



# SEIZE THE SUN

A discussion paper on New Zealand's  
clean energy future





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Climate change is the greatest challenge of our generation and requires a new way of thinking about how we power our lives. But with this comes a world of opportunity, and there has never been a better time to seize it.

Our nation made a bold move when it closed the door on offshore oil and gas exploration. Now we need a new plan: one that redesigns our energy system so that it protects our fragile atmosphere and gives people and communities control over their energy.

Today, New Zealand's energy is expensive, outdated, and still too dependent on dirty fuels. It's also unfair. The rules that govern our energy system prioritise energy company profits over a safe climate, local ownership, and affordable bills.

We need transformative policies to ensure that New Zealand joins the global transition to clean energy and that regular people, not large corporations, reap the benefits. By rolling out a comprehensive programme, such as the one outlined in the following pages, the Government would secure affordable and clean energy for every New Zealander, at the same time as tackling the existential threat of climate change.

We have the natural resources and the know-how to make this happen. What's needed now is a vision to rewire our energy system and create a clean energy future that works for all.

## IS NZ'S ENERGY REALLY CLEAN AND GREEN?

Because most of our electricity comes from renewable sources, including hydro and geothermal, we often mistakenly imagine that New Zealand is already powered by clean energy. In fact, electricity only provides a quarter of our total energy needs. As much as 60% of New Zealand's energy still comes from dirty fuels like oil, gas and coal<sup>1</sup>.

The reality of climate change means we have to rapidly achieve not just 100% clean electricity, but 100% clean energy. That means shifting our transport system to clean electricity instead of dirty oil. It means powering our factories and industries on clean electricity and biomass, instead of digging up coal or drilling the seafloor for gas. Using what we already have more efficiently and replacing outdated fuels with more home-grown clean power from the sun, wind, and water sit at the heart of this transition.

# REPOWERING NEW ZEALAND

Imagine a country where most of our energy comes from wind, sun, and water; where households make and control their own power; where our trains, buses, cars, and trucks are driven by clean electricity rather than polluting fuels; and where clean-energy jobs and skills are created for thousands of New Zealanders.

A profound technological revolution has made this vision possible, unleashing new opportunities that can transform the way we make and use energy for good. What's needed now is an overhaul of how New Zealand's energy system is designed, run, and regulated. A rethink that puts people and the climate at the heart of our energy system.

Recent analysis in New Zealand confirms that not only can we shift to an energy system increasingly powered by clean energy, but that doing so will also mean more affordable power for households<sup>2</sup>, and can place more control in the hands of regular people, instead of big energy companies.

### We can:

- Have 100% renewable electricity by 2030.
- Electrify 85% of our transport using clean power sources by 2050.
- Insulate New Zealand's 600,000 cold homes.
- Replace coal and gas used in industrial processes with clean electricity<sup>3</sup> or biomass<sup>4</sup> by 2050.
- Create thousands of jobs, both in urban areas and the regions<sup>5</sup>.
- Reduce climate pollution across the whole energy system and play our role as a responsible international player within the Paris Climate Agreement.
- Cut our dependence on expensive imported oil, which currently costs \$5.7 billion a year<sup>6</sup>.

New Zealand's energy future is at a crossroads. The decisions our Government makes in the next year or two will determine whether we'll take advantage of these groundbreaking possibilities, or stay locked in the past. They will define who benefits from this energy transition - regular people or large corporations - and whether we act fast enough to respond to the growing threat of climate change.



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# THE CHANGING FACE OF ENERGY

Right now, the world is undergoing an unprecedented period of change in the way that energy is made and used. The need to decarbonise our society, paired with huge technological advances, mean we're in the middle of an energy transition that could transform our world in much the same way that the internet and smartphones have forever changed how we communicate.

Renewable power accounted for 70% of new power generation added to the world's grids in 2017<sup>7</sup>. That same year, solar power was the fastest-growing source of new energy worldwide<sup>8</sup>. Countries the world over are abandoning plans for old-fashioned power plants and are instead opting for clean power.

Where and how we make energy is also undergoing a massive shift. The plummeting

## More clean power

To accommodate the growing electric transport sector and increased electricity demand from industry, national grid operator, Transpower, forecasts a doubling in demand for electricity in New Zealand over the next thirty years. According to Transpower's recent analysis, we would need 1.5 million solar households over that period, and the equivalent of 4.5 windfarms with 60 turbines each installed every year<sup>9</sup>.

