

Enacting Legislation to Craft an Energy Policy that Takes Action on Global Warming: One Perspective on Needs and Prospects

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The Two Things Society Needs to “Get” About Climate Change

- The scale, complexity, and urgency of the climate crisis.

Polar Ice Caps Have Shrunk Dramatically from 1979 to 2003

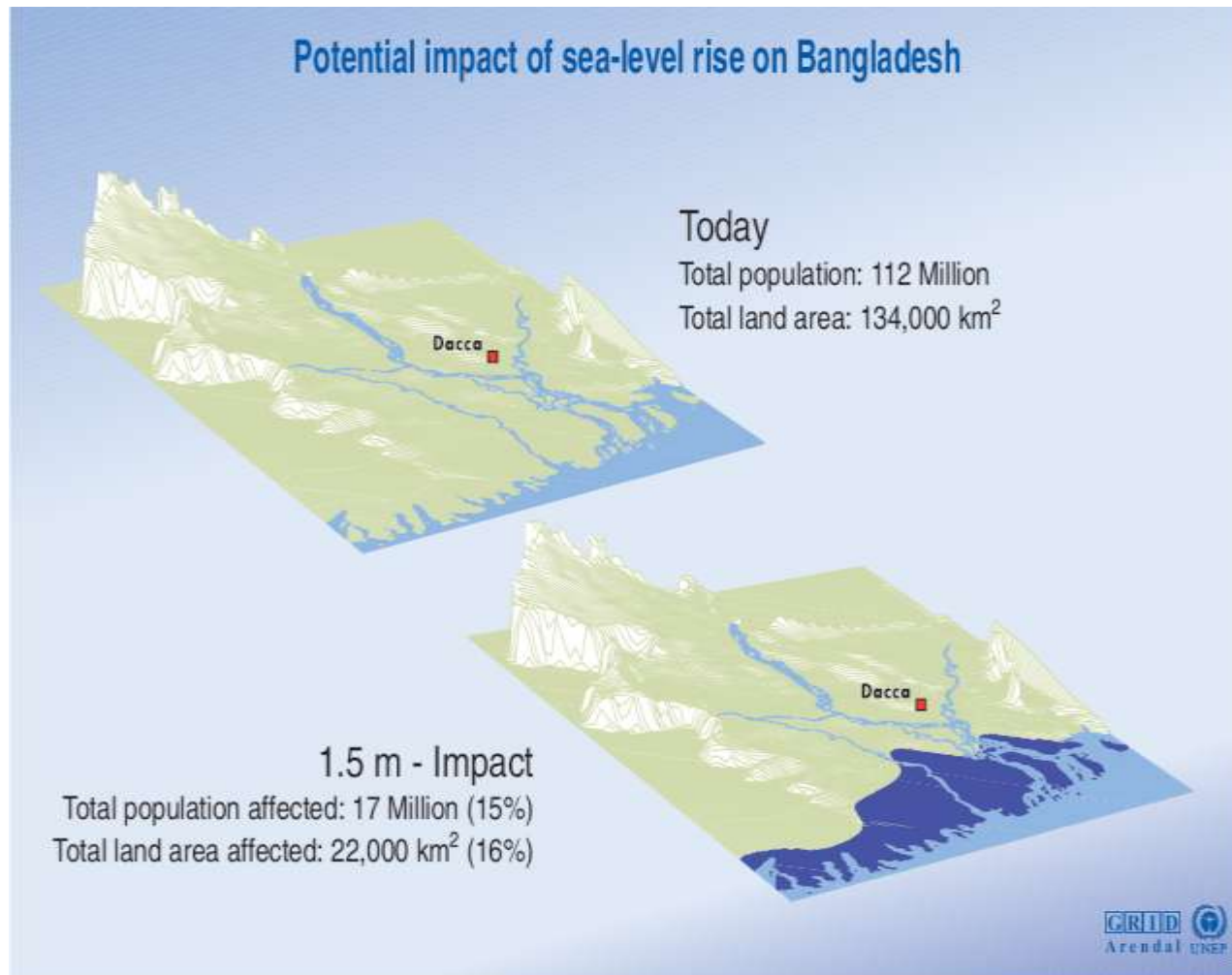


1979 SSMI Composite Data



2003 SSMI Composite Data

Impacts Projected on Coastal Areas and Populations



Source : UNEP/GRID Geneva; University of Dacca; JRO Munich; The World Bank; World Resources Institute, Washington D.C.

