


FIGURES

Figure 1.	Renewable Energy Global Overview	37	Figure 37.	Solar PV Global Capacity Additions, Shares of Top 10 Countries and Rest of World, 2021	128
Figure 2.	Renewable Energy Share in Total Final Energy Consumption, in Selected Countries, 2019	41	Figure 38.	Concentrating Solar Thermal Power Global Capacity, by Country and Region, 2006-2021	134
Figure 3.	Renewable Energy in Total Final Energy Consumption, by Final Energy Use, 2019	42	Figure 39.	Thermal Energy Storage Global Capacity and Additions, 2011-2021	135
Figure 4.	Evolution of Renewable Energy Share in Total Final Energy Consumption, by Sector, 2009 and 2019	43	Figure 40.	Solar Water Heating Collectors Global Capacity, 2011-2021	138
Figure 5.	Renewables in Power, 2021	44	Figure 41.	Solar Water Heating Collector Additions, Top 20 Countries for Capacity Added, 2021	139
Figure 6.	Annual Additions of Renewable Power Capacity, by Technology and Total, 2016-2021, and to Achieve Net Zero Scenarios for 2030 and 2050	45	Figure 42.	Large Solar Heat Plants, Global Annual Additions and Total Area in Operation, 2011-2021	142
Figure 7.	Shares of Net Annual Additions in Power Generating Capacity, 2011-2021	46	Figure 43.	Wind Power Global Capacity and Annual Additions, 2011-2021	145
Figure 8.	Renewables in Buildings, 2021	52	Figure 44.	Wind Power Capacity and Additions, Top 10 Countries, 2021	147
Figure 9.	Share of Renewable Heating in Buildings, G20 Countries, 2019	55	Figure 45.	Global Weighted-Average LCOEs from Newly Commissioned, Utility-scale Renewable Power Generation Technologies, 2010-2021	154
Figure 10.	Global Renewable Energy Employment, by Technology, 2012-2020	58	Figure 46.	Countries Developing National Cooling Action Plans for Cooling Access, as of End-2021	158
Figure 11.	Renewables in Industry and Agriculture, 2021	60	Figure 47.	Volume of Off-grid Solar Products Sold, by Size and Type of Sale, 2021	161
Figure 12.	Renewables in Transport, 2021	65	Figure 48.	Volume of Off-grid Solar Products Sold, PAYGo Only, Selected Countries, 2021	162
Figure 13.	Electric Car Global Stock, Top Countries and Rest of World, 2015-2021	68	Figure 49.	Cookstove Sales by Type, 2014-2019	168
Figure 14.	Number of Countries with Renewable Energy Regulatory Policies, 2011-2021	76	Figure 50.	Number of People Using Biogas for Cooking, Top 10 Countries in Africa and Asia, 2015 and 2019	169
Figure 15.	Countries with Selected Climate Change Policies, 2021	77	Figure 51.	Investment Raised by Clean Cooking Companies Based on Customer Location, 2014-2020	170
Figure 16.	National Net Zero Policies and Status of Implementation and Renewable Energy Targets, 2021	78	Figure 52.	Clean Cooking, Capital Raised by Source and Type, 2017-2019	172
Figure 17.	Renewable Energy Targets, 2021	81	Figure 53.	Global Investment in Renewable Power and Fuels, 2011-2021	176
Figure 18.	Renewable Energy Feed-in Tariffs and Tenders, 2010-2021	85	Figure 54.	Global Investment in Renewable Power and Fuels, by Country and Region, 2011-2021	178