## Smarter energy use

Building new clean energy is only part of the solution though. Making our homes and buildings warmer and more energy efficient will cut demand for power so that we can use what we've already got much more efficiently. In some cases, it may also be smarter to maximise energy production from waste products or help make industrial and household wood burning clean and affordable, than it is to build more electricity generation.

costs of solar panels and now also batteries means an increasing number of people are generating their own clean power from the sun, and even storing it to use when they need it most. New information technology is likely to make it possible for homes and communities to trade this energy with each other, instead of relying exclusively on power companies. Around the world, community energy projects are booming.

The need to cut carbon and pollution is also driving innovation in transport systems. It's now possible to run cars, trucks, buses, bikes, and trains on clean, locally grown electricity - and use the vehicle batteries as extra storage to keep the whole electricity sector running smoothly.

## New jobs

Creating enough clean energy to power New Zealand opens up enormous job opportunities. We need a huge workforce to construct new wind turbines and transmission wires. We need installers to fit solar panels, battery packs, and efficient heaters in homes. More workers will be needed to upgrade our homes and businesses to be smarter, warmer, and more energy efficient.

Examples from around the world show that investing in clean energy is smarter than continuing to support outdated energy. The International Renewable Energy Agency has found that solar creates twice the number of jobs per unit of electricity produced, compared to coal or gas<sup>10</sup>. In the U.S, solar jobs are growing up to 12 times faster than the rest of the economy<sup>11</sup>.

Wind farm development, geothermal energy, biomass energy, and eventually ocean energy will largely benefit the regions. We're also well placed to innovate in these areas and export our expertise to the world. Solar and energy efficiency jobs - which by their nature are local jobs - have potential in every town and city. These roles will be required over several decades, creating job security for a new generation of clean energy workers.



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# OUTDATED RULES ARE HOLDING US BACK

While other countries are seizing the chance for cleaner, locally-owned energy; here in New Zealand we've fallen behind. Clean energy development has all but stalled over the past two decades. Over 2.5 gigawatts of wind power has been consented for construction since the early 2000s<sup>12</sup>, yet none of it has been built. Meanwhile, we've met less than four percent of our solar potential<sup>13</sup>, and pioneering households that have put solar panels on their roofs have been slapped with unfair fees, and seen buy-back rates slashed.

Today, New Zealand's energy is expensive, outdated, and still dependent on dirty fuels. It's also incredibly unfair. Every winter, there are families shivering in cold, damp homes while power companies profit to the tune of hundreds of millions of dollars. In the last 20 years, New Zealand households have seen power prices rise notably faster than in other countries<sup>14</sup>. As many as 25% of New Zealanders live in energy poverty - defined as spending more than 10% of household income on energy bills<sup>15</sup>. Meanwhile businesses and industry still pay virtually the same prices they did two decades ago.

Back when the bulk of our energy supply was built, the hydro dams and power lines were paid for with public money, for the public good. Since the 1980s however, our power system has undergone a process of corporatisation, deregulation, and privatisation that has largely shifted ownership of this common resource into private hands. Still designed to service a small group of massive companies, our energy market is neither fair or competitive. It's also failing to deliver efficiency, affordability, or innovation.

The way we make and sell energy in New Zealand is a growing source of environmental and social injustice. Clearly, something needs to change.

It already has. When the Government decided to call time on offshore oil and gas exploration, it sent a signal that we can no longer rely on outdated fuels to power our society. Now it's time for a new energy vision - one that empowers New Zealanders to reap the rewards of the clean energy transition.



# A FIVE POINT PLAN FOR ENERGY TRANSFORMATION

New Zealand's energy system is at a crossroads. It's time for the Government to shut the door on outdated, dirty, and expensive energy and replace it with a plan for clean, affordable, homegrown power. Here are five ways that New Zealand could make a good start down a clean energy path.

## 1 REDESIGN THE RULES

- Make the Electricity Authority responsible for reducing carbon emissions, ensuring affordable energy for households and enabling people to generate their own power.
- Stop big energy companies from squashing competition, and instead make space for new entrants in the market.
- Make lines companies think outside their lines and poles and embrace more efficient ways of providing affordable energy to households.

