

**Restructuring the Australian Economy
to Emit Less Carbon**

John Daley and Tristan Edis

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Transcript

Grattan Institute released its second public report “Restructuring the Australian Economy to Emit Less Carbon” on Thursday 22 April 2010. Using a detailed analysis of Australian industries’ own data, the report concludes the proposed free permits being offered by the Federal Government under its carbon pricing scheme are unnecessary. The report also shows that adapting to a carbon price is less difficult than the structural adjustments as a result of tariff reduction, competition policy reforms and the introduction of the GST.

John Daley, Grattan Institute’s Chief Executive Officer, and Tristan Edis, Research Fellow Energy, presented a seminar on Wednesday 28 April, which outlined the key findings of the report and discussed the implications for Australian policy making. The discussion was moderated by Adam Lewis, Former Managing Director of McKinsey & Company, Australia.

Speakers: John Daley (John) and Tristan Edis (Tristan)

Moderator: Adam Lewis (Adam)

(Music being played)

Adam: Welcome, I think it’s about time to start. I have three welcomes to do before I introduce myself. First of all is the traditional welcome to country which I would like to show my respect and acknowledge the traditional custodians of the land, the elders past and present on the location which this meeting takes place. That’s my first welcome. My second welcome of course is to this Grattan Institute Seminar on the topic of restructuring the Australian economy to emit less carbon which we’ll get into in just a moment. My third welcome is, welcome to a mobile phone-free environment so if you haven’t checked your phones when coming in please take the opportunity to do so. Not sure what I can do about it if your phone goes off but we’ll at least perhaps draw some attention to it.

Now first of all so I’ll introduce myself, my name’s Adam Lewis, I’m going to be the moderator of this evening’s seminar. I am a member of the Policy Committee of Grattan Institute and have been involved with the formation of Grattan Institute from the very start when it was merely a twinkle in the eye of a few people sort of in roughly that direction and I’m now semi-retired having left McKinsey & Company where I was for 20 years.

I’m also going to introduce our two speakers and the two authors of the report. Both of these gentlemen have a mix of public policy and to a greater or lesser extent real business experience which I think given the topic we’re talking about is particularly pertinent because it has very deep technical issues, some great academic policy issues and also some very real implications in the real world.

Professor John Daley who is on your left here is the CEO of Grattan Institute. Many of you know John. John has 20 years of experience across a range of policy, academic, government, corporate roles in advisory and in business. He has a string of degrees from Oxford mainly in the area of public law and has deep expertise in public law and economics.

Tristan Edis in the middle there or will be in the middle when I’m on the other side, is a Research Fellow at Grattan Institute and has 10 years of experience again across business, advisory, public policy and most recently was with Ernst & Young’s Project Finance and Business Advisory Division and Tristan has a wealth of experience in the energy sector.

So I’m now going to kick things off and the process for this evening, if you’ve not been to one of these seminars before, is that John and Tristan will do a brief overview of their report. I’m actually going to act as a moderator and have them effectively answer some of the questions to elaborate on the report and we’ll leave plenty of time for direct Q and A from you on the floor in the second half of the hour. Over to you, John.

John: Thank you very much, Adam, for that very kind introduction. The Grattan Report, Restructuring the Australian Economy to Emit Less Carbon was motivated by a belief that we

needed to get some clear and useful information around just what would be the impact on Australia of a carbon price and secondly to understand as emerged as we were working on the report, what is the impact of the government assistance regime that is proposed under that CPRS scheme? And is it necessary and it is appropriate? And in particular we were very interested in the question around so-called carbon leakage. To what extent, if there were a carbon price, would that result in Australian industries shutting down and then starting up overseas particularly if that was going to lead to them starting up overseas where they would have higher emissions? And that was the aim that we started out with. In terms of where we came to - we might have a quick look at page 2 - these are the three things that I guess we discovered as we put this thing together.

Firstly, that the free-permitting regime under the draft CPRS is a \$20b waste of money and although in these days of government largesse particularly under the the financial crisis you know \$20b is only one education revolution. Nevertheless, it's still quite a lot of money. And secondly, and perhaps this is even a more serious problem, that the free-permitting regime was going to significantly reduce the incentives to emit less carbon which is after all the entire purpose of a carbon pricing regime. The idea is that we change the economy and result in fewer emissions.

I guess the second major finding is that fears of carbon leakage are greatly exaggerated. Number one, for the vast majority of emissions intensive trade-exposed industries that we had a look at, jobs are not going to go offshore and plants are not going to close essentially because these industries are very profitable and although they will be marginally less profitable if they pay a carbon price nevertheless they're going to continue to be very profitable.

Secondly, that although there are a very small number of industries that we could identify that may well be in trouble if they pay a carbon price nevertheless the evidence is overwhelming that if they go offshore that will in fact result in significantly lower global emissions, and we come back to the first point, that is the whole point of carbon pricing, we're trying to send an economic signal so that industry readjusts its production so that it has lower emissions overall.

And then the final core message, and perhaps it's a little disappointing given events of yesterday, that carbon pricing is a manageable change. Perhaps one of the problems of all of this is that we have told ourselves that carbon emissions and the greenhouse effect and so on is the great moral challenge of our generation and without doubt it is a great moral challenge but ironically, and this is the one of the key findings of the report, it's actually not that big a change relative to many other things that we have done over the last 20 years. And one of the reactions we've had to this report as we've spoken to a number of people is yeah but doesn't this mean we ought to be doing lots, lots more? And the answer is well no, if we can substantially reduce our carbon emissions without enormous changes to our economy and our lives that's actually good. And one of the biggest problems is we've built this up to be an enormous change when in some ways it's not such a big deal.