Power Dissipation by Atlantic Hurricanes Has Doubled Over the Past 30 Years

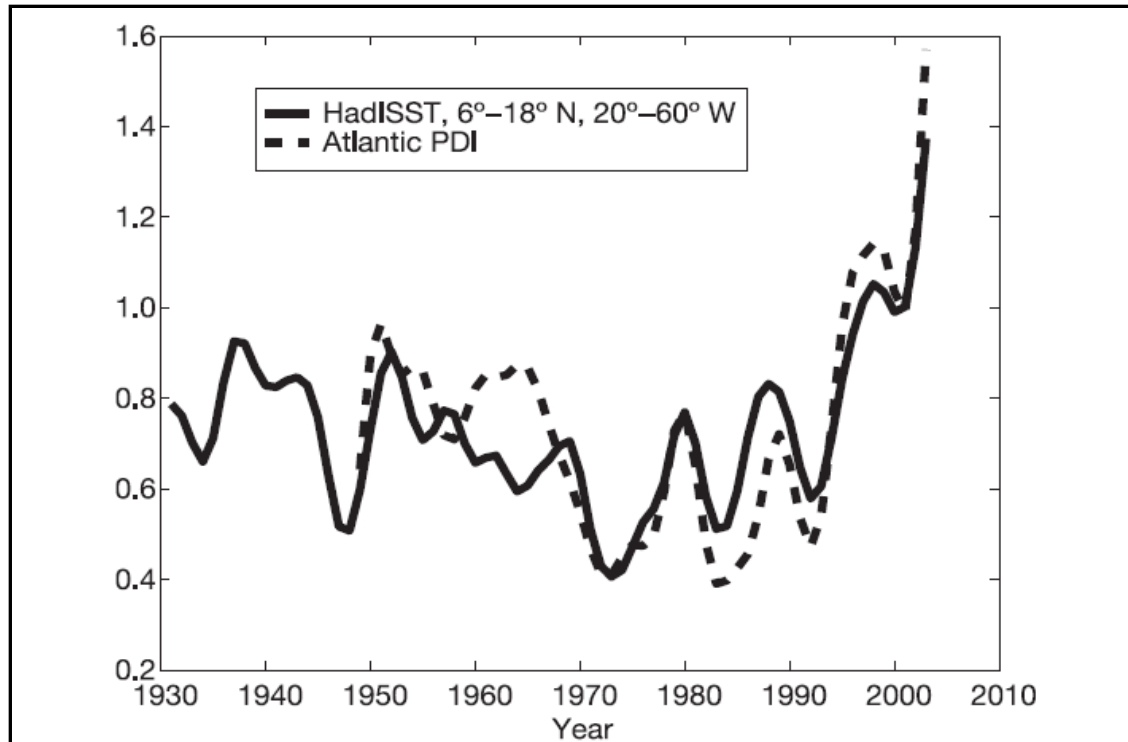


Figure 1 | A measure of the total power dissipated annually by tropical cyclones in the North Atlantic (the power dissipation index, PDI) compared to September sea surface temperature (SST). The PDI has been multiplied by 2.1×10^{-12} and the SST, obtained from the Hadley Centre Sea Ice and SST data set (HadISST)²², is averaged over a box bounded in latitude by 6° N and 18° N, and in longitude by 20° W and 60° W. Both quantities have been smoothed twice using equation (3), and a constant offset has been added to the temperature data for ease of comparison. Note that total Atlantic hurricane power dissipation has more than doubled in the past 30 yr.

