# *Quarry Vision: Coal, climate change & the end of the resources boom*

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## March/April 2009

In discussing Quarry Vision tonight, I'm going to try out a new very clean technology. It's not quite ready for commercial deployment on a meaningful scale. However, it's alluring to think it might just be around the corner—no, I'm not talking about 'clean coal' but time travel. Consider tonight's speech a small scale 'demonstration project.'

I want you to imagine that it's now 2030. Climate change is ubiquitous as Australian communities do the temperature and rainfall equivalent of moving hundreds of kilometers inland; severe weather events are increasingly deadly and routine; and when Barrier Reef tourism operators say their 'offer won't last' they really mean it. We've already spent hundreds of billions of dollars through taxes and other bills to adapt, and it's set to get much worse.

Against expectations, the global community did thrash out a climate change agreement to succeed the Kyoto Protocol, but it is not what many had hoped. If all goes well atmospheric greenhouse gas concentrations should stabilize at a level equivalent to 575ppm CO2 later this century. That's roughly double the range seen over the past 650,000 years; severe impacts across much of the world are self evident, and various catastrophic impacts are now a virtual coin toss. Kevin Rudd surprised many people in Copenhagen in 2009 by ultimately agreeing to reduce Australian emissions by 18 per cent on 2000 levels by 2020. With that achieved, Australia is on track to meet its targeted 60% emissions reduction by 2050. Australia is doing its bit—or so it seems.

But all is not what it seems in 2030, and some big problems are starting to surface. Globally, Barack Obama's secretary of Energy, Stephen Chu was right back in 2009 in saying that his own country, along with other large emitters and coal producers, weren't about to turn their back on coal. Politically, that was too hard. Yet, in spite of the billions spent on developing "clean coal" technology, the reality never lived up to the hype. Obama's claim that clean coal could make America energy-independent is a change that no-one believes in any more. Today, a handful of 'clean coal' plants—

mostly in developed countries—capture and bury less than 5 per cent of the emissions generated from coal. Almost none of the more than one thousand conventional coal fired power stations built in developing countries since 2010 capture and store their emissions.

Largely because carbon capture and storage (CCS) hasn't delivered in time, emissions from fossil fuel burning are still rising globally. However, this has been kept in check on paper mainly because coal dependant countries have been able to effectively hide their emissions. Rather than turning away from fossil fuels they have offset their emissions on the international carbon market. This trade has been dominated by cheap credits created through what is euphemistically known as 'natural storage.' Most credits have been generated by avoiding deforestation in developing countries. Others came from storing carbon in forest plantations and in charcoal.

While protecting rainforests and enriching soils with charcoal has been worthwhile, enmeshing these activities with emissions trading has been highly counterproductive. Unfortunately, these 'biocarbon' options were used as a substitute for emission cuts—buying polluters another couple of decades. Had they instead been used in addition to cutting greenhouse pollution, there would have been more scope to return the climate to safer territory. That opportunity has been squandered. As one of the most coal-addicted nations in the world, Australia—perhaps predictably—took the easy way out, meeting its international obligations by writing checks to outsource its emission cuts as it crossed its fingers for clean coal.

Most people assumed that the Copenhagen Protocol required Australia to cut its own greenhouse pollution—not realizing that the emission cuts Australia agreed to make didn't have to be made in Australia. As a result, today--in 2030—our actual greenhouse pollution in Australia—the emissions from our smokestacks and tailpipes--is about what it was in 2000—around 550 million tonnes a year—right in line with what Treasury projected back in 2008. So, we're 'on track' with our official targets, but our biggest polluting industries are just as dependent on conventional coal burning as they were in 2010, and renewable energy remains a sideshow by comparison.

To make matters worse, the emissions generated by our coal exports have almost doubled to well over 1.2 billion tonnes of CO2 a year. This now makes us the largest 'carbon mule' in the world—bigger even than Saudi Arabia whose oil production has

peaked years ago, as many warned it might. Between Australia's actual greenhouse pollution and its coal export emissions our overall carbon footprint is 50% bigger than in 2010.

