

Beyond a carbon price: a Low Carbon Incentive Scheme, to accelerate next generation power and transport development

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This paper is in response to Issues Paper 4 of the Garnaut Review, Research & Development: Low Emissions Energy Technologies.

Specific Expertise: Barriers to innovation, Diffusion of Innovation, Consumers role in innovation, Value and its relation to Innovation (implying a need for Value Management). I am writing my PhD currently on Innovation, and this submission will form a part of the Implications Chapter.

Key Issues: the key issues that this submission is trying to address are – policy simplicity, overcoming technology trajectory, avoiding the difficulty of picking technology winners, and encouraging early movers. Learning, to iterate towards the best solution is also important.

Telling Comment from Consumer:

“We are in a War on Carbon.” John, 43, father, teacher, Unionist

Conclusion: Early indications from consumers (See Appendix 3 - 15/20 consumers agreed with 2% GST recommendation) are that they are keen to participate in addressing climate change, and seek strong action from Government, to lead. This proposal, addresses some weaknesses in the Emissions Trading Scheme in encouraging timely creation of next generation power and transport. Academics and Industry have been consulted (see Appendix 2 – though with little input), and support from next generation developers (Electric Vehicles, St Kilda), and interest from market leaders (GM Holden) pursued, and media publicity sought for the proposal herein (See Appendices 4-7). Ongoing dialogue is recommended (Value Management – see Appendix 1) in a process of learning, through trial and error, yet we must be sensitive to time. Swift and decisive action may be the key to success.

This paper supports policy which is revenue neutral, allows the market to pick winners, provides substantial financial incentive for corporations (and consumers) to pursue low carbon products and services, yet protects the weaker in society. We are a community and

national family, and no-one should be left behind, nor left uncompensated, and we have a duty to look after each other. Our society is changing its values, to value the environment, and low carbon energy and transport, more highly, and for this we are willing to pay. Our action will bring about the disruption of our lifestyles, families and communities.

Workers, communities and their stakeholders in the high carbon industries need to be supported in our transition to a low carbon economy.

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I. Recommended Policy Summary:

Goals to transition to a low Carbon (C) economy:

□- low C transport □- low C power □- low C exports □- low C workforce □ □

The emission trading scheme (ETS) is a good start to get C prices into products, but greater incentive is needed to encourage success in low C technology, if we want to do so fast. The ETS is likely to take perhaps some 10-15 years to achieve this. □ □

Some problems exist with the ETS encouraging low C technology. Firstly, the ETS will encourage incremental innovation in power stations, and transfer from coal to gas, however it will not encourage radical or disruptive innovation, which is likely to come from small firms operating outside of the power and car/oil industries. Disruptors who do not hold C certificates have less incentive from the ETS to innovate. □ □

Secondly, disruptive innovation can decrease the value of C certificates, giving certificate holders an incentive to resist such technology to protect the value of their investment in C certificates. □ □

Thirdly, oil companies who purchase certificates, rather than petrol consumers, to keep the ETS simple, are more likely to pass C prices onto consumers, than to create or buy low C technology, which is outside their competencies, and would reduce their profits. □ □

Fourthly, to protect their C lock in, the coal and oil industries have incentive to undermine the processes, and distract funding away from other low C technologies eg QLD \$900M clean coal investments vs \$26M Centre for Low Emission Technology, VIC \$187M Energy technology innovation strategy (including \$103.5M clean coal) vs \$12M for renewable energy support fund, □ □

Therefore, to avoid these ETS problems, I suggest a Low C Incentive scheme, which collects funds and pays low C users and producers to encourage such use and production. Funding

should be not at the expense of other government services (revenue neutral), and should encourage market solutions to low C needs. But the incentive should be paid 50% to producers and 50% to consumers to reward both parties. □ □

Funds could be raised through a levy on petrol prices, and electricity bills. But consumers have told me, during a process of consultation (Appendix 3), that this could place too heavy a burden on already stressed households. This could be a transitional arrangement (say two years) to be replaced by a broad ranging, but small, consumption tax. A level of 2%, added to GST, and collected in the same way, and with the same rules, could be collected by the ATO, then forwarded to the Carbon Bank for distribution to low C users and producers. Low income families would be protected as food would not be levied. And at a low 2% the impact would be slight on individual transactions. Also, business would not be levied, only consumers, reducing political issues, in selling the scheme to business. At 2%, funds of around \$1B per month could be raised. Significantly ahead of Victoria's \$200M action plan or Qld \$900M investment in clean coal over ten years. □ □

A 2% extra Low CARBON levy on GST would raise \$1 billion per month.

Payments should be made for results, not for R&D, so low C MWh of electricity would be paid from the fund, up to 50% of capital costs. Low C vehicles would be paid for out of the fund eg Toyota Prius, if they save 50% over normal vehicles. □ □ □

Each month, receipts would be balanced with payments, so the fastest developers of low C technology were paid, starting a low C development race - a gold rush. Unspent receipts, would go to other C offset, such as planting trees, a portion could be saved (say 40%) for low C loans to buy solar heating, or fund low C R&D. A small proportion could fund R&D alone (say 20%), and administration (say 5%). □ □

Funding could also come from sales of C certificates. □ □

The fund should be spent on low C power (1/3), low C transport (1/3) and compensation to workers transitioning from high C to low C jobs(1/3). An incentive to leave high C jobs (say \$10,000 per year of service, payable from fund in month of leaving or pro rata from funds available) and for employers to take on workers from high C jobs (say \$10,000, payable half on hiring, and half on one year anniversary), into low C industries (ie receiving incentive payments). Yet we must do more than pay – we need to support, and look after (with retraining and counseling) our affected workers, families and communities, in conjunction and agreement with stakeholders, such as unions, the ACTU, and other relevant community interest groups. There is an opportunity to redefine our communities.

ANALYSIS

II. Garnaut Review on Low Emission Technology (Garnaut)

This document serves two masters:

- a submission to the Garnaut review, on Issues Paper 4 R&D: Low emissions energy technologies (Garnaut 2008A), and
- as the implications chapter to my PhD thesis on innovation, how innovation happens, focussing on the individual and social perspective and particularly on Value. My PhD poses the question – how do consumers understand the value in a new technology? Value has been found to be an important driver of innovation success, requiring better understanding of the nature and dynamics of value. Discovering this process, is the main implication for government, and industry from my thesis – a process I call Value

Management. Value Management is also a shorthand term I use for my new value based theory of innovation.

Where does Garnaut direct our attention? What does Value Management have to say about Climate Change, and the Garnaut questions?

Garnaut is interested in how innovation happens and what governments should do. In particular, Garnaut aims to “examine the impacts of climate change on the Australian economy, and [to] recommend medium to long-term policies and policy frameworks to improve the prospects for sustained prosperity” p1 Issues Paper 4. Further Garnaut seeks ‘input on the key innovation issues facing Australian industries in the context of climate change’ p2 *ibid*. This is also in light of the Emissions Trading Scheme Discussion Paper (Garnaut 2008B).

III. Garnaut Innovation Issues

Garnaut in Issue Paper 4 identifies many questions for consideration (around 23), including:

- 3. How Innovation happens
- 4.1 Policy clarity, continuity and coherence ie simplicity
- 4.2 Risk management and diversification through a portfolio of technological options ie difficulty ‘picking winners’ to fund, learning
- 4.3 Technological lock-in ie breaking technology trajectory
- 5.1 Market failures – national research funding ie ‘picking winners’ problem
- 5.2 Early-mover disadvantage ie spillovers, encouraging early adopters
- 5.3 Coordination failures – not addressed herein
- 5.4 International research – not addressed herein
- 5.5 Capital Market failures – not addressed herein

To serve the two masters, I will answer the Garnaut questions specifically and individually, in order to be easily read by Garnaut, then reproduce those arguments, reformatted to satisfy my PhD supervisors.

Specific / Key Garnaut Questions

3. How innovation happens

3.1 What is the role of an emissions trading scheme (ETS) in driving innovation?

3.2 How large are the market failures in innovation?

3.3 Are there alternative frameworks that may be useful in the process of policy analysis and development?

3.1 ETS vs innovation

Prices are drivers of consumer behaviour, but they are not the only drivers. Value management (VM), a new theory of innovation developed in my PhD, investigates how innovation happens, suggests that value drives action, and forms behaviour, including adoption of innovation. But what is value, what is the nature of value, and how does

value as an idea help in this process of policy development. The summary of VM is made in Appendix 1.

This document aims to take those VM ideas, derived from consumer interviews, using a grounded theory methodology, and apply those in a new arena to predict and control the behaviour of innovators, and assist government in the introduction and development of policy, that takes advantage of a VM perspective.

Background: VM builds from innovation theory, and adds new knowledge derived from analysing how consumers interact with innovation, based on interview data, and observation, using a grounded theory methodology (Glaser and Strauss 1967).

Strengths / weaknesses of Grounded Theory – Grounded theory focuses on social dynamics, so allows meaning to be brought to complex, moving, highly interactive social interaction and events. Small situations are studied intensely, and with low preceding expectations, to allow those studied to tell the story of their experiences. Results build a dynamic explanatory model of the situation, with the intention of using this model in other parallel situations. As such the results may lead to insight, in other situations, but will not lead to generalisable statements of law like rules that apply in all situations and conditions. To understand a highly dynamic, contextual and complex issue, such flexible methodology offers the potential for new answers to old questions. Innovation, and the adoption of new technology is one such dynamic, contextual, complex phenomenon. The resulting theory is Value Management, and the new situation is Climate Change policy, and related innovation adoption.

Benefits of VM: value and innovation are seen as a complex, dynamic, contextual, socially constructed (Berger and Luckmann 1967) phenomenon.

Understanding how the ETS (Garnaut 2008B) will impact innovation depends on how you believe innovation happens. I am well positioned to critique this connection, since I am writing my PhD on this topic – how innovation happens, and the implications chapter tests my theory against new situations, in this case, climate change policy development.

Issues paper 4 describes the linear model of innovation, flowing from R&D to commercialisation to Diffusion. This is Schumpeter's linear model – invention, innovation, diffusion as cited in Foxon (2003). The Foxon (2003) paper is provided on the Garnaut website as a more detailed innovation reference, and it provides an excellent step forward from the Schumpeter linear model. See below Innovation Theory – Garnaut Perspective.

