

# II The political economy of climate change

*Carlo Stagnaro*

## Introduction

Scientists try to understand trends with the earth's temperatures and climate, and economists speculate about the impact of potential climate change on human activities. 'Public interest' and non-governmental organisations, especially environmental groups, use information selectively to promote certain perspectives about humanity's role and responsibility for climate change. Whether they actually represent the public interest remains to be seen, though.

The public is exposed to the views of scientists, economists and interest groups about the causes, consequences and solutions to climate change through the news media. Because their business is to sell the news, the media tend to promote the most catastrophic views about climate change. Politicians, at the national level, are driven by these groups to create political solutions to mitigate the threat of climate change, to fund further investigations on the subject, and to participate in an international regime of climate control.

This chapter suggests that European interest group politics greatly exaggerate the risks deriving from climate change and the policies needed to address it. Even in the worst scenario, global warming is a phenomenon which occurs over a long period of time. Humanity has remarkable abilities to adapt to change – and this alone could mitigate the hypothesised negative effects. Policies that are proposed to address climate change, such as the reduction of emissions through international treaties like the Kyoto Protocol, have costs which must be evaluated carefully, so that we do not spend more than the benefits we expect to receive.

### The debate in Italy

The general debate on global warming and climate change in Italy is perhaps more biased than in other countries. Although there are many scientists who are reasonable about the uncertainties surrounding climate change,<sup>1</sup> they struggle to find voice in the news media, which gives much coverage to alarmist environmental groups and their policies.<sup>2</sup> For example, Grazia Francescato, former President of the Italian WWF and honorary president of the Italian Green Party, believes it is necessary to 'reduce the infamous greenhouse gases [...] not by 5.2% [...] but by 60%' to deal with the problem of global warming.<sup>3</sup>

There has also been little discussion in the mass media about the costs or benefits of the Kyoto Protocol. Many people believe that the Protocol is a kind of magic formula that will improve our standard of living, even though it will probably have the opposite effect.

CO<sub>2</sub> emissions in Italy have increased by 6% from 1990 to 1999, and it is foreseen that they will increase by a further 7% by 2010.<sup>4</sup> Several Italian studies have found a warming trend in this century, which is not due to the increase of maximum temperatures, but to the increase of minimum temperatures. In other words, Italy is not getting warmer, but it is getting less cold – so to speak.<sup>5</sup> Plants have benefited from the increased concentration of carbon dioxide,<sup>6</sup> and the effects of warmer temperatures were, according to scientists, not negative for agriculture.

From an economic perspective, Italy would be one of the countries most negatively affected by the Kyoto Protocol because of its industrial system, its high taxes on energy (and thus the high unit cost of emissions reductions), and its refusal to produce nuclear energy. Italy's economy is today at a difficult juncture; it faces the challenge of vast unemployment, and of a labour market that is quite rigid because of powerful unions and regulations which are inspired by a concept of 'zero risk'.<sup>7</sup>

It is not a coincidence that trade unions are amongst the greatest supporters of regulations inspired by environmental groups, including limitations on carbon dioxide emissions,<sup>8</sup> although those limitations would actually damage workers and 'capitalists' alike, and probably workers more.

For instance, the European Trade Union Confederation heartily agrees with Kyoto – probably because it would provide an inherent form of trade protectionism: 'On the whole, ETUC anticipates that

the implementation of the Kyoto targets will bring positive rather than negative employment outcomes. However, it believes that the employment potential will be realised only if the appropriate political framework is set in place. In order to achieve this, ETUC calls upon governments to pursue an “active policy of green job creation”.<sup>9</sup>

### Global warming

A coalition of academics, non-governmental organisations, international agencies and governments has agreed that the primary culprit behind global warming is greenhouse gases emissions created by humans, through our use of carbon-intensive energy sources.

About 80% of the carbon dioxide created by man comes from the combustion of oil, coal and natural gas, while the remaining 20% is attributed to deforestation. However, over half of this gas is absorbed by oceans and plants. The CO<sub>2</sub> concentration in the atmosphere has increased by 31% from the times of pre-industrialisation – but this does not mean that such a phenomenon is due uniquely, or even mostly, to human activities.<sup>10</sup>

During the 1990s, the term ‘greenhouse effect’ became a sinister phrase associated with global warming. Of course, without the greenhouse effect, life as we know it on our planet would be impossible. The earth’s atmosphere behaves similarly to the glass of a greenhouse for growing plants: it reflects part of the sun’s radiation (especially ultraviolet rays), while retaining some of those that our sphere emits (especially low-frequency, high-wavelength rays – i.e., infrared rays).

In so doing, the natural greenhouse effect elevates the average temperature of the planet to about 15°C, while making thermal excursions milder. Without the greenhouse effect, the average surface temperature would be about -8°C.<sup>11</sup> Among the gases contributing to the greenhouse effect, the most known and important are unquestionably carbon dioxide (CO<sub>2</sub>), water vapour and ozone.

However, Dr Robin Baker, a former reader in biology at Manchester University, describes the earth’s atmosphere as ‘dirty glass’. In fact, there are substances that counter warming, and even have a cooling effect. Of these, the most important are aerosols, which exist in nature as a product of marine phytoplankton, volcanic eruptions or desert sand.

The earth’s climate is not simple. The reality is that many of its

components can heat or cool, depending on the circumstance. Sometimes they contribute to warming the atmosphere, and sometimes to cooling it. For example, ozone shields the earth (thus making it cooler) in the stratosphere, while in the troposphere ozone works the other way around. Water vapour is a greenhouse gas, but when its concentrations exceed a certain limit, clouds are formed, and they act as if they were a mirror pointed upwards, reflecting solar radiation. In short 'water vapour's contribution to the contest is patchy, erratic and probably totally unpredictable.'<sup>12</sup> Climatologists and other scientists are not yet able to fully explain either the behaviour of the atmosphere, or to evaluate how individual components affect the atmosphere as a whole.

