



REmap 2030

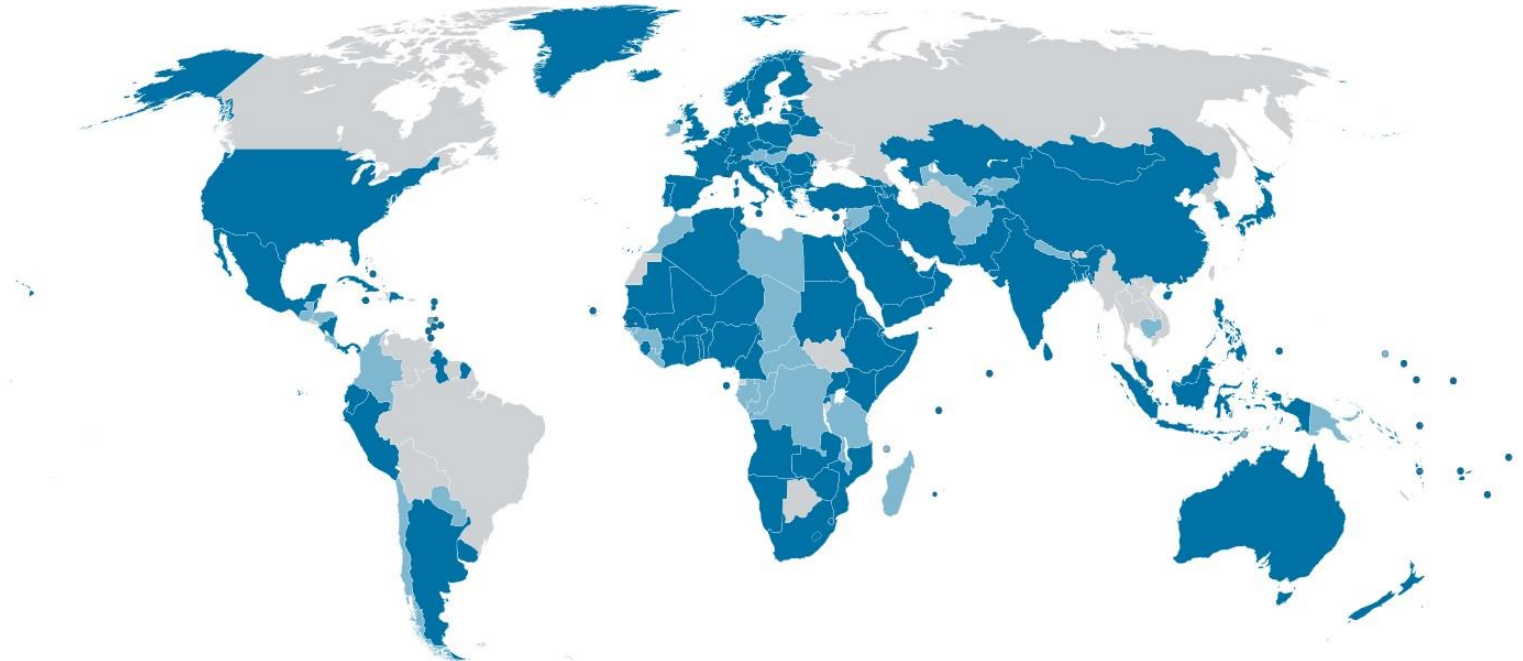
A Renewable Energy Roadmap



Geographisches Institut der Universität Bonn:
“Energie Geographien in internationaler Perspektive”
November 21, 2014

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rkempener@irena.org

The Voice. Advisory Resource and Knowledge Hub for 170 Governments



Renewable energy can:

- Meet our goals for **secure**, **reliable** and **sustainable** energy
- Provide **electricity access** to 1.3 billion people
- Promote **economic development**
- At an **affordable cost**

Headquarters:
**Abu Dhabi,
United Arab Emirates**

Three Programmes:

- **Innovation and Technology Centre (IITC) in Bonn, Germany**
- **Knowledge, Finance and Policy Centre in Abu Dhabi**
- **Country Support Programme in Abu Dhabi**