Figure 19.	Sectoral Coverage of National Renewable Heating and Cooling Financial and Regulatory Policies, as of End-2021	89	Figure 55.	Global Investment in New Power Capacity, by Type, 2021	181
Figure 20.	Coverage of Energy Codes for New Buildings, 2021	93	Figure 56.	Sustainable Finance Taxonomies Worldwide, in Place, Under Development and in Discussion, Early 2022	185
Figure 21.	National and Sub-National Renewable Biofuel Mandates and Targets, End-2021	94	Figure 57.	Estimated Share of Mitigation Finance by Sector and Technology, 2019/2020	187
Figure 22.	Targets for Renewable Power and Electric Vehicles, as of End-2021	96	Figure 58.	Range of Annual Renewable Energy Investment Needed in Climate Change Mitigation Scenarios Compared Against Recent Investments	188
Figure 23.	Hydrogen Roadmaps in Selected Countries, as of End-2021	98	Figure 59.	Renewable Energy Spending as a Share of Total Capital Expenditure, Selected Oil and Gas Companies, 2020 and 2021	191
Figure 24.	Estimated Shares of Bioenergy in Total Final Energy Consumption, Overall and by End-Use Sector, 2020	102	Figure 60.	Top Countries for Share of Variable Renewable Electricity Generation, and Maximum Daily Penetration, 2021	195
Figure 25.	Bioenergy Use for Heating in the EU-27, 2015-2020	104	Figure 61.	Longest Uninterrupted Stretch with 100%-plus Renewable Electricity, Selected Countries or Regions	196
Figure 26.	Global Production of Ethanol, Biodiesel and HVO/HEFA Fuel, by Energy Content, 2011-2021	105	Figure 62.	Illustration of Demand-side Flexibility at the Household Level	203
Figure 27.	Global Bioelectricity Generation, by Region, 2011-2021	107	Figure 63.	Share of Urban Population with a Renewable Energy Target and/or Policy, 2021	208
Figure 28.	Geothermal Power Capacity and Additions, Top 10 Countries and Rest of World, 2021	108	Figure 64.	Number of Cities with Renewable Energy Targets, by Region and Sector, 2020 and 2021	211
Figure 29.	Geothermal Direct Use, Top 10 Countries and Rest of World, 2021	112	Figure 65.	Cities with Net Zero Emission Targets and Status of Implementation, by Region, 2020 and 2021	213
Figure 30.	Example of a Heat Pump with a Co-efficient of Performance of 4	115	Figure 66.	Net Zero Emission Targets and Renewable Energy Targets in Cities with More Than 250,000 Inhabitants, 2021	213
Figure 31.	Air-Source Heat Pump Annual Sales, Selected Markets, 2011-2021	116	Figure 67.	Urban Renewable Energy Policies in Buildings, by Type, 2021	219
Figure 32.	Hydropower Global Capacity, Shares of Top 10 Countries and Rest of World, 2021	119	Figure 68.	Urban Renewable Energy Policies in Transport, by Type 2021	221
Figure 33.	Hydropower Global Capacity and Additions, Shares of Top 10 Countries, 2021	120			
Figure 34.	Solar PV Global Capacity and Annual Additions, 2011-2021	126			
Figure 35.	Solar PV Global Capacity, by Country and Region, 2011-2021	127			
Figure 36.	Solar PV Capacity and Additions, Top 10 Countries for Capacity Added, 2021	127			

