Issue #125 | November 2015
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chain reaction

The National Magazine of Friends of the Earth Australia www.foe.org.au

Challenging the Privatised University

- Emerging technology and privatised universities
- Greening the Internet
- Geoengineering: Striking targets or missing the point?
- Should Australia become the world's nuclear waste dump
- Health effects of the Fukushima disaster
- Renewable energy revolution

ARE YOU SURE IT'S SAFE?

Our food regulator, Food Standards Australia New Zealand (FSANZ) is failing to ensure that the food we eat is safe and properly labelled so that we can make informed choices.

FSANZ consistently puts the interests of big business before public health. The agency has allowed the rapid introduction of new ingredients with minimal or no testing - including genetically modified and nano-ingredients. It allows food ingredients that are banned or restricted in other countries for safety reasons – including food additives and trans fats. It has failed to regulate pesticide residues and food irradiation in a precautionary and pro-active way. FSANZ has also failed to ensure that labelling laws provide us with the information we need.

We want to change the way FSANZ does business and we need your help! Please join our campaign to ensure that FSANZ makes food safety and our right to know its top priorities.

Take Action!

- Join our campaign at **FedUpWithFSANZ.net**
- Make your **voice heard**
- Blog, Tweet, Share: **#FedUpWithFSANZ**

Friends of the Earth Australia

gene ethics

GM-FREE AUSTRALIA

RITE

NTN NATIONAL TOXICS NETWORK

Food Intolerance Network

MADGE

ADDITIVE ALERT

food sovereignty

Friends of the Earth Australia

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Give your support by:

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I'd like to make a **monthly** donation of:

❑ $20 ❑ $30 ❑ $50 ❑ other $ _____ ($10 min)

The donation will be by (please fill out appropriate card details below):

❑ **Direct Debit** from my bank account (the least admin fees!)
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A Service Agreement will be sent to you upon receipt of this form. All contributions are tax deductible with the exception of $20 per year to cover a membership fee.

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Become a FoE member with a yearly membership payment:

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3

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Request you, until further notice in writing, to debit my/our account described in the schedule below, any amounts which Friends of the Earth Inc may debit or change me/us through our direct debit system. I/We understand that 1) the bank/financial institution may in its absolute discretion determine the order of priority of payment by it of any moneys pursuant to this request or any other authority or mandate. 2) The bank/financial institution may in its discretion at any time by notice in writing to me/us terminate the request as to future debits. Bendigo Bank Direct Debit User ID no: 342785

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Please return to Friends of the Earth, PO Box 222 Fitzroy, VIC, 3065
Ph: 03 9419 8700 **Fax:** 03 9416 2081 **Email:** membership@foe.org.au
Website: www.melbourne.foe.org.au **ABN:** 68 918 945 471

Friends of the Earth

Friends of the Earth (FoE) Australia is a federation of independent local groups.

You can join FoE by contacting your local group – see the inside back cover of Chain Reaction for contact details or visit foe.org.au/local-groups

There is a monthly FoE Australia email newsletter – subscribe via the website: www.foe.org.au

To financially support our work, please visit foe.org.au/donate

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Minister for Coal

On October 30, FoE activists joined others involved in the Direct Action Melbourne coalition to occupy the electorate office of the federal Minister for Coal, Greg Hunt. The action followed Hunt's re-approval of Australia's largest new coal project – Adani's Carmichael mine. While some people occupied Hunt's office, others hung a banner from the roof and others conducted a role play to act out the damaging impacts that decisions made by the minister are having on communities and the climate.

FoE campaigner Morgana Russell, one of the four people occupying the minister's office, said: "Mr Hunt is acting as a rogue agent for the fossil fuel industry. We stand in solidarity with traditional custodians in the Galilee basin who have been fighting against Adani trashing their land. I am here because the government is putting my future at risk."

www.facebook.com/directactionmelbourne/

#Ministerforcoal

www.facebook.com/quitcoalvic/posts/586315968173701

Think before you spray

FoE Melbourne has printed 1000 copies of 'For the Sake of our Waterways, Think Before You Spray' information sheets. The sheets provide comprehensive information regarding the most commonly used garden sprays in the Melbourne region and the most commonly detected pesticides in Melbourne waterways. A survey of pesticide sellers earlier in the year found that the neonicotinoid (bee killing pesticide) Imidacloprid is commonly sold throughout Melbourne. If you have any links to gardeners, community information networks, gardening groups or urban re-vegetation groups and you would like to help distribute these sheets email Anthony Amis at ajamis50@gmail.com

Action at Greg Hunt's office, October 30.

FoE faces hostile parliamentary inquiry

In September, Friends of the Earth faced the hostile House of Representatives Inquiry into environmental organisations. It was set up by the Abbott government to curtail our advocacy and community campaigning, and threaten our tax deductibility status that allows people to fund environmental protection.

FoE Melbourne campaigns coordinator Cam Walker and operations coordinator Samantha Castro were joined by affiliates Nicola Paris (CounterAct) and Julian Vincent (Market Forces) for an hour of intense questioning from the panel (including the likes of maverick LNP MP and FoE critic, George Christensen).

Testament to the our strong community network, FoE supporters filled the public gallery. Our team answered all the questions fired at us with poise. The whole exchange was documented on social media on the #FriendOfFoE and #DefendEnviroOrgs hashtags.

The community sent a clear signal to the Federal government with a rally outside the hearing. The whole movement came together in a display of strength against this attack.

Labor has described the inquiry as "a show trial" and shadow assistant treasurer Andrew Leigh said if charities were doing the wrong thing, they should be referred to the Australian Charities and Not-for-profits Commission.

A poll commissioned by the Australia Institute found that over two-thirds of respondents (68%) support the right of environment groups to conduct environmental campaigns and advocate policy changes, while also claiming charity status.

Our resolve is strong – but we need your help to make sure that we can continue to stave off these attacks whilst maintaining campaigns like Coal and Gas Free Victoria, Yes 2 Renewables and Anti-nuclear and Clean Energy (ACE), who are delivering such important environmental outcomes.

To join Friends of the Earth or to donate, see the form on page 4 of Chain Reaction.

Protest outside the House of Representatives hearing, Melbourne, September.

River Country campaign

Wadi Wadi Traditional Owners have been trying to regain ownership and management of the Nyah-Vinifera forest since colonisation. They were promised co-management by the Victorian Labor State Government five years ago and are still waiting for an outcome.

The fight to protect the Nyah-Vinifera forest from logging and improve its health was fought by thousands of people, hundreds of committed locals and Wadi Wadi Traditional Owners. The forest was finally declared as a Regional Park by the Victorian Labor Government in 2010 after a 15-year fight to protect it. Once this happened, people believed the forest would be safe into the future.

But, the Nyah-Vinifera Park has been severely neglected over the past five years. Under the previous Coalition state government, plans put in place to protect and manage the park under the 2009 Victorian Environmental Assessment Council recommendations were stalled or forgotten.

Please show your support for Wadi Wadi by demanding the Victorian government commit to handing back the Nyah-Vinifera Park's management to its Traditional Owners. You can sign our petition at: www.melbourne.foe.org.au/nyah_vinifera_park_management

In October, the ABC reported that flows into the Murray-Darling river system are as low as they were in 2002–2003 – the first bad year of the Millennium Drought. Meanwhile, a perfect political storm is brewing that could threaten the hard-won gains for Australia's greatest river system. Friends of the Earth needs your help to secure a sustainable future for the Murray Darling Basin. Since September, the Basin's river systems have had to contend with new and worrying threats. First, the Nationals have taken control of the water portfolio, with Barnaby Joyce appointed Minister in the new Turnbull Government. Second, a group of cross-bench Senators have mounted an inquiry and are calling for the Basin Plan to be 'paused' to appease angry farmers in the Victorian and NSW irrigation districts. Please send a message to Prime Minister Turnbull using our online form: www.melbourne.foe.org.au/keep_the_murray_flowing

– Morgana Russell, River Country Campaign coordinator, FoE Melbourne.

UN climate conference and People's Marches

All across the world as world leaders gather in Paris for the 'COP21' UN climate talks in December, millions of ordinary people will be standing up for social and environmental justice – and for real action on climate change. FoE has joined with dozens of other groups in supporting the marches being held from November 27 to 29. These are happening as part of a global effort and are intended to be the world's biggest climate mobilisation ever. You can find out about the march closest to you at www.peoplesclimate.org.au

To keep in touch with FoE's activities around COP21 and to sign up for email updates, visit: www.wearetheenergyrevolution.org/en/start/

See also www.foe.org.au/articles/2015-09-29/paris-climate-talks

On October 27, FoE joined with a wide range of organisations and prominent Australians to support the call from the President of Kiribati, who is asking for a moratorium on new coal mines. The letter is posted at:

www.foe.org.au/articles/2015-10-27/61-prominent-australians-back-no-new-coal-mines

The Green Pledge

From August 31 to September 6, 500 Plegdends committed to five climate actions and helped raise $26,000 for Friends of the Earth. Across the week, Pledgends threatened to leave their banks (because of their fossil fuel investments), rode over hills and through valleys, generated zero waste and wrote letters to their MPs. Check out the website below for the list of 10 actions.

This years participants included two Federal MPs, Melissa Parke (ALP) and Adam Bandt (Greens). We partnered with five community groups and visited 30 schools across Victoria to speak about the Green Pledge and the work of Friends of the Earth. We had Councillors Helen Patsikatheodorou, Philip Mallis and Major Paul McLeish take part. And we had the hilarious Rod Quantock ambassador-ing for us along the way.

If you are interested in becoming involved or want to find out more, please visit www.thegreenpledge.net

– Harry Cossar-Gilbert, Green Pledge Coordinator, 0402 755 264, harry.cossar-gilbert@foe.org.au

Farmland not Gaslands

The past two years have been incredible and frightening. People all across Victoria discovered their fertile farmland, communities and precious natural areas were blanketed with licences for unconventional gas. But in that time, those communities have banded together to create a powerful, state-wide movement to protect their land, water, health and future.

And now there's a film about it. *Farmland not Gaslands* is a moving short film about communities, ranging from Western Victoria to Gippsland, who are threatened by the activities of mining companies, but refuse to sit down and say nothing about it.

It's a matter that is close to home for director and producer Pennie Brown. Her family live in Gippsland, where over 350,000 hectares of land is covered in approved exploration licences for unconventional gas.

Farmland not Gaslands was premiered to a sold-out cinema as part of the Environmental Film Festival in early September, going on to win the People's Choice award. The resounding success of this grassroots film shows that it is not only a wonderful work of art, but also a reminder of the amazing things that can happen when communities get together.

– Katherine Smyrk

Cheaper GreenPower available to FoE members

Friends of the Earth has joined a unique, nationwide, community GreenPower scheme – the Community Climate Chest (C3) – so that we can offer tax-deductible, clean energy to FoE members and supporters. By participating, our members can save up to 50% on standard GreenPower fees, while raising funds for FoE (FoE gets 10% of every donation our members and supporters make to C3).

What is unique about this scheme is that payments for energy certificates can be claimed as tax deductions. C3 is a joint initiative of the Alternative Technology Association, the Macedon Ranges Sustainability Group, and GreenPower provider ACXargyle.

While the C3 site offers the option of offsets (for instance to offset the impact of a car), FoE has not traditionally supported simple offsetting as a way of dealing with climate change. However there are options to select a range of offsets on the site if you choose to do so.

To start saving money and supporting FoE while reducing your carbon footprint, please visit www.climatechest.org.au/host/foe

See also: www.melbourne.foe.org.au/support_foe_and_support_green_energy_at_the_same_time

Seed Freedom Food Festival in Adelaide

Members of FoE Adelaide's Fair Food Adelaide collective were very pleased to be part of the second annual Seed Freedom Food Festival at the Market Shed in Adelaide in late September. The one day festival celebrates the importance of seed to human life, the need to protect seed from corporate control, and the ethical production of nourishing food.

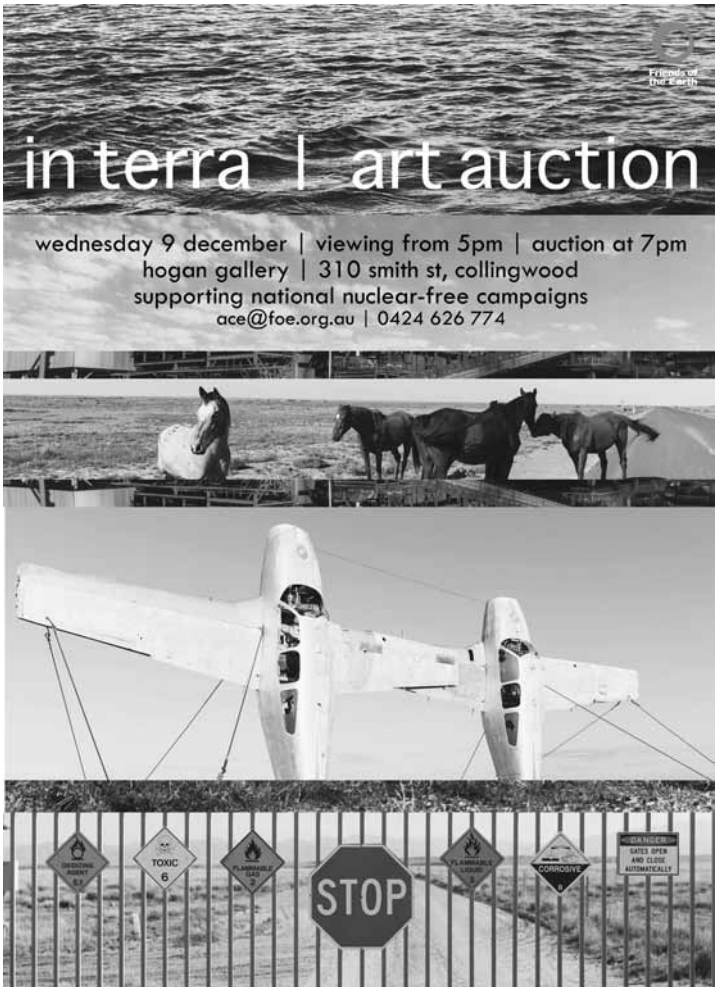
It was a wonderful day of workshops, entertainment, information, networking and good food with an emphasis on organic and vegan options. There was a seed swap, produce swap and all kinds of stalls. During the day everyone was encouraged to contribute to making a seed mandala and the finale of the day was mixing up the mandala and creating 'seed bombs' to take the mandala seeds for planting in our diverse neighbourhoods.

The festival is the brainchild of seedizen Keitha Young and a highlight of the day was a video address by environmental activist Vandana Shiva.

Our stall gave out information on GMOs, food swaps around the city and the current Royal Commission into the nuclear fuel cycle which threatens SA's local and international reputation for clean green quality food. We also had information on gas fracking which is threatening farmlands on the south east coast of SA around the Mount Gambier region.

The festival leads up to the annual Fair Food Week, an initiative of the Australian Food Sovereignty Alliance. Events are being held around Australia between October 16-25 with details of activities at fairfoodweek.org.au

FoE's groups Fair Food Adelaide and March Against Monsanto are celebrating Fair Food Week with a screening of the film *GMO OMG* and a planning/fundraising lunch. For more information contact robyn.wood@foe.org.au



September 20 march to declare Victoria gasfield free, Melbourne.

March to declare Victoria gasfield free

Two thousand Victorians united to declare that gasfields will never be welcome in Victoria. On Sunday September 20, farmers and community members from as far as Portland in the Western Districts and Seaspray in East Gippsland rallied at State Parliament to send a clear message to the Victorian government that the state is off limits to unconventional gas mining companies. The crowd included representatives of 67 Victorian communities who have declared themselves 'Gasfield Free'.

The crowd marched from the State Library to Parliament House, where a 50 metre scroll was unfurled, outlining a declaration that the people of Victoria will not allow the development of an onshore gas industry, even if that means taking non-violent direct action as people have in New South Wales.

A Parliamentary Inquiry into unconventional gas continues, with its final report due on December 1.

http://coalandgasfreevic.org/march-to-declare-victoria-gasfield-free

CORE Geelong

Thanks to support from FoE's Yes 2 Renewables campaign, Geelong now has an active Community Owned Renewable Energy team: CORE Geelong.

FoE's Leigh Ewbank rocked up in his Vegemite sweater at the initial event in early 2015. He spoke in support of our goals, adding connection to the broader Victorian campaign for a renewable energy target led by local group initiatives.

Thirty five people with a broad range of skills signed up to make our plans a reality through working together under the umbrella of Geelong Sustainability. Updates are available at: www.geelongsustainability.org.au

Leigh later guided us to bring Taryn Lane from Embark & Hepburn Springs Wind farm project to Geelong. Her talk created stronger confidence in our actions. The tools which Embark provide to support groups such as ours have been very informative.

Members of CORE Geelong are part of the Yes 2 Renewables campaign team, and the inspiring actions by Friends of the Earth keep our local plans part of the bigger picture for community led renewables in Victoria. We hugely appreciate Leigh availability, connections and guidance as we steer our project towards its first solar PV system host site in Geelong.

– Vicky Grosser and Dan Cowdell, CORE Geelong Co-Chairs

HESTA urged to divest from fossil fuels

Medical ethics are built around a central precept: 'Primum non nocere' (first do no harm). In some instances, this principle asks medical professionals to refrain from intervening. A vast (and growing) body of evidence concludes that fossil fuels are bad for our health. Investment in fossil fuels is incompatible with the enormous contribution to society of superannuation fund HESTA's 785,000 members from the health and community services – people who work day in and day out to improve quality of life for Australians. Divestment of HESTA's $29 billion in assets would put a sizeable hole in the fossil fuel industry's armoury, and enable substantial reinvestments in renewable energy and community development projects.

In order to protect health and wellbeing from fossil fuels and climate change, Friends of the Earth campaign collective Healthy Futures is mobilising to ensure health superannuation is not invested in industries that harm our communities. One day, we'll look back and be astounded that doctors, nurses, social workers and allied health professionals once invested in fossil fuels.

Healthy Futures would love to hear from you if you're keen to join us in calling on HESTA to divest. Jump on board by sending HESTA an email at www.healthyfutures.net.au/divest, come join us at one of our campaign events: www.healthyfutures.net.au/events, or contact me at gracelfitzgerald@gmail.com to find out more!

– Grace FitzGerald, medical student and a member of FoE's Healthy Futures campaign collective

Friends of the Earth International (FoEI) is a federation of autonomous organisations from all over the world. Our members, in over 70 countries, campaign on the most urgent environmental and social issues, while working towards sustainable societies. FoEI currently has five international programs: Climate Justice and Energy; Economic Justice, Resisting Neoliberalism; Food Sovereignty; Forests and Biodiversity; and Resisting Mining, Oil and Gas.

Friends of the Earth International Online

Web: www.foei.org

Social media:

www.facebook.com/foeint

www.twitter.com/FoEint

www.youtube.com/user/friendsoftheearthint

http://vimeo.com/channels/foei

www.flickr.com/photos/foei

Action alerts:

http://action.foei.org/page/speakout

www.foei.org/take-action

FoE International's web radio station (in five languages):
www.radiomundoreal.fm

We will not eat crude oil!

After members of Oilwatch Africa met in Togo on 9 June, Oilwatch Africa launched the Lomé Declaration on Climate Justice and Food Sovereignty in Africa. The declaration focuses on the implications of the world's stubborn dependence on fossil fuels in terms of climate, food sovereignty, nutrition and well-being in Africa.

http://nnimmo.blogspot.co.uk/2015/06/oilwatch-africa-we-will-not-eat-crude.html

Evictions, urban cleansing, and the COP21 in Paris

Young FoE Europe activists and allies have written about how social cleansing operations are in full swing across Paris ahead of UN COP21 climate conference. This is something that is being kept quiet and is not mentioned in the media. Many of those being evicted are homeless people, Roma people and refugees.

http://foeeurope.org/yfoee/evictions-social-cleansing-cop-21-paris

Japan promoting coal in Malaysia as solution to climate change

FoE Malaysia/SAM is concerned about a recent Japan-Malaysia statement about a strategic partnership to address climate change, especially given its focus on continued public financial support for high-efficiency coal-fired power stations. Japan is clearly aiming to promote its companies' polluting technologies abroad, regardless of the need to keep fossil fuels in the ground, and locking Malaysia into 'committed emissions' for the lifespan of the plants, some 30 to 40 years.

www.themalaysianinsider.com/sideviews/article/scrap-the-catastrophic-climate-cooperation-m.-mohamed-idris

Enforcing anti-pollution measures in Sri Lanka

FoE Sri Lanka/CEJ is making headway in terms of reducing pollution in Sri Lanka, and is now focusing on the enforcement of new laws. For example, the sale of glyphosate is now banned, but it is still available on the black market. Similarly, Consumer Affairs Authority regulations stipulate that no-one can store or sell enamel paints with more than 600ppm lead content. But a new EU- study published by FoE Sri Lanka shows that although major paint brands have reduced lead content in their paints to less than 600 ppm, there are still paints containing levels of lead as high as 44,000 ppm. The Consumer Affairs Authority will begin a crackdown on paint manufacturers who flout regulations on lead content.

FoE Africa groups pushback on extractive activities

FoE Africa groups decried the impact of extractive companies' operations across the region, cautioning that if their communities are not adequately empowered to advocate for and defend their rights, more of them will be displaced, leading to conflicts. The groups made the call during a solidarity mission to oil host communities in the Bunyoro sub-region in Uganda, who are currently grappling with the challenges associated with Uganda's developing oil industry. Participants in the solidarity visit included member groups from Uganda, Nigeria, Togo, Tanzania, Cameroon, Ghana, Mali, Tunisia and South Africa, as well as other participants from FoE International.

www.groundwork.org.za/archives/2015/news%2020150526.php

New report: Wilmar's Nigerian landgrab

FoE Nigeria/ERA and FoE US have co-published a new report, *Exploitation and Empty Promises: Wilmar's Nigerian land grab*, which shows just why a binding treaty to regulate corporate human rights abuses globally is urgently needed. Global palm oil trader Wilmar International Ltd. has come under scrutiny for a large-scale land acquisition in Cross River State, Nigeria, where it has destroyed areas of High Conservation Value, including community food-producing areas and water resources.

www.foe.org/news/blog/2015-07-when-wilmar-finishes-we-have-no-future-left

Emerging tech and challenging the privatised uni

Jeremy Tager

Friends of the Earth first began discussing the need for a conference on *Challenging the Privatised Uni* because of our concerns about the way in which corporate funding is distorting not only the research that is being done, but also the outcomes of this research. Particularly in the case of emerging technologies, such as nanotechnology and new GM techniques, the majority of research is geared towards commercialisation – rather than assessing the potential risks to human health and the environment posed by these techniques.

