1

July	2013	211	0
June	2013	210	1
May	2013	207	1
April	2013	205	0
March	2013	205	4
February	2013	197	0
January	2013	197	0

New Zealand consumed energy 2017 (PJ)^[5]

Fuel	Total	Primary	Industrial	Commercial	Transport	Residential
Coal	23.98	2.73	19.98	1.00	–	0.27
Bituminous & sub-bituminous	18.90	2.71	15.65	0.35	–	0.19
Lignite	5.08	0.01	4.43	0.65	–	0.09
Oil	279.18	16.75	19.62	7.88	231.26	3.67
Diesel	134.59	14.56	14.71	5.54	99.65	0.13
Petrol	114.60	1.20	0.20	0.62	112.55	0.03
Aviation fuel & kerosene	14.48	–	–	–	14.48	–
LPG	8.91	0.09	3.40	1.65	0.24	3.52
Fuel oil	6.67	0.90	1.31	0.06	4.34	–
Natural Gas	78.00	1.45	61.87	7.92	0.01	6.75
Renewables	66.55	0.68	53.76	2.78	–	9.33
Wood	57.67	–	48.38	–	–	8.69
Geothermal	8.18	0.68	4.73	2.50	–	0.27
Biogas	0.33	–	0.05	0.28	–	–
Solar	0.36	–	–	–	–	0.36
Electricity	143.79	9.08	55.30	34.29	0.22	43.91
Total	593.71	30.69	210.53	53.86	231.49	63.94

F A Q

(Frequently Asked Questions)

Q. Is Biocoal is the only carbon neutral option to secure industrial and electrical energy needs in New Zealand?

A. No, nuclear power is the other option.

Q. What is biocoal?

A. 'Biocoal' is less of a mouthful than 'torrefied wood briquettes'

Q. Industrial economies abandoned wood in favour of coal 200 years ago, surely it is a backward step to return to wood as an energy source?

A. OECD countries have made a commitment to transition from a fossil fuel economy to a bioeconomy in the interests of reducing global warming. It is assumed the use of coal is a major contributor to global warming.

Q. Why can we not just use electricity instead of coal and biocoal as the green alternative?

A. Electricity is not a power source, it is a means of power transportation like an oil pipeline.

Q. Surely this country has enough geothermal and hydro for its electricity needs?

A. NO. As they are cheaper sources of power, if they were sufficient we only use them already.

Q. There will be more solar panels and wind turbines soon, why bother?

A. The sun does not shine at night, solar panels only receive optimum sun 8% of 24/7/365. Unless New Zealand builds some massive pumped storage, solar power will never be enough to power New Zealand 24/7/365. Trees are a consumable hybrid of solar panel and battery. Wind turbines also will never be a consistent and secure supply.

Q. Domestic electric power consumption in New Zealand has fallen in recent years, surely this trend will continue?

A. Probably not, several factors have helped reduce electric power consumption, for example; LED lighting, home insulation and reduced family size. These factors may continue, however the electrification of road transport (EVs) will negate and dwarf these factors. It is quite likely that within 6 years private electrical power consumption will double.

Q. If plastic bags are cheaper and more convenient to use than paper bags in supermarkets why are we now using paper bags? (trick question)

A. Public opinion swayed the government to legislate against plastic bags.

Q. At the moment biofuel is more expensive and less convenient than fossil fuel, how can biocoal ever be a competitive alternative to coal?

A. The supermarket plastic bag ban has set the legislative precedent. International treaty law by definition has to take primacy over national sovereignty. Under the Paris Agreement obligations New Zealand will either have to ration electrical power, pay \$billions per year in GHG fines, build nuclear power stations or use biocoal.

Q. Logs are so valuable why bother making money from the wood waste?

A. The average export log price per tonne is at firewood prices already. It is the availability of the market which dictates whole log sales.

The only non renewable energy cheaper than wood is coal.

If we define the energy content of a log at 8GJ per JAS cube that is the energy equivalent of 2,222KWhr.

The wholesale value of 2,222KWhr of electricity is \$444.

Generation cost for grid supply would be \$92 minimum for this quantity of electricity.

From these energy and monetary values the potential of wood as an energy source is clearly apparent.

Q. Why is biocoal not already in large scale commercial use (in New Zealand)?

A. Many other OECD countries do use wood pellets and biomass for energy. New Zealand purchased (fraudulent) cheap Kyoto protocol carbon credits from Ukraine and Russia that have offset NZ carbon emissions until now.

The new regime under the Paris Agreement (which really takes effect at the beginning of 2021) will either punish our collective economy to the tune of \$billions per year or cause a punitive levy on fossil carbon use.

This will be the first time in 200 years that wood energy can compete with coal.

Q. Why not just make regular white wood pellets

A. White pellets have many storage and use problems, but the greatest advantage in the production of biocoal is that the production process has a nett energy surplus. Natures Flame use large quantities of electricity and 1J of geothermal energy for each 3J of wood pellets they produce.

Q. Why not let SCION develop the process.

A. SCION does not have a good track record with commercialising industrial processes. If they were going to commercialise wood based biofuel they would have already. (Research Terax)

Q. Why haven't forestry companies developed this industry?

A. Their R&D has been delegated to SCION

Also: To quote [Clayton M. Christensen](#) "Disruptive innovations tend to be produced by outsiders. The business environment of market leaders does not allow them to pursue disruption when they first arise, because they are not profitable enough at first and because their development can take scarce resources away from sustaining innovations (which are needed to compete against current competition)."

Q When will biocoal be in serious demand in New Zealand?

A. 2022 However there is already an export market.

Q. When should the biocoal industry be established?

A. Yesteryear.

Q. What price will biocoal be sold at?

A. At the highest price the market will bear. Currently the aim is to produce biocoal at \$200 per tonne, \$9 per GJ. Market forces may allow a higher price. Fossil fuel legislation and emissions levies will decide.

Q. Will Biocoal be good for the economy?

A. YES, YES, YES, YES. Currently our economy is faltering, biocoal production would be a stimulus.

Q. How will Biocoal be good for the economy?

A. Allow process heat users and thermal generators to not be financially punished by Carbon tax.

A. Allow EV owners to buy carbon neutral electricity that is cheaper.

A. Create another rural industry that will bring widespread employment.

A. Create more revenue for forest owners.

A. Create an industry of biocoal machine production.

A. Potentially (if there is production surplus to domestic requirements) create an export revenue stream.

Q. What are the crucial aspects to biocoal carbon neutrality?

A. Most forest waste rots and produces CO₂ anyway so to use the waste to substitute fossil fuel is an obvious Green House Gas benefit

A. Biocoal production is only feasible (energy, financially, carbon neutrality) if performed in the forest at the raw material source. It has to be small, mobile and distributed **NOT** monolithic, static and centralized.

