

Climate Change Decision Making – A Practical Application of Outcomes Theory

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www.parkerduignan.com

www.outcomestheory.org

www.oiiwa.org

www.strategicevaluation.info

If using any of the ideas in this paper, please reference to this paper. The full reference is as follows: Duignan, P. (2005) *Climate change decision making: A practical application of outcomes theory*. [Available at www.outcomestheory.org/ot/documents/135pdff.html or alternatively at www.strategicevaluation.info/se/documents/135pdff.html]

Introduction

Outcomes theory is the systematic development and application of the set of principles that underlie outcomes systems of all types. Outcomes systems are any systems that attempt to measure outcomes of any sort, to make decisions about the best way to intervene to change such outcomes, and to track, attribute and hold parties to account for changes in such outcomes. A systematic treatment of outcomes theory can be found at www.outcomestheory.org. Outcomes theory has been translated into

a practical system for analysing, working with, assessing and optimising outcomes systems. Information and resources on this system, *Outcomes Is It Working Analysis (OIIWA)*, can be found at www.oiiwa.org. Looking at climate change from the point of view of outcomes theory, each of the steps which lead to the final results (outcomes) of climate change are viewed as “outcomes” within an outcomes hierarchy. At the top of this hierarchy are the final outcomes of various sorts (e.g. increased temperature, reductions in water supply, melting ice, rising sea levels etc). Lower down the hierarchy are more intermediate outcomes such as increased greenhouse gas emissions. Further down still are the outcomes associated with the carbon emitting industries and below them all of the lower level outcomes which lead to these. Various possible interventions in the climate system are viewed as possible lower level outcomes that could be sought if pursuing various policy options. For instance, increasing the cost of creating carbon emissions would be one possible lower level outcome that could be sought in order to change the higher-levels of the climate change outcomes system. Below this would be the outcome that would be used to increase the cost of creating carbon emissions, for instance an effective carbon tax.

Individuals, companies and policy makers are constantly making decisions regarding an outcomes system such as the climate change outcomes system, some of these decisions are to take particular preventative actions (say to conserve energy usage and hence emissions) others are to not make any changes in current actions in the light of the data coming in regarding changes or predicted changes in the climate change outcomes system higher-level outcomes.

In many outcomes systems, and climate change is no exception, the various decision makers who will ultimately determine the higher-level outcomes of the system often do not have the time, or a rapidly assimilable conceptual framework, to explicitly reflect on the nature of the decision making problem they are facing. The unexamined assumptions behind such decision making are often that it will be possible to wait for a fair degree of certainty before having to decide to act (particularly since the economic implications of dealing effectively with climate change are large); that when they do act their actions will have an effect relatively quickly; and that the changes that have occurred by the time they act will be

reversible once they act. While these assumptions apply in some simple outcomes systems, it is a fatal mistake to proceed as if they do apply in cases – such as climate change – where they do not. The distributed, political and contested nature of decision making around climate change make it particularly hard to get a critical mass of the many individual decision makers involved to actually focus on what is the correct strategic decision making approach they need to employ if they are to maximising the chances of making the correct decisions around climate change.

Application of outcomes theory to climate change decision-making

There are a range of ways in which outcomes theory can inform thinking about decision making in regard to climate change. Outcomes theory identifies three different methods of decision making around strategy selection when one wishes to intervene in an outcomes system. The first is where you have total information about what does and what does not cause and change the outcomes you are interested in. Where you have this luxury, decision-making is quite simple – you just select the most effective strategies and proceed to implement them. Interestingly, in the back of many peoples’ minds, particularly some of those who have an orientation towards what’s currently called “evidence based practice” this is the only possible approach to strategy selection. They just believe that it’s all just a matter of waiting till the evidence is all in and then just using a straight forward decision making process based on the evidence to determine what does and does not work.

Unfortunately, it is not that easy in the real world, and this is where the second of outcome theory’s strategy selection approaches comes into play. This is needed in situations where you do not, and will not, have complete certainty about what will or will not affect outcomes. In this approach, you move forward measuring two sets of outcomes – both those which can and those which can not be attributed to the specific interventions your are using and you may do various evaluation as is feasible along the way. The second set of measurements are always at a much lower level of outcomes than the first. As you monitor final outcomes you can try different interventions to see if final outcomes improve or not. You may never know exactly

which intervention caused things to change, but at least you can use final outcome measurement as a way of adjusting your strategy. Of course, this relies on your final outcomes being “reversible” in some sense. That is, if they get worse you can change your strategy mix to make them improve within reasonable timeframes. While this is a useful strategy in some cases, this second approach also is not the end of the story.