It is well established that corporate funded science is far more likely to support the interests of corporations than independent research. The effects may include industry biased research priorities, design and conclusions.[1] On occasion it may even involve fraud. In a survey of US scientists 15.5% admitted that they had changed the design, methodology or results of a study in response to pressure from a funding source, whilst 12.5% admitted overlooking others' use of flawed data.[2] However, as Jack Heinemann's piece outlines, the effects of corporate investment in university science go much further. After all, corporations can and do produce their own 'science'. They can buy whatever results they want, but universities offer a level of public credibility and status that corporate labs can't replicate.

It is now common to see whole biotech or nanotechnology departments funded jointly by industry and government and bearing the corporate name. Corporate investment may include particular research projects, 'linked' grants funded by both government and industry, funding of a chair or position, in-kind contributions and access to corporate facilities. Scholarships, gifts, free events, sponsorship of activities or securing wall space for photos blessed with a corporate logo are all ways in which corporate interests buy cultural acceptance.

Universities become not only a source of intellectual and scientific capital for corporate interests, but of human capital as well. Academics and students, working in departments dependent on corporate funding, become naturalised to a state of affairs where vested interests drive research, control outcomes and provide material support and potentially future employment for students who conform.

It is rare to see scientists question or challenge the underlying cultures and structures which have provided salaries and meaning in their occupational lives. The institutionalisation of corrupt science is creating a generation of young scientists who see private funding and control of science as perfectly normal, who do not question the lack of transparency or the orientation of research towards commercial interests.

Universities give a social license to corporate interests and corporate science that no amount of advertising can buy. Universities, now desperate for funding, are prepared to sacrifice their integrity for dollars. Research is kept secret, financial agreements are confidential and negative results may well never be published.

Universities, now desperate for funding, are prepared to sacrifice their integrity for dollars.

In this culture, universities push for their own staff to become entrepreneurial. Scientists and universities take out patents, work as consultants for corporate interests, or start their own companies. Science becomes a business and scientists a new breed of businessman.

On the other side, those few scientists who conduct independent research or speak out against corporate control, are demonised, isolated and attacked.[3] This unfortunately, is the face of science in the modern Australian university. A number of scientists attending this conference have been savagely attacked for their peer-reviewed work that dares to conclude that the interests of corporations may in fact harm us. The attacks are personal and often made by other scientists. Speak out against genetic modified crops in this country and it is trained academic attack dogs who will be the leaders in a ritual of intellectual assassination. Criticise nanotechnology and it will be scientists not the corporate interests that speak against you. Often the scientist will speak as a university employee even in an area in which they have no expertise.

The corrupting effects of corporate funded science was what Friends of the Earth wanted to change. How to protect academic and scientific integrity and independence and to ensure transparency in corporate partnerships are critical discussions we want to see come out of this conference.

But it quickly became clear to us that the crisis of universities was much bigger. Universities both reflect and amplify the crisis of corporate capitalism. The change from public good universities to privatised and corporatised universities that began in the 1980s under the ALP has resulted in a deterioration in the quality of education and university life in almost every imaginable area.

As these pieces in Chain Reaction show, the nature, scope and diversity of problems associated with the privatised uni are ubiquitous and not confined to the laboratories of our university campuses. The effects of corporatising are felt

in governance, managerialism, curriculum, fees, the nature and quality of research, morale, collegiality, transparency, course availability, commodification of knowledge, loss of critical thinking, cheating, casualisation etc. It is so culturally powerful that it is accepted by many academics and students as normal.

The culture plays out in more subtle ways as well. In organising the *Challenging the Privatised Uni* conference at UQ we sought endorsement not only from UQ generally but several departments as well. No-one was willing. One department head made it clear that while she supported the conference idea, the school could not be seen to openly support it. Self-censorship in the corporate university takes many forms – and is yet another symptom of the illness in the body politic of the modern university.

The University of New South Wales recently put out a media release bragging that they were attracting more corporate funding than any other university in Australia.[4] Why isn't this driving students and academics away? Normalised however does not mean acceptable or insurmountable. The conference will be about solutions and it will be up to participants to devise and implement those solutions, whether they are projects, events, regular meetings over tea or a new organisation.

Already, there are many academics, students and activists challenging the ways in which the privatised uni supports private interests in the public sphere. There are also unprecedented grassroots movements (divestment, coal, coal seam gas and GMOs) that are highlighting dubious academic initiatives supporting these industries. There has never been a better opportunity or time to build a larger, more strategic and effective movement to protect not only public education but the public good.

For more information on *Challenging the Privatised Uni* visit privatiseduni.com

Jeremy Tager is a campaigner with Friends of the Earth's Emerging Tech Project

References:

1. See, e.g. Lesser, L.I., Ebbeling, C.B., Goozner, M., Wypij, D. & Ludwig, D.S. (2007) Relationship between funding source and conclusion among nutrition-related scientific articles. Public Library of Science Medicine 4:41-46
2. Wadman, N. (2005) One in three scientists confesses to having sinned, Nature 435:718-719, 9/6/05 www.nature.com/nature/journal/v435/n7043/full/435718b.html
3. Aviv, R. (2014) A Valuable Reputation, New Yorker, http://m.newyorker.com/reporting/2014/02/10/140210fa_fact_aviv?currentPage=all – this story of Tyrone Hayes is only one example of many. Other cases include Ignazio Chapela, Árpád Pusztai, Judy Carman, Gilles-Eric Séralini, Maarten Stapper and Jack Heinemann.
4. UNSW tops the country in industry-linked research grants (2015). www.universitiesaustralia.edu.au/research-innovation-workforce/sustainable-funding

GMO deregulation through the back door

In October, the federal government attempted to delete the definitions of GMO (genetically modified organism) and GM product from the Food Standards Act and to change the law so that the Food Standards Australia New Zealand board could potentially be stacked with industry representatives. We are concerned that the proposed changes are an attempt to deregulate risky new genetic engineering techniques by stealth and to make the agency even more industry friendly. Furthermore, these proposed changes seems to be only the tip of the iceberg when it comes to the government's deregulatory agenda.

The proposed amendments would delete the definitions of GMO and GM product from the Act. Once they are gone the only definitions remaining are those in the Food Standards Code which are substantially weaker and may not cover certain new GM techniques such as RNA interference.

Thanks so much to those of you who took the time to contact the Shadow Assistant Health Minister Stephen Jones and urge him to refer the Food Standards Australia New Zealand Amendment Bill 2015 to committee. It worked! The Bill has been referred to the Community Affairs Committee with a report back date of 30 November.

We are concerned that the proposed changes are part of the government's response to a global push by the GM crop industry to bypass regulation for a range of new genetic engineering techniques. These techniques include zinc finger nucleases and CRISPR and the evidence suggests that they pose the same risks as traditional genetic engineering.

The concerns associated with the use of these new GM techniques include food safety concerns, environmental impacts – including those on biodiversity – and GM contamination of neighbouring non-GM crops or wild relatives.

Unfortunately, it seems there are more proposed changes to come. Documents obtained by Friends of the Earth under Freedom of Information laws and questions asked by Senator Rachel Siewert in Senate Estimates reveal that the Office of the Gene Technology Regulator plans to deregulate a number of these new techniques and to conduct public consultation on this in early 2016.

– Louise Sales

For more information and to get involved in the campaign visit: http://emergingtech.foe.org.au

The universities we need

Raewyn Connell

Universities in Australia are drifting deeper into trouble. You wouldn't know it from their websites – full of delighted students, bright sunshine and well-tailored managers. You wouldn't know it from Glyn Davis, who a few years ago delivered the ABC's Boyer Lectures on *The Republic of Learning* – a wondrous picture of happy campers doing benevolent work in superbly-managed organisations.

Perhaps a Vice-Chancellor has to say this kind of thing in public. But then, that's part of the problem.

I have worked in the sector for forty-five years. I have never known so much tension, distrust, and outright fear in Australian universities as there is now. I have never known so many bright young people, capable and trained, who are disillusioned about working for universities.

Universities have been changing quickly as organisations. A corporate-style elite has been consolidating its control and gripping the daily life of the workforce in more authoritarian ways. Casualisation of the teaching staff is endemic and organisational memory and know-how among staff are being lost as more and more jobs are outsourced.

The intellectual life of universities is troubled too. Forums for internal discussion and decision-making are being replaced by management-controlled "consultations". A heavy dependence on Anglo-American models of curriculum and research are reinforced by Canberra's league-table mentality. But they are increasingly questionable in a postcolonial world.

The place of universities in the Australian community has shifted, as universities function less as an integrated public service, and more as profit-driven businesses competing for enrolments, prestige and revenue. Their main international role now, in the eyes of policymakers, is to suck money out of Asia.

Perhaps most important is the resulting change in culture. The model of universities defined by the uncomfortable search for *truth* is being increasingly subverted by spin, corporate boasting and manipulative advertising. The intellectual authority of universities is declining.

Those are issues we need to analyse and understand. That work won't be led from the top. If you look at the website of Universities Australia – taken by the innocent to be the voice of the universities but actually the Vice-Chancellors' Committee, re-badged in 2007 – you will find plenty of corporate clichés but little discussion of the tough stuff.

Such discussion does happen in staffrooms around the country, and in those student organisations that survived the Howard government's attempt to wreck student culture.

The best public discussions recently have involved the industry union, the NTEU. But even those discussions have focussed on the current problems of university work and the damage done by market-driven policies. What hasn't yet emerged is a convincing alternative model for a good university that could displace the current corporate vision.

There are rich resources. In the background, centuries of debate: on the curriculum for colonial universities, from Mexico to India; on the research university invented in Prussia in the early nineteenth century; on the American "mass university" of the mid-twentieth century; and more.

There is also a long history of experimental universities. These include the astonishing "Flying University" in Poland under the Tsars; "The New School" launched in NYC in 1919; the international "Free University" movement of the 1960s; and more.

It's important to know these alter-histories. But the vital thing is to develop ideas out of current experience. Despite the managerial takeover, there is still good teaching and hard thinking at the grass roots. What I have learnt from them points to three dimensions along which new models can emerge.

The first concerns knowledge. Good education consistently opens, rather than forecloses, questions about knowledge – about authority, truth, and relations between knowledge and action. A good university will have learners with power over their own learning. It will rejoice in debates about the production of knowledge, including the forms of knowledge and research agendas that we need as a society.

The second concerns intellectual work and a democratic workplace. A good university means a good place to work for *all* staff. It means secure rather than precarious employment; real forums for shared decision-making; and shrinking, not increasing, inequalities among staff.

The third dimension concerns public service. Debt-free higher education is completely within the resources of a country like Australia; what it requires is public funding not a fee regime. But public funding demands an ethos of public service and social justice; and building that ethos requires a big cultural shift. Modesty, rather than boasting, is wanted.

We don't have a new model yet, and it won't be easy to make. But it has become urgent to try.

Raewyn Connell is Professor Emerita at the University of Sydney, a Life Member of the NTEU, and one of Australia's leading social scientists, www.raewynconnell.net

What's wrong with privatising universities?

Jeannie Rea

"No cuts. No fees. No corporate universities", chant students protesting government cuts to higher education funding. This slogan succinctly characterises the privatising university.

Australia's level of public investment in higher education is low compared to other industrialised economies. Deregulated international and postgraduate course fees are now an important source of income as government grants account for only about one third of university income. In recent times, most vice chancellors did not oppose the Coalition Government's undergraduate fee deregulation policy, despite Australian undergraduate domestic students already paying higher fees than most comparable countries.

Fee deregulation compromises the integrity of our public university system, with better resourced universities able to charge higher fees than those with a less pecuniary student cohort. Capacity to pay rather than merit would increasingly determine access to courses and universities and in turn their future viability.

However, privatisation is not only about access or the possession of assets. Rather, it is about the process and consequences of the marketisation of public universities and the commodification of higher education learning and research.

Marketisation is emblematic in public university vice chancellors, no longer seen as leaders of a community of scholars, but re-cast as CEOs answering to university councils, which are now more akin to corporate boards of management overseeing the operation of large enterprises. Commodification is symbolised by students considered at best as clients, at worst as customers. Despite UNESCO protocols recognising our unique rights and responsibilities, university staff struggle to hold onto to our status as stakeholders. Instead, we are treated as a cost of production, a variable input from which maximum productivity is extracted.

Universities are not just another enterprise, and 'education' is not a commodity to be bought and sold. A university qualification requires work by the student, not just the purchase of a service in a commercial transaction. The market fails in higher education because the benefits of university education are not confined to the individual being educated.

It's a misnomer that student customers exercise power in the market place. Students can fill out customer satisfaction surveys, but nowadays rarely have influence over what they are taught, by whom and how. Student feedback has become more abusive and cheating has increased as student participation in the terms of their learning has declined.

Another characteristic of privatisation is the erosion of university governance as university councils/senates privilege corporate experience over stakeholder interests and dispute staff and student representation. Council meetings have become reporting forums for management rather than an avenue for meaningful debate over institutional direction and academic boards are now merely arenas to rehearse council reports.

While university councils need to prioritise financial stability, obsessions over 'salary savings' prevail at the expense of a secure workforce, facilitating investment in new initiatives and consolidating successful activities. Contracting out is favoured, even for commercial activities that could bring a return. The core 'business' of teaching is being commercialised, particularly in preparatory courses. Seemingly often weighted towards the partners' interests, the value of commercial partnerships is nebulous at best, and can carry reputational risk. Partners and donors increasingly demand an ongoing say in the university and, with most decisions 'commercial in confidence', the university community can only guess at the rationale.

In a marketised higher education sector, universities relentlessly compete with one another, reducing decades of high level inquiry and life changing innovation to slogans like 'awesome'. Whilst managing constrained budgets and pushing courses online to cut costs, universities are making massive capital investments in edifices to attract students, staff and research investors. This competitive environment explains the obsession with international research rankings and the presumption that these attract international students, whose fees cross subsidise domestic students' education and research.

However, the 'digital natives' (local and international) are highly suspicious. They canvas opinions within their cohort and in trusted advisors like teachers and families. They are not necessarily influenced by flashy websites, 'analytics' and a new 'campus centre'. They are, however, likely to listen to a student complaining that every year over half of their tutors are employed casually and have little paid time for consultation.

The researcher who has been employed on half a dozen contracts in a decade will have trouble convincing her PhD students to pursue an academic career. The esteemed professor might be attracted by the salary bonus offered, but may also be concerned over the job security of colleagues or in having a say in how his research is used.

Academic freedom is increasingly fleeting – academics are pulled off research that's not a university priority and fixed term researchers are cautious of creating waves or in following an interesting path that may yield unexpected results. Politicians call for cuts to research projects that do not fit their ideological blinkers and corporate and government funders want the answers they paid for.

Collegiality can be dismissed as an 'ivory tower' concept, conjuring up visions of white men guarding their class privilege. However, there is a mass higher education version of collegiality whereby staff and students across the university, the country and globally, share their knowledge and the immense resources of universities for the public good. But this is not the vision of the privatising university, where knowledge is guarded and resources fenced off for paying customers.

Jeannie Rea is the national president of the National Tertiary Education Union.

A focus on private investment means universities can't fulfil their public role

Margaret Thornton

The decline in government investment in higher education and the ever-increasing reliance on fees and other sources of income has made universities more like private for-profit corporations.

As institutions of higher learning that receive government funding, universities are obligated to fulfil a public role.

Students as customers

As students assume more and more of the cost of their higher education, they tend to view it as a personal, private investment that benefits them rather than a public good.

Conservative economists tell us that fee-paying students are rational egoists primarily concerned with maximising the return on their investment.[1] This means they are anxious to graduate and obtain the best paying jobs as soon as possible. They exert their customer prerogative to request universities include more applied courses to suit their vocational aims.

While preparing students for gainful employment is an important public responsibility of universities, it is short-sighted to prioritise short-term job-readiness over academic skills such as critical thinking, particularly as numerous changes in employment are predicted in the life of the typical graduate.

The focus on applied knowledge has led to a decline in critical thinking. This has impacted on all disciplines but the humanities have suffered the most because of their perceived inability to generate profits, as revealed by several searing critiques from the UK.[2]

Research valued over teaching

Research, not teaching, is the beneficiary of the increased revenue received from the proliferation of students.

Less money is spent on teaching through the casualisation of staff, the preference for large lectures rather than interactive small groups, and modes of assessment that are quick to mark.

Full-time academics are now expected to prioritise research, particularly applied research, over teaching because it is more lucrative. This entails being entrepreneurial in the pursuit of grants and the commercialisation of research outcomes. Grants allow teaching to be bought out completely and responsibility devolved to casuals.

But universities compromise their public role if they fail to nurture adequately the intellectual capital of their students.

"You are completely free to carry out whatever research you want, so long as you come to these conclusions."

Justice and equity

Universities perform a civic role in preparing graduates to go out into the community, but high fees have the potential to skew leadership positions in the professions and the public service in favour of the sons and daughters of the wealthy.

Fee deregulation inevitably shifts the balance away from the egalitarian values of equity, access and upward mobility for the less well off.

Middle-class students are more likely to see the high cost of a degree as an investment, whereas the less well-off tend to be deterred at the prospect of substantial debt.

FEE-HELP, the income-contingent loan scheme, mitigates the class impact somewhat, but recent research from the UK showed a marked decline in the enrolment of male students from lower socio-economic families since 2010 when fees were trebled.[3]

The US experience of high fees has also found that students are hesitant to pursue less well paid careers in public interest and social justice in case they are unable to meet their loan repayments.[4] They prefer high paying jobs on the corporate track which effectively tips the social scales in favour of the wealthy.

When the public good role is compromised by the market

There have been many revelations of late of universities admitting or passing sub-standard students because they are full-fee paying.[5]

Universities are keen to emulate the American Ivy League's ability to generate substantial endowments through donations,[6] but the issue is fraught. A number of universities have accepted donations by companies,[7] where the contractual details are shrouded in secrecy and the independence of researchers could be compromised.

Not only have we seen a shift away from the traditional idea of the university where knowledge is pursued for the betterment of society as a whole, but private good has become normal in university life.

Vice-chancellors at Australian Universities now seem to regard themselves as CEOs of for-profit corporations and command extraordinary salaries, frequently joining the $1m+ club learning more than their counterparts at Oxford or Harvard.[8]

Bizarrely, according to a University of Auckland study,[9] academics too have come to accept that personal, private investment and immediate financial returns are now being cast as the new source of public good.

If this is what academics believe, what hope is there of reclaiming universities' public role?

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How corporate investment corrodes the public research environment

Jack Heinemann

Public universities have always been agents of knowledge transfer, some of it proprietary. However, the western paradigm for technology transfer was only introduced in the early 1980s and was based on licensable intellectual property (IP). Licensing became the vehicle to capture the value of research and innovation. In recent years there has been a reorientation in universities towards research covered by the more powerful IP instruments, e.g., utility patents[1]. Public universities have also become more dependent on the private sector for operational funding.[2]

Public universities and government research institutions not only can file for IP rights, there is an expectation that they do so. Commercial involvement is not always bad.[3] However, it will compromise public good research unless properly managed.[4]

I believe that the public good arising from this model in public universities is largely lost because of the powerful distortion in priorities arising from the litigious and expensive[5] focus on licensing and business creation.[6]

Influence

The relationship between medical faculties and industry is a familiar example of industry influence on academia.[7] Both industry-institution and industry-staff links are common. In the US, about two-thirds of the administrative units and department chairs at medical schools and teaching hospitals have financial relationships with industry.[8]

Industry has normalised its presence in academia and academic research. Governments have been complicit in growing this relationship.

It is thus no surprise that science and engineering departments have extensive entanglements. Corporate benefactors-for-strings are common at large universities. A well-known example is the criticised[9] deal between the University of California Berkeley and Novartis[10].

Emerging academics realise that conflict with *any* industry puts their careers at risk at a university that needs to be seen as industry friendly. In New Zealand, for example, it is far more difficult to access public grant support for projects that do not have an explicit industry partner or obvious commercial objective. Industry representatives and industry-supportive academics serve on bodies that distribute public research funding.[11]

The power of gifts and relationships

While some academics deny[12] that they can be influenced, research shows that in general academics are not immune to the effects of gifts and relationships.[13] Gifts are a powerful tool to create a sense of obligation and loyalty. Small gifts, even less than $100, are effective.[14]

Thus, we should declare them. Being aware of actual or perceived conflicts helps establish important checks and balances. One is to help researchers recognise inherent human frailties. The other is to alert the public and critics to pay close attention to the research approaches.

The *New York Times* chronicled examples of academics who have taken very strong stands that are consistent with the industries with which they have connections.[15] The larger the industry, and the greater its influence on government, the more reliable it can be throughout an academic's career. That is why in one case – where the messages were sympathetic to the world's top herbicide and the genetically modified crops that it is used on – there was particular interest in the academic not forthrightly declaring his actual or reasonably perceived conflicts of interest. Instead, he routinely denied a relationship to the industry in unequivocal terms.[16]

The *Times* article and others reporting on the links between industry and academics noted how these relationships also frequently normalise a relationship between academics and public relations firms or industry groups. They are inseparable from corporations. Their purpose is to promote the interests of their clients, and to create doubt or to repudiate messages that might hurt the interests of their clients.[17]

Failure of checks and balances

Not all conflicts of interest are mortal wounds to research or teaching. Indeed, published research may be challenged if there are attempts to replicate the results, serving as a balancer for the effects of bias. This *post hoc* reassurance, however, is no substitute for trying to avoid the conflicts in the first place.