It begs the question: How in 2030 after 2 decades are we on track to meet our official targets, yet we're a bigger contributor to climate change than ever? What happened to the 'economic transformation', the 'low pollution future', and the 'green jobs' we were promised?

Looking back, we couldn't shed our 'quarry vision'—the rose-coloured glasses through which we viewed the importance of the resources sector—particularly the coal industry. Too many of us uncritically accepted that the resources sector was Australia's economic backbone. We weren't alone.

TV News directors routinely imagined that Australia wouldn't sleep soundly without knowing the closing price of BHP Billiton and Rio Tinto every night. Successive Prime Ministers called Australia an energy superpower. Some political leaders actually assured us that resources accounted for over 1/3rd of Australia's GDP; so we imagined millions of fellow Australians employed in the mines; we had the impression that government coffers were only ever awash with cash thanks to the quarry; we assumed that our stock market and a comfortable retirement depended on the ongoing success of digging and drilling.

In hard times, we thanked the resources sector for saving us from the fate that befell most other countries—especially during the Great Recession of 2008-2015. As boom turned to extended bust, we imagined the supercycle was just pausing for breath, safe in the received wisdom that the world couldn't do without our underground treasures—especially China. Believing that coal, our biggest quarry export, would soon be burned cleanly, we dared not imagine a future without it.

Looking back, almost all our assumptions about the quarry were wrong. It was less than 1/3rd as big as we're told—less than 15% of GDP at the height of the resources boom, even with mining, services to mining, minerals processing, metal production and all fossil fuel energy included. For many years the black economy was worth roughly as much as our precious black coal exports.

Too few of us realized that the quarry contributed less than 1 job in 20 until 2010, and even fewer since then. Twice as many people worked for McDonalds as there were coal miners; Bunnings employed 50% more people than the entire aluminium industry. And, far from underwriting our retirement, more than 90% of our superannuation holdings were not tied up in quarry industries. Indeed, resources went from being the largest sector on the ASX in 1992 to being the smallest by 2006. Yet, as its real importance diminished, in our minds it was still our great strength.

We wrongly assumed the quarry was mostly Australian-owned, not realizing that Australian-sounding companies like Cement Australia, for instance, were owned by UK, Swiss and Mexican interests. Even the 'Big Australian' was mostly foreign owned, as were all the other coal mining giants: Rio Tinto, Xstrata, Anglo, and Peabody. Across the resources sector—the profits mainly went offshore.

We were too focused on digging deeper to notice that the resources sector paid a fraction of the taxes we imagined—at the time, perhaps 4 in every 100 tax dollars federally. The quarry was important, but not our economic backbone. In reality, we were service-providers--services generated 75% of GDP and jobs. As a former sugar farming client of mine once sneered at me suspiciously—'Australia is a nation of backscratchers'. And we still are today.

Looking back, we failed to learn from history, squandering the proceeds of the boom when history suggested that the windfall would be temporary. Rather than setting money aside during the good times, we piled on permanent liabilities—blowing tens of billions of dollars on income tax cuts and superannuation tax breaks—which all needed funding or reversing later when the boom ended. Where we did spend on lasting infrastructure, much of it was directed to digging deeper—particularly in coal mining—as if the bust would never come, as if coal could be exported indefinitely in ever larger quantities.

It was in stark contrast to Norway, which as the world's 3rd largest oil exporter was also exposed to climate change and peak oil. Norway knew the wells would eventually run dry and to their credit, they steadily set aside a portion of all their oil revenues. By 2008, they'd amassed a future fund bigger than their GDP. While Norway prepared for the future, we were busy protecting the past. It makes more sense when you understand that a generation Australian policymakers consciously and fatefully decided to turn coal into our national competitive advantage.

As recently as the 1970s, Australia's energy supply wasn't particularly emissions intensive, nor were we a very big coal exporter. However, that decade saw the oil shocks, and increasing demand for coal. It's well known that Australia cut tariffs, relaxed foreign investment restrictions, and floated the currency—all in a bid to turn Australia's economy outward, to become more trade-oriented and internationally competitive. What's less well appreciated is that we deliberately increased energy consumption by using cheap coal to make Australia the international destination of choice for footloose investment in energy intensive industries like Aluminium. What our manufacturers lost without protection, we hoped to gain from increased exports and energy intensive investment.