In particular, if you look at the jobs that are at stake in Australia even if every single job in emissions-exposed industry went, and the finding of our report is that it's very, very unlikely, nevertheless far fewer jobs are at stake than through say electricity competition reform or tariff reform. In terms of compliance burdens it's a much smaller shift than the GST and in terms of impact on household budget, again even if there were no compensation to households, it would be a significantly smaller shift to household budgets than the GST.

So those are the three things that we're hoping you will remember and take home and talk to your colleagues and your friends about when they ask you about the Grattan Report on Restructuring the Australian Economy to Emit Less Carbon. Firstly, that the free-permitting regime is a waste, expensive and actually counterproductive. Secondly, that fears of carbon leakage are greatly exaggerated, and thirdly, that this is a very manageable change. And indeed even if Australia went it alone, even if we impose a carbon price tomorrow and nobody else changed their position, and it's worth remembering that all we will be doing is catching up to a number of countries as distinct from leading the world, nevertheless that would be a change to the Australian economy very manageable relative to many of the changes we've had over the last two decades in our economy. And also it would be not a bad thing given that Australia is

starting a long way behind. We have the highest emissions per capita anywhere in the world and consequently we've got relatively more change to do than many other countries and consequently there's a good argument for saying we ought to get started as soon as we can.

In terms of what we actually looked at, we have looked at the industries that emit the most carbon for every dollar of revenue that they produce and therefore their economics will be most affected. In the darker orange colour here we've picked out the industries that have the highest emissions for every dollar of revenue that they produce. What we're seeing here is only the first 12% of Australia's GDP. By definition the remaining 88% has lower carbon emissions and therefore by definition a carbon price of \$35 will alter their costs by less than 1.4% of revenue and for many of them a great deal less than 1.4% of revenue.

And one of the things that I think people struggle with in terms of carbon pricing is that they don't appreciate that by and large energy is a relatively small input for many of the things that are produced in our economy and consequently even if you increase the price quite substantially it just doesn't increase the overall cost base by that much.

So we focused on the things where energy prices, and particularly carbon emissions, are relatively significant. As you can see aluminium refining is a standout in terms of its impact. We then looked at a number of others. Inevitably given time we haven't looked at absolutely everything. In particular there's a number of basic chemicals processes, non-mineral metallic products and so on that we haven't looked at. That was by and large because, although they get categorised in this chart as a single thing, in fact they consist of a series of different industries with different economics, different structures and so on. But what we can say is that we have dealt with the industries that account for something like 70% of the emissions-intensive industries and we suspect that the conclusions we have come to with the industries we have looked at will be relatively similar to the industries we haven't had a chance to look at. Although one of the recommendations we make is that for other industries that think they might be in a radically different category that the Productivity Commission should be given a brief to have a look at. So that's the scope of the report.

In terms of the overall conclusions, what we've been doing is looking at, and this is what's down bottom, what's the impact on profitability of these industries, if they have to pay a carbon price of \$35 a ton? On the right-hand side are industries whose economics are very severely affected i.e. they become either unprofitable or very close to unprofitable. On the left-hand side are industries which although they'll become largely less profitable will still nevertheless be very comfortable and we believe there will be minimal impact on their net production.

And then on the vertical axis we've asked what's the impact on global emissions if those industries move offshore from Australia? As you will see there is nothing that we could find where greenhouse emissions will substantially deteriorate if the industries move away from Australia. That's not surprising. Australia has amongst the most emissions-intensive electricity production anywhere in the world. Consequently if things move away from Australia it's very unlikely that that will result in significantly higher global emissions. Nevertheless there are some industries where we believe that there will be significantly lower emissions if they move offshore and in particular aluminium and oil refining are in that category.

Then the size of these circles and the numbers that are inside the circles represent the value of the free permits that are proposed under the government's draft CPRS over the next decade. And in particular if we look at aluminium we can see that this is an industry where yes, we believe that its profitability will be severely threatened if it pays a carbon price. On the other hand we believe it's very likely that global emissions will reduce as a result but thirdly keeping it onshore will cost us in the order of \$8.1b in free permits over the next 10 years which is quite a lot of money and when you work it out at per job in the aluminium industry it's about \$160,000 per job per year to keep that industry onshore and as job creation schemes go that's a very expensive way of keeping jobs in Australia. So those are the kind of overall conclusions of the report and what we're hoping we can now do is move into talking to Adam about a little more of the detail. Thank you.

ADAM: Okay, thank you, John. Well Tristan, I might direct the first question to you which is really just for the benefit of placing us at a starting point, could you just do two minutes and we'll just keep it to two minutes, on the high points of what the current CPRS proposal is so that we can then talk about Grattan Institute's recommendations in the context and then what's different?

TRISTAN: Oh okay. Can everyone hear me up the back? Yes? Okay. So where the government legislation stands right now is if you are deemed a highly emissions-intensive industry, so aluminium smelting falls into that category, steel falls into that category, you will receive 94.5% of your carbon emissions requirement including your electricity consumption, sort of implied liability for free, and that then declines over time at a relatively moderate rate to around 84% free permits by 2020. And if you are a moderately emissions-intensive industry such as say oil refining or LNG or coal ... well, sorry coal is a separate category altogether, but for those particular industries you receive 66% free permits declining to I think something like 53.5% free permits by 2020 so a substantial proportion of your liability is essentially taken care of through provision of free permits.

ADAM: Okay, great. We'll come back to that in a second. I then want to sort of ... before we get to the question how yours is different, as a public policy institute, so not an industry group, you've clearly come at this work with a certain set of principles or philosophies about what works in a public policy setting so I'd be very keen to explore what those are because I think they come through quite strongly in the context of the report? Thank you.