Scientists have observed an increase in average temperature of about 0.8°C starting from the middle of the nineteenth century.<sup>13</sup> Their measurements show that almost all the warming which has taken place in the twentieth century is concentrated in two well-defined time periods: from 1920 to 1945, and from 1975 onwards.

Humanity's carbon emissions have been rising since the Industrial Revolution, and proponents of catastrophic global warming believe that these emissions are causing global warming. But the discontinuity in observed warming in the twentieth century shows that this explanation is wrong.

The temperature variations read in the past century could be part of a larger process that is alien to humanity. A geologist at the University of Naples 'Federico II', Dr Franco Ortolani, summarises this:

The last cold period is called the 'Small Ice Age' (1500–1850). By using new geoarchaeological data it is clear that preceding cold periods have been characterised by climatic-environmental conditions similar [to that one], and in fact we have defined those periods as the 'Small Ice Age of the High Middle Ages' (AD 500–750), and the 'Small Archaic Ice Age' (520–350 BC) [...] The known warm periods took place in the Middle Ages (1000–1300) and the Roman Age (AD 200–400).<sup>14</sup>

On the other hand, Greenland earned its name because when it was discovered by the Vikings, it was covered with vegetation. In the ninth century, vineyards were common in Scotland, while in the 1400s skating on the frozen Thames was commonplace, and malaria

(often misunderstood to be solely a tropical disease) was prevalent throughout England.<sup>15</sup> These climatic changes are totally natural, and may be the result of a great number of causes, including solar activity, and the variations in the cycles of our star – which could also explain some of today's climatic changes.<sup>16</sup>

There are many reasons why systematic observations could be biased, and therefore overestimated. First, measurement stations are mostly on land, so we have relatively less information about temperature over the oceans. Second, temperature readings are often taken near urban centres, which act as heat reservoirs,<sup>17</sup> and these measurements may also be affected by economic and social variables.<sup>18</sup> Actually, satellite measurements do not seem to show significant variations in the average temperature of the atmosphere.<sup>19</sup>

Last, we have too little data, for all intents and purposes, to be able to comprehend the Earth's complex climate. Dr Franco Battaglia, a physicist at the Third University of Rome and former chairman of the Scientific Committee, Associazione Nazionale per la Protezione dell'Ambiente (the Italian Environmental Protection Agency) suggests that 'the only reliable data on global average temperatures concerns just the last one hundred years. It shouldn't appear strange that, if one begins [to measure] at any point in time, the global temperature either increases or decreases.'<sup>20</sup>

Paradoxically, therefore, we should actually be more surprised if the earth's temperature remained constant.

The news media is of particular interest with respect to scientific reporting of climate change. Newspaper headlines may announce the earth's impending demise from global warming, but the debate in the news media is one-sided and highly sensationalised. Many Europeans have been led to believe that any number of negative impacts will occur because of a changing climate – pestilence, disease, death, severe weather – even though the evidence suggests that such phenomena will not be the consequence of warming. The news media generally do not promote sensible perspectives on the scientific issues of climate change, relying instead on environmental groups for a steady stream of press releases and interesting stories.

### **IPCC forecasts and models**

The Intergovernmental Panel on Climate Change (IPCC) was set up

under the auspices of the United Nations in 1988 to study and address the issue of climate change at an international level. As such, it is one of the primary interest groups driving the debate on climate change.

To assess the potential impact of climate change, the IPCC has attempted to construct mathematical models to simulate climate behaviour from now to the year 2100. These models forecast a temperature increase between 1.5°C and 4.5°C. If the first estimate is true, climate change is likely to be beneficial – the earth's climate would simply be milder or moderately warmer, which could lead to substantial benefits for human health. Greater concentrations of carbon dioxide would mean that vegetation (thus crops) would grow faster and would be more abundant.<sup>21</sup>

But we cannot trust the IPCC's analysis on the science or economics of climate change. Its climate models are very complex mathematical tools that essentially rest on a series of simplified hypotheses. Given our lack of understanding of climatic dynamics, almost any such hypothesis is arbitrary.

So far the IPCC has not demonstrated that there is a direct link between increased greenhouse gases and increased temperature – or that the increase in atmospheric carbon dioxide is mainly (or in large degree) due to anthropogenic emissions. This is due to uncertainty about the behaviour of many substances, and some of them – such as water vapour – can have either a warming or cooling effect. Logically, a model cannot take into account such ambiguities, and thus it must be calibrated in such a way as to attribute an either positive or negative coefficient to each.

The IPCC's models have always assumed a positive feedback among all the substances that contribute to global warming. Particularly, it has been assumed that more carbon dioxide warms the earth and leads to more water vapour being released into the atmosphere, which in turn would further contribute to temperature increase. However, when water vapour creates clouds, this actually cools the atmosphere, so temperatures are pushed in the opposite direction. We don't know if the latter contribution is greater than the former, but if it is, then all of the IPCC's models have a tendency to overestimate temperature increases by a great deal.

