

CLIMATE CHANGE AND INDONESIA

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My presentation¹ this morning is about climate change and Indonesia. But we cannot sensibly talk about climate change only in one country. The impacts of climate change know no boundaries. Neither do contributions to the mitigation of climate change. The only solutions are global, with participation from all substantial economies. Failure to find and to apply effective global solutions will hurt some countries earlier and more than others, but in the end it will hurt all countries. It happens that Australia and Indonesia will be hurt more and earlier than most countries.

While there are large uncertainties about the detail, the overwhelming weight of relevant global scientific opinion says that human-induced climate change is happening, and will intensify for as long as the concentrations of greenhouse gases in the atmosphere continue to grow. The effects are not linear: the first doubling of concentrations will have a larger proportionate effect than the second, but this does not save us from immense incremental damage from a second doubling. There are lags in the effects of changes in concentrations of greenhouse gases on climate, so that the full effects of the acceleration of the increase in emissions in the early twenty first century will not have its main effects for two or three decades. By the end of this time, the mainstream science expects that in the absence of effective global mitigation, global temperatures will have moved above the range that has been present through the emergence of human modern civilization over the last 10,000 years or so (Garnaut 2008: chs 2 and 4).

Human-induced climate change is caused by rapid growth in the concentrations of carbon dioxide and other greenhouse gases in the atmosphere, principally from the combustion of fossil fuels. There are also large contributions from changes in patterns of land use, especially deforestation.

The concentrations have been growing particularly rapidly in the early 21st century because the beneficent processes of modern economic growth have moved powerfully into the world's most populous countries—China, India, Indonesia—and other developing countries. Without strong measures to reduce global emissions, the costs of climate change will continue to increase through the twenty first century and beyond, with potentially catastrophic economic as well as environmental effects.

Modern economic growth is a wonderful phenomenon, and all of the people of the world want and are entitled to enjoy its full benefits. Unfortunately, in the form it has taken until now, it has some unfortunate environmental side effects. One of these, human-induced climate change, has the potential to change the world so much that the living standards now enjoyed by the world's high-income countries would not be part of the lives of people in any country. It would be undesirable and impractical to expect people in the developing countries to truncate their hopes for rising living standards. The mitigation task is to end the connection between economic growth and greenhouse gas emissions.

The 2008 global financial crisis is a timely reminder of how closely we are joined across the world today, as societies and economies. The problems of some of us quickly become the problems of all of us. The crisis is also a reminder that short-term policy issues can deflect attention from long-term structural issues. And the crisis is a reminder

¹ This draws on The Garnaut Climate Change Review (Cambridge University Press, 2008 and www.garnautreview.org.au) and my Panglaykim Memorial Lecture in Jakarta last October, published in the CSIS journal *The Indonesian Quarterly* 36 (3–4), December 2008 and the *Bulletin of Indonesian Studies*.

that money politics can distort policy towards private interests and away from the public interest even in the most sophisticated economy in the world, in ways that cause immense damage to people everywhere.

That is the way it could be with climate change policy. If climate change is managed as badly as financial regulation, our generations will have left greatly diminished possibilities for life to our children and their children. While our own parents and grandparents left us much more than they had had, we will have let down those who come after us. Our generations will have broken the thread that has joined the generations of humanity in the building of the wonderful structures and potential of civilization.

I describe climate change as a diabolical policy problem, because of its complexity; because of the mismatch of time frames between the costs of mitigation (which come early) and the benefits (which come much later); and because of the prisoner's dilemma that inhibits international cooperation on mitigation (with each country having an incentive to do as little as possible if it thinks its own actions will not affect the policy decisions of others).

While an effective response to climate change must be global, it must be built from the national contributions of sovereign countries, acting alone or together with others. We will not get a good outcome unless all substantial countries make large contributions.

My country, Australia, has big responsibilities, as the developed country with the largest per capita emissions, as the world's largest exporter of the world's most emissions-intensive major form of energy (coal), and as a county with immense human and natural potential for the development of low-emissions energy and for development and application of sequestration technologies.

