JOBS AFTER COAL

A JUST TRANSITION FOR NEW ZEALAND COMMUNITIES

Coal Action Network Aotearoa

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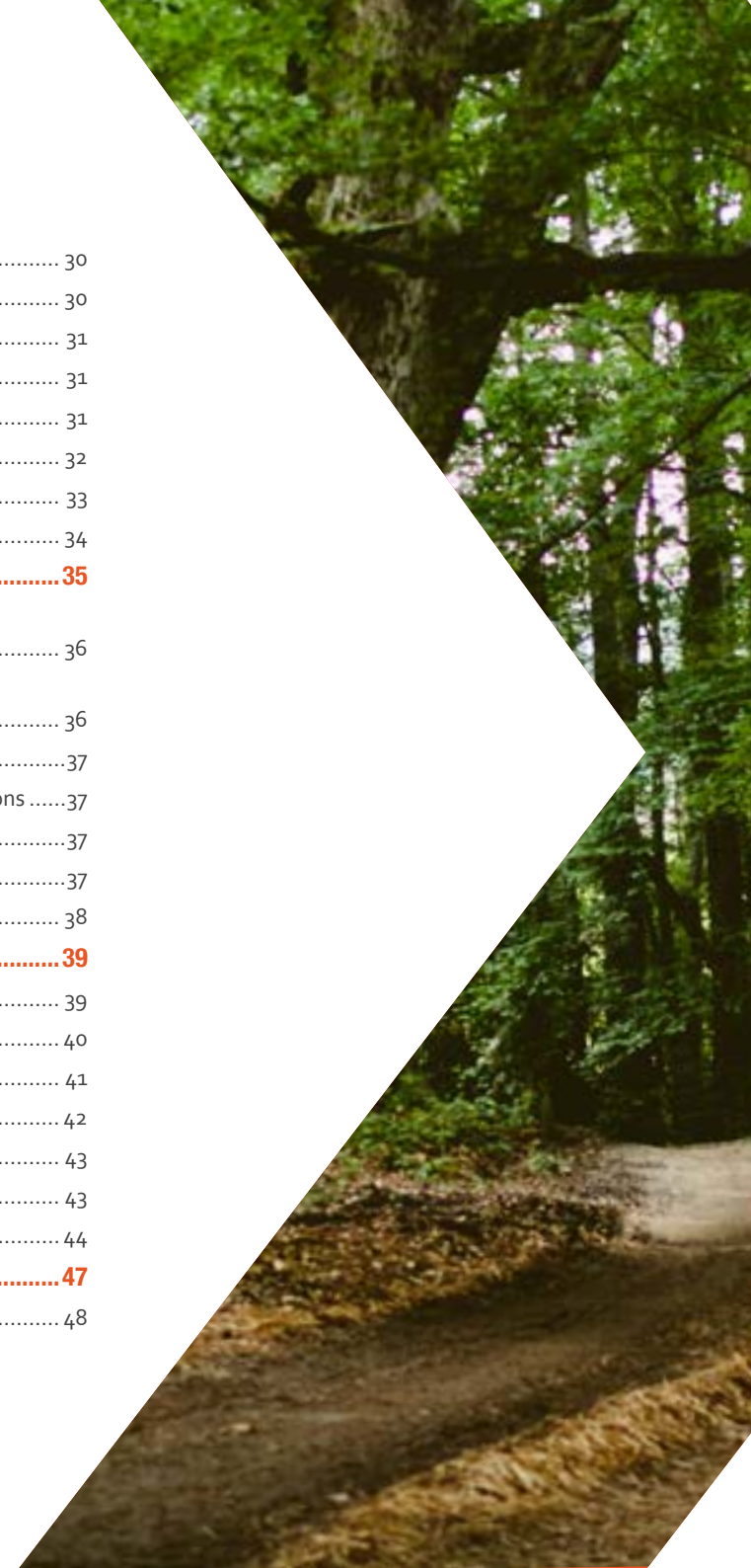


INTRODUCTION

Coal Action Network Aotearoa (CANA) is a voluntary group that came together in 2011 to draw attention to the fact that coal is the major cause of climate change.

This followed the tour of New Zealand by climate scientist Dr James Hansen, one of the first scientists to bring the issue of climate change before the US Congress in 1988. Dr Hansen argued that in order to avert the looming climate crisis, one must start with phasing out coal.

At this point, Southland faced an onslaught by Solid Energy with its grandiose plans to develop the lignite coal that lies under the region's productive farmland. Solid Energy was planning a massive development where lignite would be turned into briquettes and sold as boiler fuel, a coal-to-liquids fuel plant, and a coal-to urea plant. None of the plans have eventuated, save for the experimental briquetting plant, which currently remains under mothballs.

At the same time, Bathurst was beginning its process of applying to dig up the Denniston Plateau for its coking coal, the first application of what the company ultimately wants to be a suite of new coal mines in the area.

CANA's central policy is a commitment to a coal-free Aotearoa by 2027, the date when most permits for current big mines run out.

We seek to achieve this by allowing all existing mines to run their course up to that date, so there is no threat to existing jobs, but opposing the opening of new mines from our baseline date of 2012. We seek a "just transition" to an economy based on renewable fuels which puts workers' and communities' interests at the heart of the transition.

The main objection put forward by opponents of our policies is that New Zealand needs new coal mines for the jobs they create.

This report is CANA's contribution to the discussion in Aotearoa as to how we can achieve a transition away from coal, meet our climate change goals, and look after the people in mining towns across the country.

We don't pretend to have all the answers, but we see a clear need to begin the discussion.

Coal Action Network Aotearoa
May 2014
Coalaction.org.nz

EXECUTIVE SUMMARY

Coal mining communities in New Zealand and elsewhere have faced major disruptions in recent years.

Falling international coal prices, the Pike River tragedy, changing markets with declining demand, poor management and a high exchange rate have caused major uncertainty and significant job losses.

Around the world, the coal industry is contracting. Prices have fallen to where many mines are no longer economic. Coal is a sunset industry, and coal towns urgently need new options. Coal demand is shifting, with renewable energy becoming much cheaper and competitive, and concerns about climate change putting pressure on fossil fuels, particularly coal.

COAL ACTION NETWORK AOTEAROA (CANA) HAS NEVER ARGUED FOR THE CLOSURE OF AN EXISTING MINE OR THE LOSS OF AN EXISTING JOB, UNLIKE SOLID ENERGY WHICH RESPONDED TO A DROP IN THE PRICE OF COAL BY DISMISSING 500 WORKERS.

We are at a transition point from an old, dirty economy to a new, clean future that replaces coal with renewable energy and coal mining jobs with clean energy, low carbon jobs.

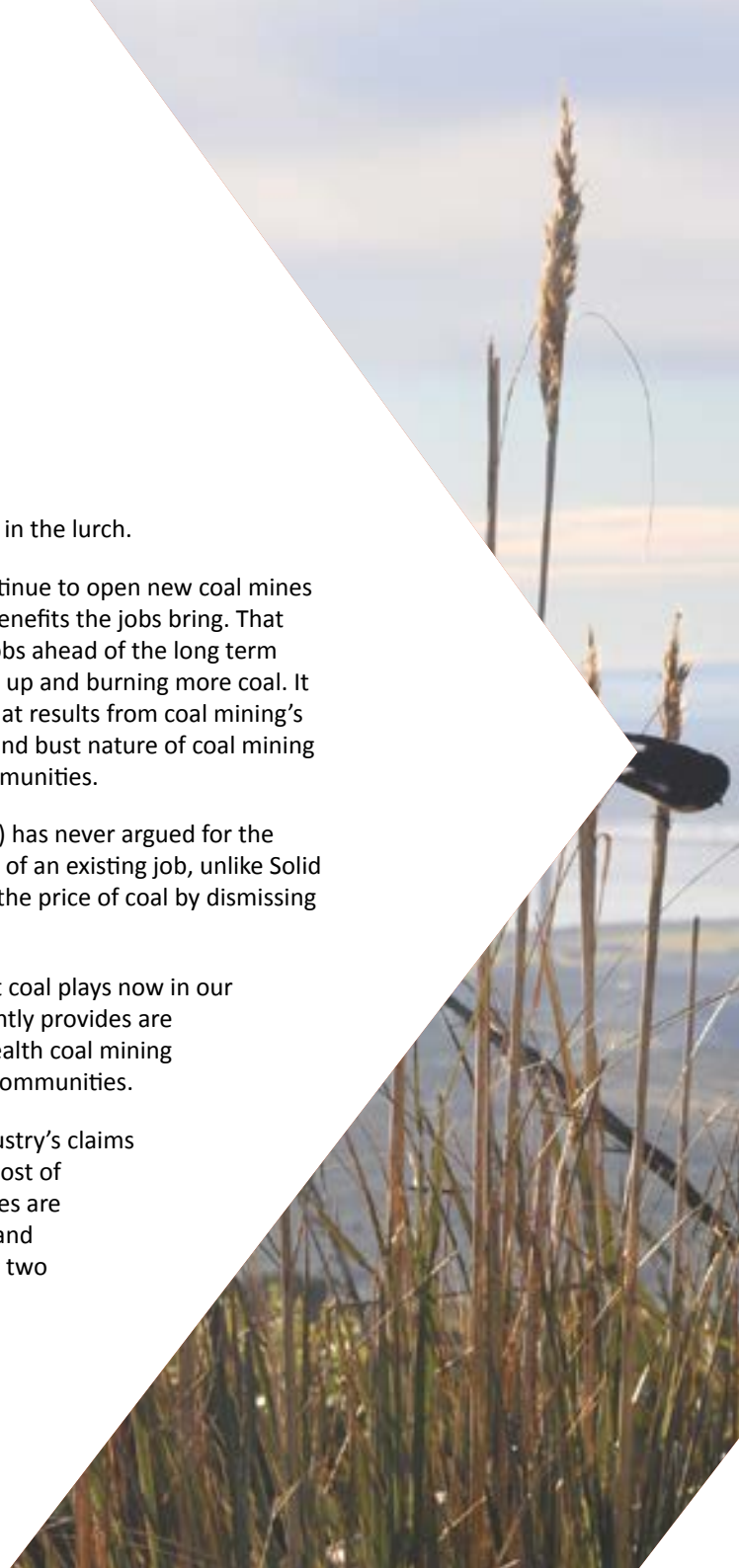
Such transitions always cause disruption, and it is the workers and communities that depend on the old industry for their prosperity that most often bear the brunt of the disruption. It need not be that way. In this report Coal Action Network Aotearoa (CANA) offers an alternative, a Just Transition, to a low carbon economy that does not leave workers in the lurch.

Many people argue that we must continue to open new coal mines because of the social and economic benefits the jobs bring. That argument places limited short term jobs ahead of the long term detrimental climatic effects of digging up and burning more coal. It also overlooks the social disruption that results from coal mining's boom and bust economy. The boom and bust nature of coal mining delivers social disruption to their communities.

Coal Action Network Aotearoa (CANA) has never argued for the closure of an existing mine or the loss of an existing job, unlike Solid Energy which responded to a drop in the price of coal by dismissing 500 workers.

SECTION ONE examines the role that coal plays now in our economy – and finds the jobs it currently provides are relatively few, and that little of the wealth coal mining generates stays in those coal mining communities.

» We find that despite the coal industry's claims of employment and prosperity, most of New Zealand's mining communities are a lot worse off than other towns and communities in their region. Only two mining communities in the entire country have higher median



incomes than their surrounding district and only one has higher employment.

- We look at the health impacts of coal where combustion of coal contributes to four of the five leading causes of mortality in the United States (US): heart disease, cancer, stroke, and chronic lower respiratory diseases.
- Mining does not employ as many people as is often thought. We calculate there are between 1200 and 2,000 people employed directly, and as contractors, by the mining industry. This compares with nearly 40,000 jobs lost in manufacturing alone over the past five years, with Government doing nothing to stem the flow.

SECTION TWO looks at the drivers of change – the reasons coal mining is under severe pressure and why it needs to be phased out worldwide.

- The price of all types of coal has dropped significantly, and many market commentators are saying it's unlikely to rise again, for a variety of reasons, such as major shifts in China to cut pollution, and the increasingly competitive price of renewable energy. This has led to massive layoffs at Solid Energy and Bathurst to delay its development of the Denniston mine.
- Climate change concerns and divestment campaigns are now becoming mainstream as the threat of a "carbon bubble" looms

SECTION THREE sets out the energy that coal provides in NZ and shows it is relatively easy to replace with other energy sources.

The phase-out of coal raises four questions, which are interrelated:

- What will we use for energy instead of coal?
- Where else can miners use their skills?
- What kinds of economic development could replace the role coal exports play in our economy?
- How can communities which are heavily reliant on coal for prosperity and jobs find other sources of economic activity?

There is no one answer, but there is a jigsaw of many pieces from which to construct a new future.

Coal provides very little of New Zealand's energy, and it is readily substituted by renewable sources – geothermal, wind and solar for electricity; wood chip from logging waste for boilers.

SECTION FOUR outlines the jobs that could be developed in energy efficiency, renewable electricity, renewable industrial fuels, building state houses, horticulture, local food production and public transport. It looks at the skills miners have and ways these skills could be utilised.

Mining skills are diverse - engineering, loader and digger driving, electrical work, water and waste water management, health and safety, soil rehabilitation, welding, blasting, accountancy, secretarial work, administration, carpentry, rescue staff, first aid, fire prevention, chemistry, geology, hydrology and more. These skills can be used in quarrying, construction, house building, the forestry industry, the railway workshops, and many other areas of the economy.

We find there are many new sources of economic activity for communities moving out of coal mining.

- New Zealand could have thriving job-rich industries in energy efficiency, renewable energy, construction of public transport systems, and expanded horticulture.
- New climate-friendly technologies developed in New Zealand can strengthen wood for use in buildings to replace steel and concrete, reducing the huge quantities we currently export as raw logs.
- Logging waste can be used to replace coal as boiler fuel and eventually replace petrol as transport fuel.
- Longer term there is scope for wood-derived chemicals. Wood is New Zealand's key strategic advantage for a low carbon economy, yet Government emphasis remains with fossil fuels, an economically risky choice.

These new economic opportunities won't just arise spontaneously; they must be planned for in advance. Crucial to this process is central government guidance and funding together with local planning which includes all stakeholders.

SECTION FIVE proposes a planning process for a Just Transition away from coal to new industries and new jobs, where communities are supported to take control of their own future.

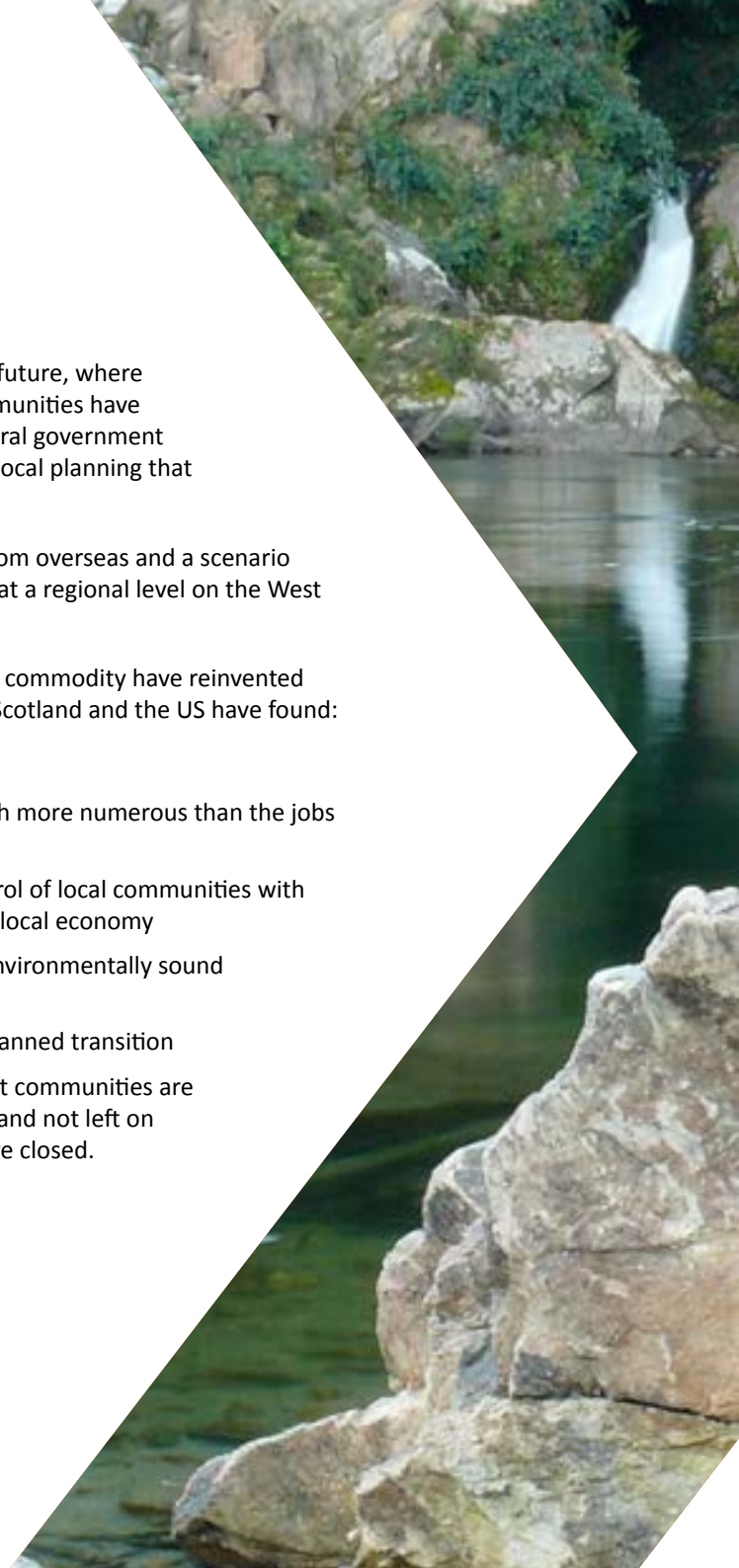
We propose a process for a "Just Transition" – a term used around the world for moving to a new economic future, where workers, their families and their communities have options. Crucial to this process is central government guidance and funding, together with local planning that includes all stakeholders.

SECTION SIX includes case studies from overseas and a scenario for how these ideas could be applied at a regional level on the West Coast.

Many communities reliant on a single commodity have reinvented themselves. Communities in France, Scotland and the US have found:

- there are, in fact, jobs after coal
- they can be high quality and much more numerous than the jobs mining provides now
- they can be more under the control of local communities with more of the profits staying in the local economy
- they can lead to a more stable, environmentally sound economy
- they will not happen without a planned transition

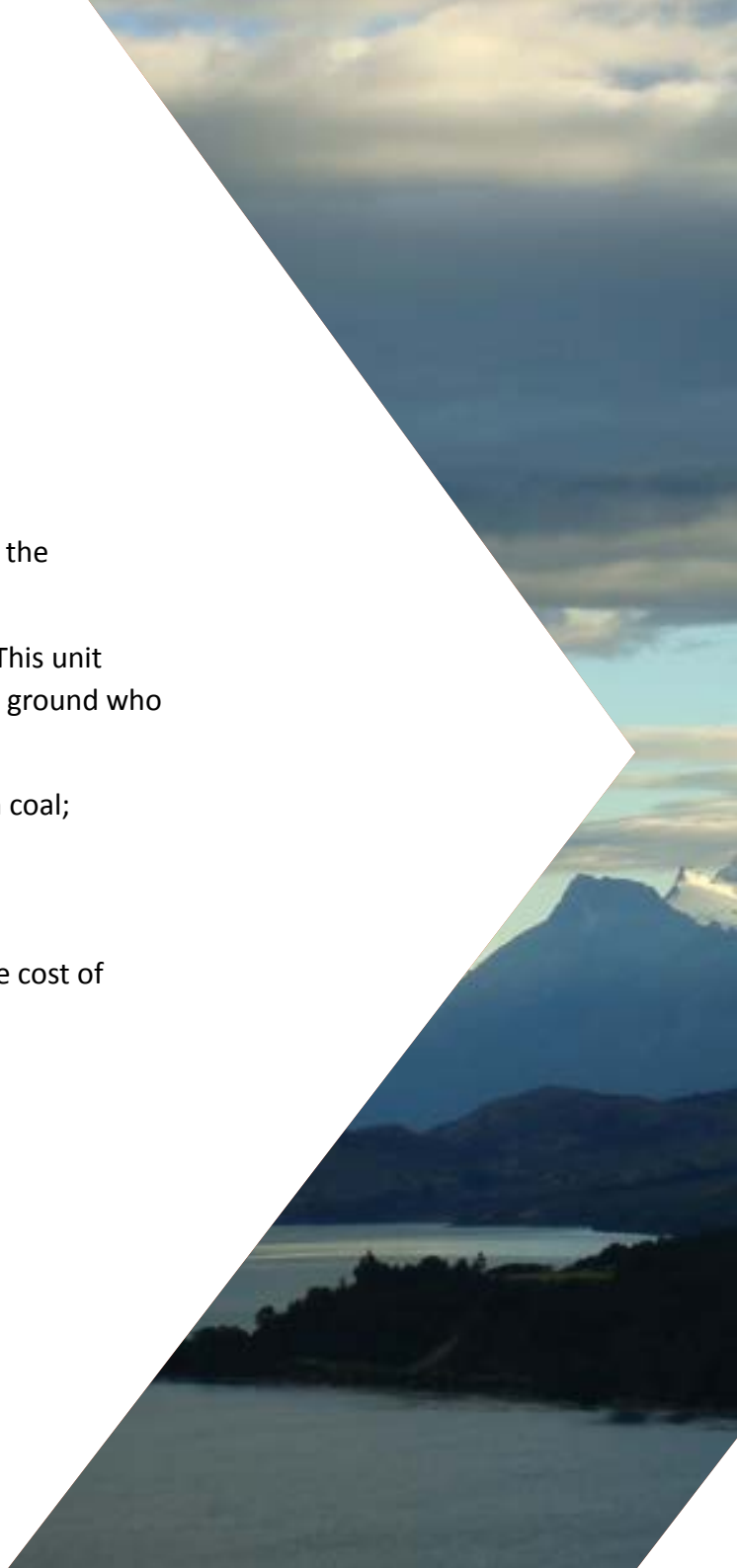
We need to start planning now so that communities are empowered to plan their own future and not left on their own to cope after the mines have closed.