JOHN: Oh I guess we attacked it in a couple of ways. Firstly we were just trying to get the facts on the table, just work out as a you know when you add it all up and multiply it through and look at it on a facility by facility basis what are the facts here? Who's going to be profitable? Who's not going to be profitable? Whose emissions will be higher? Whose emissions will be lower? So, and by and large the report is based on industry data so by and large essentially this is coming from company's own annual reports, submissions and so on, so pretty much all of the stuff that's here is on the public record albeit you know by no means in one place. So that was I guess principle number one. We were trying to get to the facts and we were trying to get at them in a way where we weren't going to be arguing about the facts, we were going to be arguing about you know what are the consequences?

I guess the second thing that we were looking at was well what are we trying to do when we provide industry assistance? And one of the, I guess, issues that's in the report is it's not always entirely transparent what it is that government is trying to do with this industry assistance and it's been put on a whole number of bases, for example it's been put on the basis that's for transition although as we point out if you're going from 94 down to 84 in 10 years you carry on at that rate and it's up for grabs as to what happens after 10 years you know we'll finish transitioning some time in more or less by the end of the century, which is not exactly a rapid transition to anything. You can put it on the basis that it's about welfare but we point out if you're really serious about welfare of the workers you don't pay money to companies, you pay money to you know to communities and to workers to retrain and relocate. And then I guess there's been an overall philosophy that we're looking at this from an Australian interest perspective so we're asking what would be in the best interests of the country?

And I guess there's been a ... we've had a fairly clear attitude that what we were trying to do was ensure that Australia has a competitive economy for the foreseeable future and yes, we've made an assumption that carbon pricing is coming over the longer term, and I guess there's also a very clear philosophy that we're better off trying to get ourselves organised for that sooner rather than later, and in particular, I guess Australia's experience over the last two decades has been where we have taken conscious, clear, aggressive steps to make our economy as competitive as it can be for the future we've wound up doing very well out of that, and lots of countries have been looking at the Australian productivity miracle over the early '90s and saying well what happened here? And the answer is we made some politically tough but policy-sensible decisions and none of that was pleasant at the time, and certainly none of it was politically easy at the time, but it very much set us up as a country and therefore the way that we've attacked the report is to ask not what's going to be politically easy here, we've asked what would be in the best interests of the country over the long term?

ADAM: So you've more or less said that the CPRS as currently proposed first of all won't actually result in lower emissions because the so-called transitional arrangements will encourage the emitters to keep emitting.

TRISTAN: I suppose we ... it's not that we so much said that it would not reduce emissions so much as it wouldn't do it in the most efficient way possible.

ADAM: Fair enough. It's alright, I'm not trying to do a Herald Sun here. The second argument you're making is that as a means of supporting industry and supporting the Australian economy through that transition, the free permits is actually the wrong mechanism by which to do that, but thirdly I think you're also ... between the lines, or maybe even quite directly in the report, you're sort of saying it is okay for governments to legislate away company profits in the interests of the greater good.

JOHN: Yeah, absolutely and I guess we point out in the report, governments have been in this business for hundreds of years, governments have been in the business of looking at environmental impacts of corporate activity, of occupational health and safety impacts and legislating to say that there are some things that we're not happy for you to do and to the extent that that results in reduction of company profits you know that's how it is and it's indeed ... it's the function of government to set rules about what is acceptable behaviour particularly when behaviour has impact on other people, so-called externalities. And carbon emissions are the classic externality where a company does something that has an impact on many people that in the absence of government legislation the company doesn't pay for. In effect, it's a form of pollution, and we've had government legislation that's essentially prevented pollution and thereby reduced company profits for a long time.

Adam: Not to mention tariff reduction, payroll tax, any other of these sort of impositions on industry that occur. So okay well let's ... you've sort of outlined the essence of the proposal here. Let's dive into each of these industries because you know ...

TRISTAN: I suppose just one thing is ... I think once we set it all up we said there's one clear area where this is a problem, and I think Ross Garnaut picked up on this in his report as a sort of terrible problem, although they weren't the precise words which is there's no point doing this if industry shuts down in Australia, we lose jobs, economic activity moves overseas and emissions become worse. And that is clearly a perverse outcome that we would want to prevent from happening and therefore some kind of measure of assistance from government would make complete policy sense.

ADAM: Which in theory of course gets solved, you know, Ross' problem and everybody else's problems gets solved if all of the countries in the world sign up to these agreements at the same time under the same conditions, and you know some miracle happens to do that, but in the interim you then have to go for ... you're putting a stake in the ground and preventing leakage as you put it.

TRISTAN: Yes.

ADAM: Alright well let's sort of now dive into a bit of the detail because as you pointed out there are winners and losers in a sense in your report from this and we might start with what you label as the high emissions-intensive industries that remain competitive. And in this let's just sort of do a couple of minutes on what are the situations in each of these industries and why did you reach the conclusion. So we'll start with alumina as being an industry that effectively needs no additional support.

JOHN: So if we can have a look at slide 7. And I ... 'cause I guess this is a good illustration of the methodology that underlies a lot of this report. Some people in this audience are probably very familiar with this kind of analysis, some people less familiar. For those who've spent their lives in management consulting to industry this is a cost curve that's kind of bread and butter but it's not the kind of analysis that everybody does. What you do with this kind of analysis is that you take all of the facilities that are involved in a particular industry, and in this case this is

the alumina industry, so this is the business of taking raw bauxite and turning it into aluminium oxide. Note that it's very difficult from aluminium smelting which is the business of taking aluminium oxide and turning into aluminium metal which is a completely different industry that we'll talk about later.

But this is alumina smelting so this ... sorry, alumina refining sorry so bauxite to aluminium oxide. You take the world's facilities and you put them in order and you take the ones that are most expensive and put them on the right-hand side, take the ones that are least expensive to operate and you put them on the left-hand side and the width is proportionate to the production of the facility so how much it produces, and on the vertical axis you've got how much it costs each facility to produce a ton of alumina.