Foxon, relies on Geels (2002) to offer an enhancement over the linear model, of a 'non-linear, systemic view of [] innovation' (p.28), which allows a fuller analysis. This model sees the innovation environment as including innovators, suppliers, users, financiers, researchers and government as actors in an interacting environment. Foxon emphasises learning and knowledge, and the push of technology and pull of markets but is not very specific on the mechanisms.

Further innovation literature can cast light on the interactions between these parties to provide a richer understanding of the dynamics within the innovation process. I propose to discuss three, which may have application, and relevance to climate change policy, and lead to four weaknesses of the EST to encourage low carbon technology development:

- Christensen's (1997) Disruptive technology theory
- Bijker's (1995) social construction of technology
- Ferrers' (2008) Value Management theory of Innovation

Christensen (1997) and Disruptive Innovation – The Innovator's Dilemma, Harvard Business School Press (Also Bower and Christensen 1995 Harvard Business Review)

Christensen disruptive innovation theory was perhaps the most important new innovation theory in the 1990s, until Kim and Mauborgne's (2005) book, Blue Ocean Strategy. Christensen examined the disk drive industry as it moved through generations of radical technology shift, largely a shift to decreasing size from 8" to 5.25" to 3.5" to 2" drives. Disk drives move through these generations very quickly so were an ideal industry to examine, innovation at an industry level.

Christensen found several surprising, perhaps counter-intuitive results, which marked his work as significant, and have importance in climate change policy:

1. Two types of innovation were found, sustaining and disruptive
2. Market leaders were able to deal with sustaining innovation easily (about 200 innovations)
3. No market leader survived a disruptive technology (about six), becoming generally accepted in the mainstream – each new generation technology was led by new, often smaller competitors
4. Disruptive technologies started off with significantly lower performance, that was not attractive to the customers of market leaders. By listening to their customers, market leaders ignored the potential of the disruptive technology. While market leaders often had developed the disruptive technology, it was unappealing to develop, since it had higher uncertainty, was not accepted by their large customers, and offered only small returns
5. New markets took advantage of disruptive technologies
6. Disruptive technologies improved progressively (with sustaining incremental innovations) until they satisfied basic mainstream users, and eventually power users. At this point the market leaders responded, but the market momentum was with the initially smaller, but fast growing competitors who knocked the market leaders from their dominant position
7. This pattern repeated several times through each generational shift.

Christensen uses the example of an electric car as another potential disruptive technology, where it is likely to be ignored by the mainstream market leaders eg Ford, Holden, since its performance is substantially less than what the market demands, so new companies form to bring the technology to a new audience.

Electric cars exist now, but we don't think of them as cars. They are not built by car makers, and serve a different market. Two examples are golf buggies, and electric wheelchairs. These are vehicles for specific niche purposes, that drive slower, and shorter distances than cars. Car makers don't think of them as cars. Yet if they could improve their range to 100km, then 200km, and improve their speed from 10km/hr to 20, then 40, then 60, then they would start to appeal to basic mainstream car users, and a shift could occur from the market leaders to the innovators.

Example – Electric Vehicles Company (EV), St Kilda (www.evehicle.com.au)

EV produces electric bicycles, which they design in Melbourne and manufacture in China. Building from Chinese designs they tailor the bikes to Australian conditions. They have been experimenting with an electric car. An electric bike can do up to 30 km/hr, and its battery gives it a range of up to 100km. Extra battery packs, can extend the range to 200km, before recharging is necessary.

Who is more likely to produce an Electric car? Holden, who spends \$2 billion on developing a new vehicle, or EV. EV is the Wright Brothers of the electric car market. Following Christensen's theory, it is EV, who is more likely to produce the next generation low carbon transportation.

EV can produce 1500 (bicycles) electric vehicles a year, and their manager says these people are buying electric vehicles to replace cars. To ramp their business up to 1500 a month, and then 10,000 a month, is a massive undertaking and yet their technical lead over Holden producing 1500 electric vehicles a year is impressive.

Holden, Director of Innovation, Richard Marshall was approached for comment, by mail, as Holden provides no email contact, but no response was forthcoming.

[Update: 10 April: Directory of Innovation has requested meeting to discuss proposal in the next two weeks.]

[Update2: Meeting confirmed for 16 April, by phone.]

Lessons from Christensen

- **Disruptive innovation comes from small unexpected innovators, targeting different users**
- **If disruptive innovators can reach mainstream user requirements, with electric cars, range, speed, low carbon, (and of course price) then car users will switch to electric vehicles.**
- **Less impact on low carbon power – though wind, tide, solar, less disruptive, since power only has two dimensions – price, and Kwh output.**

Bijker (1995) – Social Construction of Technology (SCOT)

Bijker (1995) describes new technology as presenting itself as a new variation competing for dominance in the market. This is a process of "variation", followed by "selection" and then "stabilisation". Importantly for this thesis, Bijker (1995) also suggests that a period of "interpretive flexibility" (p.269) exists that leads to "closure and stabilisation". This process of interpretive flexibility is one in which consumers

decide on the value for an innovation and if it is worth having. This is the process that 3G consumers are working through now.

A new technology is said to work when it is "accepted by relevant social groups" (Bijker 1995, p.270). Thus "an artefact does not suddenly appear as a result of a singular act of heroic invention; instead it is gradually constructed in the social interactions between and within relevant social groups" (Bijker 1995, p.270). Further, "the success of an innovation will depend upon the formation of a new constituency - a set of relevant social groups that adopts the emerging technological frame" (p.278). This view of the diffusion of a technology rejects a linear perspective of technology development, and seeks to provide a richer, more dynamic explanation.

The Bijker approach to innovation is dynamic, and emphasises co-construction between technology push, and demand pull. In this sense, Apple does not make an innovative new product, but the product, such as the iPhone is the result of a backwards and forwards between Apple the innovator, and consumers decision to purchase, discuss and interact with the innovation. Bijker suggests innovation occurs much more in relation to consumers, through their interaction with each other, with the innovator and with government. Within the linear view, this is the diffusion phase, which is seen as occurring after the innovation is made. Bijker's view rejects this, and suggests that the invention and innovation is done in close connection with the ultimate users.

In relation to clean power and clean transport, and its development, Bijker would suggest consumers play an important role in this development, through their purchase and social discussion activities. On this basis, I have consulted with a range of consumers to determine their level of interest in the creation of low carbon power and transport, and particularly would they be prepared to pay for it, through a tax on petrol or other consumption taxes. Grounded theory suggests that about 20-30 interviews are required to exhaust the possible range of interpretations (social constructions) consumers may have about low carbon technology. While time does not allow an exhaustive study, to date 20 consumers with as widely ranging demographics as possible, have been consulted, and the majority (about 2/3) have indicated strong positive attitudes towards paying for low carbon transport and power, through higher taxation. A full list of comments, and summary is provided in Appendix 4.

Relevance to clean power and transport include what falls into those categories. For example, does nuclear energy satisfy description as clean energy. Consumers may be quite negative towards nuclear energy because of perceived risk, and social cost of waste disposal. Similarly, wind turbines could be seen as an unacceptable blot on the landscape, requiring protest and pressure to be applied to local councils. In such ways, consumers can have strong input into what technology options are acceptable early on in the process.

Clean transport is more flexibly open to interpretation. Consumers would think of clean transport as a Toyota Prius, but thinking more widely it includes, bicycles, trams, trains (provided they can show they emit less carbon per km than cars). Such use of low carbon transport should be encouraged and rewarded.

Consumer response to the policy suggestion

Consumer response has been surprisingly positive, which is indicative of the shift in attitudes to accept the necessity for action on climate change. Consumer change fast, but corporations change slow. The Rudd Government was the first significant act of the new consumer attitude, and the time is ripe for consumers to take the next step in triggering further action by government. This submission is trying to pick up on that new attitude to give feedback to the Garnaut review that consumers are prepared to pay the price for long term social stability, in relation to climate change in general, and the cost of developing clean energy and clean transport in particular. What consumers lack is a concrete way to make a difference. The Low Carbon Incentive Scheme, this submissions conclusion, aggregates consumer power, to drive corporations towards a social goal – creating a low carbon, sustainable society.

However, consumers are suspicious of government doing the right thing, especially when it comes to raising taxation (a carbon tax) to pay for / encourage the solution. Consumers expressed significant concern about whether government could be trusted to fulfil the scheme as outlined in this submission.

However, I believe there is a great opportunity for the Rudd government to take a bold, leadership decision, to lead the world in climate change action, riding the positive consumer attitude to pay a carbon tax, to stimulate corporations to develop next generation clean energy and transport, and to set an example for the rest of the world. Australia is well placed to make such a bold move, with a strong economy, thoughtful consumers, and a new government that is ready for bold action, with a popular mandate for action. The time to act is now.

Lessons from Bijker (1995), social construction of technology theory, and consumers

- **Listen to consumers, for attitudes positive/negative to accepting low carbon innovation - consumers were found to be highly positive to paying for low carbon innovation through higher taxation, particularly through an increase in GST. Particular technologies need to be accepted by consumers eg Geothermal, and algae submissions to Garnaut.**
- **Consumers were highly suspicious that government promises would be kept, and extra taxation they authorised for a specific purpose (low carbon technology incentive) could be used for another purpose**
- **See Consumer opinions (20) on policy proposal - Appendix 3**

Ferrers (2008) Value Management theory of Innovation

Value Management suggests that value is a key driver of innovation acceptance, and hence innovation success. A successful innovation create value. An innovation fails, when it fails to create value for consumers. But value is dynamic, subjective and individual. Value moves when new information is received by a consumer, and moves when the consumer consults with their social network. Consumers make a value assessment, and when enough positive value elements are accumulated, a consumer acts. Consumers also strongly act when their value is reduced. Twelve value dimensions were found – four universal, four social, and four individual. These were derived by looking at

mobile phones, and will apply somewhat differently in looking at other technologies. Consumers have a number of strategies they use to assess value, including exploring, comparing and contrasting, observing, balancing, filtering, and aggregating. Value has a trajectory, so consumers wait and see as a strategy, not reacting immediately to new offers or information, allowing new knowledge to pass through complex social filters before a new conclusion is drawn and action made.