A. Torrefaction produces energy as a by-product, this biocoal production process uses this energy for the production process.

A. Logistical efficiency (necessary for the success of the industry) requires that the wood waste be converted to biocoal before long distance transportation, storage and repeated handling

General Prior Knowledge

It is deeply engrained in human culture that wood contains energy.

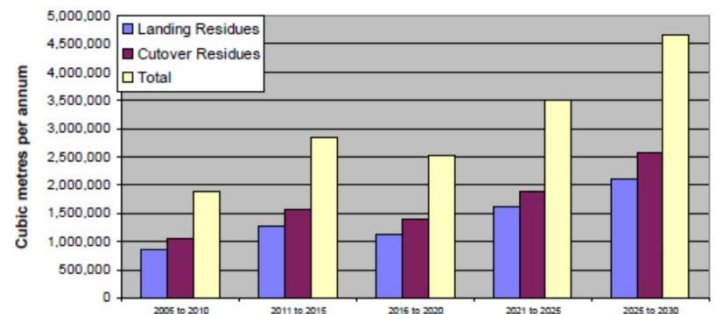
Fuel Type	Unit Sale	Energy Content	Retail Price	Typical cost in BC	
		GJ / Unit Sale	\$/ Unit Sale	\$/ GJ	\$/ MWh
Natural Gas	GJ	1.0	11-19	11-19	40-70
Propane	Litres	0.0253	0.48-0.63	19-25	70-90
Electricity	kWh	0.0036	0.068-0.083	19-23	70-80
Heating Oil	Litres	0.0387	0.74-0.97	19-25	70-90
Ponderosa Pine	Cord	17.9	200-250	11-14	40-60
Wood Chips	Green Tonne	11.2	35-55	3-5	10-20
Pellets (Retail)	Tonne	19.2	175-210	9-11	30-40

Energy content, price and cost of fuel types in BC. (Sources: Dubois et al. 2012; Ghafghazi 2011,

Anybody who has the slightest exposure to forestry and wood processing knows that waste is produced.

	Ground-based logging flat to rolling terrain	Hauler logging steep terrain
Total extracted stem volume	500 to 700 m ³ per ha	500 to 700 m ³ per ha
Stem waste at landing		
- Manual log making	20 to 28m ³ per ha (4%)	25 to 35m ³ per ha (5%)
- Mechanised log making	30 to 42m ³ per ha (6%)	30 to 42m ³ per ha (6%)
Branch waste at landing	2.5 to 3.5m ³ per ha (0.5%)	15 to 21m ³ per ha (3%)
Total waste at landing	22 to 32m ³ per ha (4.5%)	40 to 56m ³ per ha (8%)
Stem waste on cut-over	25m ³ per ha (5%)	49m ³ per ha (10%)
Branch waste on cut-over	52m ³ per ha (10%)	58m ³ per ha (11%)
Total waste on cut-over	77m ³ per ha (15%)	107m ³ per ha (21%)
Total in forest waste	100 to 130m ³ per ha (ca 20%)	140 to 160m ³ per ha (ca 28%)

Table 1 - Tonnes of residues per hectare available for conversion into biomass fuel



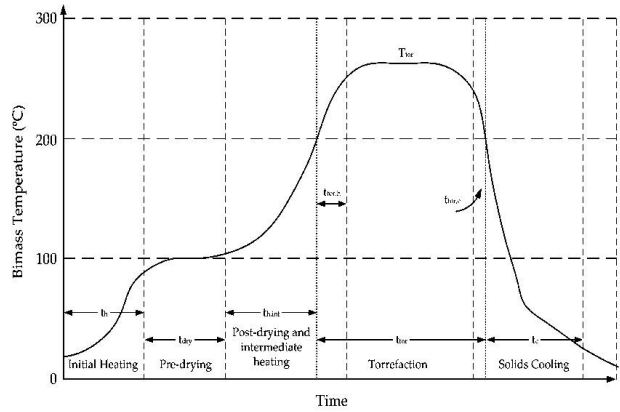
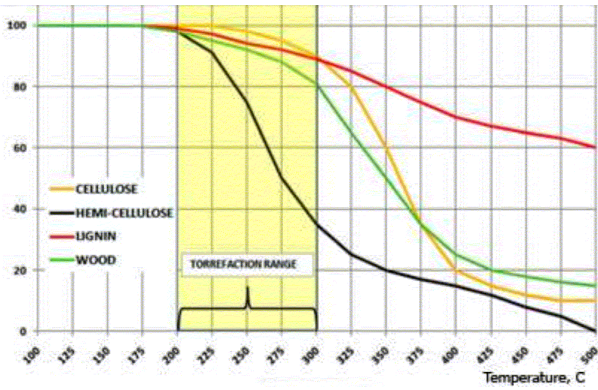
When bark is included in the measurement of the logs and of the sawmill waste, the utilization is as follows:—

Waste in logging =19.5% of stand
 Slabs, edgings and bark waste in mill =17.9% “ “
 Sawdust =13.3% “ “
 (Green lumber =49.3% “ “)

This refers only to the manufacture of green lumber. There is, in addition, a reduction in the log volume of 1.2 per cent., due to the seasoning, and of 11.0 per cent., due to the surfacing of a portion of the green lumber, or a total reduction of 12.2 per cent. of the log volume due to planing mill waste. = 9.8% of standing tree.

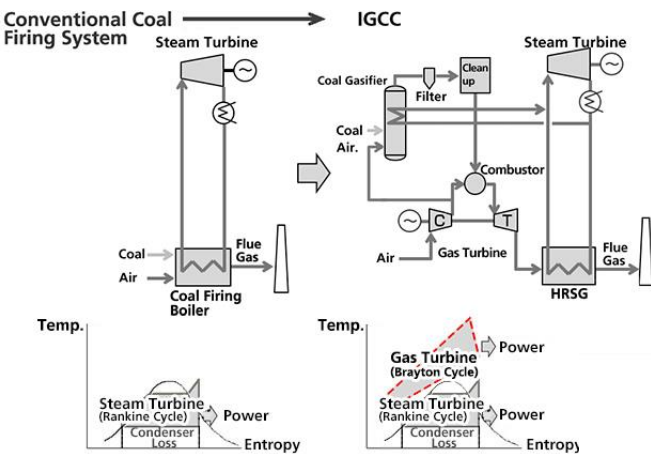
Thus in this case finished lumber is 40% of standing tree

Mild torrefaction happens everytime food is cooked sufficiently (Maillard reaction) to produce additional flavours and browning. More intense torrefaction occurs when coffee beans are roasted or toast is burnt.

