

# 'The Dumb State?: Queensland's Continuing Carbon Addiction'

Speech by Guy Pearse –  
 Research Fellow  
 Global Change Institute, University of Queensland  
 (<http://www.guypearse.com>)

Brisbane – Thursday 28 October 2010

It's beautiful one day, it's perfect the next—this great state—the beaches, some of the world's best coral reefs, a land of contrasts, such a rich history. Nearly 2 million square kilometres of land are rich in commodities for which the world has an insatiable appetite. Compared with those around us, we are richer, our incomes are growing faster, and our export oriented economy enables our government to invest more in public infrastructure and education. More and more people are voting with their feet – already one third of our population has come from over the border, bringing their skills, enthusiasm, not to mention their capital to invest in our success story.

Yet, there's a sense of foreboding as we come to grips with an unsettling reality. We're more exposed than most other parts of the world to the looming threat of climate change. The projected increase in global temperatures of perhaps 6 degrees by this century's end could devastate natural assets that we hold dear, along with water supplies, our agricultural base, and our growing tourism industry. Lucrative and reliable as fossil fuel exports have been, generating income and jobs for our people, deep down we know change is coming. As pressure to reduce greenhouse pollution intensifies, it's clear that ten years from now there'll be political consequences for anyone exporting a billion tonnes of CO<sub>2</sub> each year.<sup>1</sup>

Hence all the forward planning--gas-fired electricity expansion and large scale renewable energy projects. Hence the deliberate government plan to diversify our economy in the years ahead—to plan beyond the 'dig it up, ship it out' dependence on emission-intensive commodities, anticipating a carbon-constrained global economy. As difficult as the transition will be, the sooner we start the better, because a cleaner, greener economy is ultimately in the interests of the smart state.

And it wouldn't be possible without the foresight, leadership and personal engagement with the task of the premier... His Majesty, the King (King Abdullah bin Abdulaziz Al Saud)..... Oh, I'm sorry -- you thought I was talking about the State of Queensland, not the state of Saudi Arabia. Things are quite different I'm afraid to say... back in Queensland—the so-called smart state.

Sure, Queensland has its similarities with Saudi Arabia: around the same size, equally vulnerable if not more so to the impacts of climate change. We too depend on fossil fuel exports, our per capita greenhouse gas emissions are among the world's highest, and our population is growing much faster than those around us. The other big similarity is that at some point between now and 2030, as their oil exports decline and our coal exports expand, Saudi Arabia and Queensland will both be exporting around 1 billion tonnes of CO<sub>2</sub> annually.

The two big differences are that in Queensland there's no sense of foreboding, and no diversification away from fossil fuels.<sup>ii</sup> On the contrary. Whereas the reality of 'peak oil' is setting in among policy makers in Riyadh, in Brisbane there is a faith verging on fundamentalism, that coal will meet most of the world's energy needs this century and beyond.<sup>iii</sup> Our premier has gone so far as guaranteeing that a 'green solution' to coal will be found.<sup>iv</sup>

Here, when it comes to coal exports, environmental protection is more about protecting the Great Barrier Reef from the occasional spill, rather than protecting the climate from the emissions caused should coal ships reach their destination. Here, when a coal baron announces his intention to export another 40 million tonnes of coal annually the Premier shares the stage to announce it and lauds it as 'great news'.<sup>v</sup> Here, unlike the Saudis, we're increasing our reliance on fossil fuel, not diversifying away from it. Here, state-owned railway companies brag in television ads that they carry '500,000 tonnes of coal on the average day' — as if it's a good thing to add more greenhouse pollution daily than 300,000 cars do yearly. Here, the government's ClimateSmart Leadership Award is sponsored by a company whose offshore coal mining produces more CO<sub>2</sub> each year than the states of Western Australia, South Australia and Victoria combined.<sup>vi</sup> While the Saudis are coming to terms with a new reality, here we see no reason to acknowledge one.

To our government's way of thinking, Queensland is on a winner with coal and our economy is having a 'blinder'. We already see coal as the state's economic backbone, the benefactor whose royalties fund much of what government provides. We're in the early days of a 'super-cycle' boom, sitting on 33 billion tonnes -- it's full steam ahead.<sup>vii</sup> Securing economic prosperity in the years ahead is seemingly not about doing things differently, but doing a great deal more of what we're doing now.

On that basis, the Queensland government is 100% behind the coal industry's plans to double exports from this state in the next decade or so.<sup>viii</sup> New coal mines and coal seam gas wells are being approved across much of the state, under prime Darling Downs agricultural land, aquifers and rivers at the headwaters of the Murray Darling Basin. Whole towns are being abandoned and swallowed, nearly a thousand kilometres of new coal railway track is being added, new ports built — with a large share of infrastructure funded by the Queensland government.<sup>ix</sup> We've seen our fair share of mining rushes, but none like this.

Counterintuitive as it may seem to external observers, there's no hint that the Queensland government sees any contradiction between being ClimateSmart and doubling the CO<sub>2</sub> it exports in coal. We show not a hint of no embarrassment as we ignore scientists like James Hansen when they warn us that "agreement to phase out coal use except where the CO<sub>2</sub> is captured is 80% of the solution to the global warming crisis".<sup>x</sup> Far from it. Since we take for granted that coal will be cleaned up in due course, we don't see the emissions in our coal exports as a problem. And, since they count in the country buying the coal, they're certainly not seen as *our* problem. Queensland is concerned with emissions occurring within its borders, and it's relying mainly on a federally imposed carbon price to deal with that problem.<sup>xi</sup>

On these grounds, the emissions generated by our coal exports, our biggest contribution to climate change are completely ignored in the state's official climate change strategy. The 424 page-long document *ClimateQ—Towards a Greener Queensland*, released last year—and dubbed by the Premier as the 'Government's main weapon against the massive global threat of climate change'—does not mention coal export emissions once.<sup>xii</sup> Instead, the focus is on dispelling the idea that individual action makes no difference—with a host of 'ClimateSmart' programs aimed at proving that consumers, businesses and

government agencies all doing their little bit can cumulatively help move Queensland towards a low carbon future.<sup>xiii</sup>

From every angle, it seems, everyone is being offered government incentives to green up their act. The sheer number of people being mobilised is impressive, as are the greenhouse emission savings whether it's solar hot water on another 200,000 homes, a million light bulbs given away, 74,000 Queenslanders signing up for what's called 'the Bligh Government's Low Carbon Diet', and over a quarter of a million Queenslanders taking advantage of the ClimateSmart Home service in search of emission cuts.<sup>xiv</sup>

The government is doing its bit just as eagerly, offsetting its official travel and government vehicles—with the plan being to offset all government buildings and vehicles by 2020.<sup>xv</sup> Meanwhile fossil fuel based power generation is being cleaned up with the 15% gas requirement, funding for clean coal projects, and low emission conditions for any new coal fired power stations.<sup>xvi</sup> Also, the government now requires proposals to government to come with a Climate Change Impact Statement (CCIS).<sup>xvii</sup>

The action is even more frenetic on the renewable energy front with the plan being to double Queensland's solar energy use in the next few years. Visitors to the city are already greeted on the road in from the airport with billboards welcoming them to 'The Solar State.'<sup>xviii</sup> And seemingly everyone is getting involved to justify that claim by 'doing the bright thing' as the government catchcry goes. There are 'solar kindies', 'solar schools', 'solar sporting and community associations', 'solar railway stations', 'solar cities'. Thanks in part to Queensland government help, the state has its first solar farm; first solar-coal-hybrid power station is on its way, as is the largest PV solar array in Australia which will turn UQ into the 'solar university'

'Home by home, school by school, street by street, city by city', as the ads put it, a 'virtual' 500 megawatt solar power station is being created.<sup>xix</sup> The sheer magnitude of public involvement makes it hard not to imagine that a green revolution of sorts is sweeping across Queensland. And it would seem that Queensland is on track to achieve the seemingly bold ClimateSmart aim to reduce the carbon footprint of Queenslanders by one third by 2020.<sup>xx</sup> So, does Queensland has the winning formula – are we showing the world that the biggest coal exporting state in the world can also be clean and green?

Well, as with most things that sound too good to be true, this is too. What's missing is context. When we hear government say it aims to cut the carbon footprint of Queenslanders by one third, it sounds to most people as if *Queensland's* carbon footprint is being slashed by a third. Some Bligh government ministers, including the climate change minister, even seem to believe that.<sup>xxi</sup> Yet, as ever, the devil is in the detail. The target actually applies to the emissions of Queensland *households*, which are only 16% of the state's emissions total—so we're really talking about cutting less than one sixth of our emissions by one third.<sup>xxii</sup> Hence, as laudable as it is for Queenslanders to cut their emissions by 1/3<sup>rd</sup>, this has very little impact on *Queensland's* overall carbon footprint. Householders busily do their bit, and no doubt feel justifiably greener for it, but the state's carbon footprint is growing in spite of their all efforts.

Factor in the growth projected by 2020 – the year to which the government's emissions target applies and it soon becomes hard to argue that Queensland is 'doing the bright thing'. By 2020, its emissions are still much higher than today.<sup>xxiii</sup> And by 2050, without any major policy shift they are expected to grow by over 30%.<sup>xxiv</sup> That's before we factor in the emissions generated by Queensland growing coal exports. Before we do that, though, let's have a closer look at coal export industry.

Australia is the undisputed king of the global seaborne coal trade. Australia produces around a third of the world's coal exports. We provide half of the world's metallurgical coal exports. Only Indonesia comes close to us, and Australian companies mine between 1/3<sup>rd</sup> and ½ of their exports. Australian companies play a similarly prominent role in the fastest growing coal exporting nations – like Mongolia and Mozambique. Producing 2/3rds of Australia's coal exports, Queensland is to the Australian coal industry what the Australian coal industry is to the global coal trade—the mother ship.