While this study is based on consumers, and the methodology does not make the conclusions generalisable, innovators, corporations, and government are likely to follow similar social mechanisms.

Indeed, within issues paper 4, value dimensions are obvious, including – simplicity*, power*, learning*, time*, price*, complexity*. The government seeks a simple policy, that facilitates learning, they want options (power), to deal with a complex situation. Those words marked with an asterisk are value dimensions. Value dimensions compete with each other, and the complex balancing act (value assessment), to find the best solution (bounded rationality), is the essence of the value process. Consumers take in information, look for value, based on their circumstances and input from their social network. The policy development process is highly similar.

Corporations are more complex in their value assessments, because groups have to negotiate their individual values to reach a group consensus over value, and remember value moves with new information, so value can be constantly shifting. Refer Appendix 1 for more Value Management summary.

Corporations, like consumers will protect their value, and will react strongly to a situation that decreases their value. Thus the oil companies, might buy out successful competing technologies, or lobby government to protect their value – consider pressure on California to reduce the requirement for zero emissions vehicles (see movie – Who killed the Electric Car? <http://www.imdb.com/title/tt0489037/>). According to the movie:

“In 1996, electric cars began to appear on roads all over California. They were quiet and fast, produced no exhaust and ran without gasoline.....Ten years later, these cars were destroyed.”

In this way, technology trajectory is created and reinforced. To shift this trajectory and lock-in, a significant and equivalent force needs to be applied. Corporate power comes from their wealth, their employment, and their access to government. Consumers have less power, individually, but they can exercise their power collectively, for instance in changing a government at a general election. The policy proposal uses collective consumer power to shift corporate thinking into line with consumers value, that is more concern for the environment, which has to date been shown through the election of the green friendly Rudd government.

However, the recommended policy gives corporations a chance to create value for themselves, and may encourage the actions in line with the policy. Corporations are like computer programs, in that the right incentives, will drive them, in following their profit maximising

Lessons from Ferrers Value Management

- **Everyone tries to maximise their value, so rewards will encourage positive behaviours**
- **Corporations will protect their value, and act strongly when their value is threatened**
- **Consumer move fast, corporations move slow, and industries slowest. Smaller corporates move faster (usually) than bigger corporates.**
- **Value changes with new information. Consumers have taken climate change information, and redefined their values about urgency and action in relation to this issue, not least in electing the Rudd Government. They are now prepared to take the next steps, though with concerns about trusting the government and protecting the poorest and least able to protect themselves. See their comments in Appendix 3.**

Conclusion: ETS weaknesses in encouraging innovation.

An innovation analysis of the ETS, has also raised four issues, that suggest that the ETS only weakly encourages development of next generation low carbon technologies:

- Firstly, the ETS will encourage incremental innovation in power stations, and transfer from coal to gas, however it will not encourage radical or disruptive innovation, which is likely to come from small firms operating outside of the power and car/oil industries. Disruptors who do not hold carbon certificates have less incentive from the ETS to innovate. □ □ **(Christensen's Disruptive Innovation)**
- Secondly, disruptive innovation can decrease the value of carbon certificates, giving certificate holders an incentive to resist such technology to protect the value of their investment in carbon certificates. □ □ **(Ferrers' Value Management)**
- Thirdly, oil companies who purchase certificates, rather than petrol consumers, to keep the ETS simple, are more likely to pass carbon prices onto consumers, than to create or buy low carbon technology, since these actions are outside their competencies, and would reduce their profits. □ □ **(Ferrers' Value Management)**
- Fourthly, to protect their carbon lock in, the coal and oil industries have incentive to undermine the processes, and distract funding away from other low carbon technologies eg QLD \$900M clean coal investments vs \$26M Centre for Low Emission Technology, VIC \$187M Energy technology innovation strategy (including \$103.5M clean coal) vs \$12M for renewable energy support fund. □ □ **(Ferrers' Value Management)**

3.2 How large are the market failures in innovation?

Points:

- Innovators protect gains eg buy competitors eg Who killed electric car?

- market failure : no, people follow value, never wrong, everyone exploits environment, change the rules to change behaviour

VM suggests consumers interact with their environment to maximise value. Innovators, as corporations maximise profit, sometimes at the cost of consumer value eg a price increase, with no change in function or quantity delivered, think weekly petrol price cycle.

Value management views innovation as highly dynamic, individually and socially constructed, and as such very difficult to measure. The true measure of success, will be the tracing over time of the level of clean transport (% clean km travelled), and level of clean energy (% clean MWh produced).

3.3 Are there alternative frameworks that may be useful in the process of policy analysis and development?

The Christensen disruptive technology model, and Bijker's social construction of technology model, along with Value Management, all have relevant things to say for policy development.

4.1.1 How can Australian governments improve policy clarity, continuity and coherence for businesses looking to invest in new energy technologies, or in other sectors with the potential to contribute to mitigation or adaption?

Value Management (see Appendix 1) suggests consumers value **simplicity** (which allows fast, decisive action), **learning** (which allows us to better respond to our environment), **power** (which grants options and flexibility), and **time**. We assess value, sometimes by waiting to see what happens, and through consultation with our social network. Simplicity, learning and power compete against each other. Increasing simplicity reduces power. **Waiting** to learn, costs time. Increasing options (power) decreases simplicity. The challenge is to find a mix that we are happy with.

Such a mix is dynamic, ongoing, subjective, and socially constructed, probably with no optimal answer. Consumers act based on incomplete information, and then react if there is an adverse reaction to value (a decrease in value).

The government, in making a policy and industry, in responding to policy face the same dilemmas of conflicting values.

The proposed scheme, the Low Carbon Incentive Scheme (LCIS), focuses on simplicity, power, and timeliness. By being revenue neutral, it is sensitive to cost, and leverages the consumers willingness to pay, to create financial power, or leverage to encourage corporations to act.

If the governments chooses power, at the cost of simplicity, the resulting complexity may also come at the cost of time, as industry has to be more cautious in their responses. The simplest plan, will enable the fastest action. I hope that the LCIS has the benefit of simplicity.

4.1.2 How will this [policy clarity, continuity and conherence] be improved with the implementation of an Australian emissions trading scheme? What areas of uncertainty might remain?

The ETS does provide some certainty, but as the IMF (2008) points out, an ETS while reducing emissions, does not provide certainty of a carbon price, in the way that a carbon tax provides a stable price for carbon. Thus there will be continued uncertainty that the ETS will not remedy.

Further, associated policies, such as R&D investment will require industry to examine, and respond if they believe they may extract value from that policy. These policies may change over time, and lead to ongoing uncertainty

4.2.1 How can the Australian Governments avoid ‘picking winners’ while encouraging increased innovation? What is the current best practice for technology neutral innovation policy?

If the government is going to pick R&D, then the challenge is to pick winners and avoid losers. This can be done like, the ARC grants through an expert panel, but my preferred answer is that R&D is not funded, and that only successful output is funded. When clean power or clean transport is delivered then it is funded. Clean power is measured in MWh, and clean transport is measured in clean kilometres per person. This could extend to train and tram services, where they could show that they use less carbon per passenger km than cars. A threshold level, should be set, say at 50% of the carbon of the best selling car, so that there is certainty as to what level public transport needs to achieve. It also allows the market to shift from six cylinder to four cylinder cars and for public transport to similarly reduce its carbon output. To do this, there would need to be less empty trains, on off peak services.

Certainty comes from the pool of money which is available to compensate the producers of clean energy and transport. A GST is useful, as the funding of the scheme, since there should be predictions of the funds available from prior fiscal years.

An example of **technology neutral policy** comes from the Ecommerce legislation, where some jurisdictions mandated certain technologies to be used, whereas Australia took a light touch, and set a standard to be reached.

<extract from Law of Ecommerce and Internet lectures LAWS20042 Central Qld Uni>

See Text: Forder, J. & Quirk, P. (2003) *Electronic commerce and the law*, 2nd edn, John Wiley, Milton,

Chapter 7.

- Electronic Transactions Act (ETA)(Cth - 1999) / Electronic Transactions (Qld) Act 2001
- media neutrality - "paper based commerce and electronic commerce should be treated equally" SG4-5
- technology neutrality - "the law should not discriminate between the forms of technology" (ibid.)

Legislative schemes (Forder p.100) - Electronic signatures

- signature enabling ie minimalist
 - legislation not long or detailed
 - easy to implement
 - but not set requirements => unhelpful to support and guide Ecommerce eg Massachusetts Electronic Records and Signatures Act 1998
- prescriptive ie use this technology eg Utah Digital Signature Act 1995, Germany Digital Signature Law 1997
- criteria based
 - technology neutral
 - broad, general
 - meet standard
- eg California Government Code 1995

<end extract>

4.2.2 How can the Australian Government balance the need for diversity and option value with the increasing returns from uniformity and specialisation?

I recommend 'let the market decide'. Let consumers spend what they will, and compensate producers and consumers, at the rate that consumers are prepared to pay. This is the basis of the Low Carbon Incentive Scheme. Perhaps consumers buying solar panels will be the best answer. Perhaps geothermal, or growing algae. Let the market find what works best, and reward the production of clean power, and clean transport.

4.2.3 How can policy promote diversity without falling into the trap of needing to specify at a technical level what such diversity should include?

By promoting a reward, rather than a means, the policy can tap into the creativity of the market to find what works best. By time limiting the scheme, then innovators are motivated to move fast to capture the benefit while they still can. By sharing the benefit amongst all producers, the quicker the ramp up of production, the greater the share of the rewards. Rewards should be pro-rata, based on production levels, and not related to the costs to produce. Rewards should also be capped at 50% capital cost of production. Once production levels of this magnitude are achieved, the market should be mature, and no longer need incentives.

4.3.1 What are the barriers to entry that create uncompetitive incumbency advantages in the Australia?

The main barrier here is that there is a downside to success, which is that successful firms become big and slow. Apple is one of the few firms, also Intel, that push technical boundaries as part of who they are. Following Christensen (1997), market leaders find it

difficult to exploit market opportunities, like climate change, that smaller more nimble, less well resourced firms can take advantage of. Small firms focus on survival, whereas market leaders focus on required rate of return, and size of returns, which make small untried market unattractive to market leaders. See discussion on Christensen in 3.1 above.