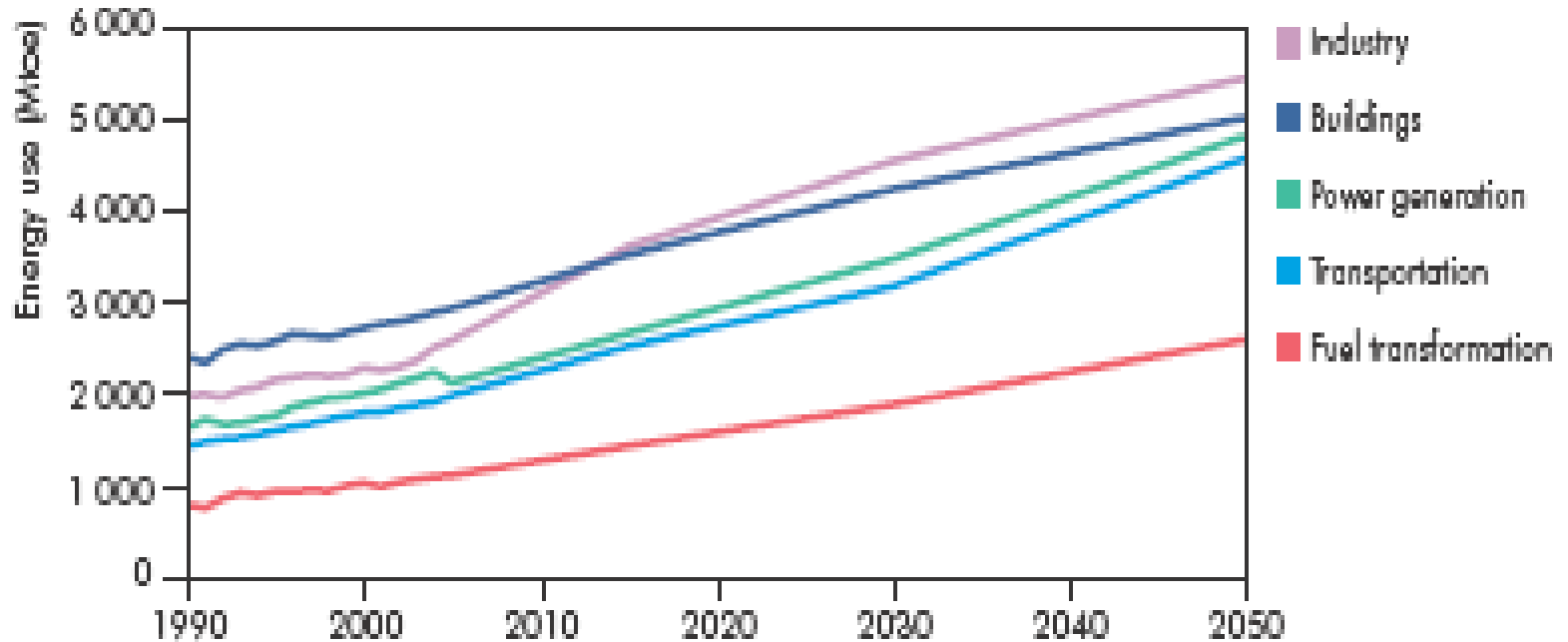
National Academy of Sciences (2002): Abrupt, Major Climate Changes Are a Real (and Unwelcome) Possibility

- “Recent scientific evidence shows that major and widespread climate changes have occurred with startling speed.”
- “Abrupt climate changes were especially common when the climate system was being forced to change rapidly.”
- “Greenhouse warming and other human alterations of the Earth may increase the possibility of large, abrupt, and unwelcome regional or global climatic events.”
- Possible non-linear responses to global warming:
 - Changed ocean circulation
 - Rapid glacier melting
 - Changed patterns of rainfall/drought
 - Decline in forest health

