THE CASE FOR FOSSIL FUEL DIVESTMENT

MARCH 2017

A GUIDE FOR AUCKLAND COUNCIL

+350 AOTEAROA

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The photographs in this report depict the effects of extreme weather events in the Pacific (namely cyclones Pam and Winston in Vanuatu and Fiji respectively), and one of the many efforts undertaken by Pacific peoples to fight back against the fossil fuel industry: the Pacific Climate Warrior blockade of the Newcastle coal port in Australia. Climate change is expected to increase the intensity of both these kinds of events.

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Executive Summary

Divestment is the opposite of investment and consists of withdrawing and withholding funds from a problematic sector. Divestment undermines the legitimacy of the targeted sector and thereby builds pressure for change. Historically, divestment was a component of the successful international push against Apartheid in South Africa. Tobacco, alcohol, munitions, gambling and pornography have all been targets of divestment campaigns. Recently, divestment from fossil fuels has gained prominence as a means whereby investors may curb the problematic activities of the fossil fuel industry contributing to climate change. Globally, fossil fuel divestment is accelerating: *$5.2 trillion has been divested to date, double the amount divested by 2015.*

A major conclusion of the research into fossil fuel divestment is that *funds divested from fossil fuels perform better than fossil fuel-inclusive funds* – that is, from a purely financial point of view, the case for fossil fuel divestment is robust. In addition to poor recent performance, the fossil fuel industry faces major near-future challenges that cast serious doubt upon the future profitability of the industry (namely, continued advancements in renewable energy technologies, increasing adoption of electric vehicles and increasing government regulation of greenhouse gas emissions). Fossil fuel divestment is thus fiscally prudent.

However, the fiduciary duties of Auckland Council extend beyond simply seeking the highest immediate returns. While Auckland Council currently has a Low Carbon Auckland Action Plan, a responsible investment policy, is a member of the C40 group of cities (Compact of Mayors), and has pledged to cut Auckland's greenhouse gas emissions 40% by 2040, *all of these positions are fatally undermined if the Council chooses to continue profiting from the activities of coal, oil and gas companies*. **The Council's funds belong to all Aucklanders, and should be invested responsibly.** Auckland Council has a fiduciary duty to invest its funds responsibly on behalf of Aucklanders and must account for the hidden future costs of its investments – therefore, *fossil fuel divestment is the right and imperative thing for Auckland Council to do regardless of any financial incentives.*

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Introduction

Today we stand at a crucial moment for the climate.

In 2015, the world agreed in Paris to limit global warming to 1.5 °C above pre-industrial levels. However, under the current Paris pledges, at least 2.7 °C of warming will occur.[2] Meanwhile, 2016 – the hottest year ever recorded – was 1.3 °C warmer than pre-industrial levels, breaking the records previously held by 2015 and 2014.[3] In March 2016, northern hemisphere temperatures actually exceeded 2 °C transiently,[4] and in February 2016 the global average temperature briefly touched the Paris Agreement's 1.5 °C "target".[5] In September 2016, the concentration of carbon dioxide (CO_2) in the atmosphere surpassed 400 parts-per-million (ppm), pushing us well beyond the 350 ppm point considered "safe".[6]

The consequences of these changes are underway. Arctic temperatures were exceptionally high in 2016, to the extent that overall Arctic sea ice levels shrank during the winter months in which they normally expand.[7] Since 2014, the longest global coral bleaching event ever recorded has been underway, affecting over 90% of the Great Barrier Reef[8] and killing 70% of Japan's largest coral reef. [9] Inundated island nations - such as Kiribati, the Marshall Islands, and Tuvalu - continue to face the existential threat of rising sea levels. Closer to home, an increase is expected in the prevalence of droughts comparable to the 2012-13 drought that cost the New Zealand economy at least $1.3 billion.[10] Rising temperatures and ocean acidification directly threaten commercial fisheries and crops such as paua[11] and kiwifruit.[12] The incidence of damaging flood events is set to increase, and

future international instability resulting from climate change directly threatens the export and tourism industries vital to our economy.[13]

City and regional councils will be crucial in the effort to deal with these changes.[14] We here advocate **fossil fuel divestment** as one component in the array of measures Auckland Council should take to aggressively act upon the threats posed by climate change. *Divestment* is the opposite of investment, and consists of withdrawing and withholding funds from a targeted sector. By doing so, divestment stigmatises targeted entities and increases the pressure for change. Tobacco, alcohol, munitions, gambling and pornography have all been targeted by divestment campaigns. Historically, divestment was a component of the successful international push against Apartheid in South Africa, with investors refusing to invest in South African securities in protest of the government's racist policies. Today, fossil fuel divestment is accelerating globally: $5.2 trillion in assets has been divested so far, double the amount divested by September 2015.[15] Prominent cities that have divested include Berlin, Melbourne, Sydney, San Francisco and Stockholm.

In this report, we outline the logic behind fossil fuel divestment and address common questions and concerns. A major conclusion of research into fossil fuel divestment is that *funds divested from fossil fuels perform better than fossil fuel-inclusive funds* – in other words, from a purely financial point of view, there are persuasive arguments in favour of divestment. Thus, we urge Auckland Council to join Dunedin, Victoria University of Wellington, Otago University, and the Anglican Church of New Zealand and divest of all investments in fossil fuels.

Fossil fuel divestment is the best way for Auckland Council to fulfil its fiduciary duties

The broader interests and fiduciary duties of any public institution considering fossil fuel divestment extend beyond the narrowly financial. However, were one's bottom line the only relevant concern, there are still persuasive economic arguments for divesting from fossil fuels. For instance, in 2014 MSCI launched a fossil-free alternative to its ACWI index, which tracks the performance of the world's 9,500 biggest stock-market quoted companies.[16] They back-tested the fossil-free index to 2010, allowing for comparison between the two indices over the course of this decade. To date, their results show that investors who divested from fossil fuels in 2010 have earned an average yearly return of 12.79%, whereas "conventional" investors have earned just 11.58% a year. In other words, if you had, for example, $100m in funds and jettisoned all coal, oil and gas holdings in 2010, you would now have realised profits over $10m greater than if you had kept fossil fuels in your portfolio.[17] There has been a plethora of studies in recent years discussing the benefits of divestment in purely financial terms. For instance, Genus Capital Management reported similar results for their Fossil Free CanGlobe Equity Fund from 2013-16,[18] as did Sustainable Insight Capital Management when comparing three fossil-free funds against the S&P500 index in 2014.[19] Other relevant studies include those by the University of Oxford,[20] the Carbon Tracker Initiative,[21] Impax Asset Management,[22] Standard Life Investments,[23] the Aperio Group,[24] and BlackRock.[25]

Given the recent performance of the fossil fuel industry, these findings are not surprising. Coal[26] and oil face increasingly tight times: nearly half of US coal is produced by companies that have declared bankruptcy since 2012,[27] Chinese coal consumption peaked in 2014,[28] and the profitability of the world's major oil companies has fallen dramatically. For instance, in 2017 ExxonMobil reported its ninth straight quarter profit decline (its longest such streak since at least 1988),[29] was forced to take a $2 billion write-down in January 2017,[30] and then was forced to take 3.6 billion barrels off its books in February 2017 (its largest de-booking since 1999).[31] 2017 also saw Shell[32] and BP[33] reporting their worst annual profits in more than a decade, with Chevron reporting its first annual loss since at least 1980.[34] In addition to this poor recent performance (described as the "deepest market slump in a generation"),[35] evidence is mounting that **the fossil fuel industry faces three major near-future challenges** that will likely cause these negative trends to continue or even deepen.

(1) Continuing advances in renewable energy. The cost of renewable energy continues to fall precipitously. For instance, the capital cost of wind and utility-scale solar power generation fell by 61 percent and 82 percent respectively between 2009 and 2015.[36] As a consequence of these dramatic drops, renewable energy is well on track to beat all other technologies on price *without subsidies* in most of the world.[37] Notable, utility-scale solar power plants *already* produce cheaper power than natural gas plants.[38] In 2015, global investment in new

renewable electricity generating capacity was US$266 billion, more than double the investment in new coal and gas-fired electricity generation.[39] Europe is expected to phase out gas and coal for electricity by 2040, with renewables making up 70% of power generation.[40] Battery technology for energy storage has also made impressive strides, with prices falling 73% from 2008 levels by 2015.[41]

(2) Widespread adoption of electric vehicles (EVs). The precipitous oil price crash starting in 2014 – which saw prices plummet from about US$100/barrel to around $US45/barrel – has hit the industry hard. While the industry is making various moves to address the current oil price environment,[42] it is set to struggle to re-consolidate from the current difficulties before being struck again by the rise of electric vehicles (EVs). As battery prices for EVs continue to fall, unsubsidised EVs could be as affordable as internal-combustion vehicles by the 2020s. At the current rate of EV uptake, by as early as 2023 EVs could displace demand for two million barrels of oil a day – the same amount of excess oil that sparked the 2014 price crash – by as early as 2023.[43]

(3) Increasingly proactive government regulation of emissions. Government regulations and international cooperation have the potential to push markets towards clean energy definitively (by means such as emissions regulations, efficiency standards and shifting subsidy patterns, for example). Agreements like the Paris Agreement indicate that the world is moving - slowly - in this direction.[44] Given these trends, fossil fuel divestment is a prudent measure to pre-emptively protect one's portfolio.