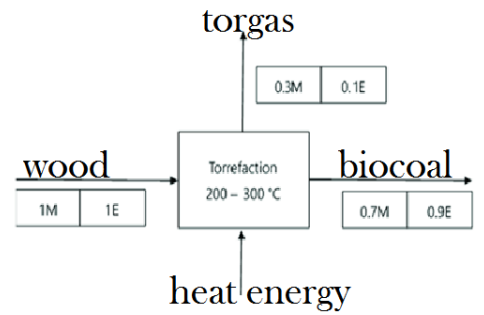


The title of Ray Bradbury's book 'Fahrenheit 451' effectively is a reference to torrefaction temperature.

On the industrial level the torrefaction process has similarities with the production of charcoal, coke, towngas and the WW2 woodgas/syngas generators.



Inspiration could also be attributed to the 'Velox' boiler.



There is an analogy in efficient torrefaction process to combined cycle (Brayton/Rankin) coal fired power stations

Pressure always enhances heat processes.

As repeatedly noted torrefaction has been well researched (if anything over researched and underdeveloped)

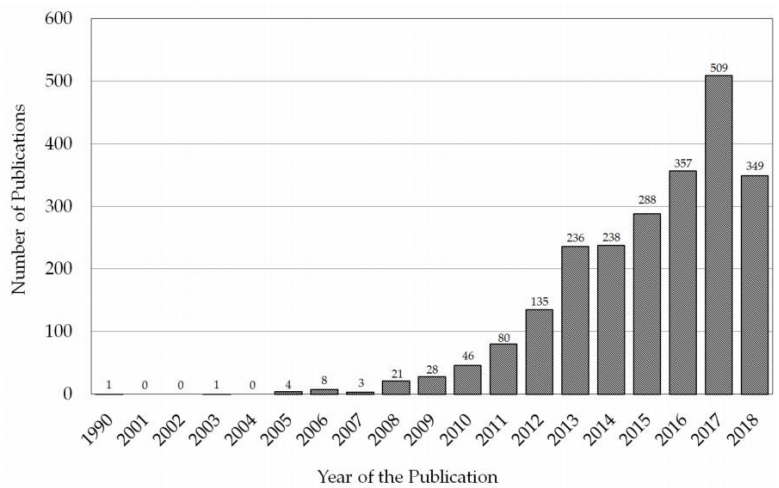
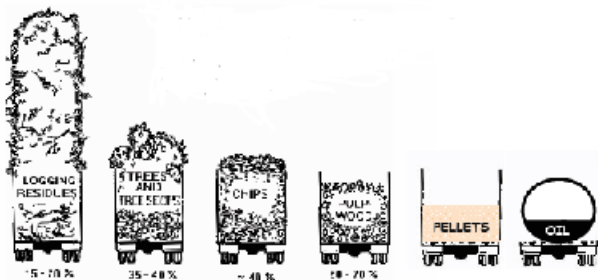


Figure 5. The year of publication of all the publications concerning the torrefaction of biomass.



Economic feasibility

Summary:

Near to source biocoal production using the energy arising within the process is the only economically feasible method to utilize forest harvest residue.

It is self evident that there are vast quantities of wood waste available in New Zealand.

However research has been done on this topic, the quantity of waste left in the forest is approximately proportional to 25% of the harvested mass. At sawmills the waste can be 25%-50% of the log.

New Zealand exports most of its log harvest as round logs New Zealand thus does not retain the potential processing waste from these logs.

The maximum potential wood waste generated in New Zealand per annum could be equated to 50% of the annual log harvest, approximately 17 million tonnes.

Wood pellets have a global market value of \$200NZD per tonne

The production ratio of raw wood waste to wood pellets is 2:1

Thus potentially 8 million tonnes of pellets @ \$200 per tonne could be sold for export

THAT IS \$1.6 billion dollars export value.

Or we could replace all the thermal coal use and electrical generation coal use and still have surplus to export.

Maybe I have extrapolated to stress the point.

IF only 10% of that waste was gathered and utilized it would still be an industry worth

\$160 million!!

Wood waste is not utilized as it is not seen as economically feasible to do so

The barriers to feasibility are:

- Transport cost
- Comminution cost (breaking it down)
- Drying cost
- Densifying cost

The transport costs are linked to comminution, drying and densifying.

If **at source** wood waste was dried, comminuted and densified then transport costs would be vastly reduced.

One of New Zealands largest wood pellet producers is Natures Flame, owned by Norske Skog.

It should be noted that they are a commercial success due to the fact that they have:

- minimal or no pre-process transport costs
- they have cheap geothermal energy to dry the wood waste (460,000 gigajoules of steam annually, for every 3J of wood pellets produced they use 1J of steam energy).
- access to cheap electrical power (Norske Skog uses 1,000 GWh per year).
- The waste is pre comminuted

How can 'in forest' biocoal production compete?

- Process the waste on site, no double handling and no transportation of low value low density commodities
- No static production plant=lower overheads, should fit within Resource Management (National Environmental Standards for Plantation Forestry) Regulations.
- Build simple (low CAPEX, low OPEX) low capacity shredders whose output matches the biocoal production rate.
- Dry the raw wood using recycled steam from the drying process (heat quality boosted by volatile combustion)
- Dry the wood under pressure so the steam has useful energy.
- Generate electricity from the torgas and steam
- Further comminute waste in a torrefied state (lower energy requirements)
- Briquettes not pellets, less energy required, surface area to volume ratio is relevant.
- Torrefied product is easier to store.

The key feature that makes a torrefied product more feasible than regular white pellets is the energy released during production that can then be used for production.

In a truly free market economy it would be unlikely that biocoal would ever compete with coal on a cost only basis.

BUT

We must learn from the recent plastic bag to paper bag conversion in supermarkets.

If coal use was banned then biocoal demand would be guaranteed.

The breakeven point is assumed to be when carbon tax reaches \$50NZD per tonne CO₂

It is quite likely that carbon tax will reach \$100NZD by 2025

Currently Coal energy costs including carbon tax is approximately \$5.50 per GJ

If coal prices stay low and carbon tax rises to \$50 then the biocoal would be energy cost comparative with thermal coal.

If the use of thermal coal is banned by government legislation then cost comparisons become a moot point like single use plastic shopping bags.

Currently the price point that biocoal is aiming for is \$9 per GJ (\$200NZD per tonne).