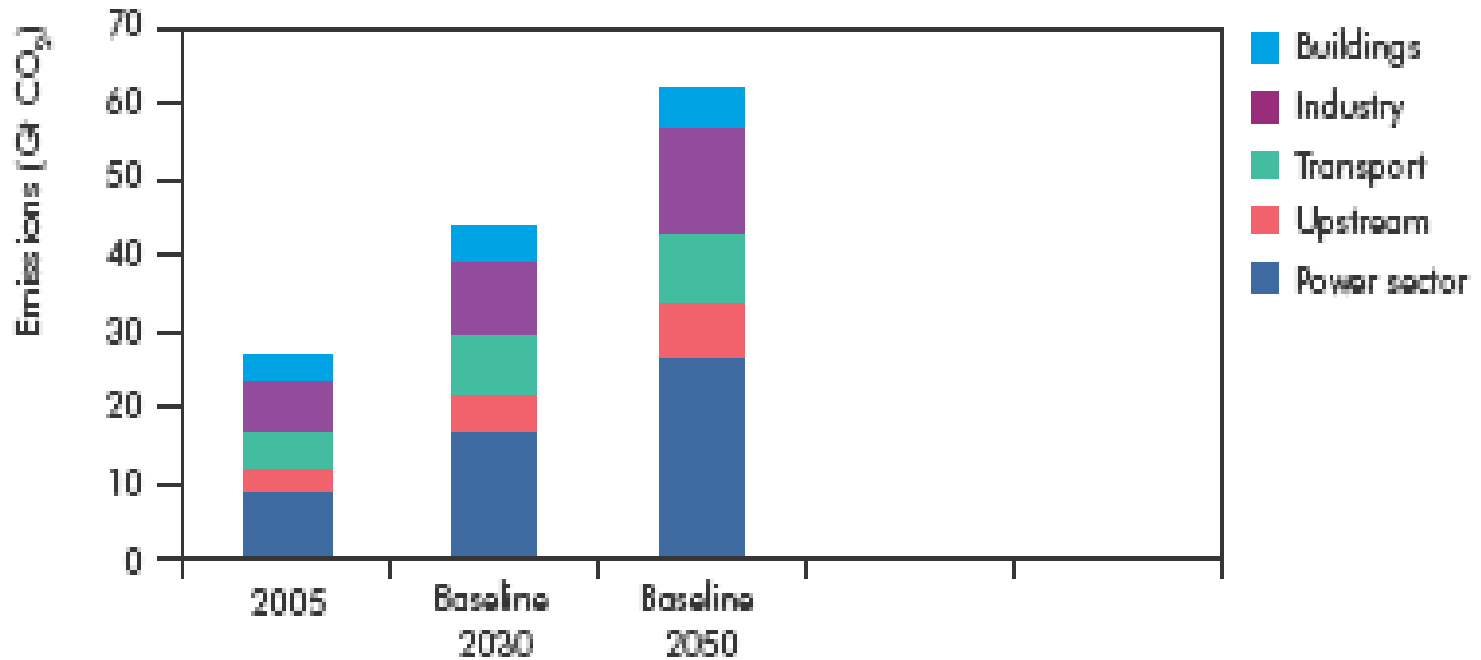
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- The scale, complexity, and urgency of the climate crisis.
- The scale, complexity, and urgency of the response needed.