As Robin Baker states in *Fragile Science: The Reality Behind the Headlines*:

if the positive feedback on which computer models depend is largely imaginary, the climate could simply be less sensitive to human activity than we were first warned. *The only thing that is certain is that the current models are neither powerful enough, sophisticated enough, or informed enough to be able to decide.*<sup>22</sup>

The IPCC's economic forecasts are equally unreliable, as they rest on a foundation of assumptions about a warming climate. In a letter addressed to Rajaendra Pachauri, chairman of the IPCC, Australian statistician Ian Castles alleged that there are many 'wrong hypotheses', concerning in particular the economic growth of less-developed countries. Dr Castles wrote:

I believe that it is important that governments be advised as soon as possible that the economic projections used in the IPCC emissions scenarios are technically unsound, having been derived by converting national GDPs in nominal values into a common currency using exchange rates. This procedure is not permissible under the internationally recognised *System of National Accounts*, and was recently rejected by an expert group in a report to the UN Statistical Commission. The practice of using exchange rate conversion is especially inappropriate in relation to projections of physical phenomena such as emissions of greenhouse gases and aerosols.<sup>23</sup>

Many of the IPCC's economic forecasts treat global warming as if it would occur in a very short period of time, and not gradually throughout the course of an entire century. As Brookings Institution's Robert Crandall observed:

Regardless of the model used, all forecasts of global warming see only a gradual warming over the next few decades or centuries. The alleged problems from the delayed impact of past and future greenhouse-gas accumulations do not become serious for at least fifty or sixty years. Every dollar dedicated to greenhouse-gas abatement *today* could be invested to grow into \$150 in the next 50 years at a ten percent social rate of return, and even at a puny five percent annual return, each dollar would grow into \$12 in 50 years. Therefore, we need to be sure that the prospective benefits,

when realized, are at least 12 to 150 times the current cost of securing them. Otherwise, we should simply not act, but use our scarce resources in other ways.<sup>24</sup>

Lastly, to evaluate the opportunity to limit warming (assuming that it is primarily caused by humanity's emissions of carbon dioxide) it is necessary to understand the costs to humanity if we choose to do business as usual. 'The total annual cost of all the considered global warming problems is estimated to be around 1.5–2 percent of the current global GDP, i.e. between 480 and 640 billion dollars.'<sup>25</sup> This figure should be approached with hesitation for the reasons that have just been explained, but it may act as a yardstick for comparison.

### **Adaptation**

The interest groups driving the climate change debate promote the view that politicians must act quickly, because climate change is imminent and its negative effects are already occurring. Climate change is viewed as a problem in itself – environmentalists and others argue that we must 'do something' urgently, regardless of the costs or benefits of that action.

However, global warming is a problem only if it presents a danger to the well-being or survival of humanity. Changes in the earth's climate will most certainly happen, but these will occur over the long run, and we do have time to rationally consider any number of potential responses. It is of utmost importance to focus on the effects that climate change would have on poor and rich countries alike, and how we can adapt to such changes.

Humanity has adapted to change (climatic or otherwise) through technology, and through markets. During our evolution as a species and as civilisations, humans have modified the environment, first with agriculture, and developed more efficient technologies to feed, clothe and shelter ourselves, to be transported from place to place, and to improve the well-being of many people.

Without adapting our environment, we would be much less able to protect it. For instance, we would need to plough under larger areas of land, entailing deforestation and loss of biodiversity, to feed the earth's 6+ billion population. Between 1950 and 1989, although the world's population doubled, the land used for agricultural purposes

grew only by 26%. Per capita land surface utilisation has decreased from 0.45 to 0.28 hectares, while per capita food consumption has increased everywhere, in both wealthy and poor countries.<sup>26</sup> A similar phenomenon has been observed for every other challenge presented to humanity.

Economist Julian Simon emphasised that our ‘ultimate resource’ is human intelligence, which is expressed through our minds, our creativity, and our ability to address and solve problems in an original manner, thus creating a better world for future generations. Without the need to warm themselves, our ancestors would have not discovered fire; and if that had not happened, we might still live in caves.

Individual efforts to solve particular problems, in the form of new technologies, are harnessed by markets, which leave humanity better off in the long run.<sup>27</sup> New technologies supply the means to obtain better goods and services with fewer resources, fewer negative environmental consequences, and at a lower economic cost. For example, today’s car engines cost, burn and pollute far less than those of past decades. By the same token, energy sources such as carbon-intensive fuels will be gradually replaced with cleaner and more efficient alternatives.<sup>28</sup>

In the long run, economic growth results in a cleaner environment, because wealthier societies generally can afford to shift their priorities from mere day-to-day survival to aesthetic concerns.

Free markets, unhindered by subsidies or trade barriers, are fundamental to creating economic growth. Markets harness new technologies, stimulate the circulation of ideas, information, goods and services. They create a closed loop of economic interdependence and labour skills which, in turn, produces wealth and welfare. As analyst Indur Goklany observes:

Even in the absence of formalized agreements on technology transfer, throughout history, trade has helped disseminate both ‘hardware’ and ‘software’ technology, i.e., knowledge, ideas and modes of thinking around the world, some of which have helped shape our political, legal and economic frameworks.<sup>29</sup>

(See also Chapter 3 ‘Climate change: the 21st century’s most urgent environmental problem or proverbial last straw?’)

The mere opportunity to engage in economic exchange has always

allowed societies to improve their well-being. On the other hand, closed systems and planned economies have damaged not just human flourishing, but also the environment.<sup>30</sup>

A framework for adaptation may entail eliminating some of the rent-seeking ability of interest groups, for instance, removing subsidies for all forms of energy (including renewables), encouraging technological innovations and adopting those technologies, and eliminating regulatory barriers which stifle economic activity and distort prices. While this might be a difficult short-run strategy, in the long run it would yield greater benefits.

Certainly, risks presented by global warming should not be underestimated – but they shouldn't be overestimated, either. It is a problem, not a tragedy, and we must unleash human creativity to adapt to it.