To truly grasp the enormity of the carbon in our coal exports, consider that the 167.9 million metric tonnes we export annually generates 453 million tonnes of CO<sub>2</sub>--more than two and a half times as much greenhouse pollution as is generated *in* Queensland.<sup>xxv</sup> Those ships carrying Queensland coal abroad might carry up to 250,000 tonnes of coal.<sup>xxvi</sup> Once burnt, that coal has roughly the same annual CO<sub>2</sub> impact as 160,000 cars.<sup>xxvii</sup> If we take ships carrying 80,000 tonnes as the average, one leaves a Queensland coal port about every 4 hours.<sup>xxviii</sup> Those trains you see heading for the port—extending for well over 1 kilometre—routinely pull 100 wagons at a time—each wagon contains around 100 tonnes of coal, or 270 tonnes of CO<sub>2</sub>.<sup>xxix</sup> If we take this as an average, over 16,700 trains arrive at our ports each year—46 a day, one every 32 minutes. Break it down further, and Queensland exports over 5 tonnes of coal a second, 100 tonnes of CO<sub>2</sub> every seven seconds. Put another way, we export the annual emissions of the average Queensland household every second.<sup>xxx</sup>

The pace at which coal exports are growing is equally daunting, with another million tonnes or roughly 15 new shiploads every month. At the rate our coal exports are increasing, Queensland is effectively adding a large new coal fired power station or steel mill about every six weeks. This all helps to put into proper perspective 'ClimateSmart' campaigns, and the talk of doing the bright thing, turning Queensland into the Solar State etc.

So, for example, if we imagine all the effort involved in 420 solar kindies around the state installing solar power—the time, the cost, the labour, the paperwork, the young hearts and souls inspired by the projects.<sup>xxxi</sup> All of the greenhouse pollution cut is added back by just 3 ½ wagon more of coal<sup>xxxii</sup>; Imagine the excitement and passion of kids and staff at over 750 Schools across the state installing solar energy and energy efficient lighting thanks to the 'Solar Schools' program<sup>xxxiii</sup>—how would the kids feel knowing their CO<sub>2</sub> saving is wiped out by less than a trainload of coal.<sup>xxxiv</sup> Then there's the 'Solar University of Queensland' – the biggest rooftop solar array in Australia –the CO<sub>2</sub> saved annually is erased by 6 ½ more wagons of coal.<sup>xxxv</sup> As for what is billed as 'the largest solar thermal project in the southern hemisphere' – being tacked onto the Coal fired power station at Kogan Creek--it's expected to save enough electricity to power 5,000 homes – a saving that is wiped out by 4 trainloads of coal—something currently happens every 2 hours.<sup>xxxvi</sup>

Let's add in all the others incentives for solar hot water, solar grants to sports and community associations, a Solar Cararra Stadium, and even solar panels at Queensland Rail.<sup>xxxvii</sup> If it tallies up to a 500 MW 'virtual solar power station', doubling Queensland's use of solar energy might eventually save nearly a million tonnes of coal *annually*.<sup>xxxviii</sup> And it sounds great until you realise that we are increasing coal exports by more than a million tonnes every single month.<sup>xxxix</sup>

As for the government offsetting its official travel for a year – that CO<sub>2</sub> saving is erased by just over 1 trainload of coal – it's roughly equivalent to pausing the state's coal exports for 37 minutes;<sup>xl</sup> Giving out a million energy-efficient light-bulbs – erased by 3 trainloads of coal. Just imagine the effort in distributing a million light bulbs; it's the equivalent of pausing our coal exports for 90 minutes.<sup>xli</sup> As for what it took

74,000 Queenslanders a year to achieve by signing up to ‘the Bligh Government’s low carbon diet – the CO2 saved is packed back by increasing coal exports in about two weeks.<sup>xliii</sup> The CO2 saved by 260,000 Queenslanders using the ClimateSmart Home Service erased in 7 ½ weeks by increasing coal exports.<sup>xliii</sup>

If the government succeeds in cutting the carbon footprint of Queensland households by 1/3<sup>rd</sup> by 2020 – it will save 10.1 million tonnes of CO2 a year, but keep this in mind: Queensland currently exports that much CO2 in its coal every 8 ½ days.<sup>xliv</sup> And, at the rate those exports are growing, it takes less than 100 days for new coal exports to erase what will take Queenslanders over a decade to cut their carbon footprint by a third.<sup>xlv</sup> Put another way, one new 12 million tonne a year coal mine in Central Queensland will on its own produce three times as much CO2 as all the ClimateSmart householder emissions savings by 2020 put together.<sup>xlvi</sup>

If you get onto Google Earth and zoom in on a coal stockpile at one of Queensland ports, depending on how hungry you are, it resembles an enormous block of very dark chocolate. That’s only fitting – amidst all the talk about the Bligh Government’s Low carbon diet, coal exports are the Government’s favourite ‘high carbon treat’. And the battle between Anna Bligh’s big chocolate bar and the low carbon dieting is no contest. During the time it will take me to deliver this presentation, the plan to cut Queenslanders’ carbon footprint by a third will save about 100 tonnes of CO2. Yet, over the same 50-60 minute period, another 4,000 tonnes of CO2 will be added just through the increase in coal exports from Queensland.<sup>xlvii</sup> In short, the Bligh Government’s High Carbon Diet is about 40 times as effective as its ‘Low Carbon Diet.’

To do justice to the sheer brazenness of the claim that the ‘Solar State’ is being so ‘ClimateSmart’, we need to factor in those export emissions. (For those who don’t have superhuman eyesight, I’ve included a magnifying glass so you can still see what ‘cutting Queenslanders’ carbon footprint by 1/3<sup>rd</sup> by 2020 means’—that little green bit). Now let’s factor in a doubling of coal exports over the next decade as sought by both the industry and government.

Then let’s factor in the 140mt in CO2 generated by the 50 million tonnes a year of LNG that the state government wants Queensland to export.<sup>xlviii</sup> Queensland is a ‘Greenhouse Ghetto’ a decade from now: between its own emissions and the carbon dioxide exports in fossil fuels, generating over 1.1 billion tonnes of CO2 – nearly twice Australia’s current emissions total, and not much less CO2 than Saudi Arabia exports in its petroleum today.<sup>xlix</sup> (And to illustrate that point, here are Saudi Arabia’s CO2 exports today compared with ours in 2020.) Maybe the billboard on the road in from the airport should read – Welcome to Queensland—Saudi Arabia of the South Pacific... Or perhaps the Premier should merely have this number plate (HI-CO2 Queensland – the Dumb State) attached to her official car.

Oh, and just in case you’re wondering just how we can become the Saudi Arabia of the South Pacific while also consolidating our claim to ‘Solar State’ status by doubling solar energy use? Well, counting solar hot water (as the government does) about 6 per cent of Queensland’s electricity capacity is renewable--around 1.2% of it solar. Because solar is starting with such a tiny share, and because electricity demand is set to increase by 55%, doubling our solar energy use has little impact. By 2020 around 4% of electricity capacity would come from solar, and the so-called ‘solar state’ would remain overwhelmingly reliant on fossil fuels.<sup>1</sup> Now you have the context required to see the ClimateSmart and Solar State branding clearly. While the Queensland public has been busy cutting their carbon footprint, the Bligh government is busy increasing the state’s carbon footprint as if climate change is not even happening.

Once you appreciate this, you won't be surprised to learn that the government is spending more than 13 times as much on infrastructure to expand coal exports as the \$1.4 billion it is spending to fight climate change.<sup>li</sup> You won't be surprised to hear that in spite of over 150 Climate Change Impact Statements being prepared, not one coal mine or emissions-intensive project has been prevented from proceeding because of its emissions impact.<sup>lii</sup> Nor will you be surprised to learn that the new conditions hailed as a 'ban' on conventional coal fired power amount to anything but a ban.<sup>liii</sup> Ostensibly, they require new coal fired power stations to capture their emissions or to be 'capture ready' and hooked up within 5 years of carbon capture and storage becoming commercially proven. Yet, the fine print says the conditions don't apply if the power station is linked to a major project that might go to a developing countries where no comparable restriction exists.<sup>liv</sup> In practice, there are about 150 such countries, and that very dynamic applies in to most new resource projects in Australia.<sup>lv</sup> Even if the project being considered for Queensland is not genuinely in competition with an alternative developing country location, companies are extremely good at pretending otherwise. Having helped a major mining company do just that in a previous life to win government support here, I can vouch for that. So, even though it sounds nice ,in practice, the new conditions on coal fired power are no significant obstacle to new dirty coal fired power stations.

The great irony is, that as most of us are out there doing the bright thing, we are slowly and surely being hooked up to greater coal addiction. In our minds, many of us are already addicts in so far as we accept without question the notion that coal is the backbone of the state's economy, a big employer, an indispensable source of tax revenue – our meal ticket. But addiction comes in many forms, and our drip is being supplemented all the time.

In coal states like Queensland, every time a new coal project proceeds, more people move to coal communities, and those communities become more reliant on coal. When, on the back of a new coal project, people move to town, build a house, start or refashion their business, their addiction to coal intensifies. When government expands schools, hospitals, and other services in these communities, the addiction grows. And as families put down roots—send their kids to schools, join sporting clubs, make friends—the addiction to coal deepens. With each little step, the cost of kicking addiction becomes greater.

The current float of QR National is another good example. It will hook up to one million investors up to coal addiction.<sup>lvi</sup> Their capital gains and dividend incomes will depend on Queensland continuing to export hundreds of millions of tonnes of coal every year. Punters are being promised a financial rush in return for backing the coal rush;

Meanwhile, millions of small businesses across Australia are about to be hooked up to increased coal addiction through the minerals resource rent tax. Of course, it's never put like this by government but because some of the revenue will be spent cutting the company tax, in effect a company tax cut for millions of small businesses will depend on continued expansion of coal mining; The same goes for our own retirement savings. The aim is that the company tax cut will enable employers to fund an increase in compulsory superannuation contributions. Take away the revenue generated by the new tax, a large share of which will come from coal mining, and the drip-feed is diluted. Sure, the coal industry complains about some of these things, but they also know that each step makes it harder for coal addicted governments, communities and individuals to kick the habit. Each little step helps to lock in permanency for the industry and addiction for us. Most of us don't even notice the needle going in or the dose being raised. Others bank on a miracle cure for our coal addiction – clean coal technology.

So what is clean coal, when will it vindicate ClimateSmart Queensland? Once upon a time, ‘clean coal’ meant low sulphur. Now that CO<sub>2</sub> is the main concern, the term ‘clean coal technology’ is used for anything producing slightly less CO<sub>2</sub> per tonne of coal than older technologies. So, for example in Victoria the plan is to build a new power station run on gasified brown coal. It would be roughly as ‘clean’ as a new black coal fired power station, adding at least 3 million tonnes of CO<sub>2</sub> a year to the atmosphere, but it’s apparently qualifies as ‘clean’.<sup>lvii</sup> There are various other clean coal technologies – underground gasification, for example, upgrading low grade coals into briquettes, tacking small solar and biomass powered generators onto existing coal fired plants. Their practical impact is not to reduce or prevent coal emissions, it is to slow the rate of increase per tonne of coal burned—not so we burn less coal, but so we can burn much more..