SNAPSHOTS. OVERVIEW



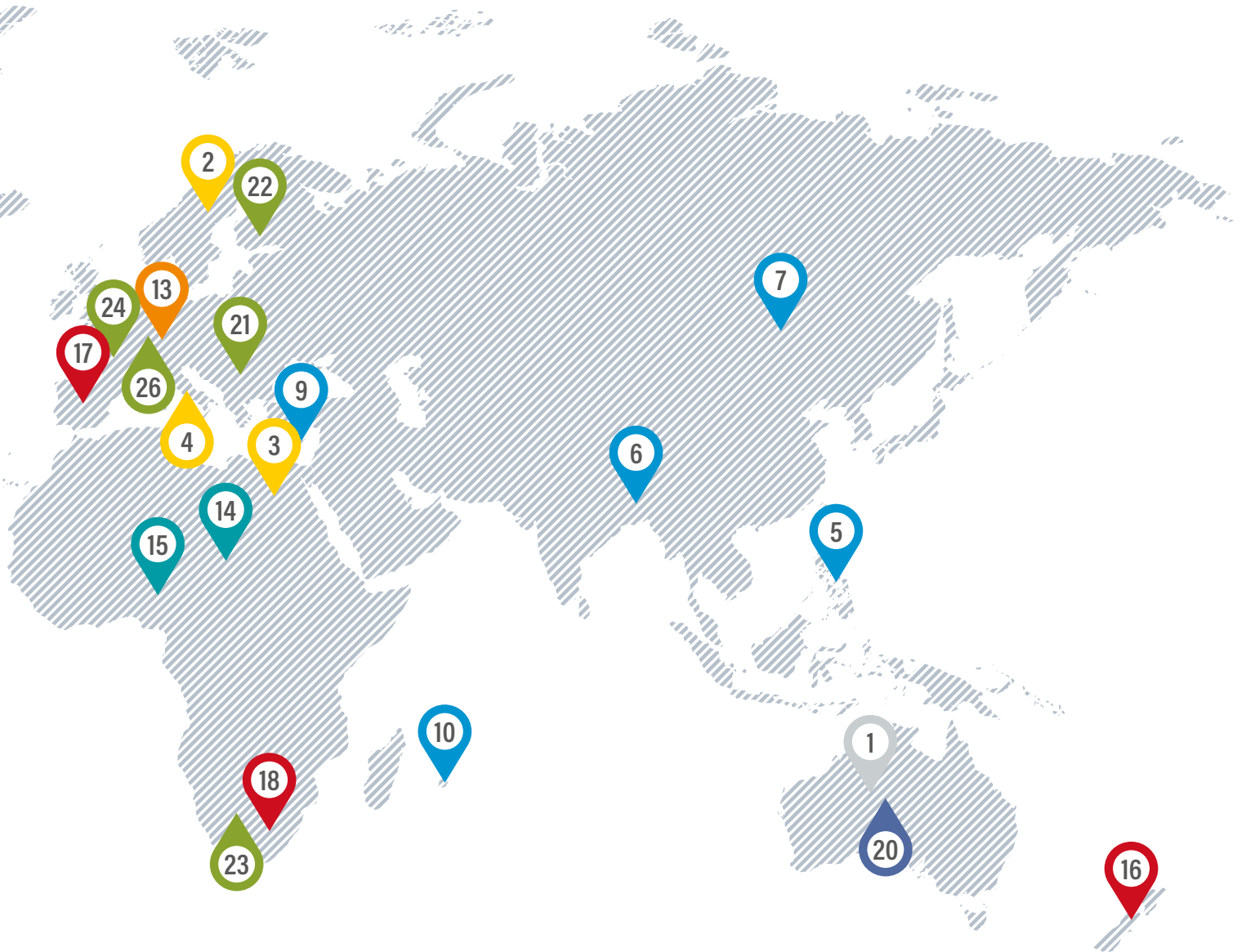
This report features a number of Snapshots (case studies) from around the world putting forward stories from 2021; where renewables have been deployed in different end-use sectors (buildings, transport, industry and agriculture) at the national and sub-national level. These stories showcase the context, drivers, challenges and achievements, as well as stakeholders involved and are portrayed through policy, markets investment, energy access, system integration and cities lenses.

	1 South Australia	page 20
	2 Sweden	page 34
	3 Egypt	page 47
	4 Italy	page 56
	5 Philippines	page 74
	6 Bangladesh	page 83
	7 China	page 86
	8 Chile	page 91
	9 Cyprus	page 92
	10 Mauritius	page 97
	11 Argentina	page 100
	12 El Salvador	page 111
	13 Germany	page 117
	14 Chad	page 156
	15 Africa	page 160
	16 New Zealand	page 174
	17 Spain	page 180
	18 South Africa	page 183
	19 USA	page 192
	20 South Australia	page 197
	21 Serbia	page 206
	22 Finland	page 214
	23 South Africa	page 215
	24 France	page 216
	25 USA	page 217
	26 Germany	page 220





Featuring
26 renewable
energy success
stories
across the globe.





REN21 is committed to mobilising global action to meet the United Nations Sustainable Development Goals.