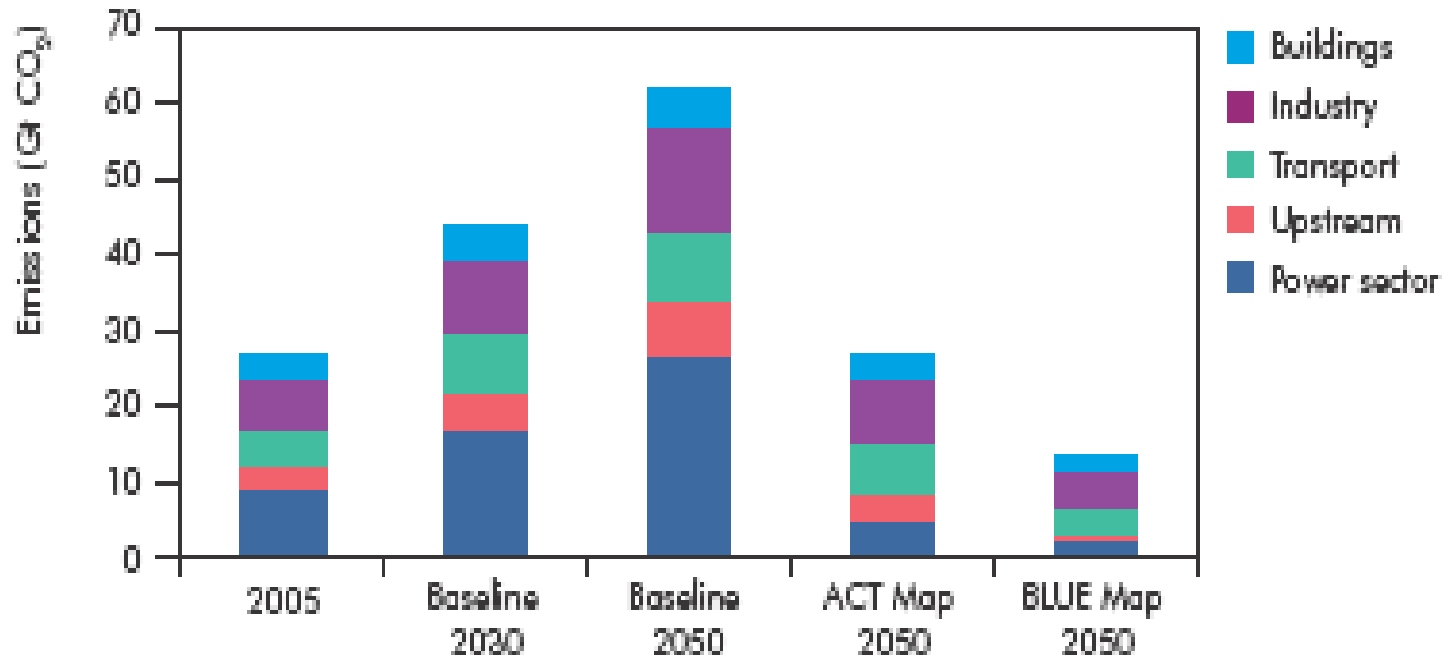
Where Global Energy Use Is Headed



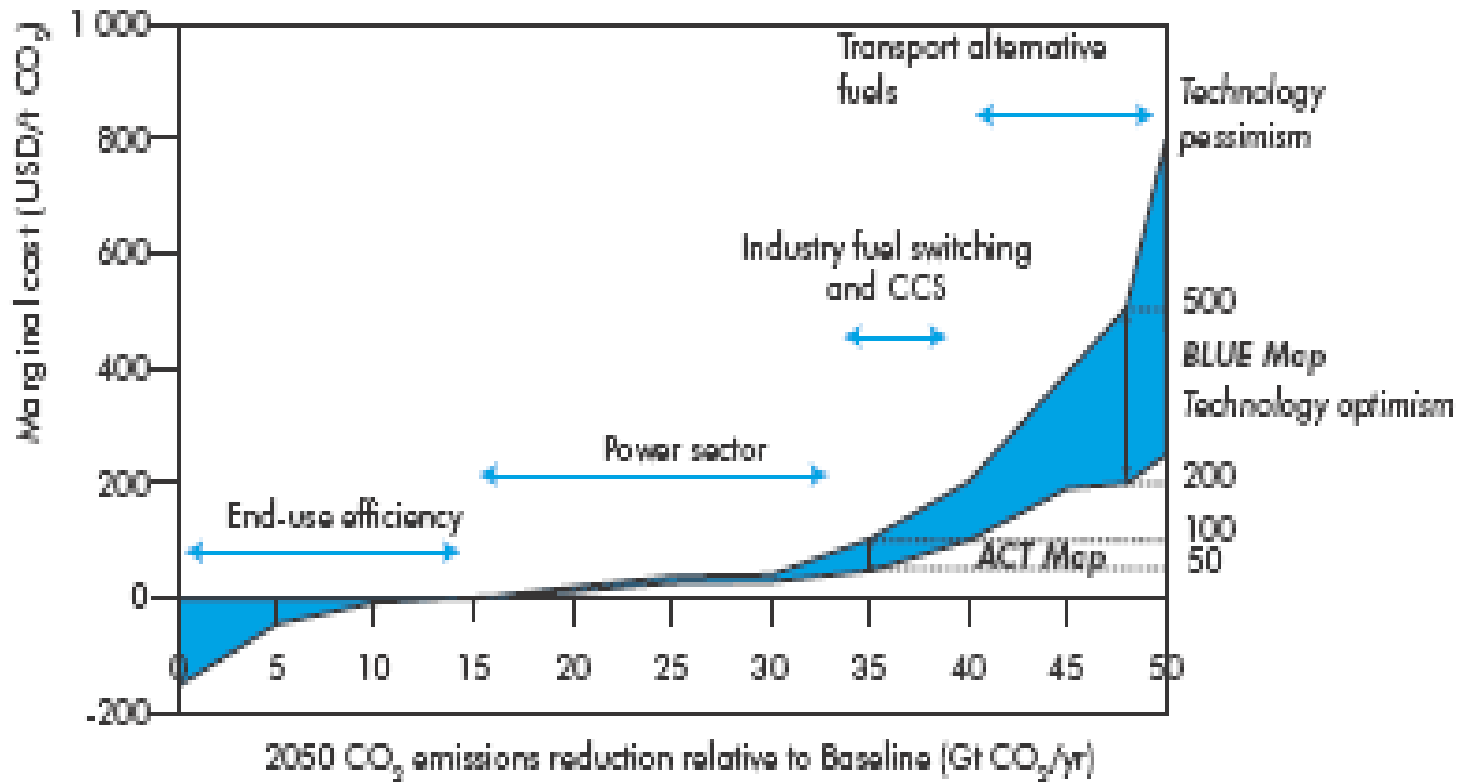