Now the theory of these curves is that as the price reduces, because you know prices go up and down, it's the facilities on the right-hand end that will stop producing first because by definition those are the facilities that will essentially lose money as they produce. So ... and then what you can do is overlay against that the price of the particular commodity so in this case you can see two lines, one is the price for alumina, spot price in February 2010, the slightly higher one is the guess about the long-term average. And so as that price comes down you would expect the facilities on the right-hand end of the chart to stop producing. If the price went up you would expect to see more facilities coming in and at least as a matter of economic theory supply and demand meet at the kind of right-hand end of these kind of curves.

Then what we've done is overlaid on that orange the Australian facilities. As you can see, by and large, Australian alumina production facilities are in the kind of bottom curve of production facilities worldwide. And then at the intermediate orange colour we've got the impact of a carbon price and so if you for example take the Kwinana facilities and you increase its costs by ... carbon costs, it'll affect move up the curve a little bit but as you can see not by all that much. And so one of the things that this enables you to do is to see well if we have a carbon price how much do the Australian facilities move up the curve? And what you can see just by eyeballing it is that by and large they move up a bit but not that much and the implication is they will remain very profitable facilities and in production even if the world price for alumina drops very substantially. And the one big exception to that would be the Gove facility which is relatively high cost because it's a long way from anywhere, it is powered by oil which we ... oil being shipped in and burnt which also means that it's got relatively high emissions.

ADAM: Okay before we leave this chart so you've raised one point about Gove of course which all of the analysis is done at an industry level and of course there's going to be relative winners and losers at a facility level in here in all of these situations so we ... you may want to come back to that at some point. But of course the other issue that comes about is well what happens when new capacity gets added globally around the world so Guinea on the west coast of Africa for example has got substantial bauxite deposits, there's going to be development there. They are unlikely to have a cost of carbon at that location and they may very well be at such a scale that they enter at the left-hand side of the cost curve so isn't this argument actually saying for now these ... this industry is okay but undoubtedly the imposition of a carbon cost may precipitate earlier an exit than otherwise would have been the case? So to some extent there is a ... unless we get the rest of the world following this eventually there could be impacts there.

JOHN: Yeah. Look, that's exactly right but we suspect it'll be you know a long-term thing in the sense that these are not industries that kind of you know open facilities overnight and secondly there's a question of where you can enter because it's probably no coincidence that the Australian facilities are very much clustered down the bottom left-hand end of this curve and that's because Australia has a bunch of natural advantages relative to the rest of the world that aren't going to go away. We've got very large concentrations of bauxite. If you want to be a really low cost producer of alumina what you need to do is have a large reserve of bauxite preferably pretty close to a large reserve of fuel to basically power the process, by and large these days LNG. Now there's only so many places in the world that have really large you know reserves of bauxite with lots of LNG nearby and by the way you probably ...

TRISTAN: Gas, John.

JOHN: Sorry, sorry, gas more accurately. And also in an ideal world you want to be somewhere near a port and you also want to be somewhere where the government's not going to kind of legislate you out of business the next day and take your facility away from you.

ADAM: Alright so your argument effectively would be technically what I said might be correct but actually we're talking long, long-term for those sort of changes to take place.

JOHN: Yeah.

ADAM: Alright, very good. Shall we move on to LNG just quickly? And I guess we don't necessarily need to go through each of these 'cause it's in the report so maybe if there's anything particular to talk about LNG let's do that otherwise we'll move on.

JOHN: Well why don't we talk about LNG very briefly? LNG's a slightly different game in the sense that the question here is not about existing LNG facilities, the question is about will Australia develop new LNG facilities? And one of the kind of intriguing things that comes out of this report is the scale of the LNG industry that's proposed for Australia is enormous. I mean we're talking about an industry that would single-handedly add percentages to Australia's GDP and therefore making sure we don't mess it up is a substantial thing that we ought to worry about and ironically it's actually driven by carbon pricing, one of the things that's driving the world's growth in LNG is precisely that people want to shut down their coal-fired power stations and replace them with gas-fired power stations which have substantially lower emissions.

The way we've thought about this is what is the price that you need for LNG to justify investing in a facility? And by definition that means that you're expecting a return on capital and we've assumed a 12% return on capital which is the kind of return that you expect for long-term facilities and you can doubtless get slightly different answers if you pick a different whack but that's a reasonable assumption, it's one that the industry by and large is happy to use. And we've asked what price of LNG do you need to get at 12% return and then how does that price change if you are paying a carbon price of \$35 a ton? So if we take Queensland Curtis on the left-hand end, roughly speaking that needs about a \$7 ... sorry a \$7.30 price for LNG in order to get a 12% return on capital.

If you impose a carbon price on it, it needs about \$7.45. So yes it changes but not by very much. And then you have to ask well where are world LNG prices? Well the answer is if you look at recent Woodside and Santos presentations they're all saying we expect that long-term LNG prices, assuming that world oil prices stay at around \$80 a barrel, long-term LNG prices are going to be around 13.30 Australian per NBTU which is the units that are used for LNG. That means that prices have to reduce an awful lot before anybody stops worrying about these things and secondly that in the scheme of things a carbon price is not going to be the thing that stops you producing an LNG facility ... sorry, setting up an LNG facility.

If you thought for example that oil prices were going to crash well you know bets might well be off. If you think that the cost of setting up a facility's going to inflate by 25% well that is a big swing factor in your consideration but the reality is that a carbon price is not going to be what tips you into either setting up or not setting up an LNG facility.

ADAM: We're in danger of running out of time here with chatting so I might actually see if we can take us to the really controversial one, I guess, which is the aluminium sector just to book-end this debate.

JOHN: Thank you. So if we have a look at page 14. Firstly the aluminium sector has two issues floating around. One is whether or not it pays market electricity prices. Most of the Australian aluminium refining industry ... got it the wrong way 'round again ... smelting industry ... Tristan has been trying for several months to try and get me to get smelting and refining the right way 'round.