Because for the checks and balances to work effectively, research findings must be reported in ways that allow the work to be replicated, it must be public and there must be the will and money to replicate it. Unfortunately, in one of the most important ways that science impacts society, these checks and balances are compromised.

There is no doubt that vested interests influence the outcome of research.[18] Most research that really matters to the lives of the average citizen is both produced explicitly by those with a vested interest and never published. This is the 'science' provided to safety regulators for determining whether or not to allow the release of products ranging from pesticides[19] to GMOs[20]. As MD Boone and JR Rohr observe, a conflict of interest is "inherent in research directly conducted or funded by industry for assessments or regulatory purposes."[21]

Much of this research is either secret, uses material not generally available, or uses methods that are too opaque to reproduce by others. Such research cannot be effectively challenged or validated by independent researchers.

This should change. The public should demand change. Governments should enable the change. Universities should be funded to respond by establishing research and teaching career pathways shielded from entrepreneurialism. It has to be done quickly, though, because the public researcher who can afford to be dispassionate and successful is an endangered species if not all but extinct.[22]

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Why do universities still invest in fossil fuels?

Carol Richards

Despite the strong claims that universities make about their sustainability leadership, they have been slow to divest their fossil fuel investments and take a strong, public stand on climate change. This places them behind religious institutions, philanthropic organisations, local councils, banks, superannuation funds and a host of other institutions moving capital away from fossil fuels.

Divestment[1], often described as the opposite of investment, involves the socially motivated withdrawal of capital by public and private investors in response to unethical business interests or practices. To divest in this way is to take a public moral and political stance. Divestment as a political strategy relies on this public dimension as socially respected institutions lend their weight to the cause.

The fossil fuel divestment movement has been instrumental in the enrolment of major institutions into the movement, extending the divestment movement from an 'activist' environmental campaign to a 'mainstream' social movement. The involvement of mainstream actors such as the church, super funds and local councils has brought about greater legitimacy for the campaign, despite strong opposition from mainstream political parties. The fossil fuel divestment movement is now claimed to be the most effective divestment movement ever, exceeding the campaign around tobacco in terms of public support.[2] The reluctance of Australian universities to take a public stand and divest from fossil fuels is even more curious against this backdrop.

The economic, environmental, moral and reputational risks associated with fossil fuels now means investments in coal, gas and oil are aligned with the 'sin stocks' of tobacco, alcohol, vice and weapons. There is a moral element to profiting from the destruction of the planet, but there is also an increasingly convincing economic argument against investing in fossil fuels. Climate projections, and international agreements not to exceed a two degree centigrade temperature rise, have led to concerns about 'unburnable carbon' and the potential for coal, gas and oil assets to be 'stranded'. This means fossil fuel assets may lose economic value, adding a financial imperative to divest on top of a moral one.[3]

Universities' engagement in the divestment debate

Fossil Free Universities have been active in awareness raising on campus, and challenging universities to divest. Globally, over 30 educational institutions, including Oxford and Stanford, have publicly announced their divestment in fossil fuels. Whilst many Australian universities are engaging with the climate/divestment debate, their commitment to divestment has been minimal at best. No Australian universities have committed to completely divest their interests in fossil fuels, while just two universities, Australian National University (ANU) and Sydney University, have committed to a partial divestment. This year, Sydney University announced it would divest 20% of its fossil fuel shares over a three-year period. In 2014, ANU announced a partial divestment amid much controversy. Strong reactions from the then Prime Minister, Tony Abbott, and Finance Minister Joe Hockey, highlight the political power of the mining sector in Australia.

Some universities have released statements regarding their investments without committing to divest. For example, the University of Melbourne draft charter states that the University will "strategically focus investment priorities on sectors and organisations that lead in the delivery of a low carbon and ethically sound future, while ensuring the University's long-term financial position". Queensland University of Technology in a letter to Fossil Free QUT campaigners explained: "QUT is undertaking a review of its investment strategy, which will include consideration of the mix of fossil fuel and carbon intensive assets within the universities management funds."

The extent to which these responses represent the beginnings of a process of divestment is unclear.

Vested interests

To appreciate why Australian Universities are reluctant to divest their endowments from fossil fuels, it is useful to scrutinise the extent to which mining corporations have penetrated Australian universities. Not all transactions between mining corporations and universities are knowable. However, the information that is available in the public domain shows a close relationship between major fossil fuel mining corporations and universities – including board membership of senior university executives, student scholarships, and research centre funding and donations.

At The University of Queensland (UQ), a divestment campaign has been underway for a couple of years, yet campaign group Fossil Free UQ has not received any formal statement from university management regarding its stance on divestment. Interestingly, UQ has an ongoing relationship with the fossil fuel industry, particularly via its Centre for Coal Seam Gas, situated in the Sustainable Minerals Institute. The Centre receives $500,000 per year from Santos, Arrow and Australia Pacific LNG as well as $2,000,000 from Queensland Gas Company. The coal seam gas industry has not been without controversy regarding their environmental and health impacts. Santos, for example, was fined $1,500 by the New South Wales Environmental Protection Agency for the pollution of an aquifer with uranium.

At my own institution, Queensland University of Technology, Fossil Free QUT have asked the university to divest its fossil fuel assets. Campaigners have also argued that the Graduate School of Business, who have an executive training contract with Adani, should sever its links with the company.[4] Earlier this year, a student protested by making public her decision to turn down a prestigious scholarship, citing concerns about links between QUT and Adani.[5]

Adani has attracted much negative attention amid concerns about the sheer size of the proposed Carmichael coal mine in the Galilee Basin and its contribution to catastrophic climate change, as well as harm to the Great Barrier Reef World Heritage Site, if the mine goes ahead. Protests from citizens both overseas and Australia, including the traditional owners the Wangan and Jagalingou people[6], highlight that the company do not have a social licence to operate. Further, fifteen of the world's major banks have either withdrawn funding or committed not to lend capital

for the development of the Carmichael mine in the Galilee Basin. Amongst these are London-based Standard Chartered and Australia's own Commonwealth Bank.

A number of universities have explicitly stated that they will not divest from fossil fuels. These include University of New South Wales, University of Canberra and University of Adelaide. The latter has a long-standing association with South Australian based mining company Santos, who along with The Australian Petroleum Production & Exploration Association (APPEA) have a financial relationship with the institution. According their website, the School of Petroleum, Engineering and Management "was founded in 2000 as a result of a very generous donation from Santos Ltd to the University of Adelaide to establish a world-class petroleum engineering school".

Likewise, BHP Billiton has had a longstanding financial relationship with the University of Western Australia, including a $17m contribution in 2013 to its 'New Century Campaign' to create a centre of excellence for the resources industry.

Universities in the public interest?

Whilst it makes sense for universities and industry to work together for the greater public good, it would be difficult to argue that fossil fuel mining represents a public good. It is therefore questionable whether universities should be engaging with the industry, other than to assist in the transition toward a low carbon future.

Strong links and vested interests with the mining sector places universities in a difficult position, caught as they are between concerns about climate change, and the income and benefits derived from links with fossil fuels corporations. Yet, when Australia's universities engage with any business, they lend legitimacy to that endeavour, just as divestment would lend legitimacy to the movement addressing climate change.

If universities divest from fossil fuel corporations, it will likely impact on their relationships with the fossil fuel industry and possibly compromise future funding – but can universities and their reputations as good climate citizens and sustainability leaders afford not to take that step?

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A shift towards industry-relevant degrees isn't helping students get jobs

Kristen Lyons and Richard Hill

Competition between universities is more intense than ever, resulting in a shift towards industry-relevant degrees. But this attempt to link universities and the economy has not been universally successful so far – employers still complain that graduates lack the necessary job skills[1] and research shows thousands of graduates are unable to obtain jobs[2] of their choice.

Are universities then going about things in the wrong way? Is university all about being job-ready? And in their drive to make graduates more employable and move up the global rankings, has students' ability to learn and choose the courses they want to study taken a hit?

Universities share a commitment to delivering courses and programs that meet the needs of industry by linking tailored degrees to employment outcomes; and in the process restructuring course offerings and content.

While policymakers, university administrators and employers champion links between universities and the economy, thousands of graduates are still struggling to find work. This is especially true in the case of fields like engineering, teaching, nursing, law, speech therapy, finance, commerce and accounting.

Despite such concerns, universities continue to reform and restructure programs and courses with industry in mind.

When pursuit of profit gets in the way of learning

One of the most significant shifts towards streamlined, industry-relevant degrees occurred in 2007 with the introduction of the so-called "Melbourne Model".

Melbourne's vice-chancellor, Glyn Davis, justified the consolidation of undergraduate degrees on the grounds that this would avoid duplication and the delivery of costly small courses.[3] However, its primary focus was to make the university more "globally competitive" in what was an increasingly cut-throat international market.

The university cut 96 courses and replaced them with six US-style, three-year undergraduate programs that fed into various postgraduate programs.

This offered the university huge potential for income generation. Predictably, the most severe cuts were to arts courses, which in turn resulted in the shedding of dozens of staff. This resulted in protests by academics, students and some members of the public. Despite this opposition, the Melbourne Model was a sign of things to come.

Earlier this year the University of Sydney, under the stewardship of vice-chancellor Michael Spence, sought to emulate the Melbourne Model and elevate Sydney in the university world rankings. Spence's management team did so by embarking on a similar process of course rationalisation.

In June, the ABC reported[4] that the proposed changes would mean reducing the current 122 degrees to just 20. Spence argued[5] that: "if it's a degree that is going to make our graduates more internationally competitive, more employable, it might actually be expenditure that's worth it".

Academics, administrative staff and students protested the proposed cuts, arguing that staff redundancies would exacerbate an earlier round of cuts and reduce the quality and range of degrees.

Similar cuts to programs and staff at La Trobe University[6] were also intended to boost its place in the world rankings.

According to vice-chancellor John Dewar, "efficiency and quality driven reforms" would allow for the introduction of "hallmark" or "niche" degrees relevant to the workplace of the 21st century. Such changes, he added, would result in a "rejuvenated university", although neglecting to mention that over 300 jobs would be lost and numerous units cut.

Similar restructuring exercises have occurred at the following universities: Tasmania, Swinburne, Monash, Victoria, Curtin, Newcastle, Charles Stuart and Western Australia. Such rationalisation cuts at the heart of universities, removing the very assets for which institutions are renowned.[7]

The many examples of cuts to courses are accompanied by far-reaching changes to course content, with more emphasis placed on vocational outcomes.

Skills and knowledge "competencies", "attributes" and other measures of performance have turned traditionally accepted priorities like "critical thinking" into commodities marketed at prospective employers through e-portfolios and job-ready CVs.

Although the humanities, arts and social sciences continue to make up two-thirds of the undergraduate intake, deep cuts have occurred in these areas or, as in the case of La Trobe University, they have been fine-tuned to meet industry needs, or abandoned altogether as occurred at QUT[8] in favour of "creative industries".

Elsewhere, cuts have been made to peace and conflict studies, history, gender studies, philosophy and many language departments, while industrially relevant "hard sciences" and courses like business, commerce and accountancy have proliferated.

University education isn't just about being 'job ready'

Is there any alternative to this streamlined and homogenised market-led agenda?

The slow university movement[9] - characterised by scholarship and teaching that slows down the pace of knowledge production, and celebrates collective and creative endeavours; free universities[10] and various independent colleges highlight the possibility of a more social rather than economic approach to higher education.

In practice this requires:

- a reassessment of links between universities, government and business;
- the provision of more time and space for deeper learning;
- greater emphasis on critical thinking and community action.

Decoupling education from markets will be a vital step in ensuring a vibrant democratic future.

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Nuclear power's long farewell?

The 'World Nuclear Industry Status Report 2015' (WNISR) has been released.[1] These annual reports provide a vast amount of useful information about the global nuclear industry and useful summaries of the development of renewable energy. Here are the key findings.

Reactor operation. 31 countries operate nuclear power plants. A total of 391 reactors have a combined installed capacity of 337 gigawatts. The total of 391 reactors excludes the 42 reactors in Japan that have been shut down, only some of which will restart (two restarted in mid-2015). Even including all the Japanese reactors, there are fewer reactors than there were a decade ago.

Industry in decline: The 391 operating reactors are 47 fewer than the 2002 peak of 438, while the total installed capacity peaked in 2010 at 367 GW and has since declined by 8% to 337 GW. Annual nuclear electricity generation reached 2,410 terrawatt-hours (TWh) in 2014 – a 2.2% increase over the previous year, but 9.4% below the historic peak in 2006.

Share in power mix. The nuclear share of the world's power generation remained stable over the past three years, with 10.8% in 2014 after declining steadily from a historic peak of 17.6% in 1996. Nuclear power's share of global commercial primary energy production also remained stable at 4.4%, the lowest level since 1984.

Reactor age. The mean age of the world operating nuclear reactor fleet continues to rise, and by mid-2015 stood at 28.8 years. Over half of the total, or 199 reactors, have operated for more than 30 years, including 54 that have run for over 40 years. One third (33) of the US reactors have operated for more than 40 years.

Lifetime projections. If all currently operating reactors were shut down at the end of a 40-year lifetime, by 2020 the number of reactors would be 19 below the number at the end of 2014. In the following decade to 2030, 188 units (178 GW) would have to be replaced – five times the number of startups achieved over the past decade. (The International Energy Agency predicts a "wave of retirements" – almost 200 reactor shut downs by 2040.)

Construction delays. As in previous years, 14 countries are currently building nuclear power plants. As of July 2015, 62 reactors were under construction. Almost 40% of the projects (24) are in China. All of the reactors under construction in 10 out of 14 countries have experienced delays, mostly year-long. At least three-quarters (47) of all reactors under construction worldwide are delayed. Five reactors have been listed as "under construction" for more than 30 years.

Construction starts. In 2014, construction began on three reactors, one each in Argentina, Belarus, and the United Arab Emirates (UAE). Construction starts in the world peaked in 1976 at 44. In the 4.5 years from 1 January 2011 and 1 July 2015, first concrete was poured for 26 new plants worldwide – fewer than in a single year in the 1970s.

Construction cancellations. Between 1977 and 2015, a total of 92 (one in eight) of all construction sites were abandoned or suspended in 18 countries in various stages of advancement.

Newcomer program delays. Only two newcomer countries are actually building reactors – Belarus and the UAE.

Generation III Delays. Twenty-nine years after the Chernobyl disaster, none of the next-generation or so-called Generation III+ reactors has entered service, with construction projects in Finland and France many years behind schedule. Of 18 reactors of Generation III+ design (eight Westinghouse AP1000, six Rosatom AES-2006, four AREVA EPR), 16 are delayed by between two and nine years.

Installed capacity. In 2014 almost half (49%) of the added electricity generating capacity was new renewables (excluding large hydro), including 49 GW for new wind power and 46 GW of solar photovoltaics. Since 2000, wind added 355 GW and solar 179 GW – respectively 18 and 9 times more than nuclear with 20 GW.

Electricity generation. Brazil, China, Germany, India, Japan, Mexico, the Netherlands, and Spain – a list that includes three of the world's four largest economies – now all generate more electricity from non-hydro renewables than from nuclear power. These eight countries represent more than three billion people or 45% of the world's population.

There is much more of interest in the WNISR report, including chapters on new reactors types (especially small modular reactors) and the Fukushima disaster.

It's a lot easier to shut a reactor down ...

Steve Kidd, an independent consultant and economist who worked for the World Nuclear Association for 17 years, recently noted in a trade magazine:

"Looking forward, despite the many forecasts that point to sustained growth of nuclear, there will be a substantial number of reactor closures. ... We have learned one thing for certain: it's a lot easier to shut a reactor down than to build a new one. There are alternatives to nuclear for power generation and the competition is getting continuously stiffer.

"Hence well-researched and articulate critiques against the concept of any nuclear growth ... such as the annual World Nuclear Industry Status Report, are becoming increasingly difficult to ignore. The combination of aging operating reactors, delayed construction plans combined with escalating costs of new units and competition from renewable power technologies is becoming a compelling story to any lay reader. ...

Brazil, China, Germany, India, Japan, Mexico, the Netherlands, and Spain – a list that includes three of the world's four largest economies – now all generate more electricity from non-hydro renewables than from nuclear power. These eight countries represent more than three billion people or 45% of the world's population.

"Whether the number of reactor start-ups exceeds the number of closures depends on China. Over the next few years, the number of start-ups (five to six per annum) combined with Japanese reactors returning to service should certainly outweigh the number of closures. But in the 2020s things get more unpredictable for both closures and start-ups. Most people's expectations of Chinese growth in nuclear have been cut back substantially. ... Russia's domestic program has also slowed, while many of the claimed reactor export deals are little more than statements of intent. India remains something of an enigma, but it shows few signs of overcoming general problems in completing major infrastructure projects, including local land rights and volatile public opinion."

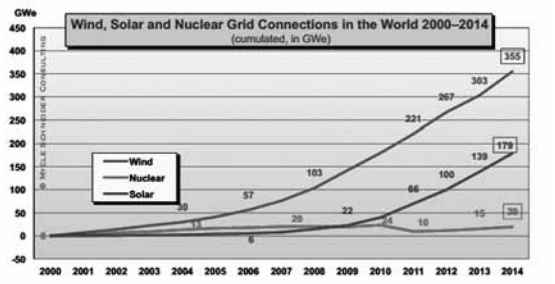
"The optimistic view that nuclear will eventually take up the substantial place allocated for it in energy scenarios that mitigate climate change ... holds increasingly little water."

IAEA report

The International Atomic Energy Agency (IAEA) has produced the 35th edition of its publication, 'Energy, Electricity and Nuclear Power Estimates for the Period up to 2050'.[2] The IAEA now projects nuclear capacity growth by between 2.4% and 68% from 2014 to 2030 (average annual capacity growth of 0.1–3.3%).

Historically, the IAEA's 'high' estimates have been ridiculous and even its 'low' estimates tend to be too high – in which case the pattern of stagnation that has prevailed for the past two decades will likely prevail for the next two.

Figure 20: Wind, Solar and Nuclear, Capacity Increases in the World 2000–2014



Source: World Nuclear Industry Status Report

To its credit, the IAEA has published data demonstrating its habit of overestimating nuclear power growth.[3] For example:

- In 1985, the IAEA's high estimate was 702 GW capacity in the year 2000, but actual capacity in 2000 was 350 GW (50% of the estimate).
- In 1990, the IAEA's high estimate was 528 GW capacity in the year 2005, but actual capacity in 2005 was 368 GW (70% of the estimate).

Even the IAEA's 'low' forecasts are too high – by 13% on average. For example:

- In 1985, the IAEA's 'low' estimate was 502 GW capacity in the year 2000, but actual capacity in 2000 was 350 GW (70% of the estimate).
- In 1990, the IAEA's 'low' estimate was 450 GW capacity in the year 2005, but actual capacity in 2005 was 368 GW (82% of the estimate).

The IAEA's current 'low' estimate for 2030 (385 GW) is down 29.5% from the pre-Fukushima, 2010 'low' estimate of 546 GW. The high estimate (632 GW) is down 21% from the pre-Fukushima, 2010 high estimate of 803 GW.

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Should Australia become the world's nuclear waste dump

Jim Green

In February, the South Australian Labor Party government established a Royal Commission[1] to consider options for an expanded role in the nuclear fuel cycle. Currently, the state has two operating uranium mines (Olympic Dam and Beverley Four Mile) but no other nuclear facilities. As the debate has progressed, it has become clear that the main interest is in the possibility of making billions of dollars by importing spent fuel / high level waste from overseas.

There is a precedent to current discussions. Pangea Resources was an international consortium that was planning a high level waste repository in Australia.[2] Pangea set up an office in Australia in the late 1990s but gave up in 2002 in the face of overwhelming public and political opposition.

The existence of Pangea Resources was a closely-guarded secret until a corporate video was leaked to Friends of the Earth. Pangea chief Jim Voss denied meeting with federal government ministers when he had in fact met at least one minister. A Pangea spokesperson said: "We would not like to be lying ... we very much regret getting off on the wrong foot." Ironically, the Association for Regional and International Underground Storage (ARIUS), the successor to Pangea, said in its submission to the Royal Commission that an "essential element of any approach is the open and complete flow of information."[3]

How much money might be made by taking nuclear waste from other countries? There is no precedent to base an estimate on. There may be countries that would be willing to send nuclear waste to Australia for storage and/or disposal but there are many reasons why countries may choose other options:

- About ~160 of the world's 194 countries have never operated power reactors and thus have no spent fuel or high level waste from nuclear power programs (although some have small quantities from the operation of research reactors).
- Some countries are advancing domestic or regional waste disposal plans.
- Some countries (and companies/utilities) would consider it irresponsible to entrust nuclear waste to a country that has very little or no experience or demonstrated competence – and a proven track record of incompetence (discussed below).
- Some countries (and companies/utilities) would consider it unethical to send nuclear waste to Australia given the pattern of Aboriginal land rights and heritage protections being sacrificed in order to advance radioactive waste repository projects (discussed below).
- Some countries are pursuing spent fuel reprocessing programs and would be unlikely candidates to send spent fuel to Australia (although they might pay to rid themselves of the high level waste stream from reprocessing).
- Some countries would be unwilling to rid themselves of spent fuel as they see it as a military asset (as it contains weapons-useable plutonium).

While proponents make absurd claims about the potential income – including claims that the income would allow the provision of free electricity to all South Australians and the abolition of all state taxes – they have had little to say about the costs. Since the volume of waste would presumably be relatively large (as a commercial venture), the cost of deep underground repository would likely be in the tens of billions of dollars. Plans for a high level waste repository in Japan may be comparable: the estimated cost is ¥3,500 billion[4] (A$40.8 billion).