However, the fiduciary duties of Auckland Council extend beyond simply seeking the highest immediate returns. **The Council's funds belong to all Aucklanders and should be invested responsibly**. This involves taking into account the future costs of these investments and recognising the implicit approval the Council grants to the activities they invest in. Auckland Council currently has a Low Carbon Auckland Action Plan, a responsible investment policy, is a member of the C40 group of cities (Compact of Mayors) and has pledged to cut Auckland's greenhouse gas emissions 40% by 2040, *but all of these positions are fatally undermined if the Council chooses to continue profiting from the activities of coal, oil and gasl companies*. The costs of dealing with the future effects of climate change (such as increased drought, rising sea levels, migration from vulnerable Pacific nations, and negative impacts upon our export, fisheries and tourism industries[45]) clearly mean that while the Council *could* opt to profit from fossil fuel investments in the short term, they would need to spend significantly more money in the future to deal with the inescapable consequences of these investments. Citigroup, one of the world's largest financial institutions, concluded in 2015 that the costs of taking aggressive action against climate change would be *less* than the future costs of taking no action.[46] Any failure by Auckland Council to account for the *hidden costs* of fossil fuel investments would thus do a terrible fiduciary disservice to Auckland residents.

To summarise: while we here advocate that Auckland Council *restrict* its investment options, adopting a fossil-free investment portfolio would in fact benefit Auckland Council as a strategy for maximising investment returns and minimising risk. A divested portfolio maximises returns by acknowledging that fossil fuels are not as profitable as they once were and that this trend is projected to continue - and even deepen - as advances in renewables, electric vehicle adoption and government regulation challenge the industry.[47] These conclusions are backed by all the reputable evidence to hand. Most crucially, however, Auckland Council has a fiduciary duty to invest its funds responsibly on behalf of Aucklanders and must account for the hidden future costs of its investments – therefore, *fossil fuel divestment is the right and imperative thing for Auckland Council to do regardless of any financial incentives.*

Manufacturing dissent?

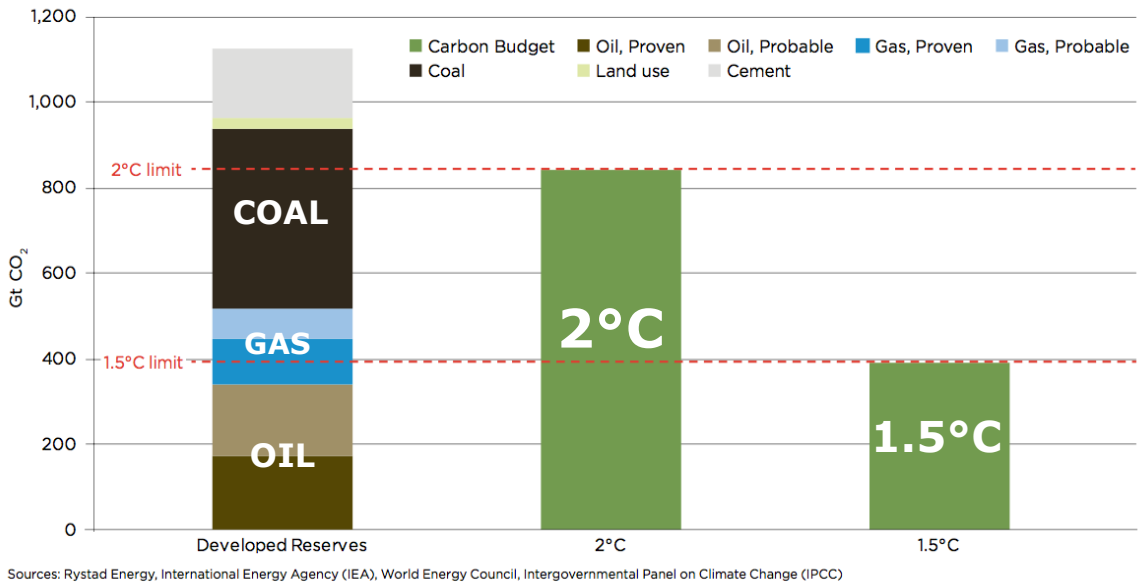
While there has recently been a plethora of independent studies demonstrating that fossil fuel divested portfolios enjoy improved returns, it is possible to find studies that claim the opposite, such as a study by D. R. Fischel (2015).[42] Commissioned and funded by the Independent Petroleum Association of America, this study is about as impartial as you'd expect, with significant methodological concerns.[43] We mention this study so readers understand the need to be critical when surveying the literature on divestment. Industry-funded studies like the above are in the minority and widely discredited, but they do exist and are occasionally rolled out to bolster shaky counter-arguments to divestment. Notably, the funding of research of poor quality research in order to undermine the credibility of more rigorous research is a tactic straight from the playbook of the tobacco industry. Big tobacco employed a strikingly similar campaign of disinformation once the health effects of their products came to light and they began to face similar divestment movements.

Clear thinking about fossil fuels: the *carbon budget* and *stranded assets* concepts highlight the need for fossil fuel divestment

Divestment is the fiscally intelligent response to the *stranded asset* risk inherent in fossil fuel investments. The science unambiguously informs us that **the vast majority of current fossil fuel reserves cannot be burned** while staying within temperatures compatible with the level of civilisation and material prosperity we are accustomed to. The amount of CO_2 that may be released into the atmosphere before these temperatures are exceeded constitutes the world's *carbon budget*, and in order to stay within this budget, the vast majority of estimated fossil fuel reserves must stay in the ground. [50] It logically follows that a rapid managed decline of existing fossil fuel extraction projects, with *absolutely* no further developments of new extraction projects, is imperative. Currently, fossil

fuel companies are valued according to the amount of fossil fuels they predict they will be able to extract, which includes proven and estimated reserves incompatible with "balancing" our carbon budget. As the world moves with increasing pace towards containing climate change (as witnessed by the Paris Agreement now in force), it is clear that these companies will face mounting opposition to the full exploitation of these reserves. To put it simply, ***these companies are currently grossly over-valued***. This will inevitably result in shareholders waking up to a day when the true value of their investments – based not on what is *in* the ground, but on what governments, businesses and citizens will tolerate being taken *out* of the ground – is recognised, and their value accordingly plummets. Thus, fossil fuel investments run the risk of becoming ***stranded assets*** in the near future, making fossil fuel divestment fiscally prudent.

The *carbon budget* and *stranded assets* concepts, along with both the opportunity to re-invest in the renewables sector and the deeply-held ethical concerns of the wider public,[51] have brought fossil fuel divestment into the mainstream of economic thought and financial practice (*a list of prominent divested institutions may be found in appendix II*). Business communities around the world are now



The most important graph you will see today: the world's carbon budget. *On the far left is the amount of carbon dioxide (CO_2) that burning all the fossil fuels contained in the world's developed reserves will emit. On the right are two "carbon budgets", depicting the amount of CO_2 that the world may emit while having a reasonable chance at staying below either 2 °C (middle bar) or 1.5 °C (far right) of global warming. It should be noted that even if global coal consumption were to drop to zero overnight, the world's developed oil and gas reserves alone are enough to push us past 1.5 °C warming (the Paris "target"). The main conclusions to be drawn are that (i)* ***no new fossil fuel extraction projects should be undertaken*** *(or the left bar would get larger and capital would be sunk into "stranded assets"), and that (ii)* ***a managed decline of existing fossil fuel projects must begin immediately.*** *For readers wishing to know more, the recent report by Oil Change International (The sky's limit: why the Paris climate goals require a managed decline of fossil fuel production, 2016) is highly recommended.*

getting on board: investment advisors are steadily issuing reports discussing the subject[52] and are making unequivocal statements about the risks posed by continued investment in fossil fuels.[53] Prominent financial figures, from the governor of the Bank of England to the president of the World Bank, also agree that "the vast majority of [fossil fuel] reserves are unburnable"[54] and urge investors to be the "first movers" of funds out of fossil fuels.[55] The stranded assets framework also helps answer an understandably common question put to the fossil fuel divestment movement, that of "Won't somebody else just pick up these investments when we divest?" The answer is "Yes, almost certainly – and they'd almost certainly be making a bad investment decision by doing so."

What impact will fossil fuel divestment have upon the fossil fuel industry?

