



## TARGETS AND TIMETABLES

### **Nicholas Institute Discussion Memo on H.R. 2454, American Clean Energy and Security Act of 2009**

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Will climate legislation stabilize greenhouse gas concentrations at a level adequate to prevent dangerous anthropogenic interference with the climate system? That's the key question for all climate. Future U.S. emissions reductions are only a piece of the puzzle: The success of the program depends on whether other nations also pursue equivalent reductions.

To assess possible Waxman-Markey reduction pathways, we ran several emissions scenarios through a simplified, coupled gas-climate model that allows us to examine potential climatic impacts (the MAGICC v. 4.1, or Model to Assess Greenhouse-gas Induced Climate Change). We have projected three scenarios in which the G8 and non-G8 OECD nations, except Mexico, adopt emissions reductions beginning in 2013 that follow the Waxman-Markey targets:

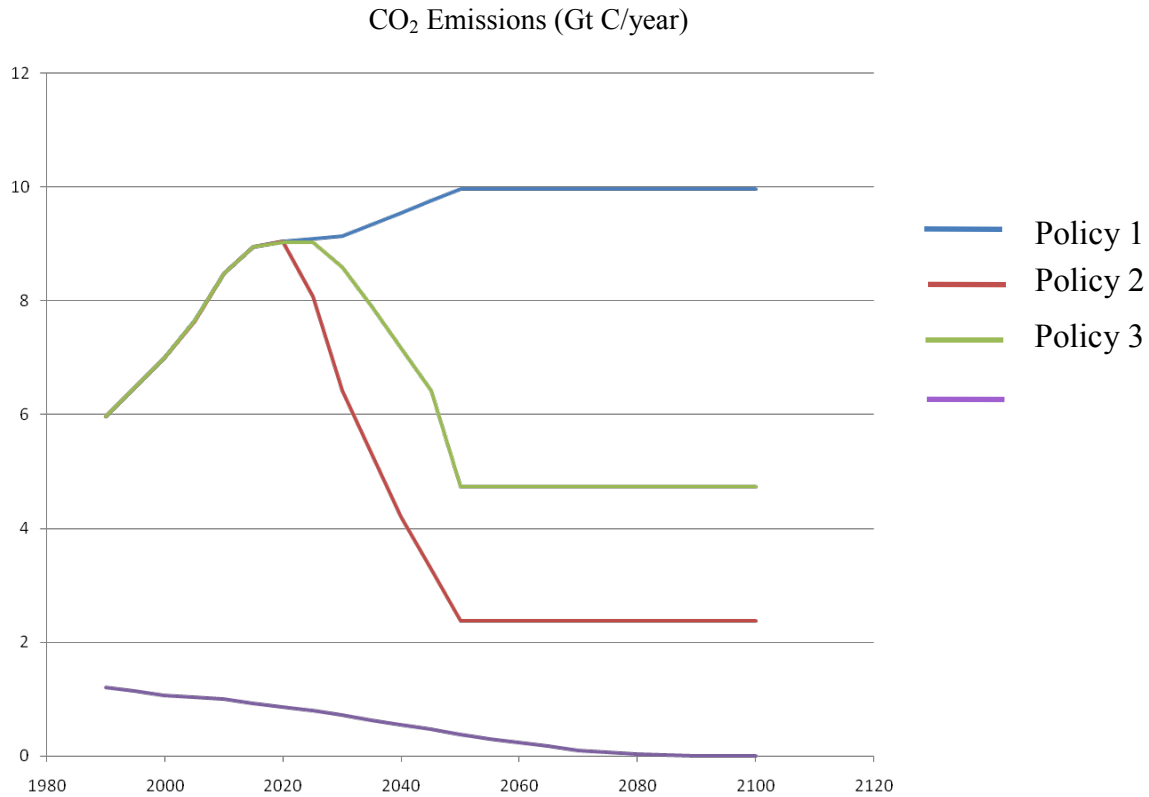
\* In Policy 1, all other nations continue to emit at their business-as-usual emissions levels

