IPCC Fourth Assessment Report

Synthesis Report

Topic 4

Adaptation and mitigation options

A Wide Array of Adaptation Options is Available, but More Extensive Adaptation is Required to Reduce Vulnerability to Climate Change

- There are barriers, limits and costs, which are not fully understood
- Societies around the world have a long record of adapting to weather- and climate-related events
- Some planned adaptation is already occurring
- There are viable adaptation options that can be implemented in some sectors at low cost
- Comprehensive estimates of global cost and benefits of adaptation are limited

Adaptation Options – Water Sector

- *Adaptation Options:* Expanded rainwater harvesting; Water storage, conservation and re-use; Efficient water use and irrigation; Desalination
- *Policy Framework:* National water polices; Integrated water resource management
- *Constraints:* Financial, human resources and physical barriers
- *Opportunities:* Integrated water resource management; Synergies with other sectors

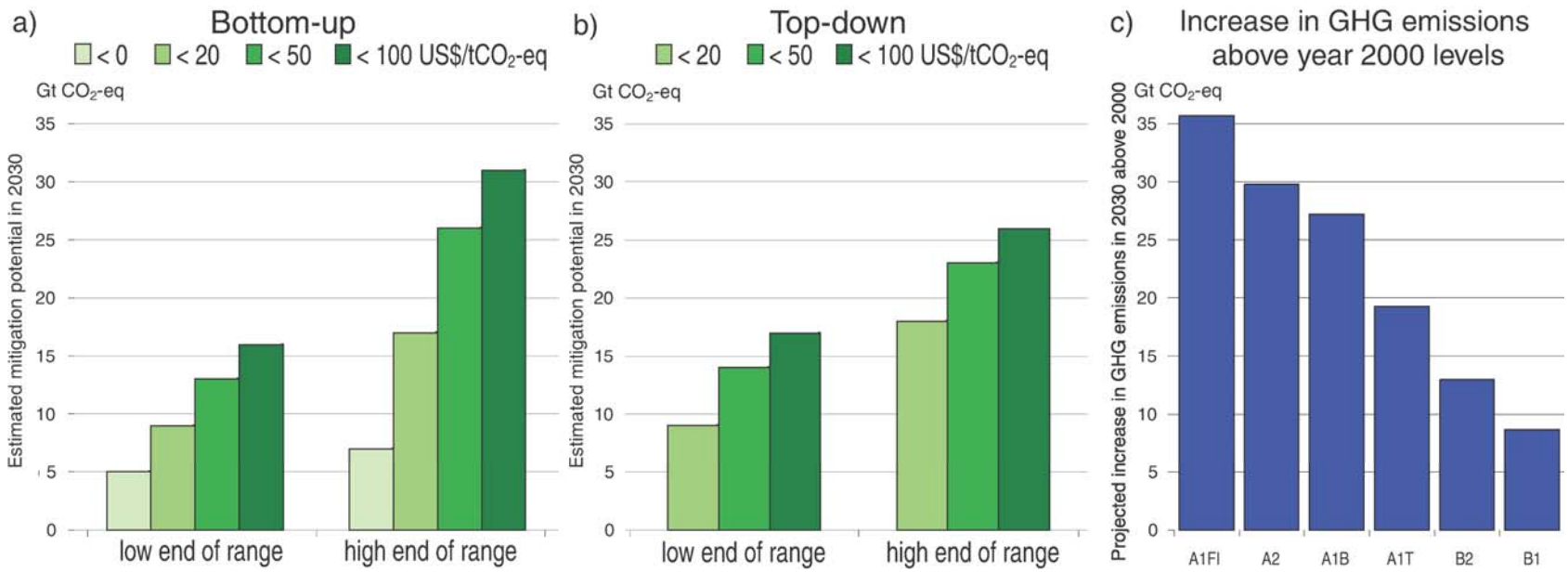
Adaptive Capacity is Intimately Connected to Social and Economic Development

- Unevenly distributed across and within societies
- Capacity to adapt is dynamic and is influenced by a society's productive base
- It is also affected by multiple climate and non-climate stresses, as well as development policy