Indonesia also has large responsibilities. Its total emissions are actually very large, because of forestry and land use change, and also because its emissions from fossil fuel and especially coal combustion are growing rapidly. Indonesia is a leader of the developing world, and many other countries, in Southeast Asia and far beyond look to it for directions. President Yudhoyono's hosting of the Bali conference of the United Nations in December 2007 is widely recognized as having been critical to a successful outcome, and this gives Indonesia continuing respect and influence.

In addition, the Great Crash of 2008 and its recessionary consequences have accelerated changes in the global centre of gravity of economic activity and strategic weight in ways that enhance the global leadership opportunities and responsibilities of Indonesia and the other large developing countries. The Great Crash has left an awful legacy of debt and weakened financial institutions in much of the developed world, which will slow their growth for a long time to come. But it has had much less effect on the growth and growth prospects of the large developing countries, first of all China, India and Indonesia. The Great Crash has accelerated movement towards a world in which no major international cooperation can work without the major developing countries helping to shape them and playing major roles in their implementation. This carries responsibilities as well as power and opportunity, not least in relation to global climate change policy.

VULNERABILITY TO CLIMATE CHANGE

Indonesia shares vulnerability to climate change with all countries on earth. It is highly vulnerable because the science indicates that the tropical regions will suffer greater negative impacts on agriculture than all but a few developed countries. Reefs and fisheries will experience severe effects. People already living in tropical regions, near the upper limits of the range of temperatures in which humans make their lives, will find it harder to adapt to even higher temperatures. In addition, the rise in sea levels, which is a signature impact of climate change, will have especially damaging effects on low-lying cities, including the great cities of Jakarta and Surabaya. It is likely to displace large numbers of people from coastal and riverine rural communities all over the archipelago, including from the vast lowlands of Papua.

Among the largest points of vulnerability to unmitigated climate change for Australia and Indonesia is one they share with each other. Australia and Indonesia share the Asian and western Pacific regions with other vulnerable countries. Some of our neighbours in this region are populous countries with vast communities inhabiting river deltas that would be damaged disproportionately by rising sea levels. On the mainland of Asia, many of our populous neighbours depend in important ways on the steady flows in the great rivers that have their origins in the Himalayas and the Tibetan Plateau—the Yangtze, Yellow, Mekong, Ganges, Brahmaputra and Indus rivers and others. This steady river flow has nurtured human civilisation since the cradle. It is threatened by climate change.

Developing countries will find adaptation to climate change especially difficult. With unmitigated climate change, we in Australia and Indonesia will have great problems of our own. In addition, the problems of other developing countries in our region will become our problems.

I should mention one other way in which Australia and Indonesia share exceptional vulnerability. Both of us, but especially Australia, have export structures that cause slower growth in the global economy to damage our terms of trade. In this, we are unlike nearly all developed and many high-income developing countries. Unmitigated climate change would cause slower growth in economic activity through the second half of the 21st century, the more so with each passing decade. Both of us would be hurt more than the average country by deterioration of our terms of trade resulting from the growth effects of climate change.

INDONESIA AND THE GLOBAL MITIGATION EFFORT

The first requirement of effective global mitigation is an international agreement on the concentration of greenhouse gases in the atmosphere that represents the right balance between the costs of mitigation and the risks of dangerous climate change. Discussion of the right level of global mitigation ambition has so far taken place mainly in the developed countries, although on average developing countries have an even greater interest in how this matter is resolved. The G8 meeting of heads of government in Japan, in July 2008 agreed that global emissions should be reduced by 50% by 2050. This was not unequivocally supported by the developing countries which participated in the larger meeting alongside the G8 meeting in Rome last week. There was however widespread support for the ambitious objective to contain the change in global temperature from pre-industrial levels to a two-degree Celsius increase from pre-

industrial levels. This would require the holding of concentrations in the atmosphere to about 450ppm of carbon dioxide equivalent, and it is hard to see how this would occur if global emissions were not reduced by half from 1990 levels by the middle of the century.

Since it is universally acknowledged that developed countries will have to accept much larger proportionate reductions in emissions than developing countries, the achievement of the "two degrees" objective would require reductions by developed countries to much less than half of existing levels. The Rome meeting spoke of a reduction of 80 percent in the developed countries. That may not be enough.

It is widely accepted that most developing countries will need to be allowed to increase emissions in absolute terms for some time. To avoid high risks of dangerous climate change, it will nevertheless be essential for them to reduce the growth of their emissions to below business-as-usual levels from an early date.

