

Scenarios

(Supplemental to Chapter 4)

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E.1 THE EMISSIONS SCENARIOS OF THE IPCC SPECIAL REPORT ON EMISSIONS SCENARIOS (SRES) (NAKIĆENOVIĆ AND SWART, 2000)

A1. The A1 storyline and scenario family describes a future world of very rapid economic growth, global population that peaks in mid-century and declines thereafter, and the rapid introduction of new and more efficient technologies.

Major underlying themes are convergent among regions, capacity building, and increased cultural and social interactions, with a substantial reduction in regional differences in per capita income. The A1 scenario family develops into three groups that describe alternative directions of technological change in the energy system. The three A1 groups are distinguished by their technological emphasis: fossil intensive (A1FI), non-fossil energy sources (A1T), or a balance across all sources (A1B) (where balanced is defined as not relying too heavily on one particular energy source, on the assumption that similar improvement rates apply to all energy supply and end-use technologies).

A2. The A2 storyline and scenario family describes a very heterogeneous world. The underlying theme is self reliance and preservation of local identities. Fertility patterns across regions converge very slowly, which results in continuously increasing population. Economic development is primarily region-

ally oriented, and per capita economic growth and technological change more fragmented and slower than other storylines.

B1. The B1 storyline and scenario family describes a convergent world with the same global population as in the A1 storyline (one that peaks in mid-century and declines thereafter), but with rapid change in economic structures toward a service and information economy, with reductions in material intensity and the introduction of clean and resource-efficient technologies. The emphasis is on global solutions to economic, social, and environmental sustainability, including improved equity, but without additional climate initiatives.

B2. The B2 storyline and scenario family describes a world in which the emphasis is on local solutions to economic, social, and environmental sustainability. It is a world with continuously increasing global population, at a rate lower than for the A2 storyline, intermediate levels of economic development, and less rapid and more diverse technological change than in the B1 and A1 storylines. While the scenario is also oriented toward environmental protection and social equity, it focuses on local and regional levels.

An illustrative scenario was chosen for each of the six scenario groups A1B, A1FI, A1T, A2, B1 and B2. All should be considered equally sound.

The SRES scenarios do not include additional climate initiatives, which means that no scenarios are included that explicitly assume implementation of the United Nations Framework Convention on Climate Change or the emissions targets of the Kyoto Protocol.

E.2 RADIATIVE FORCING STABILIZATION LEVELS AND APPROXIMATE CO₂ CONCENTRATIONS FROM THE CCSP SAP 2.1A SCENARIOS (TABLE I.2; CLARKE ET AL., 2007)

The stabilization levels were constructed so that the CO₂ concentrations resulting from stabilization of total radiative forcing in Watts per square meter (W per m²), after accounting for radiative forcing from the non-CO₂ greenhouse gases (GHGs) included in this research, would be roughly 450 parts per million by volume (ppmv), 550 ppmv, 650 ppmv, and 750 ppmv.

	Total Radiative Forcing from GHGs (W per m²)	Approximate Contribution to Radiative Forcing from Non-CO₂ GHGs (W per m²)	Approximate Contribution to Radiative Forcing from CO₂ (W per m²)	Corresponding CO₂ Concentration (ppmv)
Level 1	3.4	0.8	2.6	450
Level 2	4.7	1.0	3.7	550
Level 3	5.8	1.3	4.5	650
Level 4	6.7	1.4	5.3	750
Year 1998	2.11	0.65	1.46	365
Preindustrial	0	0	0	275