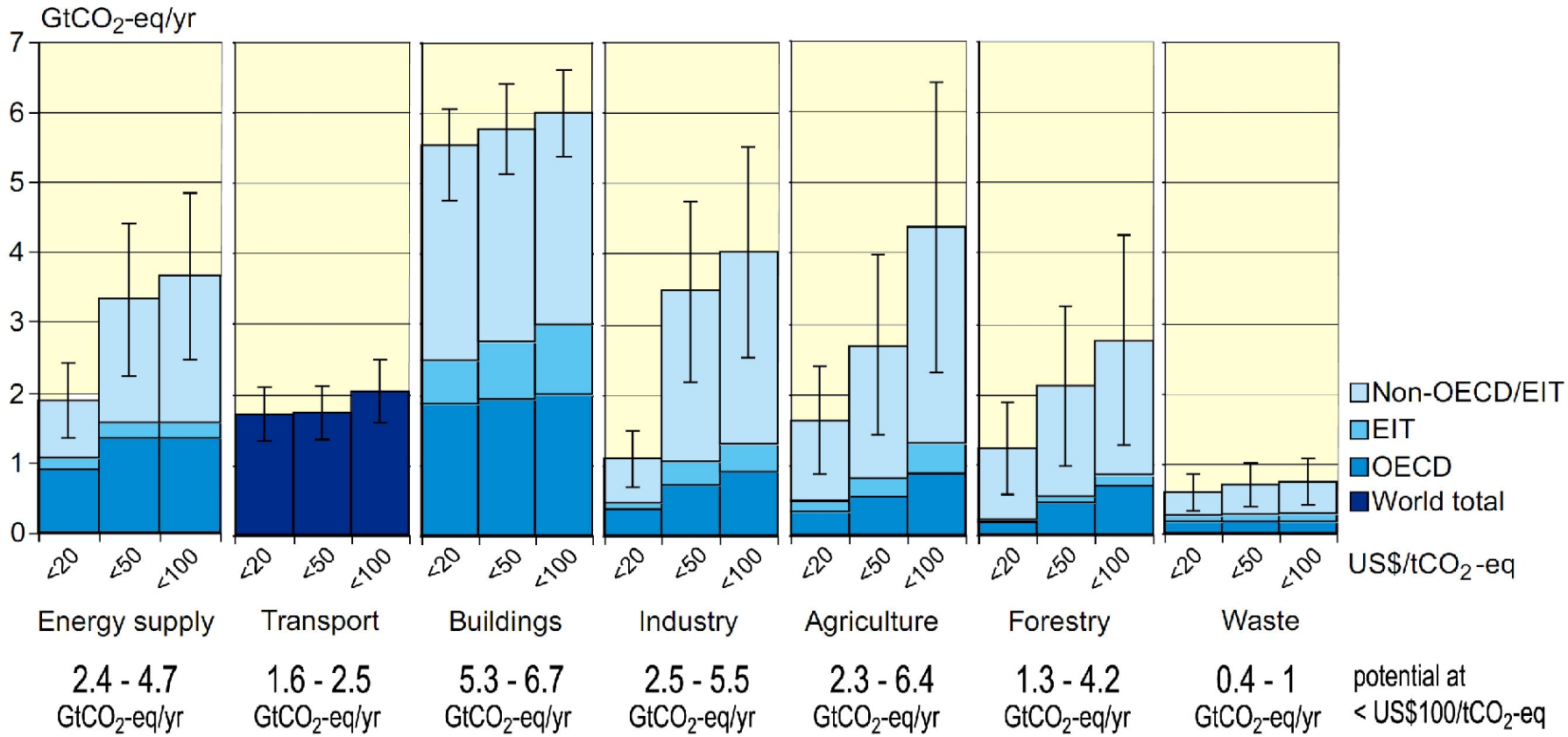
There is Substantial Economic Potential for Mitigation of GHG Emissions

- Agreement between top-down and bottom-up studies at the global level, but substantial differences at the sectoral level
- No one technology can provide all of the potential
- Energy infrastructure investment decisions, expected to exceed $20 trillion up to 2030, will have long-term impacts on GHG emissions
- Life style and behavioral changes can contribute to mitigation across all sectors

Economic Mitigation Potential Could Offset Projected Growth in Emissions to 2030 or Reduce Below Current Levels



Economic Mitigation Potential in 2030 is Spread Across All Sectors and Regions



Mitigation Options – Building Sector

- *Mitigation Options:* Efficient lighting and daylighting; more efficient electrical appliances, heating and cooling; passive and active solar design; alternative refrigeration fluids

- *Policy Options:* Appliance standards and labeling; Building codes and certification; Demand-side management programs; Public sector leadership programs; Incentives for energy service companies

- *Constraints:* Need for periodic revision of standards; Enforcement difficulties

- *Opportunities:* Attractive for new buildings; Expanded market for energy-efficient products

A Wide Variety of Policies and Instruments are Available to Governments to Create the Incentives for Mitigation Action

- Their applicability depends on national circumstances and sectoral context
- An effective carbon price signal could realize significant mitigation potential
- Mitigation actions can provide near-term co-benefits
- Annex I country actions may affect the global economy and emissions
  - The scale of carbon leakage remains uncertain
  - Spillover effects depend on policy decisions and oil markets

Many Options Exist for Reducing GHG Emissions through International Cooperation

Notable achievements of the UNFCCC and Kyoto Protocol:

- -Establishment of a global response to climate change
- -Stimulation of national policies
- -Creation of an international carbon market
- -Establishment of new institutional mechanism that may provide the foundation for future mitigation
- -Progress on addressing adaptation and suggestion of additional initiative

Greater cooperative efforts and expansion of market mechanisms will help reduce the global cost of achieving a given level of mitigation

Some Climate Response Options Can Realize Synergies and Avoid Conflicts with Other Dimensions of Sustainable Development

- Both synergies and trade-offs exist between adaptation and mitigation
- Non-climate polices can significantly affect emissions, adaptive capacity and vulnerability
- Climate change will interact with other environmental and natural resource concerns
- It is *very likely* that climate change will slow the pace of progress towards sustainable development

Integrating Climate Change Considerations into Development Decisions – Selected Examples

Sector	Non-climate Change Policy Instrument or Action
Macro-Economy	Implement non-climate taxes/subsidies and/or other fiscal and regulatory policies that promote sustainable development
Electricity	Adoption of cost-effective renewables; Demand-side management programs; Transmission and distribution loss reduction
Petroleum Imports	Diversify imported and domestic fuel mix; Reduce energy intensity to improve energy security
Insurance	Differentiated premiums; Liability insurance exclusions; Improved terms for green products
Forestry	Adoption of forest conservation and sustainable management practices