The objectives of holding the temperature increase to two degrees, or the greenhouse gas concentrations to 450 ppm, or lower, or of reducing emissions by half or more by 2050, make excellent sense from the viewpoints of Australia, Indonesia, our neighbours in the western Pacific and the international community. When careful economic analysis has been undertaken of the costs of achieving ambitious mitigation objectives, it generally shows that these are small alongside the increases in living standards over the next several decades and next century that would occur within a framework of effective global mitigation. The costs, if the mitigation is pursued through economically sound policies, are substantial but manageable for each of us.

There are several reasons why costs can be expected to be generally lower for developing than for most developed countries. It is less costly to transform emerging than established economic structures. Many developing countries, including Indonesia, have exceptional opportunities for low-cost bio-sequestration, including through a diminished rate of destruction of established forests.

Once there is broad agreement on the desirable objectives of mitigation policy, the really hard task is to agree on the distribution of the emissions reduction burden across countries. At some time, it will be necessary to allocate emissions entitlements to each country that add up to totals consistent with the agreed environmental objective. This requires the articulation of principles for allocation that are widely seen as being fair and practical.

Entitlements are not the same thing as emissions. In a good global system, there would be trade in entitlements. Countries which have the capacity to reduce their emissions at low cost can sell the entitlements that exceed their allocation to those who are unable or unwilling to keep emissions within their entitlements.

I cannot see any alternative to allocation eventually on the basis that entitlements across countries will be equal per capita. This was the approach taken by the Garnaut Review last year, and it has been reinforced by much discussion since then. Most recently, a paper by staff members of China's National Development and Reform Commission, the agency with responsibility for climate change policy, made exactly this point at a conference in Canberra earlier this week.

There will remain a question about when the equal per capita entitlements should take effect. It would be difficult for high-emissions countries to go immediately to equal per capita entitlements, and they will argue the case for an adjustment period. The Garnaut review suggested convergence to equal per capita entitlements by 2050. Many developing country analysts argue for immediate and early convergence on equal per capita entitlements. This is a crucial issue that we have to talk through earlier rather than later.

Playing its full proportionate part in a global effort to stabilise greenhouse gas concentrations at or below 450 ppm, within a framework of convergence towards equal per capita entitlements in 2050, would require Australia to reduce emissions from 2000 levels by 25% by 2020, and by 90% by 2050. Convergence towards equal per capita entitlements before that date would require larger Australian reductions, and would make correspondingly smaller demands on low-income developing countries. The timing of convergence towards equal per capita entitlements is an important matter for international discussion and agreement.

The Garnaut Review's work on 'business-as-usual' emissions (ch. 3) notes that past analysis of the prospects for global warming, in the Intergovernmental Panel on Climate Change (IPCC) review and the Stern review of the economics of climate change (IPCC 2001a, 2001b, 2007a, 2007b; Stern 2007), greatly under-estimates the future growth of emissions from Asian developing countries. This is because it under-estimates the likely rates of economic growth of China, India, Indonesia and other developing countries, the energy intensity of that growth, and the emissions intensity of energy use. It therefore misses the urgency of including China and other developing countries in a regime designed to constrain the growth of global emissions below 'business-as-usual' levels.

An immense effort in international cooperation is required over the months ahead, leading up to the United Nations conference scheduled for Copenhagen in December 2009, to bridge the gulf between general objectives and national commitments. In this context it is crucial that national commitments are backed realistically by policies to implement them that add up to achievement of desired global objectives. One big gap between reality and the current official international discussion arises from the premise that developing countries will not accept binding constraints on emissions for the foreseeable future. Unfortunately, the arithmetic of global mitigation does not add up without substantial reductions in developing country emissions below business as usual.

There are advantages in shifting the emphasis from whether it is fair for developing countries to have fixed entitlement obligations, to what would constitute a fair allocation of entitlements that was consistent with satisfactory increases in living standards in developing countries. Unfortunately, these discussions are not well enough advanced for us to be able to expect a conclusion in Copenhagen. There is probably a need for meetings beyond Copenhagen to settle details. And it is probably necessary for Copenhagen to settle on transitional post 2012 arrangements, towards comprehensive global commitments that add up to an effective global effort five or seven years after that.

