# Climate policies can help resolve energy security and air pollution challenges

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Policies to protect the global climate and limit global temperature rise offer the most effective entry point for achieving energy sustainability, reducing air pollution, and improving energy security, according to an article published in the latest issue of *Nature Climate Change* (Vol 1 Dec 2011). By adopting an integrated perspective on energy and climate policy, one that simultaneously addresses three of the key objectives for energy sustainability, major synergies and cost co-benefits can be realized.

The article, written by scientists at the International Institute for Applied Systems Analysis (IIASA), Austria, finds that policies focusing on mitigating climate change have synergistic effects in other dimensions, as they necessarily involve massive improvements in energy efficiency and the rapid and widespread deployment of clean, secure energy sources, in particular renewables.

"A clear advantage of pursuing ambitious climate policies is that, in general, many of the technologies and clean fuels that they will motivate, will simultaneously reduce both carbon emissions and a suite of other air pollutants that are harmful to the health of humans and the environment," says lead author David McCollum of IIASA.

"Moreover, once stringent climate policies are in place, our calculations show some strong synergies. The additional costs of supplementary policies to achieve the air pollution and energy objectives are significantly reduced – by several hundred billion dollars per year

globally, or approximately one-half of one per cent of global GDP." (See Figure 1).

Cost savings of this magnitude represent large financial flows according to the authors, equating to approximately one third of today's investments into the energy system, and these offsets to climate protection policy would accrue globally, every single year, for several decades into the future.

The efficiencies identified in the study are likely to be a bit conservative, according to the scientists. "We've used a partial economic accounting approach, which means we have not attempted to place an economic value on the many other co-benefits of achieving these three critical sustainability objectives, such as reduced health expenditures and increased life expectancies – especially for the world's poorest – reduced eutrophication and acidification damage to vegetation, or reduced fossil-fuel subsidies. Similarly the mid- to long-term avoided costs of climate change impacts and of adaptation measures have also not been quantified," states co-author Volker Krey, IIASA.

The practice of integrating sustainable energy policies within a holistic framework offers marked advantages over traditional approaches, which, because they are typically more fragmented, often ignore important policy synergies.

Leader of IIASA's Energy Program, Keywan Riahi adds that alignment of policies can be complicated due to time disparities.

"One of the difficulties for policy makers is that these issues are often viewed on very different time scales: climate change for example, is seen as a mid- to long-term issue (2030-2050 and beyond), while energy security and air pollution are viewed with near-term urgency (for the next two decades). Thus, the policies discussed for each objective fail to

complement each other; or worse, they may compete for attention. When this happens, for instance, through single-minded policies for security or air pollution, the potential for synergies and co-benefits is largely lost," concludes Riahi.

As world leaders prepare to travel to Durban for the next round of UNFCCC climate talks, the authors are urging for a new lens to be cast on policy development when it comes to climate change mitigation, stating that a far deeper appreciation is needed of the multiple and far-ranging benefits of 'green growth' and, in particular, the advantage of using climate policy as a driving force for solving a host of social and environmental issues in a cost effective and sustainable way.

In reaching their conclusions, the IIASA team used an integrated assessment modeling tool with a detailed representation of the global energy system, MESSAGE, to develop a large ensemble of different 'energy-pollution-climate futures', each of which assumes a unique combination of policy priorities with respect to the three energy sustainability objectives. The MESSAGE model, which has been developed at IIASA over many years, is commonly used for medium- to long-term energy system planning, energy policy analysis, and scenario development.

**More information:** David L. McCollum, Volker Krey and Keywan Riahi, An integrated approach to energy sustainability, *Nature Climate Change*: Vol 1 December 2011.

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