KEY RECOMMENDATIONS:

Government should:

- Cease all subsidies to fossil fuels, increase royalties on coal, oil and gas, and transfer that funding to the transition process;
- Set up a unit within MBIE to assist coal mining communities with the transition to a new economy. This unit should help with research, resource the process of community planning, and provide people on the ground who can give guidance and share information with those planning an alternative future;
- Put a sufficient, stable price on fossil carbon that will make fuels from waste wood competitive with coal;
- Increase funding for Research & Development to at least the OECD average, prioritising low carbon technologies;
- Factor in all costs and benefits when letting government contracts for goods and services so that the cost of losing jobs and economic activity when procurement is sourced overseas are part of the equation;
- Amend the RMA so that new coal mines are a prohibited activity.



SECTION ONE

THE ROLE OF COAL IN NEW ZEALAND

Coal has helped build the New Zealand economy over the last 150 years. It has powered locomotives, ships and industry. It has heated homes and generated our first electricity. New Zealand's organised labour movement began in the West Coast coal mines.

Today coal's role is much reduced. In 2012, some five million tonnes a year (MT/y), with a value of $710 million, were mined, of which over half was exported, principally to India and Japan. Exports are mainly of bituminous (coking) coal from the West Coast, used particularly for steel making.

LESS THAN TEN PERCENT OF NEW ZEALAND'S PRIMARY ENERGY COMES FROM COAL.

Less than ten percent of New Zealand's primary energy comes from coal. The major users are the Huntly power station, although that uses gas whenever it is available and cheaper, and has at times used coal imported from Indonesia; the Glenbrook steel mill; boilers to raise heat in the dairy and other industries; and cement making. Fonterra is the third largest user of coal in New Zealand for its milk drying plants. Very little is used in homes and this is discouraged by many district councils for clean air reasons.

COAL AND EMPLOYMENT

About 700 people are directly employed by coal mining companies in New Zealand. (This figure was 690 in 2009 and 711 in 2010, according to the Department of Statistics). There are further jobs in exploration and support services, where the numbers are not broken down by type of mineral. In addition there are some jobs in exploration and support services directly at the mine sites.

All forms of mining together generate some 6,000 jobs, 0.3 percent of New Zealand employment. On coal mining, the Royal Commission on the Pike River coal mine tragedy said that in 2010 “fewer than 2,000 people were working in 22 mines.” [1]

Our research puts this figure at 1259 for contracted and directly employed staff (see pages 11 and 12). We have not used job multipliers for either the coal industry or for alternative jobs as they are so easily manipulated.

Since then, Solid Energy has laid off some 500 workers in mines and at their head office, with the associated loss of about 200 contracting jobs, reducing the total still further. Coal mining jobs are not spread evenly throughout the country. They are concentrated in a few communities like Westport, Greymouth, Reefton, Huntly, Kaitangata, Nightcaps and Ohai which have grown up around coal and where there appear to be few alternatives. This has led to a legitimate concern for the future of workers, families, communities and small businesses in those communities, as coal is phased out.

MINING COMMUNITIES, IN GENERAL, HAVE LOWER INCOMES AND HIGHER UNEMPLOYMENT THAN THE REGIONS OR DISTRICTS OF WHICH THEY ARE PART.

It is worth noting that none of the jobs lost, suddenly and with no attempt at a transition, have been for environmental or climate change reasons. All have been determined by the company in response to market conditions. This is a high-risk industry for communities.

1 Pike River Royal Commission report, page 15.

While mining jobs themselves are well-paid, our research provides evidence that coal mining does not produce prosperous communities. Mining communities, in general, have lower incomes and higher unemployment than the regions or districts of which they are part. This is shown in Table one, with all data drawn from the 2013 Census.

One explanation is that this reflects the fact that many of the higher-paid workers commute long distances – for example from Top of the South to the West Coast – and that many communities close to the mines are not places favoured by those who can afford to live elsewhere.

TABLE 1: ECONOMIC WELLBEING OF COAL MINING COMMUNITIES, 2013 CENSUS

NZ median income	**2013**	**$28,500**
NZ unemployment %2013 15y+	**2013**	**4.5%**
NZ Full Time Jobs %	**2013**	**45.60%**

Economic Zone	Population	Median Income	$ vs district	Unemploy-ment %	UE vs district	Full Time Jobs %	FTJ vs district
Huntly East	3174	$22,800	-$5,100	6.0	1.3	38.0%	-7.0%
Huntly West	1923	$19,100	-$8,800	12.0	7.3	30.0%	-15.0%
Waikato region	**316155**	**$27,900**		**4.7**		**45.0%**	**45.0%**
Reefton	852	$24,600	-$600	2.4	-0.6	43.6%	-1.0%
Westport urban	3222	$24,600	-$600	3.1	0.1	42.5%	-2.1%
Westport Orowaiti	606	$30,900	$5,700	2.0	-1.0	50.7%	6.1%
Granity	198	$21,500	-$3,700	6.0	3.0	30.3%	-14.3%
Hector-Ngakawau	198	$22,000	-$3,200	4.6	1.6	36.9%	-7.7%
Buller District	**8514**	**$25,200**		**3.0**		**44.6%**	**44.6%**
Greymouth-Blaketon	765	$25,800	-$800	3.9	0.5	46.2%	-0.4%
Greymouth-Cobden	1305	$20,400	-$6,200	5.0	1.6	36.7%	-9.9%
Greymouth Central	543	$21,000	-$5,600	3.8	0.4	37.0%	-9.6%
Greymouth South	2310	$28,100	$1,500	2.6	-0.8	44.4%	-2.2%
Grey District	**10713**	**$26,600**		**3.4**		**46.6%**	**46.6%**
West Coast region	**26001**	**$26,900**		**3.0**		**47.0%**	**47.0%**
Kaitangata	610	$28,900	-$1,000	4.4	2.1	50.0%	-1.1%
Clutha District	**13386**	**$29,900**		**2.3**		**51.1%**	**51.1%**
Ohai	228	$17,100	-$16,800	5.2	3.3	25.0%	-30.4%
Nightcaps	249	$18,700	-$15,200	3.6	1.7	33.7%	-21.7%
Southland District	**23**	**$33,900**		**1.9**		**55.4%**	**55.4%**
Mataura	1179	$23,100	-$5,700	5.0	2.5	42.2%	-5.8%
Gore District	**9624**	**$28,800**		**2.5**		**48.0%**	**48.0%**

http://apps.nowwhere.com.au/StatsNZ/Maps/default.aspx

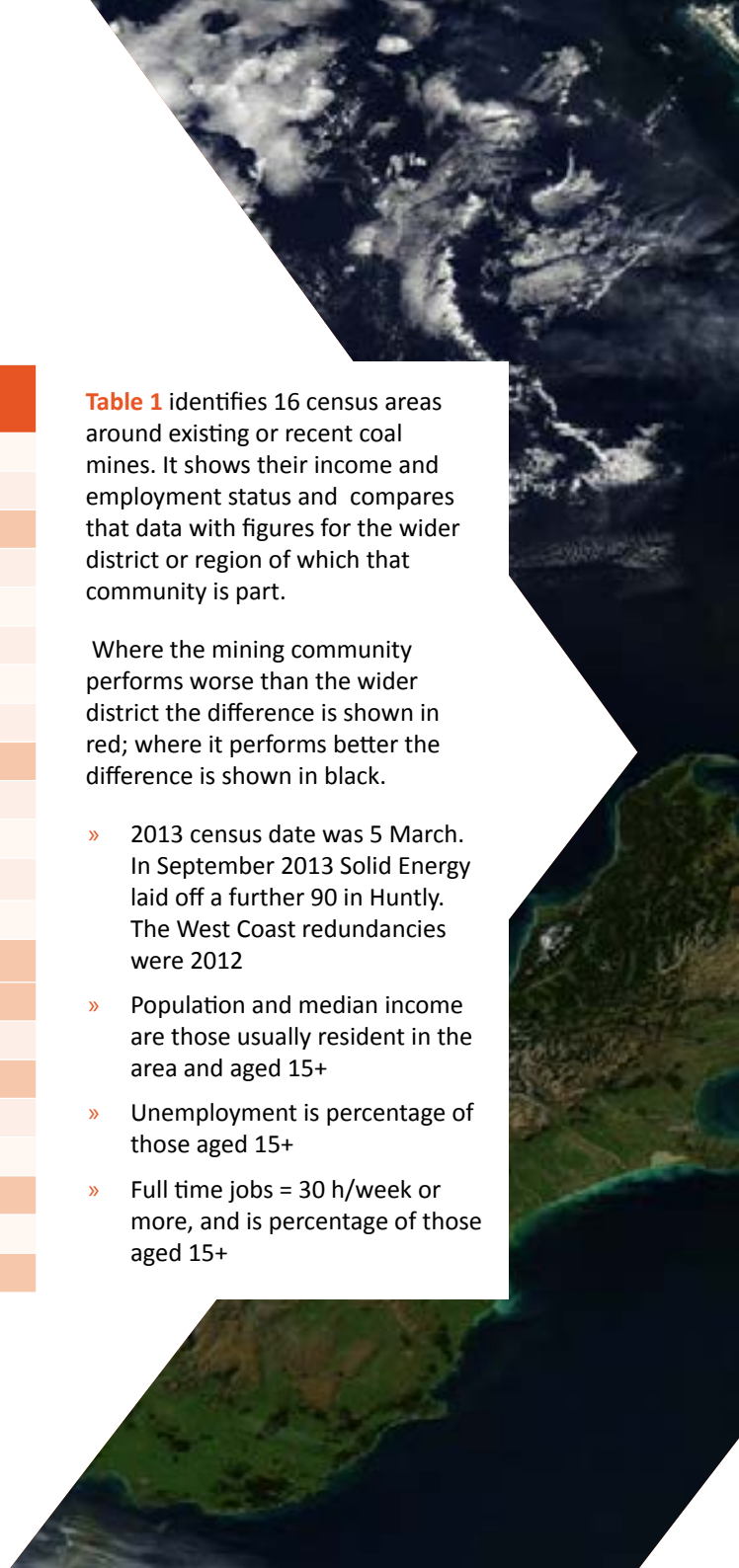


Table 1 identifies 16 census areas around existing or recent coal mines. It shows their income and employment status and compares that data with figures for the wider district or region of which that community is part.

Where the mining community performs worse than the wider district the difference is shown in red; where it performs better the difference is shown in black.

- 2013 census date was 5 March. In September 2013 Solid Energy laid off a further 90 in Huntly. The West Coast redundancies were 2012
- Population and median income are those usually resident in the area and aged 15+
- Unemployment is percentage of those aged 15+
- Full time jobs = 30 h/week or more, and is percentage of those aged 15+

Our research shows very clearly that coal mining does not bring prosperity to a community.

Only two mining communities in the country have higher median incomes than their surrounding district, and one of these is the tiny Orowaiti, a sea-front, high-income suburb of Westport with a population of only 606.

Unemployment statistics can be misleading as people are not counted as unemployed if they work even one hour per week. A truer picture is given by the proportion of people over 15 with full time jobs. Again, from all the coal mining communities across New Zealand, only Orowaiti is better off than the district median.

Huntly West has only 30% of its adults with full time jobs compared with the national average of 45.6%. The community of Nightcaps, home to the Bathurst Resources' rapidly expanding Takitimu mine, underperforms on income by $15,200 and on full time jobs by 21.7% compared with the wider Clutha District council area.

It is clear that while coal mining may create some wealth, it certainly does not for the local communities where it is sited. It is also clear that these communities might be better to look for sources of income other than the boom and bust mining industry.

Even in the Hunter Valley in the huge coal mining region of Australia's New South Wales, mining provides only 5% of the jobs and royalties provide only 2% of the State budget. Mining produces 36% of the economic output but as it is all foreign owned, little remains in the state.[2]

2 "Another way to look at coal" – Rod Campbell, The Australia Institute, Jan 2014.

THE HEALTH IMPACTS OF COAL

Coal mining is a dangerous occupation. New Zealand's fatality rate for mining and quarrying is high, both internationally and compared to other New Zealand industries.3 The Pike River tragedy on 19 November 2010, which killed 29 men, was the seventh major mining disaster in New Zealand.

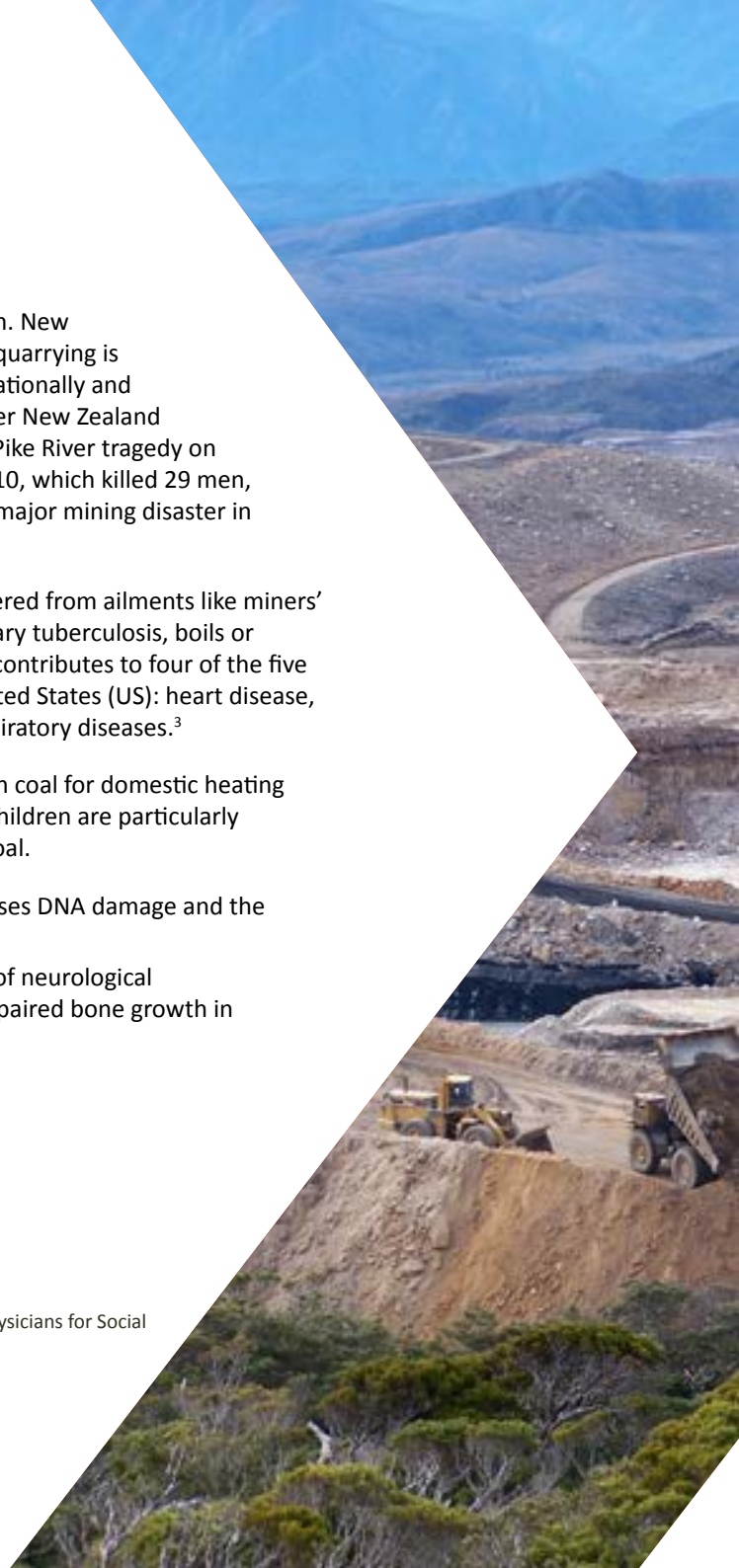
CHILDREN ARE PARTICULARLY VULNERABLE TO THE EFFECTS OF BURNING COAL.

Early miners suffered from ailments like miners' phthisis, pulmonary tuberculosis, boils or poisoned hands. Combustion of coal contributes to four of the five leading causes of mortality in the United States (US): heart disease, cancer, stroke, and chronic lower respiratory diseases.[3]

Coal mining communities tend to burn coal for domestic heating where there is no pollution control. Children are particularly vulnerable to the effects of burning coal.

- Heavy metal accumulation increases DNA damage and the likelihood of developing cancer.
- Coal ash toxins can pose the risk of neurological disturbance, birth defects and impaired bone growth in children.

3 Report: Coal's Assault on Human Health – Physicians for Social Responsibility, 2009.



» Particulate matter ('a mixture of solid particles and liquid droplets found in the air') containing toxic chemicals, carcinogens and heavy metals, can penetrate nearby communities, leading to increased mortality rates, increased cardiovascular, kidney and chronic obstructive pulmonary disease and hypertension.

In 2012 Reefton had 27 clean air breaches due to particulate matter, prompting the West Coast Regional Council to call for a coal fire ban to reduce breaches to three per year by 2016.

HOW MANY JOBS ARE THERE IN COAL MINING TODAY?

In January 2014, we contacted all working New Zealand coal mines by phone and asked how many people were employed at each site. The results of this survey are shown in Table Two, page 12. In total there are 1259 people working in coal mining in New Zealand, including miners, contractors and support staff.

These figures are in line with the estimate given by the Royal Commission into the Pike River Disaster and numbers given by the Department of Statistics.

However, job numbers fluctuate to a small degree for several reasons, such as to service Fonterra's demand for thermal coal during the high milk flow season.

We found that Solid Energy's job numbers had changed on contacting them three months later. There have been 29 layoffs by Bathurst Resources since January.

Table Two shows the mines in each region, their owners, and expiry dates of current mining permits.

Most of these expiry dates coincide with CANA's aim of a just transition to a coal free Aotearoa by 2027, and accord with the global need to stop digging and burning all coal by 2030. Alternative sustainable jobs must be in place by these dates.

While some smaller coal mines (shaded in darker orange) have expiry dates beyond 2027, their combined employee numbers add up to 152 people, less than half the number of jobs lost when Solid Energy mothballed Spring Creek in November 2012.

There is ample time for these mines to work towards alternative livelihoods for their employees by 2027.

