

A Paper presented at the 2009 Pacific Rim Real Estate Conference, Sydney

Climate Change and Property Value

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Significance of human activities on global climate is critically reviewed in terms of the scientific explanations. Data and politics are compared to assess the dynamics of community action in response to perceived climate change.

Implications for property markets are reviewed and assessed. Actual climate change to date compared to policy and property utilisation changes. It is found that there is considerable pre-emptive activity, but little connection to the mechanics of actual climate change or its effective mitigation.

The psychological power of climate change concerns is concluded to be the primary driver of actual impacts on property markets. Implications for property markets and welfare are considered leading to the conclusion that climate change concerns have the capacity to significantly lower the welfare outcomes for majority of the community but will provide substantial concurrent investment opportunities.

Keywords: climate change, property value, economic welfare.

Anthropogenic global warming (AGW) was first widely suggested during the 1979 First World Climate Conference held in Geneva following earlier theoretical consideration of the possibility of carbon dioxide concentrations affecting global temperature (Kininmonth 2008). The notion gained public support that was galvanised by the work of Mann and others (1998) which was adopted in the Intergovernmental Panel on Climate Change (IPCC) (2001) Third Assessment Report that concluded in favour of the AGW hypothesis. From about that time onwards there has been wide public acceptance of the reality of carbon induced global warming (Suppiah, Preston et al. 2006) leading to a wide range of responses from school educational programmes to the creation of public authorities such as the Australian Greenhouse Office. Australia will shortly be commencing a strategy of carbon property trading in an effort to control the release of carbon dioxide.

The implications of AGW for property are immense. They range from construction and management interventions to minimise carbon dioxide production in buildings to constraints on rural land use to prevent the liberation of carbon dioxide from biota. The development of carbon property is but one property impact, but it is likely to have wide reaching effects on the community (Sheehan and Small 2004; Sheehan and Small 2008). One of the consequences of a warmer earth is the prospect of rising sea levels with some authors suggesting up to a seven metre rise (Fisher 2005) through this century, despite the IPCC estimating a more likely range may be between 9-88cm.

The strength of the response has been impressive. It represents perhaps one of the few areas of public policy that has received considerable bipartisan acknowledgement and currently is a major policy focus for many governments and appears to have been

influential in the last Australian federal election. There is a plethora of supporting literature and the media have adopted a tendency to correlate many climatic abnormalities to global warming. At the popular level, the prominent US figure, Al Gore produced a powerful cinematic summary of the problem that has been widely used in schools and elsewhere as a summary of the problem and its urgency.

Empirical support was at first mixed. Early work on AGW largely consisted of theoretical computer simulation models and loose observations of temperature trends. John Houghton (1994) collected the science and evidence in a concise but comprehensive summary that included detailed temperature data. At that time Houghton concluded that despite the trend in the temperature record at least back to beginning of reliable direct global temperature records (about 1881), showing an overall pattern of warming, the AGW hypothesis would need several more decades of data to prove conclusively.

Mann reviewed a considerable array of proxy temperature series derived from various sources including old ice core samples and tree ring analysis. The significance of Mann's work was in showing that the temperature patterns of the last century showed an upturn in global temperatures that was unlike anything in human history. The graph quickly acquired the title of the "hockey stick" due to its long straight trend to about 1880 followed by a sharp and novel upward turn. The change has been correlated to increase in atmospheric carbon dioxide that has resulted from global industrialisation during the same period (Houghton 1994). Mann's 1998 work using proxy historical temperature records appeared to supply the missing data and the IPCC concluded that in 2001 there was broad consensus in the scientific community in support of the reality of AGW.

Currently there is little dispute that the earth's climate has warmed significantly over the last century or so, however the AGW hypothesis has not proceeded without controversy. The U.S. Senate Environment and Public Works Committee (2008) Minority Report lists some 650 prominent scientists who disagree with the AGW hypothesis, including some who were earlier supportive and working within the IPCC. A common reaction to scientists who publically question the AGW hypothesis is to view them as aligned to interests who would be adversely affected by carbon emission control, principally the fossil energy industry. In this way dissenters from the AGW position are seen in a similar light to those in the employ of the tobacco industry who questioned the adverse health impacts of smoking. This charge may have some merit, but it raised the counter charge that in general funding for AGW research and publication opportunities, tended to be biased very much in favour of the supporters of the hypothesis.

Fortunately scientific questions may be resolved through recourse to the evidence. The IPCC has been active in extending the theory of greenhouse warming and has developed aides for its identification. In particular, it is now known that different forms of warming tend to affect the earth's climate in different ways. Greenhouse warming should include a concentration of warming in the upper atmosphere, especially about ten kilometres above the equator. David Evans (2008) was an active consultant to the Australian Greenhouse office about the time of the IPCC 2001 report and has followed attempts to observe the high atmospheric "hot spot" begun in the early part of this decade. He is concerned that it has not been found and that the scientific community has been especially resistant to accepting the implications of its absence.