The Low Carbon Incentive Scheme encourages a GOLD RUSH, by offering a POT OF GOLD, for both small nimble companies, and market leaders to chase. This is likely to overcome these barriers. This is evidenced by Holden's interest in talking to me in relation to this proposal (see 3.1 above). For Electric Vehicles, it allows their prices to be lowered to attract greater volume of output.

4.3.2 What are the appropriate policies for minimising barriers to market entry without undermining the competitive advantage of established firms?

By changing the rules, and creating new policy, almost by definition you are impacting competitive advantage. Industry will assess the impact of the policy changes, and act to further their own interests. If necessary, by expending time and effort to change the policy. If they do, this is a sign that their competitive advantages are being eroded. See for instance, the lobbying to change the California zero emissions mandate. A similar policy in Australia, would bring a similar reaction from the motor vehicle industry. On that basis, it is probably a sound policy to pursue here.

Funding is also a barrier to entry. A POT of GOLD, allows firms to borrow to enter the market, with a more certain return at the completion of production ready technology.

5.1.1 What criteria, processes and institutional structures are most desirable for allocating funding to public good research?

I prefer funding to be on a loan basis, payable on results, and without results repaid, than to be on a grants basis. The results should be licenced, and funding recovered, from those who profit from the research. Every effort should be made to discourage wasteful play, though perhaps there is a place for a certain percentage of this, say 20% in line with Google's policy of staff working one day a week on their own projects.

5.1.2 What types of reform are needed to ensure that public funding is allocated to the most appropriate and highest-value uses?

I would trust the market, and perhaps the auctioning of public funding, so that those bidders who are most certain of the results bid higher, and pay more to access the funds. Perhaps they could bid the percentage ownership, that the government would own of the finished product.

More speculative funding, should be a smaller proportion of total invested in R&D. Speculation should be for industry who are pursuing profits, where losers can be offset against winners.

5.2.1 Whare are the spillovers faced by firms at the marketisation phase and how large are these spillovers?

Spillovers are a normal and natural part of the innovation process. It is in the nature of innovators to create value, and it is in the nature of imitators to copy the innovation to try to capture some of that value, more cheaply without spending the R&D. This can be done, to avoid the speculative end of research, to take advantage of market power, where they have less R&D skill. The market will reward both innovators and imitators to the extent that they create and distribute value.

Spillovers are also less of a problem when there is time sensitivity, since it takes time to imitate a working product. The Low Carbon Incentive Scheme (LCIS), is heavily biased towards early-movers, in order to promote early and fast action. While there are less producers, the first to market will reap high rewards from the LCIS. Followers will have to share their reward with the greater number who come to market later. This scheme seems to provide a useful balance between the innovator and the imitator.

5.2.2 Are there significant spillovers at other stages?

There are likely to be spillovers at every stage of the innovation process. Ultimately who wins, is less of an issue than that the community wins by finding a technical solution to climate change. The LCIS will motivate fast action, especially with an expected \$1 billion per month to distribute for their effort. At this level of incentive, there should be very strong reasons for industry to work together to maximise the benefits they receive under the scheme.

5.3, 5.4, 5.5 – not considered in this submission

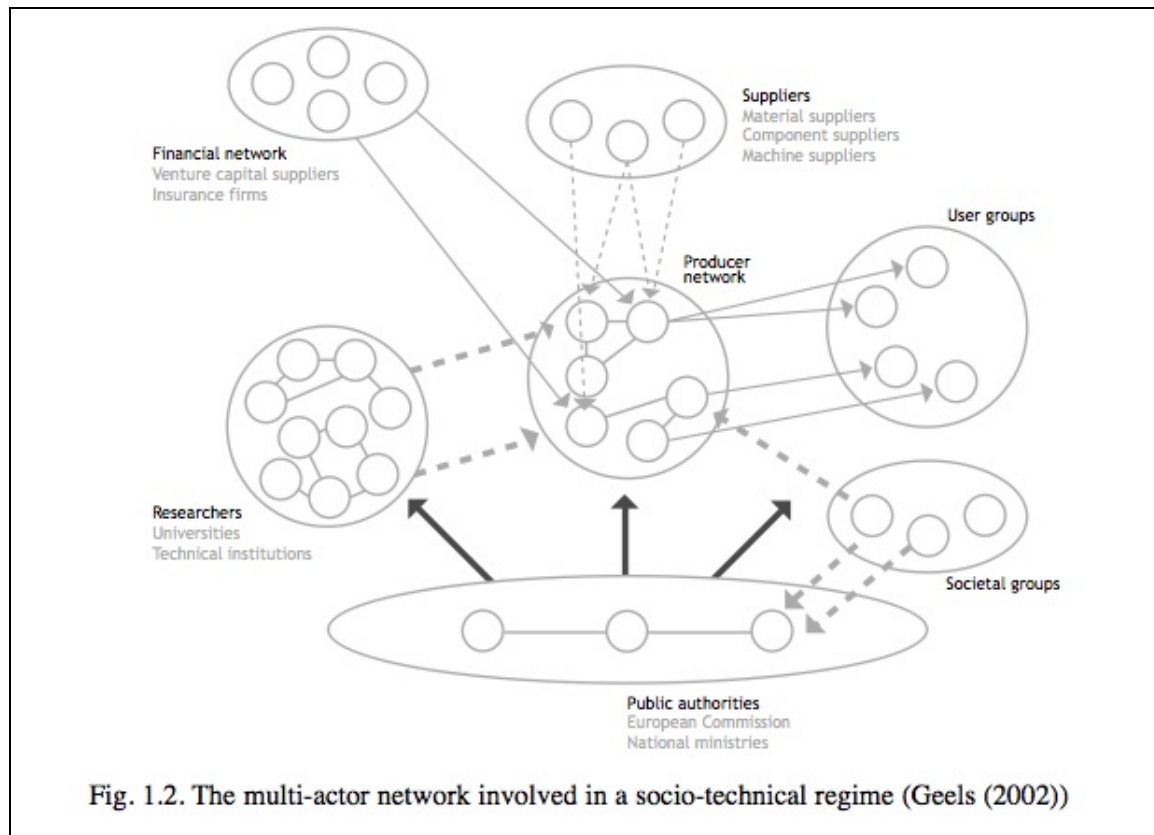
<end Garnaut specific questions>

The following sections are the answers to the Garnaut questions in a more wholistic perspective, not considered question by question.

IV. Innovation Theory – the Garnaut perspective

Garnaut Issue Paper 4 relies in part of a policy report from the UK Carbon Trust, by Foxon (2003), an energy policy researcher from Imperial College London, called ‘Inducing innovation for a low-carbon future: drivers, barriers and policies’. This report, which is excellent, tries to go beyond a linear view of innovation (Schumpeter’s invention, innovation, diffusion model) to a more systemic and institutional model, relying heavily on the ideas of ‘lock-in’ (David 1985) and ‘technology trajectory’ (Dosi 1982), and the importance of learning by doing, using and interacting (Arrow 1962, Rosenberg 1982, Lundvall 1988). Building from Nelson and Winter (1977), and ideas on dominant design (add ref), and niches in Christensen’s (1997) sense, he embraces Geels (2002) view of a socio-technical regime, which includes a landscape that has interacting groups including producers, users, suppliers, government, researchers, financiers, and

other social interest groups. Foxon believes this view is a ‘non-linear, systemic view of [] innovation’ (p.28), which allows a fuller analysis.



Foxon Fig. 1.2 (Geels 2002)

Foxon is concerned with policy intervention when there is a break in market efficiency, caused by ‘lock-in’ – a market failure. Foxon’s concern is significant, saying it can “create persistent incentive structures that strongly influence systems evolution and stability, reinforcing dominant technological, organisational and institutional designs”, for instance, the coal industry obtaining significant funding for carbon sequestration, and clean coal initiatives.

For instance, Qld has a \$900M clean coal development (\$300M from government, and \$600M from industry over ten years), yet only a \$26M group looking at Clean Energy technology. Qld has put aside \$300M for a climate change fund (QG 2007), which gives about \$20M annually for climate change initiatives, and a \$50M renewable energy fund. The balance between coal and other initiatives is affected by the place of coal in the Qld economy – an \$18 billion industry (add refs), which employs many people (read votes) and provides much tax revenue. In comparison, Victoria has a \$103.5M Energy Technology and Innovation Strategy (ETIS) scheme, which funds clean coal projects, compared to a \$12M renewable energy support fund. However, at the recent Victorian Climate Change Summit (04.04.08), Premier Brumby (<http://www.climatechange.vic.gov.au/summit/index.html>) noted in his address the ETIS scheme was raised to \$187M, and included new \$50M funding for a solar project in

Northern Victoria with TRUenergy, in a \$290M project. The federal government is also funding \$79.5M towards this project. (<http://www.alp.org.au/media/0208/msccw251.php>) Penny Wong, Minister for Climate Change, mentioned other renewables funding including “\$500 million Renewable Energy Fund, \$150 million Energy Innovation Fund, \$489 million National Solar Schools Program, and solar hot water and solar power rebates for homes and communities.” (ibid.)

While the investments might seem significant on their own, in light of Qld’s \$18 billion coal industry (annual production), Australia’s \$780 billion annual production, these numbers become less impressive. Compare this to the recommended scheme, which provides an incentive to low Carbon energy of \$1 billion per month.

Foxon recognises ‘bounded rationality’ in actors (Simon 1955), and thinking about flows of knowledge as important, following OECD (2002) report on Dynamising Innovation Systems.

Foxon identifies barriers to innovation, including spillovers – where R&D is observed by competitors before the inventors can fully exploit it eg Microsoft copying Windows from Apple, who copied it from Xerox; sharing risk, and weakening benefits (from sharing benefits) to dampen risk-taking, Arrows (1962) ‘moral hazard’.

V. Low Carbon Technology - Policy Key Issues

Thus the key issues that this submission is trying to address are – policy simplicity, overcoming technology trajectory, avoiding the difficulty of picking technology winners, and encouraging early movers. Learning, to iterate towards the best solution is also important.