### **The costs of Kyoto**

The interest groups driving the Kyoto Protocol in Europe have failed to illustrate to the public that pursuing a mitigation policy is not without cost. Of course, this is in their self interest. Mostly, the debate has focused on the urgent need to react to climate change, without a careful consideration of the costs and benefits of various strategies.

The Kyoto Protocol is an agreement which forms part of the United Nations Framework Convention on Climate Change. It mandates that countries which have ratified the treaty will reduce their carbon dioxide emissions by precise and significant amounts. The Protocol focuses on limiting greenhouse gas emissions, but it doesn't address what is considered to be the actual problem, which is atmospheric concentrations of greenhouse gases.<sup>31</sup>

Under Kyoto, European Union countries committed to reducing their emissions by 8% under their emissions in 1990, and some committed to even stricter targets.<sup>32</sup> Poor countries are excluded from Kyoto, although they contribute to about 50% of worldwide emissions. By 2050, that figure may rise to 75% of global emissions.<sup>33</sup> On the other hand, asking poor countries to adopt reductions similar to wealthy countries would have devastating effects on their economies and economic growth.<sup>34</sup>

If the countries listed in the Protocol's Annex I fully accepted and enforced its requests, the warming would be minimally mitigated, that

is, by only 3–10% in a one-century period.<sup>35</sup> Bjørn Lomborg, author of *The Skeptical Environmentalist*, notes that Kyoto will do little to help the earth's climate, with 'a temperature increase by 2100 of around 0.15°C less than if nothing had been done', and this would occur six years later – in 2100 rather than in 2094.<sup>36</sup>

So the Kyoto Protocol is not enough to stave off climate change. If we want to act seriously against human-caused global warming, Kyoto is only a first step towards a crackdown that would be much more severe, and would involve every country in the world.

A super-Kyoto regime implies at least two consequences of great importance, neither of which has been highlighted by interest groups in Europe.

First, the use of energy for food production, refrigeration, transportation, heating, manufacturing and air conditioning would be greatly curtailed. Affordable, reliable energy has enabled human beings to live longer, healthier, happier lives. People, especially Europeans, would be forced to greatly curtail or give up their use of energy, leading to a drastic reduction in quality of life.

Second, a 'super-Kyoto' would entail a global enforcement mechanism, through central planning by global agencies such as the United Nations, a prospect viewed with suspicion by many people. Poor countries would likely see this as a kind of 'ecological imperialism' against their desire to obtain a better quality of life through economic growth, which relies on more intensive energy use.

The impact of the Protocol would be at any rate differentiated even within the OECD countries. The main factors that determine the effect of Kyoto measures are:

- The rate of emissions growth, which is affected by variables such as demographic trends, income growth, and the relative importance of the various energy sources. Greater emissions reductions imply greater loss in GNP terms.
- Where already high taxation exists on energy (i.e. in Italy, France and Japan) it is necessary to impose even heavier taxation to obtain reductions in emissions.
- The countries that not only have important industrial sectors that are based on an intensive use of energy, but also participate in vast trade with other countries – especially the OECD ones – face greater sacrifices.<sup>37</sup>

Countries that have economies based on an intensive use of energy would be subject to greater costs.

France and Italy are the European countries that must sustain the largest expenditures because of the Protocol. France, in particular, produces about one-third of its energy with nuclear power. France will have to reduce emissions by a smaller amount, but the unit price of those reductions will be greater. Germany and the UK are the countries less affected by Kyoto, especially because of the slow growth of their economies.

The UK can be considered as a 'minimum threshold' for European countries. According to a study performed by DRI-WEFA, the price of oil for heating purposes in that country would increase by 46%; diesel and petrol by 13% and 10% respectively; industry would pay about 117% more for natural gas; and the cost of energy in general would double.<sup>38</sup> The most critical period would be between 2008 and 2012. The GNP would be reduced by up to 4.5%, and it would not return to normal levels until 2020.

For the same reasons, economic production would decrease because of increased energy costs. Moreover, a decrease in consumption could cause a depression in the short term. Between 2008 and 2010, the UK risks losing up to one million jobs each year. The productivity of individual jobs would decrease because of the efficiency reduction (greater cost) of all the other production factors.<sup>39</sup>

In May 2003, the European Environment Agency announced that in 2002 most EU countries did not reach their emissions targets under the Kyoto Protocol.<sup>40</sup> The UK has already contributed heavily to initial reductions of emissions, by substituting natural gas for coal, as has Germany, which renewed the inefficient industry of East Germany after reunification. On the other hand, ten of the fifteen member countries increased their emissions during the 1990s.

According to the projections, Europe's emissions in general will increase by 9% by 2020, unless dramatic political choices are undertaken to curb them. The DRI-WEFA study was extended to the entire EU, and it estimated that such a policy would have a strong impact on the GNP of various nations: a decrease of 5.2% for Germany, 5% for Spain, 4.5% for the UK, and 3.8% for the Netherlands.<sup>41</sup>

What would this mean for the average European citizen? Consumers would see rapid increases in living costs – food, durable goods, heating and cooling, transportation – because all energy, not just oil

and gas, would be more expensive. If emissions limits were established, the cost would be passed on by businesses to consumers. Combined with the increased cost of energy, consumers would see the buying power of their salaries greatly weakened. Because economic production would greatly slow, many people might lose their jobs.

The cost of the Kyoto Protocol for the EU is very steep indeed. Its benefits – the actual impact on the earth’s climate that its emissions cuts would achieve – are negligible. Europeans should ask themselves whether they are willing to give up their well-being – economic growth, the buying power of their salaries, and many jobs – in exchange for a hypothetical slowdown of global warming.