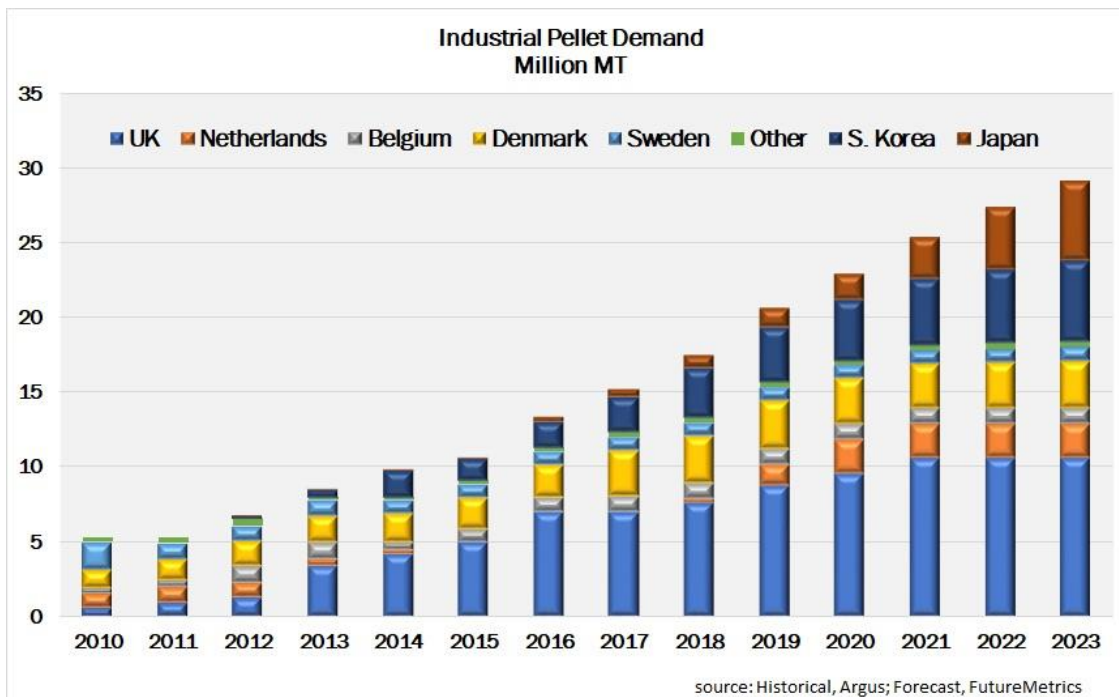
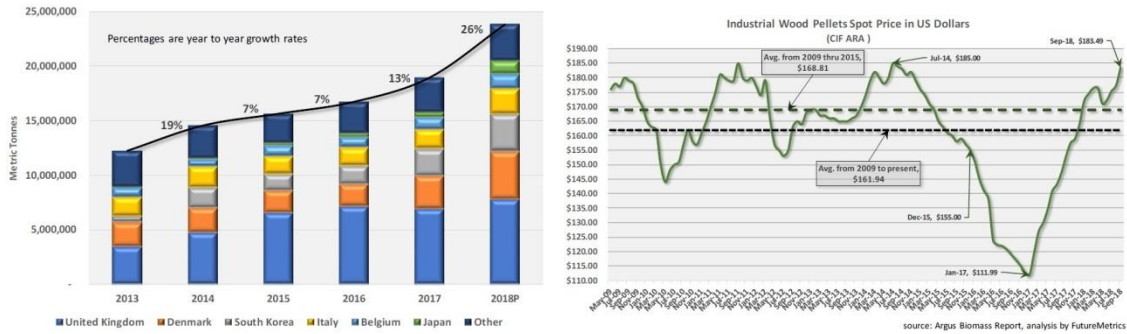
Another major issue in the future market for biocoal in New Zealand is Electrical Generation at Huntley.

Currently Huntley uses approximately 1.5million tonnes of coal per annum. For security of electrical supply there is a stockpile of coal at Huntley saved for the opposite of a 'rainy day', specifically when hydro lake levels are low. This stock pile is usually maintained at a minimum of 0.3 million tonnes.

Though there is much emphasis on the use of electricity as the green alternative for fossil fuel use in process heat and transport the reality is that Huntley is the North Island backstop that keeps the system going. With the forthcoming **electrification of road transport** the need for Huntley's Rankin Cycle power generation is likely to increase rather than decrease. This is within the current hostility towards fossil fuel use thus Huntley will be forced to use biomass, biocoal would be the most suitable replacement for coal in this context. Refer to Drax as the poster child of biomass electrical power generation.

Global export market

The global trade in wood biomass biofuel is rapidly growing. If biocoal was already produced in export quantities there is a ready export market.



Currently to have an export market the cost point aimed at is \$200NZD per tonne (\$9 per GJ). However it is safe to assume that fossil coal use will be severely curtailed over the next 5 years (via carbon tax and legislative restrictions) thus the demand will increase as will the value per tonne. Domestically the breakeven point is about \$50NZD per tonne of CO₂.

It is important to develop the process now ready for the burgeoning market in 3 years time.

It important for New Zealand to develop this technology.

If New Zealand is not first in the field with this system New Zealand will lose out, not just because New Zealand is not selling it worldwide BUT because New Zealand is importing it for their own forest industry.

#5

COMPLETE

Collector: Final submissions link (Web Link)
Started: Thursday, January 16, 2020 10:40:27 AM
Last Modified: Thursday, January 16, 2020 12:58:05 PM
Time Spent: 02:17:38

Page 1: Introduction

Q1 Name (first and last name)

Alex Gilbert

Q2 Email

Privacy of natural persons

Q3 Is this an individual submission, or is it on behalf of a group or organisation? **Individual**

Q4 Which group do you most identify with, or are representing? Other (please specify):
Rural employment, forestry, security of electricity supply

Q5 Business name or organisation (if applicable)

Biocoal NZ

Q6 Position title (if applicable)

CEO

Q7 Important information about your submission (important to read)The information provided in submissions will be used to inform the Ministry of Business, Innovation and Employment's (MBIE's) work on Accelerating renewable energy and energy efficiency.We will upload the submissions we receive and publish them on our website. If your submission contains any sensitive information that you do not want published, please indicate this in your submission.The Privacy Act 1993 applies to submissions. Any personal information you supply to MBIE in the course of making a submission will only be known by the team working on the Accelerating renewable energy and energy efficiency.Submissions may be requested under the Official Information Act 1982. Submissions provided in confidence can usually be withheld. MBIE will consult with submitters when responding to requests under the Official Information Act 1982.We intend to upload submissions to our website at www.mbie.govt.nz. Can we include your submission on the website?

Yes

Q8 Can we include your name?

Yes

Q9 Can we include your organisation (if submitting on behalf of an organisation)?

Yes

Q10 All other personal information will not be proactively released, although it may need to be released if required under the Official Information Act. Please indicate if there is any other information you would like withheld.

Respondent skipped this question

Page 2

Q11 Where are you located?

Northland / Te Tai Tokerau

Q12 In what region or regions does your organisation mostly operate?

Respondent skipped this question

Page 3: Areas you wish to provide feedback on

Q13 Part A relates to process heat.Please indicate which sections, if any, you would like to provide feedback on.