And the waste would need to be monitored and problems addressed for millenia: it takes about 300,000 years for the radioactivity of spent nuclear fuel to fall to that of the original uranium ore.[5] The annual cost of monitoring waste might be modest; the cost over millenia would be astronomical.

Many other significant costs would be incurred. ARIUS proposes transport by purpose-built ships; a dedicated sea port; a dedicated rail system; and support and maintenance facilities for ships, rail locomotives, rolling stock and transport packages.[3]

Hazards

Professor John Veevers from Macquarie University wrote in *Australian Geologist* about the serious public health and environmental risks associated with a high-level nuclear waste repository: "Tonnes of enormously dangerous radioactive waste in the northern hemisphere, 20,000 kms from its destined dump in Australia where it must remain intact for at least 10,000 years. These magnitudes – of tonnage, lethality, distance of transport, and time – entail great inherent risk."[6]

Proponents of Australia becoming the world's waste dump claim that Australia has uniquely suitable geology. However Dr Mike Sandiford from the School of Earth Sciences at University of Melbourne writes: "Australia is relatively stable but not tectonically inert, and appears to be less stable than a number of other continental regions. Some places in Australia are surprisingly geologically active. We occasionally get big earthquakes in Australia (up to about magnitude 7) and the big ones have tended to occur in somewhat unexpected places like Tennant Creek. ... Australia is not the most

stable of continental regions, although the levels of earthquake risk are low by global standards. To the extent that past earthquake activity provides a guide to future tectonic activity, Australia would not appear to provide the most tectonically stable environments for long-term waste facilities."[7]

Australia's track record

There are social as well as technical dimensions to risk assessments. Australia has a history of mismanaging nuclear waste. Nuclear engineer Alan Parkinson states: "The disposal of radioactive waste in Australia is ill-considered and irresponsible. Whether it is short-lived waste from Commonwealth facilities, long-lived plutonium waste from an atomic bomb test site on Aboriginal land, or reactor waste from Lucas Heights. The government applies double standards to suit its own agenda; there is no consistency, and little evidence of logic."[8]

In the late-1990s, the Australian government carried out a 'clean up' of Maralinga, the site in SA where the British government tested nuclear weapons in the 1950s. The 'clean up' was done on the cheap and many tonnes of plutonium-contaminated debris remain buried in shallow, unlined pits in totally unsuitable geology – a breach of Australian guidelines for the management of long-lived nuclear waste.[9]

A number of scientists with inside knowledge of the Maralinga project complained about deficiencies:[9]

- Alan Parkinson said of the 'clean up': "What was done at Maralinga was a cheap and nasty solution that wouldn't be adopted on white-fellas land."
- US scientist Dale Timmons said the government's technical report was littered with "gross misinformation".
- Geoff Williams, an officer with the Commonwealth nuclear regulator ARPANSA, said the 'clean up' was beset by a "host of indiscretions, short-cuts and cover-ups".
- Nuclear physicist Prof. Peter Johnston said there were "very large expenditures and significant hazards resulting from the deficient management of the project by DEST [the Department of Education, Science and Training]."

Barely a decade after the Maralinga 'clean up', a survey revealed that 19 of the 85 contaminated waste pits have been subject to erosion or subsidence.[10]

Radioactive racism

Former Prime Minister Bob Hawke said Australia could end the disadvantage endured by Aboriginal people by opening up traditional lands as dumping sites for nuclear waste. But there are simpler and safer methods to close the gap. For example, the federal government could reverse planned cuts of $500 million from Aboriginal spending over the next five years.

Attempts to establish a national radioactive waste repository in Australia have involved crude racism. From 1998–2004, the federal government attempted to impose a dump on Aboriginal land in SA. The project came unstuck when the Federal Court ruled that the government had illegally used the *Lands Acquisition Act 1989* to seize land for the dump and to annul Aboriginal Native Title rights and interests.[9]

From 2005–2014, the federal government tried to impose a dump on Aboriginal land in the Northern Territory, and the racism was even cruder. The government passed legislation overriding the Aboriginal Heritage Act and the Aboriginal Land Rights Act, and allowing the imposition of a radioactive waste dump without any consultation with or consent from Aboriginal people. Muckaty Traditional Owners launched a legal challenge against the nomination of the dump site, and the government abandoned the waste dump proposal during the court case.[9]

Aboriginal people are deeply concerned about the Royal Commission and in particular renewed proposals for nuclear waste dumps on their land. A meeting held in May in SA released the following statement:

South Australian Traditional Owners say NO!

We oppose plans for uranium mining, nuclear reactors and nuclear waste dumps on our land.

We call on the SA Royal Commission to recommend against any uranium mining and nuclear projects on our lands.

We call on the Australian population to support us in our campaign to prevent dirty and dangerous nuclear projects being imposed on our lands and our lives and future generations.

Endorsed by members from the following groups, present at the Port Augusta meeting: Kokatha, Kokatha-Mirning, Arabunna, Adnyamathanha, Yankunytjatjara-Pitjanjatjara, Antikirinya-Yunkunytjatjara, Kuyani, Aranda, Western Aranda, Dieri, Larrakia, Wiradjuri.

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Summing the health effects of the Fukushima nuclear disaster

Dr Ian Fairlie

New emerging evidence from Fukushima shows that nuclear disasters and their aftermaths kill thousands of people due to necessary evacuations. In future, these deaths from ill-heath and suicides should be included in assessments of the fatalities from nuclear disasters. In sum, the human toll from Fukushima is horrendous: 2,000 Japanese people have died from the evacuations and another 5,000 are expected to die from future cancers.

Deaths from necessary evacuations

Official data from Fukushima show that nearly 2,000 people died from the effects of evacuations necessary to avoid high radiation exposures from the disaster, including suicides.[1]

The uprooting to unfamiliar areas, cutting of family ties, loss of social support networks, disruption, exhaustion, poor physical conditions and disorientation can and do result in many people, in particular older people, dying. å

Increased suicide have occurred among younger and older people following the Fukushima evacuations, but the trends are unclear.[2]

A Japanese Cabinet Office report stated that, between March 2011 and July 2014, 56 suicides in Fukushima Prefecture were linked to the nuclear accident.[3] This should be taken as a minimum, rather than a maximum, figure.

Mental health consequences

It is necessary to include the mental health consequences of radiation exposures and evacuations. For example, Becky Martin has stated her PhD research at Southampton University in the UK shows that "most significant impacts of radiation emergencies are often in our minds".

She adds "... imagine that you've been informed that your land, your water, the air that you have breathed may have been polluted by a deadly and invisible contaminant. Something with the capacity to take away your fertility, or affect your unborn children. Even the most resilient of us would be concerned ... many thousands of radiation emergency survivors have subsequently gone on to develop Post-Trauma Stress Disorder (PTSD), depression, and anxiety disorders as a result of their experiences and the uncertainty surrounding their health."[4]

It is likely that these fears, anxieties, and stresses will act to magnify the effects of evacuations, resulting in even more old people dying or people committing suicide.

The above sections should not be taken as arguments against evacuations: they are an important, life-saving strategy. But, as argued by Becky Martin, "we need to provide greatly improved social support following resettlement and extensive long-term psychological care to all radiation emergency survivors, to improve their health outcomes and preserve their futures".

Untoward pregnancy outcomes

Recently, Dr Alfred Körblein from Nuremburg in Germany noticed a 15% drop (statistically speaking, highly significant) in the numbers of live births in Fukushima Prefecture in December 2011, i.e. nine months after the accident.[5] This might point to higher rates of early spontaneous abortions. He also observed a (statistically significant) 20% increase in the infant mortality rate in 2012, relative to the long-term trend in Fukushima Prefecture plus six surrounding prefectures. These are indicative rather than definitive findings and need to be verified by further studies. Unfortunately, such studies are notable by their absence.

Cancer and other late effects from radioactive fallout

Finally, we have to consider the health effects of the radiation exposures from the radioactive fallouts after the four explosions and three meltdowns at Fukushima in March 2011. Large differences of view exist on this issue in Japan. These make it difficult for lay people and journalists to understand what the real situation is.

The Japanese Government, its advisors, and most radiation scientists in Japan (with some honourable exceptions) minimise the risks of radiation. The official widely-observed policy is that small amounts of radiation are harmless: scientifically speaking this is untenable. For example, the Japanese Government is attempting to increase the public limit for radiation in Japan from 1 mSv to 20 mSv per year. Its scientists are trying to force the ICRP to accept this large increase. This is not only unscientific, it is also unconscionable.

Part of the reason for this policy is that radiation scientists in Japan (in the US, as well) appear unable or unwilling to accept the stochastic nature of low-level radiation effects. "Stochastic" means an all-or-nothing response: you either get cancer etc or you don't. As you decrease the dose, the effects become less likely: your chance of cancer declines all the way down to zero dose. The corollary is that tiny doses, even well below background, still carry a small chance of cancer: there is never a safe dose, except zero dose.

But, as stated by Spycher et al[6], some scientists "... *a priori* exclude the possibility that low dose radiation could increase the risk of cancer. They will therefore not accept studies that challenge their foregone conclusion."

One reason why such scientists refuse to accept radiation's stochastic effects (cancers, strokes, cardiovascular system diseases, hereditary effects, etc) is that they only appear after long latency periods – often decades for solid cancers. For the Japanese Government and its radiation advisors, it seems out-of-sight means out-of-mind. This conveniently allows the Japanese Government to ignore radiogenic late effects. But the evidence for them is absolutely rock solid. Ironically, it comes primarily from the world's largest on-going epidemiology study, the Life Span Study of the Japanese atomic bomb survivors by the RERF Foundation which is based in Hiroshima and Nagasaki.[7]

Negative lottery tickets

The mass of epidemiological evidence from the Chernobyl disaster in 1986 clearly indicates that cancer etc increases will very likely also occur at Fukushima, but many Japanese (and US) scientists deny this evidence.

For example, much debate currently exists over the existence and interpretation of increased thyroid cancers, cysts, and nodules in Fukushima Prefecture resulting from the disaster. From the findings after

Chernobyl, thyroid cancers are expected to start increasing 4 to 5 years after 2011. It's best to withhold comment until clearer results become available in 2016, but early indications are not reassuring for the Japanese Government. After then, other solid cancers are expected to increase as well, but it will take a while for these to become manifest.

The best way of forecasting the numbers of late effects (i.e. cancers etc) is by estimating the collective dose to Japan from the Fukushima fall out. We do this by envisaging that everyone in Japan exposed to the radioactive fallout from Fukushima has thereby received lottery tickets: but they are negative tickets. That is, if your lottery number comes up, you get cancer. If you live far away from Fukushima Daiichi NPP, you get few tickets and the chance is low: if you live close, you get more tickets and the chance is higher. You can't tell who will be unlucky, but you can estimate the total number by using collective doses.

The 2013 UNSCEAR Report[8] has estimated that the collective dose to the Japanese population from Fukushima is 48,000 person-Sieverts (discussed further below).

Unfortunately, pro-nuclear Japanese scientists also criticise the concept of collective dose as it relies on the stochastic nature of radiation's effects and on the Linear No Threshold (LNT) model of radiation's effects which they also refute. But almost all official regulatory bodies throughout the world recognise the stochastic nature of radiation's effects, the LNT, and collective doses.

Summing up Fukushima

About 60 people died immediately during the actual evacuations in Fukushima Prefecture in March 2011. Between 2011 and 2015, an additional 1,867 people (as of March 2015) in Fukushima Prefecture died as a result of the evacuations following the nuclear disaster. These deaths were from ill health and suicides.[9] (In addition, 1,603 people were killed directly by the earthquake and tsunami in Fukushima Prefecture, and approximately 1,350 tsunami evacuee deaths occurred in Miyagi and Iwate Prefectures: in the latter cases, the evacuations were not radiation-related.)

From the UNSCEAR estimate of 48,000 person-Sv, it can be reliably estimated (using a fatal cancer risk factor of 10% per Sv) that about 5,000 fatal cancers will occur in Japan in future from Fukushima's fallout. This estimate from official data agrees with my own personal estimate using a different methodology.[10]

In sum, the health toll from the Fukushima nuclear disaster is horrendous. At the minimum:

- Over 160,000 people were evacuated most of them permanently.
- Many cases of post-trauma stress disorder (PTSD), depression, and anxiety disorders arising from the evacuations.
- About 12,000 workers exposed to high levels of radiation, some up to 250 mSv
- An estimated 5,000 fatal cancers from radiation exposures in future.
- Plus similar (unquantified) numbers of radiogenic strokes, CVS diseases and hereditary diseases.
- Between 2011 and 2015, about 2,000 deaths from radiation-related evacuations due to ill-health and suicides.
- An, as yet, unquantified number of thyroid cancers.
- An increased infant mortality rate in 2012 and a decreased number of live births in December 2011.

Non-health effects include

- 8% of Japan (30,000 sq km), including parts of Tokyo, contaminated by radioactivity.
- Economic losses estimated between US$300 and US$500 billion (260–430 billion).

The Fukushima accident is still not over and its ill-effects will linger for a long time into the future. However we can say now that the nuclear disaster at Fukushima delivered a huge blow to Japan and its people. 2,000 Japanese people have already died from the evacuations and another 5,000 are expected to die from future cancers.

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Abridged from www.ianfairlie.org/news/summing-the-health-effects-of-the-fukushima-nuclear-disaster/

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Shenhua Watermark Coal – the fight for the Liverpool Plains continues

Aidan Kempster and Phil Evans

The Shenhua Watermark Project near the quiet township of Breeza in the Liverpool Plains of NSW has captured the attention of farmers, environmentalists and traditional owners from across the political spectrum. The plan for the 35 sq km Watermark open-cut coal mine consists of three pits and intends to extract up to 10 million tonnes per year of both coking and thermal coal for export over 30 years.[1] Shenhua Watermark, a subsidiary of Shenhua – the largest coal company in the world and a Chinese state-owned entity – has already paid $300 million to the NSW (then ALP) government to secure its exploration licence and looks set to do whatever it takes to see this project come to fruition.

The strong local-led campaign that has emerged, which has seen the Liverpool Plains Youth and Gomeroi Traditional Custodians take a lead role, claims that this is the wrong mine in the wrong place. But more than that, it is the wrong fuel in the wrong time. For decades, coal has dominated the economic and political domains in Australia, but thanks to a strong divestment movement (including Friends of the Earth affiliate Market Forces) and strong on-the-ground opposition and direct action, the power dynamic has changed. And for the first time in Australia for over two centuries, the end of coal is in sight.

With that in mind, the Liverpool Plains is fast gearing up to be the new flashpoint in the fight against coal exports. The movement, which came into maturity in Maules Creek and had a phenomenal win in the courts over the plan to mine the Galilee Basin, is now itching for the fight – to protect land, water and culture.

The land

The Liverpool Plains are one of Australia's food bowls, producing beef, sorghum, barley, wheat, corn and soybeans on land that is rated "the best cropping land in NSW".[2] The soil is so rich that many crops can survive a rainless growing season and the life-giving aquifers underneath connect all the way to the Murray-Darling basin. It's no wonder two separate polls both found that 96% of the public are against the mine approval.[3,4]

Local farmers are angry and worried because the mine will kill their productivity. Tim Duddy of the Caroona Coal Action Group has called the mine "agricultural genocide", adding: "We are not talking about a coexistence model, we are talking about mining coming and farming going and it's as simple as that."[5]

The Shenhua project will open the door for another proposed massive coal mine – BHP's Caroona project, slated to open up shop right next door. Pollution from coal dust, drawdown of the water table and massive land buys threaten to bring existing agriculture to its knees. Shenhua has downplayed this by claiming there will be no impact on the surrounding agricultural properties outside their project boundary.[1] But the evidence contradicts this.

Several cotton producers exist downwind of the mine, and the going local rate for discoloured cotton is $50–$65 – 17% less than market price per bale.[6] The idea that these farms would be unaffected by coal dust during the three months of growing, with five blasts a week, is preposterous.

If the farmers, who know the area well, are right, and the mine creates an expanding agricultural dead zone, there is growing fear the Liverpool Plains will become a bigger, uglier version of the Hunter Valley as more mining projects will become easier to approve with less farmers.

The water

There are many allegations that the modelling done by Shenhua in order to obtain approval for the project was based on flawed science and a severe 'knowledge gap' in regards to how the aquifers in the area work. According to the local farmers in the Caroona Coal Action Group, Whitehaven Coal's Werris Creek mine has seen water drawdowns 4000% greater than in the original Environmental Impact Statement (EIS).

Farmers hold grave fears that the Watermark project will just mean more of the same. They also point to the massive differences between modelling done for the neighbouring Caroona coal project and say that they are very hesitant to trust any modelling that Shenhua puts on the table.

Stated in Shenhua's EIS is a condition not to disturb the black soil floodplains. Shenhua claim to be upholding that statement1, but it's not to be taken at face value. For the purposes of the Watermark approval, former Liberal Minister for Mineral Resources Chris Hartcher endorsed a definition of a floodplain different from the one contained within the NSW Water Act. It is acknowledged in Shenhua's own documents that without this change in definition, the mine would not be able to proceed.[1]

The culture

The Gomeroi Traditional Custodians, a committee of the local indigenous population fresh from the Maules Creek fight, are also up in arms over the mine. The proposed development site contains scores of highly significant indigenous cultural sites including a set of massive groove stones that were used for sharpening spears and axes. Shenhua has publically stated that they intend to honour and respect the culture and heritage of the Gomeroi and as such would not destroy the site but 'gently relocate' it and then return it 17 years later.[1]

Gomeroi spokeswoman Dolly Talbot disputes the idea of 'gentle relocation', stating that the grinding grooves site is too large and not strong enough to survive that process: "The truth is that Shenhua wants to carve them up – like a jigsaw puzzle – forever destroying them. The aquifer providing the water which keeps the grinding grooves in their state will also be destroyed and the landscape Shenhua wants to return the grooves pieces to will be forever changed and the meaning and purpose of the area lost."[7]

Shenhua Watermark have pulled out the standard economic arguments for why the mine should go ahead – local jobs, state revenue – but the numbers just don't add up. The economic benefits of the project are touted by politicians and the miners, but an independent review found the numbers were exaggerated.[6] The economic assessment Shenhua relies upon is based on a sale price of $142/tonne for semi-soft coking coal and $99 for thermal coal, which is substantially higher than the current price, about $80 for both.[8,9] There is a good chance that, due to the continued decline of the coal market, the mine may never meet its own costs of production, and the state of NSW will not receive anything like the royalties promised.

The groundswell begins

"This isn't over. It hasn't even begun. And, frankly, any government that doesn't see the stupidity of this doesn't deserve to be in government." – radio broadcaster Alan Jones.[10]

A court case has been launched by the Mooki Landcare Organisation against Shenhua and the NSW Minister for Planning due to improper and inaccurate assessment of the mine's impact on koalas. Mooki Landcare claims Shenhua's Environmental Impact Assessment failed to properly investigate the risk of koala extinction in the area. Shenhua used population estimates of 12,753 animals for the entire Gunnedah Local Government Area, however the Australian Koala Foundation estimates that there are only 800-1,300 animals in the area. The case was heard from 31 August to 3 September in the NSW Land and Environment Court. The result is still pending at the time of writing.[11]

The consistent public outrage over the project, which currently only has conditional federal approval, is causing political shockwaves. Many Greens MPs and unlikely ally Jacqui Lambie (Tasmania) have already travelled to the local area to meet with community, hear their concerns and join resistance to the mine. Lambie took part in a tractor rally organised by the Caroona Coal Action Group and the Liverpool Plains Youth. The real surprise is Barnaby Joyce's vocal opposition to the mine. However, without action Joyce's words ring hollow and seem to be a cynical ploy to sure up slumping Nationals support in rural NSW.

With final approval from the federal government still pending, and the mining lease still to be granted by the NSW government, the fight has only just begun. Hundreds of people will soon converge on the small town of Breeza – city and country united in voice to say 'never again', and to cry out in unison against this disastrous project. This unlikely alliance of traditional owners, greenies and farmers has learnt valuable lessons from Maules Creek and in the battle for the Galilee Basin. Shenhua should expect a formidable fight.

Check out http://liverpoolplainsalliance.com to keep up with the campaign.

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The fantasy of cheap, safe nuclear energy

Mark Diesendorf

Back in the 1970s and 80s, solar and wind energy were expensive and their supporters were criticised by the nuclear industry for dreaming of a renewable energy future. Nowadays the situation is reversed. Several countries are well on their way to their targets of 80-100 per cent renewable electricity while global nuclear energy generation ceased growing nine years ago.

In northern Europe and the USA wind energy is about half the price of nuclear. In South America contracts to deliver electricity from big solar photovoltaic (PV) power stations are being signed at 8 US cents per kilowatt-hour, already less expensive than nuclear, and the price of solar PV is still declining. In many places, including mainland Australia, rooftop solar is much less expensive than retail electricity from the grid.

The current fantasy is that nuclear energy is cheap, safe, CO2-free and necessary, and that South Australia could make a profit storing the world's nuclear wastes. All of these claims by enthusiasts for the nuclear fuel cycle, made in submissions to the current South Australian Nuclear Fuel Cycle Royal Commission, are poorly based.

In theory, the geologically stable regions of South Australia could provide a location for storing high-level nuclear wastes. But as yet there are no permanent repositories for high-level nuclear wastes operating anywhere in the world. It would be crazy for Australia to attempt build one when the USA has failed.

Apparently recognising this, South Australian Liberal Senator Sean Edwards has proposed an even greater fantasy: that South Australia could earn huge revenue from storing the world's high-level wastes temporarily in dry casks. He claims that the revenue would be sufficient to fund a nuclear power station.

Unfortunately, this scheme fails under basic economics. Why would a nuclear power country pay the additional costs of shipping and storing high-level waste in Australia when it can store its own wastes temporarily in dry casks? Indeed, several nuclear power countries are already doing this.

Senator Edwards' fantasy is that Australia could convert the long-lived component of the nuclear wastes into nuclear fuel in an Integral Fast Reactor. However, this technology is not commercially available. It has only ever existed as a pilot plant in the USA. Proposing that SA buy unproven technology at huge expense is a poor prescription for the economy.