The answers to date have largely centred around an Emissions Trading Scheme (ETS) which aims to develop a market price for carbon, which is factored into market prices of carbon producing output, such as coal power, petrol, and industrial production, such as steel and aluminium. Some concern has been raised about the ETS, such as the possible instability of a carbon price which sends weak signals to consumers and producers. A low carbon prices will be a weak incentive to switch to renewable energy, or consume less. Prins and Rayner (2007) suggest “there is little sign of a stable global carbon price emerging in the next five to ten years”. The International Monetary Fund, in its World Economic Outlook (2008), note “an effective mitigation policy must be based on setting a price path for the greenhouse gas emissions that drive climate change” (p.2). However, they go on to note that “the choice between carbon taxes and cap-and-trade systems is less clear cut” (p.23). Carbon taxes give flexibility, strong and stable prices signals, while allowing uncertainty in abatement. Similarly and oppositely, cap and trade systems give abatement certainty at the cost of pricing uncertainty – “cap-and-trade systems could give rise to volatile emission pricing when demand conditions change” (p.23). Thus they go on to suggest that a hybrid system could take advantage of the strengths of both systems

(p.27). The recommended scheme in this submission is for a carbon tax to exist alongside the cap-and-trade ETS.

Two other issues that are important here are timing of **policy impact**, and **level of impact**. Prins and Rayner (2007) suggest a level of impact, similar to the US Defence R&D budget, is necessary, which is in the order of \$80 billion per annum, but the IMF (2008) notes that Europe is only committing \$3 billion over Framework 6, 2002-2006 to “support [] climate change research and technologies, plus \$1.8 billion for nuclear energy” (p.26). The recommended impact of policy here is \$12 billion per annum – about 1.3% of GDP.

Timing is also important, with earlier action costing less than a wait and see policy (Stern perhaps made this point). While corporations who are benefitting from the existing regime (think oil, coal, and motor vehicles), have incentives to delay, perhaps the rest of us do not.

An innovation analysis of the ETS, has also raised four issues, that suggest that the ETS only weakly encourages development of next generation low carbon technologies:

- Firstly, the ETS will encourage incremental innovation in power stations, and transfer from coal to gas, however it will not encourage radical or disruptive innovation, which is likely to come from small firms operating outside of the power and car/oil industries. Disruptors who do not hold carbon certificates have less incentive from the ETS to innovate. □ □
- Secondly, disruptive innovation can decrease the value of carbon certificates, giving certificate holders an incentive to resist such technology to protect the value of their investment in carbon certificates. □ □
- Thirdly, oil companies who purchase certificates, rather than petrol consumers, to keep the ETS simple, are more likely to pass carbon prices onto consumers, than to create or buy low carbon technology, since these actions are outside their competencies, and would reduce their profits. □ □
- Fourthly, to protect their carbon lock in, the coal and oil industries have incentive to undermine the processes, and distract funding away from other low carbon technologies eg QLD \$900M clean coal investments vs \$26M Centre for Low Emission Technology, VIC \$187M Energy technology innovation strategy (including \$103.5M clean coal) vs \$12M for renewable energy support fund. □ □

Thus, it appears that alternate policy is needed to provide the right incentives to corporations to develop clean, low carbon technology. If we can get the policy settings right, the corporations should satisfy our goals, by following their profit maximising impetus. The proposed scheme is called a Low Carbon Incentive Scheme. First we will consider some principles of the scheme.

VI. Policy Principles

The recommended Low Carbon Incentive Scheme (LCIS) is useful in addressing these Garnaut matters, such as picking winners, breaking technology trajectory, simplicity, and encouraging early movers, and is based on the following principles:

- let the market decide – the market picks the winners
- results (in terms of MWh for power, and km delivered for transport), not R&D are rewarded – the market picks the winners
- revenue neutral – no funds from existing government programs are required
- revenue is shared by low carbon producers (50%) and low carbon consumers (50%)
- corporations change slow, but consumers change fast – consumers are more likely to understand the urgency of action, so are more willing to pay for change than corporations, especially highly profitable high carbon industries, such as oil, coal, and motor vehicles
- Simplicity – a simpler plan allows faster communication, consideration, and an easier transition to action
- Learning – the more you learn, the more you earn. Innovators are rewarded for fast action, fast solution to problems, and fast output
- Time focussed – the fast earn higher rewards than the slow

The underlined principles are value dimensions discovered in my research on understanding innovation from a value perspective (www.valman.blogspot.com). Value is, I argue a key driver in innovation adoption. While corporations are profit maximisers, consumers are value maximisers.

Problems:

1. The idea is radical and will not be easy for people to get their heads around.
2. The scheme is a carbon tax on top of an ETS – in effect it is double taxation. A double taxation system is not really fair. But it is the unfairness which encourages investor and entrepreneurs to act fast, and get their share of the LCIS payments. Competition between entrepreneurs and investors should over time make the scheme more fair.

See below in Section VIII, for an analysis of the suggested policies strengths and weaknesses.

Policy summary:

Goals to transition to a low Carbon (C) economy:

□- low C transport □- low C power □- low C exports □- low C workforce □ □

The emission trading scheme (ETS) is a good start to get C prices into products, but greater incentive is needed to encourage success in low C technology, if we want to do so fast. The ETS is likely to take perhaps some 10-15 years to achieve this. □ □

Some problems exist with the ETS encouraging low C technology. Firstly, the ETS will encourage incremental innovation in power stations, and transfer from coal to gas, however it will not encourage radical or disruptive innovation, which is likely to come from small firms operating outside of the power and car/oil industries. Disruptors who do not hold C certificates have less incentive from the ETS to innovate. □ □

Secondly, disruptive innovation can decrease the value of C certificates, giving certificate holders an incentive to resist such technology to protect the value of their investment in C certificates. □ □

Thirdly, oil companies who purchase certificates, rather than petrol consumers, to keep the ETS simple, are more likely to pass C prices onto consumers, than to create or buy low C technology, which is outside their competencies, and would reduce their profits. □ □

Fourthly, to protect their C lock in, the coal and oil industries have incentive to undermine the processes, and distract funding away from other low C technologies eg QLD \$900M clean coal investments vs \$26M Centre for Low Emission Technology, VIC \$187M Energy technology innovation strategy (including \$103.5M clean coal) vs \$12M for renewable energy support fund. □ □

Therefore, to avoid these ETS problems, I suggest a Low C Incentive scheme, which collects funds and pays low C users and producers to encourage such use and production. Funding should be not at the expense of other government services (revenue neutral), and should encourage market solutions to low C needs. But the incentive should be paid 50% to producers and 50% to consumers to reward both parties. □ □

Funds could be raised through a levy on petrol prices, and electricity bills. But consumers have told me, during a process of consultation, that this could place too heavy a burden on already stressed households. This could be a transitional arrangement (say two years) to be replaced by a broad ranging, but small, consumption tax. A level of 2%, added to GST, and collected in the same way, and with the same rules, could be collected by the ATO, then forwarded to the Carbon Bank (see Garnaut) for distribution to low C users and producers. Low income families would be protected as food would not be levied. And at a low 2% the impact would be slight on individual transactions. Also, business would not be levied, only consumers, reducing political issues, in selling the scheme to business. At 2%, funds of around \$1B per month could be raised. Significantly ahead of Victoria's \$200M action plan or Qld \$900M investment in clean coal over ten years. □ □

A 2% extra Low CARBON levy on GST would raise \$1 billion per month.

Payments should be made for results, not for R&D, so low C MWh of electricity would be paid from the fund, up to 50% of capital costs. Low C vehicles would be paid for out of the fund eg Toyota Prius, if they save 50% over normal vehicles. □ □ □

Each month, receipts would be balanced with payments, so the fastest developers of low C technology were paid, starting a low C development race - a gold rush. Unspent receipts, would go to other C offset, such as planting trees, a portion could be saved (say 40%) for low C loans to buy solar heating, or for loans to fund low C R&D. A small proportion could fund R&D alone (say 20%), and administration (say 5%). □ □

Funding could also come from sales of C certificates. □ □

The fund should be spent on low C power (1/3), low C transport (1/3) and compensation to workers transitioning from high C to low C jobs (1/3). An incentive to leave high C jobs (say \$10,000 per year of service, payable from fund in month of leaving or pro rata from funds available) and for employers to take on workers from high C jobs (say \$10,000, payable half on hiring, and half on one year anniversary), into low C industries (ie receiving incentive payments).

VII. Key concepts of policy submission:

Good policy = tech neutral, incentive to act, cheap (self-funding), simple, allows learning, time sensitive, allows market to find best solution (several value dimensions involved which compete for attention)

Issue = market failure = uncapped GHG emissions ie low coal price

Value interpretation: Need to shift the value away from coal to low emission technology, for industry. Consumers have already shifted - evidenced by change of government. Consumer attitude has moved. Business attitude needs to be encouraged to shift, but business is very \$\$ oriented.

Value trajectory - a change in value is not followed by immediate action, wait and see, for both consumers and industry. Action preceded by change in attitudes, social network consultation and wait and see.

Value assessment: consumers and industry will consult with their peers before acting (social construction of technology theory)

Value dimensions: compete for action, need to be weighed against each other, before action, therefore very complex decision required. Dimensions include price, time, community, simplicity/complexity (ie risk), power (ie potential avenues of action), learning, and of course function (power delivery eg coal, oil, solar, wind).

Therefore need to OVERSHOOT (see appendix 5):

A fair priced carbon charge, or incremental increases in price will lead to slow changes of action by consumers and industry. This is a shift in value which business and consumers will bring within their value assessments to decide what and when action is appropriate.

OVERSHOOT = incentives for innovators to act quickly. For instance, an unfair priced carbon charge, that motivates early movers, but declines over time to penalise late movers. Yet this needs to be captured in a few simple rules, that can be easily communicated and passed through a social network for assessment. (social construction of technology theory) - business as value exploiters.

OVERSHOOT = time limited incentives, paid for by prepaying for carbon.

