

Preface

The Special Report on Renewable Energy Sources and Climate Change Mitigation (SRREN) of the IPCC Working Group III provides an assessment and thorough analysis of renewable energy technologies and their current and potential role in the mitigation of greenhouse gas emissions. The results presented here are based on an extensive assessment of scientific literature, including specifics of individual studies, but also an aggregate across studies analyzed for broader conclusions. The report combines information on technology specific studies with results of large-scale integrated models, and provides policy-relevant (but not policy-prescriptive) information to decision makers on the characteristics and technical potentials of different resources; the historical development of the technologies; the challenges of their integration and social and environmental impacts of their use; as well as a comparison in levelized cost of energy for commercially available renewable technologies with recent non-renewable energy costs. Further, the role of renewable energy sources in pursuing GHG concentration stabilization levels discussed in this report and the presentation and analysis of the policies available to assist the development and deployment of renewable energy technologies in climate change mitigation and/or other goals answer important questions detailed in the original scoping of the report.

The process

This report has been prepared in accordance with the rules and procedures established by the IPCC and used for previous assessment reports. After a scoping meeting in Lübeck, Germany from the 20th to the 25th of January, 2008, the outline of the report was approved at the 28th IPCC Plenary held in Budapest, Hungary on the 9th and 10th of April, 2008. Soon afterward, an author team of 122 Lead Authors (33 from developing countries, 4 from EIT countries, and 85 from industrialized countries), 25 Review Editors and 132 contributing authors was formed.

The IPCC review procedure was followed, in which drafts produced by the authors were subject to two reviews. 24,766 comments from more than 350 expert reviewers and governments and international organizations were processed. Review Editors for each chapter have ensured that all substantive government and expert review comments received appropriate consideration.

The Summary for Policy Makers was approved line-by-line and the Final Draft of the report was accepted at the 11th Session of the Third Working Group held in Abu Dhabi, United Arab Emirates from the 5th to the 8th of May, 2011. The Special Report was accepted in its entirety at the 33rd IPCC Plenary Session held also in Abu Dhabi from the 10th to the 13th of May, 2011.

Structure of the Special Report

The SRREN consists of three categories of chapters: one introductory chapter; six technology specific chapters (Chapters 2-7); and four chapters that cover integrative issues across technologies (Chapters 8-11).

Chapter 1 is the introductory chapter designed to place renewable energy technologies within the broader framework of climate change mitigation options and identify characteristics common to renewable energy technologies.

Each of the technology chapters (2-7) provides information on the available resource potential, the state of technological and market development and the environmental and social impacts for each renewable energy source including bioenergy, direct solar energy, geothermal energy, hydropower, ocean energy and wind energy. In addition, prospects for future technological innovation and cost reductions are discussed, and the chapters end with a discussion on possible future deployment.

Chapter 8 is the first of the integrative chapters and discusses how renewable energy technologies are currently integrated into energy distribution systems, and how they may be integrated in the future. Development pathways for the strategic use of renewable technologies in the transport, buildings, industry and agricultural sectors are also discussed.

Renewable energy in the context of sustainable development is covered in Chapter 9. This includes the social, environmental and economic impacts of renewable energy sources, including the potential for improved energy access and a secure supply of energy. Specific barriers for renewable energy technologies are also covered.

In a review of over 160 scenarios, Chapter 10 investigates how renewable energy technologies may contribute to varying greenhouse gas emission reduction scenarios, ranging from business-as-usual scenarios to those reflecting ambitious GHG concentration stabilization levels. Four scenarios are analyzed in depth and the costs of extensive deployment of renewable energy technologies are also discussed.

The last chapter of the report, Chapter 11, describes the current trends in renewable energy support policies, as well as trends in financing and investment in renewable energy technologies. It reviews current experiences with RE policies, including effectiveness and efficiency measures, and discusses the influence of an enabling environment on the success of policies.

While the authors of the report included the most recent literature available at the time of publication, readers should be aware that topics covered in this Special Report may be subject to further rapid development. This includes state of development of some renewable energy technologies, as well as the state of knowledge of integration challenges, mitigation costs, co-benefits, environmental and social impacts, policy approaches and financing options. The boundaries and names shown and the designations used on any geographic maps in this report do not imply official endorsement or acceptance by the United Nations. In the geographic maps developed for the SRREN, the dotted line in Jammu and Kashmir represents approximately the Line of Control agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties.

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This report is dedicated to

Wolfram Krewitt, Germany
Coordinating Lead Author in Chapter 8

Wolfram Krewitt passed away October 8th, 2009. He worked at the Deutsches Zentrum für Luft- und Raumfahrt (DLR) in Stuttgart, Germany.

Raymond Wright, Jamaica
Lead Author in Chapter 10

Raymond Wright passed away July 7th, 2011. He worked at the Petroleum Corporation of Jamaica (PCJ) in Kingston, Jamaica.

Wolfram Krewitt made a significant contribution to this Special Report and his vision for Chapter 8 (Integration of Renewable Energy into Present and Future Energy Systems) remains embedded in the text for which he is acknowledged. Raymond Wright was a critical member of the Chapter 10 (Mitigation Potential and Costs) author team who consistently offered precise insights to the Special Report, ensuring balance and credibility. Both authors were talented, apt and dedicated members of the IPCC author team - their passing represents a deep loss for the international scientific communities working in climate and energy issues. Wolfram Krewitt and Raymond Wright are dearly remembered by their fellow authors.