There is a third class of problem with a nasty twist in its tail if you are the decision maker. Such outcomes systems need a third type of strategy selection approach. In these cases there is often no problem in measuring final outcomes. The problem is that by the time you get to measure them, it is too late to use the information as feedback for adjusting your strategy mix. In these cases, final outcomes are not reversible, at least within any relevant time frames of interest to the decision maker.

These decision problems require an entirely different strategy selection approach and making the mistake of not understanding this element of outcomes theory is a daily occurrence for all of us when we end up doing things that we regret and cannot change their having been done. More dramatically it lies behind the tragic sight of a repentant court defendant up on a charge of manslaughter after killing someone while drunk driving. They did not modify their behaviour early enough to prevent an adverse outcome which they only realised was occurring in the last few blurry moments before it eventuated.

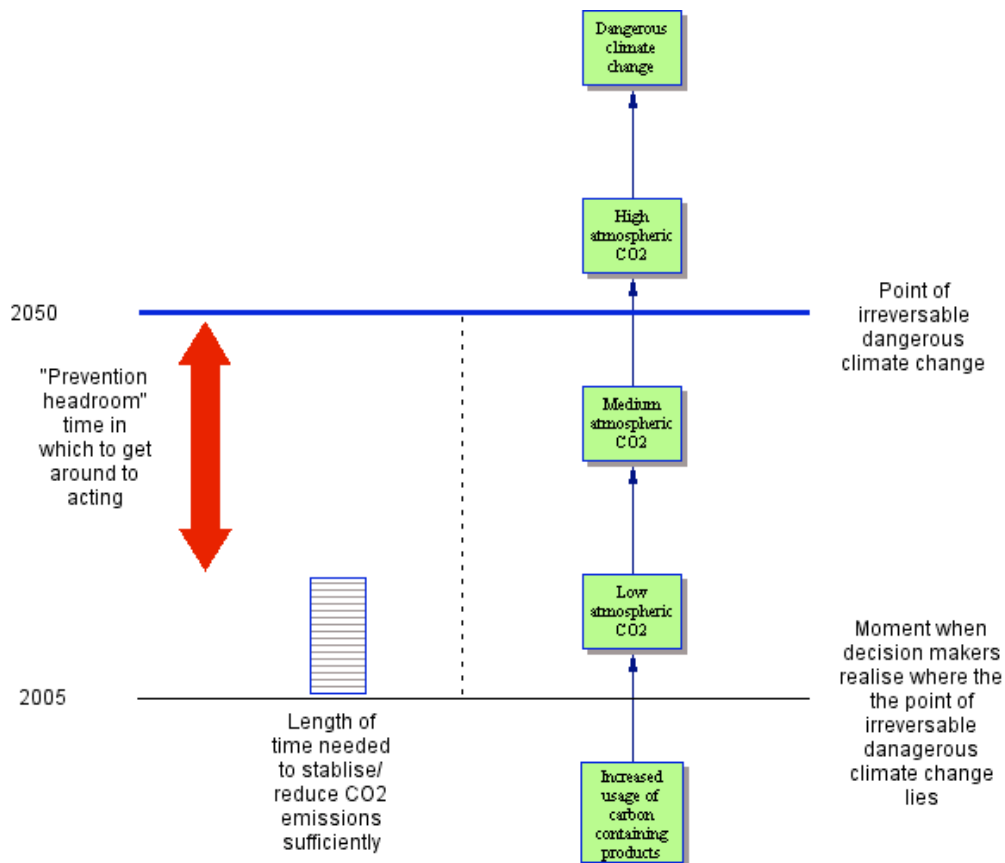
Where a decision maker sees the cost of acting as being high, they are particularly at risk of picking the wrong strategy for this third class of outcomes system problem. We can usually find out which decision-making approach someone is using for a particular problem if we look closely at how they describe their intervention strategy. For instance in a recent statement from the U.S. State Department called: “U.S. “Moving Forward” in Commitment to Slowing Climate Change”. President Bush’s goal of reducing greenhouse gas emissions by 18 percent is described as a “first step towards a long-term effort to slow, and as the science justifies, stop and then reverse the accumulation of greenhouse gases in the atmosphere.” The strategy selection approach behind this statement is the second of the three outcomes theory approaches. Long-term outcomes will be monitored and when they rise above a certain level (as

determined by the science) they will be able to be reversed and the world stabilised at a liveable temperature.

