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

![Diagram showing economic mitigation potential.]
Economic Mitigation Potential in 2030 is Spread Across All Sectors and Regions

- Energy supply: 2.4 - 4.7 GtCO₂-eq/yr
- Transport: 1.6 - 2.5 GtCO₂-eq/yr
- Buildings: 5.3 - 6.7 GtCO₂-eq/yr
- Industry: 2.5 - 5.5 GtCO₂-eq/yr
- Agriculture: 2.3 - 6.4 GtCO₂-eq/yr
- Forestry: 1.3 - 4.2 GtCO₂-eq/yr
- Waste: 0.4 - 1 GtCO₂-eq/yr

Potential at $<100/tCO₂$
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

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