ADAM: It's a good thing John's a CEO, really ...

JOHN: It's a good thing that Tristan is here. If it pays a market electricity price some of the Australian facilities will be in trouble, many of them will be significantly higher cost facilities than they are at the moment but nevertheless they'll change. Sorry, nevertheless they'll still be profitable mostly. If, however, they pay a carbon price that'll make life difficult, and if they both move to market electricity pricing, which is happening because essentially electricity prices are rolling off because we've privatised our electricity industry, and they pay a carbon price, they're going to be in deep, deep trouble. And this positioning of being high fourth quartile product producers, in other words, right at the right-hand end of those cost curves that we started off looking at, means that by and large they're going to struggle to be profitable and the chances of those facilities closing are very high.

However, if we move to the next slide the key question is whether or not Australian production moving offshore will result in higher all-over global emissions. And the key question here is not can we find a plant somewhere in China that has higher emissions than you know one of the Australian plants. The question is does the industry that replaces it across the world on average have higher or lower emissions. And the answer to that we believe is very compellingly no, replacement capacity on average will have substantially lower emissions. If you look at the top chart Australian production today is substantially higher than the international aluminium industry global average. If you look at where people are talking about putting their new facilities in terms of the power source it's much more about zero carbon emission sources, to some extent gas, a bit of coal but relative to the Australian industry which is dominated by coal, on average substantially lower emissions. And if you look at the investor presentations and so on of all of the western aluminium producers they're all telling their investors exactly the same thing, namely we're all planning on being lower than the global average for emissions intensity ... in terms of aluminium production.

Now by definition they can't all be less than average, sort of bit of a Lake Wobegon effect, nevertheless they're all worrying very hard about how do we put our facility somewhere that have substantially lower emissions preferably with substantially lower electricity costs. And that's why we believe if you look at the current, if you look at the plan, if you look at the kind of strategic intent, all of these things are pointing in the same direction, about going to lower emissions electricity and the reality is that doesn't mean Australia, we don't have low-emissions electricity, we have some of the world's highest emissions. So that's the story.

ADAM: And so the conclusion is effectively because shutting down would reduce overall emissions in the world your \$8.1b is better spent elsewhere?

JOHN: In a nutshell. And it's worth remembering and I guess one of the things we try and bring the report back to is why are we doing this? Why are we imposing carbon pricing in the first place? And the answer is because we're trying to reduce carbon emissions, that's the idea and if one of the impacts of that is that it's rational for industry to move somewhere other than Australia where it'll have substantially lower emissions that's the idea, that's what we're trying to do as a globe, is get industry to move places where it'll have the least emissions per unit of production.

TRISTAN: I think the other thing that's worth stating in this particular case is that with some industries it's not clear-cut so in cement or ... so if we took cement as an example, most of the cement clinker that we've inputted from the data that I could obtain was from Japan. Japan generally produces clinker or cement clinker with lower emissions, but overall the benefit is marginal, such that you couldn't emphatically say it would be a good idea economically to shift cement clinker overseas and to shut down Australian production, but in aluminium the difference is so large that you start to think ... I think if you had a global regime it would be efficient for Australian smelters ...

ADAM: Well if we had marketplace electricity prices for a start we probably wouldn't have the aluminium sector to begin with but you're then effectively saying on top of that if you've then got rational pricing everywhere then clearly you would not smelt aluminium using coal-fired power stations.

TRISTAN: Not in Australia.

ADAM: Well arguably not anywhere.

JOHN: Not anywhere, yeah.

ADAM: Okay look I've got a range of other questions but I do want to open it up to the floor so we have some roving microphones I think somewhere do we? Yeah, great so if you want to go to the middle here and I think the audio's being captured so if you can hold your question until you get the mic that would be appreciated.

AUDIENCE: Dennis O'Neill, Resource Futures, taking the strategic overview though, something that you haven't factored into your analysis and it's probably outside your scope but I just wanted to put it to you that it's probably worthwhile considering, whereas aluminium smelting might be an activity that the economy can afford to lose because there are no strategic implications for the functioning of the economy and result of loss of employment etc. Arguably if we push fuel refining entirely offshore there may be serious strategic implications and therefore a cost to the economy as a result of interdiction of supply or other issues such as we experienced in recent years with jet fuel being in short supply and so on, so I feel that there's an externality here associated with some of those analyses that should be costed and factored into your conclusions such that government support for example for the retention of some domestic refining capacity does have a strategic imperative which is worthwhile considering. And a second point again at the strategic level, if we do end up with a level playing field in terms of energy costing given for example the comments by the head of Roussel a few weeks ago here in Melbourne that inside of a decade most of the world's excess hydro capacity will be used up and therefore won't be available to expansion of the global aluminium smelting industry the future in his view is nuclear, could we not see merely rather than shifting aluminium smelting offshore, a gradual introduction by replacement of coal-fired energy supply to the aluminium smelting by ...

TRISTAN: Can we just touch off on the nuclear question first? I think ... this is a point that's been flagged with us in some other conversations and I think the point that we would look at is what's the timeframe on which we could see a substitution of our current coal-fired electricity fleet with lower emission sources? Okay, yes, we've got all the uranium that we could possibly need to do this but we don't have the infrastructure and the skills yet anyway to do it and according to the Switkowski report we'd need quite a considerable amount of time to implement that. So one, we're looking at a long lead time. The second thing is that we're not necessarily going to be doing it at the same scale as existing countries that have a nuclear fleet, have the capacity there and I suspect it would be difficult for us to achieve a nuclear powered electricity supply at lower cost than other countries that have a more established industry such as say France or Russia, for example.