Unfortunately the world in this area does not seem to operate in any way approximating the requirements of the second decision-making paradigm. For instance, very recently (late 2005), a thirty percent drop has been reported in an important measure of the strength of the warming element in the Gulf Stream. This keeps parts of the Northern Hemisphere warmer than they should be based just on their geographic location and even more importantly it is part of the process through which the oceans absorb CO₂. Commenting on these results, the scientists involved report that, “some climate models have suggested that we could expect such a slowdown as a result of global warming...with the change happening relatively fast, perhaps over a decade. These measurements are evidence that the models could be right.” However, they then go on to say just as we would expect careful scientists to, “to be sure that the observed change is the result of a long-term trend rather than natural fluctuations we will need to monitor [them] continuously for about a decade.” Now, at this point, as they say in the Apollo 13 Movie - “Houston, we have a problem.” These changes, identified as one of four major “dangerous” results of climate change, may occur in a decade - but it will take a decade for the scientists to tell us if the changes have actually occurred. The irony of this could not have escaped the scientists concerned, what they are clearly, and appropriately doing, is confronting decision makers with the fact that if they want to intervene in this particular climate change outcome (which could have major implications for further acceleration of climate change) they cannot wait until they have certainty that it is occurring. Obviously, at the moment of certainty it is too late to prevent it from occurring.

What has happened here is that the decision maker has just lost the possibility of waiting for scientific certainty to justify decision-making. An outcomes theory diagram that is called the *strategy action window* shows this below. The diagram consists of a set of *climate change outcomes* on the right hand side; a *point of irreversible dangerous climate change* at the top; the *time-to-irreversibility assessment point* – the moment when decision makers decide what they will take to be the future point of occurrence of irreversible dangerous climate change; the length of time it takes to stabilise/reduce CO₂ emissions and the amount of *prevention*

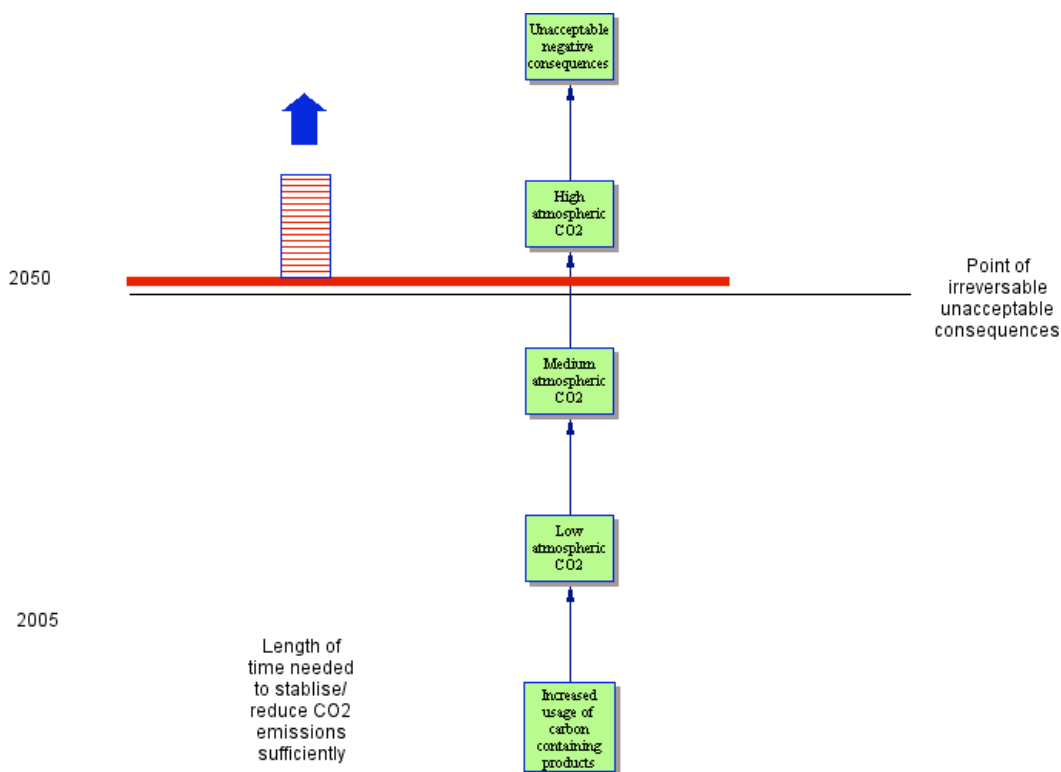
headroom – how long decision makers can spend in getting around to actually acting on the threat.