Foundation

**26 January 2009 in Bonn
International Agency since April 2011
The only international RE agency
worldwide**

Scope

**Hub, voice and source of objective
information for renewable energy**

Mandate

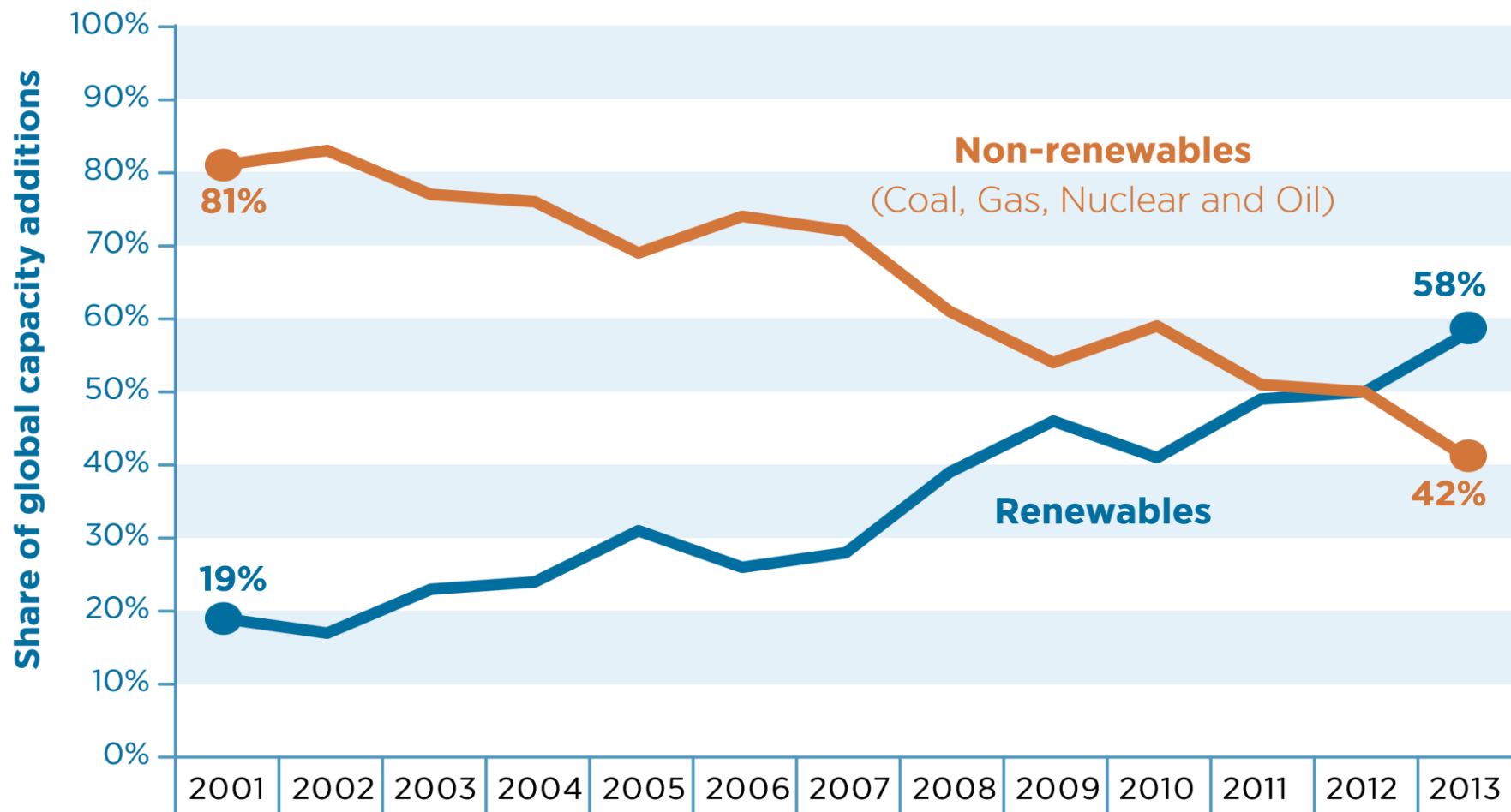
**Sustainable deployment of the six
forms of renewable energy
resources
(Biomass, Geothermal, Hydro,
Ocean, Solar, Wind)**

- Transition planning – including REMAP 2030, RRA
- Knowledge gateway – including Resource Atlas, Costing
- Enabling investment and growth – Navigator, Standards and Quality Control
- Access – Offgrid solutions
- Islands – SIDS Lighthouses
- Regional action agenda – Africa Clean Energy Corridor