Supported by:



on the basis of a decision
by the German Bundestag

This report was commissioned by REN21 and produced in collaboration with a global network of research partners. Financing was provided by the German Federal Ministry for Economic Cooperation and Development (BMZ), the German Federal Ministry for Economic Affairs and Climate Action (BMWK) and the UN Environment Programme. A large share of the research for this report was conducted on a voluntary basis.

ACKNOWLEDGEMENTS

REN21 RESEARCH DIRECTION TEAM

Duncan Gibb
 Nathalie Ledanois
 Lea Ranalder
 Hend Yaqoob

SPECIAL ADVISORS

Adam Brown
 Janet L. Sawin (Sunna Research)

CHAPTER AUTHORS

Hagar Abdelnabi
 Adam Brown
 Toby D. Couture (E3 Analytics)
 Ahmed Elguindy
 Bärbel Epp (Solrico)
 Nicolas Fichaux
 Duncan Gibb (REN21)
 Fanny Joubert (Ecotradors)
 Nathalie Ledanois (REN21)
 Rachele Levin
 Hannah E. Murdock (REN21)
 Lea Ranalder (REN21)
 Janet L. Sawin (Sunna Research)
 Kristin Seyboth (KMS Research and Consulting)
 Jonathan Skeen (The SOLA Group)
 Freyr Sverrisson (Sunna Research)
 Glen Wright (IDDRI)

RESEARCH AND PROJECT SUPPORT (REN21 SECRETARIAT)

Nicolas Achury
 Thomas André (REN21)
 Ines Benachir (REN21)
 Aishwarya Dhar (REN21)
 Stefanie Gicquel (REN21)
 Vibhushree Hamirwasia (REN21)
 Gözde Mavili
 Peter Stalter
 Nematullah Wafa (REN21)
 Yu Yuan-Perrin (REN21)

COMMUNICATIONS SUPPORT (REN21 SECRETARIAT)

Yasmine Abd-El-Aziz, Janice Chantre Raposo, Joanna Croft, Assia Djahafi, Vincent Eke, Jessica Jones-Langley, Tammy Mayer, Laura E. Williamson

EDITING, DESIGN AND LAYOUT

Lisa Mastny
 Kelly Trumbull
 weeks.de Werbeagentur GmbH

PRODUCTION

REN21 Secretariat, Paris, France

Note: Some individuals have contributed in more than one way to this report. To avoid listing contributors multiple times, they have been added to the group where they provided the most information. In most cases, the lead country, regional and topical contributors also participated in the Global Status Report (GSR) review and validation process.

SIDEBAR AND BOX AUTHORS

Sonia Al-Zoghoul (International Renewable Energy Agency – IRENA)
 Emanuele Bianco (IRENA)
 Adam Brown
 Mike Coffin (Carbon Tracker)
 Celia García-Baños (IRENA)
 Toyo Kawabata (United Nations Environment Programme – UNEP)
 Arslan Khalid (IRENA)
 Nathalie Ledanois (REN21)
 Hannah E. Murdock (REN21)
 Pablo Ralon (IRENA)
 Lea Ranalder (REN21)
 Michael Renner (IRENA)
 Peter Stalter
 Michael Taylor (IRENA)

REGIONAL CONTRIBUTORS

CENTRAL AND EAST AFRICA

Mark Hankins (African Solar Designs); Fabrice Fouodji Toche (Vista Organisation for Education and Social Development in Africa)

LATIN AMERICA AND CARIBBEAN

Aliosha Behnisch, Gonzalo Bravo, Ignacio Sagardoy (Fundación Bariloche)

MIDDLE EAST AND NORTH AFRICA

Akram Almohamadi, Sara Ibrahim, Maged K. Mahmoud (Regional Center for Renewable Energy and Energy Efficiency – RCREEE)

SOUTHERN AFRICA

Kizito Sikuka (Southern African Research and Documentation Centre – SARDC)



ACKNOWLEDGEMENTS (continued)