Government knew full well this would increase greenhouse emissions—the addition of just one new aluminium smelter is the emissions equivalent of a million cars—but they went ahead anyway, fencing off energy policy from rising concerns about global warming. Whole chapters relating to climate change were cut out of official energy policies before publication because, as one long time carbon lobbyist told me: 'senior public servants perceived it as their patriotic duty to prevent the coal industry from being undermined by an untoward focus on something that in their thinking was a load of cobblers.' We chose to become the developed world's greenhouse ghetto, and we've been defending that decision and working around it ever since.

This coal-fired mindset explains why Australia fell for the idea that energy intensive industries were scouring the globe looking to avoid a carbon price; that as more countries made polluters pay—through emissions trading or a carbon tax—multinationals would move their operations to developing nations to burn coal with impunity for decades to come; as if aluminium smelters and steel mills might somehow be tossed into a backpack and whipped off to Indonesia or China. Unless we carved these industries out of our emissions trading scheme we were assured that Aussie jobs would needlessly 'leak' offshore and the environment would inevitably be worse off because developing countries had lower environmental standards. In fact, something different was happening. The same companies were actually flocking to places like Iceland to take advantage of plentiful and cheap energy that was also renewable—not something Australia chose to offer though its renewable energy resources rivaled any country in the world.

In Iceland, companies such as Alcoa took advantage of abundant hydroelectric power, and expanded their operations with equally abundant geothermal resources. All of the major aluminium companies in Australia who led us to believe cheap coal and no carbon cost was the key to competitiveness relied mainly on renewable electricity elsewhere: Alcoa, Rio Tinto, Rusal, Hydro Aluminium. Using renewable energy to avoid any carbon liabilities was much safer than relying on political promises.

So, countries like Canada and Russia made the most of their competitive edge in producing aluminium cleanly; Brazil, and later the Congo, both attracted BHP Billiton to smelt aluminium using hydropower; Alcoa did the same in Greenland of all places; they even bought a stake in a hydro powered smelter in China; Rusal, meanwhile, also turned to renewable energy in China taking power from a chain of hydro plants on the Huang He (Yellow) River; the Chinese government went ahead with large scale hydro projects to power smelting in Tibet. A similar shift was seen in various energy intensive commodities. Of course, heavy use of hydro power to produce aluminium was not without it's own very significant environmental problems. But when it came to greenhouse pollution the same companies moving away from fossil fuels abroad screamed for cheap coal and carbon subsidies in Australia or else. They wore green shorts when playing away, black shorts at home.

In hindsight, when the prospect of pricing carbon became real in Australia in 2008-09, we were completely spooked by a few industries that were 'emissions intensive' or 'trade exposed': E-I-T-Es as they were known at the time: EITIs; or YETIs as I prefer to call them—for their legendary capacity to use scary myth to frighten policymakers and the general public. Our YETIs threatened to plunge Australia into a new dark age by shutting coal fired power stations in 4 states, shedding up to a million jobs, shrinking whole industries, and fleeing Australia, just to avoid a carbon price. Perhaps the most abominable YETI, Woodside Petroleum, even threatened to float one project to East Timorese waters just to avoid paying for its pollution. The head of the minerals council claimed that even a 5% cut in emissions would mean moving to 'a candles economy, riding horses and (shutting) down your transport sector and your power generation.'

If only more of us noticed the evidence at the time debunking the YETI mythology. Modeling by the Treasury confirmed in late 2008 that there was almost no evidence to support claims that carbon and jobs would leak offshore en-masse if Australia made polluters pay for their emissions; the economy would nearly treble by 2050 even if

Australia made 60% emission cuts; and almost every industry—including the resources sector—would grow strongly rather than shrink, compared with today. Treasury also found that giving free permits to industries like aluminium didn't significantly alter their long term output in Australia. Other research confirmed that making deep emission cuts sooner created hundreds of thousands more jobs than it cost, but somehow it went over our heads—we were gullible and afraid of the YETIs.