Section 1: Addressing information failures,
Section 2: Developing markets for bioenergy and direct geothermal use
 ,
Section 3: Innovating and building capability,
Section 4: Phasing out fossil fuels in process heat,
Section 5: Boosting investment in renewable energy and energy efficiency technologies

Q14 Part B relates to renewable electricity generation. Please indicate which sections, if any, you would like to provide feedback on.

Section 7: Enabling renewables uptake under the Resource Management Act 1991

,

Section 8: Supporting renewable electricity generation investment

,

Section 9: Facilitating local and community engagement in renewable energy and energy efficiency

Page 4: Section 1: Addressing information failures

Q15 Option 1.1 would require large energy users to report their emissions and energy use annually, publish Corporate Energy Transitions Plans and conduct energy audits every four years. Do you support this option?

Yes - I fully support this option

Q16 Please explain your answer

To help give the government a reality check

Q17 Which parts (set out in Table 3) do you support?

Respondent skipped this question

Q18 Please explain your answer

Respondent skipped this question

Q19 What public reporting requirements (listed in Table 3) should be disclosed?

Annual corporate-level energy use and emissions, split out by a range of sources including coal, gas, electricity and transport

,

Other (please specify):

Regional flows of power on national grid

Q20 In your view, should businesses be expected to include transport energy and emissions in these reporting requirements?

Yes,

Please explain your answer:

The electrification of transport is the elephant in the room

Q21 For manufacturers: what will be the impact on your business to comply with the requirements?

Respondent skipped this question

Q22 Option 1.1. Suggests that requirements to publish Corporate Energy Transition Plans should apply to large energy users, and proposes defining large energy users as those with an annual energy spend (purchased) of greater than \$2 million per annum. Do you agree with this definition?

No

Q23 If you selected no, please describe what in your view would be an appropriate threshold to define 'large energy users'.

the increase private consumer use of electricity for EVs could easily match the increased use of electricity for industrial process heat

Q24 Is there any potential for unnecessary duplication under these proposals and the disclosures proposed in the MBIE-Ministry for the Environment discussion document Climate-related Financial Disclosures – Understanding your business risks and opportunities related to climate change, October 2019?

Respondent skipped this question

Page 5: Section 1 - Option 1.2: Electrification information package and feasibility studies

Q25 Do you support the proposal to develop an electrification information package?

Yes

Q26 Would an electrification information package be of use to your business?

Yes

Q27 Do you support customised low-emission heating feasibility studies?

Yes

Q28 In your view, which of the components should be scaled up and/or prioritised?

Respondent skipped this question

Q29 Would a customised low-emission heating feasibility study be of use to your business?

Respondent skipped this question

Q30 Please describe any components other than those identified that could be included in an information package.

An awareness that if electricity generation capacity is not more than doubled in NZ within 3 years, cost projections for the use of electricity will be grossly misleading

Page 6: Section 1 - Option 1.3: Provide benchmarking information for food processing industries

Q31 Do you support benchmarking in the food processing sector?

Yes

Q32 Would benchmarking be suited to, and useful for, other industries, such as wood processing?

Yes (please specify):
sustainability and carbon neutrality

Q33 Do you believe government should have a role in facilitating this or should it entirely be led by industry?

Government should have a role

Q34 Please explain your answer

Carbon neutrality audit of export products is part of capturing high value markets

Page 7: Section 2: Developing markets for bioenergy and direct geothermal use

Q35 Do you agree that some councils have regional air quality rules that are barriers to wood energy? **Neither agree nor disagree**

Q36 Please provide examples of regional air quality rules that you see as barriers to wood energy. Please also note which council's plan you are referring to. **Respondent skipped this question**

Q37 Do you agree that a National Environmental Standards for Air Quality (NESAQ) users' guide on the development and operation of the wood energy facilities will help to reduce regulatory barriers to the use of wood energy for process heat? **Neither agree nor disagree**

Q38 What do you consider a NESAQ users' guide should cover? Please provide an explanation if possible. **Respondent skipped this question**

Q39 Please describe any other options that you consider would be more effective at reducing regulatory barriers to the use of wood energy for process heat. **Respondent skipped this question**

Q40 In your opinion, what technical rules relating to wood energy would be better addressed through the NESAQ than through the proposed users' guide (option 2.1)? **Respondent skipped this question**

Page 8: Section 2 - continued: Developing markets for bioenergy and direct geothermal use

Q41 In your view, could the Industry Transformation Plans stimulate sufficient supply and demand for bioenergy to achieve desired outcomes? **No**

Q42 What other options are worth considering?

Funding a biocoal industry

Q43 Is Government best placed to provide market facilitation in bioenergy markets? **Respondent skipped this question**

Q44 How could Government best facilitate bioenergy markets? Please be as specific as possible, giving examples.

A carbon tax of over \$40 is necessary

Q45 In your view, how can government best support direct use of geothermal heat?

Respondent skipped this question

Q46 What other options are worth considering?

In forest, at source conversion of wood/forest residue into biocoal is the only energy efficient cost effective method of utilising wood as bioenergy.

Page 9: Section 3: Innovating and building capability

Q47 Do you agree that de-risking commercially viable low-emission technology should be a focus of government support on process heat?

Agree

Q48 Do you agree that diffusing commercially viable low-emission technology should be a focus of government support on process heat?

Strongly agree,
Please explain your answer:
CRIs (eg Scion) monopolise R&D monies and have become ineffective communes of funding junkies. There are many individuals who could show a far better ROI

Q49 Is Energy Efficiency and Conservation Authority (EECA) grant funding to support technology diffusion the best vehicle for this?

Yes

Q50 For manufacturers and energy service experts: would peer learning and lead to reducing perceived technology risks?

Yes

Q51 For manufacturers and energy service experts: would on-site technology demonstration visits lead to reducing perceived technology risks?

Yes

Q52 Is there a role for the Government in facilitating this?

Yes,
Please expand on your answer:
Provided they include independent outsiders

Page 10: Section 3 (continued): Innovating and building capability

Q53 For emissions-intensive and highly integrated (EIHI) stakeholders: What are your views on our proposal to collaborate to develop low-carbon roadmaps?

Currently government and corporations in NZ are stagnant and ineffective at innovation. Low quality standardised education and an aging population.

Q54 Would low-carbon roadmaps assist in identifying feasible technological pathways for decarbonisation?

Yes,

Please explain your answer:

Most people need more information and awareness of possibilities

Q55 What are the most important issues that would benefit from a partnership and co-design approach?

For example coal users cant think beyond coal, forest harvesters cant see wood as energy. The electricity sector can't imagine a discontinuity in rate of electricity use

Q56 What, in your view, is the scale of resourcing required to make this initiative successful?