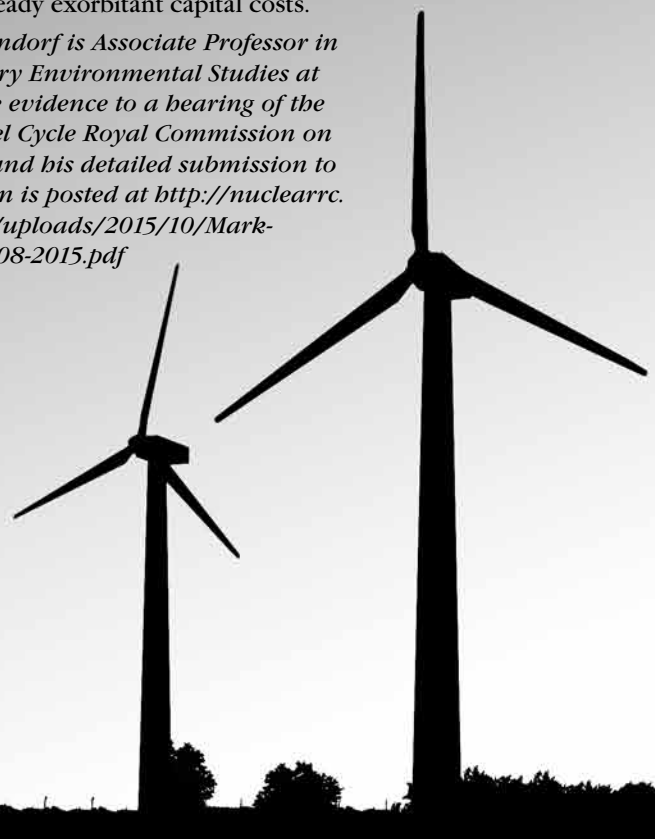
Australia could not convert the contents of the dry casks to nuclear fuel. We would be stuck with managing them while they corrode and release their deadly contents. It's far better to leave the source countries to handle the huge costs and risks of managing their nuclear wastes for 100,000 years or more.

Turning to nuclear power stations, both the Australian Energy Market Operator and our own research group at the University of NSW have shown independently that the National Electricity Market, which includes South Australia, could be operated reliably and affordably on 100 per cent renewable energy. The UNSW research uses only scaled-up commercially available renewable energy technologies. The results of the computer simulations, now spanning eight years of hourly data, are supported by practical experience in South Australia where at times renewable energy provides up to three-quarters of electricity.

Nuclear power is very inflexible in operation, unable to follow the variations in wind and solar PV output. It would be an inadequate partner for a SA electricity supply system that will soon be predominantly renewable. Instead, flexible peak-load plants are required: biofuelled gas turbines, concentrated solar power with thermal storage, and, in appropriate locations, pumped hydro.

Furthermore, under current market rules, wind and solar, with their tiny operating costs, would have priority in supplying base-load demand. Nuclear power would be displaced from operating as base-load power, just as coal is currently being displaced in SA. Then, nuclear energy would have even greater difficulties in repaying its already exorbitant capital costs.

Dr Mark Diesendorf is Associate Professor in Interdisciplinary Environmental Studies at UNSW. He gave evidence to a hearing of the SA Nuclear Fuel Cycle Royal Commission on 14 September and his detailed submission to the Commission is posted at http://nuclearrc.sa.gov.au/app/uploads/2015/10/Mark-Diesendorf-01-08-2015.pdf



The renewable energy revolution

Renewables 2015: Global Status Report

The REN21 'Renewables 2015: Global Status Report' details the striking growth of renewables over the past decade.[1] Renewable energy provided an estimated 19.1% of global final energy consumption in 2013, and growth in capacity and generation continued to expand in 2014. Heating capacity grew at a steady pace, and the production of biofuels for transport increased.

The most rapid growth, and the largest increase in capacity, occurred in the power sector, led by wind, solar PV, and hydropower. Renewables accounted for approximately 59% of net additions to global power capacity in 2014, with significant growth in all regions of the world.

Global renewable power capacity – excluding hydro – grew eight-fold from 85 gigawatts (GW) in 2004 to 657 GW in 2014. Solar PV capacity has grown at a phenomenal rate, from 2.6 GW in 2004 to 177 GW in 2014. Over the same period wind power capacity increased from 48 GW to 370 GW.

Global renewable power capacity – including hydro – more than doubled from 800 GW in 2004 to 1,712 GW in 2014 (an estimated 27.7% of the world's power generating capacity in 2014).

In 2014, total installed renewable capacity (including hydro) increased by 8.5%, compared to 0.6% for nuclear power. Hydro capacity rose by 3.6% while other renewables collectively grew nearly 18%.

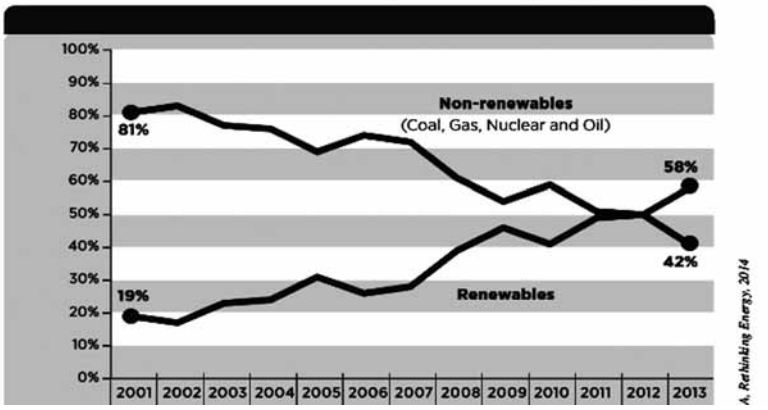
By way of sharp contrast, nuclear power has flatlined for the past two decades. Global nuclear power capacity was 365 GW in 2004 and 376 GW in 2014, and the number of reactors declined from 443 to 439 over that period.[2] Renewable capacity (including hydro) of 1,712 GW is 4.6 times greater than nuclear capacity of 376 GW.

But the capacity factor of some renewables (e.g. solar PV and wind) is lower than that of nuclear power, so how do the figures stack up when comparing electricity generation? The REN21 report states that as of the end of 2014, renewables (including hydro) supplied an estimated 22.8% of global electricity (hydro 16.6% and other renewables 6.2%). Nuclear power's share of 10.8%[3] is less than half of the electricity generation from renewables – and the gap is widening.

The REN21 report notes that the growth of renewables is being driven by declining costs and that "in many countries renewables are broadly competitive with conventional energy sources." Further, "growth in renewable energy (and energy efficiency improvements) continues to be tempered by subsidies to fossil fuels and nuclear power, particularly in developing countries."

One final point from the REN21 report warrants mention. The report states: "Despite rising

Renewables Share of Global Electricity Generating Capacity Additions



energy use, for the first time in four decades, global carbon emissions associated with energy consumption remained stable in 2014 while the global economy grew; this stabilisation has been attributed to increased penetration of renewable energy and to improvements in energy efficiency."

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International Energy Agency report

The International Energy Agency (IEA) has released its 'Renewable Energy Medium-Term Market Report'.[1] The report notes that renewable electricity expanded at its fastest rate to date (130 gigawatts – GW) in 2014.

Further, the IEA projects 700 GW of new renewable power capacity from 2015–2020, and that renewables will account for almost two-thirds of new power generation capacity over that period. The renewable share of generation is projected to rise from 22% in 2013 to over 26% in 2020.

The IEA report states that global average costs for onshore wind generation fell by 30% from 2010–2015, and are expected to decline a further 10% by 2020. Utility-scale solar PV fell two-thirds in cost and is expected to decline another 25% by 2020.

The IEA report states that renewables are not a "luxury" that only rich countries can afford. The report states that "the geography of deployment will increasingly shift to emerging economies and developing countries, which will make up two-thirds of the renewable electricity expansion to 2020. China alone will account for nearly 40% of total renewable power capacity growth and requires almost one-third of new investment to 2020."

Another report recently released by the IEA noted that renewable electricity generation has overtaken gas to become the second largest source of electricity worldwide, behind coal.[2]

Meanwhile, the Energy Watch Group has released a report detailing the IEA's track record of grossly underestimating the growth of renewables.[3] For example:

- in 2010 the IEA projected 180 GW of solar PV capacity by the year 2024 but that figure was reached in January 2015.
- the IEA's 2002 projection for wind power capacity in the year 2030 was actually reached 20 years earlier, in 2010.
- the IEA's 2010 projection of renewable energy's share of global electricity generation in 2035 has already been reached ... 20 years earlier!

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Global renewables jobs boom to 7.7 million

According to a report by the International Renewable Energy Agency (IRENA), the global renewable energy industry employed 7.7 million people, directly or indirectly, in 2014 – an 18% increase on the 6.5 million jobs reported in 2013. Large hydro directly employed another 1.5 million in 2014. IRENA expects the number to more than double, to around 16 million jobs, by 2030.

"Renewable energy continues to assert itself as a major global employer, generating strong economic and social benefits worldwide," said IRENA Director-General Adnan Amin. "This increase is being driven, in part, by declining renewable energy technology costs, which creates more jobs in installation, operations and maintenance."

According to the IRENA report, solar PV was the largest renewable energy employer in 2014, with 2.5 million jobs worldwide, followed by liquid biofuels (1.8 million), wind (1 million), biomass (822,000), solar heating/cooling (764,000), biogas (381,000), small hydro (209,000), and geothermal (154,000).

China was the world's largest renewable energy employer in 2014, with 3.4 million jobs.

IRENA, 19 May 2015, 'Renewable Energy and Jobs: Annual Review 2015',

Summary: www.irena.org/News/Description.aspx?NType=A&mnu=cat&PriMenuID=16&CatID=84&News_ID=407

Full report: www.irena.org/DocumentDownloads/Publications/IRENA_RE_Jobs_Annual_Review_2015.pdf

Renewable energy investment

According to Bloomberg New Energy Finance, global investment in renewables jumped 16% in 2014 to US$310 billion, five times the tally of a decade earlier. Solar investments accounted for almost half the total. China led the way with renewable investments increasing almost one-third to US$89.5 billion, while US investment gained 8% to US$51.8 billion.

http://about.bnef.com/press-releases/rebound-clean-energy-investment-2014-beats-expectations/

www.theage.com.au/business/renewable-investment-dives-in-australia-bucking-global-trend-20150109-12kqhk.html

Record solar growth

A record amount of solar power was added to the world's grids in 2014, pushing total capacity to 100 times the level it was in the year 2000.[1,2] Around 40 gigawatts was installed in 2014, raising the total installed capacity to 178 gigawatts (GW). China (10.6 GW), Japan (9.7 GW) and the US (6.5 GW) were the leaders.

The growth is detailed in SolarPower Europe's *Global Market Outlook*. Michael Schmela, executive adviser to SolarPower Europe, noted that in 2014 renewables produced more power than nuclear in Europe for the first time in decades. The gap between renewables and nuclear in Europe is certain to grow.

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Solar Outlook report

Deutsche Bank has released its 2015 Solar Outlook report. Deutsche Bank states: "Unsubsidized rooftop solar electricity costs anywhere between US$0.13 and US$0.23/kWh today, well below retail price of electricity in many markets globally. The economics of solar have improved significantly due to the reduction in solar panel costs, financing costs and balance of system costs. We expect solar system costs to decrease 5-15% annually over the next 3+ years which could result in grid parity within ~50% of the target markets. If global electricity prices were to increase at 3% per year and cost reduction occurred at 5-15% CAGR [compound annual growth rate], solar would achieve grid parity in an additional ~30% of target markets globally. We believe the cumulative incremental total available market for solar is currently around ~140GW/year and could potentially increase to ~260GW/year over the next 5 years as solar achieves grid parity in more markets globally and electric capacity needs increase."

Deutsche Bank, 13 Jan 2015, 'Deutsche Bank's 2015 solar outlook: accelerating investment and cost competitiveness',

www.db.com/cr/en/concrete-deutsche-banks-2015-solar-outlook.htm

Renewable energy costs reaching grid parity

Maturing clean energy technologies, such as onshore wind, solar power and biomass, are reaching grid parity in many parts of the world regardless of whether or not they receive subsidies, a report by the International Renewable Energy Agency (IRENA) has revealed.[1]

IRENA states: "The competitiveness of renewable power generation technologies continued improving in 2013 and 2014, reaching historic levels. Biomass for power, hydropower, geothermal and onshore wind can all provide electricity competitively against fossil fuel-fired power generation. Solar photovoltaic (PV) power has also become increasingly competitive, with its levelised cost of electricity (LCOE) at utility scale falling by half in four years."

IRENA estimates fossil-fuelled power plants produce power at between US$0.07–0.19/kWh when environmental and health costs of carbon emissions and other forms of pollution are taken into account.

IRENA, January 2014, 'Renewable Power Generation Costs in 2014', www.irena.org/menu/index.aspx?mnu=Subcat&PriMenuID=36&CatID=141&SubcatID=494

Economics of renewables vs. nuclear power

A report commissioned by the Vienna Ombuds-Office for Environmental Protection compares the economics of renewables and nuclear power.[4] Five different renewable technologies were analysed: biomass, onshore and offshore wind, small-scale hydropower plants and solar photovoltaics. Calculations were conducted for five different EU Member states (UK, Poland, Germany, France and the Czech Republic) and the EU-28 overall.

The report concludes: "Generating electricity from a variety of renewable sources is more economical than using nuclear power; this is clearly shown by the model-based assessment of future developments up to 2050. Across the EU end consumers can save up to 37% on their electricity costs – in some Member States even up to 74% – when plans to build nuclear power plants are shelved in favour of renewables. In order to achieve these goals it is vital that we act quickly, but with care, to create the infrastructure and regulatory framework this requires, or to adapt that which already exists."

Austrian Institute of Ecology / e-think, Nov 2014, 'Renewable Energies versus Nuclear Power: Comparing Financial Support', www.ecology.at/wua_erneuerbarevskernenergie.htm

Greenpeace: Energy [R]evolution report

Greenpeace has released the latest edition of its Energy [R]evolution series, first produced in 2005. The 364-page report has been produced by numerous experts and institutions.[1]

The Energy [R]evolution reports have an impressive track record. Energy consulting firm Meister Consultants Group noted in March 2015: "Over the past 15 years, a number of predictions – by the International Energy Agency, the US Energy Information Administration, and others – have been made about the future of renewable energy growth. Almost every one of these predictions has underestimated the scale of actual growth experienced by the wind and solar markets. Only the most aggressive growth projections, such as Greenpeace's Energy [R]evolution scenarios, have been close to accurate."[2]

Too cheap to meter? The estimated cost of two planned 'EPR' reactors in the UK is £24.5 billion or A$52.5 billion. That's $A26.25 billion for each reactor. The latest estimate of the cost of an EPR reactor under construction in France is $A16.3 billion.

The Energy [R]evolution provides mid-term projections but the focus of the report is much more ambitious and much less certain – mapping out a pathway to 100% renewable energy worldwide by 2050.

The report proposes a phase-out of fossil fuels starting with lignite by 2035, followed by coal (2045), then oil and then finally gas (2050). As with fossil fuels, nuclear power is also phased out "as fast as technically and economically possible".

The report details the extraordinary growth of renewables over the past decade, with 783 GW of new renewable power generation capacity installed from 2005 to 2014. However "the overall transition away from fossil and nuclear fuels to renewables is far too slow to combat dangerous climate change." Over the past decade almost as much new coal capacity (750 GW) has been installed as renewables. Hence the need for coordinated plans and political commitment to rapidly replace dirty energy sources with renewables.

Under the Energy [R]evolution scenario, the world would stay within the IPCC's 1,000 gigatonne "carbon budget" – total carbon emissions between 2012 and 2050 would be 744 gigatonnes in the Energy [R]evolution scenario and 667 gigatonnes in an 'Advanced' Energy [R]evolution scenario. The report envisages global emissions peaking at the end of this decade, a return to 1990 levels in 2030, a 60% reduction by 2040 and near-zero emissions in 2050 (excluding some non-energy sectors such as steel production).

The share of electricity generated by renewables doubles from 21% to 42% by 2030 under the Energy [R]evolution scenario, then expands to 72% in 2040 and 100% in 2050. Measures proposed to incorporate fluctuating power sources into reliable electricity systems include smart grids, demand side management, and energy storage.

Renewables meet around 21% of current global energy demand for heating – almost all of it biomass. In the Energy [R]evolution scenarios, energy efficiency measures reduce growing demand for heating by 33% in 2050, with the use of fossil fuels for heating replaced by a portfolio of renewable heating (solar collectors, geothermal, renewable energy-produced hydrogen) and biomass.

Decarbonising transport can largely be achieved by growing and electrifying public transport systems, as well as encouraging the uptake of ever-improving electric vehicles. Aviation and shipping are particularly difficult, but planes and ships could be powered using biofuels, hydrogen and synthetic fuels produced using electricity. Under the Energy [R]evolution scenario, just over half of road transport energy demand is met by electricity by 2050.

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2. Meister Consultants Group, 16 March 2015, Renewable Energy Revolution, www.mc-group.com/the-renewable-energy-revolution/

Global Apollo Program

An coalition of prominent people has come together to ask the world's governments to find US$15 billion per annum to invest in scientific research and development dedicated to the goal of making renewable energy cheaper than coal within 10 years.

The coalition includes

- a former chief executive of oil company BP,
- BBC documentary maker and naturalist David Attenborough,
- a former UK minister for energy,
- one of the world's leading economists on the study of what determines our happiness,
- a leading climate scientist,
- the former head of the UK's major business lobby group
- the chief executive of consumer products company Unilever,
- former World Bank chief economist Nicholas Stern
- and other prominent scientists and economists

The coalition draws its inspiration from President John Kennedy's Apollo Program which targeted putting a man on the moon and returning him safely to earth within the decade. They note that publicly-funded renewable energy R&D has been "starved" of funding, making up under 2% of the total of publicly funded research and development.

www.globalapolloprogram.org

Global renewable energy knowledge hub

The International Renewable Energy Agency (IRENA) has launched 'REsource' – an online platform that enables users to easily find country-specific data, create customized charts and graphs, and compare countries on metrics like renewable energy use and deployment. It also provides information on renewable energy market statistics, potentials, policies, finance, costs, benefits, innovations, education and other topics.

www.irena.org/REsource
www.irena.org/costs

Renewable energy potential – France, China, India

A report by ADEME, a French government agency under the Ministries of Ecology and Research, shows that a 100% renewable electricity supply by 2050 in France is feasible and would cost hardly any more than a mix of 50% nuclear, 40% renewables, and 10% fossil fuels (primarily gas).[1]

The 119-page report is the result of 14 months of detailed research, and examines the feasibility and costs of several different models ranging from a 40% reliance on renewables by 2050 up to 100% reliance.

For an all-renewables scenario, the report proposes an ideal electricity mix: 63% from wind, 17% from solar, 13% from hydro and 7% from renewable thermal sources (including geothermal energy).

To match supply and demand (and deal with intermittency), the report proposes demand management (electric cars, for example, charging and discharging), import/export, short-term storage (batteries and compressed air installations, for example), pumped-storage hydro, and power-to-gas-to-power technologies (hydrogen/methane).

The report estimates that the electricity production cost would be 119 euros per megawatt-hour in the all-renewables scenario, compared with a near-identical figure of 117 euros per MWh with a mix of 50% nuclear, 40% renewables, and 10% fossil fuels. The current average cost is 91 euros per MWh.

Damien Siess, ADEME's deputy director for production and sustainable energy, noted that renewable energy sources are currently more expensive than nuclear, but the cost of renewables is falling while the cost of nuclear is increasing, mainly because of the safety standards required for new reactors such as the EPR.

China: could get 85% of its electricity and 60% of total energy from renewables by 2050, according to government agencies. A rapid rollout of wind, solar and bioenergy is technologically and economically feasible, a report led by the China National Renewable Energy Centre claims.[2] In a "high renewable" scenario, the country's coal use would peak in 2020 and its greenhouse gas emissions by 2025.[4]

India: A detailed report by WWF-India and The Energy and Resources Institute maps out how India could generate as much as 90% of total primary energy from renewables by 2050.[3] The study develops and evaluates a potential growth path involving large deployment of renewables –

especially solar, wind and hydro – for electricity generation, with second-generation and algal biofuels meeting the additional demands of the transport sector. It argues that aggressive efficiency improvements also have large potential and could bring in savings of the order of 59% by 2050.

1. Full report (in French):
L'Agence de l'Environnement et de la Maîtrise de l'Energie (ADEME), 2015, 'Vers un mix électrique 100% renouvelable en 2050', www.ademe.fr/sites/default/files/assets/documents/rapport100enr_comite.pdf
http://fr.scribd.com/doc/261245927/le-rapport-100-energies-renouvelables
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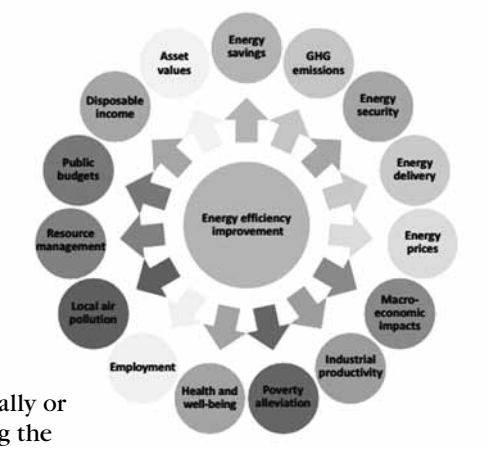
Twin Pillars: Energy efficiency and renewables

A June 2015 report by the International Energy Agency (IEA) compares an 'INDC' scenario, based on 'Intended Nationally Determined Contributions' nominated by (some) countries in advance of the UN climate conference in December 2015, with a more ambitious 'Bridge Scenario'.[1] Energy efficiency does much of the heavy lifting in reducing energy-related greenhouse emissions in the Bridge Scenario compared to the INDC scenario. Energy efficiency accounts for 49% of the reduction by 2030, renewables 17%, upstream methane reductions 15%, fossil-fuel subsidy reform 10%, and reducing inefficient coal 9%.