LEAD COUNTRY CONTRIBUTORS

Australia

Mike Cochran (APAC Biofuels Consulting Australia); Richard Day, Rebecca Draysey, Maria Kosti, Jade Kraus, Simone Mazengarb (Government of South Australia); Sharon Denny (Global Futuremakers); Veryan Patterson Hann (Australian Minerals and Energy Skills Alliance – AUSMESA)

Austria

Jasmin Haider (Austrian Federal Ministry for Climate Action – BMK)

Brazil

Suani Coelho (University of São Paulo)

China

João Graça Gomes, Juan Jiang, Xu Zhang (Sino-Portuguese Centre for New Energy Technologies); Qin Haiyan, Guiyong Yu, Hui Yu (Chinese Wind Energy Association); Frank Haugwitz (Asia Europe Clean Energy)

Colombia

Andres Rios (ERCO Energía)

Denmark

Jonas Hamann (Danfoss)

France

Romain Zissler (Renewable Energy Institute)

Germany

Roman Buss (Renewables Academy – RENAC); Sebastian Hermann (German Environment Agency); Detlef Loy (Loy Energy Consulting)

Greece

Ioannis Tsiouridis (Research Center at Tum Kenya)

India

Sreenivas Chigullapalli (Indian Institute of Technology Bombay); Amit Saraogi (Oorja Development Solutions Limited); V. Subramanian (Vasudha); Daksha Vaja (Community Science Centre Vadodara)

Indonesia

Marissa Malahayati (National Institute for Environmental Studies)

Japan

Hironao Matsubara (Institute for Sustainable Energy Policies); Stone Matsumoto (Ferris University)

Mexico

Genice Grande-Acosta (National Autonomous University of Mexico – UNAM)

Morocco

Lydia Bouazzati (independent consultant)

Portugal

Mariana Carvalho, Miguel Santos, Susana Serôdio (Portuguese Renewable Energy Association – APREN)

Russian Federation

Georgy Ermolenko (CIS Electric Power Council)

South Africa

Sabatha Mthwecu (Solar Rais)

Spain

Gonzalo Martin (Protermosolar); Silvia Ana Vera García (Institute for Diversification and Saving of Energy – IDAE)

Sweden

Abdenour Achour (Chalmers University of Technology)

Ukraine

Galyna Trypolska (Institute for Economics and Forecasting, National Academy of Sciences of Ukraine)

Uruguay

Gabriela Horta (Ministry of Industry, Energy and Mining)

Zimbabwe

Shorai Kavu (Ministry of Energy and Power Development)

LEAD TOPICAL CONTRIBUTORS

AGRICULTURE

Ramirez Bueno, Michelle Alejandra Ramirez Bueno (IRENA)

BIOMASS

Jeremy Moorhouse (International Energy Agency – IEA); H. Matsubara (independent consultant)

BUILDINGS

Femke de Jong (European Climate Foundation); Chiara Delmastro (IEA); Ian Hamilton, Harry Kennard (UCL Energy Institute); Mark Kresowik (RMI); Benoit Lebot (Ministry of Ecological Transition, France); Martin Obermaier (independent consultant); Nora Steurer (Global Alliance for Buildings and Construction, UNEP); Louise Sunderland (Regulatory Assistance Project), Vincent Martinez (Architecture 2030), Anna Zinecker (Deutsche Gesellschaft für Internationale Zusammenarbeit – GIZ)

CITIES

Constant Alarcon (C40); Amy Bills (CDP); Emmanuel Biririza, Vincent Kitio (UN-Habitat); Victoria Burrows (World Green Building Council – WGBC); Fairuz Loutfi, Inder Rivera (World Resources Institute – WRI); Philip Turner (International Association of Public Transport – UITP)

CONCENTRATING SOLAR THERMAL POWER

Candes Arendse (City of Cape Town); Gerardo Escamilla (IRENA)

DATA AND PYTHON PROGRAMMING

Nicolas Achury (independent consultant); Duncan Gibb (REN21)