Also problematic is the close correlation between the last century's temperatures and atmospheric carbon dioxide levels. Much of the warming during this period preceded World War II during which time industry was relatively limited, especially following the Great Depression following 1930. World War II ushered in immense industrialisation and energy use but the earth actually cooled for two decades following it. Likewise, the most recent period of warming appears to have stalled in about 2001 with falls ever since, especially in 2007. Currently the earth's temperature is back to the level of about 1980 (Evans 2008).

These short term anomalies have been written off due to the force of Mann's (1998) long term temperature trends. Many scientists, including supporters of the AGW hypothesis (e.g. John Houghton) had accepted significant temperature fluctuations over the period of recorded history, especially the Medieval warm period (centred in the fourteenth century) and the little ice age of the eighteenth century. Houghton is representative of scientists who recognised that the Medieval warm period was significantly warmer than the present, however Mann's meta-analysis found warming in that era. Steven McIntyre and Ross McKittrick (2003), reviewed Mann's statistical methodology and found that Mann had applied abnormal weightings to the data. In particular, tree ring data from Sheep Mountain California, apparently known to be a poor temperature proxy, was given a weighting 390 times greater than other data. McIntyre and McKittrick found among other things that the aberrant weightings caused a hockey stick result even when the other series in the data set were replaced with a random noise series. More troubling than the apparent poor scientific method, was the difficulty that McIntyre and McKittrick had in publishing their results, despite its methodological transparency.

Much of the more accessible recent material that is tendered as evidence of AGW tends to be in terms of consequential evidence (Steffen 2006). These include wildlife migration and distribution patterns and the melting of permanent ice. The melting of the north polar ice cap is representative of this genre of evidence. Unfortunately, despite carrying considerable rhetorical force, it is often problematic. The north polar ice cap appears to periodically thin, with sea access to the north pole having been possible in the 1930s. Other factors also compromise the conclusion of AGW. Air temperatures above the north pole have not warmed which should be the proximate indicator of greenhouse warming, however there is known to be current widespread volcanic activity on the sea bed below the pole. Ocean currents are also likely to be influential in affecting polar ice and the latter are currently too poorly understood to be modelled with the precision necessary to estimate their impact.

In all, it is apparent that our current understanding of climate mechanics is too primitive to be able to identify atmospheric carbon dioxide as a leading influence. This conclusion was recently made by the former head of Australia's National Climate Centre William Kininmonth (2004; 2008) who considers the importance of water vapour to be so far greater than carbon dioxide that changes in the latter of significantly greater magnitude than current levels may be ignored as significant factors for global temperature control. This position is not new and was earlier summarised by Robert Sassone (1994). Curiously, the importance of water vapour was also acknowledged implicitly in John Houghton's 1994 text despite his commitment to the AGW hypothesis (Small 1998). The impact of factors well outside of human control was further illustrated by Lori Fenton and others (2007) who found that Mars has followed a very similar trend to that of earth over the period that its temperature has been closely observed.

The ambiguity of the evidence and bias in public opinion formation was further challenged by a court review of the veracity of Al Gore's movie, *An Inconvenient Truth* in a legal test of its suitability as a teaching resource in Great Britain (Case No: CO/3615/2007, 2007). Despite a well resourced presentation of the scientific support for the documentary, nine major flaws were found in it, sufficient for the court to rule that it should be viewed as a political statement, not a balanced scientific presentation.

A growing number of scientists are becoming disenchanted with the AGW hypothesis. Bjorn Lomborg (2001) is representative as a professional environmentalist who discovered the empirical evidence did not point in the direction popularly portrayed and experienced trenchant criticism from his peers despite his sound scientific methodology. The political dimension appears to be very significant in the AGW debate and many scientists such as Evans and Kininmonth tend to find it difficult to maintain the positions of prominence once they publicise their dissenting position.

The conclusion that may be drawn from the data on global warming has been perhaps best put by the English scholar, and statesman, Christopher Monkton the third Viscount Monckton of Brenchley (2006). Monkton is a recognised expert and above the grubby weakness of submitting to the demands of funding sources and has made a detailed study of the debate to support a series of articles he wrote for the English Press. His survey of the science and politics of the AGW hypothesis concluded that it was highly unlikely that humans have influenced the earth's temperature changes, despite the heightened public concern for the matter.

Impacts on Property

The following impacts may be identified on the property sector:

- Carbon trading impacts
- Green building preferences
- Sea level concerns

These will be considered in the following sections

Carbon Trading Impacts:

The introduction of carbon property requires the creation of durable carbon property rights. These in turn rely on the community's ability to identify, quantify and manage the carbon content currently found in real property. Hepburn (2005) has outlined the way that various states have attempted to identify carbon, usually as a property right within the forestry domain. Despite the commencement of carbon trading, John Sheehan (2007) has outlined some of the challenges in creating effective carbon property.