Compared with other sectors there are relatively few jobs in coal mining. The planned phase out of 1259 coal jobs needs to be a better deal for the workers than it was for many of the 37,900 workers who have lost their jobs in manufacturing in the five years from December 2007 to December 2012.[4]

JOBS: MANUFACTURING V COAL

■ MANUFACTURING JOBS LOST 07-12

■ EXISTING COAL JOBS

4 Labour, Green, NZ First & Mana parties: Manufacturing: The New Consensus: A Blueprint for Better Jobs and Higher Wages, June 2013

MANUFACTURING JOBS LOST 07-12 COAL ■

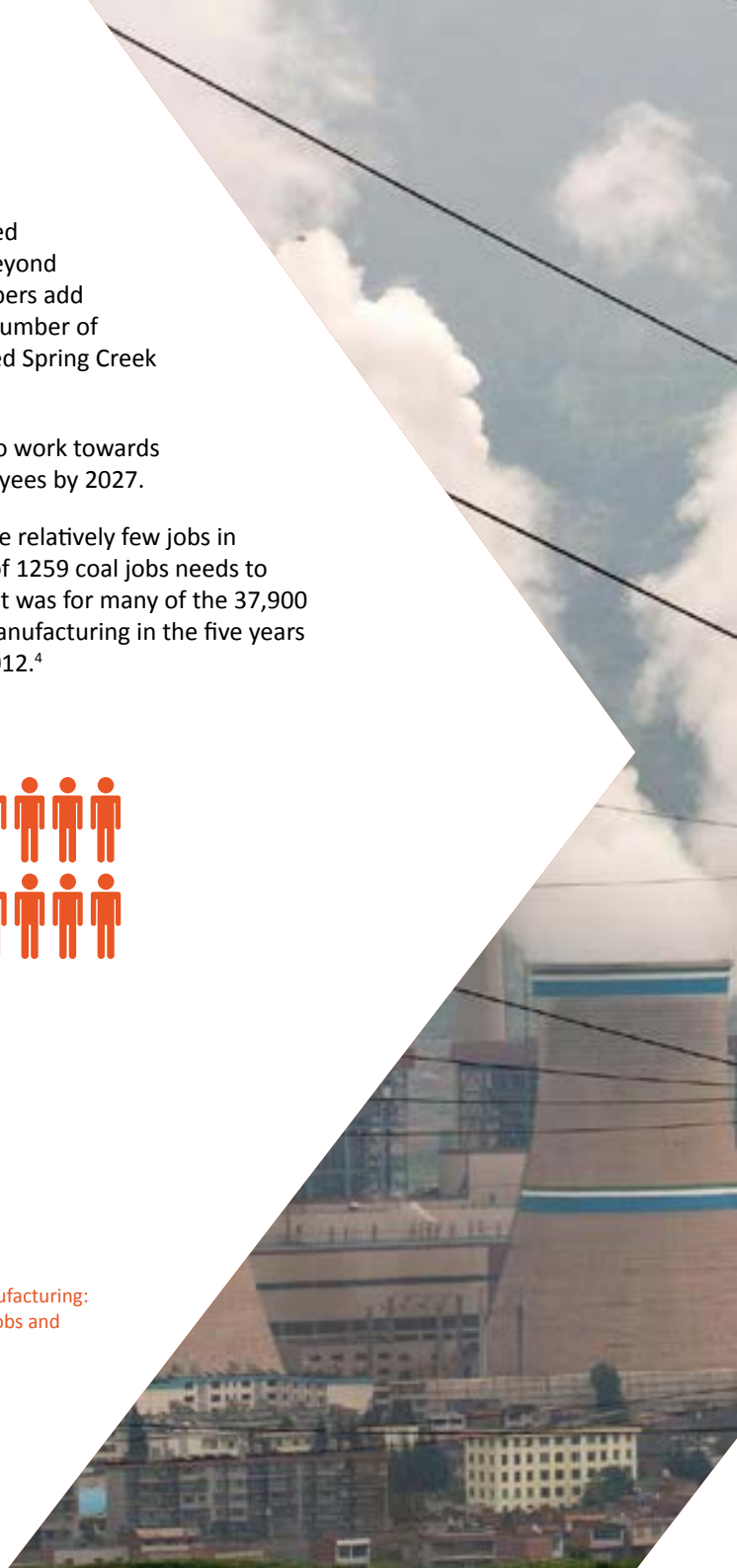


TABLE 2: COAL MINING JOBS IN NEW ZEALAND

WEST COAST

Mine	Owner	Employees/ contractors	Permit expiry
Reddale	Solid Energy	10	2013
Echo	Francis Mining	2	2015
Stockton	Solid Energy	610	2024
Office staff etc Westport	Solid Energy	10	2024*
Reefton distribution centre	Solid Energy	14	2024*
Spring Creek Wash Room	Solid Energy	25	2024*
Strongman	Solid Energy	25	2027
Pike River	Solid Energy	8	2037
Giles Creek	Birchfield Coal	40	2031
Cascade	Bathurst Resources	40	2035
Berlins Creek	Heaphy Mining	8	2038
Burkes Creek	R.J.Banks	5	2042
Roa	Francis Mining	35	2043
Rockies	Rockies Mining	4	2050

OTAGO

Mine	Owner	Employees/ contractors	Permit expiry
Castle Hill	Kai Point Coal	9	2029
Harliwich	Harliwich Carrying Co	3	2040

* support jobs, expected to end when company's largest mine closes

WAIKATO

Mine	Owner	Employees/ contractors	Permit expiry
O'Reilley's	O'Reilley's	6	2014
Kopako	Glencoal (Fonterra)	26	2025
Huntly East	Solid Energy	86	2027
Rotowaro	Solid Energy	95	2027

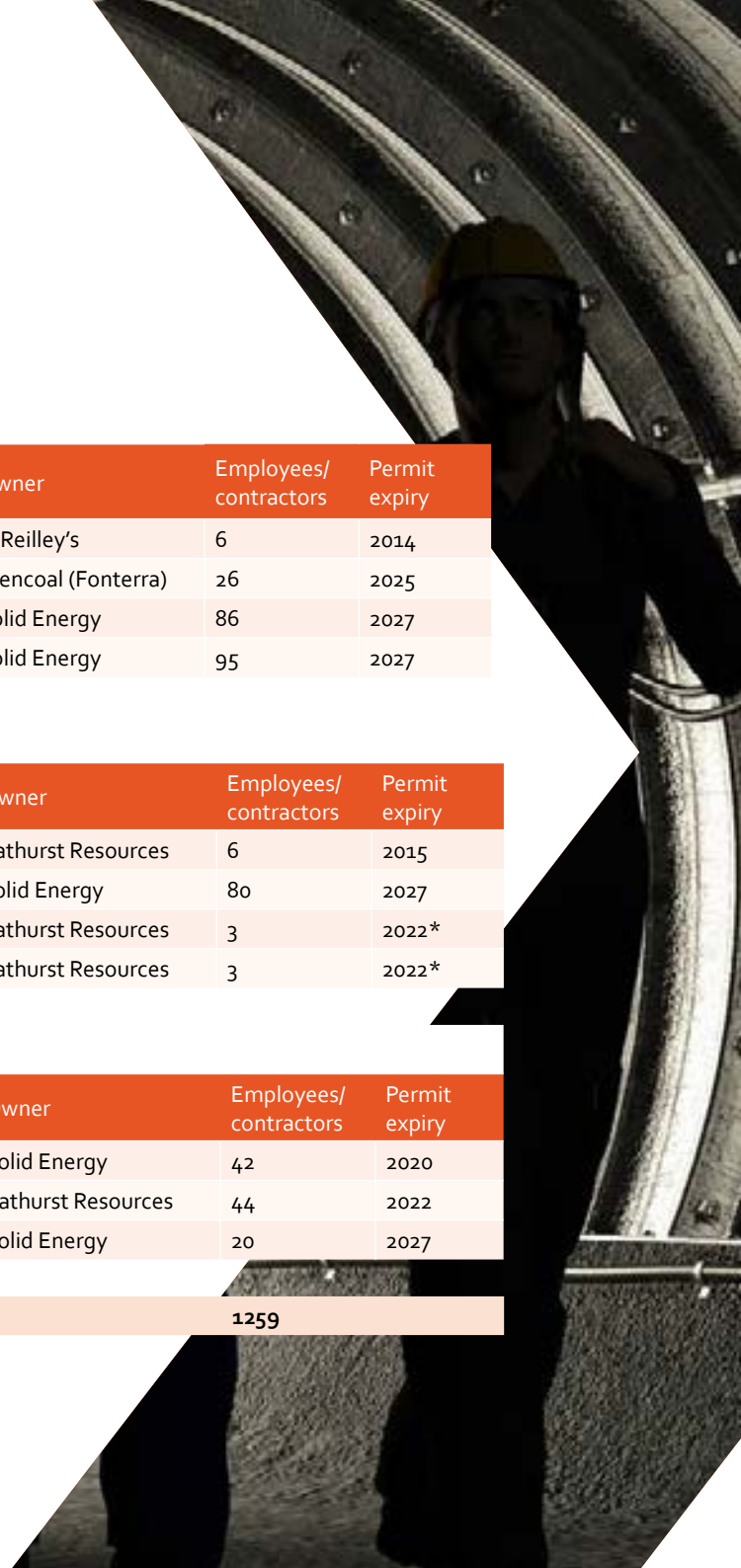
CANTERBURY

Mine	Owner	Employees/ contractors	Permit expiry
Malvern Hills/ Canterbury Coal	Bathurst Resources	6	2015
Head office Christchurch	Solid Energy	80	2027
Coal handling - Rolleston	Bathurst Resources	3	2022*
Coal handling - Timaru	Bathurst Resources	3	2022*

SOUTHLAND

Mine	Owner	Employees/ contractors	Permit expiry
New Vale	Solid Energy	42	2020
Takitimu	Bathurst Resources	44	2022
Ohai	Solid Energy	20	2027

Total Jobs	**1259**



SECTION TWO

WHAT IS DRIVING CHANGE?

Coal's future will not be like the past. Even Solid Energy's former Chief Executive, Don Elder, said:

> "After 110 years of mining in New Zealand the easy coal is gone."[5]

Miners and mining towns live with uncertainty as a matter of course. Jobs, companies, and government priorities come and go. These uncertainties are largely outside the control of mining communities and even of mining companies.

Change is coming, whether we like it or not, as we set out below.

INTERNATIONAL COAL PRICES

International coal prices have caused havoc in New Zealand's coal industry.

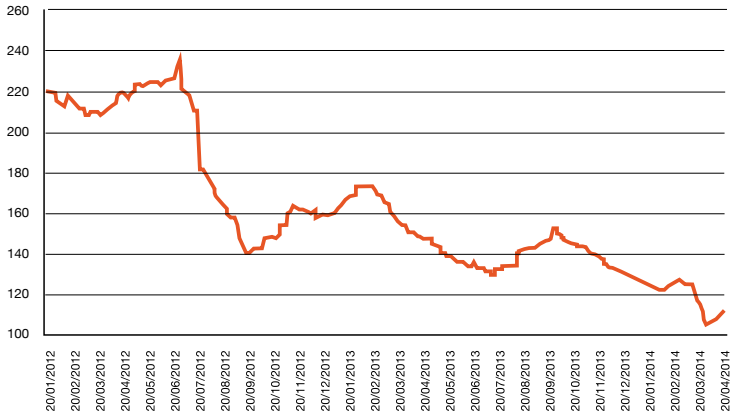
New Zealand's West Coast coal is dependent on the world coking coal market for steel making. That market has been severely impacted by China's recently announced plan for energy consumption to peak at four billion tonnes coal equivalent within the current five year plan. The IEA (International Energy Agency) projects China's coal consumption will peak within the next 10 years.[6]

Prices on the international coking coal spot market went from a high of US$330/tonne in late 2011 to a low of US$120/tonne in April 2014, causing Australian mines to lay off more workers, and close mines.[7]

5 Coast reels as mine closes, The Press, 30 August 2012.
6 Unburnable Carbon: Australia's Carbon Bubble, page 4
7 More mines to shut as coal woes deepen: The Australian, 28 April 2014

In January 2014, market analysts at Macquarie Group dropped their 2014 and 2015 coking coal forecasts by 8% and 13% respectively, even though Chinese imports from Australia had been strong in 2013.

COKING COAL - WWW.MACROBUSINESS.COM.AU



"This is just indicative of how oversupplied the metallurgical coal market is, with international prices having to fall to a level where China can mop up the surplus," the bank said.[8]

Between December 2013 and March 2014, spot prices in China had fallen 20% to $107/tonne, and have fallen further since.[9]

8 Falling prices to cause more coal mine closures: The Australian, February 3, 2014.
9 Coking coal supply talks said at six-year low prices in India: Live Mint & Wall St Journal, 4 May 2014.

The same has happened to thermal coal used in coal-fired power stations, where the high price of $120 a tonne in late 2011 has now plunged to $74/tonne, with the Australian Bureau of Resources and Energy Economics predicting the price would stay depressed for another five years.[10]

As well as being in oversupply, the market is also experiencing stricter regulation, competition from renewables and shale gas, slower growth, and government policies which are, in part, driven by the threat of climate change. The high New Zealand dollar is also contributing to the unprofitability of coal.

The increasing competition from renewable energy is also starting to hit the coal industry. "We believe that thermal coal demand is in structural decline as a result of both increasing environmental pressure and declining cost competitiveness compared to alternatives for power generation," said a Citibank report in November 2013.[11]

This statement is certainly borne out by the facts:

- In the US, the cost of renewable energy (particularly solar photo-voltaic) has dropped by 50%[12] since 2008.
- In 2013 the US solar industry employed more people than the coal and gas industries combined.[13]

10 The End of Coal – The Saturday Paper, 26 April 2014
11 ibid The Saturday Paper "The End of Coal"
12 Cost of Renewable Energy has Fallen 50% Since 2008 – Oilprice.com 12 September 2013
13 U.S. solar industry employs more than coal, gas combined, Greenbiz.com Jan 21, 2014

» Unsubsidised renewable energy is now cheaper than new coal-fired power in Australia.[14]

Opportunities for new jobs and economic development for New Zealand in renewable energy are explored in Section Three (page 21) and Section Four (page 26).

SOLID ENERGY

Before 1987, New Zealand coal prices were set and mines were kept in operation by the Government. They ran at a loss, costing an estimated $160,000 a year to keep each State Coal miner employed.[15]

The cost to the state of keeping people employed in the coal industry was about double their current wage rate.

In 1987, State Coal was corporatised into the Coal Corporation of NZ Ltd (CoalCorp), later to become Solid Energy. Employment and social objectives disappeared in favour of economic efficiency. Profits and expansion became the norm, but by 2002 new CEO Don Elder was charged with closing down Solid Energy. He chose instead to try to expand the business, with disastrous results.

Solid Energy's latest downturn in 2012 hit mining communities hard.

» In September 2012 Solid Energy laid off around 25% of their workforce.
  - 360 jobs went at Greymouth's Spring Creek Mine.
  - 63 were axed at Huntly East Mine,
  - then a further 60, mostly contracting positions relating to a halted mine shaft upgrade, went at Huntly.
  - Mining trainees, taken on with the promise of jobs for 25-30 years, were laid off six months into their training.
  - Solid Energy's Christchurch head office shed 163 staff and at Stockton, the company's largest opencast mine near Westport, more than 100 jobs, mostly contractors, also disappeared.

» A further 93 employees lost their jobs at Huntly East in August 2013, while across town Genesis Energy was importing Indonesian coal to fire the Huntly Power Station.

"The Perfect Storm" was the headline-creating quote from Don Elder and Government Ministers to describe the conditions that led to hundreds of workers losing their jobs and mining communities being gutted. That "perfect storm" was, they argued, a combination of low coal prices and the high New Zealand dollar.

In fact, Solid Energy's downturn was a foreseeable consequence of a number of internal and external pressures. Elder's ambitious growth trajectory included spending $230 million on coal technologies intended to replace coal as the company's main income earner, with almost no return. $75 million of that included an underground coal gasification pilot plant at Huntly, coal seam gas

14 Renewable Energy now cheaper than new fossil fuels in Australia –Bloomberg New Energy Finance, 7 February 2013

15 The New Zealand Coal Industry – Coal Research Association, 1997, page 12

developments at Huntly, and the Mataura domestic-scale briquette plant. Land purchased for lignite in Southland amounted to $77 million. Investigations into the feasibility of turning lignite into fuel and fertiliser cost a further $6.9 million.[16]

Putting workers' lives and livelihoods in the hands of currency traders, foreign government policy, foreign shareholders, and a range of other factors which apparently even the former Chairman of the World Coal Association and our own Government ministers couldn't see coming represented a giant gamble – a gamble that didn't pay off.

PUTTING WORKERS' LIVES AND LIVELIHOODS IN THE HANDS OF CURRENCY TRADERS, FOREIGN GOVERNMENT POLICY, FOREIGN SHAREHOLDERS... REPRESENTED A GIANT GAMBLE – A GAMBLE THAT DIDN'T PAY OFF.

Whatever your list of reasons for what went wrong at Solid Energy HQ, they have something in common. They are beyond the control of the miners themselves and their towns. Their management or mismanagement depends on an outside employer. That employer is the benefactor and the dispatcher of the town's fortunes.

When markets are profitable, sponsorships and goodwill abound. When shareholder profits drop, sponsorships dry up, workers' conditions are squeezed and jobs disappear. This type of boom-bust pattern is characteristic of "resource-dependent communities"[17] where reliance on one main industry such as mining, forestry or farming, subjects the community to the uncertain and volatile cycles of commodity prices.

16 Can Solid Energy dig its way out? Stuff Business Day, 9 March 2013

17 Health impact and the public health response to major job losses in small communities: Canterbury District Health Board, 2 May 2013, page 12.

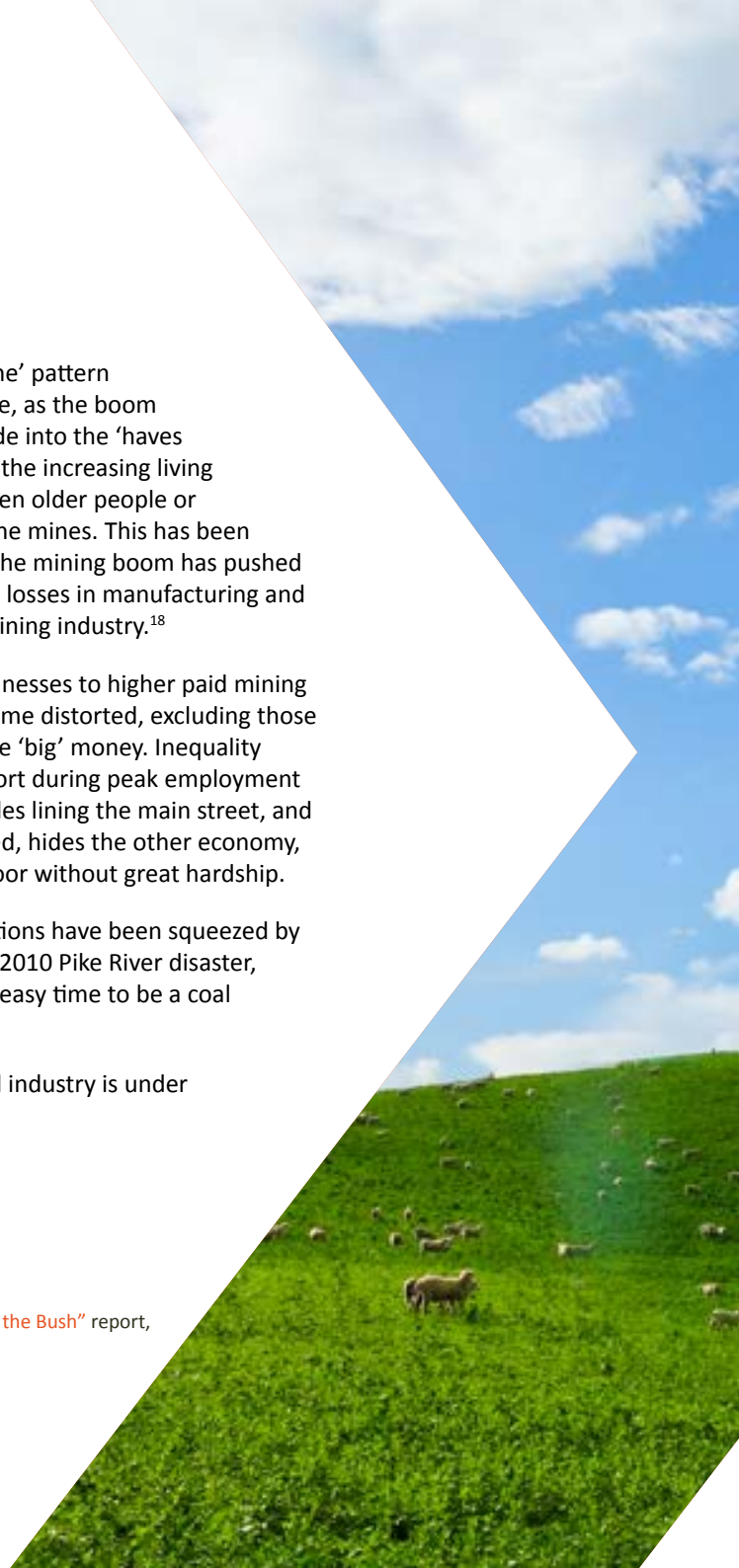
Along with this familiar 'feast or famine' pattern comes the two-speed economy, where, as the boom accelerates, mining communities divide into the 'haves and have-nots'; those who can afford the increasing living costs and those who cannot, most often older people or single parents unable to get work in the mines. This has been well-documented in Australia where the mining boom has pushed up the price of the dollar, creating job losses in manufacturing and other sectors not involved with the mining industry.[18]

Tradespeople move from existing businesses to higher paid mining jobs. Real estate and food prices become distorted, excluding those who cannot afford them, favouring the 'big' money. Inequality increases. The familiar sight in Westport during peak employment at Stockton, of four wheel drive vehicles lining the main street, and hotels and top end rentals fully booked, hides the other economy, where it is no longer possible to be poor without great hardship.

As well as layoffs, small mining operations have been squeezed by hikes in mines rescue levies since the 2010 Pike River disaster, tipping some into closure. It is not an easy time to be a coal miner.

One thing we do know is that the coal industry is under immense pressure.

18 The Australia Institute: "Still beating around the Bush" report, February 2013.



BATHURST RESOURCES (NZ)

The boom-bust pattern continues. Bathurst Resources (NZ) recently gained all consents to mine the Denniston Plateau escarpment after attempts by the Forest and Bird Protection Society and others to protect it were ultimately unsuccessful.

"BATHURST IS NOT WITHOUT RISK"

Bathurst appeared ready to mine as soon as the authority to enter and operate was given, yet in the space of a few months the price of coking coal slipped well below break-even point for the company. The project has been put on hold until prices recover, but who knows when that will happen. Weak coal prices and a negative cash flow means that Bathurst has had to go back to their investors for further capital raising and may need to do so again.

According to Forsyth Barr broker Andrew Rooney on 7 February 2014, "Bathurst is not without risk."[19] Inextricably linked to that risk are the resource-dependent communities of Nightcaps and Westport where Bathurst currently mines.