Compared to the capital the fossil fuel industry has access to, any funds we can remove will be small. However, **divestment isn't primarily an economic strategy. It is a moral and political one.** By divesting we seek to undermine the legitimacy of the fossil fuel industry, analogous to what was achieved by the anti-Apartheid movement or by tobacco divestment. Fossil fuel divestment doesn't aim to cripple fossil fuel companies financially, but to stigmatise these companies to the point where doing business with them is as distasteful to the public as doing business with big tobacco.[56] By declaring the current activities of fossil fuel

companies morally unacceptable, we create the political climate in which the policy changes needed to address climate change are possible. Historically, this approach has proven success.[57]

A study from the University of Oxford recently concluded that this "stigmatisation" process is the most important outcome of a successful divestment campaign.[58] Significantly, **fossil fuel companies are themselves aware of the threat stigmatisation poses to their profitability.** Peabody Energy (the former coal giant which declared bankruptcy in 2016) stated in a risk disclosure that *"[c]oncerns about the environmental impacts of coal combustion, including perceived impacts on global climate issues, are resulting in increased regulation of coal combustion in many jurisdictions [and] unfavourable lending policies by government-backed lending and development banks…. which could significantly affect demand for our products or our securities."*[59]

The stigmatisation process Peabody feared is well underway: fossil fuel divestment is accelerating as city councils, pension funds, charities, universities, businesses and faith groups around the world refuse to fund fossil fuels.

In practice, shareholders do not have sufficient influence over fossil fuel companies to enact meaningful change

Unfortunately, there is little to be lost by surrendering one's influence upon fossil fuel companies as a shareholder. Shareholder-led initiatives have only worked in a limited capacity, for comparatively smaller battles such as shifting labour practices and sustainability practices within companies. The key difficulty here is that to keep temperatures below "acceptable" levels, we must ask fossil fuel companies *not* to extract about 80% of the fossil fuel reserves currently underground.[60] While this is absolutely an achievable goal, can you imagine any group of shareholders willingly voting against their own economic interests in such a dramatic fashion? You wouldn't ask the local pub to keep 80% of its beer reserves in the taps. Because there is such little potential for change to come "from the inside", we see an urgent need for strong leadership on divestment from other interested parties such as city and regional councils. In cases where shareholders *have* actually tried to influence fossil fuel companies on climate change issues, the results have been predictably disheartening. For instance, in 2015 members of the Rockefeller Family committee initiated shareholder resolutions aimed at getting ExxonMobil to acknowledge the dangers of climate change, cease climate change denial activities and shift to clean energy. These shareholder resolutions were all easily defeated.[61]

Technological fixes, such as carbon capture and storage, do not preclude the need for fossil fuel divestment

Carbon capture and storage (CCS) is the process whereby the CO_2 released from burning fossil fuels is captured, compressed and stored deep underground. As they currently stand (and are forecast to develop), CCS technologies cannot cope with either the scale of current emissions or the time-frames in which emissions reductions must occur. Additionally, the reasoning behind CCS strategies is fundamentally misguided – hence the need for fossil fuel divestment.[62]

While naturally touted by the fossil fuel industry as the way to continue business as usual *and* address climate change, actual CCS projects have not borne this out. The costs of CCS are widely acknowledged to be prohibitive.[63] For instance, the sole existing CCS-coupled power venture, Boundary Dam in Canada, has failed to operate as planned, experiencing cost overruns and financial penalties for missing contractual obligations.[64] CCS advocates have themselves admitted that CCS projects world-wide face "outstanding commercial challenges"[65] and **Shell's CEO Ben van Beurden has conceded that without significant government subsidies, CCS is simply too expensive to be feasible**.[66]

Furthermore, even if CCS made financial sense, the benefits are modest at best (such as an estimated extension of the world's carbon budget from 12% to 14% by 2050).[67] Concerns about the safety of the stored carbon have also been raised: at the first industrial scale CCS initiative, the Sleipner project in Norway, fractures in the caprock where compressed carbon is stored have been observed.[68] Unfortunately, it turns out that you cannot have your cake and eat it too. As such, many have backed away from gambling on CCS: in 2015, the UK, the US and four major European utilities cancelled competitions, funding, and research into CCS.[69]

The proposal of CCS as a means to combat climate change is based upon fundamentally flawed reasoning. This is an example of an "ambulance at the bottom of the cliff" strategy,[1] as CCS does nothing to address the underlying *cause* of the problem (burning fossil fuels). Instead, CCS seeks only to mitigate downstream *effects* of the problem (CO_2 emissions from burning fossil fuels), while allowing the fossil fuel companies *responsible* for the problem in the first place free rein to continue *exacerbating* the problem. This fatally flawed reasoning is inextricable from *any* argument suggesting that the solution to climate change will come from a technological fix somewhere around the corner, rather than from upscaling investment in *existing* technologies.[70] Thus, regardless of any future developments in CCS technologies, there is a pressing need for widespread fossil fuel divestment.

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[1] For those not familiar with the analogy: **if there's a cliff that people keep falling off, would you rather (a) keep an ambulance at the bottom of the cliff, or (b) build a fence at the top of the cliff?**

Fossil fuel investment exacerbates the problems of the developing world

Developing countries urgently need to expand their energy generation capacity and accessibility in order to lift millions out of poverty. While this is a complex issue and the best path forward is far from obvious, what *is* clear is that fossil fuels can only exacerbate the problems of poor countries.

Unfortunately, the benefits of fossil fuel investment in the developing world typically do not accrue to the poor.[71] Grid connectivity (rather than overall grid supply) is often the major problem facing the poor of the developing world, and developing new fossil fuel plants is *not* the same thing as expanding grid access. Typically, connecting poor people to the grid is a loss for utilities, due to infrastructure costs, low power consumption by the poor, and the fact that utilities often struggle financially in poor countries as it is – so, it often doesn't get done. For instance, coal plants tend be built in developing countries to serve commercial or industrial interests, rather than the interests of the "energy-poor".[72]

When large scale fossil fuel investments do occur in developing countries, a host of negative impacts follow that impede economic development.[73] For example, fossil fuel plants have a voracious appetite for fresh water – ironically, China has had to use coal-generated electricity to power desalination plants to replace this lost water![74] When fossil fuel plants grow big enough, kickback against pollution pushes energy prices up. High fuel, operating and transport costs also push prices

up, often beyond the reach of the poor. To make matters worse still, any added fossil fuel capacity is *further* subject to unpredictable price fluctuations: sudden price spikes during periods of increased demand place great stress upon countries with low incomes and savings.

Finally, these are also the countries that will be hit the hardest by runaway climate change.[75] The United Nations estimate that by 2050, climate change could push up to 122 million people worldwide into extreme poverty by jeopardising food supply and small-scale farmers' incomes.[76] Displacement caused by climate change in vulnerable regions (such as the Pacific Islands) will also result in increased migration, decimating economies.

How to supply energy to those around the world who need it most is one of the most pressing problems of today. Perhaps the most equitable and financially sound solution would combine two separate approaches: a "top-down" approach of *centralised grid expansion* to serve more people, and a "bottom-up" approach of *distributed renewable energy resources* to assist in the meantime. As seen above, centralised grid expansion would serve the interests of developing countries best if powered primarily by renewable energy - without the volatility of fossil fuel prices, investment in renewables is more akin to investment in infrastructure than risky commodities. Observed trends are encouraging. **For the first time in history, the developing world overtook the developed world in newly-added renewable electricity generation capacity in 2015**.[77] The unexpected transformation of China from global climate pariah to global renewables leader[78] is especially remarkable.

The other approach ("bottom-up") consists of *distributed energy resources* (DERs): small, flexible, on-site power generation by single solar panels, small

hydro and other micro-scale energy sources. While naturally lower capacity, DERs are within reach of individual villagers residing outside the reach of centralised grids. Power supply predictability is a major advantage of DERs, and fuel costs are a predictable $0 after installation.[79] This approach promotes self-reliance and small-scale enterprise (such as the ability to sell power and for villages to link up microgrids), promoting a kind of "energy democracy". These small-scale resources may serve until centralised grid connectivity arrives, offering invaluable first steps up the energy access ladder.[80] Ideally, a "leapfrogging" scenario would play out overall - just as in telecommunications previously, where mobile phone usage became ubiquitous in much of the developing world before anyone had the chance to install landlines.

Naturally, there are no simple solutions to the energy needs of the developing world. Problems of historic responsibility complicate the picture,[81] necessitating international agreements on how to fund a fair energy transition in these countries – a topic quite beyond the purview of this report. However, the answer to these problems most definitely is *not* more fossil fuels: the legacy of international fossil fuel extraction in the developing world is one of exploitation and environmental degradation.[82] While our country may sit at a latitude comparatively less vulnerable to the most dramatic *direct* effects of climate change, the reverberations from the economic and geopolitical shocks evoked by runaway climate change in other countries will be felt keenly in all parts of the world.

Fossil fuel divestment in a fossil fuel world?

The challenges of moving beyond fossil fuels can seem daunting, but it is important to understand that it *is* possible to do so.[83] However, this does not mean that we should attempt to achieve this transition by avoiding fossil fuels and fossil fuel-derived products in our daily lives altogether. Just as 19th century US abolitionists campaigned against slavery while wearing clothes and consuming sugar produced by the labour of slaves, we can campaign against fossil fuels while living in a fossil fuel driven world. The fact that fossil fuels are so ubiquitous in today's world makes this effort all the more imperative.