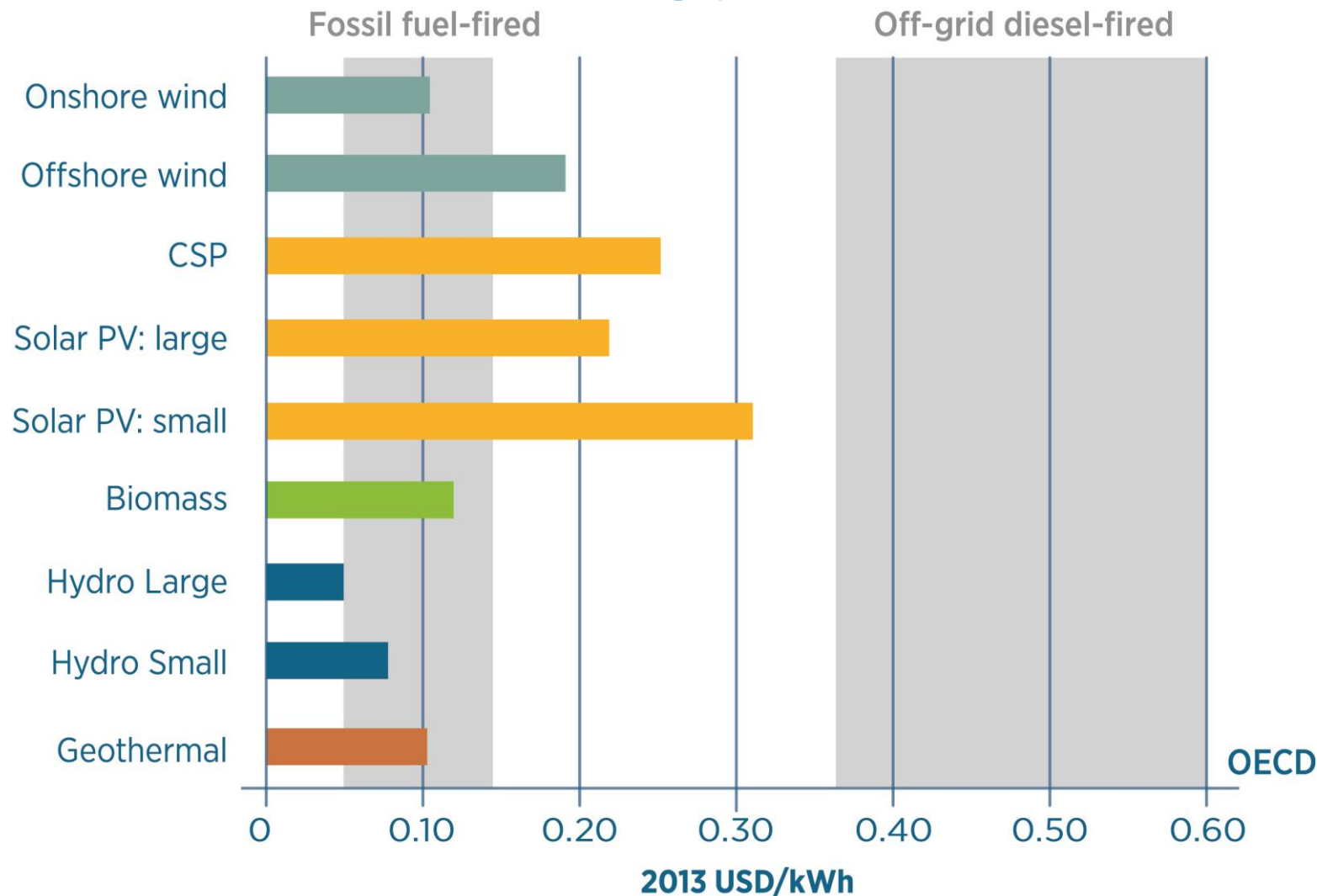
- *Abu Dhabi Fund for Development - USD 350 M for innovative project financing*

