

Climate Policy in the Face of Uncertainty: The Roles of Adaptation and Mitigation

Both adaptation and mitigation help to reduce the potential impacts of climate change to nature and society. However, their effects vary over time and place. Mitigation will have global benefits but these will hardly be noticeable before the middle of this century. The benefits of adaptation are largely local to regional in scale but they can be immediate if they also address risks associated with current climate variability. Climate policy is therefore not about making a choice between adapting to and mitigating climate change. Adaptation is necessary because even the most stringent mitigation efforts cannot avoid further climate change in the next few decades. Mitigation is necessary because reliance on adaptation alone could eventually lead to a magnitude of climate change to which effective adaptation will be possible only at very high social, environmental and economic costs.

The need to consider both adaptation and mitigation as essential components of climate policy has raised questions as to how they may be combined or traded off against one another, and whether or not synergies can be created between the two options. In this submission I present five propositions that qualify the predominant macro-economic perspective from which links between adaptation and mitigation tend to be analysed.

Proposition 1: There is no single optimal mix of adaptation and mitigation

It is doubtful whether it is sensible to refer to "the" optimal mix of mitigation and adaptation. As argued by the Intergovernmental Panel on Climate Change in its Third Assessment Report (IPCC TAR), striking the appropriate balance between mitigation and adaptation will be a tedious process and the optimal mix of options will vary by country and over time, as local conditions and costs change. Striking the balance will be particularly challenging because of some unique characteristics of the problem: long time horizons, non-linear and irreversible effects, the global nature of the problem, social, economic and geographical differences amongst affected parties, and the fact that institutions needed to address the issue have only partially been formed (Arrow *et al.*, 1996; Tãh *et al.*, 2001). Given these characteristics, as well as the widely differing interests, values and preferences within and between societies, there is no single optimal mix of mitigation and adaptation. In addition, uncertainty about climate and socio-economic change strongly affects the outcome of any optimisation exercise. As soon as new information becomes available, the optimal mix will be different (Lempert *et al.*, 2000).

The optimal mix will also vary depending on the decision framework and criteria that are applied to determine it. The IPCC TAR provided a number of examples of such frameworks, including cost-benefit analysis, cost-effectiveness analysis, tolerable windows approach, game theory and multi-criteria analysis. Each framework differs in the way assumptions, criteria and value judgements are handled and the choice for a particular decision framework is essentially a policy decision. Nonetheless, there is some consensus that under conditions of deep uncertainty, robustness, as opposed to optimisation, is a better decision-making criterion (Lempert and Schlesinger, 2000).

Proposition 2: Trading off adaptation and mitigation is not a zero-sum game

As public policies, adaptation and mitigation compete for resources with all other public policies (e.g., education, public health, military spending). At an aggregate level tradeoffs must be made between any type of public policy, not only between adaptation and mitigation. Moreover, only

to a limited extent is climate policy a public affair. Decisions on adaptation and mitigation are taken by many different actors, operating across different sectors and on different scales and, importantly, managing different budgets. Climate policy therefore does not involve allocating a single fixed budget to adaptation and mitigation, whereby increased spending on adaptation would mean that less money were available for mitigation (and vice versa). For example, investments by an energy-intensive industry to reduce its greenhouse-gas emissions will have very little effect on the resource availability of water companies to develop and execute drought-contingency plans, and even less on that of consumers to purchase water-saving shower heads.

Rather than actually developing and implementing specific adaptation and mitigation measures, a national government's role in climate policy should be to facilitate such development and implementation as part of sectoral and local policies and practices. This would involve, amongst other things, supporting the production of relevant knowledge, removing barriers to effective action, providing financial incentives and resources to those with the power to implement climate-policy measures, and any other ways to build adaptive and mitigative capacity (see also Proposition 4).