Concluding remarks

We hope to have convincingly and honestly presented the case for fossil fuel divestment. We acknowledge the complexity of the challenges posed by climate change, and the enormity of the measures needed to face these challenges – much more needs to be done beyond fossil fuel divestment. Divestment is, however, a clear signal of intent. Removing the social licence of fossil fuel companies will be a key step in facilitating the transition to a low or even zero carbon Auckland. Fossil fuel divestment also resolves the contradiction between attempting to deal with climate change while simultaneously profiting from the activities of companies exacerbating climate change. While we are hopeful for the future, we must conclude by emphasising the urgency of the situation – despite decades-long awareness, effective movement has been far too slow. We thus urge Auckland Council to follow the example of Dunedin, Victoria University of Wellington, Otago University, and the Anglican Church of New Zealand and divest from fossil fuels immediately.

Appendix I: Auckland Council's current fossil fuel investments

Auckland Council's Diversified Financial Assets Portfolio (DFA) is managed by Auckland Council Investments Limited (ACIL). At the time of 350 Aotearoa's last successful Official Information Act request on the DFA in September 2015, this portfolio was worth around $320 million and was comprised of 11 different funds under the control of external fund managers. These funds demonstrate a level of exposure to the fossil fuel sector which is not dissimilar to that of the global stock market (around 7%). A glance at the DFA as of September 2015 shows Auckland Council invested in a number of fossil fuel companies including Anadarko, Exxon and Total. Anadarko has been controversially exploring New Zealand waters for deep sea oil since 2008.[84]

The primary objectives of the DFA are determined by the Council through the Statement of Investment Policy and Objectives (SIPO), a document which is reviewed at least every three years. The current SIPO requires that ACIL implement a responsible investment policy that **"integrates environmental, social and governance considerations into the investment and operational policies of the DFA, where possible"**. ACIL's conforming responsible investment policy essentially rests on the decision-making process for the selection of new fund managers. Where two fund managers under consideration are equally appealing to ACIL on the basis of purely financial criteria, the fund manager that better incorporates environmental, social and governance (ESG) issues into its investment decision-making and ownership practices will be selected. This is a woefully inadequate way to ensure ethical investment.

In the Council's management of their portfolio, ethical considerations are completely subordinate to purely financial considerations. However, best practice responsible investment would require the wholehearted integration of ESG considerations into the fund manager selection process, and exclusions across the DFA of the industries most harmful to humanity – such as fossil fuels, tobacco, and cluster munitions. 350 Aotearoa is thus urging Auckland Council to update their responsible investment policy so that fossil fuel holdings are explicitly excluded from their funds. This commitment has already been made by other city councils in New Zealand and around the world (*see appendix II*). As illustrated in this report, the best evidence suggests that fossil fuel divestment is a sound and responsible investment strategy.

Appendix II: Selected divested institutions

FULLY DIVESTED INSTITUTIONS

Charities

Aria Foundation
Arkay Foundation, The
Ben & Jerry's Foundation
Betsy and Jesse Fink Foundation, The
Bewegungsstiftung
Bioregional
Blumenthal Foundation, The
Both ENDS Foundation
Bullitt Foundation, The
Catherine Donnelly Foundation
Children's Investment Fund FOundation
Chino Cienga Foundation
Chorus Foundation, The
Christensen Foundation
Comart Foundation
Community Impact Foundation
Compton Foundation
David Suzuki Foundation
Desmond & Leah Tutu Legacy Foundation
Earth Welfare Foundation, The
Educational Foundation of America, The
Edward W. Hazen Foundation
Edwards Mother Earth Foundation
English Family Foundation
Foundation Charles Leopold Mayer
Forsythia Foundation
Frederick Mulder Foundation
GLS Treuhand
Garfield Foundation
General Service Foundation
Goldman Environmental Foundation
Graeme Wood Foundation
Granary Foundation
Hanley Foundation, The
Hidden Lead Foundation
Hull Family Foundation
Hunt Foundation, The
Ian Somerhalder Foundation
JJ Charitable Trust, The
JMG Foundation
Jacob & Valeria Langeloth Foundation, The
Janelia Foundation
Jenifer Altman Foundation
Jessie Smith Noyes Foundation
Jim and Patty Rouse Foundation
Joffe Charitable Trust, The
John & Marcia Goldman Foundation
John Merck Fund
Joseph Rowntree Charitable Trust
Jubitz Family Foundation
KL Felicitas Foundation
KR Foundation
Kestrelman Trust
Laird Norton Family Foundation
Laughing Gull Foundation
Lemelson Foundation
Leonard and Sophie Davis Fund, The
Libra Foundation, The
Lookout Foundation
Lydia B. Stokes Foundation, The
Madden Sainsbury Foundation
Madirriny Foundation
Mark Leonard Trust, The
Mary Babcock Foundation
McKenzie River Gathering Foundation
McKinnon Family Fund
Mennen Foundation
Merck Family Fund
Meyer Family Enterprises
Mize Family Foundation
Morning Star Foundation
Mullum Trust
New England Biolabs Foundation
New Priorities Foundation
Nia Community Fund
Norman Foundation
North Star Fund
Orp Foundation
Overbrook Foundation, The
Pace Foundation
Palette Fund, The
Panahpur
Park Foundation, NY
Pax Fund
Pig Shed Trust
Polden Puckham Charitable Foundation
Prentice Foundation
Put Your Money Where Your Meaning Is Community (Pymwymic)
Quixote Foundation
Robert Treat Paine Association
Rockefeller Brothers Fund
Rose Foundation for Communities and the Environment
Rubblestone Foundation
Russell Family Foundation
SWF Immersion Foundation, The
Sainsbury Ashden Trust
Samuel Rubin Foundation
Schmidt Family Foundation
Schott Fund
Scott Trust
Serve All Trust
Shared Earth Foundation
Shugar Magic Foundation

Sierra Club Foundation
Singing Field Foundation
Solidago Foundation
Staples Trust
Swift Foundation
Switzer Foundation
Tedworth Charitable Trust
Tellus Mater Foundation
The Foundation of the University of Maine
Presque Isle
The Grantham Foundation
The Roddick Foundation
Threshold Foundation
Trust Africa
V. Kann Ramussen Foundation
Wallace Global Fund
Water Dragon Foundation
Waterloo Foundation
Wermuth Family Office
Winslow Foundation, The
Woodward Charitable Trust

Cities & regions

Australian Capital Territory
Ballina Shire Council
Banyule City Council
Bass Coast Shire
Bordeaux
Bordeaux Métropole
Byron Shire Council
City of Albury
City of Amherst, MA
City of Ann Arbor, MI
City of Armadale
City of Ashland, OR
City of Ballarat
City of Bayfield, WI
City of Belfast, ME
City of Berkeley, CA
City of Berlin
City of Borås
City of Boulder, CO
City of Boxtel
City of Brisbane, CA
City of Cambridge, MA
City of Concord, MA
City of Copenhagen
City of Corvallis, OR
City of Dunedin
City of Eugene, OR
City of Framingham, MA
City of Fremantle
City of Frouzins
City of Great Barrington, MA
City of Hellemes
City of Ithaca, NY
City of Leichhardt
City of Lille
City of Lismore
City of Madison, WI
City of Malmö
City of Marrickville
City of Melbourne
City of Melville
City of Minneapolis, MN
City of Moreland
City of New London, CT
City of Newcastle
City of Northampton, MA
City of Oakland, CA
City of Oxford
City of Palo Alto, CA
City of Paris
City of Portland, OR
City of Provincetown, MA
City of Ravoire
City of Richmond, CA
City of San Francisco, CA
City of San Luis Obispo, CA
City of Santa Fe, NM
City of Santa Monica, CA
City of Seattle, WA
City of Stirling
City of Stockholm
City of Strömstad
City of Sudbury, MA
City of Swan
City of Sydney
City of Truro, MA
City of Uppsala
City of Venissieux
City of Vincent
City of Wodonga
City of la Rochelle
City of Örebro
City of Savenay
Dane County, WI
Departmental council of Essonne
First district of the city of Lyon
Gironde department
Gloucester Shire Council
Hastings Borough Council
Kansas City, MO
Le Mans City
Macedon Ranges Shire Council
Montreuil
Mount Alexander Shire Council
Multnomah County, OR
Oslo Pensjonsforsikring
Radwick City Council
Regional Council Ile de France
Regional Council Rhône Alpes
Regional Council Burgundy
Regional Council of Poitou Charente, Rennes
Richmond Valley Council
Roskilde Municipality
Santa Clara Valley Water District
Shire of Goomalling, Western Australia
State College, PA
Strasbourg
Town (City) of Fredericia
Town of Allonnes
Town of Ambérieu en Bugey
Town of Bassendean
Town of Cherbourg
Town of Colombes
Town of East Fremantle
Town of Pierrefitte sur Seine
Town of Saint Denis
Town of Saint Herblain
Town of Saint Maur des Fosses
Tubmanburg City Coorperation
Urban Community of Cherbourg
Urban community of Hénin-Carvin
Östergötland Region