The IEA report's comments on renewables are worth noting. In the Bridge Scenario, 60% of new power capacity between 2015 and 2030 comes from renewables (23% wind, 17% solar PV, 14% hydro, 6% other renewables) compared to just 6% for nuclear, with fossil fuels accounting for the remaining 34%. In the Bridge Scenario, nuclear accounts for 13% of global power capacity in 2030, almost three times lower than renewables' share of 37% (hydro 18%, wind 9%, solar PV, 4%, bioenergy 4%, geothermal 1%, and concentrated solar power 1%).

In the scenario presented in the International Energy Agency's 'World Energy Outlook 2014', which envisages modest efforts to reduce emissions, oil demand in 2040 would be 22% higher without the cumulative impact of energy efficiency measures, gas demand 17% higher and coal demand 15% higher.[2] The report states: "Beyond cutting energy use, energy efficiency lowers energy bills, improves trade balances and cuts CO2 emissions. Improved energy efficiency compared with today reduces oil and gas import bills for the five largest energy-importing regions by almost $1 trillion in 2040."

The REN21 report[3] notes that renewables and energy efficiency are twin pillars of a sustainable energy future – enabling applications



that otherwise might not be technically or economically practical and rendering the outcome greater than the sum of the parts. The report provides examples of the synergies:

- *Synergies for greater system benefits.* Efficient building systems and designs, combined with on-site renewable energy generation, reduce end-use energy demand, electrical grid congestion and losses, and the monetary and energy expenditures associated with fuel transportation.
- *Synergies for greater renewable energy share in the energy mix.* Improving end-use efficiency and increasing use of on-site renewables reduce primary energy demand. With lower end-use energy requirements, the opportunity increases for renewable energy sources of low energy density to meet full energy-service needs. Targets to increase the share of renewables in total energy consumption can be achieved through both increasing the amount of renewable energy and reducing total energy consumption.
- *Synergies for greater investment in renewables and efficiency.* Improvements in end-use energy efficiency reduce the cost of delivering end-use services by renewable energy, and the money saved through efficiency can help finance additional efficiency improvements and/or deployment of renewable energy technologies. These synergies exist across numerous sectors, from buildings and electrical services to transportation and industry.

A 2011 study by University of Cambridge academics concluded that a whopping 73% of global energy use could be saved by practically achievable energy efficiency and conservation measures.[4] Julian Allwood, one of the authors of the study, said: "We think it's pretty unlikely that we'll find a good response to the threat of global warming on the supply side alone. But if we can make a serious reduction in our demand for energy, then all the options look more realistic."[5]

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Renewables can do 100%, but when will Australia see it done?

Alastair Leith

In 2010, Beyond Zero Emissions (BZE) asked this: if the critical decade starts now, what kind of technology investment would it take to power our entire economy with 100% RE by 2020?[1] Other researchers have studied the 100% RE question for Australia's National Energy Market – the electricity generation and network grid excluding WA and NT (Australian Energy Market Operator for 2030/50[2], UNSW for 2030[3]). All three major studies have found 100% RE for grid in Australia is feasible and that it's affordable – BZE in fact went beyond just the electricity grid to model for renewable supply to all other energy uses including transport, space heating and industrial processes.

Compelling cost curves (the rate at which any technology becomes less or more expensive over time) for wind, solar and storage make the inevitability of 100% RE seem a given to any enthusiast. But if the past three years in the Australian RE industries have shown anything, it's that this inevitability doesn't extend to a meaningful timeline for saving what's left of our safe climate.[4]

Many people are aware of the collapse of large scale renewable investment in Australia over the past few years – an 88% decline in investment in 2014 alone causing Australia to free-fall from 11th to 39th place in the world of large scale RE in a single year.

One of the reasons is that stationary energy, the power provided on the grid, is not something consumers have direct purchasing power over. Large generators and networks are owned by powerful fossil-economy aligned interests (sometimes states themselves) who've acted in concert with Coalition governments at both levels and cross-bench Senators to thwart and undermine the RE industry. So the technology adoption curve for large scale RE is very different to what we've seen with, PCs, mobile devices, HDTVs or (until 2011) rooftop solar.

This is not just due to government attacks on the large scale RE sector. It's also been the big three power retailers themselves launching a capital strike against RE projects by withholding on new Power Purchasing Agreements (PPA). PPAs are the piece of paper that make wind farms bankable in this country. These contracts underpin most of the RE projects launched in this country by locking down a fixed capacity and/or purchase price for power over the 20 years a project needs to provide a financial return.

Solar PV growth rates

Australia has the highest level of rooftop solar per capita in the world, yet that promising beginning is largely on the back of high growth peaking around 2009. Nationally, growth has plateaued into linear growth for the past four years. Yet internationally the growth rate is exponential and continues at the rate of a doubling in PV deployment every two years; as it has done for three decades. The attendant learning curve says that for each doubling there is a 20% drop in module price. The cost improvements drive more deployment, the exponential growth in deployment spurs greater innovation. Much the same as with high-volume consumer tech-goods like PCs, mobile devices and HDTVs.

Australia-wide the number of solar PV installations has been falling, and the number of jobs in the industry has been falling. Each state has seen a different surge and decline pattern, suggesting state government energy and feed-in tariff policies significantly impact the installation numbers.

Is a case for RE boosterism credible?

Unlikely suspects are claiming they're on board with consumer-driven RE disruption. Politicians are dropping the fallacious *renewables can't do baseload power* meme and cloaking themselves with some *it's inevitable* rhetoric – Greg Hunt talking about grid defection[5], Mike Nahan talking about his expectation that rooftop solar capacity will meet the bulk of demand in Perth in daylight hours[6], and Victorian Liberal MP and shadow Spokesperson for Renewables David Southwick talking up the "renewables revolution"[7].

But are such MPs being disingenuous when the deployment data, and more importantly their own policies and tariff changes (not to mention fossil fuel subsidies) are so obviously *not* driving the country towards mass RE deployment and negative greenhouse gas emissions?

I've mentioned the disastrous government policy and white-anting effects and the motivated resistance to rooftop PV and large scale renewables within our energy markets. The irony is, consistent with being a past director of the most organised and influential climate denial organisation in Australia (the Institute of Public Affairs), while Mike Nahan was WA's Energy Minister he eschewed wind power and large scale solar and continued the expansion of platinum-plated fossil-fuel energy networks that he now says as Treasurer the state can no longer afford to subsidise.[8] Much as we all look forward to noting the removal of fossil fuel subsidies in WA, his new 82 megawatts (MW) diesel peaking plant at Merredin receives $15m a year in capacity payments without dispatching energy to the grid, ever.[9]

an 88% decline in investment in 2014 alone causing Australia to free-fall from 11th to 39th place in the world of large scale RE in a single year.

With Solar Citizens and others championing rooftop solar's growth you'd be forgiven for thinking that solar PV in Australia has never seen it so good. Certainly if growth in solar PV was matching the three decade long global trend of a doubling in deployed capacity each two years then, yes, we could smash very ambitious RE targets like 100% RE before 2025 in every state of Australia. Ray Kurzweil – a futurist with something most futurists lack: an impressive track record – points to the fact that solar modules are on track to be delivering virtually free energy by 2036, and with another six doublings (~12 years) we will be meeting the world's current energy demands with PV capacity.[10]

Similar to wind farm growth, solar PV is not going to be adopted rapidly to saturation point where our entire economy is powered directly from renewables without reforms in government policy and tariffs that set positive incentives for an orderly but rapid transition. There's too many vested interests in mining and in the three big energy retailers who are protecting the status quo.

If we look at the solar installation data from the past decade what is evident is that solar is not going to meet anything like maximum demand on current trends — however virtuous the solar PV learning curves. And however much of a rhetorical about-face from WA Treasurer Nahan, on current trends his prediction falls way outside the bounds of current trends. Indeed if we are to (generously) apply the national linear trend of the past four years to growth in WA's rooftop solar it would take until 2032 to meet 2014's yearly maximum demand peak of 3,702 MW[11] with nameplate capacity of PV. But given the peak was 5:30-6:00pm you'd be needing to turn those panels west facing and you'd need still more of them. Safer to say it could be 2050 before a late afternoon peak was met without very significant levels of distributed storage. Global trend-matching exponential growth in rooftop PV would see a much healthier 7,112 MW deployed by 2023.

Victoria, currently considering 2020 and 2025 targets for it's reintroduced VRET, saw a 8,067 MW maximum for peak demand in 2014. Similarly to WA, linear growth on national average would see 7,969 MW of PV deployed by 2055, while two-year doublings would see 4,900 MW PV then 26,121 MW deployed by 2020 and 2025 respectively.

When the potential is there for massive growth in solar power, when it's happening all over the world, when it was happening in Australia up to 2010 but has backed off since, it's regressive in the extreme for governments to withdraw policies supporting exponential solar PV growth until we have met around 80% daily maximum demand from RE sources. With that kind of support 100% RE will be assured in a time frame that actually might make a difference for life-on-Earth as we know it.

There's a moral imperative and urgency that says we all must do as much as we can to save what's left of a safe climate. In a democracy, our governments in particular don't get a pass on ensuring we deploy RE as soon as policies measures can deliver it. The invisible hand of our energy market is hindering the rapid deployment of solar and wind power. If it's not government's job to fix this failing, then whose?

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Eight things Malcolm Turnbull should do on climate, renewables

Giles Parkinson

Malcolm Turnbull's dramatic replacement of Tony Abbott as prime minister of Australia has raised hopes of a change in direction for the Coalition government, particularly on climate change and renewable energy, and thereby the shape of its economic future.

Turnbull promised an end to "policy by slogans", and a new move to bring the Australian population along with the idea of an exciting future, first of all by explaining what that future might be, and respecting their intelligence. But is this all just style and no substance?

Some are hopeful. Paul Gilding, author and corporate advisor, describes a collective sigh of relief for those arguing for progressive climate and renewable energy policies. Gilding said: "We will never get on track as a country on this issue without genuine bipartisan support – and because of the way Rudd and Abbott made this a Left/Right issue, only the Liberal Party shifting can deliver the change we need. "That's why Turnbull's arrival as PM is a game changer for Australia's approach, but the impact will be medium to long term rather than sudden policy shifts. While Abbott had to *say* he supported action on climate policy, everyone knew he was faking it because the politics demanded he do so. Turnbull actually supports climate action and has long understood the economic implications of the transition required."

Others are not so sure. John Hewson, the former Liberal leader and now champion of fossil fuel divestment campaigns, said Turnbull may well have sold out. "I think it's all for Malcolm to do right now," Hewson said on ABC TV's Q&A program. "The rumour is he's sold out on climate change, which I personally think is the largest policy challenge – moral challenge, economic, political and social challenge – of this century."

So what will Turnbull do? Over the next few days, weeks, months, we will find out. But here are eight things he could do right now:

Stop the slogans

This should be the easy part. No more "axe the tax", no more "climate change is crap", no more "wind farms are offensive", no more "coal is good for humanity." Oh, and don't replace the slogans with 120-word ones.

Get excited about new technology:

This shouldn't be too hard, either. Just before the first leadership crisis in February, Turnbull was in California having a test drive of a Tesla Model S, the up-market electric super-car. He raved about the experience: "Tesla has gone from employing 500 people to 11,000 in five years. A reminder of how innovation drives jobs," he noted on his blog. "Batteries have the potential to revolutionise the energy market, reducing peaking power requirements, optimising grid utilisation of renewables and in some cases enabling consumers to go off the grid altogether. The excitement of technology in the Bay Area is exhilarating ... but not quite as palpable as the jolt you feel when you hit the accelerator!"

Perhaps he should require all party members to test drive a Tesla. He could just as equally share that enthusiasm, and dump the party's poisonous rhetoric, about other technologies such as battery storage and renewables. And he should not funnel government funds to daft projects like the rail link for the Galilee Basin coal mines. Even Barnaby Joyce understands that.

Get moving on climate change:

There was a telling moment in Turnbull's first press conference when the newly designated PM was about to answer a question on emissions reduction targets. Deputy Julie Bishop quickly noted that Australia's targets were set and would not change. It was a reminder to Turnbull that whatever his own views on climate change, he had to take the party with him.

It is clear that Turnbull has cut a deal with the Far Right rump of the party not to reintroduce an ETS – the very policy mechanism that caused his downfall in 2009. But Turnbull's own views are very clear. As he said in 2010: "Climate change is real, it is affecting us now, and yet, right now we have every resources available to us to deal with climate change, except for one, and that is leadership. We cannot cost-effectively achieve a substantial cut in emissions without putting a price on carbon."

Turnbull has the opportunity to provide that leadership. It will take time to introduce a carbon price, but it will most likely come through a baseline and credit scheme, a sort of emissions reduction fund and safeguards mechanism with bite, and amendments to the current proposal.

Sweep out the dead wood:

Turnbull may be constrained by promises made to the Right Wing, but he can change the rhetoric and the mood, and the vision, by sweeping away the inner cabal that fashioned Abbott's policy making. This includes the likes of climate deniers such as Maurice Newman, Dick Warburton, David Murray and Tony Shepherd, and shake the Cabinet from the grim grasp of the Institute of

Public Affairs and its policy wish-list. The right wing commentariat – including Alan Jones, Ray Hadley, Tim Blair and Andrew Bolt voiced their anger. They will be sniping at every turn.

That generational change is also needed elsewhere, particularly in the energy industry where many of the incumbent utilities, and policy and pricing regulators – from the industry minister Ian Macfarlane down – are from the "old school" of energy management, and don't seem to get the concept of decentralised generation, and the exciting technologies that Turnbull has alluded to, including EVs (such as his affection for Tesla), solar, and battery storage, and the smart software that will pull these technologies together.

Remove the threat to dismantle CEFC, ARENA and the CCA:

If only Bernie Fraser had hung around for another week. The chairman of the Climate Change Authority (CCA) resigned the week before Abbott's replacement by Turnbull, apparently frustrated by his inability to get his voice heard, even by environment minister Greg Hunt. Yet the CCA should play a critical role in advising on climate change policies.

Ditto the Clean Energy Finance Corporation and the Australian Renewable Energy Agency. Both have committed to playing a large role in the imminent roll-out of utility-scale solar, yet have been hamstrung in their broader goals by funding cuts in the case of ARENA, and restricted mandates in the case of the CEFC (Abbott's instruction not to invest in wind farms or rooftop solar).

Both agencies have been operating with the threat of closure looming behind them. With a positive mandate, both can play a critical role in the bringing in and lowering the cost of the technologies that Turnbull is so excited about.

Express support for renewable energy, and boost the target:

Tony Abbott, Joe Hockey and others in the Coalition made it very clear, they don't like renewable energy, and they hated wind energy. That has caused the investment drought to continue, despite the reduced 33,000 GWh target that was supposed to provide certainty, and turned large investors like Meridian Energy to greener shores. Turnbull should be able to turn that antipathy on a dime, simply by expressing support for new technologies.

Turnbull has been an enthusiastic supporter of renewable energy. Way back in 2010, he even attended the launch of Beyond Zero Emissions' Zero Carbon plan for 2020, along with Bob Carr and the Greens' Scott Ludlam. Turnbull was particularly supportive of solar thermal with storage.

"As you know the great challenge with renewable sources of energy; solar and wind in particular, is that they are intermittent," he told the event. "So what do we do when the sun isn't shining and the wind isn't blowing. How do we store that power.

"There is the ability with concentrated solar thermal power stations to use the sun's energy to superheat a substance, in this case molten salt, that will hold its heat for long enough to be able to continue to generate steam and hence energy after the sun has stopped shining or during or day after day of rain. So there is a real opportunity there, with that technology, to generate baseload power from solar energy – something of a holy grail."

Given that experience, maybe Turnbull should pitch for 100 per cent renewables? It is probably too much to expect Turnbull to lift the current renewable energy target in the short term, but that is exactly what he needs to do. The industry needs a long term policy, and Turnbull will be under pressure to match Labor's 50 per cent renewable energy target by 2030, which even big investment banks say is readily achievable. Rooftop solar needs ongoing regulatory support as well, and it fits Turnbull's rhetoric about a new economic future.

The industry needs a long term policy, and Turnbull will be under pressure to match Labor's 50 per cent renewable energy target by 2030, which even big investment banks say is readily achievable.

Impose emission standards on coal generators, and efficiency standards on cars

Whatever his support for the current policy, Turnbull cannot duck the fact that Australia's industrial emissions are growing, and particularly in the energy sector. Short of a carbon price, Turnbull could follow the lead of the US and China and impose strict emissions limits for coal-fired generators, impose energy efficiency targets for vehicles, and reintroduce the efficiency standards for new homes. Designing an exit strategy for coal generators is one of the most urgent issues.

Find a new environment minister, or tell Greg Hunt to stop saying silly things:

Greg Hunt likes to tell people how hard it was to push a progressive line in an Abbott government. Many people wondered how hard he tried. Hunt came up with some of the Abbott government's worst whoppers on climate change, coal, and renewable energy. Turnbull cannot afford to have such rhetoric repeated under his leadership, so if Hunt stays in that office the former Australian universities debating captain will have to be given another topic to argue: Decisive climate change is good for the economy and will not bankrupt Australia.

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Geoengineering: Striking targets or missing the point?

Ben Courtice

This is a response to Phil Sutton's latest paper, 'Striking Targets', published by BreakThrough (in Melbourne, not the controversial US think tank of the same name). The paper is posted at www.breakthroughonline.org.au/#!papers/cxeo

I take issue with the central proposition of the paper, that:

"Key climate/earth system parameters that need to be restored to safe levels are:

- *ocean heat content*
- *global surface temperature*
- *ocean acidity*
- *sea level"*

How feasible is that list? Are there mechanisms that can reduce ocean heat, for example? Water has a high specific heat capacity, meaning it can absorb a lot of heat energy yet only gain temperature slowly. The reverse is true: it takes a relatively large amount of heat loss before it cools appreciably. (This is due to its molecular structure, the same reason CO2 can hold a relatively high amount of heat in the atmosphere).

The climate science that I've seen over the years on this topic suggests that ocean temperature rise is basically irreversible on human lifetimes. If we stop adding greenhouse gases and stop adding heat to the atmosphere, it may gradually cool back to where it was, but over centuries. In the meantime, warmer oceans means warmer climate and there's not much can be done to change it. Warmer oceans and climate also drive sea level rise.

I haven't seen research on how fast ocean acidification may be reversed, but I suspect it's similar if not slower.

I'm very happy to hear of research which contradicts me on either of these points, of course. But in the meantime, there is only one crucial parameter that we know for sure we can control: the excess greenhouse gases being added to the atmosphere every day, month and year.

You could add that we can also stop destroying the biodiversity that gives ecosystems some stability and/or adaptability in the face of climate change. Indeed, biodiversity loss is a close second to climate change on the scale of major ecological threats to human civilisation. We will have to work to reverse this, too.

Backcasting vs wishful thinking

Phil Sutton's paper goes on to use the methodology of "backcasting": if we aim to protect people and species, what actions do we need to take to get there? The goal set – 'restoring a safe climate' – leads to the conclusion that we must actively remove CO2 and heat. But as I pointed out above, it may not be feasible to remove heat. Removing CO2 is also a big task, although limited progress may be feasible via revegetation.

A nasty complication is that ending fossil fuel use will end the emissions of sulphate aerosols that partially cool the earth by reflecting some sunlight ("global dimming"). They only last in the atmosphere very briefly, unlike CO2, so we will probably get a sudden jump in warming if we stop emitting sulphates from our coal power stations and other sources.

"Solar radiation management" is Phil's proposal for active cooling, and this geoengineering concept is hypothetically possible by deliberately putting more sulphate aerosols into the atmosphere – perhaps into the stratosphere, where they will last for a bit longer.

But such geoengineering techniques are hypothetical and fraught with problems. There is no way to trial them, other than at scale with the Earth as a laboratory. Geoengineering is often promoted like "clean coal", an excuse for not cutting emissions. In reality, its various hypothetical methods are untested and not known to work safely or even at all in many cases. They are, however, expected to cause climatic chaos (yes, more) especially for tropical areas dependent on monsoon rainfall. Where a large part of the world's population lives.

The notion that clumsily meddling further with the climate systems is a good idea is silly in any case. There are too many unknowns. It may make a neat sounding policy proposal to square the circle of "restoring a safe climate", but in reality it's a dangerous distraction.

Working backwards from an impossible goal

Beyond Zero Emissions (BZE) also started from a backcasting approach in designing the groundbreaking Zero Carbon Australia 100% renewable energy plan in 2010: assuming that we needed to reach zero emissions as fast as possible (choosing 10 years as the timeframe), they researched the technology and systems that could achieve that. The thing that BZE had in their favour was that engineering an energy supply system (or energy efficient buildings) is a relatively simple task, and as it turned out available technologies are up to the task. The Earth's climate system is at the far other end of the complexity spectrum.

Carbon draw down is the other dubious concept in the paper. It is unlikely for agriculture and forestry to go beyond zero emissions in the long term, and draw down significant amounts of CO2 from historic fossil fuel combustion. Vegetation regrowth and soil building is unlikely to draw down more CO2 than was released when it was cleared and ploughed previously: once soils hit their natural peak amount of stored carbon, any excess organic matter tends to decompose to CO2 fairly rapidly.

Other mechanisms for carbon draw down are hypothetical, pie-in-the-sky: industrial (artificial) methods for removing CO2 from the air, for example.

Backcasting approaches can be a useful thought exercise for exploring a problem, but not necessarily for solving it. Factoring in complex systems, including politics, makes it like planning a game of chess backward from the checkmate: it's impossible. Equally, it's not a very useful process if the desired outcome turns out to be unachievable. Backcasting from an unachievable aim won't provide meaningful guidance.

Is a "safe climate" a realistic goal?