### Market solutions ... or markets?

It is alleged by some economists that environmental problems such as global warming are ‘market failures’. Specifically, they mean that markets result in ‘externalities’ – unintended and/or undesirable effects for third parties. They often propose that government intervention is required to solve such problems – usually in the form of regulations, subsidies, and by generally limiting human activities.

Using the tools of public choice analysis, global warming policy is no different than other public policies. The political arena naturally produces inefficient rules that are designed for vested interests such as economic pressure groups, bureaucrats, and the political elite.<sup>42</sup>

Some economists, including those at the IPCC, do realise that markets achieve allocation of scarce resources better than governments do. They have recommended a ‘market mechanism’ (which is included in the Kyoto Protocol) to deal with the problem of CO<sub>2</sub> emissions, through emissions trading schemes where governments allocate a certain number of emissions permits, which are then traded by companies and valued by the market. This scheme is now being tried in Europe.

One problem with such market mechanisms is the allocation of emissions permits.

An alternative approach, based on markets rather than market mechanisms, is to treat carbon dioxide as a common law pollutant, if it is established that carbon dioxide emissions are excessive, and they are causing harm to third parties.<sup>43</sup> Pollution implies that a right has been violated, and that violation should be compensated through a

legal remedy. Rather than encouraging rent-seeking by interest groups, the common law protects the right not to be polluted upon.<sup>44</sup>

If this is the right way to approach global warming, then quotas should not be viewed as a panacea. Indeed, they are part of the ‘myth of efficient central planning’, as named by Dr Roy Cordato.<sup>45</sup> The main strike against the permit system is that governments cannot possess information which is spread amongst millions and millions of actors in the market. Order evolves in this context from competition and independent actions, but with central planning it does not. Thus, central planning can never be efficient or produce the best allocation of resources.

The Kyoto Protocol’s justification is also quite controversial. Interest groups suggest that we must decide today to pursue expensive climate mitigation strategies which will produce a net benefit for future generations. This assumes that we know a whole series of preferences that logically and practically cannot be known: neither by people living now nor by future generations.<sup>46</sup> Thus, we cannot know the costs of our choices today, so we are simply making blind choices.<sup>47</sup>

We live in a world characterised by a scarcity of resources, including human resources. The price of any resource reflects its relative scarcity – and through markets, prices transmit information to other economic actors. Just as it fails to allocate resources efficiently, government’s intervention generally prevents a discovery process to solve pollution-related problems. In the long run, this prevents creative individuals from finding a solution for the problem.<sup>48</sup>

Moreover, if we view the greenhouse effect as a possible cause of external costs, then we should not view it as completely catastrophic. Instead, we should find ways to assign a price to that pollution – then private actors can flexibly find ways to minimise their pollution, and they have an incentive to develop new technologies and substitutes. But environmental groups are often completely unrealistic about this, on the one hand painting scary scenarios of resource scarcity, and on the other hand demanding the taxpayer-subsidised adoption of highly expensive energy sources.<sup>49</sup>

## Conclusions

We should be concerned about the earth’s future, but too much worrying can be unproductive. It is important to get our priorities

straight. So far in Europe the debate on climate change has not included the scientific uncertainties which surround the debate.

Scientists do not fully understand climate dynamics, and climate models are not sufficiently reliable. Amongst a variety of other uncertainties, there is a discrepancy between the earth's surface temperatures, which show warming, and satellite readings, which do not show evidence of warming.

For the same reasons, economic forecasts on the impact of global warming or of the Kyoto Protocol must be regarded with scepticism, because often they are based on excessive simplifications or on unreliable information. We also do not fully comprehend the potential effects of climate change for humanity or the environment. These could be positive or negative, but we should be certain before we act to mitigate climate change.

The European debate has also lacked a discussion of how we should prioritise climate change, amongst other policy priorities. It has been one-sided and driven by interest groups with a variety of agendas, some of whom believe it is our moral duty to act urgently against climate change, and others of whom stand to gain from rent-seeking relating to the Kyoto Protocol and supporting regulations.

Bruce Yandle, an economist at Clemson University, suggests that:

An analysis of the agreement and of the post-Kyoto strategizing suggests that control of global warming is largely symbolic, which does not gainsay its vital importance to environmental groups. The real effects of the Protocol relate to cartelization and efforts by interest groups and countries to gain competitive advantage in a globally competitive world. Global warming may be just the right wrapping for a major rent-seeking package.<sup>50</sup>

(See also Chapter 9, 'Bootleggers, Baptists and the global warming battle'.)

Europe's policies should be driven by an analysis of their costs and benefits – not by reliance on arbitrary criteria such as the 'precautionary principle'. Kyoto will produce marginal effects in avoiding global warming, but its costs will be extremely high, for wealthy and poor countries, as outlined in this chapter.

More importantly, Europeans should encourage and adopt policies that allow flexibility, innovation and adaptation to change – whatever

those changes may be. By rationally facing potential problems, we will avoid wasting and diverting resource from more urgent and substantial needs. To that end, we should:

- Invest in climate research, both scientific and economic. A better understanding of the process and its effects is indispensable to creating public policy.
- Encourage innovation in energy sources and utilisation.
- Stimulate adaptation to change.
- Remove obstacles to the scientific process and to economic growth, including subsidies and trade barriers.

To achieve these results, it is necessary to:

- Guarantee freedom of research for scientists.
- Strengthen the institutions of free societies, to enable human innovation and creativity.
- Support free market reforms which are unbiased towards specific energy sources.