The Garnaut Review devoted considerable effort to the development of proposals that have a chance of being acceptable to developing countries within a global agreement. The proposals cover not only the allocation among countries of entitlements to emit greenhouse gases but also cooperation on the development of public investment in new

low-emissions technologies and on adaptation to climate change. On research, development and commercialisation of new technologies and on adaptation, high-income countries, with per capita incomes exceeding \$11,000 per annum, would take on special global responsibilities. Developing countries that participate in and accept mitigation responsibilities under a global agreement would be beneficiaries of transfers under the international technology and adaptation commitments.

A fair allocation of entitlements across countries, that allowed many developing countries to generate export revenue from the sale of surplus permits, together with technology and adaptation commitments that would only be available to developing countries that participated in the global mitigation effort, would provide incentives for developing countries voluntarily to constrain emissions below the defined trajectories. The incentive for poorer developing countries to be part of a global mitigation effort would be increased by high-income countries providing assistance for adaptation to climate change available to low-income developing countries.

INDONESIA'S SCOPE FOR CONTRIBUTING TO MITIGATION

While there is uncertainty about precise levels of emissions from land use change and forestry, the best estimates suggest that these are large on a global scale, and that as a result Indonesia may be the world's third highest emitter of greenhouse gases in absolute terms, or at least may have been at the end of the 1990s. Indonesia has taken important initiatives to measure and to monitor emissions as a first step towards constraining net emissions from forestry. There are opportunities for large reductions in emissions from forestry and land use change at relatively low cost. The global community and Indonesia both have strong interests in introducing incentives for greenhouse gas abatement to take place at low cost in Indonesia rather than at higher cost elsewhere. The opportunities for low-cost abatement cover afforestation and re-forestation as well as avoided deforestation. The United Nations' acceptance of credits for forests conservation provides opportunities for Indonesia and other developing countries, along the path to comprehensive inclusion of forestry and land use change in a global mitigation regime. Leading the design for these new arrangements could be a special Indonesian contribution to the global mitigation effort.

At the same time, Indonesia has rich opportunities for generating low-emissions power at relatively low cost. It has considerable unutilised capacity for hydro-electric and conventional geo-thermal power generation. The development of appropriate incentive structures for making good use of this capacity, assisted by gains from the international sales of carbon credits, would be highly beneficial for Indonesian development, and helpful to the emergence of an effective global emissions regime covering developing as well as developed countries.

As in all countries including Australia in which the cost of energy has been relatively low, there are large opportunities for reducing emissions in Indonesia from improvements in energy efficiency. There are no good reasons for keeping energy prices below international prices through the use of subsidies for petroleum products and electricity. Subsidies slow economic growth and the rise in living standards of Indonesians as well as artificially increase energy use and greenhouse gas emissions. Their removal would be a first step in improving energy efficiency in Indonesia. In addition, the provision of information to businesses and households on how they could reduce the use of energy

could often enhance living standards of people making the changes, in addition to contributing to environmental objectives.

Both Australia and Indonesia have large, cooperative and productive relations with developing countries in the western Pacific region. This gives us both special capacities in the development of mechanisms for encouraging developing country participation in an effective global mitigation effort, and also in the shaping of mechanisms for assisting developing countries with adaptation to climate change.

WHAT DIFFERENCE DOES THE FINANCIAL CRISIS MAKE?

What difference is made by the unprecedented financial crisis that began in 2007 and plumbed new depths from September 2008? Does it make mitigation genuinely less urgent, by slowing global growth in economic activity and therefore energy use and emissions? Will it reduce commitment or capacity to sustain economic costs to reduce emissions? In particular, will it reduce the chances of strong mitigation in major emitting countries—in particular, the United States?

A decision to reduce emissions in the interests of limiting the risks of dangerous climate change is not a decision to favour the environment over the economy. Unmitigated climate change is likely to have large environmental costs, but it would also have large economic costs. The policy challenges of mitigation derive partly from the reality that the costs of mitigation come early and the gains from reduced costs of climate change come later. So the economic policy choice is not between economic costs and environmental benefits. It is between short-term economic costs and long-term economic benefits, the latter potentially of much larger dimension. In this context it is worth keeping in mind that the financial crisis itself can be understood as a consequence of favouring the short term over the long term in private and public decisions affecting the economy.