? If started now a nationwide biocoal industry could grow in a self sustaining manner after sufficient seed funding and a carbon tax of over \$40 per tonne

Page 11: Section 4: Phasing out fossil fuels in process heat

Q57 Do you agree with the proposal to ban new coal-fired boilers for low and medium temperature requirements?

Strongly disagree

Q58 Do you agree with the proposal to require existing coal-fired process heat equipment for end-use temperature requirements below 100 degrees Celsius to be phased out by 2030?

Strongly disagree

Q59 Referring to Question 56 - is this ambitious or is it not doing enough?

Please explain your answer:

Biocoal is virtually a drop in replacement for coal requiring minimal or no boiler modification, allow industry to build coal boilers, just tax fossil coal out of economic feasibility. Biocoal will not be any great cost disadvantage over coal

Q60 For manufacturers: what would be the likely impacts or compliance costs on your business of a ban on new coal-fired process heat equipment?

Dumb, just encourage carbon neutral coal replacement

Q61 For manufacturers: what would be the likely impacts or compliance costs on your business of requiring existing coal-fired process heat equipment supplying end-use temperature requirements below 100°C to be phased out by 2030.

Forcing industry to use electricity instead of biocoal will lead to unnecessary economic hardship

Q62 Could the Corporate Energy Transition Plans (Option 1.1) help to design a more informed phase out of fossil fuels in process heat?

No,

Please explain your answer:

It is important that industry is encouraged rather than discouraged, the generation of wealth within the nation is of continued importance. An increasing fossil fuel carbon tax is sufficient provided there are feasible alternatives available

Q63 Would a timetabled phase out of fossil fuels in process heat be necessary alongside the Corporate Energy Transition Plans?

No,

Please explain your answer:

just incrementally increase carbon tax while ensuring there are feasible alternatives available

Q64 In your view, could national direction under the Resource Management Act (RMA) be an effective tool to support clean and low greenhouse gas-emitting methods of industrial production?

No

Q65 If yes, how?

Respondent skipped this question

Q66 In your view, could adoption of best available technologies be introduced via a mechanism other than the RMA?

Yes,

Please explain your answer:

Carbon tax and market forces with funding from carbon tax being reinvested into R&D rather than just ets

Page 12: Section 5: Boosting investment in energy efficiency and renewable energy technologies

Q67 Do you agree that complementary measures to the New Zealand Emissions Trading Scheme (NZ-ETS) should be considered to accelerate the uptake of cost-effective clean energy projects?

Agree

Q68 Would you favour regulation, financial incentives or both?

both,

Please explain your answer:

The only regulation being the taxing of fossil and nuclear energy

Q69 In your view what is a bigger barrier to investment in clean energy technologies, internal competition for capital or access to capital?

internal competition for capital

Q70 If you favour financial support, what sort of incentives could be considered?

At present the CRI's monopoly on innovation capital has stifled innovation

Q71 What are the benefits of these incentives?

Respondent skipped this question

Q72 What are the risks of these incentives? **Respondent skipped this question**

Q73 What are the costs of these incentives? **Respondent skipped this question**

Q74 What measures other than those identified above could be effective at accelerating investment in clean energy technologies? **Respondent skipped this question**

Page 13: Section 6: Cost recovery mechanisms

Q75 What is your view on whether cost recovery mechanisms should be adopted to fund policy proposals in Part A of the Accelerating renewable energy and energy efficiency discussion document? **Respondent skipped this question**

Q76 What are the advantages of introducing a levy on consumers of coal to fund process heat activities? **Respondent skipped this question**

Q77 What are the disadvantages of introducing a levy on consumers of coal to fund process heat activities? **Respondent skipped this question**

Page 14: Section 7: Enabling development of renewable energy under the Resource Management Act 1991

Q78 Do you agree that the current NPSREG gives sufficient weight and direction to the importance of renewable energy? **Neither agree nor disagree**

Q79 What changes to the NPSREG would facilitate future development of renewable energy?

A priority needs to be given to development of pumped storage facilities

Q80 What policies could be introduced or amended to provide sufficient direction to councils regarding the matters listed in points a-i mentioned on pages 60-61 of the discussion document? **Respondent skipped this question**

Q81 How should the NPSREG address the balancing of local environmental effects and the national benefits of renewable energy development in RMA decisions? **Respondent skipped this question**

Q82 What are your views on the interaction and relative priority of the NPSREG with other existing or pending national direction instruments? **Respondent skipped this question**

Q83 Do you have any suggestions for how changes to the NPSREG could help achieve the right balance between renewable energy development and environmental outcomes?

Respondent skipped this question

Q84 What objectives or policies could be included in the NPSREG regarding councils' role in locating and planning strategically for renewable energy resources?

Respondent skipped this question

Q85 Can you identify any particular consenting barriers to development of other types of renewable energy than REG, such as green hydrogen, bioenergy and waste-to-energy facilities?

Green hydrogen is a red herring for policy in the next couple of decades

Q86 Can any specific policies be included in a national policy statement to address these barriers?

Respondent skipped this question

Q87 What specific policies could be included in the NPSREG for small-scale renewable energy projects?

mini and micro hydro plants, large pumped storage need encouraging

Q88 The NPSREG currently does not provide any definition or threshold for "small and community-scale renewable electricity generation activities". Do you have any view on the definition or threshold for these activities?

Any positive steps should be taken

Q89 What specific policies could be included to facilitate re-consenting consented but unbuilt wind farms, where consent variations are needed to allow the use of the latest technology?

The government has just let Windflow liquidate, this is shutting the stable door after the horse has bolted

Q90 Are there any downsides or risks to amending the NPSREG?

Respondent skipped this question

Page 15: Section 7 - continued

Q91 Do you agree that National Environmental Standards (NES) would be an effective and appropriate tool to accelerate the development of new renewables and streamline re-consenting?

Neither agree nor disagree

Q92 What are the pros of using National Environmental Standards as a tool to accelerate the development of new renewables and streamline re-consenting?

Respondent skipped this question

Q93 What are the cons of using National Environmental Standards as a tool to accelerate the development of new renewables and streamline re-consenting?

Respondent skipped this question

Q94 What do you see as the relative merits and priorities of changes to the NPSREG compared with work on NES?

Respondent skipped this question

Q95 What are the downsides and risks to developing NES?

Respondent skipped this question

Q96 What renewables activities (including both REG activities and other types of renewable energy) would best be suited to NES?

Respondent skipped this question

Q97 What technical issues could best be dealt with under a standardised national approach?

Respondent skipped this question

Q98 Would it be practical for NES to set different types of activity status for activities with certain effects, for consenting or re-consenting?

Respondent skipped this question

Q99 Are there any aspects of renewable activities that would have low environmental effects and would be suitable for having the status of permitted or controlled activities under the RMA? Please provide details.