DISTRIBUTED RENEWABLES FOR ENERGY ACCESS

Benjamin Attia (Wood Mackenzie Power Renewables); Christopher Baker-Brian (Bboxx); Daron Bedrosyan, Juliette Besnard (World Bank Group); Peter George, Asna Towfiq (Clean Cooking Alliance); Rana Ghoneim, Patrick Nussbaumer, Karin Reiss (United Nations Industrial Development Organization – UNIDO); Suranjana Ghosh

(Power for All); Jens Jaeger, Gabriele Pammesberger (Alliance for Rural Electrification); Aaron Leopold (EnerGrow); Wambui Mathoni, Jessica Stephens (Africa Minigrid Developers Association – AMDA); Divyam Nagpal, Ali Yasir (IRENA); Gustavo Ponte (Ministry of Energy Brazil); Arnaud Rouget, Gianluca Tonolo (IEA); Michele Souza (Empresa de Pesquisa Energética – EPE); Patrick Tonui (Global Off-Grid Lighting Association – GOGLA); Leslie Zambelli (Schneider Electric)

EDUCATION

Leonardo Barreto-Gomez (Austrian Energy Agency); Samah Elsayed (IRENA); Debra Rowe (Yale University)

ENERGY SYSTEM INTEGRATION

Galen Barbose, Dev Millstein (Lawrence Berkeley National Laboratory); Stephan Bowe (Green Gas Advisors); Robert Bruckmann (German Energy Agency – dena); Jaquelin Cochrane, Anthony Lopez, Katy Waechter, Owen Zinaman (US National Renewable Energy Laboratory – NREL); Søren Hermansen (Samsø Energy Academy); David Jacobs (International Energy Transition); Bryant Komo (HECO Hawaii); Gonzalo Piernavieja Izquierdo (IITC Canarias); Alexandra Styles (Hamburg Institute); Ralph Torrie (Corporate Knights)

GLOBAL OVERVIEW

Zuzana Dobrotkova (World Bank Group); Paolo Frankl (IEA); Tomas Kåberger (Renewable Energy Institute); Ruud Kempener (European Commission)

HEAT PUMPS

Caroline Czajko (Heating, Refrigeration and Air Conditioning Institute of Canada); Yang Jie (ChinaIOL); Thomas Novak (European Heat Pump Association); Koki Watanabe (Heat Pump & Thermal Storage Technology Center of Japan); Cooper Zhao (Heat Pump Committee of China Energy Conservation Association)

HEATING AND COOLING

Francois Briens (IEA); Hongzhi Cheng (Sun's Vision); Pedro Dias (Solar Heat

Europe); Monika Spörk-Dür, Werner Weiss (AEE Institute for Sustainable Technologies – AEE INTEC); Lindsay Sugden (Delta-EE)

HYDROPOWER

Alex Campbell (International Hydropower Association)

INVESTMENT

Camille André (UN Green Growth Knowledge Partnership – GGKP); Kanika Chawla (Sustainable Energy for All – SEforALL); Albert Cheung, James Ellis, Divya Sehgal, Ben Vickers (BloombergNEF); John Dulac, Deger Saygin, Cecilia Tam (OECD); Malin Emmerich, Christine Gruening, Michael Koenig, Karsten Loeffler (Frankfurt School); Charlotte Gardes-Landolfini (International Monetary Fund); Marion Haas (independent consultant); Sandra Hanni (International Chamber of Commerce); Josh Mayer (MSCI); Nicolas Mottis (Ecole Polytechnique); Elke Pfeiffer (UN Net Zero Asset Owner Alliance); Frédéric Pinglot (Schneider Electric)

OCEAN POWER

Ana Brito E. Melo (WavEC); Rémi Gruet, Lotta Pirttimaa (Ocean Energy Europe)

POLICY

Valerie Bennett (Ontario Energy Board); Richard Carlson (Pollution Probe); Julia Levin (Environmental Defense)

TRANSPORT

Stefan Bakker (Netherlands Institute for Transport Policy Analysis); Cornie Huizenga (Climate and Environment Service Group – Shanghai); Nikola Medimorec, Karl Peet (Sustainable Low Carbon Transport – SLOCAT Partnership); Leonardo Paoli, Per Anders Widell (IEA); Marion Vieweg (Current Future)