Corporations

APRA/AMCOS
Australian Ethical
Bendigo and Adelaide Bank Limited
Guardian Media Group
Hunter Hall Investment Management
Pi Investments
RS Group
Sun Common

Faith groups

All Souls Unitarian Universalist Church
American Ethical Union
Anglican Church of Aotearoa
Anglican Diocese of Auckland
Anglican Diocese of Canberra and Goulburn
Anglican Diocese of Dunedin
Anglican Diocese of Melbourne
Anglican Diocese of Montreal
Anglican Diocese of Perth
Anglican Diocese of Waiapu
Anglican Diocese of Waikato and Taranaki
Anglican Diocese of Wellington
Anglican Diocese of Ottawa
Australian Religious Response to Climate Change (ARRC)
Barnegat Monthly Meeting
Bathurst Street United Church
Boston Church of the Covenant, MA
Brighthelm Church and Community Centre
Canadian Unitarian Council (National), ON
Central Philadelphia Monthly Meeting of the Religious Society of Friends
Church of Sweden
Church of the Covenant, Presbytery of Boston, MA
Church of the Redeemer, Diocese of Newark, NJ
Colorado Ratnashri Sangha
Community Friends Quaker Meeting in Cincinnati, OH
Council of Progressive Rabbis of Australia, Asia, and New Zealand
Dover Friends Meeting
Earthsong
Eastminster United Church
Ecumenical Ministries of Oregon
Episcopal Diocese of California
Episcopal Diocese of Los Angeles, CA
Episcopal Diocese of Massachusetts
Episcopal Diocese of Nebraska
Episcopal Diocese of Olympia
Episcopal Diocese of Western Massachusetts
Evangelical Lutheran Church in America
Evangelical Lutheran Church of Oregon
First Parish Church UU, Ma
First Parish Unitarian Universalist Church in Cambridge, MA
First Parish in Concord, UU, MA
First Parish in Hingham, Unitarian Universalist - Old Ship Church, MA
First Presbyterian Church, Tallahassee, FL
First Presbyterian Palo Alto, CA
First Religious Society of Newburyport, MA
First Unitarian Church of Des Moines, IA
First Unitarian Church of Pittsfield, ME
First Unitarian Church of Rochester, NY
First Unitarian Church, Ottawa, ON
First Unitarian Society of Milwaukee, WI
First Unitarian Toronto, ON
Follen Community Church UU, MA
Franciscan Sisters of Mary
Friends Fiduciary Corporation
Friends World Committee for Consultation
Haverford Friends Meeting
Huddersfield Quakers
Islamic Society of North America (ISNA)
Jamaica Plain Unitarian Universalist, NY
Lake Country Unitarian Universalist Church, WI
Lansdowne Monthly Meeting
Lehigh Valley Monthly Meeting
Lutheran World Federation
Maine Council of Churches, ME
Marist Sisters Australia
Massachusetts United Church of Christ
Medford Friends Meeting
Melbourne Unitarian Church
Metropolitan New York Synod, Evangelical Lutheran Church in America
Miami Monthly Friends (Quaker) Meeting - Waynesville, OH
Miami Quarterly Friends (Quaker) Meeting of Ohio Valley, OH
Montreal Quakers
Mount Holly, New Jersey
National Synod of Scotland

New York Conference of The United Methodist Church
New York Quarterly Meeting
Newtown Monthly Quaker Meeting, PA
Northern Yearly Meeting - Quakers in the Upper Midwest
Norway Unitarian Universalist Church Maine
Ohio Valley Yearly Meeting, Society of Friends (Quakers), OH
Old Haverford Monthly Meeting
Pacific Northwest Conference of the United Methodist Church
Pacific School of Religion
Pilgrim Lutheran Church, St. Paul
Portsmouth South Church Unitarian Universalist, NH
Presbyterian Church of New Zealand
Presbyterian Peace Fellowship, NY
Presentation Sisters, Queensland
Presentation Sisters, Wagga Wagga
Protestant Church Hessen-Nassau
Provincial of the Passionists - Holy Spirit Province Australia, NZ, PNG
Quakers Religious Society of Friends Quakers in Britain
Saint Paul Area Synod - Evangelical Lutheran Church of America
Scarboro Missions, ON
Shalom Centre
Sisters of Loretto
Society for Community Work, First Unitarian Universalist Society of San Francisco, CA
Society of Friends, Canberra Regional Meeting
Sojourners
Student Christian Movement
Sydney Buddhist Centre
Thomas Jefferson Memorial Church, VA
Trenton Meeting
Trinitarian Congregational
United Church of Christ, Warwick, Massachusetts
UU Congregation of Binghamton, NY
Union Theological Seminary, New York City
Unitarian Society of Northampton & Florence, MA
Unitarian Universalist Association
Unitarian Universalist Church of Palo Alto, CA
Unitarian Universalist Church, First Parish, Sherborn, Massachusetts
Unitarian Universalist Congregation of South County, RI
Unitarian Universalist Fellowship of Ames
Unitarian Universalist Fellowship of Corvallis, OR
Unitarian Universalist Society of Amherst, MA
Unitarian Universalist Society of Bangor, Maine
United Church of Canada
United Church of Christ, Minnesota Conference
United Reformed Church of Scotland
Uniting Church of Australia Assembly
Uniting Church, New South Wales & ACT, Australia
Unity Temple Unitarian Universalist Congregation, IL
Westtown Monthly Meeting
World Council of Churches

Funds

Abracadabra Retirement Fund
Access Strategies Fund
Alleycat Super Fund
Barnett Super Wealthy Fund
Barry Family Super Fund
Bondage Super
Booth Super Fund
Brinstones Super
Cecily Dignan Superannuation Fund
Darwin Superannuation Fund
Davara Super Fund
Decco Superannuation Fund
District of Columbia Retirement Board
Ditton's Super Fund
Dobra Super Fund
Earth Super Fund
Flame Tree Super Fund
Flou Flou Super Fund
Future Super
Gibson and McGregor Super Fund
Good Vibrations Super
Gross and Watts Super Fund
H Green Superannuation Fund
Haydon Family Super Fund
Jacobs Robinson Super Fund
Jalana Super Fund
Jennie Di Blasi Super Fund
Kerr Ratcliffe Super
Kommunal Landspensjonskasse (KLP)
Kuhn's Gold Super
M & N West Pension Fund
Malbird Super Fund
Maree Kordonsky Super
McKinnon Super Fund
Millamac Super Fund

Moomintroll Super Fund
Neranie Super Fund
Nevada Super Fund
Perpetual Ocean Super Fund
ROS Super Fund
Ross Knowles Super Fund
Rusborne Private Superannuation Fund
SUJAY Superannuation Fund
ScouseMouse Super Fund
Stiftung Abendrot
Super Three Super Fund
Taikura Super Fund
The Tin Dog Super
Tweeps Super Fund
Unfolding Futures Pty Ltd Superannuation Fund
Wahcumba Super Fund
Wombat Super

NGOs

350.org
Center for Humans & Nature, The
Center for International Environmental Law
Citizens for Public Justice
Clean Water Action
Climate Action Network Australia
Conservation Breeding Specialist Group
Council of Canadians, The
Diakonia
Doctors for the Environment Australia
Earthjustice
Eastside Audobon Society
Ecotrust
Environment America
Environmental and Energy Study Institute
Friends of the Earth
Funeral Consumers Alliance of Maine
Great Old Broads for Wilderness
Island Institute
League of Conservation Voters
National Ethical Service
Natural Resources Defense Council
Northeast Wilderness Trust
Oregon Metro
Santa Fe Art Institute
Sierra Club
Union of Concerned Scientists
Vincent Wildlife Trust
WWF-UK
Western Australian Local Government Association
Wilderness Society, The

Universities & Educational Institutions

Bournemouth University
Brevard College
California Institute of the Arts
Cardiff Metropolitan University
Chalmers University of Technology
Chicago State University
College of the Atlantic
College of the Marshall Islands
ESF College Foundation, Inc.
Foothill-De Anza Community College Foundation
Green Mountain College
Hampshire College
La Trobe University
Manchester Metropolitan University
Naropa University
Newcastle University
Nottingham Trent University
Oxford Brookes University
Peralta Community College District
Pitzer College
Queen Margaret University
Queen Mary University London
Queensland University of Technology
Rhode Island School of Design
SOAS, University of London
Sterling College
Stockholm University
Swedish University of Agricultural Sciences
Syracuse University
The New School
The New Zealand Tertiary Education Union
Trinity College Dublin, The University of Dublin
Unity College
University of Oregon Foundation
University of Abertay Dundee
University of Arts Bournemouth
University of Bedfordshire
University of Copenhagen
University of Dayton
University of Glasgow
University of Hawaii
University of Kent
University of Lincoln
University of Maryland
University of Massachusetts Foundation
University of Otago Foundation Trust
University of Sheffield
University of Southampton
University of Surrey
University of Wales Trinity Saint David
University of Warwick
University of Worcester
University of the Arts London
Victoria University of Wellington
Warren Wilson College