Respondent skipped this question

Q100 Do you have any suggestions for what rules or standards could be included in NES or National Planning Standards to help achieve the right balance between renewable energy development and environmental outcomes?

Respondent skipped this question

Q101 Compared to the NPSREG or National Environment Standards, would National Planning Standards or any other RMA tools be more suitable for providing councils with national direction on renewables ?

Respondent skipped this question

Q102 Please explain your answer

Respondent skipped this question

Page 16: Section 7 - continued

Q103 Are there opportunities for non-statutory spatial planning techniques to help identify suitable areas for renewables development (or no go areas)?

Respondent skipped this question

Q104 Do you have any comments on potential options for pre-approval of renewable developments?

Renewable energy production must be seen as a priority over the next decade

Q105 Are the current National Policy Statement on Electricity Transmission (NPSET) and National Environmental Standards for Electricity Transmission Activities (NESETA) fit-for-purpose to enable accelerated development of renewable energy?

Respondent skipped this question

Q106 What changes (if any) would you suggest for the NPSET and NESETA to accelerate the development of renewable energy?

Respondent skipped this question

Q107 Can you suggest any other options (statutory or non-statutory) that would help accelerate the future development of renewable energy?

Respondent skipped this question

Page 17: Section 8: Supporting renewable electricity generation investment

Q108 Do you agree there is a role for government to provide information, facilitate match-making and/or assume some financial risk for PPAs?

provide information

Neither disagree nor agree

facilitate match-making

Neither disagree nor agree

assume some financial risk

Neither disagree nor agree

Q109 Would support for PPAs effectively encourage electrification?

Yes - support for PPAs would effectively encourage electrification

Q110 Would support for PPAs effectively encourage new renewable generation investment?

Yes - support for PPAs would effectively renewable generation investment

Q111 How could any potential mismatch between generation and demand profiles be managed by the Platform and/or counterparties?

Respondent skipped this question

Q112 Please rank the following variations on PPA Platforms in order of preference. 1 = most preferred, 4 = least preferred.

Contract matching service

2

State-sector led

4

Government guaranteed contracts

3

Clearing house

1

Q113 What are your views on Contract Matching Services?

Respondent skipped this question

Q114 What are your views on State sector-led PPAs?

Respondent skipped this question

Q115 What are your views on Government guaranteed contracts? **Respondent skipped this question**

Q116 What are your views on a Clearing house for PPAs?

We need to transition to an economy where M2M transactions and tendering leads to a seamless flow of resources and wealth

Q117 For manufacturers: what delivered electricity price do you require to electrify some or all of your process heat requirements?

? of course every manufacturer desires the lowers possible cost of power. Coal is \$2.50 per GJ electricity is over \$30 per GJ, Biocoal aims at \$9 per GJ

Q118 For manufacturers: is a long-term electricity contract an attractive proposition if it delivers more affordable electricity? **Yes,**
Please explain your answer:
budgeting

Q119 For investors / developers: what contract length and price do you require to make a return on an investment in new renewable electricity generation capacity?

How long is a bit of string?

Q120 For investors / developers: is a long-term electricity contract an attractive proposition if it delivers a predictable stream of revenues and a reasonable return on investment? **Yes,**
Please explain your answer:
dumb question

Page 18: Section 8 - continued

Q121 Do you consider the development of the demand response (DR) market to be a priority for the energy sector? **Yes**

Q122 Do you think that demand response (DR) could help to manage existing or potential electricity sector issues? **No**

Q123 What are the key features of demand response markets?

profit to share holders at expense to industry

Q124 Which features of a demand response market would enable load reduction or asset use optimisation across the energy system? **Respondent skipped this question**

Q125 Which features of a demand response market would enable the uptake of distributed energy resources?

m2m on the fly contracts

Q126 What types of demand response services should be enabled as a priority? **Respondent skipped this question**

Q127 Which services make sense for New Zealand? **Respondent skipped this question**

Page 19: Section 8 - continued

Q128 Would energy efficiency obligations effectively deliver increased investment in energy efficient technologies across the economy? **No**

Q129 Is there an alternative policy option that could deliver on this aim more effectively? Yes (please specify):
just tax fossil energy production

Q130 If progressed, what types of energy efficiency measures and technologies should be considered in order to meet retailer/distributor obligations? **Respondent skipped this question**

Q131 Should these be targeted at certain consumer groups? **Respondent skipped this question**

Q132 Do you support the proposal to require electricity retailers and/or distributors to meet energy efficiency targets? **I do not support the proposal,**
Please explain your answer:
Less governmental intervention the better

Q133 Which entities would most effectively achieve energy savings? **Respondent skipped this question**

Q134 What are the likely compliance costs of this policy? **Respondent skipped this question**

Page 20: Section 8 - continued

Q135 Do you agree that the development of an offshore wind market should be a priority for the energy sector? **Strongly disagree**

Q136 What do you perceive to be the major benefits to developing offshore wind assets in New Zealand?

There isn't any,

Q137 What do you perceive to be the major costs to developing offshore wind assets in New Zealand?

As our domestic windturbine manufacturer, Windflow, have just liquidated, development will lead to wealth leaving the country

Q138 What do you perceive to be the major risks to developing offshore wind assets in New Zealand?

Just not necessary, low ROI, low ongoing employment, flight of wealth off shore

Page 21: Section 8 - continued

Q139 This policy option involves a high level of intervention and risk. Would another policy option better achieve our goals to encourage renewable energy generation investment?

Yes (please specify):
Over regulation is a bad thing

Q140 Could the proposed policy option be re-designed to better achieve our goals?

Respondent skipped this question

Q141 Should the Government introduce Renewable Portfolio Standards (RPS) requirements?

Respondent skipped this question

Q142 At what level should a RPS quota be set to incentivise additional renewable electricity generation investment?

Respondent skipped this question

Q143 Should RPS requirements apply to all electricity retailers?

Respondent skipped this question

Q144 Should RPS requirements apply to all major electricity users?

Respondent skipped this question

Q145 What would be an appropriate threshold for the inclusion of major electricity users (i.e. annual consumption above a certain GWh threshold)?

Respondent skipped this question

Q146 Would a government backed certification scheme support your corporate strategy and export credentials?

Respondent skipped this question

Q147 What types of renewable projects should be eligible for renewable electricity certificates?

Respondent skipped this question

Q148 If this policy option is progressed, should electricity retailers be permitted to invest in energy efficient technology investments to meet their renewable portfolio standards? (See option 8.3 on energy efficiency obligations).

Respondent skipped this question

Q149 If this policy option is progressed, should major electricity users be permitted to invest in energy efficient technology investments to meet their renewable portfolio standards? (See option 8.3 on energy efficiency obligations).