The acceleration of economic growth in China, India, Indonesia and other major developing countries that has made early and strong mitigation more urgent has deep foundations. It has not been permanently knocked off course by the crisis. The 'business-as-usual' trajectory of emissions growth beyond 2008 and 2009 in the large developing countries is likely to be much the same as is anticipated in the Garnaut Review. For the world as a whole, the effect of the crisis may be a pause for two or three years in rapid emissions growth as a result of widespread recession in developed countries. This gives us no more than a little breathing space—which may turn out to have been necessary for the attainment of anything like announced mitigation objectives, given the points from which we are starting in mid-2009.

The biggest effect of the crisis may be on the acceleration of the shift in economic and geo-strategic weight from the developed to the large developing countries. This reduces the former's capacity and increases the latter's responsibilities for global leadership on climate change as on other important issues requiring international cooperation.

Fortunately, the change of government in the United States in January this year has made that country a leader rather than a drag on global climate change policy. This is the result of political forces separate from the Great Crash and its recessionary effects, and offsets what may have been negative effects on the United States' global role on climate change policy.

Financial crises, however severe, are short-term phenomena. The current signs of a shift from recession to prospects for tepid growth in the developed countries, and of a reasonably robust outlook in the large developing countries, are helpful to the preparations for Copenhagen. The crisis will have left a legacy of reduced wealth, incomes and in some countries of growth prospects, the extent of which will depend on the effectiveness of policy decisions that are still under consideration at the time of writing. But the financial crisis itself will be passing into history.

By contrast, climate change is a long-term structural issue. It is bad policy to allow the approach to important long-term structural issues to be determined by short-term cyclical considerations. Moreover, the period of accelerated growth out of recession is a favourable time to implement policies involving major investment in new technologies and considerable structural change. So the financial crisis does not materially reduce the magnitude or urgency of the mitigation task. Nor does it create a sound reason for delaying mitigation.

In short, climate change mitigation may be more difficult politically in the immediate aftermath of the financial crisis, but it will be neither less important nor less urgent. Without effective global mitigation, climate change will still be here tomorrow. The possibility of effective action to remove great risks to economic as well as environmental values may not.

CONCLUDING REMARKS ON INDONESIAN POLICY

Effective global mitigation is unlikely to be achieved unless Indonesia plays a leading role in its contributions to building an international policy framework, and in its domestic mitigation efforts. Indonesia has already played a large and constructive role in international climate change policy, and has started the task of adjustment of domestic policy to allow it to play a positive role in a large global mitigation effort.

Indonesia's international role will be more important than ever in the period ahead. It will need to play a role in shaping arrangements that have a chance of being seen as being fair by enough countries to make a global effort work. It has a particular opportunity in relation to the shaping of the role of forestry and land use change in an effective international regime.

And what Indonesia does at home will be of crucial importance. The world needs to move quickly towards a global regime that systematically rewards reductions in and sequestrations of emissions. If that is the direction in which the world is heading, there will be large economic benefits in Indonesia shaping all new investment consistently with those longer-term directions. Otherwise there are potentially large costs in carrying or scrapping investments that have been made redundant by the emerging greenhouse gas regimes.

A good domestic policy framework will need to put a price on carbon dioxide and other emissions that is similar to the emerging and rising global emissions price—in addition to removing current subsidies which from time to time reduce fossil fuel prices below world prices. It will need to systematically reward the sequestration of greenhouse gases in plants or in the ground, at that same price. It will also need systematically provide for public support for research, development and commercialization, and especially for their

first application in a new environment in Indonesia, in recognition that the pioneers carry risks and costs from which the whole community receives benefits. The large revenues from putting a price on emissions, in Indonesia probably most efficiently through an emissions tax, would provide the means for supporting the new technologies as well as assisting low-income households to adjust to higher energy prices.

It is important that Indonesia's efforts are deeply integrated into mainstream economic policies, as both climate change and its mitigation have economic consequences of national significance.

The whole world is fortunate that Indonesia, with its newly elected and experienced government, and with robust economic growth continuing through the deepest global recession since the 1930s, is well placed to manage the large challenges that lie ahead on climate change and its mitigation.

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