\* In Policy 2, all other nations take on the Waxman-Markey emissions reductions obligations as the G8 plus OECD, but with a 10-year time lag

\* In Policy 3, all other nations take on emissions reductions that kick in only when the rise in their per capita emissions reaches the level to which G8 countries' emissions have declined under the Waxman-Markey targets. Thereafter, global per capita emissions track G8 per capita emissions. (Several negotiators from non-G-8 nations have argued they should not be required to reduce emissions until their per-capita emissions equal those of the G8)

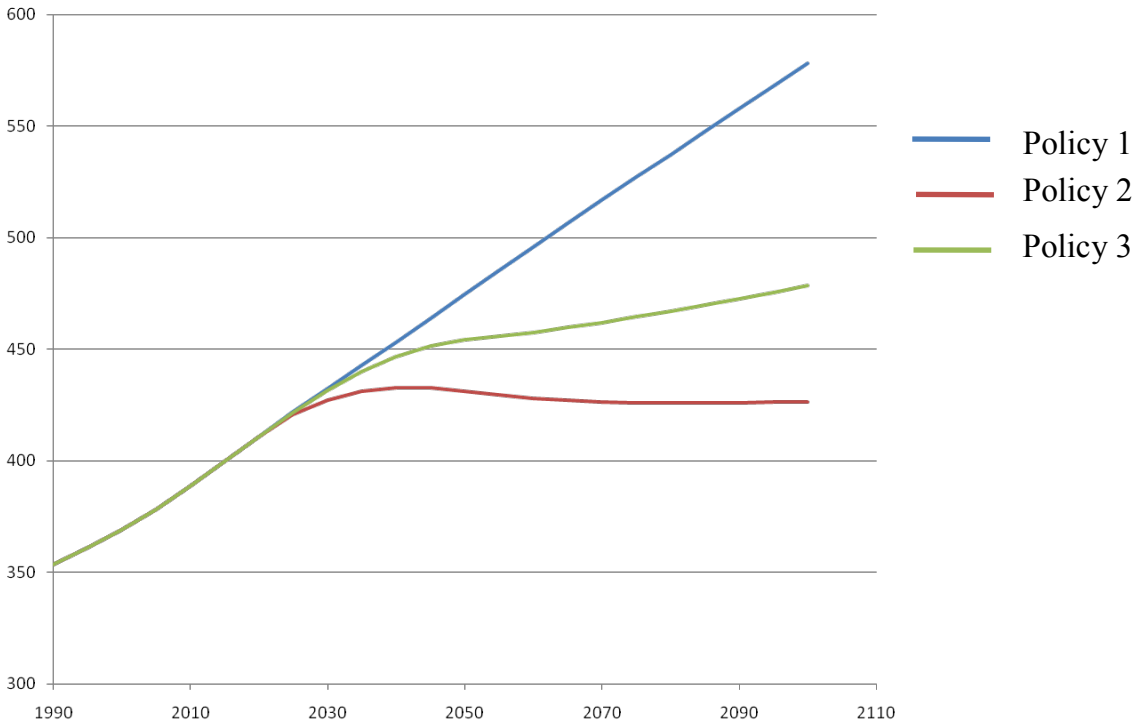
Note: For all programs, emissions are held constant after 2050 for ease of analysis (thereby creating a conservative assessment).

The modeling results of these scenarios are indicated in the three charts below:



If nations outside the G-8 and OECD (minus Mexico) continue to emit at their business-as-usual levels (Policy 1), then growth in the developing world are predicted to increase global emissions level constantly. When developing nations take on targets similar to those in Waxman-Markey, as in Policy 2 indicates, the model predicts a precipitous decline in emissions. When developing nations delay emissions reductions until their per capita emissions equal those of the G-8 and OECD (minus Mexico), there is a similar, but slower paced, reduction in emissions. The unlabeled purple line reflects assumed emissions from global deforestation.