ADAM: Just speaking on with this, Dennis, the broader implication of what you raise in that second point you made is actually about the dynamic nature or versus static nature of the model which is picked up in the report effectively and I think this is quite clear, the report says this is static-based modelling on what we see today because I can imagine a comeback from you on Tristan's comment that said but actually the biggest problem here is maybe there's a 15 year window where we lose an industry that otherwise we wouldn't have lost had we taken a different action and seen through the period and I think in general the report does acknowledge that actually this is a static view but in terms of the timeframes we're talking about and in terms of effectively a CPRS legislation being in front of Parliament within the next three to five years I'd say this is something that needs to be decided. I did say within three to five years.

TRISTAN: Yeah but I think though on that I mean we are genuinely sceptical about Australia being able to provide electricity at low carbon and low prices.

ADAM: Sure, there's that too but I think that in the context of what you're trying to achieve with the report it is very much a foreseeable timeframe issue.

JOHN: Well I think that one of the issues for the aluminium industry is we would need to be lower cost, lower emissions than the rest of the world. As Tristan points out it's really hard to

see that happening in 20 ... within 20 years so in the meantime we're going basically be paying in the order of \$8b to keep this thing alive for 10 years ...

ADAM: On the off chance ...

JOHN: On the off chance that maybe there's a miracle and you know frankly in 20 years' time people will be building you know any aluminium plant that exists today will probably be shut down and replaced with you know a shinier new plant that looks different. The second issue that you raise around oil refining is actually something that we do deal with in detail in the detailed analysis and the way that we put it is this, you need to distinguish between security of domestic supply i.e. for you and me to drive our cars and security of supply for defence purposes in terms of providing fuel for tanks and fighter planes and all that kind of stuff. In terms of security of domestic supply it's actually arguable ... in fact we think very arguable that security would actually improve if we stopped refining in Australia. And that's because the biggest threat to security of supply in Australia is in fact that the very old Australian refineries ... they're all old by world standards ... have significant interruptions to supply because they're old plant and they basically break down and takes them a while to get it fixed whereas if you're dealing with very large refineries offshore, number one, because they're kind of new shiny plants they break down less often and number two, your supply is coming on a ship and if you know a particular plant shuts down it's relatively easy to try and get shipments from another plant. And bear in mind we're already vulnerable to ...

ADAM: Or the shipping ran short.

JOHN: We're already vulnerable to shipping. By definition a lot of the stuff is coming as crude oil anyway so in fact if anything security of domestic supply probably improves if we have more refining that's come from offshore. Secondly, in terms of defence security, number one, we would need to substantially re-tool the Australian plants if we were serious about using Australian-produced oil for defence purposes. They're not actually set up to produce those kind of fuels at the moment. And secondly, you wouldn't need anything like the number of plants that we have at the moment, and thirdly, if that's what you're really worried about it, far better to have a direct targeted subsidy that's aimed at that problem rather than trying to do it indirectly through some kind of free-permitting regime that may not even have the right desired effect.

ADAM: Okay, any other questions? And we'll go here just for logistics purposes and then I'll come back down to the front.

AUDIENCE: Matt Reddy, Carbon Advantage. My question's about arriving at the \$35 price for carbon and my carbon crystal ball is the same as anybody else's so I wouldn't exactly say that today in taking that point on board but yes, this is a snapshot of where we are today but \$35 is at all realistic given the offset price is around the AU\$1.20 mark how would the scenario play out if we had a \$20 carbon price?

TRISTAN: I think you could replicate it and say that it's ... you're proportionally lower is the simple thing. \$35 ... we looked at the Treasury modelling, we said this is what the price roughly is, it doesn't quite ... it goes a bit above \$35 if you do it in real terms but we said look, this is a you know a reasonable assessment. We could probably do \$40 and probably come up with very similar results but 35 seemed like a reasonable level over the outlook period to 2020.

ADAM: I guess my question would be how low does it have to be to save the aluminium industry? Which I suspect is zero but ... or it might even be negative.

JOHN: And I guess that's a point of ... as the aluminium industry moves to market electricity pricing it's going to need to be very low and you know it's not like we're saying that the Australian government should you know legislate to say that the aluminium industry has to move offshore, we're just saying that they shouldn't be you know paying out large sums of money to stay here and you know if the aluminium industry winds up being viable at \$20 well that's you know that's how it is. And that's terrific and the whole point about creating market-based schemes is that you let the market do the work for you.

ADAM: Okay so is there a question from here? We got a microphone over there somewhere?

AUDIENCE: Hi, Dan Cass. I really like your report, it's great, very clear and I like what the graphic designer's done with the very reassuring kind of monochromatic T effect, carbon prices peak and the skies collapse, it's nice solidity. How does ...

ADAM: Where is this going to go now?

AUDIENCE - DAN: Oh it's really simple and quick. The interim carbon price idea from Ross Garnaut now being championed by the senators and ... the green senators but apparently not with any particular interest from Penny Wong. What do you think of the interim carbon price and the price level that Garnaut has recommended for it?

JOHN: Look, I think the short answer is you know any carbon prices ... or sorry, a carbon price is better than no carbon price. A carbon price sooner rather than later is something that will help us get started on the way towards restructuring the Australian economy so we would say a good thing. In terms of the precise level look you can have lots of arguments about you know do you make it \$10 or \$15 or \$20 or \$30 and I guess the point of our analysis is that at \$35 it's not going to be the end of the Australian economy but clearly \$35 is going to send a pretty sharp signal to business to change its emissions. And a lower price will send a weaker signal but on the other hand have less of an impact.

ADAM: There was a question down there, has that disappeared now? No? And then we'll go over here, I think. Oh sorry, okay, well let's go down here ... sorry, we'll go up the back and then we'll come back to you.