All this leaves us with the unpleasant fact that greenhouse emissions have (already) done massive damage to the stability of our planet's climate system, and that the only way we know that it may return to a more stable balance is by natural processes that take a lot of time: centuries, in most cases.

The first challenge, logically, is to stop doing damage. We have to move to zero emissions. "Beyond zero" is only hypothetical. In fact, BZE adopted the approach of only advocating technology that is proven and commercially available. By that practical measure, artificial carbon draw down and solar radiation management are not worth advocating.

So this unfortunate backcasting exercise leads us to a lot of dubious, hypothetical, and possibly dangerous technology, that we should not be spending our time advocating when there are practical things we can do.

I think the "restore a safe climate" proposition should be abandoned. If it becomes apparent in future that it is a realistic proposition, then we could revisit the discussion. Right now, though, we need to admit the fact that our coal-burning capitalist economy has done apparently irreversible damage. We need to firstly stop it, and secondly, deal with the consequences to prevent suffering and (as much as possible) see that ecosystems are protected and/or allowed to adapt to a changed climate. That's a big job. It's a people power solution, not a technocratic solution enacted from on high.

For Pacific nations or Bangladeshi farmers faced with sinking beneath the waves, threatened by a future of dispossession and living as refugees, and for all the other people who will suffer in various ways: this doesn't mean we have to write them off as though we're saying "too bad, it's too late for you lot" from our comfortable first-world situation. We have to fight with them to save their lands by artificial means if possible, or to rehouse and resettle. But first and foremost to stop the deepening of climatic instability by our ongoing fossil fuel use.

In support of this, it would be good if we could meet one important challenge that Sutton's paper sets. I'm not sure the world will, but certainly it would be good to advocate for it and explore what it would take.

The challenge is this:

"To prevent severe climate and ocean acidification impacts expected by 2030, net global greenhouse gas emissions should reach zero …"

But it seems a fantasy to think we can make the remainder of this sentence happen safely:

"… and temperatures start to fall before then."

It's certainly true we need to take the fight against climate change to a new level. I agree with the paper's sharp insight from its introduction:

"Over those last 27 years, while all the research, activism and negotiation has been going on, the climate has actually become dangerous. So, the key goal now must be to provide, at the 11th hour, real protection for the vulnerable people, species and ecosystems of the world.

"The principal struggle must shift, from the clash between no action and some action, to the crucial struggle between those who want to constrain reform to levels that are not too disruptive and those who want action that will provide highly effective and timely protection."

But exploring geoengineering and "safe climate restoration" really doesn't provide the answers that we need to resolve that struggle. It sets impossible targets, obscuring the achievable targets that we urgently need to fight for. It's a recipe for missing the point, not striking the target.

Poison or poverty? Glencore's blackmail of Borroloola

Lauren Mellor

Panic has set in for the global resource sector with a sharp commodities slump bringing some of the world's biggest mining companies to the brink of financial collapse.

In Australia, Glencore, one of the world's largest and fastest growing diversified commodity traders, has been hit hardest of all. And the Northern Territory government's failure to insist the Glencore operate in compliance with financial and environmental laws may mean Australian taxpayers and those mining communities on the frontlines of the company's extraction will be left counting the costs of a resource boom gone bust.

When it floated four years ago Glencore was valued at US$60 billion. But its capitalisation now stands at around US$16 billion. It's a disastrous position for a miner carrying debts in excess of US$50 billion, with markets predicting a default sometime in the next few years.

Given that the company employs thousands of people and has prospective mine rehabilitation costs running into the billions, Glencore's situation should be a matter of concern for every Australian taxpayer, and in particular the state governments charged with regulating its mining and trading activity. Companies like Glencore have been allowed, and even abetted, by governments eager to share in the short term profits, who turn a blind eye to the mounting long-term costs of environmental contamination and clean up.

McArthur River Mine, an unfolding environmental disaster

Glencore's McArthur River lead and zinc mine is located in the bed of the McArthur River in the Gulf of Carpentaria in the Northern Territory. From its earliest days McArthur River Mine has been the beneficiary of extraordinary government largesse, granted at the expense of the region's Gurdanji, Garawa, Yanyuwa and Mara people. The remote pastoral and fishing community of Borroloola is home to the four clan groups, situated just 50 km downstream of the mine.

With NT government support, the lands on which the mine operates were exempted from the Northern Territory Land Rights Act, preventing the site's Aboriginal custodians from making a legal bid from its return.

In 2007 corporate lobbying efforts to turn the mine from an underground to open pit operation succeeded against good science, community opposition and a successful Supreme Court challenge by local clan groups. The expansion required the diversion of a 5.5 km stretch of the McArthur River, which saw local opposition flare up into active antagonism including site blockades and protests.

Despite this, the NT government proceeded with approval for the controversial expansion by overturning the Supreme Court decision in a midnight sitting of parliament, quelling protests with police intervention and retrospectively applying laws to prevent further legal challenges to its operation.

In 2013 the Northern Territory government again ignored advice from its own regulatory departments warning of the high probability of mine-site flooding in the wet season. Glencore's Phase 3 expansion plan, which would more than double its mineable reserves from 53 million tonnes (Mt) to 115 Mt, and extend the life of the mine from 2027 to 2036, was approved.

But before work could get underway McArthur River Mine hit the headlines again in 2014 when a sulphur dioxide smoke plume emanating from the mine's massive waste rock dump became public after rock began spontaneously combusting at the site. The toxic fires burned for over eight months, with smoke plumes visible more than 30 km downwind of the site. The government attempted to play down the scale of the problem, with NT Mines Minister Dave Tollner assuring the public that Glencore had advised it was doing all it could to extinguish the fires, by covering the reactive rock with a thin layer of clay capping, and operations at the site would continue as normal.

Fast forward a year and further evidence has emerged of McArthur River Mine's deep structural, environmental and economic problems. A government appointed Independent Monitor confirmed heavy metal contamination linked to the mine's ore body has been found in tributaries of the McArthur River, downstream of the mine's leaking tailings dam, and residents have been warned off eating fish due to lead levels found to exceed safe standards. Hundreds of cattle with access to poisoned waterways within the mineral lease were culled due to concerns over lead contamination.

The Independent Monitor warned that the huge volumes of reactive waste rock, exposed to tropical wet season rains and heat, risk becoming sulphuric acid runoff into surrounding waterways, and if left untreated, would have catastrophic consequences for the health of downstream ecosystems.

Freedom of Information documents obtained on behalf of local clan groups in June 2015 showed that the NT Government ignored advice on the mounting environmental liability and public health risks posed by the mine's operations and took no action.

During a recent round of emergency rehabilitation negotiations the NT Chief Minister appeared to be offering Glencore concessions due to the 'structural difficulties' the miner faced, citing the jobs vs environment mantra that had for a decade prior fuelled the mine's unsustainable expansion.

Aboriginal custodians

The site's Aboriginal custodians have been reclaiming responsibility for environmental and cultural management at the site. Gadrian Hoosan, a young Garawa man, has led protest actions to reclaim and occupy sacred sites damaged inside the mineral lease, and to highlight what he sees as NT government complicity in allowing Glencore and other big miners to treat their lands as sacrifice zones for the pursuit of profit.

Hoosan said: "Nearly 100 years ago our old people fought miners with spears for encroaching on our land to open Redbank copper mine. Mining

October 2014: Borroloola clan groups rally at the Independent Monitor's meeting calling for closure of McArthur River Mine following revelations of heavy metal contamination of local waterways and fish stocks.

went ahead, and now that river runs dead for 40 km across the NT border and into Queensland. Today the young people who have witnessed that damage are fighting in the same tradition, but today we fight alongside each other – black and white and all clans for our future. We're respecting each other's culture, but the government doesn't, they just try to divide us to get the yes they need for mining to go ahead. The Northern Territory government needs to stop selling our land off from under our feet. Get out and listen to the people living next to and downstream of the mining pits."

Under pressure and faced with mounting threats to disrupt mining activity, an agreement between the NT government and Glencore was reached to increase the rehabilitation bond. But NT laws designed to protect corporates from financial scrutiny allow mining rehabilitation liabilities to be hidden in commercial-in-confidence clauses, meaning taxpayers are exposed to multi-billion dollar debts with no capacity to determine if mining meets the test of a cost/benefit analysis.

As Glencore's crisis unfolds and the company moves to cut costs and shed jobs, for communities like Borroloola, who have born all of the costs and seen little of the benefits of the resource boom, it is vital to ensure that the dispossession caused by mining is not repeated in the coming crash.

Building strategic partnerships with labour unions and environmentalists, local clan groups are campaigning to guarantee every local job is retained for the urgent task of site clean up, and to bring new opportunities to the community for well-paid, skilled jobs in a clean environment that can redress decades of government neglect in housing and other critical areas.

The McArthur River Mine case highlights the failure of the economic development paradigm in which state and territory governments' insist that remote Indigenous development must be based on natural resource extraction.

Environmental justice campaigns like that fighting for the closure of McArthur River Mine are propelled by a growing recognition that the social conditions of our communities are inextricably tied to the health of the natural environment. Old dynamics of resource extraction and accumulation based on dispossession, where resources are appropriated and privatised alongside the exploitation of local communities, are now being challenged on an unprecedented scale.

Instead of looking for a rescue package for the resource giants, we should be celebrating the limits and embracing the bold new global movement emerging from Indigenous communities like Borroloola to challenge the endless growth logic of the extractives. It's just such a movement that can help us re-learn the true value of uncontaminated water, clean air and resilient communities.

Hoosan concludes: "This government has plans for more mining on our land but they are living in the past, where they think they can make decisions over our land that we don't want. We're not going to be sacrificed. We want a better future. We don't want no more mining on our land."

Greening the Internet

Felicity Ruby

While it was invented in the universities and Defence Department of the USA, the Internet has very quickly become a global commons upon which financial, media, education, health and government systems rely. Because it is a backbone for communications, transportation and governance, it affects everyone; the 3 billion people who have access and the 4 billion who do not.

The Internet is the greatest global information sharing tool and library in history. The freedom to connect has led to information sharing, scientific and technical innovation and the formation of global civil society networks that are extraordinarily valuable. It can provide carbon- and jet-lag free conferencing, telecommuting work patterns and smart cities.

The tech utopian picture sure is pretty, isn't it?

Some of our rose-coloured glasses about the Internet were shattered by Edward Snowden, who confirmed that entire populations are under dragnet surveillance, compromising rights to privacy, freedom of association and expression. Backdoors into software and hardware have rendered much online infrastructure – from cell phone devices to server stacks and email clients to payment mechanisms – vulnerable to attack. Browsers are infected. Encryption standards have been deliberately weakened. Submarine cables are tampered with. Even offline devices can be 'illuminated' and their data read.

Campaigners promoting responsible e-waste management and against genetically modified seeds lost their innocence about the power of the Internet early on, given the counterstrategies deployed by corporations to identify, neutralize and influence debate.[1] However, Snowden revealed technically optimised tools for political control in sharp and shocking focus, which is relevant to everyone who uses the Internet to organise, educate, communicate and take action in environmental campaigning. To defend our democratic rights and responsibilities, Friends of the Earth recently co-sponsored a series of crypto trainings that have seen 400 activists around Australia begin the journey towards better security hygiene and use of legal and open source encryption tools.

Online economic and content monopolies have enormous resources and ability to influence how cultural activities and projects evolve. With the dominance of some cultures and languages currently online, the potential exists for culture and news from one part of the globe to dominate all else. This is in part a reflection of the fact that the 3 billion people online are predominantly in the global north.

Energy consumption and greenhouse gas emissions

Yet another danger arises from how the Internet is powered.

If the Internet is powered by coal, oil and gas it is simply not sustainable and will be a major driver towards catastrophic climate change. Mark Mills of the Digital Power Group calculates the IT ecosystem represents around 10% of electricity consumption, "… about 1500 terrawatt-hours of electricity annually, equal to all the electric generation of Japan and Germany combined – as much electricity as was used for global illumination in 1985."[2] The International Energy Agency estimates that digital culture will use 30% of residential energy supplied globally by 2022 and 45% by 2030.

One source of this energy drain is the millions of data centres worldwide – air-conditioned rooms full of buzzing servers that store and disseminate information. Their number doubled between 2000 and 2005. A large data centre has the capacity to use as much electricity as a small town. According to government sources, in 2013 data centres consumed 3.9% of Australia's national electricity consumption[3], and in late 2014, the International Data Corporation predicted the total number globally will peak at 8.6 million in 2017.[4] In 2013 in the US, according to the Natural Resources Defence Council, data centres consumed the annual output of 34 large (500-megawatt) coal-fired power plants, projected to increase by 2020 to the equivalent annual output of 50 power plants, at a cost of $13 billion annually in electricity bills and emitting nearly 100 million metric tons of carbon pollution per year.[5]

Another source of the energy suck is our devices. Small electronics account for the same carbon emissions as the airline industry. The average tablet or smart phone, if used to watch one hour of video a week, consumes more electricity than two new refrigerators. Internet data is growing by 20% per year. Hourly Internet traffic will soon be more than annual traffic in 2000. As the carbon footprint of the Internet grows, as more devices and users, share, stream, send and store data, the urgency to power the Internet by renewable sources also grows.

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Electric cars are rather large devices connected to the Internet, and the International Energy agency predicted in 2013 that there would be 20 million on the road by 2020. If Elon Musk of Tesla has his way, the transition to sustainable transport will happen a lot faster, all powered by renewable energy. The solar filling stations that dot the US, and Tesla's lithium ion battery gigafactory in Nevada are all running on 100% renewable energy. Not all electric manufacturers are committed to using renewables.

In the US, Greenpeace has driven a campaign to get Internet giants to commit to 100% renewable energy for powering their data centres. In some states, this has changed the electricity grid. The Clicking Clean report[6] indicates that Apple is leading in powering its corner of the Internet with renewables (given their US$53 billion profit in the last financial year, translating to $6.1 million per hour, they'd want to be). The Greenpeace campaign to win a 100% renewable commitment from Amazon is welcome, but still lacks transparency, so may remain simply aspirational or a clever PR gimmick.

Microsoft is worth a closer look, given that Bill Gates recently pledged $2 billion to green energy, while admitting that in the absence of a substantial climate tax incentive, the private sector is too selfish and inefficient to deliver climate change action.[7] Microsoft has made some progress in recent years, introducing an internal carbon fee and purchasing large amounts of wind energy to power two of its data centers, but perhaps Bill could do more with the $22 billion profit Microsoft made in the last financial year.

According to the Greenpeace report, Microsoft's commitment of 'carbon neutrality' just doesn't go far enough, when the company operates 19 regional data centres in the US with the capacity for nearly 12 million servers, "primarily reliant on the purchase of unbundled renewable energy credits and carbon offsets, which have little if any impact on the energy powering its data centres. The continued lack of a meaningful strategy to guide its rapidly growing fleet of data centres with renewable energy leaves Microsoft falling further behind Google and Apple, and on a path similar to Amazon not only in terms of its growth, but also in its being predominantly powered by dirty sources of electricity."

Australian ISPs, data centres, technologists, and companies could feel more pressure from environmental campaigners to green our Internet. A good place to start would be for our National Broadband Network (NBN) to get off copper entirely as fibre optic cable is much more energy efficient. Instead the current government is spending $14m to buy 1800 km of additional copper, having abandoned the vision of NBN fibre to every home and now investing in the inferior fibre to the node model.

Techies for Climate Justice marched in the "solutions" section of the New York climate march because we believe the tech sector has a role and a responsibility to clean up our own act by plugging our devices and our ideas into renewable energy. Techies in Australia will be marching again in November because we hold the keyboards, and some of the keys, to a low carbon and smart economy.

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The Great Artesian Basin, Great Barrier Reef, Gulf of Carpentaria and inland Australia at risk

John Glue

The Queensland Labor Party is backtracking on pledges it made before the last election to repeal water reforms which deregulated the use of groundwater by resource companies, giving big mining operations rights to billions of litres of water without the need for a licence.

These reforms gave the mining industry a statutory right to take associated underground water, or water that has to be removed to allow for the extraction of the resource and means the public would no longer be able to challenge miners taking this groundwater even if it would seriously impact on water supplies to regional towns and farms. The Adani Carmichael coal mine alone would need to take around 12 billion litres of water a year from local rivers and aquifers while a recent report in *The Australian* says the loss of pressure caused from coal seam gas mining "could be enough to stop bores flowing throughout the Great Artesian Basin, which is the sole water source for towns and farms across 22 percent of Australia."

In the lead-up to the Queensland state election this year, Labor vowed to repeal the legislation of the Water Reform and Other Legislation Amendment Act (WROLA) which was introduced by Campbell Newman's LNP government in November last year. If it is not amended or repealed, the Act will come into force this November. Before the election Labor warned this Water Reform Act would allow too much water to be taken from the Great Artesian Basin and would harm the Great Barrier Reef. During the parliamentary debate on the Bill the then Labor environment spokeswoman Jackie Trad, who is now Deputy Premier, said that the package of reforms were "shameful" and "an utter disgrace", warning they would have "a detrimental effect on the Great Barrier Reef catchment systems and allow for over-allocation of Queensland's precious water resources".

The over-allocation of water resources is a concern for Cape York and North Queensland as large parts of it have been struggling with drought for the past three years. Big Gulf rivers have been starved of the usual heavy monsoonal rain. These rains are needed to flush algae and juvenile barramundi out of fresh water tributaries and lagoons and back into saltwater and as a result commercial barramundi catches are well down in the Gulf of Carpentaria this year.

A recent ABC *Lateline* report noted that fishers fear the situation will only get worse from new projects being proposed which will be competing for Gulf river water such as the $2 billion Integrated Food and Energy Development Pty Ltd project. This privately funded agricultural project plans to draw enough annual flood water from the Gilbert River catchment to irrigate 650 square kilometres of sugar cane and guar beans. Some of the cane will be used to make ethanol and the guar bean is used to make fracking fluids for the hydraulic fracturing of the land for gas extraction.

Because of this project the Queensland government is making no new water allocations from the Gilbert River system, the fourth biggest river in Australia, until the project has been environmentally approved or rejected. As this decision could take several years it means that graziers who are struggling with the drought in the Gilbert catchment say they worry that they will be left without enough water.

There are also similar concerns about a $200 million, 15,000 hectare cotton farm proposed for Glenore Station, 90 km south of Normanton – also known as the Three Rivers Irrigation Project. This project will bid for an allocation of 150,000 megalitres annually from the Flinders River. As cotton is one of the heaviest users of pesticides and fertilisers there are fears by many that the chemical, fertiliser and sediment runoff from this project will damage the aquatic ecosystems of the Flinders River as well as the Gulf of Carpentaria fishing industry.

The Queensland Labor government is also delaying implementing another one of their important pre-election commitments – which was to restore tougher tree clearing laws. A new report by WWF scientist Martin Taylor has found that the relaxation of vegetation clearing laws by the Newman government has led to many farmers panic clearing in Great Barrier Reef catchments, after the Labor Party said that they would reverse the laws if they won the election. Clearing under the Newman government had already more than tripled from 78,000ha a year in 2009/10 to 280,000ha in 2013/14. Some of the clearing on Cape York is threatening, via coral-killing sediment run-off, the last major section of the inshore Reef deemed to be in excellent condition.

This panic clearing occurring now in Great Barrier Reef catchments throws into doubt the

The Adani Carmichael coal mine alone would need to take around 12 billion litres of water a year from local rivers and aquifers while a recent report in The Australian says the loss of pressure caused from coal seam gas mining "could be enough to stop bores flowing throughout the Great Artesian Basin, which is the sole water source for towns and farms across 22 percent of Australia."

federal and state governments claims that they will be able to meet UNESCO demands to stop coral and seagrass dieback with the latest report card for the Great Barrier Reef saying 'the inshore marine environment remains poor and progress towards water quality improvement targets has slowed dramatically'.

A consortium of scientists from the University of Queensland's National Oceanic Atmospheric Administration estimate that we have lost 40% of corals around the world in the past 30 years alone and the University of Queensland's Global Change Institute director Ove Hoegh-Guldberg has said that "they expect the complete loss of coral reefs by the middle of this century." This confirms a report released by Environmental Justice Australia lawyer Ariane Wilkinson, which was compiled by Australian and international lawyers, which says the Reef World Heritage Area should now be listed as in danger by UNESCO due to degradation and overdevelopment.

The federal and state governments don't seem to understand that they need to try to live within Australia's environmental limits and that they shouldn't deplete or destroy the country's natural resources in just one or two generations – resources which are meant to meet the needs of Australia indefinitely into the future. Unfortunately one of the reasons the Australian government has rushed to sign the Trans-Pacific Partnership is to protect major corporations from liability for the damage that they have done, or will do, to the environment, the economy and people's health from the negative impacts of mining, climate change, pollution, pesticides, etc. Surely the Liberals, Labor and the National Party can never again be trusted to run the government if they are prepared to risk Australia's greatest environmental assets such as the Reef and the Great Artesian Basin for such short sighted and limited financial gain.

John Glue is a member of Friends of the Earth, Kuranda.

A spoonful of sugar is not enough to help the TPP go down

Sam Castro and Kat Moore

At the most recent Trans-Pacific Partnership (TPP) negotiations in Atlanta, Georgia, delegates agreed in principle to the provisions of the secret deal. In order for the TPP to be signed, it now needs to be ratified by each of the 12 participating governments.

While Minister Andrew Robb and others in the federal Cabinet remain enthusiastic about Australia's involvement in this secret deal, many Australians have very serious concerns about a deal by corporations, for corporations. The lengthy process that must still be complied with is a blessing for the growing community campaign for transparency, corporate accountability, and fair trade.

The TPP will be more powerful than the World Trade Organisation; it is effectively NAFTA on steroids and a Trojan Horse that threatens our democracy. A decade and a half on, the legacy of The North American Free Trade Agreement is one of lost jobs in the USA and offshoring to Mexico where unions are often threatened and working conditions are often intolerable. Why does the TPP have this dubious reputation? Let's take a look.