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If we apply this diagram to the case of the slowing of the Gulf Stream warming element and if the decision-maker is not going to allow adequate effective prevention to commence until they have scientific certainty (as perhaps is what is meant by the State Department’s comment) then the only time they will decide to start acting will paradoxically be the moment when the thing they are trying to prevent (slowing of the warming element) will have actually occurred. The strategy window will have closed and in doing so foreclosing the decision-makers only chance to act. There will be no gap between the ceiling and the floor of the window in the diagram in which decision makers can act as illustrated in the diagram below. So if that is the approach decision makers think they can use to respond to the findings from the science around climate

change (and much of it is similar to the case of the gulf stream findings) then the consequence of that approach is absolutely clear - such decision makers are opening themselves to seriously unacceptable chances of allowing irreversible dangerous climate change to occur.



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So outcomes theory having warned against using the first or second strategy selection approach on those outcomes systems where the third is warranted, what exactly is the third approach? The third strategy approach consists of being very clear about where you stand in terms of the size of your strategy action window at any moment in time. On the basis of this, you then use every shred of information you can muster to make sure that you do not leave it too late to get around to estimating the point of irreversible dangerous climate change. If you ever let the window between the ceiling and floor get smaller than the time it takes you to take preventive action, then it is a foregone conclusion that you will have opened yourself up to an unacceptable level of risk of irreversible dangerous climate change. Making a mistake about this decision

point is so critical that the only rational way to proceed in the case of these outcomes systems is that when you have reasonable (and they only have to be reasonable) scientific predictions regarding the ceiling, you move as if it definitely is the ceiling, you act as if it is, then monitor the outcomes. If it transpires that the subsequent outcomes measurements do not track as predicted, then you can pull back on your strategy at a later day as the information comes in. There is obviously a cost associated with this, and you should implement the lowest cost initiatives at the start (as long as they are part of a comprehensive plan that can be fully implemented within the time frame of the strategy action window). You just have to accept the trade off that you may have acted too early because this is your only insurance against completely unacceptable outcomes – in this case going beyond the threshold of dangerous climate change.

So how should we be currently estimating this window for climate change? One current view of the size of the strategy action window for climate change is that it is something like the first half of this century. This view is reflected in a 2005 comment from the Australian Environment Minister:

"This inane preoccupation with short-term targets is incredibly bad public policy. This [climate change] is a problem that took 150 years to create. We've increased the amount of carbon in the atmosphere by 30 percent over the last 150 years and we've got 45-50 years to fix it."¹

This view of the size of the strategy action window was reflected in the first diagram in this paper. It shows 2005 as the date of the floor of the strategy action window and 2050 as the ceiling. In this view, policy makers have a reasonable time in which to act and we would want serious action to have occurred by the middle of the century and we should be safe.

Now, given the nature of the climate change outcomes system, it is essential that policy makers are right regarding this optimistic view of the strategy action window

¹ *Forget climate targets, timetables, Australia says.* Reuters 9 December 2005.