Other institutions

British Medical Association
California Academy of Science
Canadian Medical Association
Chicago Medical Society
Field Museum in Chicago
Health Care Without Harm
National Tertiary Education Union
Phipps Conservatory and Botanical Gardens
Practice Greenhealth
Royal Australasian College of Physicians
World Medical Association

PARTIALLY DIVESTED INSTITUTIONS

Cities

Cambridge City Council
City of Bristol
City of Christchurch
City of Providence, RI
City of Stuttgart
Kirklees Council, Australia

Corporations

Allianz Group
AXA S.A
Nordea Bank AB
Storebrand

Faith groups

Chester Quarterly Meeting of the Religious Society of Friends
Episcopal Church, USA
Hancock United Church of Christ, Lexington, Massachusetts
Religious Society of Friends in Australia
Synod of Victoria and Tasmania

Funds

Anglican National Super
AustralianSuper
Berliner Ärzteversorgung / Berlin Doctor's Pensionfund
Environment Agency Pension Fund
First State Super
Government Pension Fund Global (Norway)
Just Money Super Fund
Kollanti Super Fund
PFA Pension
PKA Pension
Pensionfonds Zorg en Welzijn (PFZW)
Presse-Versorgung
Second Swedish National Pension Fund (AP2)
UniSuper

Universities

Australian National University
Georgetown University
Humboldt State University
Lund University
Prescott College
University of Liège
University of Sydney
Western Oregon University
Yale University

References and supplementary notes

[1] Daniel Fischel, "Fossil fuel divestment: a costly and ineffective investment strategy", (2015).
[2] Louise Jeffery, Claire Fyson, Ryan Alexander, Johannes Gütschow, Maria Rocha, Jasmin Cantzler, Michiel Schaeffer et al. *Climate action tracker.* 8 December, 2015.
[3] Doyle, Alistar. "World heat shatters records in 2016 in new sign of global warming." *Reuters,* 5 Janurary, 2017.
[4] Eric Holthaus. "Northern hemisphere temperature breaches a terrifying milestone." *New Scientist,* 7 March, 2016.

[5] **Of the 17 warmest years ever recorded, 16 have occurred since 2001;** NASA, *NASA, NOAA Data show 2016 warmest year on record globally.* (2017).

[6] **Humans burning fossil fuels have caused global CO_2 concentrations to rise more than 120 ppm since pre-industrial times, with half of that rise occurring since 1980**; Kahn, Brian. "The world passes 400 ppm threshold. Permanently." *Climate Central,* 27 September, 2016.

[7] National Snow and Ice Data Center. *Low sea ice extent continues in both poles. (*2017).
[8] Slezak, Michael. "The Great Barrier Reef: a catastrophe laid bare." *Guardian,* 7 June, 2016.
[9] McCurry, Justin. "Almost 75% of Japan's biggest coral reef has died from bleaching, says report." *Guardian,* 12 January, 2017.
[10] Morton, Jamie. "Climate change could recreate horror drought." *New Zealand Herald,* 21 October, 2016.
[11] Price, Rosanna. "Adapt or die: climate change puts pressure on NZ's paua." *Stuff*, 18 July, 2016.
[12] Gavin Kenny. "Climate change: likely impacts on New Zealand agriculture." *Ministry for the Environment,* September, 2001.
[13] James Renwick, Barbara Anderson, Alison Greenaway, Darren Ngaru King et al, "Climate change implications for New Zealand", *Royal Society of New Zealand* (2016).

[14] **For discussions Auckland city planners and policy makers may find stimulating,** please see Roberts, David, *Vox*: **"**Cities are central to any serious plan to tackle climate change" (6 December, 2016) & "Vancouver plans to go 100% renewable…" (26 July, 2016).

[15] Arabella Advisors, *The global fossil fuel divestment and clean energy investment movement.* (2016).
[16] MSCI ESG Research, *Responding to the call for fossil-free portfolios.* (2015).
[17] MSCI, MSCI ACWI EX FOSSIL FUELS INDEX (GBP). (2017). For a similar calculation based on the same index, see also: Collinson, Patrick. "Fossil fuel-free funds outperformed conventional ones, analysis shows." *Guardian,* April 10, 2015.
[18] Genus Capital Management Inc., *Fossil fuel divestment report.* (2016)
[19] John Willis & Paul Spence. "The risks and returns of fossil fuel free investing." *Sustainable Insight Capital Management,* 2014.
[20] Atif Ansar, Ben Caldecott and James Tillbury, "Stranded assets and the fossil fuel divestment campaign: what does divestment mean for the valuation of fossil fuel assets?" *Smith School of Enterprise and the Environment* (2013).

[21] **The Carbon Tracker Initiative website** has a wealth of rigorous research relevant to divestment – see, for instance, *The $2 trillion stranded assets danger zone: How fossil fuel firms risk destroying investor returns* (2015) and *Carbon asset risk: From rhetoric to action*, (2015).

[22] Ian Simm, *Climate change: now risk not uncertainty.* Impax Asset Management, London (2015).
[23] Rebecca Maclean, *Stranded assests: challenging the status quo.* Standard Life Investments Ltd., Edinburgh (2014).

[24] The Aperio Group findings are of particular interest, as they find that **carbon-free funds have closely tracked the performance of the US market since 1988 and the global market since 1997 -** a longer time-frame of consideration than the other studies referenced in this section. Thus, fossil fuel divestment is highly unlikely to negatively impact returns, *despite eliminating a significant component of the "investable universe" from one's portfolio*; Patrick Geddes, Lisa Goldberg, Robert Tymoczko & Michael Branch. "Building a carbon-free equity portfolio." *Aperio Group,* October 2015.

[25] BlackRock Investment Institute, *Adapting portfolios to climate change.* (2016)

[26] While coal's current difficulties are well-publicised, the situation is more nuanced than might be immediately appreciated. While coal's global share of power generation is set to decline overall, some countries (most notably India) are on track for problematic rises in coal consumption. Further, while the current difficulties of coal in the US are mainly due to the market (namely, low Chinese steel demand and a bad bet by US producers on metallurgic coal), the current downward spiral of coal also involves the ascendancy of natural gas. As such, more sophisticated opponents of divestment may present the current state of the coal industry not as an argument for fossil fuel divestment *per se*, but rather as an argument in favour of investing in one fossil fuel over another. Nonetheless, by looking once more at the world's carbon budget, one quickly concludes that **a 1.5° C or less scenario necessitates eliminating coal consumption altogether (and even then, proven oil & gas reserves are sufficient to tip us over the line)**. Despite much encouraging news (such as Chinese "peak coal" & coal plant cancellations), *we are still not where we need to be*. Thus, coal divestment is urgently required.

As to **natural gas**, we advocate for complete divestment of *all* fossil fuels with no exceptions (a "negative screen"). Burning natural gas produces less CO_2 than other fossil fuels; thus, natural gas is sometimes touted as a "transition fuel" to a lower carbon economy. However, this position distorts the full picture. In addition to comprising a significant component of the CO_2 emissions pushing the world over it's carbon budget, hydraulic fracturing techniques ("fracking") used to obtain natural gas are a major source of methane emissions. Methane (CH_4) is a shorter lived greenhouse gas than CO_2, but causes more than 20 times as much warming as the same volume of CO_2. Short-term temperature surges caused by methane emissions have the potential to precipitate larger warming events. **Notably, the carbon budget presented here does not account for methane emissions, and is thus likely to be overly generous (!).** Additionally, public concern and opposition to natural gas is widespread for reasons beyond climate change. Fracking has received an abundance of bad press for general environmental degradation and alarming effects on water quality. Evidence is also accumulating that fracking increases the incidence of earthquakes in geologically sensitive regions - hence the robust opposition to these ventures, which ought to blunt the appeal of investing in natural gas.

[27] Varinsky, Dana. "Nearly half of US coal is produced by companies that have declared bankruptcy – and Trump won't fix that." *Business Insider Australia,* 10 December, 2016.
[28] Carrington, Damian. "China's Coal Peak Hailed as Turning Point in Climate Change Battle." *The Guardian*, July 25, 2016.
[29] Carroll, Joe. "Exxon's profit miss shows no one immune from market ravages." *Bloomberg,* February 1, 2017.
[30] Scheyder, Ernest. "Exxon boosts capital budget but takes $2 billion charge from XTO deal." *Reuters,* January 31, 2017.

[31] Crooks, Ed. "ExxonMobil forced to make cuts to reported oil and gas reserves." *Financial Times,* February 23, 2017.
[32] Amaro, Silvia. "Shell posts earnings of $3.5 billion in 2016; an 8% slide from $3.8 billion in 2015." *CNBC,* February 2, 2017. Analysts have also expressed concerns that Shell may be borrowing to fund its dividends. O'Connell, Dominic. "Shell profits held back by BG takeover." *BBC,* February 2, 2017.
[33] Amaro, Silvia. "BP annual earnings dip to 10-year low, warns OPEC cut could affect 2017 production." *CNBC,* February 2, 2017.
[34] Carroll, Joe. "Chevron's first loss in decades signals hard time for giants." *Bloomberg,* January 28, 2017.
[35] Carroll, Joe. "Exxon's profit miss shows no one immune from market ravages." *Bloomberg,* February 1, 2017.