What people *understand* ‘clean coal’ to mean, however, is carbon capture and storage (otherwise known as CCS)—a process by which most CO<sub>2</sub> produced in coal fired power stations is buried underground resulting in 80-90% fewer emissions.<sup>lviii</sup> All the official graphs from the International Energy Agency on down assume CCS will work<sup>lix</sup>; the coal industry is investing billions in demonstration plants here and around the world, as are state and federal governments in Australia. We are also home base for a global Carbon Capture and Storage Institute which is backed by over 20 countries, and the G8 is targeting 20 large-scale CCS plants by 2020.<sup>lx</sup> It certainly *sounds* like full steam ahead, and if you go to the website of the World Coal Institute you’ll probably be impressed at how much is already happening.

According to their ‘CCS Counter’, a whopping 48 million tonnes of CO<sub>2</sub> has *already* been stored.<sup>lxi</sup> So—‘clean coal’ is already here, right? Or is it? Look more closely though and a different picture emerges. Of those 48 million captured and stored tonnes of CO<sub>2</sub> promoted by the World Coal Institute, almost none has come from coal. The overwhelming share has been injected into otherwise unviable oil reserves, not to save the planet, but to extract more oil.<sup>lxii</sup> It has nothing to do with the power stations and steel mills using the coal. What’s more that 48 million tonnes is *all* the CO<sub>2</sub> captured and stored underground by fossil fuel producers *in history* (something the oil industry has been doing for decades).

To put that in proper context I have knocked up my own CCS counter which shows that a similar quantity of CO<sub>2</sub> from coal burning is not captured and stored every day!<sup>lxiii</sup> That is, every 24 hours all the emissions ever captured and stored are replaced by unclean coal use. Don’t expect to see the second counter on the WCI website any time soon though. And don’t expect them to acknowledge this other inconvenient fact: No coal fired power station in the world is yet capturing and storing its CO<sub>2</sub> emissions on an industrial scale – NOT ONE.<sup>lxiv</sup> As former Premier Peter Beattie noted earlier this week government (and industry) are sitting on their hands. In spite of all the talk about clean coal nothing much has happened in the last 10 years.<sup>lxv</sup>

For arguments sake though, let’s assume all goes well for ‘clean coal.’ Let’s ignore for a moment the sheer enormity of the task of building global CCS infrastructure on a scale akin to the oil and gas industry in a fraction of the time.<sup>lxvi</sup> Let’s ignore the many trillions of dollars involved.<sup>lxvii</sup> Let’s gloss over the projections of the federal Treasury in 2008 suggesting that CCS may not be commercially viable in Australia even with a carbon price until 2033.<sup>lxviii</sup> Let’s suspend the reality that once CCS is viable here, the process of replacing or retrofitting all of Australia’s coal fired capacity will take decades. And let’s set aside for a moment the certainly that most of our coal export customers will use CCS much later than we do, especially those developing countries who will have no absolute emissions reduction target to worry about. Let’s imagine a best case scenario for CCS.

That scenario is the one targeted by the G8 – that worldwide by 2020 there would be 20 large scale CCS demonstration plants. If all goes well, and assuming these plants relate to coal (which is not assured), that might save 150 million tonnes of CO<sub>2</sub> annually.<sup>lxxix</sup> Once more, it's impressive...until you have the context. If notwithstanding more efficient coal use, coal consumption grows by a quarter by 2020 while the G8 is busy promoting the 150 million tonnes of CO<sub>2</sub> saved by clean coal, over 20 billion tonnes of CO<sub>2</sub> annually would still be coming from coal use where the emissions are *not* captured and stored.<sup>lxxx</sup> In rough terms, by 2020 about 1 in every 135 coal fired power stations and steel mills might capture and store the emissions.<sup>lxxxi</sup>

Ultimately though, Queensland isn't banking that heavily on clean coal. We're banking heavily on Canberra giving us national policies that enable us to *claim* low carbon status without cutting emissions or coal exports. With Queensland's representation in federal parliament increasing as its population grows, that strategy is working well too. There's lots of feigned outrage at the damage that federally imposed carbon prices and renewable energy targets might inflict on Queensland, but there's no evidence to suggest Canberra is less determined to double coal exports and fuel carbon addiction.

By way of illustration, let's add up the impact of all federal emission reduction measures – the 20% Renewable Energy Target, the \$6.2 billion Green Car program, solar hot water on 400,000 roofs, what remains of the plan to insulate 2.7 million homes. If we include all measures since the Rudd/Gillard government was elected in 2007, and on the figures of the Department of Climate Change, the impact is to cut Australia's projected annual emissions in 2020 from around 680 million tonnes to perhaps 660m.<sup>lxxii</sup> A tiny saving that leaves emissions more than 10% higher than today.<sup>lxxiii</sup> And much as a carbon price is seen by many as the game-changing reform, there's no guarantee whatsoever that it will significantly reduce emissions levels *in* Australia. All the rhetoric has been about a carbon price capping emissions in Australia and making the big polluters pay, but the actual proposals emanating from Canberra would have the opposite effect. The so-called Carbon Pollution Reduction Scheme, for example, allowed unlimited importation of cheap carbon credits to count towards Australia's emission targets.<sup>lxxiv</sup> As Treasury's analysis in 2008 showed, even if we used this loophole to effectively outsource only half of any post-Kyoto emission obligation, the actual greenhouse pollution that comes from smokestacks and car exhausts here in Australia at all wouldn't fall *here* for decades.<sup>lxxv</sup> With no limit at all on outsourcing emission cuts, reductions in greenhouse pollution here in Australia would be even further away.

Meanwhile, the money raised from emissions trading was to be spent mainly on giving the biggest polluters between 66-94.5% of their pollution permits for free.<sup>lxxvi</sup> As these industries grow, their overall number of free permits would also grow, as would their total emissions.<sup>lxxvii</sup> The CPRS only worked if our emission cuts could be outsourced en-masse to developing countries who might agree to protect forests on the cheap. The coalition wants to rely less on hiding carbon in foreign forests, and more on hiding carbon in agricultural soils, but the bipartisan intent is the same—cosset the addiction to fossil fuels, especially coal.

This equation is unlikely to change in a hurry, much as some believe precarious minority government in Canberra will force ambitious action. Let's not forget that our new Prime Minister was put in the position by a few union bosses who ascertained that 3 multinational coal mining companies would change the government through a relentless ad campaign unless Labor changed its leader. On day one in the job, she famously threw open her door to the mining industry and within days cut a deal in their favour.<sup>lxxviii</sup> Our new climate change minister, meanwhile, is a former coal engineer and union rep, who on his first day in

the job reportedly declared that the mining industry would be safe.<sup>lxxxix</sup> So, in the wake of Copenhagen, and stalled emissions trading legislation in the US, the carbon lobby has more leverage than a year ago—not less.

Naturally, the federal government wants the appearance of action—perhaps with a new trading scheme or carbon tax, but expect the same sort of outsourcing loopholes that enable Australia to use foreign forests and farm paddocks to mask its growing greenhouse pollution. Expect the biggest polluting companies in the domestic economy to again be offered billions of dollars in carbon subsidies – either through free permits or carbon tax rebates; and expect Canberra to keep ignoring the emissions generated by coal exports, at least in the short term. Just don't bank on that lasting.

I say that because the 'official future' is on pretty thin, some might say melting, ice. When you look at the assumptions that underpin continued coal addiction—the assumption that carbon intensive resources are our economic backbone, that alternatives to coal either don't exist or are too expensive—they don't stand up to scrutiny. Contrary to popular myth, Australia is a modern services based economy, and increasingly so. Coal is an important export, about 23% of our export basket, but 3-4% of our overall economy, about 1/3<sup>rd</sup> of 1 percent of jobs.<sup>lxxx</sup> This is roughly half as many people as work for advertising agencies or for McDonalds. Nor is coal quite the government cash cow we imagine – in New South Wales, coal royalties are generally about 1% of government revenue – 3% in a good year; in Queensland they are more like 3% in a normal year, rising to 6-9% during boom years like this one.<sup>lxxxi</sup> But, much of that royalty money is returned to the industry – when you realise the state is spending more on coal infrastructure than it has collected in coal royalties over the past decade the notion that coal royalties fund Queensland's schools, hospitals and police etc is less persuasive.<sup>lxxxii</sup>

Also on thin ice is the notion that there's no alternative to coal. As was highlighted last night when Beyond Zero Emissions held its Queensland launch of its Zero Carbon Australia Stationary Energy Plan, there's no technical hurdle to Australia replacing all its coal fired power with renewable energy sources over the next decade.<sup>lxxxiii</sup> All the technology required is already being deployed elsewhere in the world. Contrary to the myth, many of these technologies can replace base load electricity – solar thermal, biomass, and in some cases hydro as well. In combination with back-up from a small amount of natural gas, intermittent sources like wind can deliver something better than base load.<sup>lxxxiv</sup> The only thing lacking is the political will.

The final thing sitting on thin ice is the notion that the alternatives to coal are too expensive, that they involve 'taking the back of the axe to the Australian economy', as the new climate change minister puts it. All the official analysis imagines continued expansion in coal exports. Perhaps because so many vested interests don't want to know the answer, not one federal or state agency in Australia has yet modelled the impacts of a wholesale shift away from coal to renewable energy sources in a 10-20 year timeframe. But start doing the sums and you get some surprising results.