1 TRENDS

Renewables Dominate New Capacity Additions

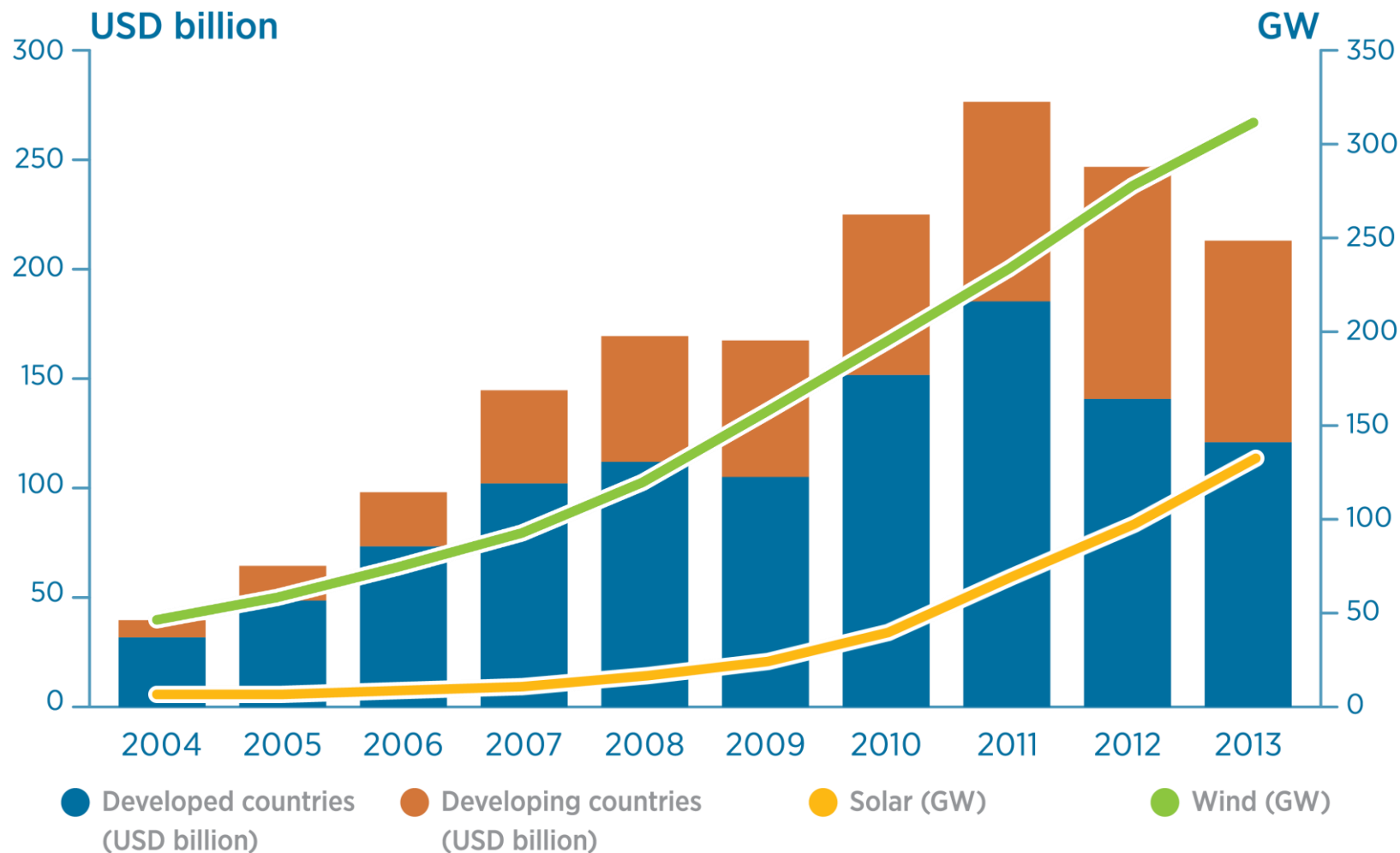


Renewables are Increasingly Cost-Competitive



Note: The weighted average in OECD is at 10% WACC

Global Investment in Renewable Energy



2 REMAP 2030

REmap 2030 A Renewable Energy Roadmap



Summary of findings

January 2014

UN Resolution (Jan. 2011)

2012 INTERNATIONAL YEAR OF SUSTAINABLE ENERGY FOR ALL (SE4ALL)

“increased use of new and
renewable resources”

