

OUTLINES

- 0.1 Summary for Policy Makers
- 0.2 Technical Summary

1. Renewable Energy and Climate Change (3-5%)

- 1.1 Background
- 1.2 Summary of renewable energy resources
- 1.3 Meeting energy service needs and current status (*energy need, energy deficits, energy efficiency trends and renewable energy potential*)
- 1.4 Barriers and issues (*in using renewable energy for climate change mitigation, adaptation and sustainable development*)
- 1.5 Role of policy, R&D, deployment, scaling up and implementation strategies
- 1.6 Methodology (*resource assessment, life-cycle assessment, setting boundaries for analysis, measures of sustainability, definitions, units qualitative and quantitative, integration methods*)

2. Bioenergy (15%)

- 2.1 Introduction (*traditional and modern use*)
- 2.2 Resource potential (*within limits of sustainable forestry and agriculture, different feedstocks and impact of climate change on resource potential*)
- 2.3 Technology (*e.g. biological and thermo-chemical conversion*) and applications (*electricity, heat, transport and cooking*)
- 2.4 Global and regional status of market and industry development
- 2.5 Environmental and social impacts (*food security, biodiversity, competition with water, fodder, fiber, and land use, role of sustainable forestry and agriculture, health impacts from air pollution*) GHG emissions)
- 2.6 Prospects for technology improvement, innovation and integration
- 2.7 Cost trends
- 2.8 Potential deployment

3. Direct Solar Energy (10%)

- 3.1 Introduction
- 3.2 Resource potential (*impact of climate change on resource potential*)
- 3.3 Technology (*solar thermal, photovoltaics, concentrating solar power*) and applications (*heating and cooling, lighting, cooking, electricity, fuel*)
- 3.4 Global and regional status of market and industry development
- 3.5 Integration into broader energy system
- 3.6 Environmental and social impacts
- 3.7 Prospects for technology improvement and innovation
- 3.8 Cost trends
- 3.9 Potential deployment

4. Geothermal Energy (3-5%)

- 4.1 Introduction
- 4.2 Resource potential
- 4.3 Technology and applications (*electricity, heating, cooling*)
- 4.4 Global and regional status of market and industry development
- 4.5 Environmental and social impacts
- 4.6 Prospects for technology improvement, innovation and integration
- 4.7 Cost trends
- 4.8 Potential deployment

5. Hydropower (5-10%)

- 5.1 Introduction (*large and small hydro*)
- 5.2 Resource potential (*impact of climate change on resource potential*)
- 5.3 Technology and applications (*run-of-river, storage, multi-purpose*)
- 5.4 Global and regional status of market and industry development
- 5.5 Integration into broader energy system
- 5.6 Environmental and social impacts (*displacement of people, GHG emissions*)
- 5.7 Prospects for technology improvement and innovation, and multi-purpose use of reservoirs
- 5.8 Cost trends
- 5.9 Potential deployment

6. Ocean Energy (3-5%)

- 6.1 Introduction
- 6.2 Resource potential (*impact of climate change on resource potential*)
- 6.3 Technology (*wave, tidal, ocean thermal, osmotic*) and applications
- 6.4 Global and regional status of market and industry development
- 6.5 Environmental and social impacts
- 6.6 Prospects for technology improvement, innovation and integration
- 6.7 Cost trends
- 6.8 Potential deployment

7. Wind Energy (5-10%)

- 7.1 Introduction
- 7.2 Resource potential (*impact of climate change on resource potential*)
- 7.3 Technology and applications (*onshore, offshore, distributed*)
- 7.4 Global and regional status of market and industry development
- 7.5 Near-term grid integration issues
- 7.6 Environmental and social impacts
- 7.7 Prospects for technology improvement and innovation
- 7.8 Cost trends
- 7.9 Potential deployment

8. Integration of Renewable Energy into Present and Future Energy Systems (15%)

- 8.1 Introduction (*potential role of renewable energy in future energy systems and climate change mitigation*)
- 8.2 Integration of renewable energy into supply systems (*electricity grids, heat distribution networks, gas distribution networks, liquid fuels; load management, grid management, energy transport, interactions with conventional systems, necessary back-up and storage for intermittent sources, distributed versus centralized deployment of renewables, relation to energy efficiency*) (*to be differentiated regionally*)
- 8.3 Strategic sectors and elements for transition (*transportation, buildings and households, industry, agriculture, interactions among demand sectors, urban and regional development, interregional connections*) (*to be regionally differentiated*)

9. Renewable Energy in the Context of Sustainable Development (10%)

- 9.1 Introduction
- 9.2 Environmental impacts: global and regional assessment
- 9.3 Socio-economic impacts: global and regional assessment (*energy supply security*)
- 9.4 Implications of (sustainable) development pathways for renewable energy
- 9.5 Synthesis (*consequences of including environmental and socio-economic considerations on the potential for renewable energy, sustainability criteria*)
- 9.6 Gaps in knowledge and future research needs

10. Mitigation Potential and Costs (10%)

- 10.1 Introduction
- 10.2 Methodological issues
- 10.3 Assessment and synthesis of scenarios for different renewable energy strategies (*top-down and bottom-up*)
- 10.4 Cost curves for mitigation with renewable energy (*regional, sectoral, temporal; impacts of climate change on mitigation potential*)
- 10.5 Costs of commercialization and deployment (*investments, variable costs, market support, RDD&D*)
- 10.6 Social, environmental costs and benefits (*synthesis and discussion on total costs, and impacts of renewable energy in relation to sustainable development*)
- 10.7 Gaps in knowledge and uncertainties

11. Policy, Financing and Implementation (10-15%)

- 11.1 Introduction
- 11.2 Current trends: Policies, financing and investment
- 11.3 Key drivers, opportunities and benefits
- 11.4 Barriers to renewable energy implementation
- 11.5 Enabling environment and regional issues (*Technology transfer, transition management, capacity building, finance & investment, quality standards, international trade regulations*)
- 11.6 Experience with and assessment of policy options (*local, national, regional; innovation and deployment*)
- 11.7 Policy frameworks for innovation, systems integration and deployment of renewable energy (*policy assessment of the realisation of the scenarios in 10.3*)