Where Global CO₂ Emissions Are Headed



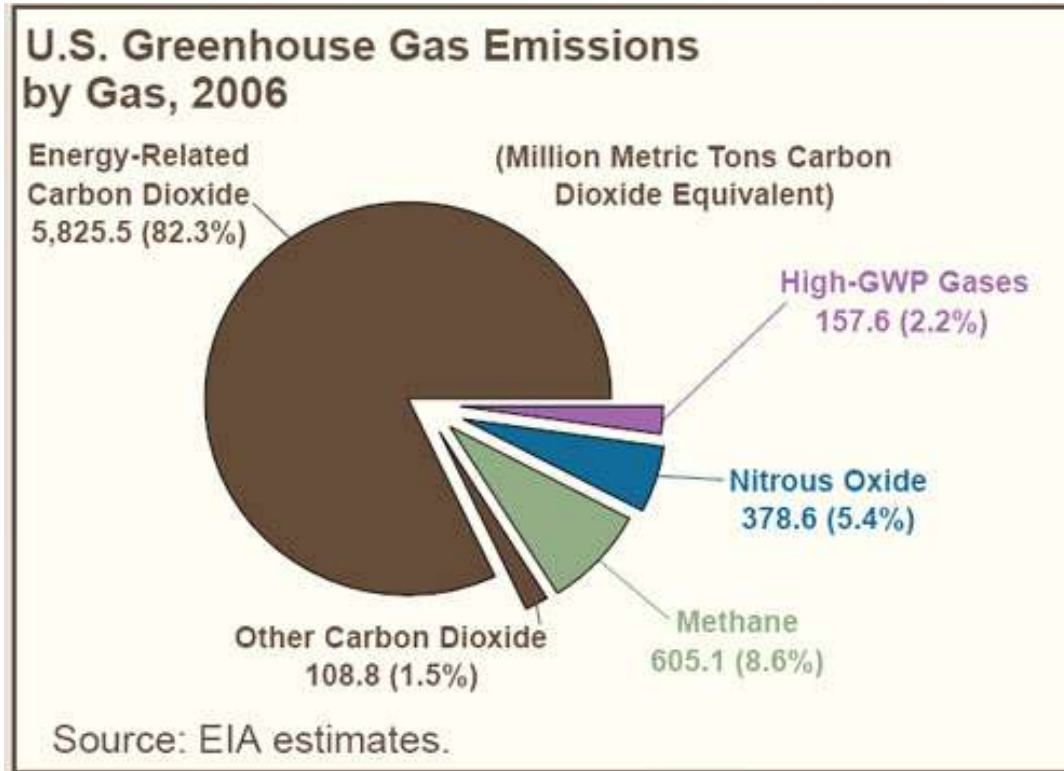
Where Global CO₂ Emissions Are Headed and Where They Need to Be in 2050