[36] Lazard Asset Management. *Lazard's levelised cost of energy analysis – version 9.0.* November, 2015; US Department of Energy. *6 charts that will make you optimistic about America's clean energy future.* September, 2016.
[37] Bloomberg New Energy Finance, *Climatescope 2016: the clean energy competiveness index.* 14 December, 2016. **See also:**

- Roberts, David. "**2 remarkable facts that illustrate solar power's declining cost**." *Vox,* 22 December, 2016; & "**Bigger, better, cheaper: wind power is flourishing in the US.**" *Vox,* 19 August, 2016.
- Frankfurt School of Finance & Management. *Global trends in renewable energy investment 2016.* 2016.
- Shankleman, Jess & Martin, Chris. **"Solar could beat coal to become the cheapest power on Earth."** *Bloomberg,* 3 January, 2017.

[38] Lazard Asset Management. *Lazard's levelised cost of energy analysis – version 9.0.* November, 2015. However, it should be noted that *rooftop* solar remains very expensive, and that government subsidies will still play a vital role in expanding renewable energy generation in the time-frames necessary to deal with climate change.
[39] Bloomberg New Energy Finance, *Climatescope 2016: the clean energy competiveness index.* This rate of decline will not be sufficient to keep warming below 1.5 ° C.
[40] Bloomberg New Energy Finance, *New energy outlook 2016.* June, 2016. For discussion of this report, see: Roberts, David. "The climate fight will be won or lost in India, in 8 charts." *Vox*, June 14, 2016. As an indicator of things to come, in December 2016, Portugal ran entirely on wind, hydro & solar for 4 & a half days.
[41] US Department of Energy. *6 charts that will make you optimistic about America's clean energy future.* September, 2016. **Massive battery storage plants are also coming online in the US** (Randall, Tom. "Tesla's battery revolution just reached critical mass." *Bloomberg*, 31 January, 2017).

[42] It remains to be seen how much the recent OPEC-led supply reduction manoeuvres will raise the price of oil. This is very much an open question, given the traditional rivalries of the OPEC countries (eg. Saudi Arabia & Iran) and their competing interests (countries like Iraq, emerging out of traumatic conflicts, would benefit from significantly *increasing* output); see Plummer, Brad. "Can OPEC still swing global oil prices? We're about to find out." *Vox,* 29 November, 2016. The fossil fuel industry *does* seem to be betting on a recovery, as indicated by increasing project approvals and exploration spending (the first increase in the latter in three years). However, as noted in the main text, even *if* oil prices recover significantly, these investments run the risk of becoming stranded assets in the near future. Further, many of the green-lighted projects for 2017 are deep-water projects – these are the most expensive projects to develop, and often require high oil prices to be profitable (sometimes as high as $60 a barrel to break even). BP, having recently clawed its way back into profitability after its worst year on record (2015), has admitted that it is relying upon oil prices of $60 a barrel to balance its books by the end of 2017. Katakey, Rakteem. "Oil industry starts revival as project approvals to double." *Bloomberg,* 11 January, 2017.

[43] Randall, Tom. "**Here's how electric cars will cause the next oil crisis**." *Bloomberg,* 25 February, 2016.

Naturally, there is some uncertainty about the timing of this crisis-precipitating oil displacement by widespread EV adoption: the 2020s is a bullish - yet not unreasonable - estimate, with more conservative estimates stretching into the 2040s. Uncertainty chiefly arises from **(i)** *uncertainty about the amount of oil displacement needed to cause a crisis in the oil industry* (although 2 million barrels/per day is a reasonable estimate given recent experience, this is not guaranteed to hold going forward); **(ii)** *a lack of allowance for a downward pressure exerted on oil prices by the excess oil supply created by widespread EV adoption*, which could well push the onset of the "crisis" back; and **(iii)** *oil price volatility* - invariably, oil price fluctuations take observers by surprise: oil prices are exquisitely sensitive to many complex, difficult to predict forces, such as the political stability of exporting countries (typically prone to intense political instability), the global economic "pulse" (witness the effects of Chinese industrialisation fluctuations or global recessions), and the actions of producer cartels (would OPEC respond to EV threats by shifting tactics and attempting to flood the market with cheap oil in order to stave off collapse?). As such, Bloomberg New Energy Finance *also* modelled scenarios where oil prices crash further to $20/barrel, concluding that this would delay an EV-evoked crisis in the oil industry until the 2040s.

However, despite uncertainty about the timing, **the reasoning is fundamentally sound** (an analysis by Wood Mackenzie (2016) also considers a peak in oil demand "well before 2035" highly probable (paywall))**.** Thus, fossil fuel divestment is a prudent measure to (i) pre-emptively protect one's portfolio and (ii) to insure against a worst-case scenario (for the climate) of relatively slow EV adoption (for further discussion about the impact of electric vehicles upon fossil fuels, the following is highly recommended: Roberts, David. **"Within a decade, electric vehicles could be cheaper than gasoline vehicles. Then, watch out."** *Vox,* 4 March, 2016; "We're probably underestimating how quickly electric vehicles will disrupt the oil market." *Vox,* February 2, 2017). BP has recently tried to downplay these concerns, predicting growth in oil demand through to 2035 despite increased EV penetration – a conclusion widely disputed (especially given BP's dismal track record at predicting growth in renewable energy) and at odds with the predictions of the automobile industry. However, one apposite point that the BP-commissioned study *does* make is that a rising middle class in the developing world will quite likely result in increased demand for personal automobiles. Thus, if electrified alternatives are not also presented to the developing world, the inevitable crisis that rising EV adoption presents to the fossil fuel industry could well be pushed back. Vaughan, Adam. "Electric cars will not stem global demand for oil, says BP." *Guardian,* 25 January, 2017.

[44] **Levels of ambition vary, with New Zealand on the low end of the scale** ("NZ wins first "Fossil" award at Paris talks." *New Zealand Herald,* 1 December, 2015).

[45] James Renwick, Barbara Anderson, Alison Greenaway, Darren Ngaru King et al, "Climate change implications for New Zealand", *Royal Society of New Zealand* (2016).

[46] **Failure to account for the hidden costs of fossil fuels effectively subsidises the fossil fuel industry at the taxpayer's expense**.

[47] As detailed in the main text, divestment is a prudent response to the imminent challenges to the fossil fuel industry on the horizon. These challenges - EVs, renewables, and government regulation - pose a much more existential threat to the industry than the current spate of supply/demand-driven difficulties for oil and coal. However, while the current and projected profits of the fossil fuel industry are **unambiguously poor**, we do not wish to overstate our case: **business as usual continues, and it will take widespread concerted effort to change this *within the necessary time-frame*.** For instance, while it is true that the share of renewables in global newly-added

electricity generation capacity historically overtook that of fossil fuels in 2015 (continuing a well-established trend of steadily increasing investment), the overall share of renewables in power generation remains a sliver of *total* generation. While clean energy is expected to continue to expand dramatically (New Energy Outlook 2016), overall "dirty" energy levels are currently expected - *under "business as usual"* - to retain a relatively constant share through to 2040 (due especially to a tripling of coal consumption projected for India). While it *is* technically feasible to power the world by clean energy, in the developed world that typically means displacing existing energy production capacity - a hard but necessary sell. Thus, in order to limit warming to acceptable levels, significant political will, foresight and careful planning will be needed. Actions such as fossil fuel divestment can play a strong supporting role in this process – as such*, the evidence of greater returns for divested portfolios should only be a small additional incentive.*

[48] Daniel Fischel, "Fossil fuel divestment: a costly and ineffective investment strategy", (2015).
[49] **For an impartial discussion of this paper's shortcomings, see the critique in *Forbes* by Zeller Jr., Tom.** "Fossil fuel divestment: smart bet or losing strategy?" *Forbes,* February 10, 2015.

[50] Andrew Grant, James Leaton, Mohammed Adow, Wendel Trio et al. *The sky's limit: why the Paris climate goals require a managed decline of fossil fuel production*. Oil Change International (2016). **This recent report is highly recommended to readers who wish to know the details of such calculations and the current breakdown of the world's carbon budget.**

[51] For instance, Market Forces found (2016) that about half of Australians would switch banks if they were lending money to climate change exacerbating projects (most are lending).
[52] For example, references 13-23 above.
[53] Carrington, Damian. "Axa IM warns that companies linked to fossil fuels risk their reputations." *Guardian,* January 15, 2015.
[54] Shankleman, Jessica. "Mark Carney: most fossil fuel reserves can't be burned." *Guardian*, October 13, 2014.
[55] Jim Yong Kim. *World Bank Group President Jim Yong Kim Remarks at Davos Press Conference.* World Bank Speeches and Transcripts (2014).