## 2 SUPPORT CITIZENS TO GENERATE THEIR OWN POWER

- Rewire our laws and energy pricing so they reward people for contributing clean energy to the grid, instead of punishing them.
- Provide a one-stop community power advice shop to support community energy schemes.
- Introduce a People's Power Fund that provides grants for community energy.

## 3 DOUBLE DOWN ON ENERGY EFFICIENCY

- Ensure Kiwibuild homes are highly energy-efficient so they require little or no heating.
- Tighten efficiency standards for buildings, appliances, and vehicles.
- Insulate all 600,000 under-insulated homes in the next 10 years.

## 4 REPLACE POLLUTING TECHNOLOGY

- Reintroduce the ban on new coal and gas generation.
- Plan for the managed closure of coal and gas plants with a just transition for workers.
- Boost investment in clean energy and battery storage, and demand flexibility to manage peaks.
- Invest in research and development into dry-year back-up

## 5 BACK BOLD PROJECTS

- Add solar and batteries to every new-build home, starting with Kiwibuild.
- Create a training centre for clean energy workers, supporting new jobs and skills for thousands.
- Invest in innovation in offshore wind and ocean energy.



## REDESIGN THE RULES

All New Zealanders deserve access to affordable clean energy and a safe climate. Unfortunately, our current energy system is delivering neither, and parts of our community that are ready to embrace clean energy face barriers that prevent them from doing so. The outdated and unfair rules that govern our energy system prioritise

energy company profits over affordable bills, local ownership, and a safe climate. Written in the last century, they are no longer fit for purpose. All over the world, governments are redesigning their electricity systems, with a focus on clean power, electric transport, and locally-generated energy. New Zealand needs to do the same.

The following rule changes would create a fairer, cleaner energy system for New Zealanders:

### 1. Make our electricity regulator responsible to people and the climate

People and the climate must be protected by the laws that govern our energy system. Currently this isn't the case. The government energy regulator, the Electricity Authority, must be given new statutory objectives to reduce carbon emissions to zero, ensure fair prices for households, and enshrine the right of all people and communities to produce their own energy.

New Zealanders must also be given a genuine seat at the table when it comes to designing

a new energy policy. Right now, big energy companies have far too much say. Compared to other countries, New Zealanders have very few opportunities to participate in decision-making on energy. In Europe, Australia, and the US for example, consumer advocacy bodies have much greater opportunities to work with the regulator to promote the long-term interests of energy-users in the development of policy.

### 2. Genuine competition: make space for new market entrants

Electricity rules must be updated to make it easier for people, communities, and new entrants to compete with the big energy companies. At a minimum, this would include requiring retailers to be much more transparent about their pricing. It also means removing the barriers that prevent households and small organisations from independently selling energy to each other.

The Government must also seriously consider measures to reduce the market dominance of the generator-retailers. Just five companies still produce 90 percent of our electricity and control

89 percent of the retail market<sup>16</sup>. This is neither competitive nor fair, and is stifling innovation. One option is for the Government to introduce new rules separating the generation and retail arms of these companies. The other is they could mandate that these large retailers are only legally permitted to purchase 50 percent of their electricity from their generation arm, requiring them to buy the rest from other players, including specific targets for community and household-generated energy.

### 3. Make lines companies fit for the 21st century

As lines companies are local monopolies, there are very clear laws about what they can and cannot do to earn a return. These need revisiting. New technology means there are now more efficient ways to deliver affordable energy to households. That's why a number of countries and US states are upgrading the business models of these regulated utilities. They are shifting the focus away from simply building more infrastructure, and towards incentivising measures that support good environmental

outcomes and more affordable energy for households.

Lines companies could receive performance-based incentives to help customers save energy and cut carbon emissions, for example through solar panels, batteries, insulation, efficient heating, smart appliances, and other measures. Community-owned lines companies should also be given more space to support community-scale solar and wind projects.



# SUPPORT HOUSEHOLDS TO GENERATE THEIR OWN POWER

New technology has opened up the opportunity for people and communities to make their own clean energy. Research shows this is precisely what New Zealanders want. Only 30 percent of people are happy getting electricity from their

power company. Fifty eight percent would prefer to generate their own energy<sup>17</sup>. The Government needs to level the playing field and enable households and communities to be part of the energy transition.