I was a bit bored one afternoon recently, so I tallied up the cost of replacing the nearly 30 GW of existing coal fired electricity in Australia with 115GW of renewables. Factoring in energy efficiency improvements along the way, and some back up from gas, 115GW is roughly enough to meet projected demand, and replace half the car fleet with plug-in electric vehicles. Based on estimates from the Clean Energy Council, the overall cost is around \$316 billion.<sup>lxxxv</sup> Sounds like a big number, until you compare it with the alternative. At the moment we're spending around \$9 billion a year subsidising fossil fuel use (mainly through the tax system)<sup>lxxxvii</sup>; and under the CPRS we would be spending another \$6 billion annually giving

the biggest polluting industries in Australia free emission permits. On top of that, meeting our post-Kyoto emission targets by importing carbon credits could cost \$7-18 billion—which is roughly like buying a Sydney Harbour Bridge, a Sydney Opera House, and a Snowy Hydro Scheme *every year*.<sup>lxxxviii</sup> It's hard not to wonder whether for that scale of investment we might do something of more enduring national benefit than sandbagging our coal industry. Once you start reallocating that money towards renewables, it soon becomes apparent that a shift away from coal is well and truly doable. Going 50-50 with the private sector, for example, there is more than enough to offset the cost of replacing all coal fired power with renewables, and the royalties and taxes generated by coal and coal dependent industry. It is also almost certainly a cheaper option for government than the alternatives so far proposed by government.<sup>lxxxix</sup>

Do the sums and it's hard not to conclude that Australia could exit coal altogether over the next decade or so, and come through with flying colours, mostly green and black. The impact on coal and coal-dependent industries would result in a GDP \$100 billion or so lower in 2020 *than might otherwise be the case*, but that's still a GDP one third bigger than today. So, instead of doubling in size by around 2034, our economy doubles in 2037 or so.<sup>xc</sup> Our export basket would suffer in the short term without coal, but the change would take some of the heat out of our exchange rate which would fall and, as it did, make many other exporting industries – from tourism to education to manufacturing—more competitive. And we'd be saving tens of billions on imported oil—especially as oil prices rise. On the rare occasion this economic heresy is raised, some of the country's best known economic commentators will quietly accept it. As former Chief Economist of the ANZ Bank, Saul Eslake, for example, last year acknowledged that whilst phasing out coal won't be painless, it 'might be manageable' and 'would have environmental benefits that are not normally measured in GDP, and which could make it worthwhile'.<sup>xcii</sup>

Of course, there is no guarantee that the 'official future' will crumble any time soon—even as it becomes clear that clean coal won't fix the CO<sub>2</sub> we export in coal; even as people come to understand that alternatives to coal are affordable. No-one should underestimate the power of the carbon lobby, and the extent to which political inertia favours their interests. No one should take clean energy revolution as a given. With coal production on track to grow by half in the next 15-20 years, it's hard to make the case that this is an 'empire in decline.' That said, there are signs of imperial hubris—a sense of invincibility within the industry, a belief that it is too big to fail. Big Coal looks permanent much as the Iron Curtain once did. If anything, the faith that Britannia would forever rule the waves was much less widespread than the acceptance that coal will dominate the world energy market. But, as those examples, and many other show, betting on the official future can be a dangerous gamble.

Right now, like the coal industry itself, Queensland is betting big on coal being too big to fail, and acting as if the best way to prevent coal's demise is to make it much bigger. It is as if the state has decided that in the unlikely event that it loses its bet on coal, it is determined to lose big. With each extra tonne of coal Queensland adds to its pile, the cost of being wrong gets bigger. More taxpayer money is spent on coal infrastructure, more communities become addicted to coal, more families tie their future to coal's future. The danger for those who imagine that coal's future is guaranteed is that climate change is in fact 'The great moral challenge of our generation', as one ex-Prime Minister famously claimed before squandering his chance to do something worthwhile about it.<sup>xciii</sup> Australians may come to realise that we can and must kick the coal habit, sooner rather than later. They may come to think it unconscionable to double CO<sub>2</sub> exports over the next decade. They may start demanding that their governments think less about what's the best bet, and more about what's the right thing.

If that occurs, movement is likely to be radical and swift, as is usually the case when official futures are trashed. The unthinkable would become routine—in this case, closed coal mines, disused railways and ports, unhappy shareholders, lawsuits, lots of what economists euphemistically call ‘structural adjustment’, and lots of coal left in the ground. The bigger Queensland’s gamble on coal in the next few years the greater the economic and social liabilities should that bet backfire.

The great shame is that Queensland even sees such a gamble as necessary. The Saudis are looking beyond oil, a commodity 9 times as important to their economy as coal is to Queensland’s, yet life beyond coal seem unimaginable here?<sup>xciii</sup> As a result, Queensland is missing its opportunity to play a starring role in a transition to a cleaner, greener economy—by calling a halt to the coal rush, by setting a timetable to phase-down coal use where the emissions are not captured and stored. The billions of dollars we currently spend expanding coal production would pay for just the sort of investment in renewable energy you’d expect from a ‘solar state’. If we went 50-50 with the private sector, for example, the money Queensland is currently spending on coal infrastructure could phase out nearly half of its coal fired power stations instead.<sup>xciv</sup> The truth is that Queensland could be digging out of carbon addiction, rather than digging deeper into it. It could become the solar state if it was serious about being ClimateSmart. The millions of Queenslanders trying to cut their own emissions in good faith could also be having real impact too—but that can only happen once Queensland decides to respond to climate change by cutting emissions rather than increasing spin.

<sup>i</sup> Saudi net oil exports are currently around 8.7 million barrels a day (CIA World Factbook). This amounts to 3.175 billion barrels a year which equates to around 1.36 billion tonnes of CO<sub>2</sub> exported annually. (Conversion factor: 430 kilograms of CO<sub>2</sub> per barrel of crude oil; Source: USEPA)

<sup>ii</sup> According to research conducted by ACIL Tasman for the Queensland Government, the mining industry’s share of Gross State Product is increasing rather than shrinking – coal mining is the biggest component of that industry in Queensland. See: ‘Queensland mining industries -- The economic significance of mining and mineral processing to Queensland (Summary report)’, The State of Queensland (Department of Mines and Energy) p.iii [http://www.dme.qld.gov.au/zone\\_files/mines\\_pdf/acil\\_tas\\_sr.pdf](http://www.dme.qld.gov.au/zone_files/mines_pdf/acil_tas_sr.pdf)

<sup>iii</sup> For an example of Saudi concern about peak oil, see the recent comments by Ibrahim al-Muhanna, adviser to Saudi Minister of Petroleum and Mineral Resources regarding peak oil demand. ‘Saudi shift to renewables; Riyadh sees peak oil demand’, CBS Business Network (BNET), 26 April 2010. [http://findarticles.com/p/articles/mi\\_hb6478/is\\_17\\_74/ai\\_n53306390/?tag=content;col1](http://findarticles.com/p/articles/mi_hb6478/is_17_74/ai_n53306390/?tag=content;col1)

<sup>iv</sup> In feting those responsible for building ‘what is now the world’s largest seaborne coal export trade’, and noting a projected doubling in Queensland coal exports, Premier Anna Bligh told an audience in 2008, ‘The State and the coal companies, through our Clean Coal Council, are putting our money where our mouth is to ensure a green solution is found. It will be.’ See: ‘Premier predicts coal boom to continue,’ Media Statement by Premier Anna Bligh, 9 July 2008. <http://www.cabinet.qld.gov.au/MMS/StatementDisplaySingle.aspx?id=59087>

<sup>v</sup> Waratah Coal says of the Galilee Coal Project, ‘The proposed open cut mine is planned to have an initial annual export capacity of 40 million tonnes’. <http://www.waratahcoal.com/galilee/GCPNEF.php> ‘Premier Bligh welcomes \$60 billion deal – thousands of jobs for Queensland’ Media Statement by Premier Anna Bligh, 6 February 2010

<sup>vi</sup> For details on Leighton’s sponsorship of the ClimateSmart Leadership Award in 2010 see: [http://www.derm.qld.gov.au/premiersawards/sponsors.html#ministers\\_award\\_for\\_climatesmart\\_leadership](http://www.derm.qld.gov.au/premiersawards/sponsors.html#ministers_award_for_climatesmart_leadership); For more information on the CO<sub>2</sub> generated by Leighton’s offshore coal mining see: Pearse, Guy. ‘Long Black Cloud’, *The Monthly*, September 2010. Leighton plans to mine around 80 million tonnes of coal annually in other countries within the next few years. This generates over 210 million tonnes of CO<sub>2</sub> once burnt. The combined total emissions of Vic, SA and WA are 223 mt CO<sub>2</sub>-e (See: <http://www.ageis.greenhouse.gov.au/SGGI.aspx>). Add in the CO<sub>2</sub> that Leighton’s mines themselves produce and it easily surpasses the difference between the two.

by Guy Pearse At 78mt of coal, Leighton generates 212mt CO<sub>2</sub> – The combined total emissions of Vic, SA and WA are 223 mt CO<sub>2</sub>-e. Add in the CO<sub>2</sub> that Leighton’s mines themselves produce and it would easily make up the difference between the two.

<sup>vii</sup> Queensland’s World-class Coals: Mine Production and Developments, The State of Queensland (Department of Mines and Energy), November 2007, p.1

<sup>viii</sup> For an example of Queensland Government support for a doubling in coal exports, see: See: ‘Premier predicts coal boom to continue,’ Media Statement by Premier Anna Bligh, 9 July 2008. <http://www.cabinet.qld.gov.au/MMS/StatementDisplaySingle.aspx?id=59087>

For more up to date projections on the timetable for a doubling in Queensland’s coal exports see the presentation by David Stolz, Department of Infrastructure and Planning, Australia-Japan Coal Workshop, June 2009. It projects a more than doubling in coal exports from Queensland by 2020, and showcases the expansion in infrastructure being in part assisted by the Queensland government. (Ironically, climate change and greenhouse gas emissions are not referred to in the presentation once). See: <http://www.ret.gov.au/resources/Documents/Industry%20Consultation/Australia%20and%20Japan%20Coal%20Technology/8%20-%20QLD%20Infrastructure%20improvements%20-%20David%20Stolz%20-%20QLD%20DIP.pdf>

<sup>ix</sup> Northern Missing Link is 69km (Source: David Stolz DIP presentation p9); Southern Missing Link is 210km – (Source: Dept of Infrastructure and Planning <http://www.dip.qld.gov.au/projects/transport/rail/surat-basin-rail.html>) ; The Galilee Coal Project will require a new 490km railway (Source: Waratah Coal - <http://www.waratahcoal.com/galilee/GCPNEF.php>)

<sup>x</sup> ‘A Plea for Leadership’, Letter to Governor Jim Gibbons from James Hansen, NASA Goddard Institute and Columbia University Earth Institute, April 2008. [http://www.columbia.edu/~jeh1/mailings/2008/20080414\\_GovernorGibbons.pdf](http://www.columbia.edu/~jeh1/mailings/2008/20080414_GovernorGibbons.pdf)

<sup>xi</sup> The following statements are just a few of many examples of the Queensland government assumption that a federal carbon price will drive abatement in Queensland. 'The increasing price of carbon over time under the CPRS will provide a driver for abatement' (p.99)... 'The introduction of a carbon price as part of the Commonwealth Government's proposed CPRS will change the operating environment for Queensland industry... The CPRS will cause all businesses to assess their direct emissions and the amount of electricity they use, and consider ways to mitigate or alleviate the impact of this new cost..' (p.102) 'The increase in energy costs associated with the introduction of the CPRS will provide consumers with additional incentives to adjust their behaviour and invest in low-emission technologies.' (p.136) *ClimateQ*, op.cit.