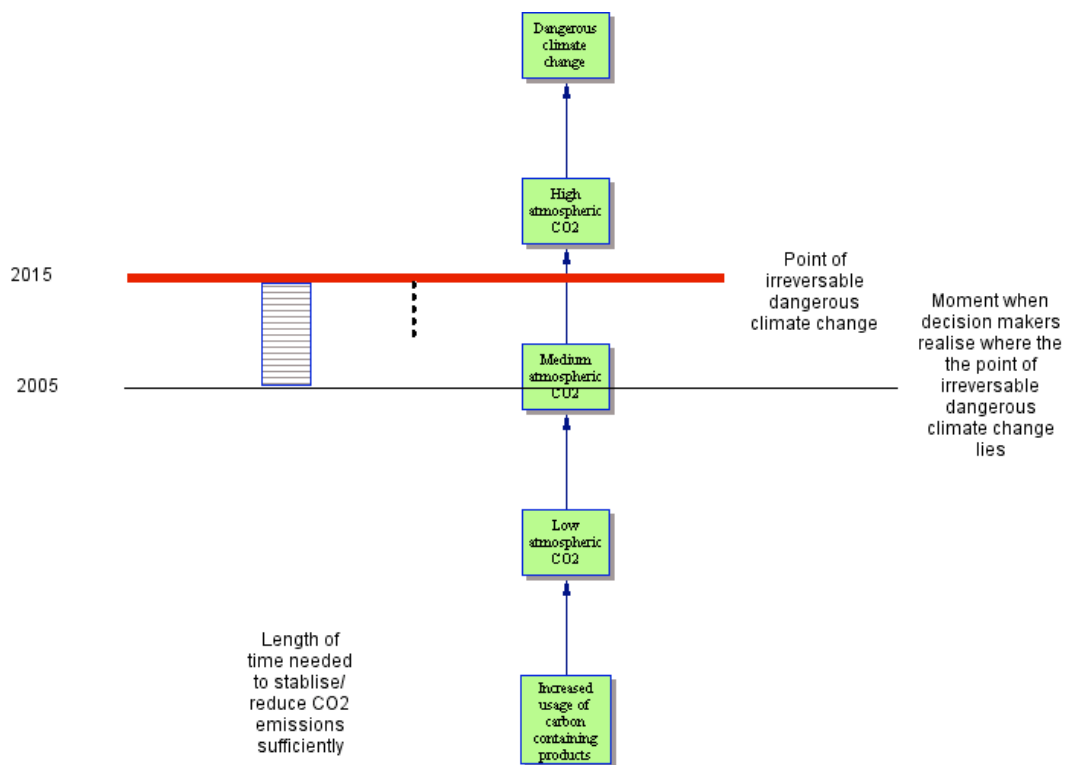
ceiling line. Have decision-makers got the estimate of the ceiling right at the moment?

From an outcomes theorist point of view there is a technical issue with the current mechanism policy makers have with which to judge whether or not this view is correct. The scientific community has established an unprecedented system of peer review amongst thousands of scientists with the purpose of generating a consensus view on climate change predictions. This useful mechanism however has one problem – it takes a long time. The last full report of this group, called the Intergovernmental Panel on Climate Change (IPCC), was issued in 2001 and the group is planning to issue the next one in 2007. The author understands that the 2007 report will only include data up until 2005.

The IPCC reports are an essential mechanism for developing climate change policy and if dealing with an outcomes system which is changing slowly, and more importantly in which the rate of change is constant, the length of time between reports would not be a problem. However there is one case in which a technical problem could arise from the length of time between the IPCC reports. If estimates of the strategy action window ceiling were falling rapidly between IPCC reports and policy makers have no way of assessing the consensus view on this, they could find themselves losing precious planning time while they wait for the IPCC results to come through and then for the whole policy making machinery to move into looking at the implications of the IPCC findings for future policy. In this instance policy makers could find most, or much worse, all of their strategy action window headroom consumed by the falling ceiling. If anyone had any reason to believe that this is the case, they would be right to be very worried about the impact of this on timely decisions being made on climate change policy. Interestingly in this regard, one leading US climate scientist, Dr James Hansen, has recently said that the world has only one decade in which to get to grips with climate change.

In order to reduce this risk, outcomes theory would suggest that, in addition to having the IPCC mechanism, policy makers would be wise to have in place an additional faster feedback mechanism that could alert them that they have a rapidly descending decision ceiling situation on their hands.