## To start with, it should:

### 1. Reward people for producing and saving clean energy

Households and communities that produce, save, or store energy must be fairly compensated for the services they're providing to our energy system. This should be enshrined in law, as in the EU.

In general, households and communities should receive fair and transparent buy-back rates for solar energy. Those rates should be set based on the value they are adding to society, such as through the "value of solar" metric that's being developed in many US states. Importantly, they should be set by an independent authority instead of being left to the whims of power

companies as is currently the case. Households that provide storage or reduce energy demand during peak times should also be rewarded.

Locally produced energy, storage, and managing demand produce significant benefits for everyone because they replace costly investments in new poles and wires that we all pay for in our energy bills. At a time when energy demand is very likely to increase, avoiding expensive new infrastructure will benefit the whole system. But currently the market does not recognise this benefit.

### 2. Increase support for community energy schemes

It's a myth that people who don't own a home or piece of land miss out on the benefits of locally produced energy. In other parts of the world, cooperative and community energy schemes are providing a way for renters and people on lower incomes to have a stake in clean, local, and affordable energy generation.

Here in New Zealand, legal and financial barriers to community energy generation must be reduced, for example by requiring local governments to provide information and support like a "one stop shop" for community organisations wishing to develop a scheme. This

is the case in countries like Germany, which have high levels of community energy generation. The Government should also consider setting up a People's Power Fund to provide grants for community energy schemes, similar to the grants being provided by New York State. Another approach is to require energy developers to offer shared ownership to local communities, which happens in Denmark for example.





# REPLACE POLLUTING TECHNOLOGY

Fossil fuels like coal and gas still produce around 15-20 percent of our electricity. Under current energy market settings, profit-motivated energy companies have no incentive to change this. In fact, they're actually making plans to build new gas-fired power stations, and repeatedly delaying the closure of New Zealand's only coal-fired power plant in Huntly.

Because clean energy like wind, solar, and hydro have no fuel costs, coal and gas plants are almost always the more expensive power source to run. And because overall electricity prices are set

based on the cost of the most expensive form of energy, power companies have an incentive to keep clean energy scarce so that they can fire up their most expensive plants more often - thereby making more money. Ultimately, customers and our climate pay the cost. When dirty fuels are burning, power prices go up. This is neither fair nor responsible.

It may seem obvious, but to change this picture and reduce climate pollution, we need to stop burning coal and gas, and start building clean energy.

## To do that, the Government should:

### 1. Phase out coal and gas with a just transition for workers

Just as the Government has said no to more oil and gas exploration, it's now time to ban new coal and gas-fired power plants. Working with unions and energy companies, the Government must plan the ordered closure of existing coal and gas-fired power plants with a just transition

plan for workers and dependent communities, and compel industry to find alternatives to coal and gas. An effective price on carbon is also essential to speed the replacement of dirty fuels with clean energy.

### 2. Roll out more storage

To deliver a sustainable clean energy system we also need storage. Power companies tell us we need gas and coal plants to meet demand on cold winter evenings, but it's not true. These days, there's a more efficient alternative - battery storage. In South Australia, replacing gas with the 100MW Hornsdale Power Reserve battery has led to huge cost savings for energy users. Installing batteries both at grid-scale, and in homes and businesses will eliminate the need

for so-called "peaking plants" and save money for everyone. One way the Government could help roll out more batteries is by providing low interest loans or tax rebates on home batteries and electric cars, which are capable of storing and sending power back to the grid. The New Zealand Productivity Commission has proposed a "feebate" through which a higher fee for registering new petrol cars is recycled into a reduced fee for new electric cars<sup>21</sup>.

### 3. Invest in research and development for dry-year back-up

Power companies say we need coal and gas as a backup in case we're hit with a dry winter that reduces the reliability of our hydro dams. While a dry year is indeed a notable risk to the resilience of our power system, this is also a convenient excuse. The truth is our power companies are still burning coal and gas even when the hydro lakes are full.

The Government must make funding available for research into clean solutions for dry winters. This should include ocean energy, biomass, geothermal, and storage. Today, barely 10 percent of research and development funding goes towards climate change solutions, while dirty fuels are still subsidised to the tune of up to \$88 million a year<sup>22</sup>. It's time to shift this public money into clean energy development.



