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## **Appendix A**

### **A. The Emission Scenarios of the IPCC Special Report on Emission Scenarios (SRES)**

**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 convergence 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 regionally oriented and per capita economic growth and technological change more fragmented and slower than other storylines.

4105 **B1.** The B1 storyline and scenario family describes a convergent world with the same  
4106 global population, that peaks in mid-century and declines thereafter, as in the A1  
4107 storyline, but with rapid change in economic structures toward a service and information  
4108 economy, with reductions in material intensity and the introduction of clean and resource  
4109 efficient technologies. The emphasis is on global solutions to economic, social and  
4110 environmental sustainability, including improved equity, but without additional climate  
4111 initiatives.

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4113 **B2.** The B2 storyline and scenario family describes a world in which the emphasis is on  
4114 local solutions to economic, social and environmental sustainability. It is a world with  
4115 continuously increasing global population, at a rate lower than A2, intermediate levels of  
4116 economic development, and less rapid and more diverse technological change than in the  
4117 B1 and A1 storylines. While the scenario is also oriented towards environmental  
4118 protection and social equity, it focuses on local and regional levels.

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4120 An illustrative scenario was chosen for each of the six scenario groups A1B, A1FI, A1T,  
4121 A2, B1 and B2. All should be considered equally sound.

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4123 The SRES scenarios do not include additional climate initiatives, which means that no  
4124 scenarios are included that explicitly assume implementation of the United Nations  
4125 Framework Convention on Climate Change or the emissions targets of the Kyoto  
4126 Protocol.

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4128 **B. Radiative Forcing Stabilization Levels ( $Wm^{-2}$ ) and Approximate CO<sub>2</sub>**  
 4129 **Concentrations (ppmv) from the CCSP SAP 2.1a scenarios (taken from SAP 2.1a,**  
 4130 **table 1.2).**

4131 The stabilization levels were constructed so that the CO<sub>2</sub> concentrations resulting from  
 4132 stabilization of total radiative forcing, after accounting for radiative forcing from the non-  
 4133 CO<sub>2</sub> GHGs included in this research, would be roughly 450 ppmv, 550 ppmv, 650 ppmv,  
 4134 and 750 ppmv.

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	Total Radiative Forcing from GHGs ( $Wm^{-2}$ )	Approximate Contribution to Radiative Forcing from Non-CO <sub>2</sub> GHGs ( $Wm^{-2}$ )	Approximate Contribution to Radiative Forcing from CO <sub>2</sub> ( $Wm^{-2}$ )	Corresponding CO <sub>2</sub> 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
Pre-industrial	0	0	0	275

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