[56] **It is important to emphasise that fossil fuel divestment aims *primarily to stigmatise* the fossil fuel industry – and *not* to substantively threaten the fossil fuel industry's profitability – as it is sometimes used as an argument *against* fossil fuel divestment that the impact *in financial terms alone* will be small.** And indeed, this is true of divestment movements past and present – for instance, studies of the *purely financial* impacts of **anti-Apartheid South African divestment** find no firm evidence of negative effects on South African stocks, currency or economic performance. However, the *indirect effects* of divestment *were* significant. Stigmatisation of South Africa led to **(i)** major anti-South Africa legislation (eg. the US Comprehensive Anti-Apartheid Act of 1986, restricting exports and loans to South Africa); **(ii)** sporting and cultural boycotts (as we in New Zealand know well), raising awareness of the problem; **(iii)** the formulation of the Sullivan principles ("racially neutral" operating policies for corporations operating in South Africa); and **(iv)** global public awareness of Apartheid undermining the diplomatic standing of the South African regime abroad. Thus, despite little discernible financial or economic impacts of divestment, it is demonstrably false to assert that divestment played no significant role in bringing down Apartheid. ("Stranded assets and the fossil fuel divestment campaign: what does divestment mean for the valuation of fossil fuel assets?" 2013). It is hoped that the convergence of divestment

with both market and political factors will force fossil fuel companies to diversify their activities and expand into renewable energy projects.

However, some who accept the rationale behind anti-Apartheid divestment from South Africa reject fossil fuel divestment on the basis of the ubiquity of fossil fuels and the need (in the developed world especially) for the displacement of much existing energy infrastructure in the transition to alternative energy sources. In response to such arguments, we point to purely market forces threatening the ubiquity (and therefore profitability) of fossil fuels – namely the continuation of recent advances in renewable energy and electric vehicle technology and growing investment in these fields. However, if left solely to the market, these inevitable sea shifts will arrive too slowly: the carbon budget considerations here presented unequivocally demonstrate **the urgent need for a swift decline in fossil fuel usage.** Given the incompatibility of further investment in fossil fuel extracton and staying below "safe" global temperatures, it logically follows that the ubiquity of fossil fuels makes fossil fuel divestment *all the more urgent*.

[57] **Almost all the divestment movements *Ansar et al. (2013)* studied resulted in restrictive legislative changes, from *"adult services to Darfur, from tobacco to South Africa."*** In their analysis, past divestment campaigns have acted as "*prominent banners… rall[ying] the faithful to successful political actions.*" They find that divestment occupies an important early role in increasing awareness of an issue and generating political will, leading directly to restrictive legislation such as the US 1969 Public Health Cigarette Smoking Act and state-led litigation against tobacco companies.

In the context of fossil fuel divestment, such restrictive legislation could include bans/moratoria on drilling, exploration and other projects, or a progressive **carbon tax**. An effective carbon tax is long overdue, given that "*[a]lone among businesses, the fossil-fuel industry is allowed to dump its main waste, carbon dioxide, for free. Nobody else gets that break – if you own a restaurant, you have to pay someone to cart away your trash, since piling it in the street would breed rats… Until a quarter-century ago, almost no one knew that CO_2 was dangerous. But now that we understand that carbon is heating the planet and acidifying the oceans, its price becomes the central issue…" (Bill McKibben, "Global warming's terrifying new math." 2012).*

Significant negative financial impacts become much more likely at *this* stage of a divestment campaign. For instance, the expectations of restrictive legislature *would* depress demand for fossil fuels and create uncertainties regarding fossil fuel company cash-flows (would banks or large multilateral organisations like the World Bank continue to readily finance fossil fuel projects in countries considering drilling bans?). **It should also be noted that relatively few institutions need to divest before such legislative momentum is generated** (for instance, only a minority of US companies active in South Africa divested before anti-Apartheid legislation began there). Thus, *from a purely financial point of view*, it may be prudent to divest fossil fuel holdings now when the fossil fuel divestment movement is rapidly growing.

[58] Atif Ansar, Ben Caldecott and James Tillbury, "Stranded assets and the fossil fuel divestment campaign: what does divestment mean for the valuation of fossil fuel assets?" *Smith School of Enterprise and the Environment* (2013).
[59] Quoted in "Carbon asset risk: from rhetoric to action", Shanna Cleveland, Rob Schuwerk & Chris Weber, *Carbon Tracker Initiative,* 2015.
[60] Andrew Grant, James Leaton, Mohammed Adow, Wendel Trio et al. *The sky's limit: why the Paris climate goals require a managed decline of fossil fuel production*. Oil Change International (2016).
[61] Goldenberg, Suzanne. "Rockefeller family tried and failed to get ExxonMobil to accept climate change". *Guardian*, March 27, 2015.

[62] Although CCS very likely *will* be needed *after the world stops emitting CO_2 at its current pace*, in order to deal with atmospheric CO_2 concentrations from *historical*

emissions. **It is the notion that CCS precludes the need to transition away from fossil fuels *right now* that we refute in this report**.

[63] OECD Companion to the Inventory of Support Measures for Fossil Fuels 2015, Box 2.1, p. 28.
[64] Austin, Ian. "Technology to make clean energy from coal is stumbling in practice", *New York Times*, 29 March, 2016.
[65] The Carbon Capture and Storage Association, "Report launch: Lessons learned from UK CCS programmes"
[66] van Loon, Jeremy. "Shell sees carbon price of $60 to $80 needed to justify CCS." *Bloomberg,* 6 November, 2015.
[67] Carbon Tracker Initiative. *Unburnable carbon 2013: Wasted capital and stranded assets.* (2013).
[68] Richard Monastersky. "Seabed scars raise questions over carbon-storage plan", *Nature,* 17 December, 2013.
[69] Gosden, Emily. "UK scraps £1bn carbon capture and storage competition." *Telegraph,* 25 November, 2015; Daniels, Steve. "FutureGen 'clean-coal' plant is dead." *Crain's Chicago Business,* 3 February, 2015; Doyle, Alister. "Four European utilities drop EU CCS technology project." *Reuters,* 19 January, 2015.
[70] Mark Jacobson, Mark Delucchi, Guillame Bazouin, Zack Bauer et al. "100% clean and renewable wind, water, and sunlight (WWS) all-sector energy roadmaps for the 50 United States." *Royal Society of Chemistry,* 8 (2015):2093-117.

[71] *Ibid.* **Note also that the Chinese coal boom was *not* the primary means by which China has recently lifted millions out of poverty - while it sounds persuasive, the timing does not actually pan out, and that distinction more properly goes to agricultural reform.**
[72] IImi Granoff, James Hogarth, Sarah Wykes & Alison Doig. "Beyond coal: scaling up clean energy to fight global poverty." *Overseas Development Institute*, October 2016.
[73] See, for instance, India's recent problems running existing coal plants during periods of increased demand (Sing, Rajesh Kumar. "Indian blackouts widen as coal stocks drop at power plants." *Bloomberg*, 30 August, 2014). What's more, **once fossil fuel plants are established, countries can be locked into unpredictable price and availability difficulties for at least 35 years**; (Kammen, Daniel. "Why you don't need fossil fuel to fight poverty (clean energy does it better)." *National Geographic,* 24 February, 2014.
[74] Liu, Coco. "As China's demand for coal soars, so does its water scarcity." *E & E News,* 1 July, 2013.

[75] Catholic Agency for Overseas Development, *Climate change and vulnerability: pushing people over the edge.* (2014).
[76] Food and Agriculture Organization of the United Nations. *The state of food and agriculture.* (2016).
[77] International Energy Association. *Renewable energy medium-term market report 2016.* (2016).
[78] China leads in global capacity and annual additions for solar and wind power, and Chinese renewable energy investment continues to rise (2005-15). Data from *Renewables 2016 global status report*, Renewable Energy Policy Network for the 21st Century, 2016.

[79] In the developing world, distributed energy resources (DER) often appeal to customers that are *already* connected to the grid, but receive inconsistent service.
[80] Bernard Tenenbaum, Chris Greacen, Tilak Siyambalapitiya & James Knuckles. "From the bottom up: how small power producers and mini-grids can deliver electrification and renewable energy in Africa." *World Bank,* 2014.

[81] For example, a country like India has an urgent need for energy capacity expansion **but also bears less responsibility for historical CO_2 emissions** (despite have 18% of the world's people, India has only contributed ~3% of the total global CO_2 emissions).

[82] As David Roberts notes ("What will it take to get electricity to the world's poor?", *Grist,* 28 October, 2014), **"[t]hat flared natural gas is plentiful in Nigeria has not meant plentiful power for Nigerians" and "[t]hat coal is plentiful in South Africa has not meant plentiful power for poor South African villages."** For another example of the predatory nature of the fossil fuel industry's engagements in the developing world, see the recent suit of the Ogoni King against Shell: "Ogoni king: Shell oil is killing my people." Vidal, John; *Guardian,* 3 December, 2016.

[83] See, for instance: Mark Jacobson, Mark Delucchi, Guillame Bazouin, Zack Bauer et al. "100% clean and renewable wind, water, and sunlight (WWS) all-sector energy roadmaps for the 50 United States." *Royal Society of Chemistry,* 8 (2015):2093-117.

[84] Anadarko website, accessed 27 January, 2017: http://www.anadarko.com/Operations/Upstream/New-Zealand/