Proposition 3: Real synergies between adaptation and mitigation are few and far between

Synergies between adaptation and mitigation are created when measures that reduce adverse effects of climate change also control atmospheric greenhouse-gas concentrations, or vice versa. Synergies are sought because of the intuitive appeal of killing two birds with one stone. Yet there are risks involved in focusing too strongly on creating synergies. First, decision-making on synergistic measures may involve greater institutional complexity because of the many different actors involved in adaptation and mitigation, which could limit the efficacy of the measures. Second, it is doubtful that sufficient opportunities for synergies can be identified to achieve the levels of adaptation and mitigation deemed required. Third, even for those opportunities that are identified it is unclear whether or not they represent a wise investment in terms of the benefits accrued. The net effect of investing in synergistic measures – in terms of reducing damages – may well be smaller than when half the money is invested in more efficient mitigation options and the other half in more efficient adaptation options.

The current emphasis on developing synergies may provide perverse incentives to decision-makers to portray their plans (which may well have very laudable goals in their own right) as combined adaptation and mitigation measures, even though they do not make the most efficient use of available resources for adaptation and mitigation. There is a risk that adaptation activities will simply be labelled mitigation activities and vice versa so as to make them eligible or increase their attractiveness for funding. This could diminish the effectiveness of climate policy and be at the expense of vulnerable communities whose only opportunities to adapt to climate change come without mitigation benefits (e.g., coastal communities threatened by sea-level rise).

Proposition 4: Adaptation and mitigation are both closely intertwined with development choices

The links between greenhouse-gas emissions, mitigation of climate change and development have been the subject of intense study (for an overview see Markandya and Halsnæs, 2002). More recently the links between adaptation and development have been brought to light. In particular when seeking to enhance the capacity of people to adapt to climate change, the link with development is evident. Adaptive capacity is often limited by a lack of resources, poor institutions and inadequate infrastructure, amongst other factors that are typically the focus of local or regional development plans (Smith *et al.*, 2003). People's vulnerability to climate change can therefore be reduced not only by mitigation or by adaptation, but also by development aimed at improving the living conditions and access to resources of those experiencing the impacts, as this will enhance their adaptive capacity.

As the links between climate change and development have become apparent, the term “mainstreaming” has emerged to describe the integration of policies and measures that address climate change into development planning and ongoing sectoral decision-making. Mainstreaming would entail making more efficient and effective use of financial and human resources as compared to designing, implementing and managing climate-policy measures separately from ongoing activities. Benefits of mainstreaming would also be to ensure the long-term sustainability of investments and to reduce their sensitivity to both today’s and tomorrow’s climate (Huq *et al.*, 2003; Agrawala *et al.*, 2005). By its very nature, energy-based mitigation can be effective only when mainstreamed into energy policy. For adaptation, however, this link has not appeared as self-evident until recently. Prospective efficiency and effectiveness gains provide a rationale to sectoral decision-makers for analysing the potential for mainstreaming adaptation to climate change in their operations.

Proposition 5: Research on the links between adaptation and mitigation needs to go beyond economic and integrated assessment modelling

The premise that human vulnerability to climate change is reduced not only when climate change is mitigated or when successful adaptation to the impacts takes place, but also when the living conditions for those experiencing the impacts are improved, raises three questions. First, how would climate policy best complement other types of public policy? Second, on which spatial and institutional scales would government action on climate change be most effective? Third, how would decision-making responsibilities between public and private actors best be divided? Current economic research on the links between adaptation and mitigation does not address these questions. Instead, it continues to focus predominantly on the perceived tradeoffs between adaptation and mitigation, framing climate policy as a national or global cost-benefit question of optimality and zero-sum games.

The notion of a global optimum is a heuristic device, useful for understanding some of the implications of policy choices, but it is not useful as an operational decision criterion to identify a policy that is “best”. A “justifiable” mix of mitigation, adaptation and other policies will come from consultative and decision processes that are perceived as legitimate even if flawed; not from globally aggregated estimates of benefits and costs (Leary, pers.comm.). There is a need to strengthen at least two types of research. First, there is a need to investigate how best to build and use capacity for adaptation and mitigation, and under which conditions mainstreaming climate policy would be most effective. Second, economic analysis of adaptation and mitigation options needs to be complemented with research on the “implementability” of the options. Such research would address the relevant political, behavioural, cultural and other contexts of decision-making and cover all relevant spatial and institutional scales.

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