CO<sub>2</sub> Concentrations (ppm)



Many scientists say that the global community should aim to restrict warming to no more than 2 degrees C. To accomplish this, it is believed that the carbon dioxide content of the atmosphere should peak no higher than 450 parts CO<sub>2</sub> for every million parts of air. We are currently at about 380 ppm, compared to a pre-industrial baseline of 280 ppm.

A Waxman-like program should stabilize emissions below 450 ppm if countries other than G8 plus OECD participate in a similar program, with a 10-year time lag (Policy 2). The “per capita equity” principle, or Policy 3, also comes close to stabilizing below 450 ppm. Overall, these simulations indicate that the Waxman-Markey program could result in stabilizing atmospheric CO<sub>2</sub> below expected international targets -- if adequate international participation is attained.

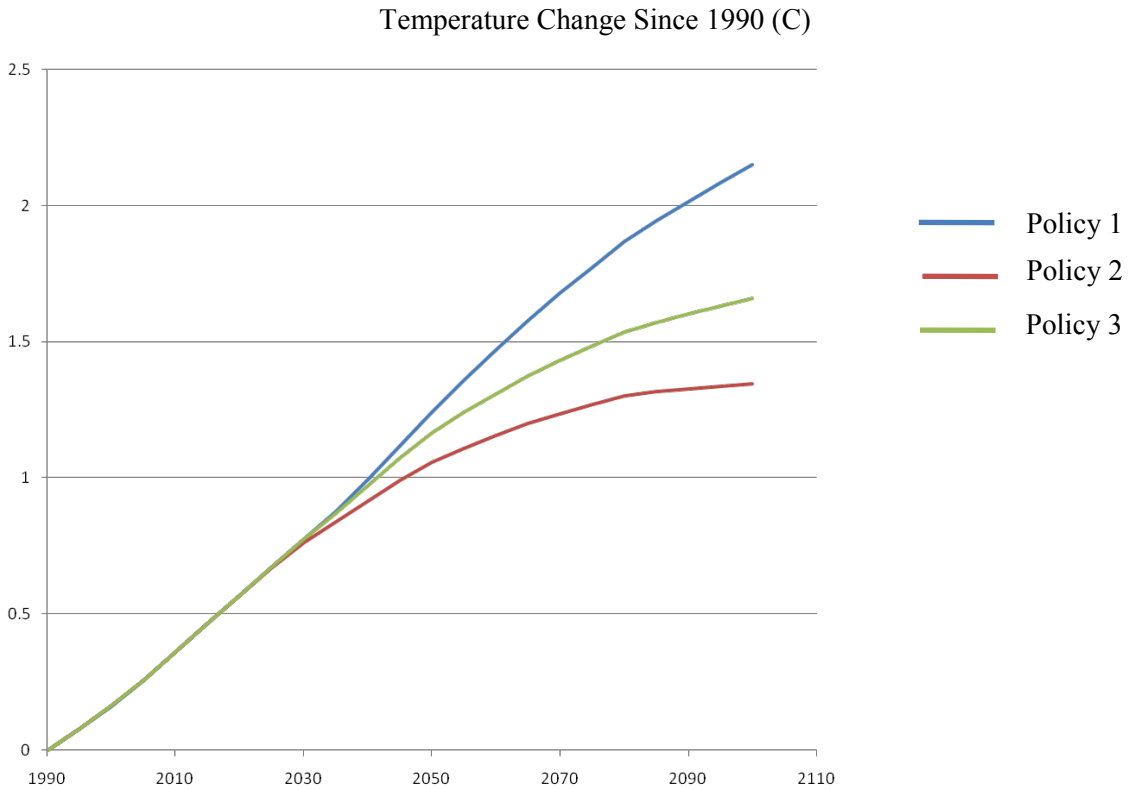


Figure 3 shows the projected CO<sub>2</sub> increases rendered as temperature increases, according to the MAGICC model. Policy 2, in which developing nations take on Waxman-Markey targets after 10 years, and Policy 3, in which they commit at per capita emissions equity, both show dramatically reduced projections – and both below the 2 degree C “tipping point.”