INTERNATIONAL MINING COMPANIES

Solid Energy and Bathurst resources are not alone in their woes. BHP Billiton, Anglo American, and Rio Tinto have all recently announced the closure or mothballing of metallurgical coking coal mines and job losses in Australia.

19 Coal price lift would help Bathurst on the way forward – NZ Resources.com

> "Further investment [in the company's metallurgical coal operations] is much less likely as the record prices we experienced over the past decade, driven by the demand shock, will not be there to support returns over the next 10 years."
>
> **BHP Billiton CEO Dean Dalla Vale.**[20]

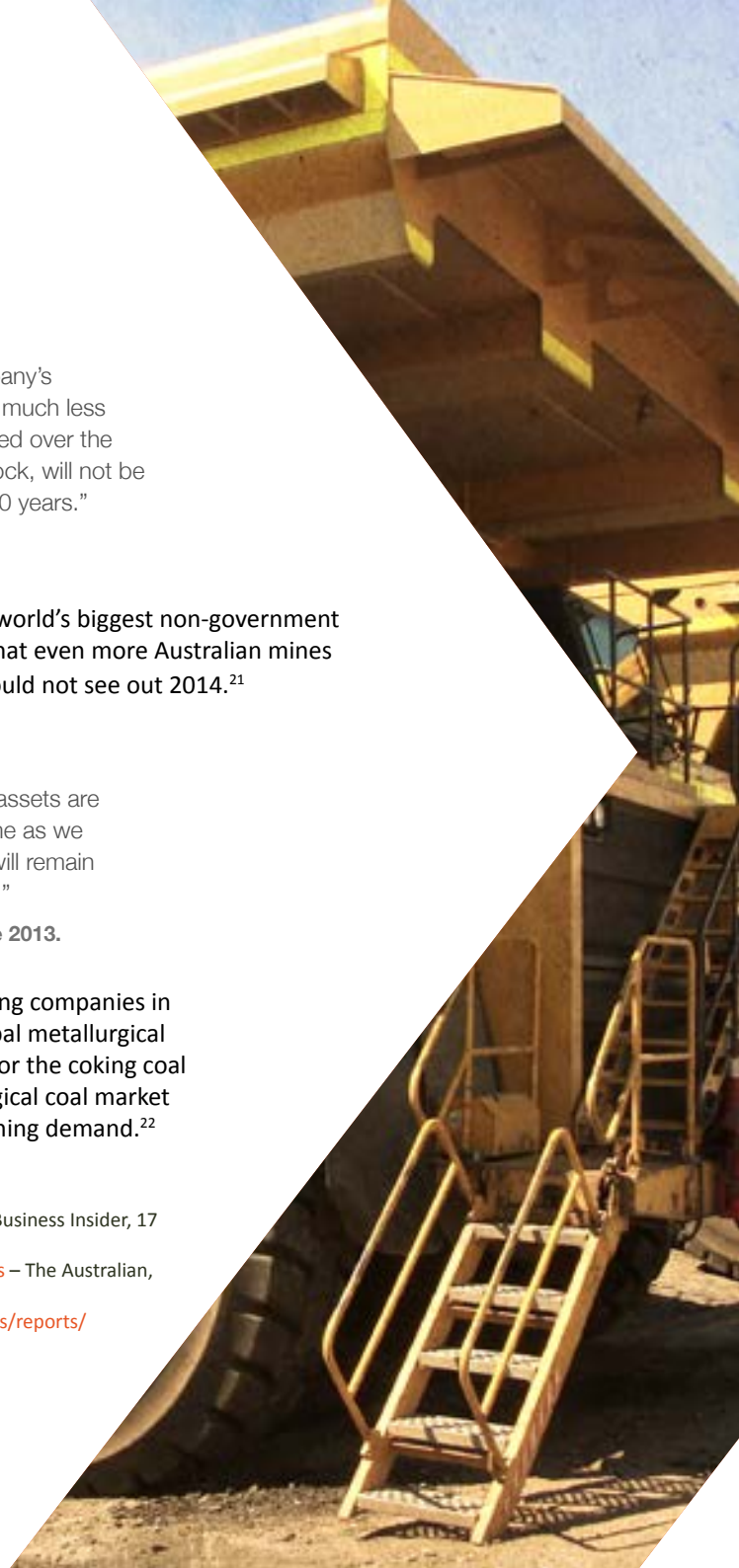
In February this year the head of the world's biggest non-government coalminer, Peabody Energy, warned that even more Australian mines were still losing cash and probably would not see out 2014.[21]

THE OUTLOOK FOR COAL PRICES

> "The carrying values of our coal assets are likely to remain low for some time as we expect that international export prices will remain depressed in the short to medium term."
>
> **Mark Ford, Solid Energy Chairman, June 2013.**

Financial reports from the major mining companies in Australia paint a grim outlook for global metallurgical coal. China was once the great hope for the coking coal exporters, but BHP Billiton's metallurgical coal market outlook (May 2013) indicated a flattening demand.[22]

20 BHP CEO – China's steel boom has peaked, Business Insider, 17 October 2012
21 Falling price to force more coalmine closures – The Australian, February 3 2014
22 http://www.bhpbilliton.com/home/investors/reports/Documents/2013/130529_CoalBriefing.pdf



The increased usage of scrap metal in furnaces, BHP Billiton warned, would result in lower growth in demand for pig iron while greater production from electric arc furnaces - which use little or no coking coal - are expected to "contribute a significant share of total Chinese steel production by 2030". But it's not just China; the company also cautions that the Indian steel outlook is less certain as steel production growth has been slower than expected.

> "The overall industry will remain [with a large amount of] over-capacity [leading to] low [profit] margins, with consequent unsatisfactory results for the steel mills"
>
> **Bruno Bolfo, chairman of Duferco, the world's biggest steel trader**[23]

This is the marketplace in which New Zealand export coals compete, and this is the marketplace that holds the livelihoods of workers and communities in its hands. The current state and future outlook of the coal industry suggests that it would be risky to rely on a newcomer like Australian-owned Bathurst to succeed in being a reliable employer where Solid Energy, BHP Billiton and other industry giants have failed.

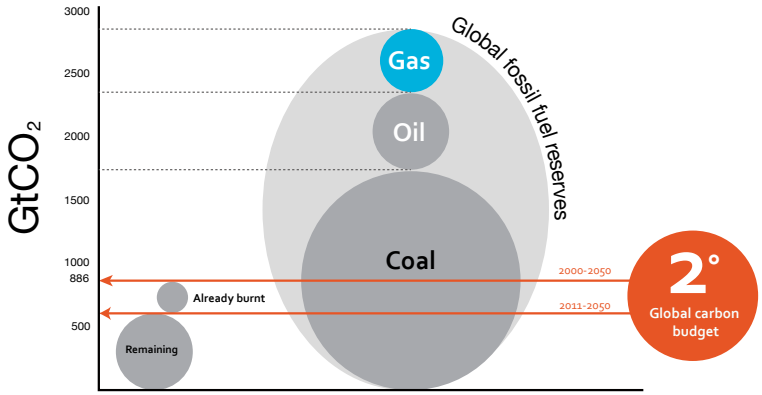
There are those who remain positive about the industry's future, but recent events in the coal industry, and the uncertainty over its future in both the medium and long terms, suggest there are better industries to back.

Underlying all this woe for the coal industry is the inescapable fact that we cannot afford to burn even the coal we already have in our inventories now.

23 http://www.marketwatch.com/story/bhp-billiton-unlikely-to-grow-australian-coal-ops-2012-10-16

THE CARBON BUBBLE

From the South Seas Bubble to the housing and dot.com bubbles of the last decade, over-investment in areas of the economy from which excess profits are perceived to be made has led to speculative bubbles which eventually burst. In the economic fallout that results, working people carry the can, while the speculators and profiteers generally are not accountable. Now another speculative bubble has formed, and it dwarfs those that went before. It is called the Carbon Bubble.



Some basic maths, from the Carbontracker 2012 report *The Carbon Bubble*, illustrates the size of the bubble:

- The one thing world leaders agreed at the Copenhagen climate talks was that the Earth needs to stay below 2°C warming to minimise the risk of runaway climate change
- If we are to avoid going over 2°C, we can emit only 565 more gigatonnes of carbon dioxide
- Burning the fossil fuel that corporations now have in their reserves would result in emitting 2,795 gigatonnes of carbon dioxide – five times the safe amount[24]

The Intergovernmental Panel on Climate Change has now produced its own carbon budget and has calculated that if we continue pumping carbon into the atmosphere at the rate we are today, we will use up this carbon budget within 15-25 years.[25]

This means there will be huge pressure on the fossil fuel industry to keep most of its reserves in the ground. That pressure has already begun around the world. Citizens are pressuring their pension funds to divest from fossil fuels and some are doing so. 2013 saw several major financial institutions recognise the financial and ethical implications of continuing to finance fossil fuels, with Norwegian Storebrand, Rabobank and the World Bank among those who made major announcements on divestment or cutting loans.

It could be argued that divestment is now going mainstream. In late April 2014, the world's largest fund manager, Blackrock, joined with the FTSE Group in London to create a new index. The ex-Fossil Fuels Index Series is an innovative set of benchmark indices that excludes companies directly engaged in extracting so-called "stranded assets" in the hydrocarbons industry.

"This is one of the fastest-moving debates I think I've seen in my 30 years in markets," a FTSE managing director, Kevin Bourne, told the Financial Times.[26]

In May, 2014, the Anglican Church in Aotearoa, New Zealand and Polynesia agreed to divest its $160 million worth of funds in fossil fuel companies by 2016.

The largest contribution to climate change from the fossil fuels in company inventories at present is from coal. As it has the largest climate impact per unit of useful energy, it is being targeted for early phase out.

THE LARGEST CONTRIBUTION TO CLIMATE CHANGE FROM THE FOSSIL FUELS IN COMPANY INVENTORIES AT PRESENT IS FROM COAL.

The book value of fossil fuel companies is determined by the size of their reserves. When companies' book value greatly exceeds their realisable value, then a speculative bubble has formed. And this one is massive. Bubbles always burst in the end, leaving behind stranded assets and stranded capital – and leaving workers in the lurch.

24 Unburnable Carbon 2013 report produced with the Grantham Research Institute on Climate Change and the Environment at London School of Economics and Political Science.

25 IPCC, Fifth Assessment Report, Working Group I, 2013, Summary for policymakers, page 27

26 FTSE joins Blackrock to help investors avoid fossil fuels, Financial Times, April 28, 2014.

Unburnable Carbon (2013) says:

> Company valuation and credit ratings methodologies do not typically inform investors about their exposure to these stranded assets, despite these reserves supporting share value of $4 trillion in 2012 and servicing $1.27 trillion in outstanding corporate debt over the same period. We need to challenge these methodologies."[27]

The World Bank, the European Investment Bank and the US Import-Export Bank have all announced they will not fund further coal-fired power plants except in exceptional circumstances.

CLIMATE CHANGE CONCERNS, NEW TECHNOLOGIES, AND MARKET REALITIES ARE REVEALING COAL AS THE SUNSET INDUSTRY IT REALLY IS.

As changes in policy by the major coal consumers, the uptake of renewables, and the need to stay within the global carbon budget begin to bite, it is high-cost producers who will be squeezed first. Indeed, they already are being squeezed, as seen in the fate of Solid Energy, who bet on continued high coal prices, and bet very wrong. Solid Energy's workers know all about the consequences of that bad bet.

27 Unburnable Carbon 2013 http://www.carbontracker.org/carbonbubble

So this is the environment in which the New Zealand coal industry finds itself. Internationally, coal is no longer looking like a safe investment. Climate change concerns, new technologies, and market realities are revealing coal as the sunset industry it really is. Domestically, the coal industry is under severe strain. This is not an industry New Zealanders can rely on for future wealth and future jobs and a managed transition is needed.

Before exploring how that transition might be managed, we look at the kind of future we might transition to.

SECTION THREE

ALTERNATIVES TO COAL

Phasing out coal over the next decade or two, whether to protect the climate or to protect communities against the volatility and heartbreak of a sunset industry, presents us with several challenges:

- For the users: what are they going to use instead of coal?
- For the national economy: what will replace the export earnings that have come from coal in the past?
- For coal workers: how are they going to provide livelihoods for their families?
- For coal mining communities: how will they sustain their population and their prosperity?

This section briefly answers the first question, which then provides some ideas we can work with in the next section to address the others.

Worldwide, most coal is used for electricity generation, but this is not the case in New Zealand where the only coal-fired generation is at Huntly power station which can burn gas or coal. It is very old and operates at only 34% efficiency. One unit is already mothballed, one is scheduled for retirement and the rest could, and should, be replaced with a mix of geothermal, wind, rooftop photo-voltaic and greatly improved efficiency of end use, for which there is a lot of scope.

Renewable energy generation projects consented - but not under construction - would together generate three to five times as much power as Huntly and could be built right away. It is the existence of Huntly that keeps them on the drawing board rather than under construction.[28]

28 (David Rohan (EECA) Generation Adequacy – renewables replacing Huntly coal-fired power station (2014) based on Electricity Authority report

The three biggest coal users in New Zealand are: [29]

1. Steel making (~30%) – coking coal
2. Huntly power station (22% in 2010 but fluctuates greatly) - thermal
3. Dairy processing (~ 18%) - thermal

Next come other industrial and manufacturing processes. Agriculture is 3.3% and buildings (eg hospitals, schools, homes) 3.4%.

There are many options for climate-friendly heat. Where geothermal steam is available it is low cost and reliable. It is already used here by Maori-owned Miraka's milk drying plant near Taupo and elsewhere for timber drying and heating.

ALL FORESTRY OPERATIONS PRODUCE LARGE QUANTITIES OF WASTE WOOD – PRUNINGS, THINNINGS, BARK, SAWDUST, LOW QUALITY DAMAGED AND BROKEN LOGS. THESE OFTEN AMOUNT TO MORE THAN HALF THE TREE.

The Kawerau A-8-D Ahu Whenua Trust and two other groups are currently seeking permission to build a geothermal power plant on land north-east of Kawerau, in the Bay of Plenty.[30]

For low temperature heat, such as swimming pools, direct use of solar is an option. For large scale, high-temperature heat, New Zealand has an unsurpassed supply of waste wood which can be made into chips or pellets.

29 These figures vary widely. Dairy processing percentage likely to increase
30 Plan for Power Plant – Radio NZ news, February 10, 2014

WHAT IS "SUSTAINABLE WOOD"?

The carbon dioxide wood emits when burned is equalled by the carbon dioxide captured out of the atmosphere by the next tree planted in its place, so rotationally-grown wood is internationally regarded as carbon-neutral.

We are not advocating cutting forests for energy, which has its own environmental issues. But all forestry operations produce large quantities of waste wood – prunings, thinnings, bark, sawdust, low quality damaged and broken logs. These often amount to more than half the tree. Much of this material is actually burned on site to get rid of it; the rest is left to rot. That's like milking a cow, taking only the cream and throwing away the milk.

New Zealand uses about 60 PJ/y of coal. (A petajoule is roughly the energy carried by a small sea-going oil tanker.) Not all forestry wastes can be economically or feasibly recovered, but a thesis by Nic Deller of Otago University calculates there is 26.7 - 48.6 PJ /y of wood residue from plantation forestry available for recovery in New Zealand in the period 2011 - 2035.[31]

This would be more than enough to replace our industrial coal use if Huntly's coal were to be replaced with renewable generation and the coal used to heat swimming pools, hospitals, schools etc was replaced with solar and greater energy efficiency. So within New Zealand, our first challenge is easily met.

31 Deller, N. Residues: a feasibiity study. Otago University 2012

COAL AND STEEL

More than half of New Zealand's coal is exported and most of that is for steel making. We are often told that you can't make steel without coal, because you need the carbon in the coke to combine with the oxygen in the iron oxide to reduce it to pure iron. Fortunately that is no longer the case.

First, there could be much greater recycling of steel than the current 30% worldwide. This can be done without any coal, using electric arc furnaces that could source renewable electricity, and don't use coal.

Forecasts and studies about China's use of scrap steel indicate that it will be making a strong shift to scrap steel in the coming years. In 2012, Bloomberg reported[32] that scrap steel may account for more than 20 percent of steel production in China by 2015, up from 14 percent now.

A study by Metal Bulletin[33] in October 2013 says the demand for scrap steel in China is expected to increase by 7 percent a year on average to 2021, "at a time when the world's scrap supply will dramatically increase, reaching well over 2 billion tonnes - with the lion's share of supply coming from obsolete scrap, stemming from the past decade's substantial manufacturing."

The study points out that electric arc furnaces compared with oxygen furnaces (that use iron from coal) "use 75-85% less energy, 90% less virgin materials and 52% less water; they also produce 76% fewer water pollutants, 86% fewer air pollutants and 97% less mining waste. On average, recycling 1 tonne of steel saves about 1.1 tonnes of iron ore, 630kg of coal, and 55kg of limestone. Carbon dioxide emissions are reduced by 58% through the use of ferrous scrap[34]. Recycling 1 tonne of steel saves 642kWh of power, 1.8 barrels (287 litres) of oil, 10.9 million Btu of energy and 2.3 cu metres of landfill space."[35]

CARBON FROM WOOD WILL DO THE JOB JUST AS WELL.

Then, both steel and energy could be used much more efficiently than they are now.

For the remainder, carbon from wood will do the job just as well. Brazil's unsustainable use of old growth forests to make charcoal for steel has rightly driven major environmental campaigns against biochar, but the same product can be made from wood waste or sustainably grown wood.

The total sustainable worldwide biomass energy potential is about 100 EJ/y (exajoule = 1,000 petajoules) (the share of woody biomass is 41.6 EJ/y), which is about 30% of total global energy consumption.[36]

A start-up business in Blenheim, CarbonScape, has invented an innovative, energy efficient microwave process to make "green coke" from waste wood

32 China steelmakers to use more scrap over iron ore, dealer says - Bloomberg News October 9 2012

33 A radical reassessment of China's future scrap consumption - Metal Bulletin research report, October 18 2013

34 if the energy source for EAF were to be renewable, this number would be much higher

35 ibid, Metal Bulletin research report

36 Parikka, M. 2003. Global biomass fuel resources. Biomass and Bioenergy, 27, 613-620

which can be dropped into a blast furnace. They have a supply contract with BlueScope's New Zealand Steel at Glenbrook for 9,000 tonnes and another contract for the necessary waste wood. A tiny fraction of the backing the government gives the coal industry could provide the start-up capital to see them go into production.

Technologies like this will eventually go global in order to address climate change. See more on this in Fitzsimons, J "Can we make Steel without coal?"[37]

CHEAP COAL

Coal is used because it is cheap. It is cheap because it doesn't have to pay for its "externalities" – the damage it wreaks both on the environment and human health. That is starting to change with a price going on carbon through the introduction of Emissions Trading schemes (ETS) around the world. While some are supra-national (EU) and others national (Switzerland, New Zealand), there is now a string of regional ETS programmes starting to spring up, such as the Regional Greenhouse Gas (RGGI) initiative that runs across nine states in the US, and the Tokyo Cap and Trade Scheme.[38]

2013 was a record year for new ETS schemes, with nine new schemes starting up, five of them in China. By 2015, the International Carbon Action Partnership estimates 70% of the world's emissions will be covered by some kind of ETS scheme.[39]

Such schemes are subject to changes in political fortune and often have loopholes that can be exploited, but they are making an impact.