After 11 years of denial and delay under John Howard, Ross Garnaut's early comments suggested that perhaps he might just stand up to the carbon lobby. However, hopes were dashed in the fine print of Garnaut's reports. He fell for the carbon leakage spin. He suggested vaguely that something less than 30% of the money raised by emissions trading should be enough to preserve the international competitiveness of trade exposed emission intensive industries—in other words: consumers should hand tens of billions of dollars to the worst polluters. And this carbon subsidy should last until Australia's competitors in each of these industries faced a similar carbon cost—which could take forever if trade negotiations were any guide. Finally, he proposed a limit on the extent to which Australia might outsource its emission cuts to other countries—he didn't suggest a number but suggested it be a limit so lax that it is never really tested.

Garnaut made clear that if other countries wanted to live within their emissions allocation that was their choice, but there was nothing wrong with Australia paying other countries to make its emissions cuts to offset our polluting lifestyle. If Australia wanted lots of carbon living space or 'lebensraum', if you like--so be it. Garnaut had recognized Indonesian and PNG rainforests as the perfect place to hide greenhouse pollution on the cheap and avoid emission cuts in Australia. Annual emissions from deforestation in these two countries alone were 3 times Australia's total emissions. Paying landholders not to log could effectively offset pollution in Australia—and various estimates cited by Garnaut—from the Stern Report and the World Bank--suggested the price might be US$1-3 – perhaps less than 1/10$^{th}$ of the price of a tonne of CO2 expected otherwise.

'We are talking about emission entitlements, not actual emissions," explained Garnaut. Paying others to cut emissions for us, to use his words, "would benefit both sides...the financial flows would benefit Indonesia and PNG while Australia would benefit from access to low-cost abatement options." As Garnaut's work concluded, a worrying sense of déjà vu emerged. Reduced deforestation in Australia since 1990 had enabled John Howard to argue for years that we were on track to meet our Kyoto

targets—meanwhile actual greenhouse pollution had increased by over 1/3rd. Garnaut now offered Australia a similar way out of any future commitment, only on a much grander scale. Australia could achieve any target it took home from Copenhagen in 2009 without making any cuts in actual pollution at home.

Kevin Rudd, meanwhile, had been elected on a promise of making deep cuts in Australia's emissions, and coming up with what he called a 'blue print for reducing carbon pollution at home'. Instead, Australia got the Carbon Pollution Reduction Scheme: a document in keeping with the Yes Minister tradition of always disposing of the difficult bit in the title because it does much less harm there than on the statute books. The CPRS did not reduce carbon pollution in Australia as was promised. In line with Treasury's 2008 projections, actual emissions were higher in 2020, and by 2050 actual pollution would be back where it was in 1990. Treasury assumed that only half of Australia's obligations might be met by buying emission permits and credits from offshore, but Rudd set no limit. This rendered much of the debate over the size of Australia's 2020 emissions target somewhat redundant. After all, if all our emission cuts could be outsourced cheaply, then all that the government promised—the 'economic transformation', the 'low pollution future', the green jobs, would also be fully outsourced whether we adopted a 5% target for 2020 or a 40% target.

Having allowed Australia to outsource all its emission cuts, Rudd nationalized the cost with a spectacular money-go-round of compensation payments: to small businesses, householders, and dozens of adjusted welfare payments. The ostensible aim was to help offset the impact of emissions trading on energy costs—estimated at $312 per household per year. The real aim was ensuring that amidst the flurry of checks, people couldn't properly identify the winners and losers. 'No-one gets a free ride', said the government. Their glossy PR material claimed that 'under the scheme, Australia's biggest polluters will pay for the pollution they generate'. But, what the government carefully didn't say was that the biggest emitters would only pay for on average one in every 5 tonnes of their pollution—the rest of us paid for the other 4 tonnes.

Of course, had men in suits representing the dirtiest industries knocked on our front doors and asked us to write them a check for $500 per household every year until 2020 and beyond to pay for their emission permits we'd have told them where to go. Had power companies billed each household $455 to prop up the value of their coal-fired power stations, we wouldn't have paid it. Had coal companies come out to our houses and asked each one to fork out $93 to cushion them from a carbon price they'd

have been laughed at. So they knocked on Kevin Rudd's door instead, where they got a much better reception. Unbeknown to most households, Rudd effectively agreed to write all these checks on our behalf. By continuing the siege defence of our coal fired economic strategy, he made it mathematically impossible for Australia to achieve deep cuts in its own greenhouse pollution, and left Australia no option but to outsource its emission cuts—to rely on 'carbon colonialism' to meet its obligations.