VIII. Policy (Low Carbon Incentive Scheme) Strengths / Weaknesses

<u>Strengths</u>	<u>Weaknesses</u>
<ul style="list-style-type: none"> • <u>immediate impact</u>, highly visible in rewarding clean energy producers, large old tech users pay small amount, which is concentrated in a small number of clean energy producers hands (=highly visible) • only rewards on basis of clean output, so not investment, or effort, 	<ul style="list-style-type: none"> • has no impact on social barriers, such as community concern over aesthetics or noise from wind turbines (perhaps community should garner some of the rewards, since pay some of the costs – aesthetic, noise), or require noise dampeners, or no community • opposition eg use offshore islands

<p>only performance eg penalises maintenance failures, thought might postpone maintenance to reap earlier higher rewards before rewards fall – market picks winners</p> <ul style="list-style-type: none"> rewards consumers for introducing small scale clean technology like solar panels – allows market to learn and experiment new, so may not work, or work in unexpected way eg unthought of weakness – need to build in learning level of impact - \$1 billion a month is world leading simplicity 	<p>for turbine sites</p> <ul style="list-style-type: none"> rewards inaction/luck for having historical clean technology assets (– good -> those who have clean assets are likely to have expertise to create new clean assets) if old tech producers own small scale clean tech, there is little incentive for them to change, unless there is threat of new clean tech with greater power output does it reward clean energy already in place eg hydro dams, or only new investment full costing, nuclear power costs should include full costs of waste permanent disposal and insurance for accidental damage, therefore wind costs should include community costs to compensate for aesthetics and noise
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Compare to Cap and Trade scheme:

<p><u>Strengths</u></p> <ul style="list-style-type: none"> market picks winners: who so ever can reduce the cost of emission, can sell their remaining emission rights, for value 	<p><u>Weaknesses</u></p> <ul style="list-style-type: none"> value of carbon unknown (but market can estimate and learn to get more accurate) time to work out, funding for innovation to reduce emissions risky, so high risk premium attached if no funding for innovation, no reduced emissions then no emission rights to sell does not pay for current period/historical C recovery eg tree planting
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IX. Conclusion:

Churchill said “This is not the end. Nor is this the beginning of the end. Rather this is the end of the beginning.” We stand at the dawn of a new generation. Climate change is the challenge of our generation. We can boldly go forth, or wait for others to lead. Let us choose to go forward boldly.

Leading low carbon development (as sent to the 2020 Summit)

The Garnaut process is a useful learning process for the Rudd Government to get the best advice on dealing with climate change. However, I am concerned that the focus on the Emission Trading Scheme, as the central plank in the policy will be insufficient to solve climate change, fast enough. The world is like a supertanker, slow to turn to avoid the dangers of runaway climate change. The oil, coal and motor vehicle industries are entrenched in our society, where they have brought us cheap power, transport and over the last fifty years, significant growth and prosperity.

The solutions to next generation power, and transport, I fear will not come from the oil, coal and motor vehicle industries, though it is these industries which the ETS will target to change their behaviour. Next generation technology often comes from small outsiders, who have the means to put the pieces of the puzzle together. Consider the Wright Brothers. They were not funded by the Rail or Shipping industries to develop next generation transport. And so electric vehicles and clean power may come from smaller businesses, which need our support.

How can we align corporation motivation, with policy to drive them to produce next generation technology, if not through an ETS. As an innovation researcher, I recommend a Low Carbon Incentive Scheme, which collects funds and rewards Low Carbon producers and consumers. Funds could come from a tax on petrol, new cars, and coal generated electricity. Funds could come from auctioning emissions certificates. Talking to consumers, they seem to prefer a smaller, but broader tax – say 2% extra on GST. This would raise, perhaps as much as \$1 billion per month to encourage development on clean energy and transport, and assist workers to move from old to cleaner industries.

Consumers are very concerned that the funds would disappear into consolidated revenue, and not be spent for this purpose. I recommend the funds should go to Garnaut's new Carbon Bank to disburse, and the scheme be limited to five years, with a potential extension for five more. This would give potential funds of \$60 billion, around 2% of GDP, over the period. Compare this to Europe which is investing \$3 billion over five years (IMF, World Economic Outlook, Apr. 2008, p.26). A better comparison is with the 'space race' when the US spent \$5.4 billion per year, in the 1960s, to get to a leading position. President Kennedy, in his 'we choose to go to the moon' speech, equated this amount to the same figure the nation spent on cigarettes and cigars.

The 21st century has its own race now. The race to protect our planet from our own prosperity, fuelled by oil, coal and cars, and to find a cleaner, greener, next generation energy and transport, to build out future prosperity upon.

Consumers are ready to pay.

Let the Rudd government embrace this opportunity to lead the world, in this race.

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Appendix 1 – Value Management Summary

Let us summarise our key findings so far (and there are a few more elements to add yet – the analysis of the non-value elements, the final saturation, including the famous, the blue collar and religious):

1. Value is a primary cause of technology adoption for consumers. Consumers are value maximisers, especially simplifying and minimising cost, while looking for new function, and holding and protecting the valuable past. This goal is inherently contradictory. Choices are bounded by social and budgetary constraints, and past choices. (bounded rationality/path dependency) Tension exists between profit maximising and value maximising.
2. The relationship between value and the action of adoption is complex, contingent (on context), social and individual, dynamic and constructionist.
3. Value management theory is in itself, success, goal and problem neutral (except value maximising).
4. A greater impetus to action for consumers, is a sudden loss of value (a devalue event), or negative shift in value (often profit maximising, though sometimes just error). Whereas an identification or assessment of value most strongly leads to a new attitude, which moves through the complex social filters of social construction, and may or may not lead to action. (devalue -> action, value -> att/soc.net/action)
5. Value is multi-dimensional. All accept four (universal) values – function, time, cost, and service/reliability. Four social values are need, duty, power, and community/connection. Four individual values are learning/new/old, simple/complex, emotion and beauty. The social and individual values are mentioned by between one third and two thirds of people, for a particular innovation. The same person may emphasise different values for different things at the same time, and may change that emphasis over time. Different people may emphasise different values at the same time, in relation to the same thing.
6. Value dimensions compete for attention, and we trade off one for another, until we reach a combination that we are satisfied with. (satisficing)
7. Value moves up or down, with any change in information relating to a value dimension. Eg a price increase, or reliability decrease, loss of beauty, lack of newness or novelty, increase in community opinion, such as a community recommendation or observation.
8. Value degrades over time, since newness (a value dimension) fades over time.
9. Value has a trajectory or momentum, that comes from a wait and see value assessment strategy. Our actions relating to value are buffered by the complex social filters, as we gather enough [positive] information to move from our current action state.
10. Value may stabilise when there is no new information, or our attention shifts significantly elsewhere, until there is new information or our attention shifts back. Our ability to remember, and conversely, our nature to forget also has impact on value stabilisation.

Appendix 2 – Consultation for Garnaut Policy Development

Academic

Economics

- a. Prof John Foster, Head of Economics School, UQ (sent 3 April)
- b. Liam Wagner, (former Energy [Gas] Trading Analyst), Postdoctoral Research Fellow, Economics School, UQ (discussed 3 April)
- c. Tom Mandeville, Senior Lecturer, Economics of Innovation and Entrepreneurship, Economics School UQ (discussed 3 April)

Technology Management / Innovation (cc Supervisors)

- a. A/Prof Mile Terziovski, Director, Centre for Global Innovation and Entrepreneurship, Unimelb (sent 3 April)
- b. Prof Jim Falk, Centre for Science, Innovation and Society, Unimelb (sent 3 April)
- c. Prof Mark Dodgson, Centre for Technology and Innovation Management, UQ (sent 3 April)

Sustainability

- a. Prof Andrew Griffiths, Business School, UQ (discussed 3 April)
- b. Nardia Haigh, PhD Student, Sustainability, Business School, UQ (Sent 2 April)

Consumer – similar to PhD sample, aim is to get 20-30 comments covering variation in perspective, eg age, gender, blue collar, white collar, race, mostly approaching PhD interviewees for a comment on this issue. Also, Street Petition, Prahran 05.04.08, Online at www.valman.blogspot.com, and Community noticeboard at St Kilda Public Library, pointing to online comments.

Street petition drew only two commenters in 30 minutes at Prahran Markets, Commercial Rd, Prahran, Melbourne. Positioned at traffic lights outside the Prahran Markets, next to a Big Issue seller, holding A4 flyer, not saying anything. About 10% people noticed the sign, but only two people took, an A4 brochure, and two people stopped to sign the petition. While several people looked at the Flyer (See Appendix 4), most people did not stop, indicating that for most people a 2% change in GST for climate change is of little interest to them – not enough interest to stop for a few minutes and participate.

Interest Groups

- **Financial** KP Venture Capital (<http://www.kpcb.com/initiatives/greentech/index.html> - sent 26 March)
- **Advisory** eg PWC Consulting, Sean Lucy, Director of Climate Change Services (10/4)
- **Unions** eg John Exton, Union member (Discussed 8 April)
- **Car Industry** eg Toyota Tech (enquiries@toyotatech.com.au) sent 3 April, Richard Marshall, Director, Holden Innovation (by mail), mechanic (Sent 4 April, to discuss 16 April)
- **Government** eg QG Exec. Dir. Greg Withers, Qld Dept. of Climate Change, VG (submission to Victoria Climate Change Summit 04.04.08), online comments to Summit.
- **Low Carbon producers** eg Electric Vehicles St Kilda (evehicles.com.au) (sent 3 April, discussed 10 April)

Copies of Policy Summary were sent. No comments from those marked “Sent”.

Appendix 3 – Consumer comments

Consumers

The consumer comments are provided here below in their entirety.

Consumers were asked, **would they support:**

- a 2% increase in GST, OR
- a petrol / new car / electricity tax,

to pay for and encourage clean transport and clean green power produced.

A one page summary of the Low Carbon Incentive Scheme was provided, but mostly discussed with the consumers. A range of demographics was sought to provide an indication of interest and potential issues. Several issues arose, including:

- GST vs petrol tax (adding GST preference)
- impact on coal workers (adding low C workforce)
- need to protect low income people affected
- distrust of government to spend the money on the LCIS (time limiting scheme, and using the Carbon Bank to administer)

Comments were also collected in a street petition, and on a blog – www.valman.blogspot.com, and by phone, with my PhD interviewees. (Last names deleted for privacy reasons.)