#### A just transition for workers

*"Just Transition is about protecting and supporting the interests of working people in the transition to a low carbon future. This includes negotiated transition processes in industries facing necessary change, leaving no one behind, as their jobs are affected by large scale change."*

New Zealand Council of Trade Unions

# BACK BOLD PROJECTS

New Zealand is endowed with abundant wind, solar, geothermal, and ocean energy potential. With targeted government support, there are countless opportunities to turn our nation into a clean energy powerhouse.

Below are some ideas for flagship energy projects that the Government should explore, in collaboration with iwi, hapū, unions, local communities, and industry.



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## Solarise New Zealand

Our nation will need to embark on an ambitious programme to build the new clean energy needed to replace the fuels of the past. There has never been a better time to put power back in the hands of people - literally - by giving hundreds of thousands of New Zealanders the chance to own and control their energy.

Through an interest free loan on solar panels and a battery, with no upfront costs for the homeowner, we can deliver clean solar power and storage to half a million Kiwi homes over ten years. It will inject a significant amount of new clean power and grid-stabilising battery storage onto New Zealand's electricity grid. And it can all be financed by diverting the \$88m a year of

public money that is currently spent on subsidies for the fossil fuel industry.

Locally produced energy paired with storage has benefits for everyone, from reducing costly peaks and avoiding expensive new investments in poles and lines, to limiting line losses and increasing resiliency. Increased household solar can particularly help reduce the cost of transmission and avoid lines losses for New Zealanders in Northland, who face some of the highest power prices in the country. Solar and batteries also enable the development of micro-grids, which can power important community facilities such as emergency shelters during natural disasters like storms and earthquakes.

## Kiwibuild: clean energy homes

The Government has set a goal to build 100,000 new affordable homes. This is a rare opportunity to increase the number of warm, efficient homes in New Zealand, which also have the ability to make and store energy. Building to the very high energy efficiency standards, and incorporating solar panels and batteries on every suitable Kiwibuild home, would significantly cut bills, at the same time as adding new clean energy to the grid. Combined, all those solar panels and batteries would add up to a new, locally-owned, virtual power plant for Aotearoa New Zealand.



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## Offshore wind for Taranaki

The cost of offshore wind has fallen dramatically in the last few years and the industry is now spreading beyond Europe, notably to the US. Engineering skills employed in the oil industry transfer well to the offshore wind sector, making Taranaki an ideal location for exploring offshore wind development in New Zealand. Taranaki already has a workforce equipped with unique skills in the energy sector and could become the hub for a new, thriving offshore wind industry.

## Ocean energy innovation hub

As an island nation surrounded by high energy oceans, our natural resources provide us with an enormous advantage when it comes to developing marine energy. New Zealand could become the Southern Hemisphere centre of ocean energy research, project demonstration, certification and commercialisation. The potential installed capacity for wave and tidal electricity generation in New Zealand has been estimated at 8,000 MW<sup>23</sup>.

## A training centre for clean energy workers

Thousands of clean energy workers are needed to install solar panels and batteries, to build wind turbines and transmission lines, to plan new electric vehicle charging infrastructure, and to retrofit homes to make them warmer and more efficient. The effects for local and regional employment would be transformative. A nationwide training programme is needed. It's important to fast-track these domestic training programmes because it will be difficult to import these skills from abroad given that most other countries are undergoing energy transitions of their own.



The reality of climate change means we can no longer rely on dirty, outdated fuels like oil, gas, and coal to power our society. And by closing the door on these old sources of energy, we will open the pathway to redesigning our energy system so that it benefits us all.

In early 2018, the New Zealand Government took a bold, world-leading stand on climate change by ending offshore oil and gas exploration. Now we need a new plan: one that redesigns our energy system so that it protects our fragile atmosphere and gives people and communities control over their power.

We would urge the Government to follow a five step programme such as the one outlined in this report. Only by doing so will we secure affordable energy for all New Zealanders, and ensure that this energy is clean, smart, and on tap for as long as we want it.

New Zealand has the natural resources, the people, the intellect, and the know-how to make all this possible. By rewriting the rules and encouraging a modern rethink of our system, we can create a new energy future that works for us all.

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**By rewriting the rules and encouraging a modern rethink of our system, we can create a new energy future that works for us all**