The secret TPP negotiations excluded our elected representatives and community stakeholders from any serious participation while enabling six hundred corporate insiders to effectively draft chapters of the text in their own interests. Members of Parliament who have asked to see the text have been told they can only see it if they sign confidentiality agreements preventing them from warning Australians about the risks.

When it comes to the TPP, Minister Andrew Robb is effectively telling Australians "trust me." While Minister Robb may wax lyrical about the benefits of the TPP, leaked information shines a light on whom it will benefit and what's really at stake.

Over the course of the past five years of the TPP negotiations, all that is known about the agreement has been published by WikiLeaks. The leaked information includes draft copies of the Investor State Dispute Settlement (ISDS)[1], Environment[2] and Intellectual Property[3] chapters, as well as recent publication of internal communication regarding State-Owned Enterprises[4].

While media reports of negotiations suggest the sticking points have included sugar, dairy, automobiles, patents and biologic medicines, the more ghastly and long-term destructive components of the TPP have been completely ignored. Leaked chapters of the TPP indicate there is a litany of clauses inserted into the agreement that are fundamentally designed to override domestic law and that fail to safeguard our already fragile democracy, public health, environment and human rights, instead empowering corporations with undue sway over public policy.

Minister Robb is pushing a TPP fairytale in which the only risk to farmers is that they will not be allowed to export as much sugar and milk to the US as they would like. In reality, the risks for farmers are much greater and the destruction to our agricultural land may be devastating. A recent Friends of the Earth briefing document, ‹Fracking the Planet: How the Trans Pacific Partnership will expand fracking in Australia and around the globe›[5], explores the effects the TPP will have on the ability of community to oppose the hydraulic fracturing (fracking) industry. The analysis would trouble farmers across the country.

The inclusion of the ISDS clause in the TPP provides foreign corporations with the ability to sue the Australian government for imposing regulations that impact that company's projected future profits. As has already been witnessed through other more localised trade deals, such as NAFTA, ISDS is most commonly utilised to combat laws enacted for environmental protection. If the Australian government was to come to its senses and attempt to move us away from extractive industries towards renewables, then foreign corporations may sue our government under the TPP for implementing moratoriums or bans on fracking, as has already taken place as in the case of Lone Pine Resources vs. Canada.[6]

It is clear that the federal government is feeling the heat on the issue of the ISDS clause. Given the fears held by many about the possibility of transnational corporations suing Australia simply for making decisions that might protect consumers or the natural environment, the Trade Minister and others assure us that there will be 'exceptions' for Australia. When no one outside the negotiating room has seen the text, how would we know?

Environmental crimes

As noted recently by Friends of the Earth US, an analysis of US initiated trade agreements in recent years has done nothing to protect the environment or halt environmental crimes like illegal logging.

Australian farmers not only face the risk of the TPP potentially opening up prime agricultural land to unchallenged fracking or coal mining, but corporations such as Monsanto, under the Intellectual Property chapter, could have complete market control over the types of seeds planted, pesticides used and therefore the methods by which our food is grown. Farmers will effectively be held hostage by Monsanto on one side and the fossil fuel industry on the other.

The message from the big corporations writing the TPP is clear: enact legislation that we agree with or be prepared for us to sue the government via the taxpayers' wallet. Not only will farmers, and the rest of us who rely on their produce to survive, be answerable to corporations, our government will be powerless to stop them.

Now that the text has been agreed in principle, from the time that President Obama notifies Congress of the secret deal, he must wait 90 days before signing it. For 60 of those days, the text must be made public. The latest intelligence from Republican and Democratic aides suggests that this will not be set in motion until after the 2016 US election. Meanwhile, Hillary Clinton has come out against the agreement in its current form, creating a complex dynamic in the lead-up to the election.

Every day there is a delay in signing this corporate deal, the global opposition becomes stronger. Here in Australia, community groups and unions have joined forces (representing over three million members) calling on the Australian government to release the TPP text or withdraw Australia from the secret negotiations. Ten years ago no-one would have believed farmers and environmental groups would have joined forces to fight unconventional gas and fracking, but the Lock the Gate movement has cemented this relationship across eastern Australia. Will the TPP see our farmers now join with unions, environment groups, and community, to become the next powerful alliance to stand up for the future of our democracy and our right to food security, clean air and water?

Sam Castro and Kat Moore are members of Friends of the Earth's Economic Justice Collective.

Australian farmers not only face the risk of the TPP potentially opening up prime agricultural land to unchallenged fracking or coal mining, but corporations such as Monsanto, under the Intellectual Property chapter, could have complete market control over the types of seeds planted, pesticides used and therefore the methods by which our food is grown.

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Minmetals and the lead poisoning of Rosebery Tasmania

Anthony Amis

The build-up of lead in the body can contribute to a number of health problems, including headaches, increased irritability, reduced sensations, aggressive behaviour, difficulty in sleeping, abdominal pain, poor appetite, constipation and anaemia. Lead exposure in children is more harmful and can lead to loss of developmental skills, behaviour and attention problems, hearing loss, kidney damage, reduced IQ and slow body growth.

Unlike most water contaminants, lead gets into water after it leaves a water treatment plant. Often this contamination is the result of water treatment changes meant to improve water quality that end up altering the water chemistry, destabilising lead-bearing mineral scales that coat service lines and corroding lead solder, pipes, faucets and fixtures.

Lead in water has been a major source of lead exposure. Corrosion from lead based solders in brass fittings and copper pipes is often the source. This problem is often worsened by people drinking and cooking with corroded water after a first use, particularly in the morning. Lead based solder has been banned in Australia since 1989 so problems are most likely to be associated in businesses and homes with water fittings pre-dating 1989.

For some Tasmanian towns, current and past mining activities contribute to lead problems in drinking water. During 2013–14, residents of Rosebery, located on Tasmania's west coast, sourced drinking water from both the Stitt River (which is disinfected at Stirling Valley WTP) and filtered water from Mountain Creek.

TasWater data in August 2013 revealed a lead sample of 182µg/L from the Stitt River, likely to be an Australian record. The lead guideline for drinking water in Australia is 10µg/L. The Department of Health and Human Services tested the water at Rosebery during 2013–14 and found that the lead levels averaged almost three times the Australian Drinking Water Guidelines. Rosebery's water supply is also located in an uncovered storage, which may also be susceptible to airborne particulates.

The intake for the Rosebery's drinking water is directly below the main drainage zone for the acid mine drainage from the open cut mine owned by Chinese multinational Minmetals Corporation.

Of the 15 detections of lead above Australian Drinking Water Guidelines at Rosebery in 2013–14, 14 came from the Stitt River and one from Mountain Creek (according to the Taswater Annual Report, which contradicts itself later
by saying all detections were from the Stitt River).

Cornwall, located in the eastern part of the state, also had excessive lead levels over 2013–14. The town gets drinking water from an unnamed spring. The intake for the system is a disused mine shaft. The small town of Avoca also suffers from past mining activities and lead in their drinking water.

In May 2013, the Department of Health and Human Services warned residents of Dalmeny Estate and Primrose in Rosebery not to drink or cook with water due to lead contamination. Clearly, the Stitt River is the key contributor to the lead problem at Rosebery. The TasWater Annual Drinking Water Quality Report 2013–14 states:

"15 detections of lead above the ADWG health limits were recorded during the reporting period. All 15 detections were from the Stitt River. Sampling was increased to weekly to monitor and quantify risk. Metals sampling in the Rosebery system is currently conducted weekly as there has been detections of lead above ADWG health limits. During this reporting period 15 samples exceeded the ADWG health limit for lead; the maximum detection was 182 µg/L on the 5/8/2013 which originated from the Stitt River system."

"TasWater established a weekly scouring program to mitigate the risk associated to lead bound sediment. In addition, a full network scour of the Dalmeny Estate was conducted in January 2014."

The source of the pollution is from contaminated mining waters under the control of MMG Limited, a company largely owned by China Minmetals Corporation. MMG Limited own an underground polymetallic base metal (zinc, lead, copper, gold) mine in the town. MMG had five concentrate spills from February to May 2013. The pollution has been well documented by the Toxic Heavy Metals Tasforce, who raised alarm bells regarding detections of lead several years ago.[1]

The Health Department only took action on lead contamination of the water supply this year and commenced a new round of weekly testing in April. Just how long people have been drinking water poisoned with lead in Rosebery will never be known.

Tas Water announced in October 2014 that new works had begun in Rosebery for water and sewerage upgrades. A new $3.3 million water treatment plant, roofing of the existing reservoir and a new treated water reservoir will be constructed. Construction is expected to begin in the second half of 2015. But one has to wonder how many people in Rosebery have been impacted by the lead pollution in their drinking water – and what are the long term consequences for children exposed for their entire lives?

Anthony Amis is the pesticides and drinking water spokesperson for Friends of the Earth, Australia.

More information:

www.foe.org.au/sites/default/files/TasDrinkingWaterLeadAluminiumFinal.pdf

Reference:

1. Toxic Heavy Metals Taskforce (December 2013) www.mininglegacies.org/wp-content/uploads/2012/12/Rosebery-Mine_article.pdf

Inside Friends Of The Earth's Yes 2 Renewables Campaign

Leigh Ewbank is the Campaign Coordinator for Friends of the Earth's renewable energy campaign – Yes 2 Renewables (Y2R). Y2R partners with communities all over Victoria to win strategic battles that will speed-up the roll out of renewable energy. Interview by Lisa de Kleyn.

What is a typical day at Friends of the Earth (FoE)?

A typical day at FoE begins at home. It's about getting up really early, jumping on social media, and putting on Radio National to see what's going on – whether there are any key announcements relevant to renewables or climate that we need to be aware of. Once we hit the office, we respond to those developments.

We have well-defined campaigns and we are lean and mean at FoE. There'll be between three and seven people in the office every day. It varies because the campaigners are always out on the ground, in the community. I'll often be in a community that is exploring how to go 100% renewable.

So early on it's media and social media, and once we've addressed that, we move into actions, events and community support.

What are some of Yes 2 Renewables achievements?

Y2R has had several achievements over the last two years.

We helped the King Island community respond to an anti-windfarm campaign. The debate came to a vote on whether or not to pursue a feasibility study for a wind farm, and the community returned a yes vote, which was the final verdict on that campaign. We're linked to that outcome.

We helped a community in Trawool in Central Victoria respond to anti-windfarm activity in their region. Subsequently, the Cherry Tree Range Windfarm was approved by VCAT with visible community backing.

Last year Y2R took the lead on the campaign to repeal the anti-windfarm laws in Victoria established by the former Liberal state government, and we're really pleased that the new Premier Daniel Andrews has delivered on that commitment already. That will allow the Woodend community to follow in the footsteps of Hepburn Wind and build their own community project.

How would you define your approach?

It is strategic, considered and pragmatic. We set campaign objectives, develop strategies to meet those objectives, and identify the multiple pathways that we can take to achieve them.

We're collaborative. Friends of the Earth's philosophy is to partner with communities. To do this, we listen to what the community's needs are, and what their vision is. We're not there to tell communities what they should be thinking about and what they should do. We're here to serve the community. That's how we've managed to be effective and keep doing this for 40 years.

What actions do you take?

It's always multi-staged, with a range of tactics. We do what's effective depending on the issue at hand.

When we're facing a new campaign and figuring out our strategy and what tactics we're going to use, we evaluate those tactics. We're not going to say – let's just do a rally. Is a rally needed to win? Do we need a rally to achieve our objectives? We don't discriminate against tactics, but we evaluate them and find what's going to work.

As an example, in the lead up to the state election in 2014, Y2R held meetings with the Macedon Ranges Sustainability Group and we figured out that there was an alignment between their push for a community windfarm, which had been killed off by the Coalition's anti-wind laws a few years ago, and the broader mission that Y2R has.

We embarked on a multiple month campaign that included:

- Open letters to all of the candidates in the seat to give them all the chance to tell the public where they stand on the issue and to engage with us.
- Letter writing campaigns to the MPs and candidates.
- Supporting public events that demonstrated that the communities wanted this law changed so they could achieve their vision of a community windfarm.
- Holding a Meet the Candidates forum once the candidates had locked in their positions so the community could hold them to account and,
- On the doorstep of the election, we produced a scorecard for where the candidates stood on the issues to make sure that there was good community awareness.

What would you most like Australians to understand?

They have so much power. They have more power than they probably realise. When you get together with your community and you start to explore the issues and put heat on your politicians to actually deliver what you want, you'd be surprised with what can be achieved. I'm absolutely committed to helping people realise how much power they have and to exercise that power.

Abridged from The Switch Report, www.theswitchreport.com.au

FoE's campaign to stop whaling 1976-78

Bro Sheffield-Brotherton

The bike wheel had been so mangled it look like it could make one of those impossible skid marks you see on "Slippery When Wet" signs. For several years it hung on the wall of the Environment Centre of WA, captioned "In memory of three Friends of the Earth who ran into each other 25 km north of Albany, 26 January 1976". It being my bike wheel, I remember that Australia Day much more clearly than my then lack of patriotic fervour would normally permit.

The three spectacularly-collapsing cyclists were part an 800 km return protest ride from Perth to Albany, port of Australia's last whale-killing fleet. It was one of many actions undertaken by Friends of the Earth (FoE) until Australia stopped slaughtering whales in 1978.

FoE began in Australia in the year following the landmark 1972 UN Conference on the Human Environment at which the Great Whales became the unofficial symbol of humans estrangement from the planet. The initial concern over the plight of the whales came from population after population and species after species being hunted to commercial, and in a few cases actual extinction. However, as the campaign developed worldwide, this was profoundly buttressed through growing understanding of the majesty and intelligence of these extraordinary creatures.

The first time I heard the sounds on the radio I had know idea what they were, but the longer I listened I grew more convinced that their utterer was communicating in an incredibly complex way. Upon learning that it was a Humpback Whale I knew I had to do something to help whales swim free of human tyranny (h dear, not another one of those early 70s hippie conversion experiences!).

FoE established its whales campaign under the banner of Project Jonah. At quite an early stage it was recognised that there were some people passionately concerned about the plight of the whales who weren't, unfortunately, in the least bit passionate about some of our other major campaigns, such as anti-uranium. The game plan was to establish Project Jonah as a separate single-issue group, while FoE would continue to work on the issue as part of its broad suite of campaigns. I acted as coordinator for a couple of years while that transition occurred.

Over the next few years we did all the things you'd expect in an activist campaign: picketing whaling nations' consulates, dawn services outside the Albany whaling station, displays and (limited) dialogue in the Albany Town Hall, media, education, petitioning, lobbying, bike pranging and so on. By 1977/78 polls were showing around 90% of Australians opposed to whaling, although it was only about 50:50 in WA – a long way from vehement pro-whale sentiment there now.

The Fraser Government announced an 'Inquiry Into Whales and Whaling' in 1978, and FoE was among the handful of official Major Parties to the Inquiry. Members of FoE Perth and then Chain Reaction Editor Barbara Hutton were there in Albany on the freezing opening day of the Inquiry when the whaling company announced it was going to shut down by the end of the year.

A major campaign goal achieved completely – hadn't seen that happen much before 1978. We checked our pulses and finding them there (if racing) waited for the alarm to go off.

It got even better. FoE continued its active participation in the Inquiry as it moved to other cities, pursuing our other goals of declaration of a whale sanctuary within Australia's territorial waters, a ban on importing whale products and for Australia to pursue with vigour the protection of whales internationally. The inquiry reported strongly along these lines and successive Australian Governments have adopted a pro-whale stance.

As witnessed at the recent International Whaling Commission meeting in Adelaide the last vestiges of the commercial whaling industry are being clung to tenaciously in Japan, Norway and the North Atlantic and the arguments seem to have changed not at all in 20 years. Distressing indeed, but I'm just optimistic enough to believe we can see the end of this industry from bygone centuries sometime in the next 20 years, although I fear it may be towards the end of that period.

Reprinted from the FoE Australia History blog, June 2015: http://friendsearthaustraliahistory.blogspot.com.au

Black Hole documentary review

Phil Evans

The coal movement came into maturity with the Leard Blockade camp set up mid-2012 to fight Whitehaven Coal's Maules Creek mine in the Leard State Forest. Too often important moments in social movements are not documented and are forgotten in the winds of time, destined to become stories told in activist circles – and nowhere else.

Thankfully film-makers like **Jo Dujon Pereira** are willing to make huge personal sacrifice to come and tell the story of the activists, the farmers and the Gomeroi people who shaped this movement. That our story can be told to a wider audience and help grow this movement is so important at this juncture in time, and to Dujon, I know, many are eternally grateful.

Dujon embedded himself within the Leard Blockade camp for much of 2014, sleeping rough and living and breathing the adrenaline rush that comes with a sustained campaign of nonviolent direct action.

I was living in camp for much of the time that he stayed with the camp. I watched him adjust to the difficult circumstances of the camp, which had recently moved from the Leard State Forest to Maules Creek farmer Cliff Wallace's property called Wando. Dujon arrived just as the campaign hit fever point and captured exciting campaign highs like the crucifix barrel lock-on (including Rev. John Brentnall – Liverpool Plains Uniting Church Minister) and rugby union superstar David Pocock's infamous 10-hour lock on. Dujon was also able access footage taken by people before his arrival, and there is footage dating back to 2012 on show.

Black Hole captures not only the action, but the human element of the story which so often is lost in the media's obsession with arrest numbers and economic framing. Dujon's candid interviews (he sifted through over 700 hours of footage to make the 104-minute documentary) and dedication to telling all sides of the story is not only compelling viewing, but also served as a kind of catharsis for the many players in this story: an ear that was so willing to listen to their tale.

The film tells the story of the camp, but also pays special attention to the plight of the Gomeroi, so often lost in the sea of noise that was the campaign. It captures the drama as Whitehaven Coal attempted to drive a wedge between the traditional custodians and the activist camp – in divide and conquer tactics all too familiar for anyone that has ever been involved in a campaign that has fought the mining industry.

Bob Brown described the movie as 'must see' for any Australian who cares for the natural environment, but I know that many more in board rooms and in the halls of power will be watching. And surely a cold fear will descend as they glimpse into the background story of what people, city and country, organised and united look like.

Black Hole is currently showing nationally via Tugg requested screenings. Check out blackholemovie.com.au to see how you can organise a screening in your area.

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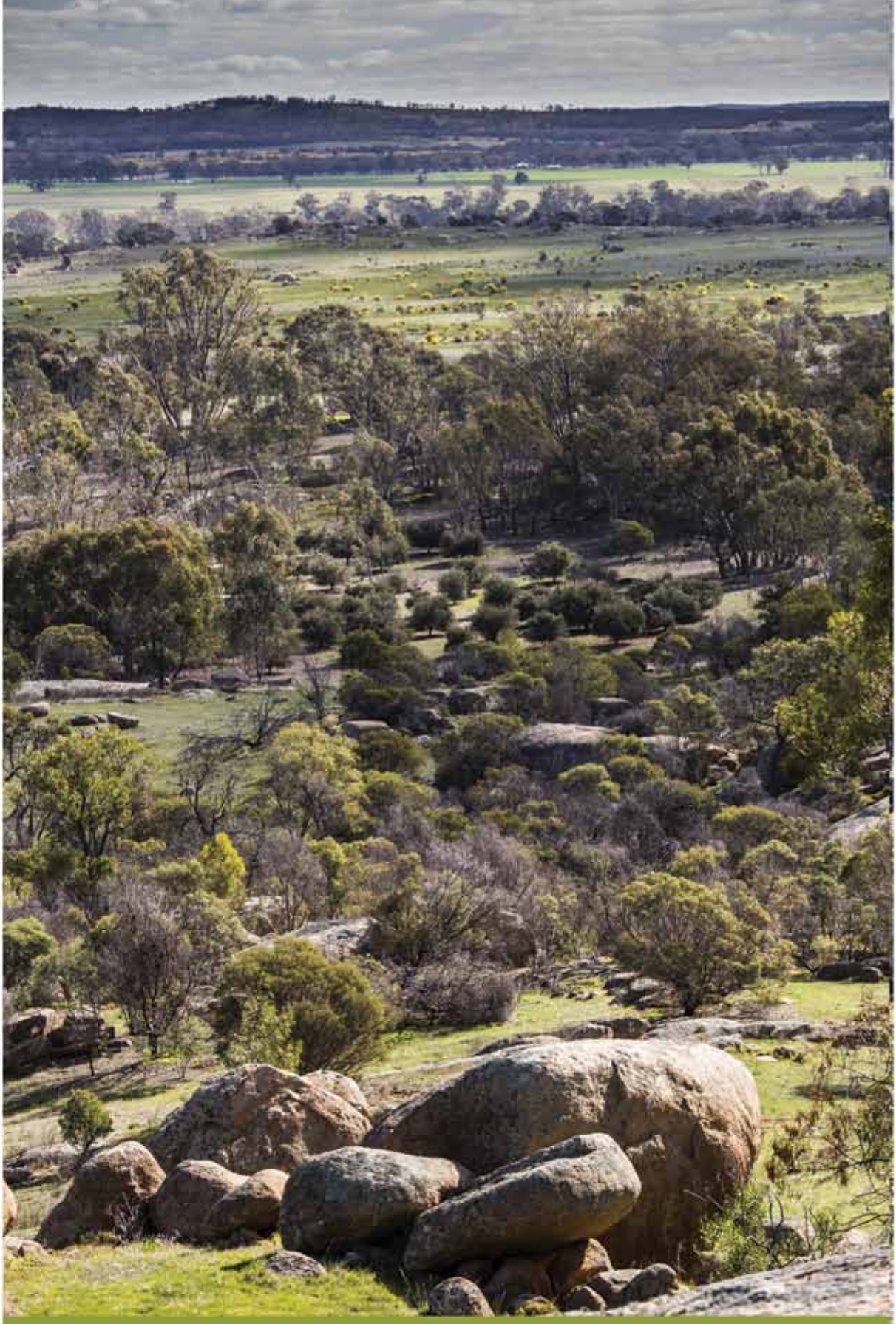

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