The separation of carbon property from the land will have some effects similar to the separation of water property, in that the value components of the separated elements will reduce the value of the land property left behind. This may have contingent impacts on land tax, transfer duties and debt security value. It may also create the risk of long term constraints on land use. The fluidity of carbon property transfer may also result in speculative bubbles and concentration problems.

Apart from the complications and costs associated with the creation and separation of the rights, the net value of the resultant bundle of individual property rights should not be significantly different to that of the simple base property right, though inefficiencies in the market may compromise this outcome.

Green Building Preferences

Interest in building forms that minimise energy use, and hence carbon emissions, has been rising for some time resulting in various systems of so called environmental efficiency largely linked to carbon emission outcomes. Considerable interest has been evident in attempting to identify the value impacts of so called green building. Direct benefits from green buildings should relate to reduced energy costs and also include contingent benefits including beneficial health impacts for occupants leading to lower sick leave costs.

Norm Miller and others (Miller, Spivey et al. 2008) reviewed and extended the available research and concluded that green buildings do return a marginal net benefit, however their investigation was focused on rents and values alone. Importantly, they recognised the pervasive importance of state incentives in creating a positive market disposition. Like Australia, US government tenants are forced by policy to opt for green buildings which creates a politically grounded bias in the rental market for green buildings. Likewise, there are a variety of material incentives from various levels of government for the development and ownership of green investment properties. Both initiatives tend to improve the return to green buildings, but can hardly be considered natural economic benefits. Private tenants do not exhibit a preference for green buildings, despite expressing an inclination to expect non-green buildings to carry a discount.

In Australia, David Parker (2008) is representative of investigators who have concluded that there is negligible direct value impact from green building design, with value differences better explained through indirect influences. This is due to a political preference for green buildings exercised by government tenants, concern for possible future regulatory discrimination against non-green buildings and an increasing number of private tenants who want to project an environmentally responsible image. Within this paradigm value impacts from green buildings come more from fear of reprisal or future preference shifts than from direct commercial quantifiable benefits. Much of the dynamic for the secondary value impacts hinge on the continuing public belief that human carbon based energy use is environmentally problematic. That is, value differences, where they exist, are better accounted for by artificial political influences and unproven future risks than by any innate present benefit or direct motivation to choose buildings classified as green.

Sea Level Concerns

Many government bodies have investigated the impacts of sea level rise. Some local governments, such as Auckland, NZ, have recognised a potential legal risk from allowing development to proceed in areas that may be inundated due to sea level rise. The risks of problems to low lying areas from greenhouse caused climate change include direct sea level rise and also hypothesised increases in tidal extremes and storm surges.

The magnitude of sea level rise is currently highly conjectural but sober estimates place it at no more than a maximum of 88cm over the next century. It should be kept in mind that a century is well beyond the usual economic life of current building

developments. A duplicity appears to currently exist in attitudes to sea level rise. On one hand, predictions extreme sea level rise appear have a significant following. On the other, there does not appear to be any published study showing a market preference for higher level property actually developing. This could be contrasted to the early post war stigma attached to water front land in parts of Sydney due to concerns of possible future invasion. In the latter case water front housing carried a negative stigma for some years after the war. It would appear that people are not as fearful of the sea invading their homes as they have been of foreign sailors.

Conclusions

Anthropogenic global warming is a highly debatable hypothesis that currently enjoys a high level of public support despite the dearth of direct empirical support. It began as a reasonable focus for attention in the latter decades of last century, but developments over the last decade are revealing evidence that makes the hypothesis appear very unlikely to be valid. Despite this, carbon property trading has commenced and will accelerate in importance in the coming decade. If AGW proves to be a groundless concern the costs of creating a carbon property regime and the contingent problems it will create appear unjustified.

The impacts of carbon emission efficient buildings do not appear to have direct commercial merit. Their only attraction is due to political preferences for occupying compliant buildings and these may eventuate into building standards. From this it is evident that any value benefit from green buildings would appear to be the result of political, rather than economic forces. The political element is further evident when the poor connection between energy efficient building and global temperature control is recognised.

Sea level rise should be a concern for low level property. While development consent authorities are concerned to allow construction in areas that may be inundated in the future, there does not appear to be any evidence of a community shift away from low lying coastal property. The slow approach of any inundation problem, which may be over the length of several building lives, makes the public's indifference understandable.

Despite the paucity of direct empirical support for the AGW hypothesis, the matter of climate change does attract strong political support. It is the political implications of the hypothesis that appear far more likely to continue to exercise the dominant influence over the actual impacts on property. For this reason, attention should be focused on the direction of public opinion and political activism in order to infer the importance of the carbon emissions issue for property into the future.

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