<sup>xii</sup> See: 'ClimateQ – Towards a Greener Queensland', The State of Queensland (Department of Environment and Resource Management), July 2009. 'Bligh Govt Readies Qld for a Lower Carbon Future', Media Statement by Climate Change minister Kate Jones, 20 August 2009. <http://www.cabinet.qld.gov.au/mms/StatementDisplaySingle.aspx?id=65862>

<sup>xiii</sup> For example, the ClimateQ strategy says of the target to reduce Queenslanders' emissions by 1/3<sup>rd</sup> by 2020 that 'By achieving this target, all households and communities can help move the state towards a low carbon future.' *ClimateQ* – op.cit. p.132

<sup>xiv</sup> According to the government, the phase-out of electric hot water systems in Queensland 'will eliminate up to 7.4 million tonnes of greenhouse gas by 2020'. Over 13 years, this is an average saving of 546,000 tonnes of CO2 per year. See 'Electric hot water system phase-out' Fact Sheet, Department of Infrastructure and Planning, May 2010. <http://www.dip.qld.gov.au/resources/factsheet/sustainable-living/electric-hot-water-system-phase-out.pdf>; The government estimates that 200,000 new solar hot water systems will save 630,000 tonnes of CO2 emissions over the three years of the program based on 200,000 systems. *ClimateQ* – op.cit. p.145; For more details on the Big Light Switch campaign conducted by the Queensland Government see: [http://www.climatesmart.qld.gov.au/get\\_informed/What\\_the\\_Queensland\\_Government\\_is\\_doing/other\\_campaigns.html](http://www.climatesmart.qld.gov.au/get_informed/What_the_Queensland_Government_is_doing/other_campaigns.html); According to Climate Change minister Kate Jones, as at March 2010, 'Almost 74,000 Queensland families and householders have directly participated in the program ("the Bligh Government's Low Carbon Diet") since early 2009. See: 'Noosa takes the low carbon diet challenge', Media Release by Kate Jones--Minister for Climate Change and Sustainability, Wednesday, March 03, 2010; The CO2 saving estimate is a cumulative figure that relates to savings 'over the life of the improvements' made under the ClimateSmart Home Service. See: 'Queensland Government Submission to the Prime Minister's Task Group on Energy Efficiency', 7 June 2010, p.9. The 260,000 homes estimate comes from the Office of Clean Energy. See: <http://www.climatechange.qld.gov.au/whatsbeingdone/g2-target.html>; The EcoBiz partnership with over 430<sup>xiv</sup> businesses is expected to save some 26,000 tonnes of CO2 annually -- *ClimateQ* – op.cit. p.110

<sup>xv</sup> *ClimateQ* – op.cit. p.194

<sup>xvi</sup> 'Bligh Govt Readies Qld for a Lower Carbon Future', Media Statement by Climate Change minister Kate Jones, 20 August 2009. <http://www.cabinet.qld.gov.au/mms/StatementDisplaySingle.aspx?id=65862>; Zerogen is expected to save at least 2 million tonnes of CO2 annually <http://www.zerogen.com.au/faqs.aspx>; the Wandoan CCS project is expected to save 2.5mt CO2 per annum. See: 'Low Emission Coal Demonstration Projects – Fact Sheet', Department of Employment, Economic Development and Innovation, (undated; accessed 11 October 2010).; For more on the gas scheme see *ClimateQ* – op.cit. p.87; 4.3mt is a cumulative saving compared with coal since 2000 – as at 2010. [http://www.energyfutures.qld.gov.au/how\\_gas\\_fired\\_electricity\\_works.cfm](http://www.energyfutures.qld.gov.au/how_gas_fired_electricity_works.cfm) [http://www.energyfutures.qld.gov.au/queensland\\_gas\\_scheme.cfm](http://www.energyfutures.qld.gov.au/queensland_gas_scheme.cfm)

<sup>xvii</sup> *ClimateQ* – op.cit. p.16

<sup>xviii</sup> See picture in accompanying PowerPoint presentation – taken September 2010 by Graham Redfearn.

<sup>xix</sup> To see the ads in full claiming that the Queensland government's incentives are turning Queensland into the solar state see: <http://brightthing.energy.qld.gov.au/tv-advertisements.html>

<sup>xx</sup> *ClimateQ* – op.cit. p.132

<sup>xxi</sup> For example, Climate Change Minister, Kate Jones, recently claimed that 'As part of the Queensland Government's Toward Q2 vision we have set the ambitious target of cutting Queensland's (sic) carbon footprint by one-third by 2020.' Noosa takes the low carbon diet challenge, Media Release, Kate Jones, Minister for Climate Change and Sustainability, 3 March 2010. <http://www.cabinet.qld.gov.au/mms/StatementDisplaySingle.aspx?id=68737>

<sup>xxii</sup> *ClimateQ* – op.cit. p.133

<sup>xxiii</sup> Current emissions are 160.1mt. Emissions projected by the government are at least 180mt per annum by 2020. Achieving the stated aim of cutting Queenslanders' carbon footprint by 1/3<sup>rd</sup> by 2020 would save a maximum of 10.1 million tonnes 'if every household achieves the target.' On that basis, it is hard to see any real fall in Queensland's emissions by 2020. For more detail on the projections, see current emission figures in the *National Greenhouse Gas Inventory and ClimateQ*, pp.20,69.

<sup>xxiv</sup> According to the Queensland government emissions 'From 2007–2050, in the absence of any additional significant abatement initiatives, Queensland's greenhouse gas emissions are expected to grow by approximately 36 per cent.' See: *ClimateQ*, op.cit p.20

<sup>xxv</sup> For the most recent coal export figures, see: 'Queensland Coal Statistics-- 2009 Calendar year (Production and Employment)', The Department of Mines and Energy, 2010. p.5 [http://www.dme.qld.gov.au/zone\\_files/coal\\_stats\\_pdf/cyr\\_09.pdf](http://www.dme.qld.gov.au/zone_files/coal_stats_pdf/cyr_09.pdf) ; For the most recent Queensland emission figures (160.1mt including LULUCF) see: Australian National Greenhouse Accounts--State and Territory Greenhouse Gas Inventories 2008, Department of Climate Change and Energy Efficiency, 2010. pp.1,20-1

<sup>xxvi</sup> Vessel capacities vary, but 150,000 is a reasonable average for the illustrative purposes. Many vessels are much bigger than this size, and ports like Dalrymple Bay are equipped to handle vessels with up to 250,000 tonnes capacity. [http://www.msg.qld.gov.au/~media/7cfb22e7-b230-4cf9-9b81-3fda54a5d77c/pdf\\_hay\\_point\\_port\\_procedures\\_sect5.pdf](http://www.msg.qld.gov.au/~media/7cfb22e7-b230-4cf9-9b81-3fda54a5d77c/pdf_hay_point_port_procedures_sect5.pdf) [http://d301432.u111.fasthit.net/files/Coaltrans\\_Alpha\\_Coal\\_Final.pdf](http://d301432.u111.fasthit.net/files/Coaltrans_Alpha_Coal_Final.pdf) <http://www.aureconhatch.com.au/documents/Upgrading%20Offshore%20Facilities%20for%20Large%20Vessels.pdf>

<sup>xxvii</sup> This is based on the average car emissions used by the Queensland government: 4.13 tonnes of CO2-e per year; *ClimateQ* op.cit p.167. 250,000 tonnes of coal equates to 675,000 tonnes of CO2.

<sup>xxviii</sup> Dalrymple Bay Coal Terminal cites 80,000 tonnes of coal as the average for its operations. <http://www.dbct.com.au/whatWeDo.cfm>

<sup>xxix</sup> Various sources cite 100 tonnes per wagon and 10,000 tonnes per train as pretty normal for the coal industry. Dalrymple Bay Coal Terminal, for example, cites 20,000 tonnes of coal as 'approximately two train loads'. The Alpha coal project is envisaged to use 10,000 tonne trains as a minimum. The Galilee coal project is being planned for 20,000 tonne trains with up to 180 wagons. Xstrata cites 120 wagon trains as being 2 kilometres long. QR National refers to its trains being 'kilometres long'. <http://www.dbct.com.au/whatWeDo.cfm> <http://www.heirg.com/projects/rail.php> <http://www.railpage.com.au/f-p1355946.htm>

<http://archive.xstrata.com/mim/www.mim.com.au/oaky.html>

[http://www.parliament.qld.gov.au/view/legislativeAssembly/hansard/documents/2010.pdf/2010\\_02\\_25\\_WEEKLY.pdf](http://www.parliament.qld.gov.au/view/legislativeAssembly/hansard/documents/2010.pdf/2010_02_25_WEEKLY.pdf)

<http://www.niha.org.au/staticpages/index.php/20060307000427889/print>;

<http://www.qrnational.com.au/MediaCentre/MediaReleases/Pages/QLaunchesNational.aspx>

<sup>xxx</sup> According to the Bligh Government, the average Queensland household generates 13.77 tonnes of CO2 annually. *ClimateQ* op.cit p.132. Based on coal exports of 167.9mt per year, the current state exports 14.42t of CO2 per second in its coal.

<sup>xxxi</sup> See 'Solar Kindergartens for Everyone' Fact Sheet, Queensland Government, <http://brightthing.energy.qld.gov.au/downloads/Solar%20kindies.pdf>

<sup>xxxii</sup> 900 tonnes of CO2 saved annually equates to 3.3 wagons carrying 100 tonnes of coal (or 270t CO2 each).

<sup>xxxiii</sup> See: '750 Schools now doing the bright thing', Media Statement by Anna Bligh and Geoff Wilson, 14 April 2010 <http://www.cabinet.qld.gov.au/mms/StatementDisplaySingle.aspx?id=69297>

<sup>xxxiv</sup> Queensland government estimate is that solar power and energy efficient lighting installations in around 750 schools will save over 20,000 tonnes of CO<sub>2</sub> annually – significantly less than one trainload of coal (27,000 tonnes of CO<sub>2</sub>) each year.

<sup>xxxv</sup> The UQ Solar project is projected to save 1750 tonnes of CO<sub>2</sub> annually. This equates to 6.48 wagons each carrying 100 tonnes of coal (or 270 tonnes of CO<sub>2</sub> each).