AUDIENCE: Patrick Groves, Beyond Zero Emissions. Can I just ... looking at the CPRS so you've said that it wouldn't necessarily have an effect on the industries, would the CPRS actually reduce emissions from these industries under the work that you've done and how so? So I mean have you looked at say you have steel making out there plus oxygen furnace steel making, would we see a shift to say direct iron reduction and more efficient forms of steel making that can use gas for example and do you think you know what ... would the carbon price or the CPRS encourage say getting the low emissions energy that we need that could make the aluminium industry more competitive for example so I mean if you're talking for what you need for aluminium, you need good, cheap, renewable electricity, I mean Queensland's got an awesome solar resource that you could use baseload solar thermal power level. Have you looked at that at all?

TRISTAN: I think the short answer is no, we haven't except to the extent that we have looked at how the free permits actually might pervert a shift say for example from glass furnaces to electric ark furnaces which would lead to a more than halving of emissions using the existing fleet of existing plant and that's because the amount of free permits that you receive per ton of steel under the current provisions are less for electric ark than they are for glass furnaces so it actually blunts or mutes the incentive to shift from say a glass furnace to a lower emission electric ark furnace. As for direct reduction that's another level of analysis that we certainly didn't do and in fact we've excluded the one operating plant and from the analysis that I looked at it didn't look like it would necessarily reduce emissions at all to move to that particular plant so I sort of struggled to understand how it was going to improve our emissions anyway.

JOHN: I think more generally the mere fact that an industry's profitable doesn't mean that it's not going to do everything it can to be more profitable you know that's capitalism, that's the idea and if an industry can improve its profitability by reducing its carbon emissions and therefore reducing the number of permits it's got to buy we believe that'll happen and indeed that's the whole point of the report, is to say that we need to make those incentives as clear as possible. In terms of how much of a difference it will make, you may well be aware that Climate Works has recently produced a very detailed analysis with some assistance from McKinsey & Company looking at what are the detailed things that might happen if you start imposing prices and I guess one of the conclusions of that report is a huge number of things become economic and smart things to do if you have a carbon price of \$35.

We do talk about a couple of those in the report, but you know they're frankly illustrative examples as distinct from the kind of work that Climate Works has done which is an attempt to be rather more comprehensive. I think one of the things that does come out of that report is it's a huge number of things and for governments to try and create direct action for every single one of these things is going to be very difficult for governments to do and the whole point about the invisible hand of the market is that you send a market signal and let you know thousands of companies around the country try and figure out how to be more profitable and if you're trying to get change ... lots of small changes across an economy that add up to quite a big change then you know the classic way to do that is to send a market signal and let the kind of invisible hand do its invisible thing.

ADAM: Okay. Sorry, you had a question up the back?

AUDIENCE: Thanks Tristan and John for some interesting work. Ross Garnaut, The University of Melbourne. Just a couple of things that you didn't take into account that I think it's worth thinking about. One is that the one is what economists call general equilibrium effects. If you close down one plant or an industry that reduces costs so other plants and industries and just the real exchange rate makes all tradeable service industries including universities more profitable. So ... and it's not going to be that all of those 30% of emissions in that set of industries are going to close and if what happens is you get less investment in aluminium and steel or whatever it is then that will reduce the costs of other industries or other export or all other import competing industries through the real exchange rate, all other resources industries through the cost pressures. We're in a resources boom, capital costs of power generation have increased to 60% in a few years because of the shortages of resources in the resources boom, have a bit less investment than some industries and costs go down before everyone else so that's one factor that needs to be taken into account but general equilibrium but to that extent you've probably overestimated the effect on costs.

And secondly, there's a premise of some of the presentation that the rest of the world isn't doing anything but that is actually not the case. At the margin in Europe most companies are paying a carbon price most of the time as high, or higher than you're assuming here although at the moment lower. A lot of states in the United States and provinces of Canada have got measures that are increasing costs quite a lot and they in the Golden Reform Commission in Beijing two weeks ago, just catching up with what they're doing to meet their very ambitious goals of reducing emissions intensity by 40 to 45% by 2020 and that involves more radical increases in the role of a whole range of renewable energy and nuclear energy and they're just forcing that onto the cost of the energy-intensive industries and forcing them to wear it.

South Africa has a carbon tax in the electricity sector so that if we ... aluminium smelters compete with the smelter-enriched bay we're not competing on a level playing field. There's a huge growth in east Asian demand for natural gas partly because of a range of environmental considerations including emissions intensity which is causing Japan, Korea, Taiwan and China to favour natural gas. That's putting up the regional world price of natural gas and therefore increasing the profitability of all of these industries so that's why in my report I said the principles that we're applying for the global [unclear 54:30] industries is compensating for the difference between the world prices we're facing and world prices that we would face if the rest of the world had a carbon price and that would be nothing like the compensation that takes the form of compensating for the fact that we have a carbon price.

TRISTAN: I have to say you're absolutely right, Ross. We can't ... unfortunately I don't have a general ... we don't have a general equilibrium model at our disposal. Now I think the thing ... the other thing is ... and this doesn't take anything away from your points, you're absolutely right, I think where we saw a gap that wasn't being filled was helping to explain or fill in what essentially ... the Treasury model tells you what happens but it doesn't tell you how it arrives at its result and so we tried to open up the black box for everyone else to see what's going on inside and why we end up with the impact actually not being that big a deal for the economy because when I say to some people well look you know someone will say to me you know I used to get this response all the time, you know once people realise just how much energy prices are going to go up they are going to hit the roof and I said you know what people spend more on alcohol and cigarettes than they do spend on energy ... electricity and gas and that's a

big surprise to some people. They don't actually realise that 'cause they think it's such a fundamental and important good which it is that we can't do without that therefore this would be a monumental effect on the economy and what we've tried to do is essentially illustrate to people using the hard numbers for physical facilities why this is not such a big deal. So we're not trying to replace the Treasury modelling, we're merely trying to complement it with something else that helps people to understand why we have the effects that we do.