Summary of Consumer consultation results:

FOR

Agree 2% GST without reservations – Robert, Jane, Anonymous2, Anonymous3, Wayne, Mick, Nicky

Agree 2% GST, with reservations – Edwina, Michael, SP, Peter, Barry, Emma, Mark, John

% agree GST to fund Low Carbon Incentive Scheme – 15/20 – approaching 75%

AGAINST

Disagree change GST – Duncan, Anonymous1

Prefer Petrol tax – Susan, Duncan, Anonymous1

Other – JM, Rixaeton

Further demographics to target would be: rural, Gen Y (early 20s)

Consumer comments follow:

CONSUMER COMMENTS (alphabetical order by Name)

Name / [Demographic]	Comment
Anonymous1	<p>“<u>Don't change the GST</u> - the G'ment will never go back to 10%. <input type="checkbox"/> <input type="checkbox"/> <u>Increase the cost of petrol</u> by at least 50 cents and all that money should go to renewables etc. <input type="checkbox"/> <input type="checkbox"/> The beauty of this is that it will immediately get people out of their cars”</p> <p>(Blog commenter)</p>
Anonymous2 [28, male, Brisbane, 65k]	<p>“The three main culprits are the Energy Industries (est. 50%), Transport (est. 15%) and Agriculture (est. 15%). Pretty much the entire society. <input type="checkbox"/> <input type="checkbox"/> <u>Yes to 2% GST incentive</u> for the green energy industry to give them the kick start. <input type="checkbox"/> A 5 years renewal contract if the incentive still needed to phase out the fossil fuel industry.”</p> <p>(Blog commenter)</p>
Anonymous3 [40's, male, Perth, Mgr (high income)]	<p>“<u>Agreed to add 2% to GST</u> as a way to gather revenue for green energy changes. <input type="checkbox"/> <input type="checkbox"/> <u>PRO's</u>. <input type="checkbox"/> <input type="checkbox"/> Broad tax base and good revenue raising capability <input type="checkbox"/> Won't hurt low income earner too much <input type="checkbox"/> <u>CON's</u> <input type="checkbox"/> <input type="checkbox"/> No link to the issue (i.e. general tax paying for green power ect.) <input type="checkbox"/> Unfairly burdening people with expense when not using the service. <input type="checkbox"/> <input type="checkbox"/> <u>OVERALL</u> <input type="checkbox"/> I personally think it is the way to collect enough revenue to deal with the problem. How do you ensure that the problem is dealt with in a cost effective way (i guess that's another topic). <input type="checkbox"/>”</p> <p>(Blog commenter)</p>
Barry [70s Retired Saleman Box Hill]	<p>“How do you guarantee the fund doesn't get bastardised? I <u>agree with you</u> [on 2% GST scheme], but the government and bureaucracy can't be trusted.”</p> <p>(Phd interviewee)</p>
Duncan [30s male primary school teacher, parent small kids, mortgage, married, Northcote]	<p>“what about the coal workers?”</p> <p>“I would be <u>reluctant to agree to increase GST</u> because the floodgates would open potentially. A petrol tax would make me use my car less, [but] \$0.50 (33%) is too much. 10% [carbon tax on petrol] is a lot, but maybe ok. I would be <u>more inclined to agree to a petrol tax</u>, but partly because I am well served by public transport, living in the inner suburbs.”</p> <p>(PhD interviewee)</p>
Edwina [42 female, St Kilda, > \$30,000]	<p>“<u>Yes [support 2% GST]</u> as long as it was for discreet period eg 10 yrs + dismantled after ie did not go into consolidated revenue.”</p> <p>(PhD Interviewee)</p>
Emma	<p>“I am <u>prepared to pay the 2% GST</u> but I want a</p>

Name / [Demographic]	Comment
[30s female music teacher Inner Melbourne]	guarantee that the money to go to green energy and transport.” (PhD interviewee)
Jane [Northcote]	“Richard. Just looked at your website and thought I would post [on Climate Summit Discussion Forum] a brief summary of your idea for a Low C [Carbon] incentive scheme in the hope that it gets considered via the [Victoria Climate Change] summit process. <u>I presonally would love the opportunity to pay 2% extra GST</u> [in such a scheme].” (Comment from Vic Climate Change Summit Discussion Forum)
John1 [50s male working class]	“More non petrol transport.” (Street Petition)
John2 [40s male teacher home owner unionist Mitchum]	<u>I would support it [2% GST]</u> but lessen impact on working class families by GST at 1%. The other revenue should be derived from a new Goods and Services Tax on Carbon unfriendly products. eg 5% related to Carbon km’s. (PhD Interviewee family)
Mark [40s male Forex analyst / developer St Kilda \$50k]	“I would be <u>happy to pay it [2% GST]</u> but I need to be sure the money is going to the right [place].” (PhD interviewee)
Michael [40s Wine Store Manager, Father, married]	“prefer broad consumption tax to tax on petrol and electricity. Households already suffering enough. <u>OK [2% GST]</u> but maybe time ok limited, and not into general revenue & tax removed at time out.” (PhD interviewee)
Mick [50s male academic artist St Kilda]	Initial response is petrol tax. In principle, cars are good target for funding source... Heart says target cars, but head says <u>GST more likely to win favour</u> with electorate. Particularly support workers transition to new [industries]. (PhD interviewee)
Nicky [46 years Female Lilydale low income earner] □ □	Yes, would <u>definitely support the incentive scheme!</u> (PhD Interviewee family)
Peter [39yrs, male, Fairfield, med-high income]	“Either option will hurt low-income earners so some kind of rebate scheme to offset negative impact on financially vulnerable people will be neccessary. □ □ With that proviso, I <u>would support a carbon tax</u> provided that 100% of the revenue raised was poured into green R&D projects which can be commercialised in Australia. I believe that a carbon tax will encourage environmentally responsible behaviour by penalising the big emitters and could potentially kick-start a new export industry.”

Name / [Demographic]	Comment
rixacton	(Blog commenter) “I have read the ETS document from the Garnaut report, and I am going to be putting my own submission in tonight :)□□I support the emissions trading scheme, but I would like to see all industrial sectors included from the start. Agriculture produces over 30% of Australia's greenhouse gases. The livestock portion produces some 30.65% (half direct emissions, the other half from land clearing practices) This is about double the amount from fuel/transport use. If we are prepared to do something about cars, surely we are prepared to do something about livestock?”
Robert [28 yrs, Male, Elwood, Student (low income)] SP	(Blog commenter) “Yes I <u>would support any incentive</u> to reduce carbon emissions.” (Co-worker of PhD Interviewee) “I think perhaps tax things such as alcohol and tobacco products at a higher rate to get the revenue. □ Government hospitals use tax payers money to treat so many alcohol-tobacco related admissions, the tax may deter the use of these substances. □□ A <u>small rise 1-2% on GST is okay</u> if it is time limited & only taxed on certain products which won't rise too sharply”
Susan [63 female retired]	(Blog commenter) “ <u>GST only on petrol and other polluters.</u> ”
Wayne [24 male Seoul via Perth \$35-50K]	(Street Petition) “Sounds like a <u>great idea</u> , though I would be concerned about the impact on lower income earners - perhaps they should receive a rebate]□□It would need to be very clear that the increased rate could only continue for 5 (with a max of 7-10) years. Perhaps it could be extended longer for other 'special programmes' but only after an election/referendum.” (Blog commenter)

Appendix 4 – Documents describing policy for consumer endorsement

- a. 1 page Description
- b. 1 page Flyer
- c. Full Petition

See www.valman.blogspot.com (posting 4 April 2008).

- a. 1 Page Description

**Title: CLIMATE CHANGE PETITION
FOR GARNAUT CLIMATE CHANGE REVIEW
(11.04.08)**

Footer: Have your say online at <http://www.valman.blogspot.com>, and see <http://www.garnautreview.org.au>.

Body:

Goals to transition to a low Carbon (C) economy:

- low C transport - low C exports
- low C power - low C workforce

The emission trading scheme (ETS) is a good start to get CARBON prices into products, but greater incentive is needed to encourage success in low CARBON technology, if we want to do so fast. The ETS is likely to take perhaps some 10-15 years to achieve this. □ □

RECOMMENDATION: Low CARBON Incentive scheme

Principles:

- revenue neutral, so no loss of current government funding
- revenue shared by low carbon producers (50%) and consumers (50%)
- avoid petrol tax, new car tax, or levy on electricity
- prefer broad based consumption tax at 2%, with current GST exemptions
- payments for results, not R&D ie power produced, actual transport, including any vehicles that save 50% carbon over best selling cars eg Toyota Prius

A 2% extra Low CARBON levy on GST would raise \$1 billion / month.

At 2%, funds of around \$1B per month could be raised. Significantly ahead of Victoria's \$200M action plan or Qld \$900M investment in clean coal over ten years. □ □

Each month, receipts would be balanced with payments, so the fastest developers of low C technology were paid, starting a low CARBON development race - a gold rush.

Unspent receipts, would go to other C offset, such as planting trees, a portion could be saved (say 40%) for low C loans to buy solar heating, or fund low C R&D. A small proportion could fund R&D alone (say 20%), and administration (say 5%). □ □ Funding could also come from sales of CARBON certificates. □ □

The fund should be spent on:

- low CARBON power (1/3), (such as SOLAR and WIND power)
- low CARBON transport (1/3) and (such as TRAIN, TRAM and ELECTRIC CARS)
- compensation to workers transitioning from high CARBON to low CARBON jobs (1/3).

An incentive to leave high C jobs (say \$10,000 per year of service, payable from fund in month of leaving or pro rata from funds available) and for employers to take on workers from high C jobs (say \$10,000, payable half on hiring, and half on one year anniversary), into low C industries (ie receiving incentive payments).

WOULD YOU SUPPORT:

A) A 2% GST INCREASE TO PAY FOR AND ENCOURAGE CLEAN TRANSPORT AND CLEAN GREEN POWER PRODUCED, OR

B) PETROL / NEW CAR / ELECTRICITY TAX TO ENCOURAGE GREEN POWER AND TRANSPORT DEVELOPMENT.