<sup>xxxvi</sup> 'Kogan Creek Solar Boost Project, 'Do the Bright Thing' Fact Sheet, Office of Clean Energy, Department of Employment, Economic Development and Innovation, 2010 <http://brightthing.energy.qld.gov.au/downloads/Kogan%20Creek.pdf>

<sup>xxxvii</sup> For more detail see: 'Solar Carrara Stadium', Fact Sheet, <http://brightthing.energy.qld.gov.au/downloads/Carrara%20Stadium.pdf> ; For more detail see 'QR Stations go solar', Fact Sheet, <http://brightthing.energy.qld.gov.au/downloads/Solar%20at%20QR.pdf>

<sup>xxxviii</sup> 'Queensland Government Response to the Environment and Resources Committee's Energy Efficiency Improvements Inquiry report 'Energy Efficiency : Queensland's First Energy Resource'', tabled in Queensland Parliament, August 2010. p.12; A 1 GW coal fired power station might typically consume 1-1.5 million tonnes of coal a year, so a 500MW power station could be expected to consume roughly half that amount -- 1 million tonnes at most. The additional 500MW of solar capacity being added, however, would replace significantly less than 500MW of coal. Thus, the notion that 500MW of new solar capacity would displace the use of 1 million tonnes of coal annually is a very conservative estimate. It is likely to displace significantly less than that amount..

<sup>xxxix</sup> Current projections suggest that Queensland coal exports will grow at around 8.5% between now and 2015. (see: Stolz, David., Department of Infrastructure and Planning, Australia-Japan Coal Workshop, June 2009. (Slide 4)). This equates to about 13.7 more tonnes of coal per or 1.15 tonnes a month. The amount of CO<sub>2</sub> we are increasing on an annual basis through coal exports is increasing by 37mt a year, and by 3.1mt every month. Assume 2.7 tonnes of CO<sub>2</sub> per tonne of coal – conversion factors courtesy of Energy Strategies Ltd.

<sup>xl</sup> A 100 wagon train with each wagon carrying 100 tonnes of coal equates to 27,000 tonnes of CO<sub>2</sub>. 31,000 tonnes of offset travel equates to 1.14 trains. On the basis that current exports equate to one train every 32 minutes, the emissions saved by offsetting government travel are erased in less than 37 minutes.

<sup>xli</sup> According to the government, this initiative saved 72,000 tonnes of CO<sub>2</sub> per annum. This equates to 2.67 trains carrying 10,000 tonnes of coal each. At the rate of one train every 32 minutes, the emissions saved by the 'Big Light Switch' are negated by current coal exports every 85 minutes.

<sup>xlii</sup> Current coal exports are 167.9mt per annum and the Queensland government projects an 8.5% over the next decade. At that rate, Queensland coal exports will increase by on average 14.3mt per annum. This equates to an annual increase in coal export CO<sub>2</sub> of 38.5mt, or just over 106,000 tonnes per day. On that basis, the emissions saved by the Bligh government Low carbon diet in just over a year are erased in 15 days. For more detail on coal export stats see: 'Queensland Coal Statistics-- 2009 Calendar year (Production and Employment)', The Department of Mines and Energy, 2010. p.5; For detail on coal export growth projections see: Stolz, David., Department of Infrastructure and Planning, Australia-Japan Coal Workshop, June 2009. (Slide 4)

<sup>xliii</sup> The ClimateSmart Home Service is projected to save 5.3mt of CO<sub>2</sub> over the lifetime of the improvements. At current rates, the CO<sub>2</sub> exported in Queensland coal will increase by an average of 742,000 tonnes per week over the next decade. On that basis, the emission savings claimed for the ClimateSmart Home Service are erased by coal export growth in 7.14 weeks. Queensland Government Submission to the Prime Minister's Task Group on Energy Efficiency', 7 June 2010, p.9. <http://www.climatechange.qld.gov.au/whatsbeingdone/q2-target.html>

<sup>xliv</sup> The estimated 10.1 million tonne of CO<sub>2</sub> saving annually 'if every household reaches the target' comes from *ClimateQ* op.cit, p.69

<sup>xlv</sup> The Queensland government projects that by 2020, cutting Queenslanders carbon footprint by a third would save 10.1 million tonnes. Coal exports are growing at 39.3 tonnes (106,000 tonnes of CO<sub>2</sub>) per day. On that basis it would take 95 days of coal export growth to erase the emissions saved if Queenslanders' carbon footprint is cut by one third.

<sup>xlvi</sup> Rio Tinto's Clermont mine will produce 12 million tonnes of CO<sub>2</sub> per annum—which equates to 32.4mt of CO<sub>2</sub> per annum. This compares with the targeted 10.1 million tonnes of CO<sub>2</sub> savings targeted by the Queensland government by 2020 in cutting the carbon footprint of Queenslanders' 1/3<sup>rd</sup>. See: <http://www.coolum-news.com.au/story/2010/10/15/rio-opens-13b-thermal-coal-mine-in-qld/>

<sup>xlvii</sup> Over 10 years, the plan to cut Queenslanders' carbon footprint by 1/3<sup>rd</sup> cuts 10.1 million tonnes annually with an annual average increase in emissions savings over 10 years of 1.01m tCO<sub>2</sub>. At this rate, 115 t of additional CO<sub>2</sub> is being saved every hour. At that rate about 105t of CO<sub>2</sub> is saved during this 55 minute presentation. Coal exports, meanwhile are increasing at a rate of 13-14mt per annum which equates to an increase in CO<sub>2</sub> of 35-37mt per year. That equates to an hourly increase in CO<sub>2</sub> from coal export growth of around 4,080t—about 4,000 tonnes during this 55 minute presentation.

<sup>xlviii</sup> For more on the 50mtpa LNG industry envisaged by the Queensland government see: 'Multi-billion dollar Gladstone LNG projects – a step closer', Media Release by Premier Anna Bligh, Friday, August 28, 2009. LNG produces 2.8 tonnes of CO<sub>2</sub> per tonne of LNG—conversion factor courtesy of Energy Strategies Ltd.

<sup>xlix</sup> Government projections suggest that by 2020, Queensland's own emissions will be at least 180 million tonnes 'in the absence of any additional significant abatement initiatives' (*ClimateQ* op.cit p.20); The government is planning for coal export capacity of at least 300 million tonnes by 2020 (in line with an expectation of up to 370mt by 2025) – see Stolz op.cit. slide 4 . This adds at least 810mt of CO<sub>2</sub> annually. With another 140mt of CO<sub>2</sub> exported in LNG should Queensland succeed in building a 50mtpa LNG export industry, Queensland could be producing 1.13 billion tonnes of CO<sub>2</sub>-e annually by 2020. Saudi Arabia currently exports around 1.36 billion tonnes of CO<sub>2</sub> in its oil (See previous note).

<sup>l</sup> As of 2008, total electricity generating capacity in Queensland was 12,500MW (p.9) of which in 2008 750MW came from renewable sources (p.16). By 2020, demand is expected to increase by 55% from 44,500 gigawatt hours to 69,000 gigawatt hours (p.6). This equates to an increase in generating capacity of at least 6,875 MW (even more, the more the system relies on intermittent renewable sources). Currently solar sources provide 150MW of capacity out of a total of 12,500MW (1.2%). By 2020, the government's plan suggests this would be expanded to 790MW or 4% of a total capacity of 19,375 MW (current capacity plus the 55% increase required to meet projected demand). See: The Queensland Renewable Energy Plan: *A Clean Energy Future for Queensland, State of Queensland (Department of Employment, Economic Development and Innovation) June 2009.*

<sup>li</sup> In 2008, the Queensland government cited \$1.4 billion worth of climate change investments in its 'ClimateSmart 2050' Fact Sheet, Office of Climate Change, 2008. In the *ClimateQ* Strategy released in 2009, another \$200m in 'key investments' are cited. *ClimateQ* op.cit. pp.vi-ix <http://www.climatechange.qld.gov.au/pdf/climatesmart2050.pdf>; According to the Queensland government, 'state agencies and government owned corporations are responsible for delivering (coal infrastructure) projects to the value of \$20.1 billion'. Source: 'Coal Infrastructure Program of Actions 2009 Progress Report', The State of Queensland (Department of Infrastructure and Planning) 2010, p.2. \$20.1b is roughly 13 times the climate change investment being made by the Queensland government.

<sup>lii</sup> *ClimateQ* – op.cit, pp.16

<sup>liii</sup> For an example of the coverage see: 'Queensland to clean up coal fired power' The Australian, 21 August 2009 <http://www.theaustralian.com.au/business/news/queensland-to-clean-up-coal-fired-power/story-e6frg90f-1225764557523> See also: No new dirty coal power for Queensland... with strings attached, by Graham Redfearn, The Courier Mail, 20 August 2009

<sup>liv</sup> For a list of non Annex 1 countries see [http://unfccc.int/parties\\_and\\_observers/parties/non\\_annex\\_1/items/2833.php](http://unfccc.int/parties_and_observers/parties/non_annex_1/items/2833.php)

<sup>lv</sup> According to the government: 'Where new generation capacity is required before commercial-scale clean coal technologies become available, the conditions specified that coal-fired projects would only be considered where power stations can demonstrate... the project is tied to direct foreign investment in a major energy-intensive project in Queensland which might otherwise be attracted to a nation that is a Non-Annex 1 country under the Kyoto Protocol (less stringent emissions standards regarding electricity generation), and they adopt best practice generation.' *ClimateQ* op.cit. p.P5

<sup>lvi</sup> 'More than one million investors want a slice of QR National' *The Brisbane Times*, 10 October 2010. <http://www.brisbanetimes.com.au/queensland/more-than-one-million-investors-want-a-slice-of-qr-national-20101010-16dgv.html>

<sup>lvii</sup> See 'Coal Station Deal Raises Eyebrows' by Adam Morton, *The Age*, 13 September 2010 -- <http://www.theage.com.au/environment/climate-change/coal-station-deal-raises-eyebrows-20100912-1570p.html> ; HRL proposes \$750m dual gas power plant for Victoria, Invest Victoria, Sept 2009 <http://www.invest.vic.gov.au/240909HRLpropose750mdualgaspowerplantforVictoria>; According to Sinclair Knight Merz (consultants to the proponent, Dual Gas Pty Ltd – a subsidiary of HRL Ltd) "The annual GHG emissions are expected to range from approximately 3.0 million tonnes to approximately 3.2 million tonnes". See: 'Dual Gas Demonstration Project – Dual Gas Pty Ltd – EPA Works Approval Application Summary (Final – Amended)', Sinclair Knight Merz, 1 September 2010, p.10; For an example of the Victorian government hailing the project as clean, see: New \$750 million clean coal power station a step closer', Media Release by the Minister for Energy and Resources, 1 July 2008. [http://www.legislation.vic.gov.au/domino/Web\\_Notes/newmedia.nsf/35504bc71d3adebcca256cfc0082c2b8/88d3d4d98cab8a78ca25747a00078360!OpenDocument](http://www.legislation.vic.gov.au/domino/Web_Notes/newmedia.nsf/35504bc71d3adebcca256cfc0082c2b8/88d3d4d98cab8a78ca25747a00078360!OpenDocument)