Perhaps our greatest folly as a nation was falling for the PR campaign around 'clean coal.' We were constantly assured that 'clean coal' was just around the corner; hardly a week went by without a grip n grin moment for the cameras involving a senior minister announcing some new clean coal milestone or funding commitment. Little did we know the biggest coal mining union was also the biggest external donor to the ALP federally. Government agencies whose staff appeared in clean coal PR didn't exactly publicize the fact that they depend on coal industry funding for their work? We weren't to know that the sky blue colour used by the coal industry in its PR was chosen because people subliminally associate it with clean technology. It wasn't immediately obvious that the federal government was spending far more to double coal exports than it was on cleaning coal use up. The coal industry didn't mention that for every $10 it got per tonne of coal it was only spending 1 cent on its clean coal fund? And few people knew that Kevin Rudd's Resources and Energy Minister had told a gathering of climate sceptics at Parliament House that Labor wouldn't touch the coal industry until clean coal arrived.

Nor did most of us realise that the amount of carbon dioxide being stored underground by 2012 in all of Australia's coal-related CCS projects was roughly equivalent to taking all of the cars off the road in Tamworth. Few people appreciated how modest the interest in clean coal actually was internationally: that 48 of the 61 projects cited as progress were located in just three countries (Australia, the US and Canada); that none of the projects listed were in India, Russia or South America.

Most had no idea that the CCS project in China showcased by our political leaders when they visited Beijing was one of just a few in the entire country, or that it was part-funded by the Australian government. None of the media coverage of this demonstration project mentioned that it was the emissions equivalent of taking all the cars off the road in Nimbin. The illusion of progress achieved its main objective which wasn't to clean up coal use, but to keep coal exports off the greenhouse policy table.

Somehow, we ignored all the warnings that CCS wouldn't deliver in time: Treasury's modeling suggesting that it wouldn't even happen in Australia until between 2026 and 2033; international forecasts that it would not even begin to be rolled out in developing countries until 2025. We ignored the warnings of electricity generators whose excitement about CCS had been replaced by serious doubts about its viability long before 2010. And, we ignored the scientific community—people like James Hansen of NASA's Goddard Institute who warned us in 2008 that it was untenable to keep burning the coal, even for another decade.

Instead, we dug deeper, knowing the coal export emissions didn't show up in Australia's official emissions, because they are counted where the coal is ultimately burned. And, as long as we could outsource our emission cuts, there was no need to change our ways or transform our economy. Now, in 2030, it is coming back to bite. Our economy is still one of the dirtiest, the cost of outsourcing carbon liabilities is increasing, and the emissions generated by our coal exports are so big they are too conspicuous to ignore. As we've postponed the day or reckoning, other countries have decarbonised, but we've missed those opportunities.

If only we could return to 2009 and make better choices. Along with a strong emissions reduction target, if our children's generation were granted three wishes, what might they have had our governments do differently?

Well first, they might have placed a tight limit on outsourcing so that the vast majority of the emissions cuts made by Australia were actually made in Australia. They'd have stipulated that polluters can meet say 10% of their emissions trading obligations at most through permits and credits sourced from abroad. That would have plugged the biggest hole in Australia's response. Allowing some carbon credits generated offshore would have been worthwhile; making the global effort more cost-effective, and transferring funds and technology to developing countries to help them industrialize more cleanly than we have. But it should never have been allowed to take the place of emission reduction at home. Had Australia set a tight limit on outsourcing, we would have been part of the transition to renewable energy, not merely a donor to it.