United Nations

A/RES/65/151



General Assembly

Distr.: General
21 January 2011

Sixty-fifth session
Agenda item 20

Resolution adopted by the General Assembly

65/151. International Year for Sustainable Energy for All

The General Assembly,

Reiterating the principles of the Rio Declaration on Environment and Development¹ and of Agenda 21² and recalling the recommendations and conclusions contained in the Plan of Implementation of the World Summit on Sustainable Development (“Johannesburg Plan of Implementation”)³ concerning energy for sustainable development,

Recalling Economic and Social Council resolution 1980/67 of 25 July 1980 on international years and anniversaries, and General Assembly resolutions 53/199 of 15 December 1998 and 61/185 of 20 December 2006 on the proclamation of international years,

Recalling also its resolution 55/2 of 8 September 2000, by which it adopted the United Nations Millennium Declaration,

Recalling further the High-level Plenary Meeting of the sixty-fifth session of the General Assembly on the Millennium Development Goals and its outcome,⁴

Recalling its resolutions 53/7 of 16 October 1998, 54/215 of 22 December 1999 and 55/205 of 20 December 2000, as well as its resolutions 56/200 of 21 December 2001, 58/210 of 23 December 2003, 60/199 of 22 December 2005,

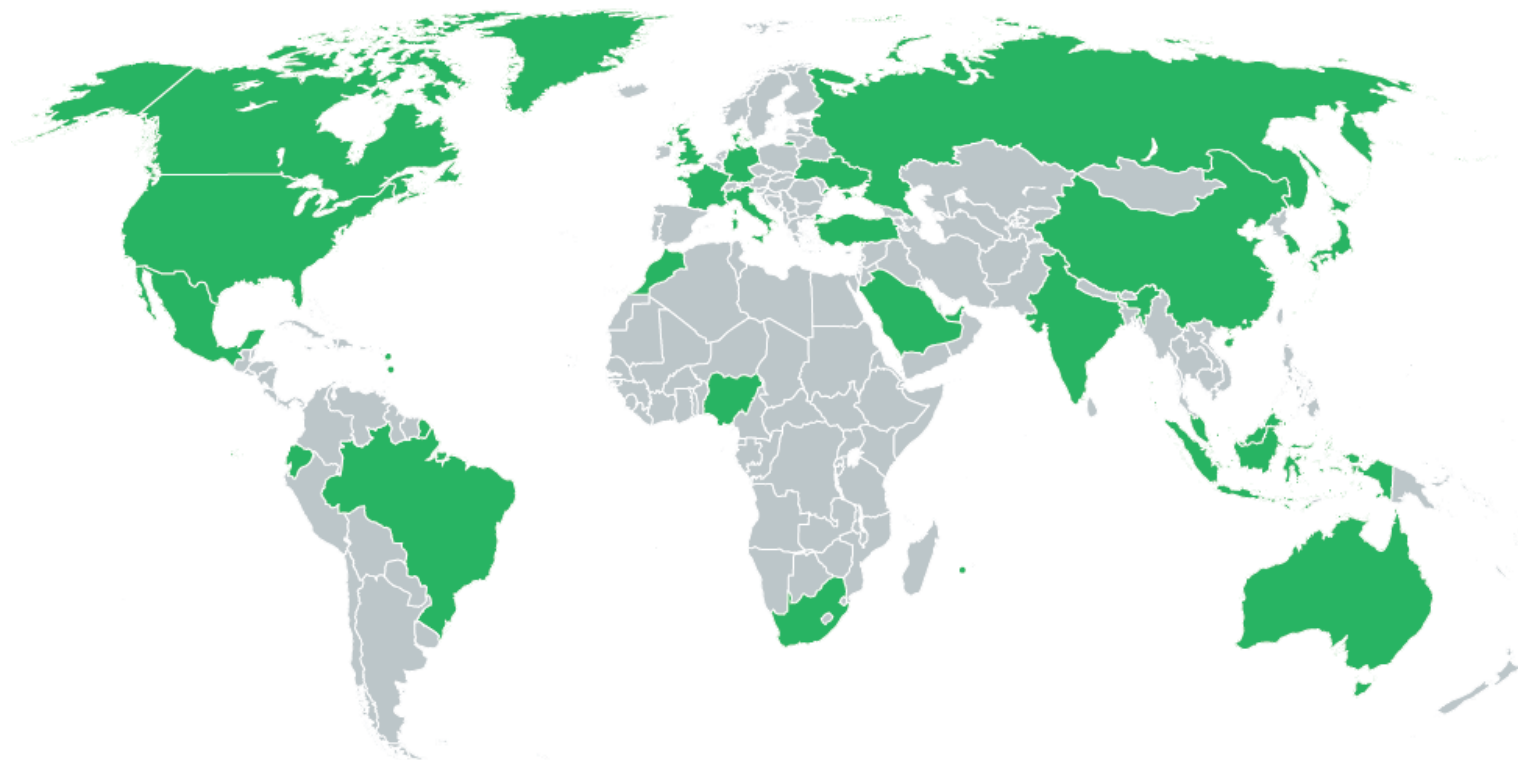
¹ *Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992*, vol. 1, *Resolutions Adopted by the Conference* (United Nations publication, Sales No. E.93.I.8 and corrigendum), resolution 1, annex I.