37 Fitzsimons, J, Coal Action Network Aotearoa, April 2013.
38 Emissions Trading Worldwide International - Carbon Action Partnership (ICAP) Status Report 2014
39 Ibid

The US's RGGI scheme is expected to generate USD$1.6 billion in the first three years, saving consumers USD$1.1 billion in electricity costs, creating 16,000 "job years" in the region and keeping USD$765million in the region.[40]

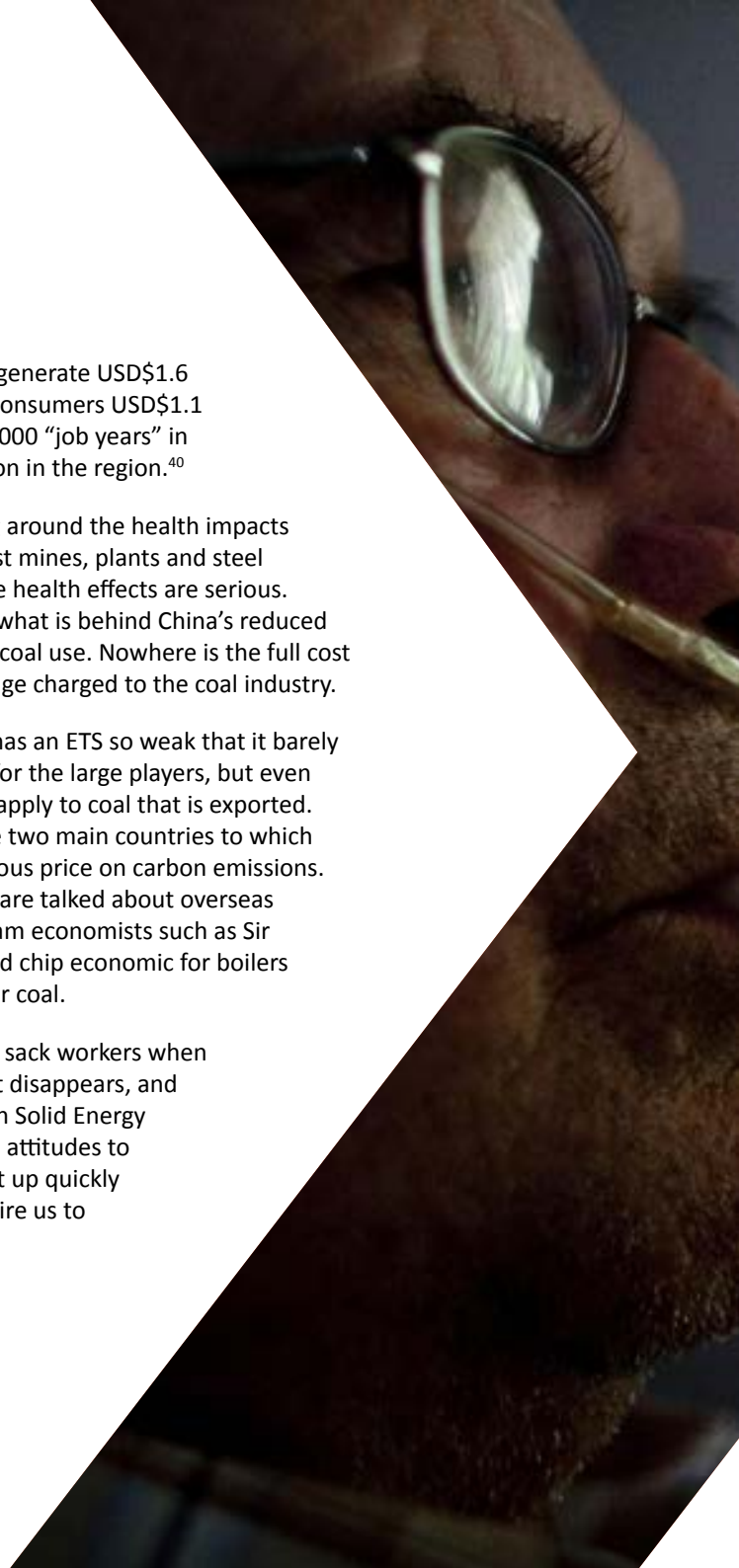
Furthermore, scientific understanding around the health impacts of burning coal or living near open cast mines, plants and steel mills is accumulating and it is clear the health effects are serious. This is part of what is behind China's reduced projections of coal use. Nowhere is the full cost of heath damage charged to the coal industry.

NOWHERE IS THE FULL COST OF HEATH DAMAGE CHARGED TO THE COAL INDUSTRY.

New Zealand has an ETS so weak that it barely affects prices for the large players, but even that does not apply to coal that is exported. Neither do the two main countries to which we sell – India and Japan - have a serious price on carbon emissions. But carbon prices of $50-100 a tonne are talked about overseas and are advocated by many mainstream economists such as Sir Nicholas Stern. That would make wood chip economic for boilers everywhere and reduce the market for coal.

We have seen how mining companies sack workers when the price of coal drops or their market disappears, and we have not seen the end of this. Even Solid Energy recognised the changing international attitudes to coal, advising the government to dig it up quickly before international agreements require us to keep it in the ground.

40 ibid



In August 2010 Solid Energy proposed to Treasury that it develop a Natural Resources Company. It included these two assumptions in its underpinning rationale:

- "a short window of opportunity - the assumption is that the world is entering a transition period between traditional fossil fuels and yet to be developed renewable technologies, during which time supernormal profits will accrue to those able to exploit natural resources. ***Post the transition period, these resources are to decline in relative value*** [our emphasis]."
- "New Zealand could miss out on supernormal profits during this period - to capture these returns, SEL states New Zealand must own the exploration, production and marketing processes, not just receive a royalty from the resource."[41]

Treasury didn't take up the offer.

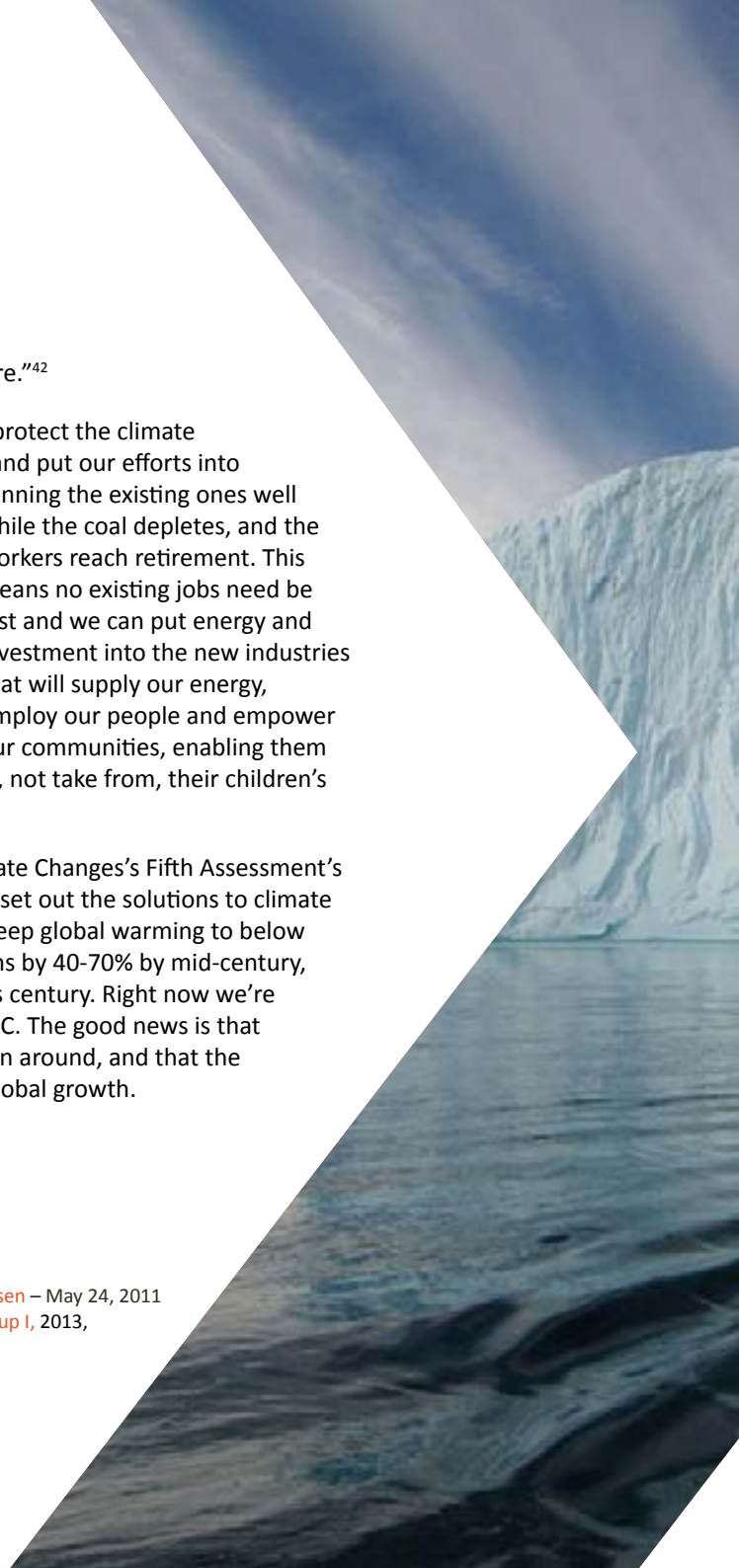
While these observations may make sense from a purely profit-oriented perspective, they are irresponsible in terms of our children's future. During a visit to New Zealand in May 2011, climate scientist Dr James Hansen advised our Prime Minister John Key to *"leave the massive deposits of lignite coal in the ground,"* and instead develop New Zealand's *"natural bounty of renewable energies and energy efficiency."*

He saw New Zealand's voice in support of international actions to ameliorate climate change as important, and said "The fact is that we, the older generation, are on the verge of handing young people a dynamically changing climate out of their control, with major consequences for humanity and nature."[42]

The way to phase out coal in time to protect the climate is to stop developing any new mines and put our efforts into running the existing ones well while the coal depletes, and the workers reach retirement. This means no existing jobs need be lost and we can put energy and investment into the new industries that will supply our energy, employ our people and empower our communities, enabling them to determine a path that will build up, not take from, their children's future.

THE FACT IS THAT WE, THE OLDER GENERATION, ARE ON THE VERGE OF HANDING YOUNG PEOPLE A DYNAMICALLY CHANGING CLIMATE OUT OF THEIR CONTROL, WITH MAJOR CONSEQUENCES FOR HUMANITY AND NATURE.

The Intergovernmental Panel on Climate Changes's Fifth Assessment's Working Group III,[43] released in April, set out the solutions to climate change. The IPCC says if we want to keep global warming to below 2degC, we have to cut global emissions by 40-70% by mid-century, leading to near zero by the end of this century. Right now we're heading to a warming of at least 4degC. The good news is that it's not impossible to turn the situation around, and that the cost would be only 0.06% of annual global growth.



41 New Zealand Herald, FOI documents from Treasury, November 2013

42 Open Letter to John Key from Dr James Hansen – May 24, 2011

43 IPCC, Fifth Assessment Report, Working Group I, 2013, Summary for policymakers, page 27

SECTION FOUR

A LOW-CARBON ECONOMY AND NEW JOBS

In the 1980s, under Thatcher in the UK and Roger Douglas's Rogernomics programme in New Zealand, we saw all too well that when industries are closed and jobs destroyed in large numbers, that investment does not automatically flow into new industries and new jobs. The market needs help to achieve this or workers are left to pay the price.

Co-ordinated planning at national, regional and local levels can create flourishing communities in which workers are protected. In the longer term we need to rethink economic objectives and design an economy better suited to meeting human needs. In section five we outline how coal communities might reinvent themselves and the sort of help they will need.

TRANSITION TO A GREEN ECONOMY

Around the world there are business and government initiatives to foster "green growth" – economic development that meets human needs, employs people in stable, worthwhile jobs, and that does not rely on fossil fuels, depleting water resources, over-using soils, or releasing toxic chemicals.

There are many overseas reports on how this can be done, for example:

- The Economic and Social Commission for Asia and the Pacific (ESCAP) has written a green growth road map for the region[44]
- The Global Green Growth Institute (GGGI) has 20 member countries and works with UNEP, the OECD and the World Bank.[45]

44 Green Growth, Resources and Resilience: Environmental Sustainability in Asia and the Pacific – UNESCAP – January 1 2012
45 Global Green Growth Institute: about

- The World Bank, normally a conservative body, has set up the Green Growth Knowledge Platform and has recognized the importance of sustainable development.[46]

- In New Zealand, Pure Advantage has set out major opportunities for the New Zealand economy to prosper in ways that protect the environment and the climate.[47]

A Price Waterhouse Cooper report stated[48] that, should we choose it, New Zealand's potential share of the global market for clean technologies is estimated at up to $22 billion per year. The jobs these technologies will generate are local, longer lasting and less subject to the uncertainties described in section two. For example, while jobs in the fossil fuel economy were lost during the financial crisis, job growth in the green economy remained strong.

WHILE JOBS IN THE FOSSIL FUEL ECONOMY WERE LOST DURING THE FINANCIAL CRISIS, JOB GROWTH IN THE GREEN ECONOMY REMAINED STRONG.

Many of these jobs could be created right now, employing the hundreds who have already lost jobs in the coal industry, if the government and local development trusts were determined to look after workers and our climate. But little action is being taken to support vulnerable workers and communities.

46 Green Grown Knowledge Platform
47 Green growth: opportunities for New Zealand: University of Auckland Business School & Vivid Economics, November 2012
48 A Clean Economy Vision for New Zealand 2025, Price Waterhouse Coopers for New Zealand Trade and Enterprise, 2009. quoted in Greenpeace report

REPLACING COAL: THE NATIONAL ECONOMY AND EMPLOYMENT

There is unlikely to be a single solution to replace fossil fuels. Instead there are myriad potential solutions. The renewable energy sector, as one example, has become a significant employer worldwide, with the potential for adding millions of jobs in the coming years. In their 2013 report "Renewable Energy and Jobs" IRENA, the International Renewable Energy Agency, say that wind power related employment more than doubled in the past five years, while solar photovoltaic (PV) employment has soared nearly 13-fold.[49]

New Zealand is well-placed to share in this fast growing sector. We have some of the best wind sites in the world, reasonable solar potential, large quantities of waste wood and good expertise and resources for geothermal energy.

ENERGY EFFICIENCY

Many New Zealand homes are very poorly insulated, or not at all. For some years, Governments have been making grants to assist homeowners to make their houses warmer. From 2009 to 2013 an expanded, four-year programme insulated 230,000 homes, but in 2013 the programme was cut back and now only low income homeowners and tenants with high health needs qualify for assistance. This was poor economics as the job is far from done.

49 "Renewable Energy and Jobs" IRENA, 2013

The home insulation scheme more than pays for itself by reducing sickness, especially asthma and respiratory problems that, in turn, reduces health costs to the taxpayer and days off work and school. For every $1 the government spends on insulating homes the benefits are $4-5 in saved health costs, strengthening the economy and reducing the deficit. An expansion of the scheme to include an additional 100,000 homes per year would see 4,000 new jobs created, spread through every community.[50] That alone is far more than coal mining employs.

AN EXPANSION OF THE SCHEME TO INCLUDE AN ADDITIONAL 100,000 HOMES PER YEAR WOULD SEE 4,000 NEW JOBS CREATED.

RENEWABLE ELECTRICITY

The economics of solar photovoltaic generation by households and small commercial businesses has improved enormously in the last three years as the price of panels has plummeted. It is becoming worthwhile for households to install panels and feed their surplus into the grid. This can reduce the use of coal and gas in power stations.

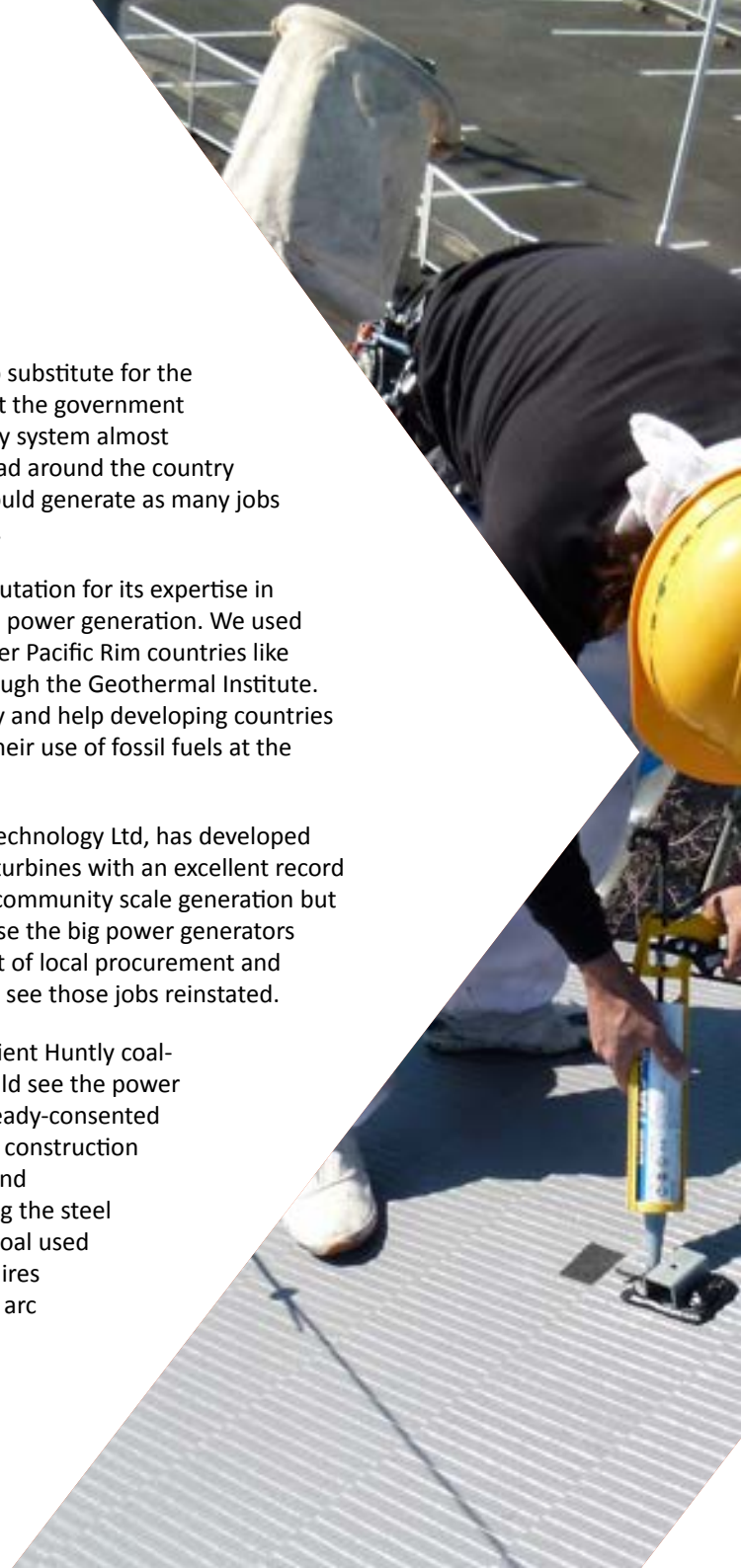
Nelson-based Solar City[51] employs 22 people selling and installing such grid-tied home generation but the industry is slow to develop because, unlike many developed countries, households here have no security over the price they will be paid for their surplus power.

A modest "feed-in tariff" such as exists in Germany, the UK[52] and a number of other countries would make solar electricity worthwhile for many more people and could help substitute for the Huntly power station. That would cost the government nothing, and would cost the electricity system almost nothing, but just five companies spread around the country doing the same trade as Solar City would generate as many jobs as the Rotowaro mine in the Waikato.

New Zealand has an international reputation for its expertise in geothermal energy, for both heat and power generation. We used to train geothermal engineers for other Pacific Rim countries like Indonesia at Auckland University through the Geothermal Institute. This could again be an export industry and help developing countries develop their resources and reduce their use of fossil fuels at the same time.

A New Zealand company, Windflow Technology Ltd, has developed and manufactured high quality wind turbines with an excellent record in durability and output, suitable for community scale generation but has laid off most of its workers because the big power generators in New Zealand prefer to import. A bit of local procurement and support for its export initiatives could see those jobs reinstated.

A requirement to close the old inefficient Huntly coal-fired power station, for example, would see the power companies building some of their already-consented wind and geothermal plants, creating construction jobs for several years and operation and maintenance jobs thereafter. Recycling the steel from the Huntly plant would reduce coal used in steel making as recycling steel requires no coal and can be done with electric arc furnaces.



50 Robert Lintermann, EECA, pers comm
51 Solar City website
52 UK Feed in Tariff website

RENEWABLE INDUSTRIAL AND TRANSPORT FUEL

Wood waste can replace coal in boilers and eventually in steel making and create many sustainable job opportunities. Harvesting techniques that make it easier to recover forest residues and process them can employ more people wherever there is commercial production forest: jobs in residue recovery, chipping, drying, transport, boiler design, boiler running.

MOST OF THE WOOD WASTE CURRENTLY STOCKPILED ON LANDING SITES IS LEFT TO ROT OR IS EVEN BURNED TO GET RID OF IT, BECAUSE COAL IS CHEAPER.

Most of the wood waste currently stockpiled on landing sites is left to rot or is even burned to get rid of it, because coal is cheaper. A decision to phase out coal or a real carbon price on its emissions would see new industries develop to harvest, process and deliver this wood to customers. There is already a small-scale industry where waste wood aggregators put together continuous supply from multiple forests of partly dried and chipped wood waste for industrial boilers. There is scope for this to grow very significantly everywhere that there are commercial forests.

Peter Hall, Scion, estimated in 2012 that 'in-forest' residues would be 4.9 million tonnes per annum by 2030, which is comparable to current coal demand in New Zealand.[53] MPI has since then revised the forest area on which this was based, and the author's updated estimate is just over 4 million tonnes, of which some 2.2 million is estimated to be recoverable.[54]

53 IEA bioenergy – promising resource series, 2013
54 Hall to Fitzsimons, pers comm, April 2014

Differing estimates for different years reflect a lot of variables, including forest ages over time, and costs of recovery which are still evolving but it is clear there is enough to achieve significant replacement of coal.

Even the West Coast, not a major plantation forestry region, currently has enough forestry residue, going to waste, to replace 18,000 tonnes of coal.[55] This could be powering West Coast industry and employing ex-coal miners right now – for example in a new industry heating greenhouses to grow foods that are currently imported from other regions or even overseas, or supplying heat to schools and hospitals.

While a 2010 study commissioned by EECA[56] created an input-output model to assess job numbers in particular industrial uses of wood waste, nobody has undertaken a whole value-chain study of the jobs created by collecting wood waste from our vast tracts of plantation forests, drying it, chipping it and transporting it. However, a moment's reflection indicates these jobs would outstrip the 1200 in coal mining.