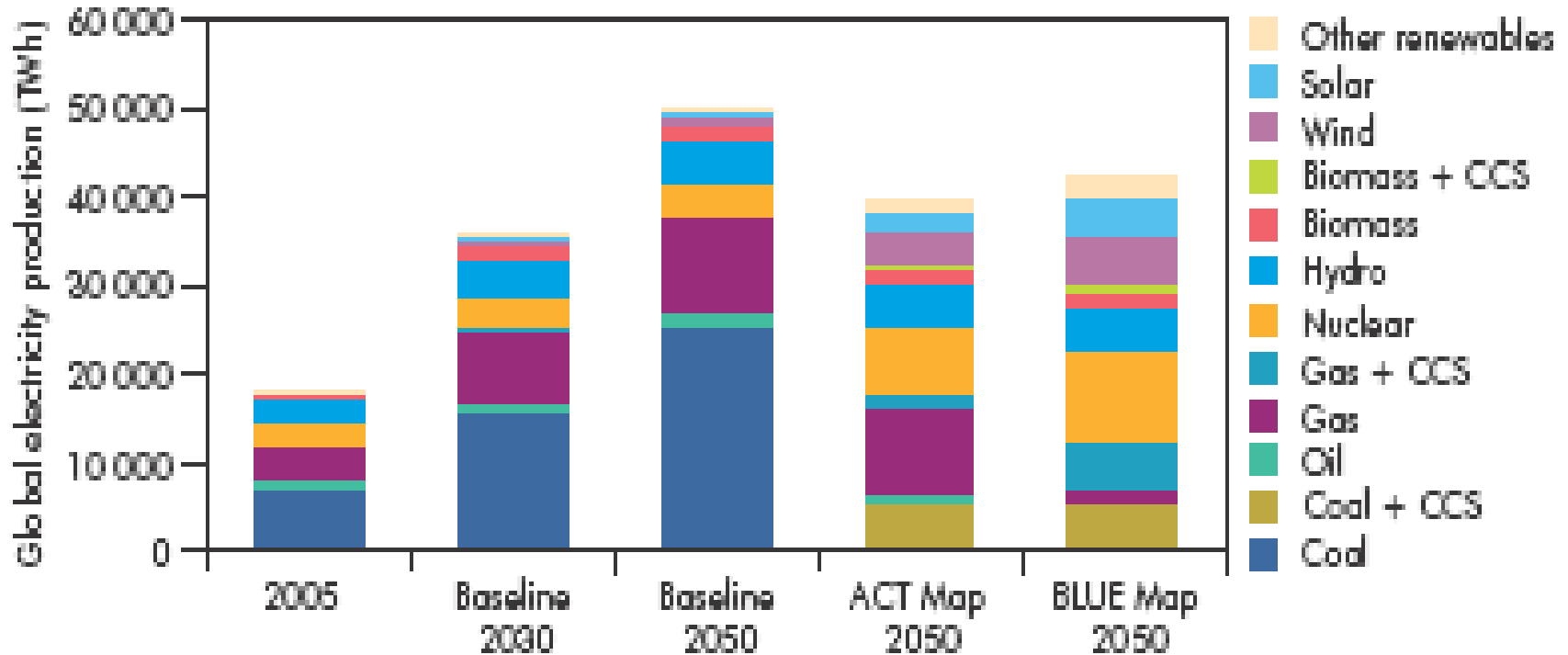
Deep Global Cuts in Emissions Will Be Expensive