## Notes

- 1 See, for example, the ‘Galileo 2001 – For the freedom and dignity of science’ manifesto, <http://www.cidis.it/articoli/vari/galileo2001.htm>; Gaspari (1997), pp. 234–35; Gheddo and Beretta, p. 227.
- 2 See Ricci (2002), p. 39.
- 3 Francescato (2002), p. 43.
- 4 IEA (2001). See also EIA (2002).
- 5 Brunetti, *et al.* (2000); Moonen *et al.* (2002).
- 6 Tognetti *et al.* (1998).
- 7 See Bianco *et al.* 2002.
- 8 See Midena (2002), p.7; Serafini (1998).
- 9 EIRO (no date).
- 10 Lomborg (2001), p. 260, citing IPCC (2001) Section 3.1.
- 11 Marsh (2002).
- 12 Baker (2001), p.138.
- 13 Jones *et al.* (2001).
- 14 Ortolani (2000), p.5.
- 15 This theme was explored recently in an analysis of proxy data from the past 1,000 years, which concluded that ‘Many records reveal that the twentieth century is likely not the warmest nor a uniquely extreme climatic period of the last millennium.’ Soon *et al.* (2003), p. 233.
- 16 Friis-Christensen and Lassen (1991).
- 17 Corbyn and Golipur (1996).
- 18 McKittrick (2001).
- 19 Spencer and Christy (1990), p. 1558.
- 20 Battaglia (2000).
- 21 ‘Today’s 30 percent increase in atmospheric concentrations of CO<sub>2</sub> is estimated to have increased crop output between 5 and 10 percent. Doubling CO<sub>2</sub> concentrations could increase growth of the same plants and crops by as much as 30 percent’, Bradley (2000), p. 92. ‘Carbon dioxide is not a pollutant; it is essential to life. Based on extensive evidence from agricultural research on enhanced carbon dioxide environments both in the field and in laboratories, increases in carbon dioxide should cause many plants to grow more vigorously and quickly. The reason is that most plants evolved under, and so are better adapted to, concentrations of atmospheric carbon dioxide higher than those found at present’, Soon and Baliunas, *et al.* (2001), p. 37.
- 22 Baker (2001), pp. 146–47. Emphasis added.
- 23 Castles (2002).
- 24 Crandall (1997), p. 145.
- 25 Lomborg (2001), p. 301, citing IMF (2000), p.113 (‘with global GDP at 32,110 billion dollars in 2000’).
- 26 FAO (1991).
- 27 Simon (1996).
- 28 Cohen (1995), pp. 576–87.
- 29 Goklany (1995), p. 442.

- 30 Hardin (1968); Mitchell and Simmons (1994); Steele (2002).
- 31 'The goal of the Protocol is to stabilise *emissions* of CO<sub>2</sub>, not the atmospheric *concentrations* of CO<sub>2</sub> (and of course the other greenhouse gases). Even if emissions could be stabilised at 1990 levels, six billion tons of carbon would be added to the atmosphere annually by human activities. That carbon would build up in the atmosphere and a doubling of CO<sub>2</sub> would still occur near the middle of this century.' Balling (2002), p. 156.
- 32 Kyoto Protocol (1997).
- 33 Thorning (1998).
- 34 Goklany (2001a).
- 35 Goklany (2001b), p. 73.
- 36 Lomborg (2001), p. 302, citing Parry *et al.* (1998), p.286, WEC 1998, Nordhaus and Boyer (1999), p.104.
- 37 Montgomery (1997), pp. 65–68.
- 38 DRI-WEFA (2002).
- 39 *Ibid.* p. 15.
- 40 EEA (2003).
- 41 Thorning (2002).
- 42 Buchanan and Tullock (1975), pp.139–47.
- 43 See Reisman (2002), pp. 13–14, for a discussion of how Austrian economists might address global warming. Desrochers (2002).
- 44 Meiners and Yandle (1998), pp.63–64. See also Rothbard (2002), pp. 260–68; Leoni (1991).
- 45 Cordato (1999).
- 46 See Cordato (1999), pp. 5, 10.
- 47 *Ibid.* p.4. See also Buchanan (1969).
- 48 Desrochers (2002).
- 49 See Simon (1996), pp. 54–72; Bradley (2002).
- 50 Yandle (1999).

## Bibliography

- Baker, R. *Fragile Science. The Reality Behind the Headlines* (London, MacMillan, 2001).
- Balling, R. C. Jnr, 'A climate of uncertainty in the greenhouse century', in Morris, J. (ed.), *Sustainable Development. Promoting Progress or Perpetuating Poverty?* (London, Profile Books, 2002) pp. 145–58.
- Battaglia, F. (2000), 'Ecco perché l'effetto-serra è solo una grossa bufala,' *Il Giornale*, 4 September.
- Bianco, G., Piombini, G. and Stagnaro, C., *Il libro grigio del sindacato* (Bologna, Edizioni Il Fenicottero, 2002).
- Bradley, R. L. Jnr, *Julian Simon and the Triumph of Energy Sustainability* (Washington, DC, American Legislative Exchange Council, 2000).