<sup>lviii</sup> IPCC Special Report -- Carbon Dioxide Capture and Storage, Summary for Policymakers, A Special Report of Working Group III of the Intergovernmental Panel on Climate Change, p.4

<sup>lix</sup> For example, see the IEA projections under a 450ppm scenario in slide 7 of: 'Clean coal and CCS at the IEA', Presentation by Keith Burnard International Energy Agency, ETTIC Workshop, Beijing 13-14 June, 2009. [http://www.iea.org/work/2009/ett\\_beijing/burnard.pdf](http://www.iea.org/work/2009/ett_beijing/burnard.pdf)

<sup>lx</sup> Details on the Canberra HQ of the GCCSI [http://www.globalccsinstitute.com/contact\\_gccsi/contact.html](http://www.globalccsinstitute.com/contact_gccsi/contact.html); Over 20 countries back the GCCSI according to it: [http://www.globalccsinstitute.com/about\\_gccsi/about\\_us.html](http://www.globalccsinstitute.com/about_gccsi/about_us.html); Re the 20 demonstration plant target see: Joint Statement by G8 Energy Ministers, Aomori, Japan, 8 June 2008;

<sup>lxi</sup> The WCI CCS Counter listed 48,649,440 tonnes of CO<sub>2</sub> stored as at 10 October 2010. See: <http://www.worldcoal.org/>

<sup>lxii</sup> See: Table A.5: Large-scale integrated CCS projects in the Operate Stage in: 'The Status of CCS projects – Interim Report', Global CCS Institute, September 2010, p.25 <http://www.globalccsinstitute.com/downloads/general/2010/The-Status-of-CCS-Projects-Interim-Report-2010.pdf>

<sup>lxiii</sup> Globally, around 6 billion tonnes of hard coal is consumed annually. This excludes close to a billion tonnes of lignite. <http://www.worldcoal.org/coal/coal-mining/> Coal Industry Advisory Board – International Coal Market and Policy Developments 2009, Feb 2010, pp.12,19. This equates to 16.2 billion tonnes of CO<sub>2</sub> annually or 44.4 million tonnes of CO<sub>2</sub> a day. Including lignite would take that figure to at least the 48m cited in the WCI CCS counter.

<sup>lxiv</sup> The Global CCS Institute lists 80 'Large Scale Integrated Projects' around the world in its latest assessment of CCS projects. Not one of the projects listed is a large scale coal fired power stations that *currently* captures and store most of their CO<sub>2</sub> emissions. See: 'The Status of CCS projects – Interim Report', Global CCS Institute, September 2010. <http://www.globalccsinstitute.com/downloads/general/2010/The-Status-of-CCS-Projects-Interim-Report-2010.pdf>

<sup>lxv</sup> 'Cleaner world will demand carbon capture and storage', Opinion Piece by Peter Beattie, *The Australian*, 23-4 October 2010

<sup>lxvi</sup> Re: the comparability of a global CCS industry to oil & gas infrastructure, see for example: 'Carbon Capture and Sequestration (CCS)', Topic Paper #17, Working Document of the NPC Global Oil & Gas Study Made Available, National Petroleum Council, July 18, 2007. p.1

<sup>lxvii</sup> According to the International Energy Agency, some US\$3 trillion would be required to build a global CCS network in the decades ahead. See: 'Trillions for CCS to fight climate', Royal Society for Chemistry, October 2009 <http://www.rsc.org/chemistryworld/News/2009/October/21100901.asp>

<sup>lxviii</sup> *Australia's Low Pollution Future: The Economics of Climate Change Mitigation* (Canberra: Commonwealth Treasury, 2008), p.144, 179, 255

<sup>lxix</sup> Assuming these facilities were large 1-gigawatt scale (which is very unlikely – they'd probably be smaller demonstration projects), and assuming that carbon capture and storage (CCS) saves 80–90 per cent of emissions, they might save around 6.5 metric tonnes of CO<sub>2</sub> annually each, or about 130 metric tonnes in total. This is without incorporating the extra energy required by the CCS process – between a quarter and a third more than conventional coal-fired power generation.

<sup>lxx</sup> Current global hard coal consumption is around 6 billion tonnes per annum. Notwithstanding efficiency improvements (According to the World Coal Institute, 21<sup>st</sup> century coal fired plants emit 40% less than the 20<sup>th</sup> century average. <http://www.worldcoal.org/>), Peabody Energy projects global coal demand to increase by just over 3 billion tonnes by 2030, driven in large part by a doubling in demand for metallurgical coal. On that basis, by 2020, it is entirely conceivable that global coal demand may be over 7.5 billion tonnes per annum. Even if 150 million tonnes of CO<sub>2</sub> were saved annually by 2020 should the G8 meet its CCS target through coal projects, emissions from coal burning would still be 20.25 billion tonnes of CO<sub>2</sub> per annum – a quarter higher than today. For Peabody's projections, see (Slide 12) 'Energizing the world one BTU at a time' Presentation by Greg Boyce—Chairman and CEO of Peabody Energy, Barclays CEO Energy Power Conference, 15 September 2010. [http://www.fags.org/sec-filings/100915/PEABODY-ENERGY-CORP\\_8-K/c60242exv99w1.htm](http://www.fags.org/sec-filings/100915/PEABODY-ENERGY-CORP_8-K/c60242exv99w1.htm)

<sup>lxxi</sup> This is based on an assumption that the average 1GW coal fired power station might generate 7 million tonnes of CO<sub>2</sub> annually.

<sup>lxxii</sup> Government figures show that prior to the election of the Rudd government, Australia's emissions would have been 680 million tonnes of CO<sub>2</sub>-e by 2020 (815 million tonnes had nothing been done after 1990, minus an estimated 135 million tonnes per year of abatement measures implemented between 1990 and 2007). According to the Rudd government's own estimates, the impact of all its own measures (except the CPRS, which was not passed by parliament at the time of writing) is to reduce Australia's projected emissions in 2020 to 664 million tonnes. This includes that portion of the RET that did not duplicate previous state-government commitments, the Energy Efficient Homes package announced in 2009 as part of the 'National Building and Jobs Plan' (4.4 million tonnes abatement per year by 2020) and various energy-efficiency measures announced in the 2009–10 budget (2.8 million tonnes per year by 2020). *Tracking to Kyoto and 2020* (Canberra: Department of Climate Change, 2009), 30; *Tracking to the Kyoto Target 2007* (Canberra: Department of Climate Change, 2008), 19.

<sup>lxxiii</sup> The latest national emission accounts suggest that including LULUCF, Australia's emissions are just over 580 million tonnes of CO<sub>2</sub>-e. See: Australian National Greenhouse Accounts—State and Territory Greenhouse Gas Inventories, op.cit. p.1

<sup>lxxiv</sup> *Carbon Pollution Reduction Scheme: Australia's Low Pollution Future*, White Paper (Canberra: Department of Climate Change, December 2008), p.11-9

<sup>lxxv</sup> On the assumption that international trade in permits and credits were capped at 50 per cent of the national mitigation effort up to 2020, Treasury's projections for the CPRS-5 scenario (a 5% emissions reduction target for 2020) do not see significant falls in the actual emissions occurring in Australia until the mid-2030s. See Chart 6.14 in *Australia's Low Pollution Future: The Economics of Climate Change Mitigation* (Canberra: Commonwealth Treasury, 2008) p.155

<sup>lxvii</sup> See: 'Carbon Pollution Reduction Scheme in the National Interest', Media release by Prime Minister Kevin Rudd, Treasurer Wayne Swan, and Minister assisting the Minister for Climate Change Greg Combet, 24 November 2009.

and 'Details of Proposed CPRS Changes', Statement by Penny Wong, Department of Climate Change, 24 November 2009. <http://www.climatechange.gov.au/minister/previous/wong/2009/media-releases/November/mr20091124.aspx>

<sup>lxviii</sup> Then Parliamentary Secretary to the Climate Change Minister, Greg Combet, told the mining industry in early 2009 that the CPRS was designed to accommodate growth in emission intensive industries. For that reason, unlike the emissions trading scheme proposed in the US 'there is no upper limit on the share of free permits being provided to emission-intensive trade-exposed industries'. 'Address to the Minerals Council of Australia Annual Minerals Week Conference', Parliamentary Secretary for Climate Change Greg Combet, Hyatt Hotel Sydney, 27 May 2009

<sup>lxviii</sup> See 'Transcript of joint press conference', Prime Minister, Julia Gillard and Deputy Prime Minister Wayne Swan, Parliament House, Canberra, 24 June 2010 <http://www.pm.gov.au/node/6855> ; 'Gillard replaces Kevin Rudd as Prime Minister of Australia', Adelaide Advertiser, 24 June 2010 <http://www.adelaidenow.com.au/news/national/rudd-faces-party-challenge-number-crunch/story-e6frea8c-1225883388264> ; 'Breakthrough agreement with industry on improvements to resources taxation', Joint Statement by Prime Minister Julia Gillard, Deputy Prime Minister and Treasurer Wayne Swan, and Minister for Resources and Energy Martin Ferguson, Parliament House, Canberra, 2 July 2010 <http://www.pm.gov.au/node/6868>

<sup>lxix</sup> Coal industry is safe says Greg Combet, The Australian, 13 September 2010 <http://www.theaustralian.com.au/national-affairs/coal-industry-is-safe-says-greg-combet/story-fn59niix-1225919936683>

<sup>lxxx</sup> For a good primer on the services-based nature of the Australian economy see: 'An Introduction to the Australian Economy,' paper by Saul Eslake, Chief Economist, ANZ Bank, Fourth Edition, January 2007; 23% of our exports estimate comes from the Australian Coal Association ([http://www.australiancoal.com.au/the-australian-coal-industry\\_coal-exports.aspx](http://www.australiancoal.com.au/the-australian-coal-industry_coal-exports.aspx)); Australia's mining industry accounts for around 7.5% of GDP according to the ABS—coal mining generates around half of this. The Australian Coal association claims that the coal industry generates 3.7% of GDP. They also claim the industry directly employs 37,000 people according—roughly 1/3<sup>rd</sup> of 1 per cent of Australia's current workforce of 11.3 million people.