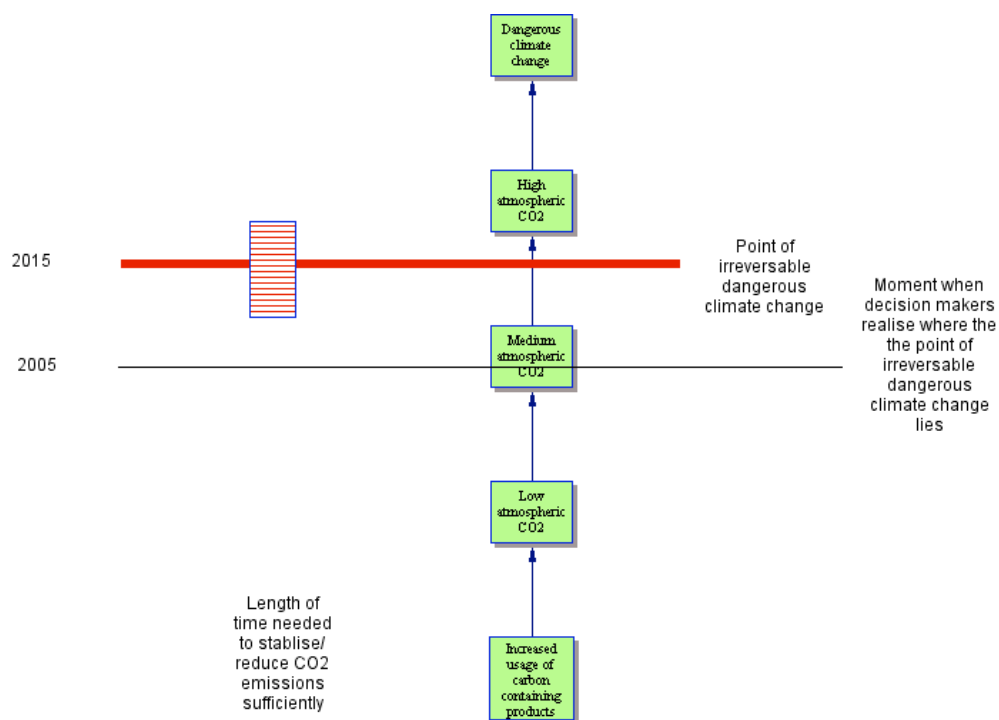
In order to further explore the implications of outcomes theory for climate change as an outcomes system it is worth doing a small thought experiment for a moment and imagining that Dr Hansen’s statement correctly reflects where climate science has moved to since 2001. The third diagram below sets out the situation if Dr James Hansen was right.



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If this were the case, and at the moment policy makers do not seem to have any mechanism for assessing whether or not it is, what would be the greatest risks to decision making at this point? The third diagram shows a situation in which there is no head room between the floor and the ceiling of the strategy action window for climate change. If this were the case, there are four hazards that could push the time taken for preventative action through the ceiling and precipitate us into a world of dangerous climate change. This situation is illustrated in the final diagram. The first hazard to avoid is listening to *feasibility-modified* predictions of the ceiling line. It

sounds strange, but outcomes theory tells us what is needed is scientists who will continue to provide an estimate of the ceiling, with a total disregard for the feasibility of acting to prevent their forecasts coming true. Outcomes theory teaches that we need to deal with strategy timing in natural systems differently than we do in human related outcomes systems. In human systems, there can be negotiation about feasibility, time frames and trade-offs; however nature does not negotiate, it has no interest in time frames influenced in any way by what we regard as feasible for humans to achieve.



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The second hazard is spending too long on initiating the preventative course of action. From the outcomes theory point of view this situation is rather like running for a train. The whole point is whether you manage to get onto the train so the time you start out running for the train is crucially important. If you miss the train, no matter how hard you run after it has gone, there is no chance that you will get to where you need to be on time. The third hazard is that stakeholders with conflicts of interest (for instance the carbon emitting industry) will continue to cloud the issue in regard to the amount of time that is left for action. The fourth hazard is the pretence of action and

ineffective action. Governments are masters of putting a positive light on whatever they do. This type of public relations distorts an accurate assessment being made of whether or not effective action is actually being taken. Outcomes theory would suggest that it would be important if the attempt was being made to intervene in climate change in a situation such as that set out in the diagram immediately above that there be independent verification of the steps which governments take.

Conclusion

This paper has outlined some of the implications of outcomes theory when looking at climate change as an outcomes system. Outcomes theory provides a systematic method for examining the three different types of decision-making processes needed in regard to different types of outcomes systems. Hopefully this analysis may be useful for those reflecting on the nature of decision-making in regard to climate change.