- Bradley, R. L. Jnr, 'Energy for sustainable development', in Morris, J. (ed.), *Sustainable Development Sustainable Development. Promoting Progress or Perpetuating Poverty?* (London, Profile Books, 2002), pp. 159-72.
- Buchanan, J. M., *Cost and Choice* (Chicago, Marham Press, 1969).
- Buchanan, J. M. and Tullock G. (1975), 'Polluters' profits and political response: Direct control versus taxes', *American Economic Review*, 65 pp. 139-47.
- Brunetti, M., Maugeri, M. and Nanni, T. (2000), 'Variations of Temperature and Precipitation in Italy from 1866 to 1995', *Theoretical and Applied Climatology* 65, pp. 165-74. Available at: [www.isac.cnr.it/~climstor/michele/print/TAC65\\_2000\\_165.pdf](http://www.isac.cnr.it/~climstor/michele/print/TAC65_2000_165.pdf)
- Castles, I. (2002), 'Letter to Dr. Rajendra Pachauri', August 6. Available at: [www.policynetwork.net/pdfs/henderson\\_castles\\_letters.pdf](http://www.policynetwork.net/pdfs/henderson_castles_letters.pdf).
- Cohen, B. L., 'The Hazards of Nuclear Power', in Simon, J. L. (ed.), *The State of Humanity* (Oxford and Cambridge, Blackwell, 1995), pp. 576-87.
- Corbyn, P., and Golipur, M., 'What is a Global Temperature? The Over-Representation of Temperate and Polar Zones', in Emsley, J. (ed.), *The Global Warming Debate. The Report of the European Science and Environment Forum* (Bournemouth, European Science and Environment Forum, 1996).
- Cordato, R. (1999), 'Global Warming, Kyoto, and Tradeable Emissions Permits. The Myth of Efficient Central Planning', *Studies in Social Costs, Regulation, and the Environment*, Institute for Research on the Economics of Taxation, 1. Available at: [ftp://ftp.iret.org/pub/SCRE-1.PDF](http://ftp.iret.org/pub/SCRE-1.PDF).
- Crandall, R. W., 'Economists and the Global Warming Debate', in Adler, J. H. (ed.), *The Costs of Kyoto. Climate Change Policy and Its Implications* (Washington, DC, Competitive Enterprise Institute, 1997): 145. Available at: [http://www.secure.cei.org/PDFs/Costs\\_of\\_Kyoto\\_Part4.pdf](http://www.secure.cei.org/PDFs/Costs_of_Kyoto_Part4.pdf)
- Desrochers, P., 'Industrial ecology and the rediscovery of inter-firm recycling linkages: historical evidence and policy implications', *Industrial and Corporate Change* 11 (2002): 1031-57.
- DRI-WEFA (2002), *Kyoto Protocol and Beyond: The High Economic Cost to the United Kingdom*. Available at: [www.scientific-alliance.com/dri4.doc](http://www.scientific-alliance.com/dri4.doc)
- Energy Information Administration (EIA) (2002), *International Energy Outlook 2002*
- Office of Integrated Analysis and Forecasting, Washington, DC, Department of Energy. Available at: [www.eia.doe.gov/oiaf/ieo/pdf/0484\(2002\).pdf](http://www.eia.doe.gov/oiaf/ieo/pdf/0484(2002).pdf)
- European Environment Agency (EEA) (2003), 'EU greenhouse gas emissions rise for second year running.' Available at: [www.org.eea.eu.int/documents/newsreleases/ghg-2003-en](http://www.org.eea.eu.int/documents/newsreleases/ghg-2003-en)
- European Industrial Relations Observatory Online (EIRO) (no date), 'ETUC anticipates green job creation under Kyoto Protocol', accessed 15 June 2003. Available at: [www.eiro.eurofound.ie/1999/04/InBrief/EU9904169N.html](http://www.eiro.eurofound.ie/1999/04/InBrief/EU9904169N.html)
- Food and Agricultural Organization of the United Nations (FAO), *1991 Country Tables* (Rome: FAO, 1991).
- Francescato, G., 'Dal concetto del limite al principio di precauzione', in Francescato, G. and Scanio, A. P., *Il principio di precauzione* (Milan, Jaca Book, 2002).

- Friis-Christensen, E. and Lassen, K. (1991), 'Length of the Solar Cycle: An Indicator of Solar Activity Closely Associated with Climate', *Science* 254, pp. 698–700.
- Gaspari, A. (1997), *Profeti di sventura? No grazie! Manifesto per un'ecologia scientifica e ottimista*, Milan, 21mo Secolo, 1997.
- Gheddo, P. and Beretta, R.,  *Davide e Golia. I cattolici e la sfida della globalizzazione* (Milan, San Paolo, 2001).
- Goklany, I. M. (2001a), *Economic Growth and the State of Humanity* (Bozeman: Political Economy Research Center, 2001).
- Goklany, I. M. (2001b), *The Precautionary Principle* (Washington, DC, Cato Institute, 2001).
- Goklany, I. M. (1995), 'Strategies to Enhance Adaptability: Technological Change, Sustainable Growth and Free Trade', *Climatic Change* 30.
- Hardin, G. J. (1968), 'The Tragedy of the Commons', *Science* 162, pp. 1244–5.
- Infantino, L., *Individualism in Modern Thought. From Adam Smith to Hayek* (London, Routledge, 1998).
- Intergovernmental Panel on Climate Change, *Climate Change 2001: The Scientific Basis* (Cambridge, Cambridge University Press, 2001).
- International Energy Agency (IEA), *Energy Policies of IEA Countries* (Paris, OECD/IEA, 2001).
- International Monetary Fund (IMF), *World Economic Outlook: April 2000* (Washington, DC, IMF, 2000).
- Jones, P. D., Parker, D. E., Osborn, T. J. and Briffa, K. R. (2001), 'Global and hemispheric temperature anomalies – land and marine instrumental records', in *Trends: A Compendium of Data on Global Change*. Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, U.S. Department of Energy, Oak Ridge, Tenn., USA. Available at: <http://www.cdiac.esd.ornl.gov/trends/temp/jonescru/jones.html>.
- Kyoto Protocol to the United Nations Framework Convention on Climate Change*, 1997.
- Leoni, B., *Freedom and the Law* (Indianapolis, Liberty Fund, 1991).
- Lomborg, B., *The Skeptical Environmentalist. Measuring the Real State of the World* (Cambridge, UK, Cambridge University Press, 2001).
- McKittrick, R. (2001), 'The Influence of Economic Activity on the Measurement of Global Warming', September. Available at: [www.uoguelph.ca/~rmckitri/research/gdptemp.pdf](http://www.uoguelph.ca/~rmckitri/research/gdptemp.pdf)
- Marsh, G. E. (2002), 'A Global Warming Primer', The National Center for Public Policy Research, *National Policy Analysis* 420. Available at [www.nationalcenter.org/NPA420.pdf](http://www.nationalcenter.org/NPA420.pdf)
- Meiners, R. E. and Yandle, B. (1998), 'Common law environmentalism', *Public Choice* 94 pp. 63–64.
- Midena, M. (2002), 'Il lavoro sarà sempre più verde, parola di Sindacato', *Ambiente e lavoro*, July–August. Available at [www.cisl.it/universita/2002/Rivista/7\\_02/lavoro.pdf](http://www.cisl.it/universita/2002/Rivista/7_02/lavoro.pdf)
- Mitchell, W. C. and Simmons, R. T., *Beyond Politics* (Oakland, CA, The Independent Institute, 1994), pp. 46–162