[http://www.australiancoal.com.au/resources.ashx/FurtherReadings/21/DocumentFile/3591A037E34606AE9637981CB1843CA3/The\\_Aust\\_coal\\_i ndustry.pdf](http://www.australiancoal.com.au/resources.ashx/FurtherReadings/21/DocumentFile/3591A037E34606AE9637981CB1843CA3/The_Aust_coal_i ndustry.pdf) '6202.0 - Labour Force, Australia', Australian Bureau of Statistics, September 2010 <http://www.abs.gov.au/ausstats/abs@.nsf/mf/6202.0> [http://www.newgencoal.com.au/issues\\_coal-in-australia\\_coal-and-australian-jobs.aspx](http://www.newgencoal.com.au/issues_coal-in-australia_coal-and-australian-jobs.aspx)

<sup>lxxxi</sup> For example, in 2010-11, the Queensland government anticipates coal royalties to contribute \$2.76 billion – 70% more than the previous year. This is around 6.8% of total government revenue. 'Budget Strategy and Outlook', Queensland Treasury, p.87 <http://www.budget.qld.gov.au/budget-papers/2010-11/bp2-4-2010-11.pdf> In relation to New South see Pearse, Guy., Quarry Vision: Coal, climate change, and the end of the resources boom', *Quarterly Essay 33*, Black Inc, 2009 p.14 & 98

<sup>lxxxii</sup> During the decade to December 2009, the Queensland government estimates that it has received \$11.4b in coal royalties. Source: Answer by the Minister for Natural Resources, Mines and Energy, and Minister for Trade (Mr Robertson) to Question on Notice—No. 155 (asked: Tuesday, 23 February 2010); Parliament of Queensland

<sup>lxxxiii</sup> *Zero Carbon Australia – Sustainable Energy Plan*, Beyond Zero Emissions, Melbourne, June 2010

<sup>lxxxiv</sup> See: *Zero Carbon Australia Stationary Energy Plan* op.cit See also: Diesendorf, Mark., *Climate Action: A Campaign manual for greenhouse solutions*, UNSW Press, Sydney 2009., pp62-86

<sup>lxxxv</sup> Coal industry is safe says Greg Combet, The Australian, 13 September 2010 <http://www.theaustralian.com.au/national-affairs/coal-industry-is-safe-says-greg-combet/story-fn59niix-1225919936683>

<sup>lxxxvi</sup> See: Pearse, GD 'On Borrowed Carbon' chapter in Mannne/McKnight's *Goodbye to All That*, Black Inc 2010 p.253; According to Access Economics' estimates for the Clean Energy Council, the capital cost of new

renewable capacity ranges from around \$2.2 billion per gigawatt (onshore wind) to \$7.5 million per gigawatt (solar photovoltaic). However, these estimates are based on capacity of less than 120 megawatts –

the cost of much larger-scale power installations of 1 gigawatt would be significantly lower. 100 gigawatts

of renewable capacity would be required to replace the nearly 30 gigawatts of existing coal-fired power,

with back-up gas available to meet any additional demand (source: Mark Diesendorf, University of

New South Wales, private communication to author, September 2009). Assume another 15GW to power half of the car fleet. Incorporating a mix in different renewable technologies at an average of \$2.75 billion per gigawatt, the total cost might be \$316 billion – or \$31.6 billion a year between now and the end of 2020. The government share of a dollar-for-dollar deployment would be \$15.8 billion a year from 2010–20.

<sup>lxxxvii</sup> Chris Riedy, 'Energy and Transport Subsidies in Australia,' report by the Institute for Sustainable Futures, University of Technology, Sydney (2007), iv. Available at [www.greenpeace.org/australia/resources/reports/climatechange/energy-and-transport-subsidies](http://www.greenpeace.org/australia/resources/reports/climatechange/energy-and-transport-subsidies) .

<sup>lxxxviii</sup> See Pearse, GD 'On Borrowed Carbon' chapter in Mannne/McKnight's *Goodbye to All That*, Black Inc 2010 p.251. If Australia adopted a 25 per cent emission reduction target by 2020, its 'abatement task' would rise to 249 million tonnes annually by that year. This is the difference between Australia's projected emissions in 2020 (taking account of all existing Rudd-Gillard government measures requiring cuts in Australia) and what Australia would be allowed if it accepted a limit 25 per cent below 2000 levels. At \$30–\$75 a tonne with all of it per cent outsourced (as was allowed for under the 'Carbon Pollution Reduction Scheme', the cost would equate to \$7.5–\$18.7 billion annually. With no limit on outsourcing, however, it is possible that emissions in Australia could rise beyond this projection, necessitating an even larger carbon import bill. See *Tracking to Kyoto and 2020*, 11–13. If we take the low end of the range for the annual cost of importing carbon credits, it is still less than the combined cost of the Snowy Mountains Scheme, Sydney Harbour Bridge and the Sydney Opera House. The Snowy Mountains Scheme cost is estimated at nearly \$6 billion in 1999 dollars. See Tim Besley, 'The Need for Infrastructure Projects – Then and Now: The Snowy Mountains Scheme and the "Speedrail" Sydney–Canberra Very High Speed Train Project,' *ATSE Focus* No. 109 (Australian Academy of Technological Sciences and Engineering: November/December 1999). Sydney Harbour Bridge construction cost around \$390 million in 2002 dollars (source: Financial Demographics, '70th Birthday for The Bridge,' 19 March 2002). Sydney Opera House completion cost around \$400 million in today's dollars (source: Andrew McIntyre, 'Cathedrals and the Birth of Freedom', *IPA Review*(Institute of Public Affairs, undated), available at [www.ipa.org.au/people/andrew-mcintyre](http://www.ipa.org.au/people/andrew-mcintyre) (accessed 5 October 2009).

<sup>lxxxix</sup> For more detail on this estimate, see: Pearse, GD 'On Borrowed Carbon' chapter in Mannne/McKnight's *Goodbye to All That*, Black Inc 2010 p.253. The calculations were based on the 'Carbon Pollution Reduction Scheme' and assumed that ETS revenue of roughly \$15 billion annually between 2010 and 2020. Incorporating \$15 billion a year in ETS revenue and \$10 billion in carbon subsidies that would be abolished, the total cost to government of the agenda outlined in 'On Borrowed Carbon' was likely to be less than around \$5 billion annually between now and 2020. (This factors in the following annual average amounts: \$1.5 billion for redesigned ETS compensation targeted at efficiency rather than offsetting carbon price impact; \$10 billion in lost state and federal tax revenue from coal phase-down; \$13.5 billion government contribution towards 100-gigawatt renewables capacity; \$2.13 billion contribution to additional 15 gigawatts required to switch 50 per cent of cars to renewable electricity; and \$3 billion for contribution to reducing emissions from deforestation and degradation. As the CPRS proposal redistributed all ETS revenue as

compensation, government would have been left with a net cost of some \$10 billion annually in CPRS carbon subsidies. It also faced the prospect of spending billions more to import carbon credits itself – as flagged in the Rudd government commitment to contribute to any 25% post-Kyoto target by buying carbon credits abroad. (See: ‘A new target for reducing Australia’s carbon pollution’, Media Release by Climate Change Minister Penny Wong, 4 May 2009) <http://www.climatechange.gov.au/minister/previous/wong/2009/media-releases/May/mr20090504c.aspx>

<sup>xc</sup> This assumes a GDP of around \$1.5 trillion by 2020 under business as usual. Losing coal would cost around 3 per cent of projected GDP; and the cost of losing half the steel, aluminium and other Emission Intensive Trade Exposed industries would be similar. Together, this cost would equate to about \$100 billion a year, leaving a GDP of around \$1.4 trillion or about 30 per cent more than today’s GDP of \$1.1 trillion. For more detail see: Pearse, GD ‘On Borrowed Carbon’ chapter in Manne/McKnight’s *Goodbye to All That*, Black Inc 2010 p.256; *Australia’s Low Pollution Future: The Economics of Climate Change Mitigation* (Canberra: Commonwealth Treasury, 2008), 145, 164; Australian Bureau of Agriculture and Research Economics (ABARE), Department of Innovation, Industry, Science and Research.

<sup>xc1</sup> ‘Old King Coal’ by Michael Bachelard, *The Age*, 8 November 2009

<sup>xcii</sup> Kevin Rudd, ‘Climate Change: The Great Moral Challenge of Our Generation,’ available at Labor TV, [www.alp.org.au/labortv/uKTHPU1yia](http://www.alp.org.au/labortv/uKTHPU1yia) (accessed 5 October 2009).

<sup>xciii</sup> The coal mining industry generates around 5% of Queensland’s Gross State Product. The petroleum sector accounts for around 45% of Saudi GDP. Sources: ‘Queensland mining industries – The economic significance of mining and mineral processing to Queensland (Summary report), The State of Queensland (Department of Mines and Energy) p.20 [http://www.dme.qld.gov.au/zone\\_files/mines\\_pdf/acil\\_tas\\_sr.pdf](http://www.dme.qld.gov.au/zone_files/mines_pdf/acil_tas_sr.pdf) ; CIA World Factbook <https://www.cia.gov/library/publications/the-world-factbook/geos/sa.html>

<sup>xciv</sup> Of the \$25 billion in coal related infrastructure identified in the Coal Infrastructure Program of Actions 2009 (CIPA), the government ‘the Queensland government says that State agencies and government owned corporations are responsible for delivering projects to the value of \$20.1 billion’ Source: ‘Coal Infrastructure Program of Actions 2009 Progress Report: Identifying the needs of Queensland’s coal industry including rail, ports, rollingstock, water, skills, energy, housing and planning. The State of Queensland (Department of Infrastructure and Planning) 2010, p.2; With the same funds, going halves with the private sector, Queensland could build 14.6GW of renewable capacity, replacing 4.42GW coal fired – nearly 1/2 of the state’s existing coal fired capacity. Qld has 9GW of coal fired capacity(Source: [http://www.dme.qld.gov.au/Energy/power\\_stations.cfm](http://www.dme.qld.gov.au/Energy/power_stations.cfm)) This estimate is based on Clean Energy Council estimates used in Pearse, GD ‘On Borrowed Carbon’ chapter in Manne/McKnight’s *Goodbye to All That*, Black Inc 2010 p.253; Assume 3.3 GW renewable required to replace 1GW coal-fired. Assume \$2.75b capital cost of 1GW of renewable capacity.