We are wary of large plans to plant huge new pine plantations for energy, bearing in mind the risk to regenerating biodiversity on land that is reforesting naturally. However, there is clearly some marginal pasture land of poor productivity where plantations would stabilise soil without cutting across

55 Peter Hall, (Scion) *Wood supply and forest derived residues, West Coast South Island*, report for EECA, 2012
56 Research report - how many jobs can be created by bioenergy? EECA 2010

the regeneration of permanent forest. As stated earlier, BERL have estimated that investment in plantation forest development and additional wood processing in Southland could result in an additional 1180 FTEs by 2026.[57]

Extrapolating that across the country, a Green Party proposal[58] to plant approximately 665,000 hectares of new forest in the next ten years estimates it would create 3,700 direct jobs for an investment of $36 million.

Transport fuels will also be made from waste wood in the future with opportunities for employment in the development of the technologies and the extra jobs created in the forestry industry. The Greenpeace Sustainable New Zealand Energy Outlook estimates 3,300 jobs could be created using biomass to fuel our industry and our transport by 2030.[59]

PUBLIC TRANSPORT

The transition to low carbon transport fuels will go hand in hand with major public transport upgrades in our towns and cities as we transform to a low carbon economy. Public transport is a job-intensive industry. Research in Austria, Canada and the US has shown that investing in public transport creates 50-100% as many jobs as investment in other areas of transport, such as national roading.[60]

57 New economic report set to ignite debate around lignite alternatives, WWF NZ, August 2012
58 Green Party of NZ: Green New Deal, December 2009
59 A sustainable New Zealand Energy Outlook – Greenpeace New Zealand, February 2013
60 Public transport: creating green jobs and stimulating inclusive growth - International Association of Public Transport, January 2013

Many of these jobs are in the supply chain – that is, in the design, engineering and manufacture of the vehicles and in the building of urban infrastructure to accommodate them. Worldwide, about 13 million jobs are linked to the provision of public transport and supply chain services. All of these should be local jobs that cannot be outsourced or moved out of the local area.[61]

Even the manufacturing could and should be local, for example, the Dunedin Hillside railway workshops could be restored to full production, providing the opportunity to utilise miners' engineering skills.

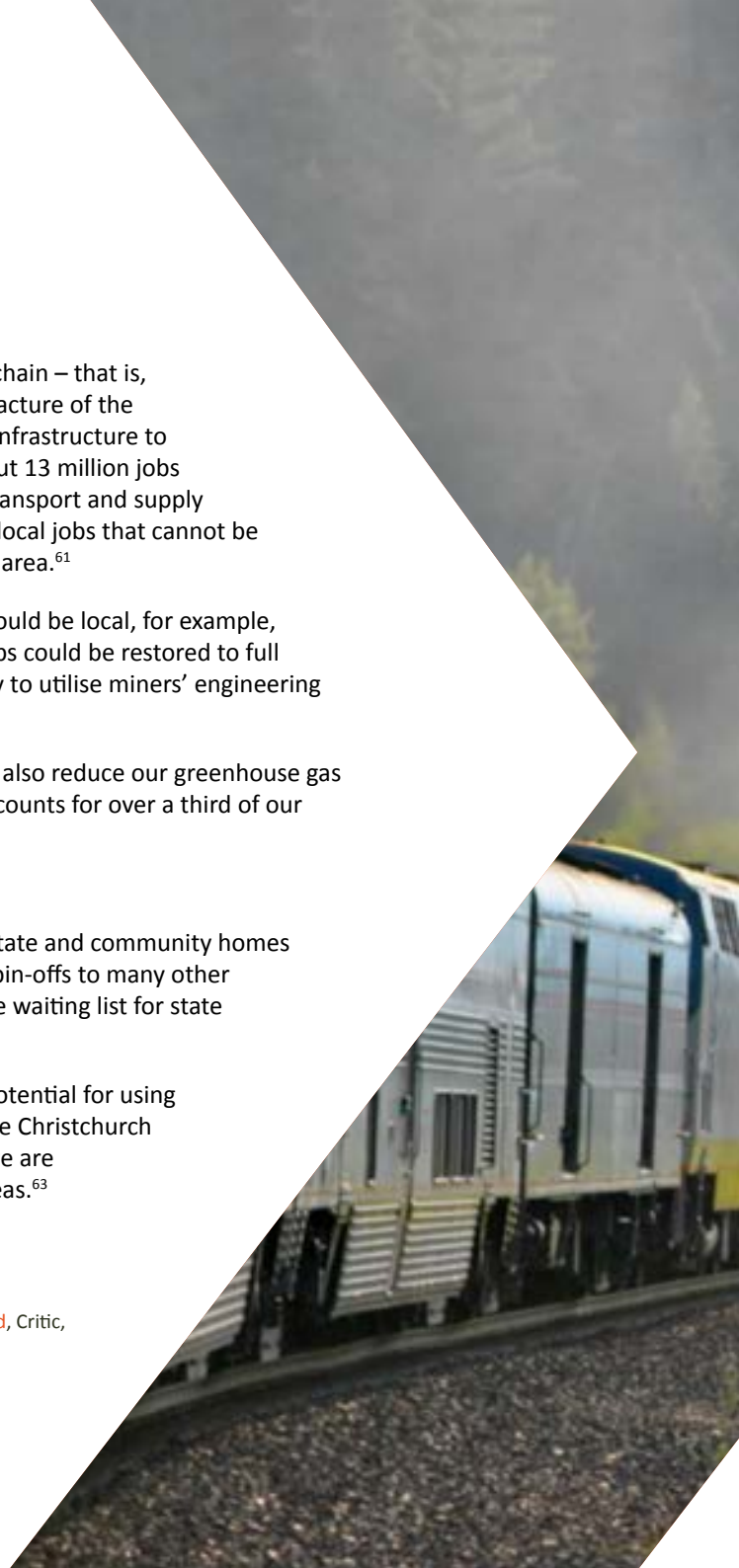
An increase in public transport would also reduce our greenhouse gas emissions profile, where transport accounts for over a third of our energy emissions.[62]

HOUSING

Building 2000 new, energy-efficient, state and community homes would create 3,100 direct jobs with spin-offs to many other industries. This makes sense when the waiting list for state houses is so long.

In the South Island there is massive potential for using both skilled and unskilled labour in the Christchurch rebuild for many years to come. Yet we are bringing in our workforce from overseas.[63]

61 ibid
62 UNFCCC New Zealand data, 1990-2011
63 Foreign workers flock to Christchurch rebuild, Critic, July 28, 2013.



INNOVATION IN THE WOOD INDUSTRY

Wood is abundant and grows easily in New Zealand, yet there is no national strategy to benefit from this advantage. Some 45% of our total wood harvest is exported as raw logs, with no value added. Despite this, the forest industry, including processing, employs 26,000 people. There would be even more jobs if more logs were processed here and if, rather than importing carbon intensive materials, more logs were used in manufacturing.

Wood provides an earthquake-proof, well-insulated and locally-grown low carbon alternative future building material to the concrete and steel edifices of the past.[64]

BUILDINGS UP TO SIX STORIES HIGH COULD BE CONSTRUCTED USING PRE-STRESSED AND LAMINATED LOCALLY GROWN TIMBER.

Instead of Christchurch being rebuilt with concrete and steel, two of the most carbon-intensive building products available, buildings up to six stories high could be constructed using pre-stressed and laminated locally grown timber, based on a method developed at Canterbury University by civil and natural resource engineers Professor Andy Buchanan, Associate Professor Stefano Pampanin and Dr Alessandro Palermo. This could also form the basis of an export industry.[65]

This is a tragic lost opportunity to use local materials, employ local skilled people, save import costs and design a resilient city.

64 Solid Wood website

65 UC engineering academics receive Innovation Medal - University of Canterbury website, 3 October 2013

Beyond Christchurch, there is great potential in the "Wood First" idea currently being promoted by the timber industry, where government buildings would be required to consider wood before choosing other materials. Add to that the opportunity to use forest-derived residues and we could have many new job-rich industries supplying boiler fuel to replace coal; liquid fuels for transport; and bio-chemicals such as polymers which are currently made from fossil fuels.

CONSERVATION

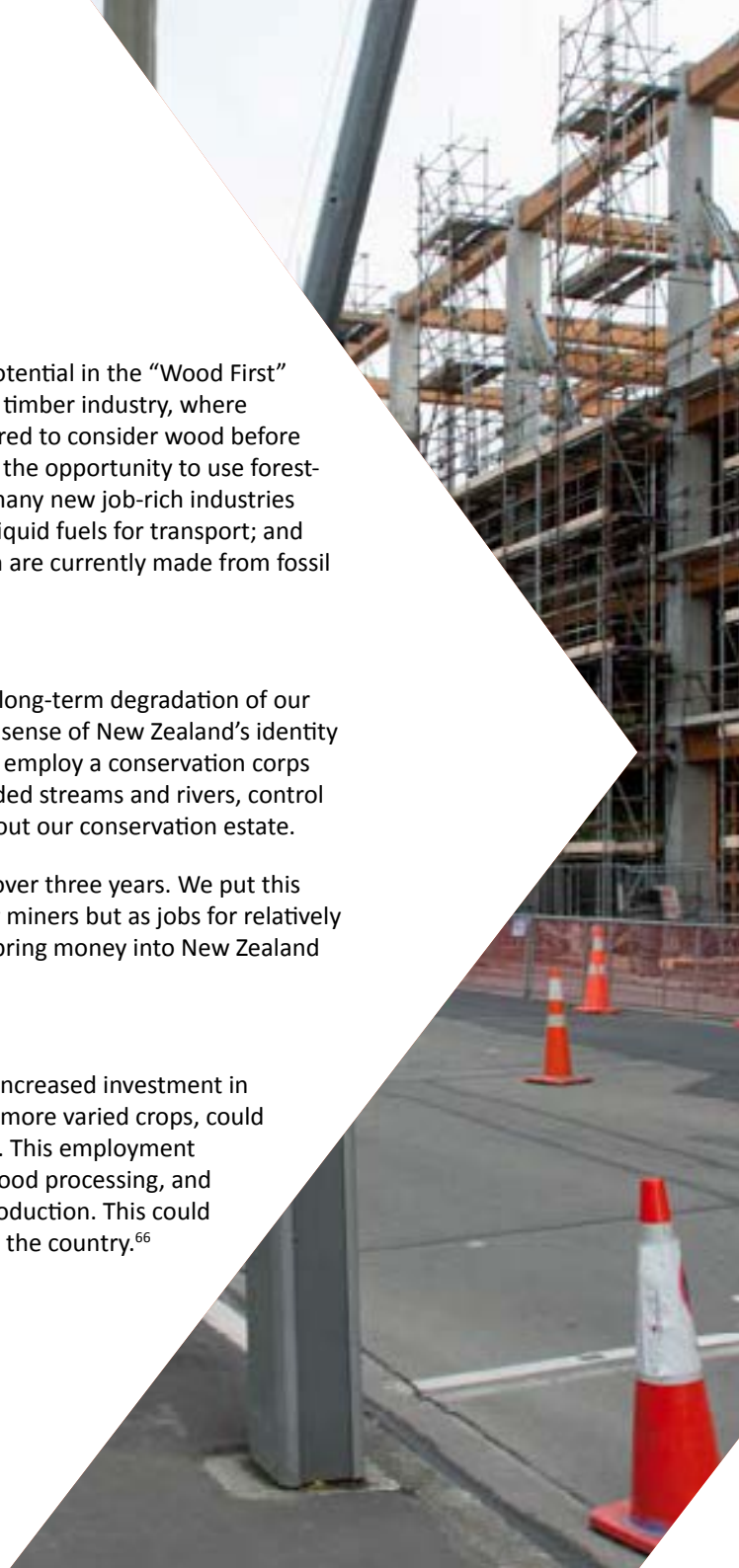
There is much to be done to stop the long-term degradation of our conservation estate. Our tourism and sense of New Zealand's identity depend on its preservation. We could employ a conservation corps of 3,000 to plant alongside our degraded streams and rivers, control wilding pines, and trap pests throughout our conservation estate.

This has been costed at $396 million over three years. We put this forward not as direct employment for miners but as jobs for relatively unskilled young people which would bring money into New Zealand rural communities everywhere.

LOW-CARBON HORTICULTURE

In Southland alone, as shown above, increased investment in horticulture, including additional and more varied crops, could add 540 FTEs in employment by 2026. This employment increase would be in sectors such as food processing, and supporting sectors such as nursery production. This could be applicable to many regions around the country.[66]

66 WWF Berl report 2012



THE ROLE OF CENTRAL GOVERNMENT POLICY

New Zealand governments have abandoned any efforts to provide a jobs-rich strategy for the transition to a new kind of world that is now inevitable. They have presided over the loss of tens of thousands of jobs in manufacturing.

Government appears to have a preference for letting government contracts to overseas firms, yet claim that coal mining and oil drilling are needed for the few hundreds of jobs these extractive industries provide.

Central government's role is essential in developing a jobs-rich transition strategy to phase out fossil fuels. For example, the government must:

- Stop subsidising fossil fuels and use that money to assist the transition
- Factor in the full costs to the New Zealand economy, not just the short term price, when choosing between New Zealand and overseas firms for contracts for goods and services
- Put a serious price on fossil fuel emissions, returning the money collected to citizens, in order to make clean alternatives relatively cheaper and help drive the transition
- Increase R&D funding, orienting it to low carbon industries, and leveraging private R&D funding. New Zealand has recently scored very low (20% below average) in a study on OECD productivity, and largely for the low percentage of GDP spent on R&D.[67] A good starting point would be low carbon fuels from waste wood
- Step up the creation of electronic infrastructure such as fast broadband, and low carbon transport infrastructure like new cycle paths, roading and rail to meet increased public transport needs
- Close the Huntly power station (although a carbon price might be all it needs to achieve this) so that new wind and geothermal are built
- Fund more home insulation, which pays for itself 4-5 times over in health cost savings
- Build more state houses, using wood wherever feasible
- Decentralise government departments where appropriate, so that government employees need not live in the major cities
- All of these strengthen the economy. An increased royalty (currently a pitiful maximum of 2% of profits) on coal mining up till the phase-out could fund some of the transition.

THE $150M RESCUE PACKAGE FOR SOLID ENERGY WOULD GO A LONG WAY TO FUNDING THE NEW, CLEAN TECH INDUSTRIES WE NEED FOR THE TRANSITION.

Coal, oil and gas exploration currently get a very good deal from the New Zealand government. Seismic information is heavily subsidised, tax and royalty regimes are very supportive. No such support is available for the transition to climate-friendly technologies. A WWF report[68] in 2013 showed that the New Zealand Government is subsidising

67 Productivity Commission report, April 2014

68 Fossil fuel subsidies in NZ: Government support – WWF, June 4, 2013

the oil and gas industries to the tune of $46 million a year. That figure doesn't include coal.

The $150m rescue package for Solid Energy would go a long way to funding the new, clean tech industries we need for the transition.

BUT WHAT ABOUT THE MINERS?

Along with replacing coal as a fuel and increasing employment opportunities across New Zealand, a transition plan needs to consider both the communities that will lose economic activity as coal phases out, and the miners themselves.

Many of the ideas above can be implemented in any community. Home insulation, increased horticulture, forestry, conservation plantings or solar energy can all be part of the solution for Westport, Huntly or Nightcaps, to sustain local businesses and local livelihoods. However many of them do not provide jobs that would use the skills of coal miners. Nor do they pay as well.

A transition plan (see Section Five) needs to analyse the skills that miners have in each community, and the other industries that use those skills. It is beyond the scope of this report to do a thorough analysis of the transferability of mining skills but there are some general points that can be made.

We have been told that a number of people were trained in some other trade or profession but did a short course and worked in the mines because of the high rates of pay. Some of them, when made redundant by Solid Energy, have gone back to their previous occupations.

Coal mining uses skills in engineering, loader and digger driving, electrical work, water and waste water management, health and safety, soil rehabilitation, welding, blasting, carpentry, rescue staff, first aid, fire prevention, chemistry, geology, hydrology accountancy, secretarial work, administration and more. These skills are transferable to various industries, some (eg office skills) more easily than others.

IT IS LIKELY THAT SOME OF THE MINERS SUCCESSFULLY RELOCATING TO THE CHRISTCHURCH REBUILDING PROGRAMME ARE USING THESE SKILLS.

Heavy vehicle drivers are needed at quarries and wherever there is building construction. It is likely that some of the miners successfully relocating to the Christchurch rebuilding programme are using these skills. Drivers of heavy machinery are also needed wherever there are roads needing major repair, or farm dams to construct in preparation for increasing drought driven by climate change.

The media has recently reported a shortage of skilled machinery operators on farms where contractors are bringing in overseas workers to do this.[69] Instead those jobs could be part of a transition plan away from fossil fuels. Electrical work and plumbing are needed throughout the country for building and maintenance. Engineering and

69 Overseas workers needed – Rural News Group, 17 December 2013

construction skills are needed to build the geothermal and, to a lesser extent, wind power stations that will replace Huntly.

Dunedin's Hillside railway workshops have always been noted for their quality and effectiveness. A full analysis of costs and benefits to the nation would likely see them reopen and employ people with engineering skills.

The greatly-expanded industry based on forestry residues that this report foresees will need drivers of heavy equipment and large trucks. Manufacturing of pre-stressed laminated building materials from wood will likewise use engineering and heavy construction skills.

This is just a sample of how mining skills can be transferred to other growth areas of the New Zealand economy in a properly planned transition driven by mining communities, involving unions and other stakeholders and with central government support, as set out in section five below. The alternative is just to let the redundancies happen, as has been the case so far, with no-one taking responsibility for the future of those affected.

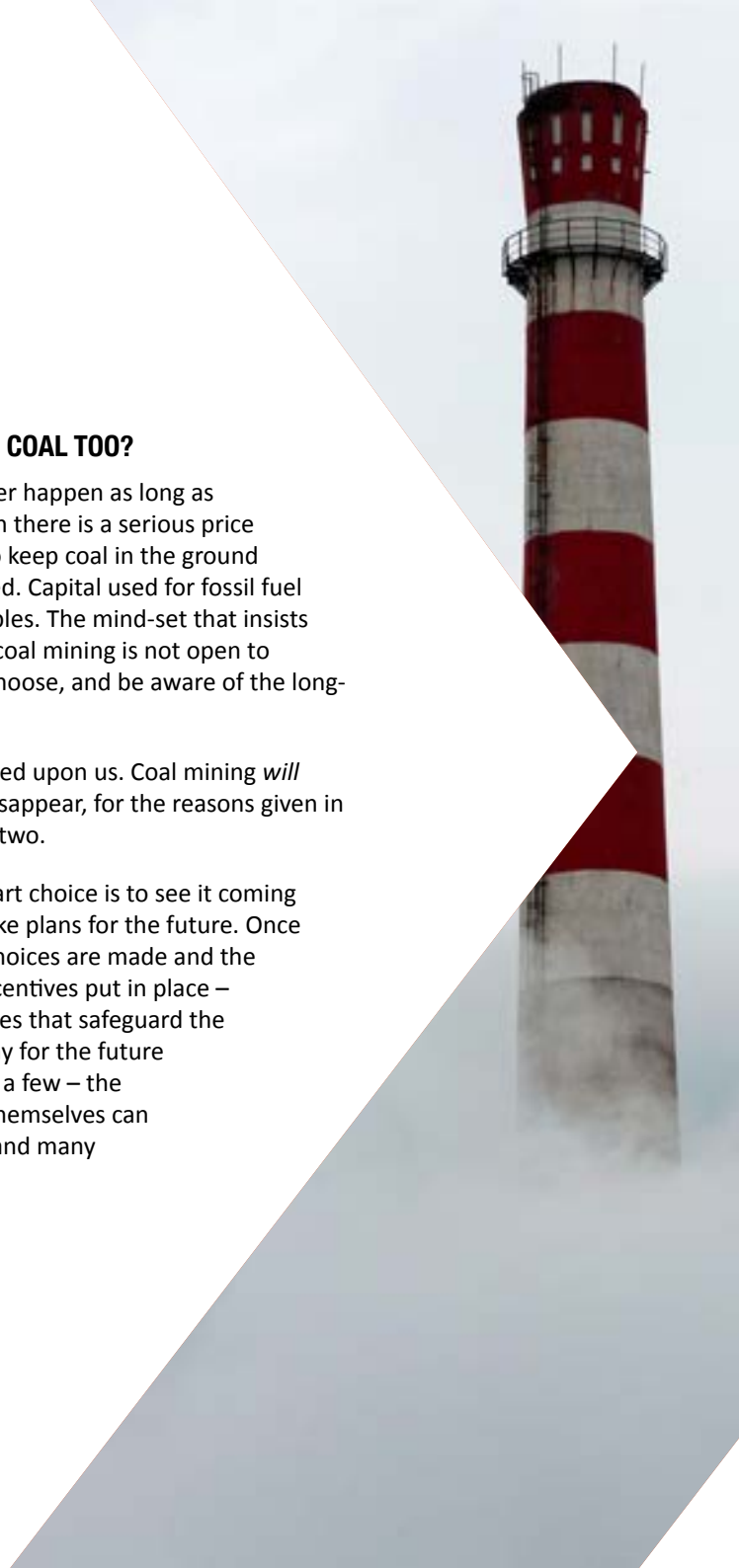
WHY CAN'T WE HAVE ALL THIS AND COAL TOO?