- Montgomery, W. D. (1997), 'Global Impacts of a Global Climate Change Treaty', in Adler, J. H. (ed.), *The Costs of Kyoto*, pp. 65–8. Available at [www.secure.cei.org/PDFs/Costs\\_of\\_Kyoto\\_Part2.pdf](http://www.secure.cei.org/PDFs/Costs_of_Kyoto_Part2.pdf)
- Moonen, A. C. *et al.* (2002), 'Climate change in Italy indicated by agrometeorological indices over 122 years', *Agricultural and Forest Meteorology* 111, pp. 13–27.
- Nordhaus, W. and Boyer, J. (1999), 'Requiem for Kyoto: An economic analysis of the Kyoto Protocol', *The Energy Journal: Kyoto special issue*, pp. 93–130. Available at: <http://www.econ.yale.edu/~nordhaus/homepage/Kyoto.pdf>
- Ortolani, F. (2002). 'Modificazioni climatico ambientali cicliche tipo "effetto serra" durante il periodo storico', *21mo Secolo* 3.
- Parry, M., Rosenzweig, C., Iglesias, A., Fischer, G. and Livermore, M. (1998), 'Buenos Aires and Kyoto targets do little to reduce climate change impacts', *Global Environmental Change* 8, vol. 4, pp. 285–89.
- Reisman, G. (2002), 'Environmentalism in the Light of Menger and Mises', *The Quarterly Journal of Austrian Economics* 5, pp. 13–14.
- Ricci, R. A. (2002), 'Problemi ambientali ed informazione scientifica', *Nuova Secondaria* 10.
- Rothbard, M. N., *For a New Liberty. The Libertarian Manifesto* (Auburn, Ala., The Ludwig von Mises Institute, (2002), pp. 260–8. Available at: <http://www.mises.org/rothbard/newliberty.asp>
- Serafini, M. (1998), 'Relazione introduttiva al Consiglio Nazionale di Legambiente', November.
- Simon, J. L. (1996), *The Ultimate Resource 2* (Princeton, Princeton University Press, 1996).
- Soon, W. and Baliunas, S. *et al.*, *Global Warming. A Guide to Science* (Vancouver, The Fraser Institute, 2001).
- Soon, W. *et al.* (2003), 'Reconstructing climatic and environmental changes of the past 1000 years: A reappraisal', *Energy and the Environment*, vol. 14, nos. 2&3, pp. 233–96.
- Spencer, R. W. and Christy, J. R. (1990), 'Precise Monitoring of Global Temperature Trends From Satellite', *Science* 247, p. 1558.
- Steele, C. N., 'The Soviet Experiment: Lessons for Development', in Morris, J. (ed.), *Sustainable Development. Promoting Progress or Perpetuating Poverty?* (London, Profile Books, 2002) pp. 88–103.
- Thorning, Margo (2002), *Kyoto Protocol and Beyond: Economic Impacts on EU Countries*, Washington, DC, American Council for Capital Formation. Available at: [http://www.accf.org/ACCF\\_KyotoEconImp.pdf](http://www.accf.org/ACCF_KyotoEconImp.pdf)
- Thorning, Margo (1998), 'Climate Mitigation Policy and US Economic Growth'. Testimony before the Congressional Subcommittee on National Economic Growth, Natural Resources, and Regulatory Affairs, US House Committee on Government Reform and Oversight, 23 April 1998. Available at <http://www.accf.org/Apr98test.htm>
- Tognetti, R. *et al.* (1998), 'Transpiration and stomatal behaviour of *Quercus ilex* plants during the summer in a Mediterranean carbon dioxide spring', *Plant, Cell and Environment* 21, pp. 613–22

- World Energy Council (WEC) (1998), 'A keynote address to the 30th Conference of the Japan Atomic Industrial Forum Inc.', by Michael Jefferson, Tokyo, 20 April. *Global Warming and Global Energy after Kyoto*. Available at: <http://www.worldenergy.org/wec-geis/publications/default/archives/speeches/spc980420MJ.asp>
- Yandle, B. (1999), 'After Kyoto: A Global Scramble for Advantage'. *Independent Review* 1; pp. 19–40. Available at: [http://www.independent.org/tii/media/pdf/TIR41\\_Yandle.pdf](http://www.independent.org/tii/media/pdf/TIR41_Yandle.pdf)