Secondly, government should have simplified and greatly abbreviated the compensation for YETIs—our EITEs – emission intensive trade exposed industries. Some of them did face a genuine adjustment but it was greatly overblown and it was something they saw coming for nearly 2 decades. Yet, the government proposed a

complex set of arrangements that cost more overall with each passing year. In practice, it entrenched a new system of corporate welfare from which it became impossible to extricate the taxpayer. It also provoked our trade competitors into adopting similar carbon subsidies, something that will take decades to unravel. This could have been avoided if the government set aside an overall percentage of emission trading revenue to help such industries through the transition, and phased down the assistance entirely by 2015. That would have addressed their transitional difficulties without defeating the purpose of emissions trading—and it would have left us with a whole lot more money to spend on everything from energy efficiency programs here to rainforest protection offshore. Of course, had we rapidly phased down transitional assistance--lobbyists, lawyers and accountants wouldn't have had such a lucrative time arguing for years that we must retain carbon subsidies because carbon prices in Mongolia or Mozambique are not yet quite equivalent to ours—but that wouldn't have been such a great loss now would it.

Finally, Australia should have announced a timetable to phase-out its coal industry. As recently as 1939, the United States had contingency plans for war with Great Britain—yes, Great Britain. Yet, Australia chose not to have a contingency plan for something much more conceivable—the dismantling of its coal industry. Writing an exit strategy from coal was so unthinkable we didn't even put pen to paper. Instead we doubled our coal exports believing clean coal 'had to work' because coal was 'too big to fail'. We abandoned the precautionary principle. Instead of recognizing coal as a sunset industry by environmental necessity, we became unwitting conscripts in a 'coal war' that could never have been won in time. Rather than becoming the Saudi Arabia of carbon exports by 2030, we should have prepared for a 'sunset on coal' that fought rather than fueled climate change. Australian governments should have announced a moratorium on new coal mines and prevented the construction of any new coal fired power stations where the emissions were not captured and stored safely. We should have established a clear timetable for phasing down coal exports and coal burning at home so that by 2020 no Australian coal was being used 'uncleanly.'

Of course it would have been dismissed as 'hair-shirted' 'green religion', as futile, and as needlessly impoverishing Australia. Kevin Rudd would probably have dubbed it as another 'radical plan to shut down the coal industry by next Thursday'. But it would have been none of these things. Far from impoverishing Australia, the economy would hardly have missed a beat. Most of the quarry would have continued to flourish, and states like Western Australia would not have even noticed. Without coal exports,

Australia's economy would have doubled in size in 2031 instead of 2030. It's true that the removal of one third of the world's traded coal would not have magically undone the world's coal addiction—only 1/6$^{th}$ of the world's coal was traded in 2010, so countries with large reserves would have been relatively unaffected in the short term. But, that doesn't mean action by Australia would have been futile, because no country would have been impervious to the odium that an Australian coal phase-down generated. More importantly, over time the price of coal would have risen, and the coal trade would have become much less reliable—countries would rightly have started wondering: who's next after Australia.

If government had taken these three steps, in 2030 we'd still be grappling with climate change, but we'd have a greenhouse policy of which Australians can be proud, not ashamed. The vast majority of our emission cuts would be Australian-made, not just Australian-paid; our emissions trading scheme would have become more effective much sooner and the taxpayer would have stopped paying out carbon subsidies to polluters long ago; nor would we have fueled a carbon subsidy war internationally. And, by announcing a timetable for an Australian sunset on coal we would have finally dealt with Australia's greatest contribution to climate change—its black coal exports. Whether or not this began what Robert Manne termed "a benign domino effect", we would have done our very best to give the world the best chance of returning the climate to a safe state.

There are lots of other useful steps we could have taken, but with the benefit of hindsight these three decisions were probably the biggest opportunities missed. Had we seized them, by 2030 our kids would be thanking us for a much cleaner legacy, a bigger variety of choices, and for not allowing coal exports to turn their country into the single biggest pusher of global carbon addiction.

Hopefully, they will find a way to make time travel possible one day, and hopefully they'll clean up coal use too. Until then, hopefully most of the coal will remain harmlessly underground. With climate change, we only get one chance and we don't have the benefit of hindsight—just the opportunity of foresight. We may not love the idea of a coal-burnt economy, but our quarry vision makes it hard for many Australians to see a different future--which is why I've spent the time I have writing this essay. If enough of us are able to leave that quarry vision behind, we have a chance to forge a different future to the one now taking shape on our watch.