Appendix 5 - Description of Overshoot, sent to Kleiner Perkins Venture Capital, Greentech (<http://www.kpcb.com/initiatives/greentech/index.html>) for comment, 26 March

<insert>

Dear KPCB,

I am an innovation PhD student in Australia, writing a submission to the Australian government about how the Australian government should encourage entrepreneurs to invest in Green energy, and was interested in your feedback for a scheme I have devised called Overshoot. (www.garnautreview.org.au Issue Paper 4: Low emissions energy technologies)

Australia is in the process of setting up a cap and trade carbon trading scheme, so that coal fired power stations will pay for the carbon that they emit.

The problem is how to we encourage firms to build green energy when the price for electricity is much higher than for coal 3.5-4.5 c/KwH. For instance, wind power costs up to 12c/KwH to produce, though will have no carbon issues to deal with.

The purpose of the Overshoot policy is to reward innovators for investing in clean energy and penalise old technology. Further, there needs to be a reward for entrepreneurs to act early (and hence take greater risk, while green technology is new and inefficient, yet encourage their rising efficiency).

Overshoot is basically a redistribution from old technology users to clean energy generators, equivalent to the cap and trade in size. This is like a double tax. Old technology providers pay under the cap and trade scheme, and they pay again under the Overshoot scheme, and by the same amount. The Overshoot payments are collected from customers (and itemised separately), and distributed by the electricity retailer to clean energy producers, on the basis of the kWh that they produce.

Consumers fund the Overshoot payments, so the scheme has no impact on government budgeting, as a tax deduction or accelerated depreciation scheme would. This encourages consumers to use less electricity, such as power saving devices, better insulation, switching off appliances, and installing solar power heating or hot water.

While there are few clean energy producers, the large number of old technology customers pay a little each, and reward the producers of clean energy. This is an incentive for investors, entrepreneurs to get into the clean energy market. Even home customers who put a solar panel on their roof could get their share of the Overshoot payments.

Benefits:

1. The market decides what technology wins - whichever technology makes the most clean Kwh.
2. The scheme is cheap - the customers buying old technology energy subsidise the clean energy investment.

3. The scheme is simple.

4. The scheme leaves room for learning - the more clean energy you make, the more is your share of the Overshoot payments. However, the scheme is proportional, so if the competition produces more than you, then your share of the payments goes down.

Competition is in play.

5. The incentive is to invest early, before all the old technology is replaced. As clean energy becomes a greater proportion of all energy produced, the Overshoot payments will shrink. So there is only a window of opportunity while investment is attractive.

Problems:

1. The idea is radical and will not be easy for people to get their heads around.

2. A double taxation system is not really fair. But it is the unfairness which encourages investor and entrepreneurs to act fast, and get their share of the Overshoot payments. Competition between entrepreneurs and investors should over time make the scheme more fair.

While I know this is not really your area, your position as significant investors would be extremely useful in testing the practicality of this incentive.

The submission to the Australian government is due 11 April 2008, so a response (if you can assist) before that time would be appreciated.

Thanks and regards

Richard Ferrers

Innovation researcher

PhD student, University of Queensland

Research Fellow, Centre for Global Innovation and Entrepreneurship, University of Melbourne</insert>

Appendix 6 – Publicising – Australian Financial Review Submission (07.04.08), reworked slightly for Australia 2020 submission (09.04.08)**Will Garnaut save us?**

The Garnaut process is a useful learning process for the Rudd Government to get the best advice on dealing with climate change. However, I am concerned that the focus on the Emission Trading Scheme, as the central plank in the policy will be insufficient to solve climate change, fast enough. The world is like a supertanker, slow to turn to avoid the dangers of runaway climate change. The oil, coal and motor vehicle industries are entrenched in our society, where they have brought us cheap power, transport and over the last fifty years, significant growth and prosperity.

Yet now we have changed. Consumers change fast, while corporations change slow, and industries slower. Consumers have embraced accepting climate change, or enough of them to elect a green friendly Rudd government, though a 55-45 win doesn't equate to a nation of believers. Al Gore has been significant in this process, and his documentary, 'An Inconvenient Truth'.

Another inconvenient truth might be that an Emissions Trading Scheme might not save us fast enough. True, carbon will be added to prices and consumers will change their behaviour to reflect these new prices (consumers change fast), but the government will use its funds to smooth this change, weakening consumer response, and shielding communities and industries from shocks.

The solutions to next generation power, and transport, I fear will not come from the oil, coal and motor vehicle industries, though it is these industries which the ETS will target to change their behaviour. Next generation technology often comes from small outsiders, who have the means to put the pieces of the puzzle together. Consider the Wright Brothers. They were not funded by the Rail or Shipping industries to develop next generation transport. And so electric vehicles and clean power may come from smaller businesses, which need our support.

How can we align corporation motivation, with policy to drive them to produce next generation technology, if not through an ETS. As an innovation researcher, I recommend a Low Carbon Incentive Scheme, which collects funds and rewards Low Carbon producers and consumers. Funds could come from a tax on petrol, new cars, and coal generated electricity. Funds could come from auctioning emissions certificates. Talking to consumers, they seem to prefer a smaller, but broader tax – say 2% extra on GST. This would raise, perhaps as much as \$1 billion per month to encourage development on clean energy and transport, and assist workers to move from old to cleaner industries.

Consumers are very concerned that the funds would disappear into consolidated revenue, and not be spent for this purpose. I recommend the funds should go to Garnaut's new Carbon Bank to disburse, and the scheme be limited to five years, with a potential extension for five more. This would give potential funds of \$60 billion, around 2% of

GDP, over the period. Compare this to Europe which is investing \$3 billion over five years (IMF, World Economic Outlook, Apr. 2008, p.26). A better comparison is with the ‘space race’ when the US spent \$5.4 billion per year, in the 1960s, to get to a leading position. President Kennedy, in his ‘we choose to go to the moon’ speech, equated this amount to the same figure the nation spent on cigarettes and cigars.

The 21st century has its own race now. The race to protect our planet from our own prosperity, fuelled by oil, coal and cars, and to find a cleaner, greener, next generation energy and transport, to build out future prosperity upon.

Further details of the scheme, and a place for your comments, especially before the Garnaut submission deadline on Friday, 11 April, is available at www.valman.blogspot.com.

(615 words)

Richard Ferrers
r.ferrers@business.uq.edu.au
Innovation Researcher
University of Queensland
Research Fellow
Centre for Global Innovation and Entrepreneurship,
University of Melbourne

Appendix 7 – Publicising - Submission The Australian 06.04.08

Climate Change:

☐-----

I have been reviewing the Garnaut Emission Trading Scheme (ETS) Discussions paper, and am concerned about the potential failure of this policy to encourage low carbon (C) technology development as part of writing my Implications chapter of my PhD thesis (<http://www.valman.blogspot.com>).

We need to encourage fast innovation to lead us to clean power and transport solutions, and move the workforce from polluting to clean industry. A Low Carbon Incentive Scheme could help in this regard. It would compensate low carbon producers and consumers from choosing green power and transport eg trains/trams, and building solar and wind technology.

The old industries (coal, oil, cars) have incentives to keep things the way they are, so they need financial incentives to change. While the emissions trading scheme will help, it is likely to be slow - 10 to 15 years.

I suggest we need a pot of gold, a gold rush to encourage fast change. Consumers I have talked to have suggested a tax on petrol, while others have said this would hurt families, and it is better to spread the load, but have a smaller but wider tax increase.

One method would be a temporary increase in GST, say 2%, for five years (with option to renew for another five years, if the results were good). This could raise \$1 billion per month to pay for clean power and transport.

Australia, are you willing to pay for clean energy and transport? Can we rely on the coal, oil and car industries to solve the Climate Challenge?

Would Australia support a 2% increase in GST for green power and transport, or ☐ would an increase in fuel tax, or decrease in fuel subsidies, compensate green innovation?

Would be interested in comments at <http://www.valman.blogspot.com>, before Garnaut submissions due 11.04.08. ☐Richard ☐Innovation Researcher ☐UQ, UniMelb

Richard of St Kilda West
Mon 07 Apr 08 (11:44am)

Appendix 8 – Publicising – Publicising – Australia 2020 Submission on Climate Change (09.04.08) – reworking slightly Australian Fin Review submission (App.5)

3.Climate Change

How do we position Australia to become a global leader within the next decade in the new low carbon technologies and industries.

Leading low carbon development

The Garnaut process is a useful learning process for the Rudd Government to get the best advice on dealing with climate change. However, I am concerned that the focus on the Emission Trading Scheme, as the central plank in the policy will be insufficient to solve climate change, fast enough. The world is like a supertanker, slow to turn to avoid the dangers of runaway climate change. The oil, coal and motor vehicle industries are entrenched in our society, where they have brought us cheap power, transport and over the last fifty years, significant growth and prosperity.

The solutions to next generation power, and transport, I fear will not come from the oil, coal and motor vehicle industries, though it is these industries which the ETS will target to change their behaviour. Next generation technology often comes from small outsiders, who have the means to put the pieces of the puzzle together. Consider the Wright Brothers. They were not funded by the Rail or Shipping industries to develop next generation transport. And so electric vehicles and clean power may come from smaller businesses, which need our support.

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Consumers are very concerned that the funds would disappear into consolidated revenue, and not be spent for this purpose. I recommend the funds should go to Garnaut's new Carbon Bank to disburse, and the scheme be limited to five years, with a potential extension for five more. This would give potential funds of \$60 billion, around 2% of GDP, over the period. Compare this to Europe which is investing \$3 billion over five years (IMF, World Economic Outlook, Apr. 2008, p.26). A better comparison is with the 'space race' when the US spent \$5.4 billion per year, in the 1960s, to get to a leading position. President Kennedy, in his 'we choose to go to the moon' speech, equated this amount to the same figure the nation spent on cigarettes and cigars.

The 21st century has its own race now. The race to protect our planet from our own prosperity, fuelled by oil, coal and cars, and to find a cleaner, greener, next generation

energy and transport, to build out future prosperity upon. Consumers are ready to pay. Let the Rudd government embrace this opportunity to lead the world, in this race.

Further: www.valman.blogspot.com. (495 words)