WIND POWER

Stefan Gsänger, Jean-Daniel Pitteloud (World Wind Energy Association – WWEA); John Hensley (American Clean Power Association); Ivan Komusanac (WindEurope); Feng Zhao (Global Wind Energy Council)

ACKNOWLEDGEMENTS (continued)

PEER REVIEWERS AND OTHER CONTRIBUTORS

Jordi Abadal (Inter-American Development Bank – IDB); Mussa Abbasi Mussa (Tanzanian Ministry of Energy); Mohammed Abdalghafoor (Arab Academy for Science, Technology & Maritime Transport); Maisarah Abdul Kadir (IRENA); Abiodun Abiola (University of Rovira I Virgili); Mahmoud Abou Elenen (General Electric); Hassan Aboughalma (Geo Environmental Renewables Consulting – Georenco); Michael Abrokwa (Netherlands Development Organisation – SNV); Cleophas Achisa (Moi University); Rob Ackrill (Nottingham Trent University); Richardson Adesuyi (Centre for Petroleum, Energy Economics and Law, University of Ibadan); Ayooluwa Adewole (University College London); Samuel Adunreke (Innovea Hubs and Innovea Development Foundation); Rodrigo Affonso (ASENGE Engenharia); Sanchit Saran Agarwal (Indian Institute of Technology – IIT Roorkee); Florencia Agatiello (Greenmap); Mohammad Ahmad (National Biotechnology Development Agency Nigeria); Shoab Ahmed Khatri (Mehran University of Engineering and Technology); Chinenye Ajayi (Olaniwun Ajayi LP); Gamze Akarsu (United Nations Development Programme – UNDP); Omar Al Sherif (Rural and Renewable Energy Agency); David Albertani (R20 Regions of Climate Action); Donee Alexander (Clean Cooking Alliance); Rind Alhage (SDG7 Youth Constituency); Mujtaba Ali (University of Lahore); Nevin Alija (Galp Gás Natural Distribuição); Ali Almarhoun (King Abdullah University of Science and Technology); Sami Alnabulsi (Alnabulsi Co.); Abdullah Al-Najdawi (EDAMA Association); Mohammad Alnajideen (Cardiff University); Bara’Ah Alsardi (Ministry of Energy and Mineral Resources of Jordan); Anne Amanda Bangasser (Treehouse Investments LLC); Carolyn Amon (Deloitte); Camille André (UN GGKP); Hary Andriantavy (African Association for Rural Electrification); Katazina Andrukonyte (Elomatic Ltd); Abdul Arif (independent consultant); Charles Arthur (UNIDO); Eros Artuso (Terra Consult Sarl); Natali Asfour (EDAMA Association); Mohamed Atef Kamel (Johnson Controls); Diana Athamneh (EDAMA Association); Patrick Atouda Beyala (SOAS University of London); Faten Attig Bahar (National Engineering School of Tunis Enit); Ayotunde Awosusi (Institute for the Development of Energy for Africa); Shakila Aziz (United International University); Abdelkader Baccouche (National Agency for Energy Conservation Tunisia – ANME); Miriam Badino (independent consultant); Rajendra Bahadur Adhikari (Rural Area Development Programme); As Bahaj (University of Southampton); Sarah M. Baird (Let There Be Light International); Firas Balasmeh (FB Group); Pepukaye Bardouille (International Finance Corporation – IFC); Ahmad Bassam (Jordan Renewable Energy and Energy Efficiency Fund – JREEEF); Emma Baz (independent consultant); Martin Behar Kölln (Congress of Deputies of Spain); Pablo Benalcazar (Mineral and Energy Economy Research Institute, Polish Academy of Sciences); Jean-Philippe Bernier (Natural Resources Canada); Sunil Bhatnagar (Sanvaru Technology Ltd.); Amit Bhatt (WRI India); Faiz Bhutta (independent consultant); Djibrine Bichara (independent consultant); Azhan Bin Hasan (Turner & Townsend LLC Qatar and Qatar Rail); Sara P. Biscaia (JGH-Group); Bojan Bogdanovic (European Bank for Reconstruction and Development – EBRD); Rina Bohle Zeller (Vestas); Alix Bolle (Energy Cities); David Bourguignon (Association les Energiques); Salim Bouziri (Goldbeck Solar GmbH); Alan Bravo (IHS Markit); William Brent (Husk Power Systems); Nelson Bunyui Manjong (Norwegian University of Science and Technology); Bernardo Joel Carrillo Castillo (independent consultant); Carlos Fernando Casillo Lara (C&C Sur Servicios Generales y Proyectos SAC); Gabriele Cassetti (Energy Engineering Economic and Environment System Modeling and Analysis – E4SMA); Julio Cesar Duran (Argentine National Atomic Energy Commission – CNEA); Joan Chahenza (AMDA); Dipal Chandra Barua (Bright Green Energy Foundation); Chia-Wei Chao (Taiwan Environment and Planning Association); Tamojit Chatterjee (SEforALL); Sanogo Cheick Ahmed (independent consultant); Xixi Chen (WRI); Robson Chikuri (Engineering Council of Zimbabwe); Sacur Chipire (Conselho Municipal Que Rimam); Zvirevo Chisadza (Zola Electric); Chuck Chuan Ng (Xiamen University Malaysia); Joy Clancy (University of Twente); David Clark (Kinetic Energy Generation Systems); Lanvin Concessao (WRI); Evaldo Costa (Iscte-University Institute of Lisbon-Dinâmia’Cet); Trevor Criswell (IEA); Penelope Crossley (University of Sydney Law School); Yerlan Dairbekov (UNDP and Global Environment Facility); Emil Damgaard Grann (Ørsted); Alekhya Datta (KPMG India); Manuel De Araújo (Quelimane Municipality Council); Emilio Deagosto (Catholic University of Uruguay); Christopher Dent (Edge Hill University); Ashish Dhankhar (GIZ); Nicolas Di Sbroiavacca (Fundación Bariloche); Mamadou Diarra (energy consultant); Abdou Diop (Senegalese Agency for Rural Electrification – ASER); Patrick Raoul Djakpou Ngansop (World Trade Marketing Agency); Kamal Djemouai (independent consultant); Viktória Döme (Hong Kong University of Science and Technology); Anna Dominique Ortiz (ICLEI South Asia); Paul Dowling (independent consultant); Serife E Can Sener (Clemson University); Williams Ebhota (Durban University of Technology); Mariam El Forgani (GECOL Company); Noor Eldin Alkiswani (EDAMA Association); James Ellis (BloombergNEF); Elgeneid Elqurashi (Navitas Engineering & Contracting Energy Solutions); Antony Philip Emenyu (Kasese Municipal Council); Myagmardorj Enkhmend (Mongolian Renewables Industries Association); Yasemin Erboy Ruff (CLASP); Ricardo Esparta (University of São Paulo); Anibal Espinoza (independent consultant); Ashkan Etemad (Leadership in Energy and Environmental Design Iran); Ammar Ewis (University of Prince Edward Island Cairo Campus); Jinlei Feng (IRENA); David Ferrari (independent consultant); Robert Fischer (Luleå University of Technology); Benjamar-Hope Flores (Seoul National University of Science and Technology); Giulia Forgnone (Euroheat & Power); Mindy Fox (Solar Cookers International); Rafael Francisco Marques (Absolar); Uwe R. Fritsche (International Institute for Sustainability Analysis and Strategy – IINAS); Joseph Gabut (Papua New Guinea National Energy Authority); Ahmed Gaidoum (National Center for Research Sudan); Maysa Gaidoum (National Center for Research Sudan); Ahmed Garba Ahmed (PV Renewable Energy Hub Nigeria); Daniel Garcia (Fabricantes Mexicanos en las Energías Renovables A.C – FAMERAC); Fabio García (Latin American Energy Organization – OLADE); Anna Geddes (International Institute for Sustainable Development – IISD); William Gillett (European Academies Science