Some of the initiatives above will never happen as long as coal is cheap and available. Only when there is a serious price on carbon and commitments made to keep coal in the ground will alternatives emerge and be funded. Capital used for fossil fuel development is not there for renewables. The mind-set that insists upon continuing business as usual in coal mining is not open to innovative alternatives. We need to choose, and be aware of the long-term effects of our choices.

However that choice will soon be forced upon us. Coal mining *will* phase out and coal mining jobs *will* disappear, for the reasons given in section two.

ONLY WHEN THERE IS A SERIOUS PRICE ON CARBON AND COMMITMENTS MADE TO KEEP COAL IN THE GROUND WILL ALTERNATIVES EMERGE AND BE FUNDED.

The smart choice is to see it coming and make plans for the future. Once those choices are made and the right incentives put in place – incentives that safeguard the economy for the future instead of seeking short term gain for a few – the process of communities reinventing themselves can begin, and these new opportunities, and many more besides, will be able to flourish.



SECTION FIVE

PLANNING THE TRANSITION

These opportunities for prosperous communities with decent employment will not just materialise by themselves.

For many years there has been an entire government department to facilitate mining with tax incentives and an established industrial infrastructure to support it. In addition, Government policy seeks economic growth by digging up as much coal and other minerals as possible.

WE PROPOSE THAT COMMUNITIES, LOCAL BUSINESSES, WORKERS, UNIONS, IWI, ENVIRONMENTAL GROUPS, LOCAL GOVERNMENT AND CENTRAL GOVERNMENT ALL NEED TO BE INVOLVED IN PLANNING A TRANSITION TO ALTERNATIVE FORMS OF ECONOMIC DEVELOPMENT AND ALTERNATIVE JOBS.

A new economic direction will need that same kind of support while it gets started.

We propose that communities, local businesses, workers, unions, iwi, environmental groups, local government and central government all need to be involved in planning a transition to alternative forms of economic development and alternative jobs. We call this a Just Transition.

Just Transition is a framework for a fair and sustainable shift to a low carbon economy, proposed by trades unions and supported by environmental NGOs. Just Transition holds that a shift to a lower carbon economy is vital to avoid dangerous climate change. Tough targets to cut CO2 emissions, supported by new environmental regulations and carbon markets, will transform economies over the next decade. These shifts will have major implications for working people in energy supply, industry and transport, and for everyone as consumers.

There is a concern that significant periods of economic restructuring in the past have often happened in a chaotic fashion, leaving ordinary workers, their families and communities to bear the brunt of the transition to new ways of producing wealth.

Just Transition seeks to prevent such injustice becoming a feature of environmental transition, suggesting that it would not only be morally wrong and socially damaging, but would undermine the credibility of the transition itself and could slow or even halt the changes that must be made.

Just Transition recognises that support for environmental policies are conditional on a fair distribution of the costs and benefits of those policies across the economy, and on the creation of opportunities for active engagement by those affected in determining the future wellbeing of themselves and their families.

Specific institutions are needed to develop such a plan and they need to have strong government support and funding, regional offices, and representation from all the above groups. This could be a unit in the Ministry of Business, Industry and Employment in Wellington to look at the national economic perspective, and people on the ground in the main coal mining areas to bring central government expertise into the regional entities that would develop local plans. It needs to have a modest budget to assist local groups to develop their transition strategies.

They also need time for research, retraining and new start-ups. This means the coal phase-out needs to be signalled in advance of any jobs going, with a timeframe, unlike the sudden and brutal redundancies of the last couple of years.

There is a substantial international literature[70] on the concept of Just Transition, for example in reports by and for the Australian, Canadian and South African unions; the OECD, the UN Environment Programme, the International Labour Organisation, the UN Framework Convention on Climate Change and the World Wildlife Fund.

70 Examples include Jacklyn Cock, (University of Witwatersrand) *Contesting a 'just transition' to a low carbon economy* Global Labour Column, 2011 and *Just Transition*: an International Trade Union Confederation presentation to an FCCC workshop June 2013

Six requirements are generally accepted as being necessary, and we use them as headings below.

RESEARCH AND EARLY ASSESSMENT OF IMPACTS OF PHASE OUT SCENARIOS

Research on the best options to support the national economy and jobs can be done centrally, but each region will need to work locally to establish the number of jobs dependent on coal, the skills of those employed, their transferability to other industries, local opportunities for new enterprises and their needs, and the local educational and training needs and resources.

LOCAL ANALYSIS AND ECONOMIC DIVERSIFICATION: EACH COMMUNITY NEEDS ITS OWN PLAN

A group of community leaders willing to think beyond Business as Usual and imagine a better future could be called together by local government, a business association, a union or by a polytechnic. Leadership may not necessarily come from traditional sources, rather from those most directly affected community groups or organisations.

Whatever its source, leadership is essential as is involvement by all the sectors affected by the transition. A starting point would be a stocktake of the existing resources, skills, and successful businesses on which a new future can be built, and an analysis of the needs of the community. Then a transition plan can be developed.

SOCIAL PROTECTION

If mines close suddenly, workers need protection for their incomes and social services, and possible relocation (though many miners these days do not live in the communities where they mine.) Ideally, the transition plan is developed early enough that new things are in place for them before the mine actually closes. That is entirely possible if we start now, but not if we wait until there are no choices. A planned phase-out provides time for ensuring proper redundancy and transitional income support.

SOCIAL DIALOGUE/ENGAGEMENT WITH WORKERS AND THEIR UNIONS

Involving the relevant unions in the planning can enable them to change from reactive agents resisting change, in the perceived best interests of their members, to proactive agents helping plan the transition, with specific knowledge about the needs of their members.

When a coal burning power station in Washington State US was scheduled for closure for environmental reasons, unions played a pivotal role, persuading environmentalists and others to delay the closure long enough for a Just Transition to different jobs for the workers. This made it possible for the coal to be replaced by wind and other renewable generation, rather than natural gas, a better environmental outcome, and the unions became an active part of the phase out planning.[71]

71 Kick Coal, Save Jobs Right Now – Sierra Club magazine article by Scott Mertelle, Jan/Feb 2012

TRAINING AND SKILLS

Retraining is crucial. Many miners came to that industry from others, attracted by the high rates of pay, and learned new skills to do so. Some of those skills will be transferable to other industries – quarries, earthmoving for building, electrical and waste water management trades. Some miners displaced by the closures at Spring Creek and Pike have already, after short courses to adapt their skills, found satisfying employment in the Christchurch rebuild. The Polytechnics have an important role to play here and should be involved in developing the local strategies.[72]

RETRAINING IS CRUCIAL.

SOUND INVESTMENTS AND POLICIES

This actually comes last, after the research and the agreement on a plan, but some funding is crucial in the early stages. A unit of central government needs to be charged with facilitating the transition, with a budget to fund the local research on which to base a community plan. The cost would be small compared with the Solid Energy bailout, for instance, or the ongoing support to the fossil fuel industry.

Some areas have local institutions that could provide capital – an obvious example is the West Coast Development Trust, given $92m[73] of Government money in 2000 to help with the transition away from logging of old growth forests on the coast.

72 Coal miners retrain for Christchurch rebuild - The Press, July 25, 2013

73 Development West Coast Website

Some part of the royalties from coal mining should be set aside to help fund the transition. Royalties are very low and should be increased to help fund the transition.

OVERSEAS INSPIRATION

All over the world, communities that have been dependent on a single, unsustainable industry have been forced to change. Sometimes this is sudden, unplanned, and involves considerable pain, most of which is felt by people working in those industries. This has been the experience in New Zealand with Solid Energy's redundancies in the Huntly area and the West Coast.

Some communities, however, have reinvented themselves, creating new industries and jobs, minimising the impacts on local people and establishing stronger local economies. We give some case studies in the next section of communities which have done this.

Inspiration can be found in the movements in the U.K and South Africa to create One Million Climate Jobs. Trade Unions have united with environmental organisations, academics, and other civil society groups to write a blueprint for the creation and financing of 1 million low-carbon long-term jobs in each country. Some of the initiatives include jobs in public transport, jobs to localise and secure food supply, jobs to protect water resources, jobs in energy, and jobs in housing.[74]

We need to build a similar alliance here in New Zealand to demand long-term sustainable low-carbon jobs. Some research into similar climate job creation has been done here but much more needs to be done to make such jobs a reality.

74 One million climate jobs Solving the economic and environmental crises – Campaign for Climate Change October 2010

SECTION SIX

CASE STUDIES

There are communities around the world which have reinvented themselves after the end of coal mining and developed prosperous economies. It has been a struggle, but where there is some government support, inspired local leadership and the community is working together it has been possible.

We are not suggesting any of these examples can be directly transferred to New Zealand communities facing the end of coal mining. The object of these case studies is not to provide a blueprint for Huntly or the West Coast or Nightcaps, but to show the diversity of ideas that have worked in other places which might stimulate New Zealand communities to reinvent themselves too.

But first, a cautionary tale.

WHAT NOT TO DO

Communities in Greymouth, Huntly and Westport are still reeling from the 500 positions disestablished by Solid Energy over the last two years in response to falling coal prices. They had no time to prepare and there were no steps taken to ease the impact on those communities. It is little wonder that they react angrily when it is suggested new mines should not go ahead.

In the mid-1980s Margaret Thatcher closed many coal mines in the UK, especially in Yorkshire, Wales and Scotland, in response to a miners' strike. This was the end point in an ongoing war with striking unionists and there was no interest in a Just Transition, no time for communities to prepare and no plans for the massive unemployment that resulted.

Some communities have despite this developed strategies for local economic renewal but without central government support these have been limited. Others have sunk into depression.

Professor Michael Northcott of New College, Edinburgh visited this country in 2008 and wrote this account to one of our members:

"I wish I could report positive stories from post industrial cities in Scotland and England but government action did little to reverse the great psychological trauma of mass enforced unemployment in these areas. Older workers went mostly on to unemployment benefit or disability benefit. The young either left these areas for London, Leeds, Manchester or overseas jobs hubs or found work in the consumer warehouses such as hypermarkets and DIY stores that replaced real industrial work. Now government is going after long term recipients of housing and disability benefit. This in the north has meant more debt and a proliferation of part time minimum wage jobs in supermarkets and call centres."

"…. meanwhile we have the draftiest, dampest leakiest building infrastructure in the western world and government has no plans to do anything except commission new power stations."

This tragedy didn't need to happen.

However, where there has been government support or innovative local leadership there are some positive stories despite the suddenness of the closures and the lack of any government support.

WALES

"If you have almost all of the community working in a coal mine, when the coal mine closes, there's nothing. Our take on that is that it's a matter of social justice. We don't think that people should necessarily get up and move, or that the fact that they're unemployed is because they're lazy or work shy, or unskilled or any of those things that are said about people who have lost their jobs. Our view is that the employers have taken jobs away in pursuit of bigger profits elsewhere, and that caring for people and making sure people have a decent quality of life is a collective responsibility and one that is a hallmark of a decent and civilized society."

Victoria Winckler, Director of the Bevan Foundation, Wales.[75]

In the Afan valley in South Wales, Government efforts turned thousands of acres of abandoned mines into a mountain bike park and the South Wales miners' museum. The two attractions bring 120,000 visitors to the former mining valley each year.[76]

In the Dulais valley, Wales, entrepreneur Geraint Lewis formed Call of the Wild,[77] an outdoor adventure company that also attracts corporate clients through a leadership development business, providing year round employment at a living wage for local people.

75 What is Community Regeneration? – After Coal website
76 Afan Valley moves from mining to mountain biking – BBC News, November 12, 2010
77 Call of the Wild UK

The DOVE workshop in Banwen, South Wales,[78] was started by a group of women who, during the 1984-85 coal miners' strike, decided that community-based education was the most practical path to regenerate the local economy. Setting up shop in an abandoned mine office, they developed a series of adult education workshops for women. Three decades later, the DOVE building hosts a diverse set of small-scale entrepreneurs, including a daycare, a library, a community garden and a café featuring local foods.

ORKNEY

Orkney, like the West Coast of the South Island, is a relatively isolated place with a small scattered population. Situated at the top of Scotland, two hours from the mainland by ferry, Orcadians feel similarly to Coasters: like spectators to what goes on in the rest of their country. They also feel vulnerable to central government decisions and are often irritated by distant authorities' lack of understanding of island life with its particular customs, dialect and ways of doing things.

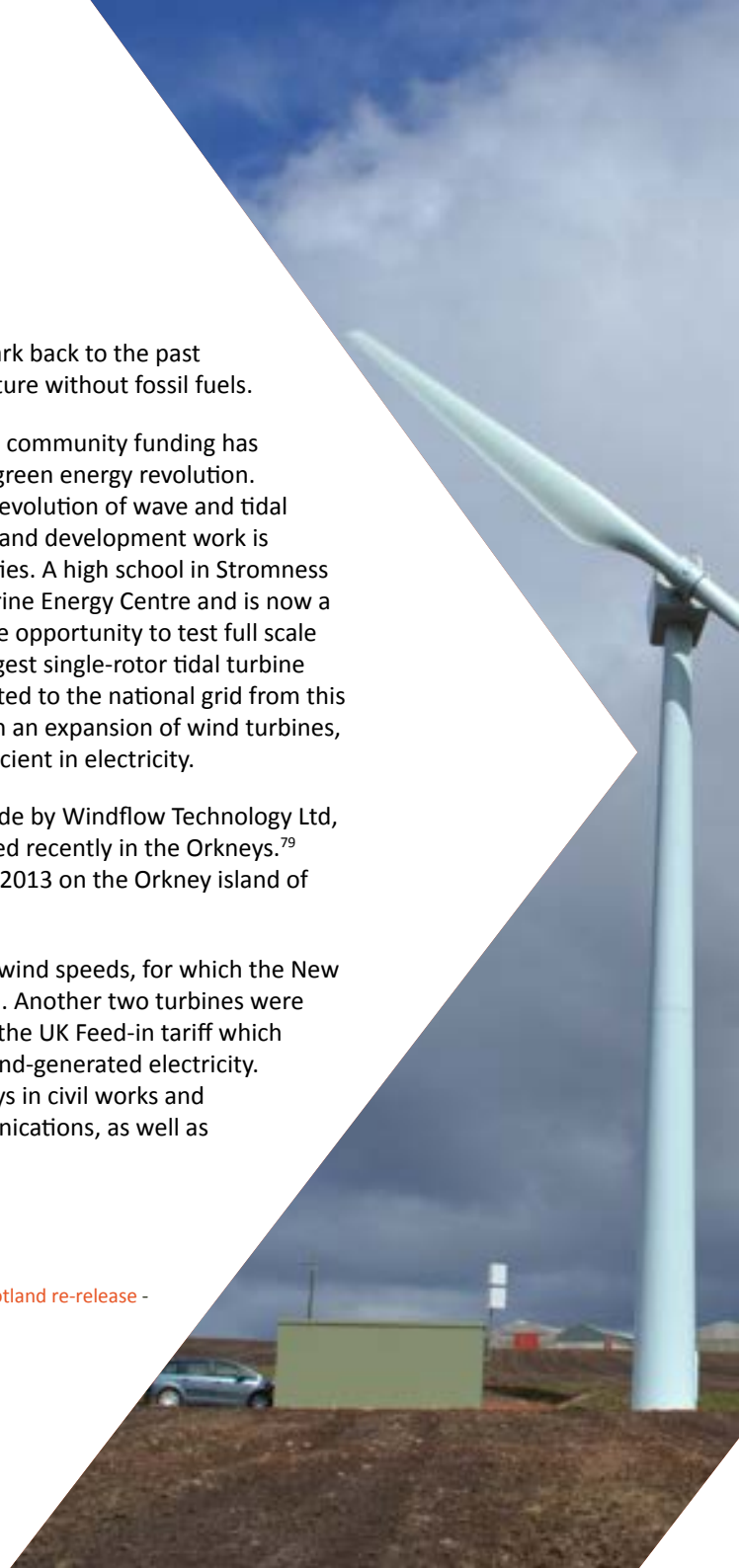
Since Norse times Orkney islanders burned peat (a very young form of coal) as their primary fuel source, but all the peat has been dug up. A traditional way of life, where each farming family had its own peat bank, and spent long summer days cutting and drying peats and sharing picnics while children played, are gone.

Another non-renewable energy source, North Sea oil, discovered in the 1970s, brought positive and negatives for the island. It turned the tide of depopulation, but, like the peat banks, the oil is depleting and another 'end of an era' is approaching. Orcadians have woken up to the fact that they can't continue to hark back to the past and are confronting the issues of a future without fossil fuels.

Over the last three decades European community funding has helped Orkney to equip itself for the green energy revolution. Orkney now plays a global role in the evolution of wave and tidal technologies and significant research and development work is creating new employment opportunities. A high school in Stromness was converted into the European Marine Energy Centre and is now a world leader, providing developers the opportunity to test full scale prototypes in the sea. The world's largest single-rotor tidal turbine was the first in Scotland to be connected to the national grid from this centre. Marine energy, combined with an expansion of wind turbines, means that the island is now self-sufficient in electricity.

Three New Zealand wind turbines made by Windflow Technology Ltd, a Christchurch firm, have been installed recently in the Orkneys.[79] The first was commissioned in March 2013 on the Orkney island of Westray.

The local advantage here is very high wind speeds, for which the New Zealand turbine is especially designed. Another two turbines were ordered in 2013, taking advantage of the UK Feed-in tariff which guarantees a fair purchase price of wind-generated electricity. These have created jobs in the Orkneys in civil works and erection, grid connection and communications, as well as manufacturing jobs in Christchurch.[80]



78 Dove Workshop

79 Windflow Turbine Generates Revenue in Scotland re-release - NZX announcement, March 19, 2013

80 Windflow media release, March 15, 2013

Investment in renewable energy and its associated R&D has attracted people to live, work, and study on the island. Islanders used to have to leave to get tertiary education but it is now possible to study for an MSc in renewable energy at a Heriot Watt University campus in Stromness.

A new generation of Orcadians have grown up to see renewable energy as the way of the future, something quite "normal", that will provide greater opportunities for their children to stay on the island with genuine prospects for employment in meaningful jobs requiring a wide range of skills and qualifications. This shows what a community in transition to a low carbon future can look like.

If Orkney can find a way to do it, we think New Zealand communities can too.[81]

NORD-PAS DE CALAIS

Until 1986, the north-east region of France, Nord-pas de Calais, was a major coal mining area. It still boasts huge twin tailings mountains, the largest in Europe, which have become a tourist attraction. It is known to New Zealanders for the war cemeteries associated with the battle of the Somme in WW1, but it has recently undergone a remarkable transformation towards a truly sustainable economy.

Old coal mines at Lens have been transformed into an art gallery, displaying works from the Louvre collection in Paris. Hundreds of people are trained in energy efficiency, solar energy and green architecture at a new training centre in nearby Loos-en-Gohelle.

81 Orkney Islands provide a glimpse of a renewable future – The Guardian, September 20, 2011

The Chamber of Commerce invited economist and social visionary Jeremy Rifkin[82] of the TIR Consulting Group, and his chief economist Skip Laitner, to apply their model of the third industrial revolution to the district.

Dr Laitner visited New Zealand for the IEA conference in March 2014 and spoke with one of our authors.

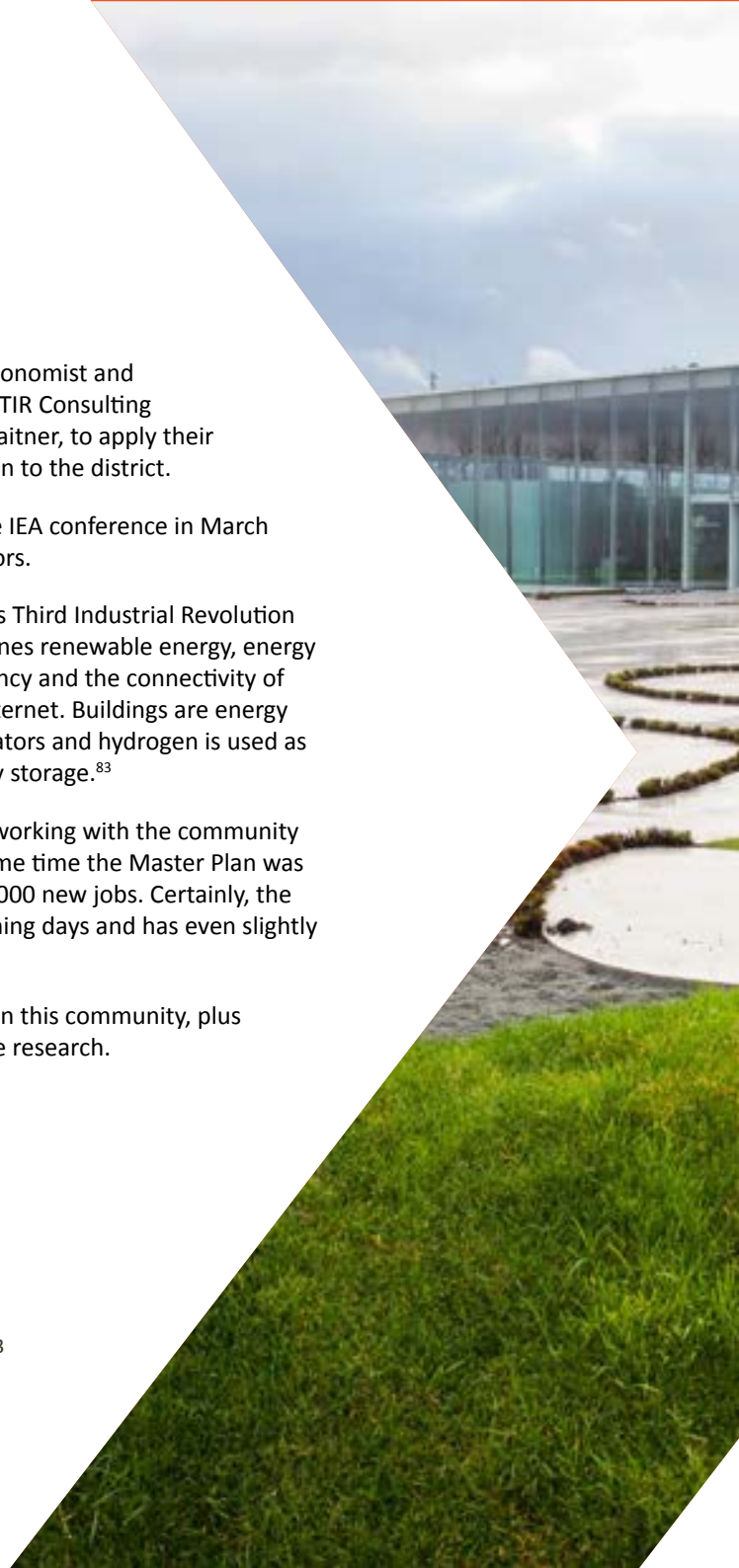
HUNDREDS OF PEOPLE ARE TRAINED IN ENERGY EFFICIENCY, SOLAR ENERGY AND GREEN ARCHITECTURE AT A NEW TRAINING CENTRE IN NEARBY LOOS-EN-GOHELLE.