Respondent skipped this question

Q150 What are the likely administrative and compliance costs of this policy for your organisation? **Respondent skipped this question**

Page 22: Section 8 - continued

Q151 This policy option involves a high level of intervention and risk. Would another policy option better achieve our goals to encourage renewable energy generation investment? **Yes (please specify):**
Start increasing baseload generation capacity now!!!!

Q152 Could this policy option be re-designed to better achieve our goals? **Yes (please expand):**
Implement a biocoal industry

Q153 Do you support the managed phase down of baseload thermal electricity generation? **Strongly against**

Q154 Would a strategic reserve mechanism adequately address supply security, and reduce emissions affordably, during a transition to higher levels of renewable electricity generation? **Respondent skipped this question**

Q155 Under what market conditions should thermal baseload held in a strategic reserve be used?

Thermal baseload should be developed dramatically, burning carbon neutral biocoal and carbon neutral syngas

Q156 Would you support requiring thermal baseload assets to operate as peaking plants or during dry winters? **Yes**

Q157 What is the best way to meet resource adequacy needs as we transition away from fossil-fuelled electricity generation and towards a system dominated by renewables?

The use of biocoal as an energy source

Page 23: Section 8 - continued

Q158 Do you have any views regarding the options to encourage renewable electricity generation investment that we considered, but are not proposing to investigate further? (See pages 90 - 92 of the Accelerating renewable energy and energy efficiency discussion document).

NZ is one of the few OECD countries that can truly become carbon neutral if it utilises its forest resources

Page 24: Section 9: Facilitating local and community engagement in renewable energy and energy efficiency

Q159 Should New Zealand be encouraging greater development of community energy projects? **Yes**

Q160 What types of community energy project are most relevant in the New Zealand context?

forest residue biofuel

Q161 What are the key benefits of a focus on community energy?

more rural employment, distributed generation, a robust system that reduces the loss of wealth.

Q162 What are the key downsides or risks of a focus on community energy?

The inability of government to understand and support it.

Q163 Have we accurately identified the barriers to community energy proposals?

No,
Please explain your answer:
This country has become stagnant

Q164 Which barriers do you consider most significant?
You may select more than one answer.

Other (please specify):
lack of true financially sound innovation

Q165 Are the barriers noted above in relation to electricity market arrangements adequately covered by the scope of existing work across the Electricity Authority and electricity distributors?

No - they're not adequately covered by existing work,
Please add a comment:
Needs to be structured for m2m micro transactions

Q166 What do you see as the pros of a clear government position on community energy?

investors would be encouraged

Q167 What do you see as the cons of a clear government position on community energy?

could lead to excessive govt intervention rather than market forces

Q168 What do you see as the pros of government support for pilot community energy projects?

security of funding and facilitation with consents

Q169 What do you see as the cons of government support for pilot community energy projects?

Respondent skipped this question

Q170 Are there any other options you can suggest that would support further development of community energy initiatives?

Respondent skipped this question

Q171 Please select the option or combination of options, if any, that would be most likely to address the first mover disadvantage. **Respondent skipped this question**

Q172 What do you see as the disadvantages or risks of Option 10.1? **Respondent skipped this question**

Q173 What do you see as the disadvantages or risks of Option 10.2? **Respondent skipped this question**

Q174 What do you see as the disadvantages or risks of Option 10.3.1? **Respondent skipped this question**

Q175 What do you see as the disadvantages or risks of Option 10.3.2? **Respondent skipped this question**

Q176 Would introducing a requirement, or new charge, for subsequent customers to contribute to costs already incurred by the first mover create any perverse incentives? **Respondent skipped this question**

Q177 Are there any additional options that should be considered? **Respondent skipped this question**

Page 26: Section 10 (continued): Connecting to the national grid

Q178 Do you think that there is a role for government to provide more independent public data? **Respondent skipped this question**

Q179 Is there a role for Government to provide independent geospatial data (e.g. wind speeds for sites) to assist with information gaps? **Respondent skipped this question**

Q180 Should MBIE's Electricity Demand and Generation Scenarios (EDGS) be updated more frequently? **Respondent skipped this question**

Q181 If you said yes, how frequently should they be updated? **Respondent skipped this question**

Q182 Should MBIE's EDGS provide more detail, for example, information at a regional level? **Respondent skipped this question**

Q183 Should the costs to the Crown of preparing EDGS be recovered from Transpower, and therefore all electricity consumers (rather than tax-payers)? **Respondent skipped this question**

Q184 Would you find a users' guide (on current regulation and approval process for getting an upgraded or new connection) helpful? **Respondent skipped this question**

Q185 What information would you like to see in such a guide? **Respondent skipped this question**

Q186 Who would be best placed to produce a guide? **Respondent skipped this question**

Page 27: Section 10 (continued): Connecting to the national grid

Q187 Do you think that there is a role for government in improving information sharing between parties to enable more coordinated investment? **Respondent skipped this question**

Q188 Is there value in the provision of a database (and/or map) of potential renewable generation and new demand, including location and potential size? **Respondent skipped this question**

Q189 If so, who would be best to develop and maintain this? **Respondent skipped this question**

Q190 How should it be funded? **Respondent skipped this question**

Q191 Should measures be introduced to enable coordination regarding the placement of new wind farms? **Respondent skipped this question**

Q192 Are there other information sharing options that could help address investment coordination issues? What are they? **Respondent skipped this question**

Page 28: Section 11: Local network connections and trading arrangements

Q193 Have you experienced, or are you aware of, significant barriers to connecting to the local networks? Please describe them. **Respondent skipped this question**

Q194 Are there any barriers that will not be addressed by current work programmes outlined on pages 118 - 122 of the discussion document? **Respondent skipped this question**

Q195 Should the option to produce a users' guide (see Option 10.6 on page 110) also include the process for getting an upgraded or new distribution line? **Respondent skipped this question**

Q196 Are there other Section 10 information options that could be extended to include information about local networks and distributed generation?

Respondent skipped this question

Q197 Do the work programmes outlined on pages 118 - 122 cover all issues to ensure the settings for connecting to and trading on the local network are fit for purpose into the future?

Respondent skipped this question

Q198 Are there things that should be prioritised, or sped up?

Respondent skipped this question

Q199 What changes, if any, to the current arrangements would ensure distribution networks are fit for purpose into the future?

Respondent skipped this question

Page 29: Additional comments

Q200 Do you have any additional feedback?

I have contacted just about every possible governmental body appropriate for seed funding for my biocoal project, I have been amazed at the apathy and ignorance. Time is short. Reports themselves will never solve the problems. We need industry.

Q201 You may upload additional feedback as a file. File size limit is 16MB. We accept PDF or DOC/DOCX.

Biocoal Combined File.docx (2MB)