JOHN: I guess if the worst that can be said of our report is that we've actually overestimated the impact on the economy when we've said this ain't a big deal, that's a good problem to have. And I guess that's the key message, is this is not such a big deal and as you point out actually if you refine the modelling you'll probably find it was an even smaller deal than the one that we've outlined.

ADAM: Okay, we've probably got time for one more question. Over here, okay.

AUDIENCE: Thank you. My name's Greg Zoof, I work for a company called Nyrstar, we actually operate a couple of RGITEs in regional areas in Australia, South Australia and Tasmania. Firstly one of the things that's glaring in the report is that you highlight the cost of the so-called subsidy I guess but you don't actually give any analysis ... I think it's probably raised to what Ross was saying before. There's no other economic modelling around what's the loss of economic output from these facilities because they do operate in regional areas, they have very large multiplier effects so that's sort of one comment. The other one, also I think ... to look at a cost curve and then to add a carbon price I think is pretty sort of one-dimensional analysis. You need to look at the gross profit risks as well and you've ... 'cause each industry's ... have a number of challenges. And certainly in our industry, zinc and lead, it's going through some challenges and structural reforms or changes.

The other thing is that the ... there's no mention of RET, there's no mention of transmission price risks in the report 'cause they all are I guess part of the climate change impacts. And just one last comment is around the debate and you say that although ... I'll just read out of here ... although the number of free permits declines by around 1% per annum any industries would be capable of reducing emissions much faster than this. Now if you're actually already operating best available technology I mean I don't think there's a lot of scope in reducing 1% per annum.

JOHN: Can I take those points in turn? Firstly around the multiplier effects I guess one of the ways that we thought about this is ... and it's a generic point about industry assistance, the question is not whether a \$20,000 industry ... \$20,000 per job industry subsidy results in a job with multiplier effects, the question is whether that \$20,000 could result in higher impacts if it was spent in a different way and if you look at the kind of subsidies that are being provided to these industries you know to take for example aluminium, at \$160,000 a job, that's got to be one of the least effective job creation schemes anywhere in the world you know there have got to be better ways of creating jobs than subsidies at \$160,000 a job.

ADAM: With equivalent multiplier effects in the economy, I think ...

JOHN: Well with equivalent multiplier effects but you know geez, \$160,000 you know there's a lot of multiplier effect you know room to play with. Secondly in terms of the gross profit risks and I guess you pointed to the cost curves in the way that we've done it, I guess one of the things that kind of drops out of those cost curves is the impact of a carbon price is relatively small for the industries which we think are not at risk. In the scheme of things. And yes of course those industries are subject to a whole series of impacts and yes, of course carbon pricing could be the straw that breaks the camel's back and you can always make that argument but for all of the industries we've shown you know what's pretty clear is that either one, the camel's looking really, really healthy or secondly, the camel's looking very, very sick and you know just as it is you know just the way the analysis has popped out, there's very few things on the margin and for steel and cement which we do believe are on the margin we've suggested what we think is a much better way of supporting them.

And I guess what we would say is look inevitably somewhere, somewhere in the Australian economy there will be a camel for which a straw winds up breaking you know that particular

camel's back. That's always got to be possible but if we're going to use that as a reason for creating a vast herd of camels at enormous cost for the Australian economy we say that's not the right way to do it you know the smart way to do this is to say that inevitably there will be a marginal effect somewhere in the economy. That's the life of having an economy, there's always something at the margin. That's the whole point about supply and demand versus the meet at the margin but overall we will all be substantially better off if we shift towards carbon pricing.

And finally in terms of 1% reductions well I don't know but certainly when I was at McKinsey and I think if you talk to most lean manufacturers they'll say look if you can't get 1% a year you're you know that's kind of standard industry practice at least to get that kind of reduction and although you might be best practice today the whole point about you know lean manufacturing and pushing towards continuous improvement is that you say you're going to push year after year after year after year and push out the efficient frontier and I'd suggest 1% a year in terms of pushing this efficient frontier is not...

TRISTAN: and we went back and looked at that ... what had happened subsequently to that plant and when you look at it, yes, it closed down, yes, it was a marginal plant that really carbon pricing had hurt it significantly but then you sit there and you think you know what? That plant was going to close anyway and that's because there was a better, more modern, bigger plant down the road owned by the same company and guess what? Those people that lost their jobs? Those that wanted a job in the new plant got a job.

I'm not saying that's the same case for Nyrstar but we're not about preserving industries or facilities that perhaps are facing an inevitable closure anyway and there's a limit to what government can do in terms of preserving the viability of particular facilities that are in the wrong location using really old technology or their source of perhaps their oil, for example, has dried up and so they're getting it from a long, long, long way away and so their cost structure is changing over time such that it's becoming increasingly difficult to compete because time has moved on. Now I'm not saying that that's necessarily the case for those particular ones but we shouldn't be judging a government policy by the most marginal plant that's out there, ensuring that that continues to operate because otherwise it would be okay.

JOHN: And I guess the final thing I would add to that and I hope that this is reasonably clear from the report is if that's the situation that we're facing the right way to use government money, our money, taxpayer money, is not to pay the producer to stay in marginal production when most of the people in that town will know they're marginal producers and ironically you get this situation where people are reluctant to invest in their community 'cause they know that at the stroke of a government pen it might disappear. The best way of using government money, the way that creates the best future for the people involved is to spend money retraining those workers, relocating those workers, getting new industries to set up in those towns that have a clearly viable future in a carbon-constrained world. I guess the report starts with a philosophy that we are going to live in a carbon-constrained world and what we need to do as Australians is structure our economy so that we are internationally competitive in that carbon-constrained world and the faster we start moving there the faster that our economy and more successful our economy will be for the future.

ADAM: Okay, thank you, John. Well I think Tristan used the phrase time has moved on and it has moved on past our scheduled close so thank you very much to everybody for coming and thank you to John and Tristan for what was a terrific discussion.

End of recording