Rifkin's Third Industrial Revolution combines renewable energy, energy efficiency and the connectivity of the internet. Buildings are energy generators and hydrogen is used as energy storage.[83]

After working with the community for some time the Master Plan was published in 2013 and envisages 100,000 new jobs. Certainly, the population has not declined since mining days and has even slightly increased.[84]

Inspired local leadership was the key in this community, plus some outside funding to help with the research.

82 Wikipedia entry for Jeremy Rifkin
83 Third Industrial Revolution website
84 Third Industrial Revolution masterplan, 2013



APPALACHIA (KENTUCKY)

The transition process is just starting here, but the community is very organised.

Kentuckians For The Commonwealth[85] has been battling the negative effects of coal mining for some decades and is now planning a transition to "building a better future, beyond coal". Last year they held a conference in Harlan, Kentucky, right in the middle of the Appalachian coal fields and invited guests from other US regions in the same position, and from Wales.

It is too soon to see what the outcome of their learning process will be, but they are another example of a community taking its future into its own hands, optimistic that there is a better future after coal.

SOUTHLAND EXAMPLE

Regional government can commission studies such as Southland's BERL (Business and Economic Research Limited) Report "A View to the South", commissioned by WWF (World Wildlife Fund)[86] New Zealand. Concerned that proposals by Solid Energy to develop Southland's massive lignite reserves could add up to 10 per cent a year to New Zealand's greenhouse gas emissions, WWF asked BERL to investigate the potential for lower carbon forms of economic development in the region.

Report author and chief economist Dr Ganesh Nana said: "What we found was that with greater investment, all four sectors [forestry, horticulture, manufacturing and engineering] present opportunities for greater employment and GDP beyond the business as usual outcome. Greater investment in forestry and wood processing, for example, could create 1,180 full-time jobs within the next 15 years, over and above business as usual growth. It could add $190 million of GDP to the Southern region economy."

BERL's economic modelling also showed that by 2026, an additional 820 jobs in engineering, 755 in education and training, and 540 jobs in the horticulture sector could be created, generating $115 million, $91 million and $67 million respectively, above business as usual growth.

85 Kentuckians for the Commonwealth website

86 WWF BERL report 2012

THE WEST COAST

HOW COULD A JUST TRANSITION WORK THERE?

The West Coast has been severely impacted by the mine closures at Pike River and Spring Creek with the loss of around 520 jobs. Changes at Stockton, Solid Energy's largest mine, have cut another 400 or so jobs in the past two years. A plan to strengthen that economy is urgent, but an economic strategy to prosper after coal cannot be designed outside the region.

The "Just Transition" process described in section five can be applied anywhere. It must include all stakeholders: business, local government, unions, workers, iwi, community groups. This could be led by any of those organisations, but councils have the resources to start the process.

The eventual plan will probably not include an art gallery underground as in Nord-pas de Calais or a cycle track over the old mines tailings as in Wales; but the principles of strengthening the economy through energy efficiency, renewable energy, improving housing, and building on local land based resources hold good everywhere.

The West Coast has a unique opportunity to provide capital for start-ups and community development with the West Coast Development Trust which has the $120m compensation fund from the ending of old growth forest logging in 2,000.

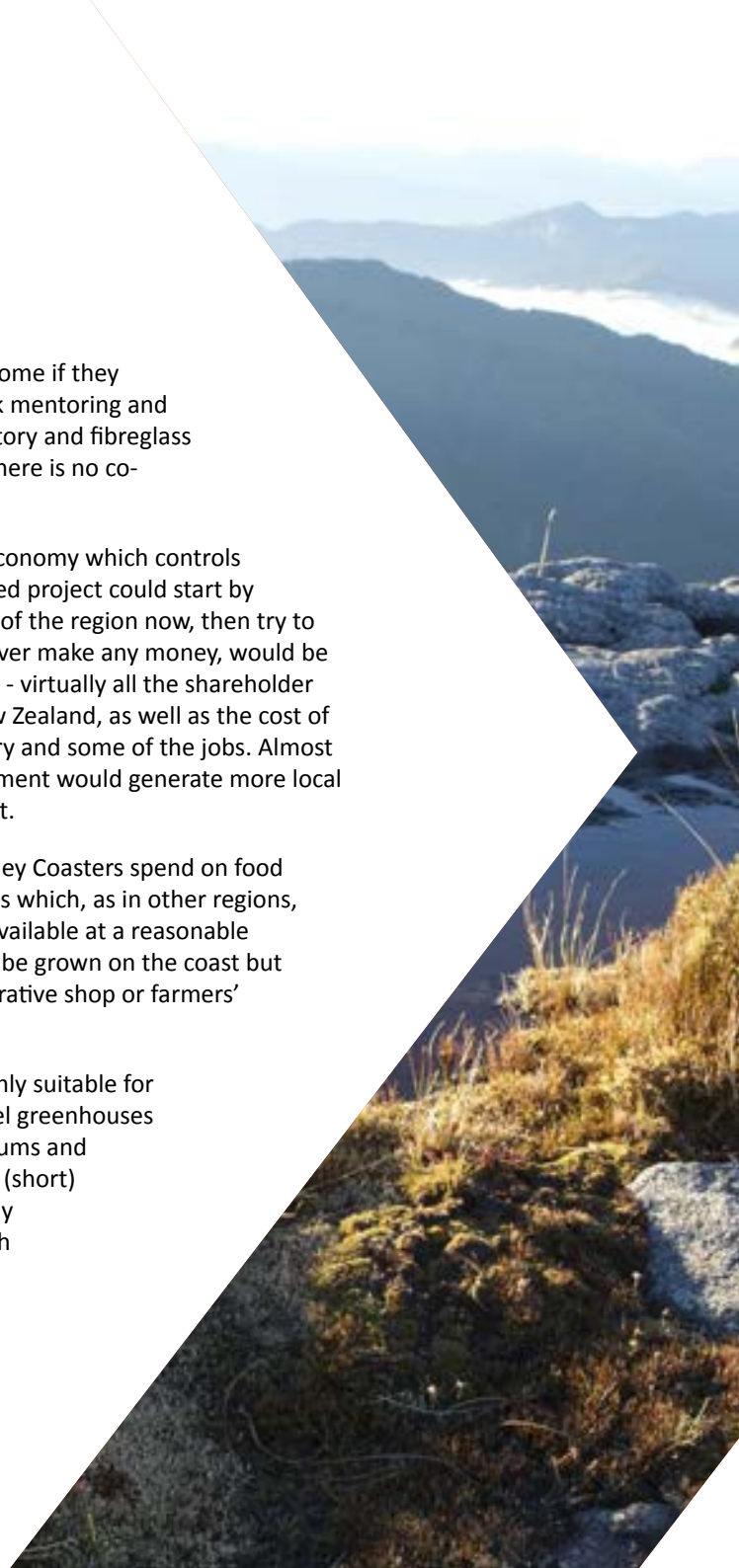
While the income so far has been spent, most of the capital is still there and generating income. Trustees are elected at the time of local body elections and the opportunity is there for citizens to choose a different focus for spending that income if they wish. While they do some useful work mentoring and coaching business, the failed sock factory and fibreglass factory they supported suggest that there is no co-ordinated strategy.

Localisation is the key to a jobs-rich economy which controls its own future. A community-supported project could start by analysing where the money leaks out of the region now, then try to plug those leaks. Bathurst, should it ever make any money, would be a prime example - virtually all the shareholder value leaves New Zealand, as well as the cost of the big machinery and some of the jobs. Almost any other investment would generate more local economic benefit.

LOCALISATION IS THE KEY TO A JOBS-RICH ECONOMY WHICH CONTROLS ITS OWN FUTURE.

Most of the money Coasters spend on food leaves the region via the supermarkets which, as in other regions, won't buy local even if products are available at a reasonable price. A lot more fresh produce could be grown on the coast but it would need an outlet, e.g. a co-operative shop or farmers' markets.

The coast's wood waste, which is mainly suitable for chipping rather than pellets, could fuel greenhouses to grow tomatoes, aubergines, capsicums and fruit, especially in the shoulder of the (short) growing season. These are all currently brought in by the supermarkets, which force down the price to growers to undercut others.



The cost of power bills mostly leaves the region and generates few local jobs. Energy efficiency saves money on power bills and is very job-rich. The Government's revised home insulation scheme only provides for homes with Community Service Cards and then only helps with 60% of the cost. Many can't afford the other 40% and if you don't have a card there is no help at all. The Trust might find it worthwhile to provide low interest loans to help people further because of the health, family wellbeing and jobs that would generate.

Training in energy efficiency for homes could lead to an industry retrofitting business, commercial and local government buildings, which could grow into a whole energy efficiency industry. Some funding is available from EECA for investigations into the prospects for energy efficiency, and sometimes to subsidise the costs, particularly for public buildings. Most studies of energy efficiency potential find savings of 30% can be made that will pay for themselves over a reasonable timeframe.

TRAINING IN ENERGY EFFICIENCY FOR HOMES COULD LEAD TO AN INDUSTRY RETROFITTING BUSINESS, COMMERCIAL AND LOCAL GOVERNMENT BUILDINGS, WHICH COULD GROW INTO A WHOLE ENERGY EFFICIENCY INDUSTRY.

There is a lot of concern locally about earthquake risk from the Alpine fault. The Trust could fund the strengthening of public buildings at risk and thus create jobs. This could be combined with energy efficiency retrofits, utilising the new skills developed, that employ people and save energy dollars. The programme could move on to use this expertise and work force to help with the cost of retrofitting private buildings that support community infrastructure.

New Zealand banks, other than Kiwibank and the Co-operative bank, are owned in Australia and this is where the profits go from interest, account charges and mortgages. A credit union or community owned bank would keep Coasters' money circulating locally.

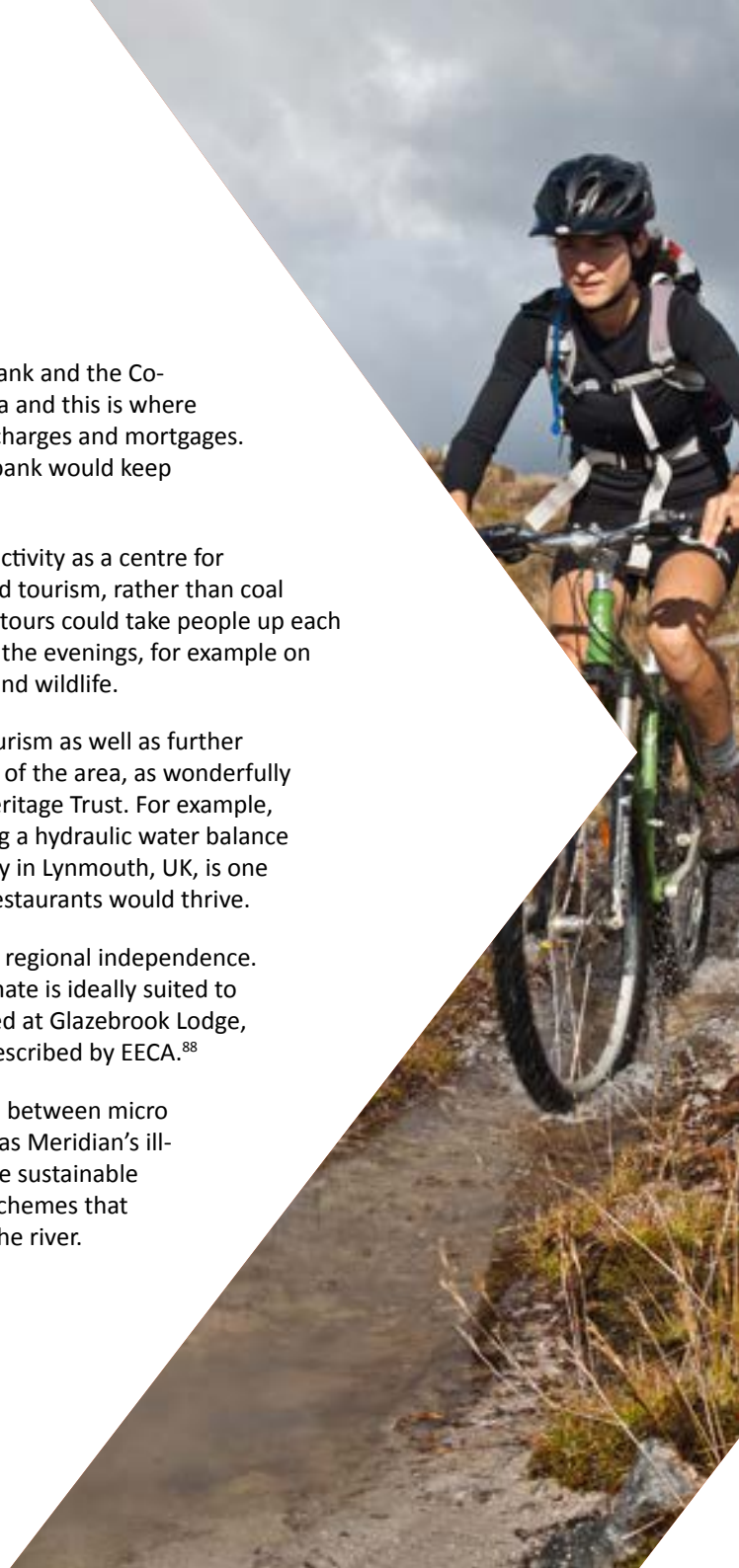
Denniston could generate economic activity as a centre for ecological and historical education and tourism, rather than coal mining. Based in Westport or nearby, tours could take people up each day for three days and run lectures in the evenings, for example on the history, geomorphology, botany, and wildlife.

There is scope for more adventure tourism as well as further capitalising on the history and beauty of the area, as wonderfully achieved already by the Denniston Heritage Trust. For example, re-opening the Denniston incline using a hydraulic water balance operation such as the funicular railway in Lynmouth, UK, is one option.[87] Local accommodation and restaurants would thrive.

Distributed electricity generation aids regional independence. The West Coast's topography and climate is ideally suited to micro hydro ventures such as that used at Glazebrook Lodge, Waihopai Valley, Marlborough, and described by EECA.[88]

It is important to make the distinction between micro hydro and large hydro schemes, such as Meridian's ill-fated plan to dam the Mokihinui; to be sustainable micro schemes must be run-of-river schemes that do not dam or take the water out of the river.

87 South Western Electricity Historical Society
88 EECA micro hydro information



The key feature of all these new jobs is that they can't be suddenly taken away as a result of decisions in boardrooms outside the Coast.

THE KEY FEATURE OF ALL THESE NEW JOBS IS THAT THEY CAN'T BE SUDDENLY TAKEN AWAY AS A RESULT OF DECISIONS IN BOARDROOMS OUTSIDE THE COAST.

This hypothetical case study presents some ideas generated by concerned people outside the region. We hope they could provide useful input to the discussions, but the plan and the decisions must be the Coast's.

What we can all do from outside, is to lobby governments for the research, funding and guidance to resource the process and support a Just Transition in all the communities facing the end of coal.

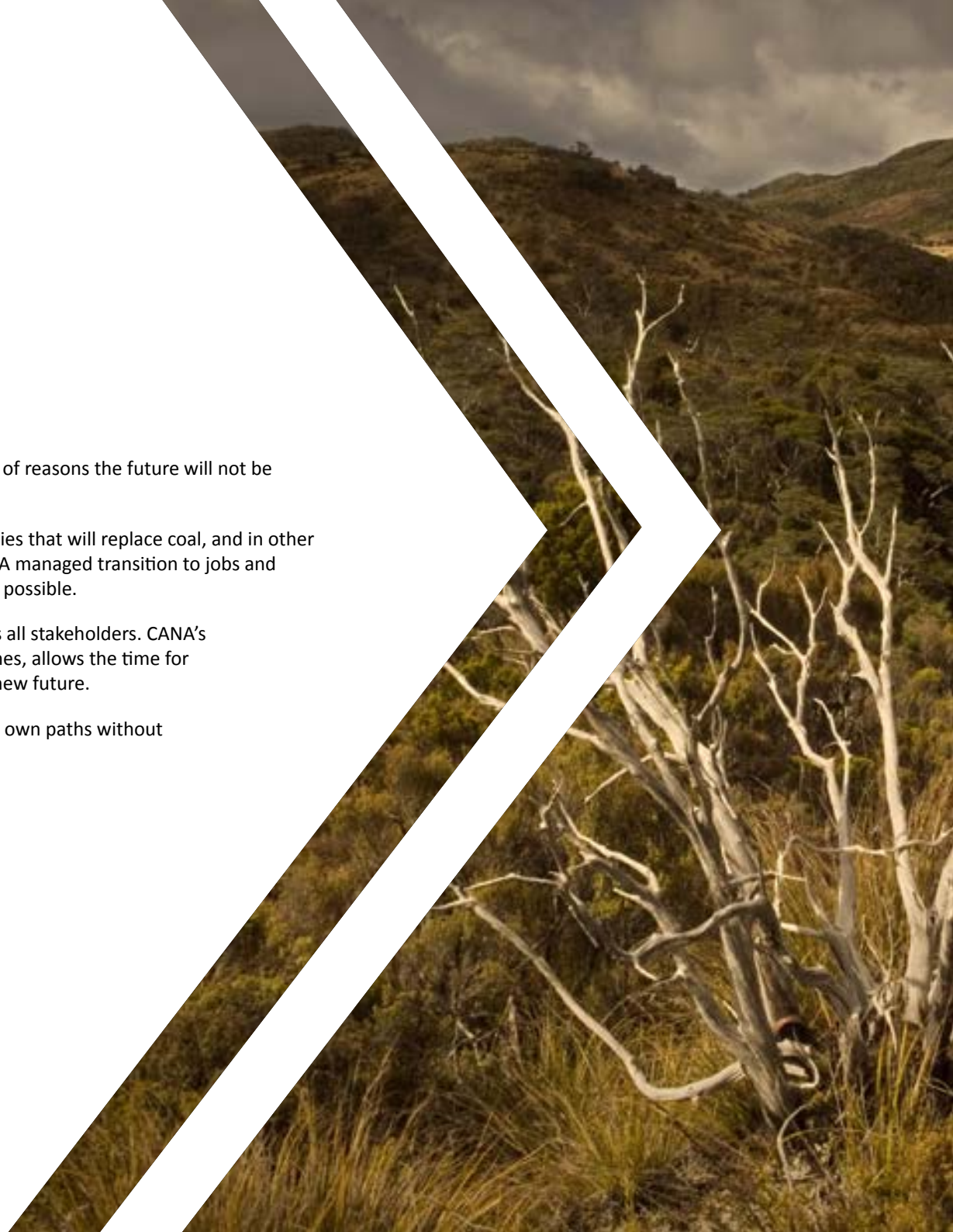
CONCLUSION

Change is coming for the fossil fuel industry, particularly for coal. For a range of reasons the future will not be like the past and employment in coal mining will shrink.

However, there are many opportunities for new jobs in the energy technologies that will replace coal, and in other undeveloped areas of the economy, as we transition to a low-carbon future. A managed transition to jobs and prosperity where workers no longer bear the brunt of the changes is entirely possible.

Such a future will not happen unless there is a planning process that involves all stakeholders. CANA's policy of not seeking the closure of any existing mine, by opposing all new ones, allows the time for planning a just transition, phasing out coal mining jobs while phasing in the new future.

The sooner we prepare for a future where mining towns can determine their own paths without dependence on the vagaries of a dying industry, the better.



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