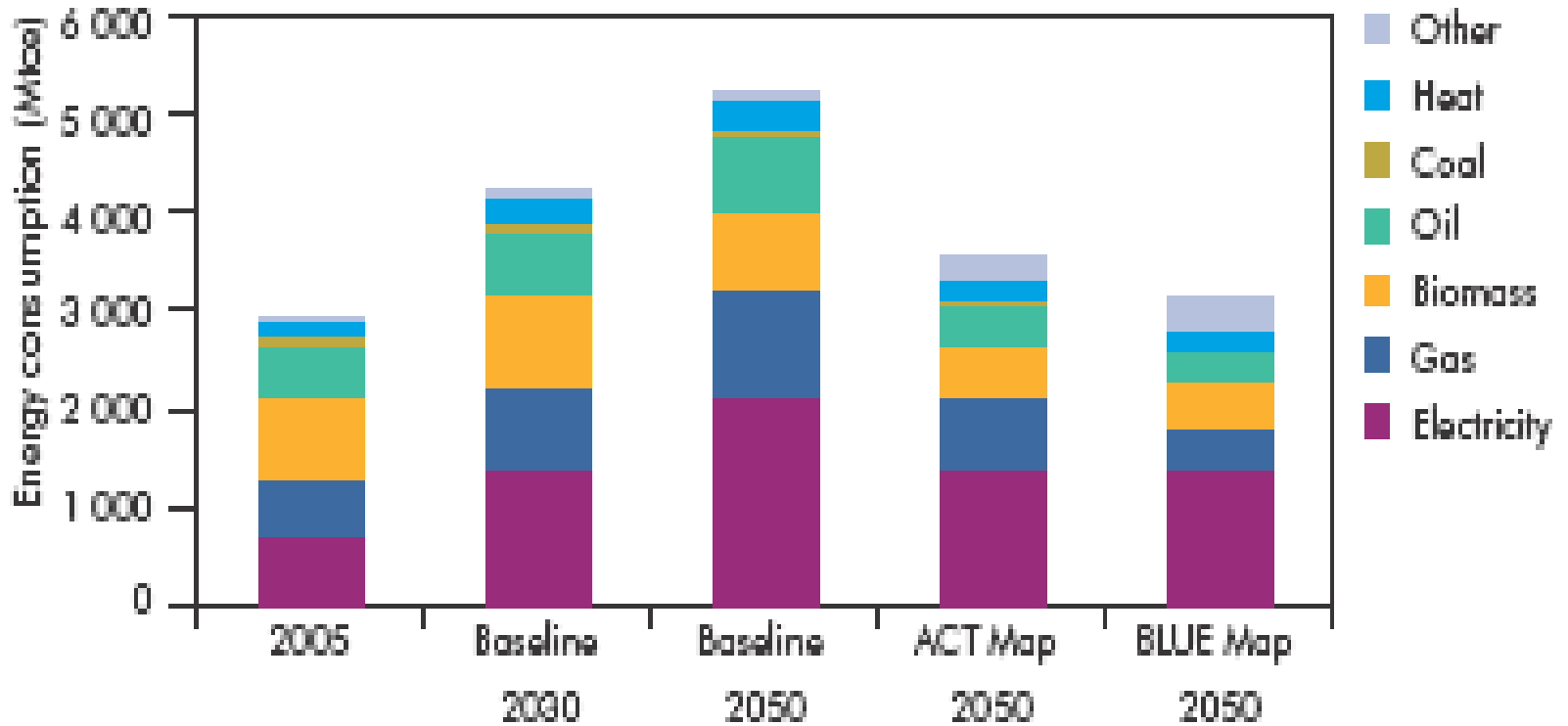
CO₂ Emissions Are Tightly Linked to Our Energy System



We Will Need An Entirely Different System of Electricity Generation, Transmission, and Use



We Will Have to Transform the Buildings Sector



And There Is Not a Moment to Lose

- We need:
 - A revolutionary transformation of the global energy system.
 - At a time of surging global population.
 - World Population in 2050 = 9 billion
 - World Population in 2050 Outside OECD = 8 billion
- Capital stock built in the next decade will, to a large extent, still be in use in 2050, so we need to start as soon as possible.
 - As it is, a 50% reduction in CO₂ by 2050 will mean that we have to mothball about 350,000 MW of existing coal-fired capacity that cannot be retrofitted with CCS.
 - The longer we wait to act, the greater the costs, by a large margin.

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- Finding an effective balance between Federal and State action
- Educating the public on the difficult and necessary choices ahead