² *Ibid.*, resolution 1, annex II.

³ *Report of the World Summit on Sustainable Development, Johannesburg, South Africa, 26 August-4 September 2002* (United Nations publication, Sales No. E.03.II.A.1 and corrigendum), chap. I, resolution 2, annex.

⁴ See resolution 65/1.

REmap 2030 coverage



26 countries representing **75% of global energy demand** in 2030

Country results are aggregated and extrapolated to global findings

- Doubling the global RE share is feasible
- Doubling the global RE share is affordable **when externalities are accounted for**
- Doubling has important socio-economic benefits
- Act jointly but differentiated
- Not only power sector, also buildings, industry and transportation
- Biomass is key but uncertain

Global RE use in 2030

including REmap Options

RE shares incl. electricity from renewables

Buildings 38%

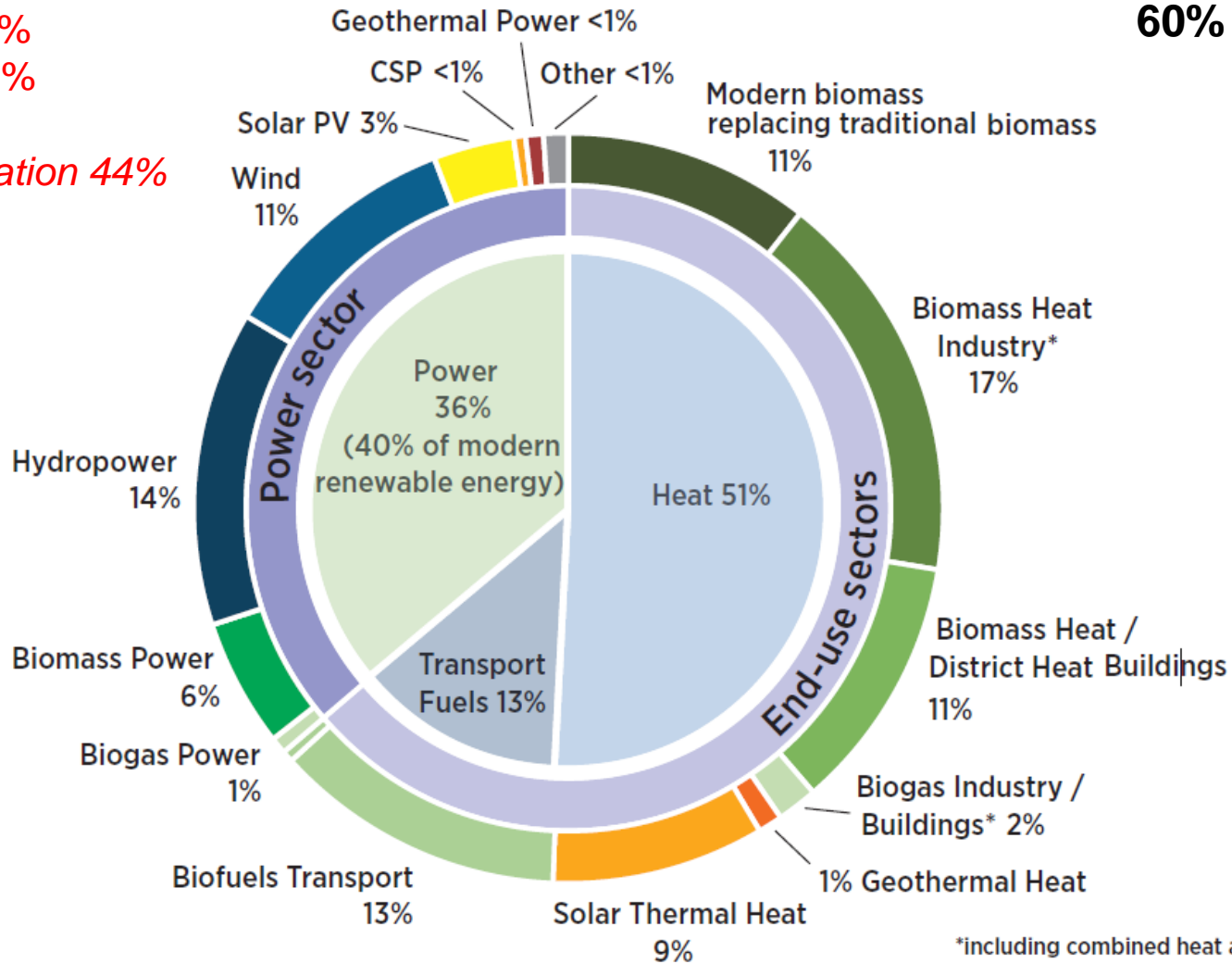
Industry 26%

Transport 17%

Power generation 44%

REmap 2030 - 132 EJ (final energy)

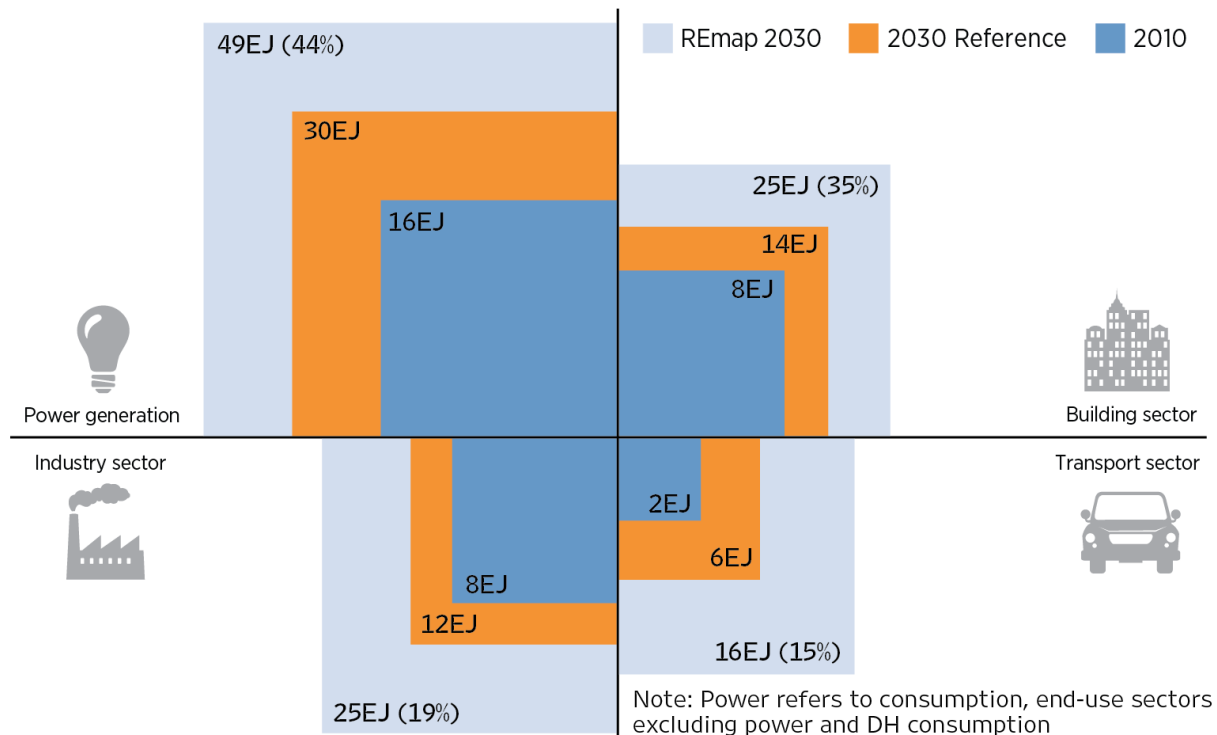
60% is biomass



*including combined heat and power (CHP) and district heat

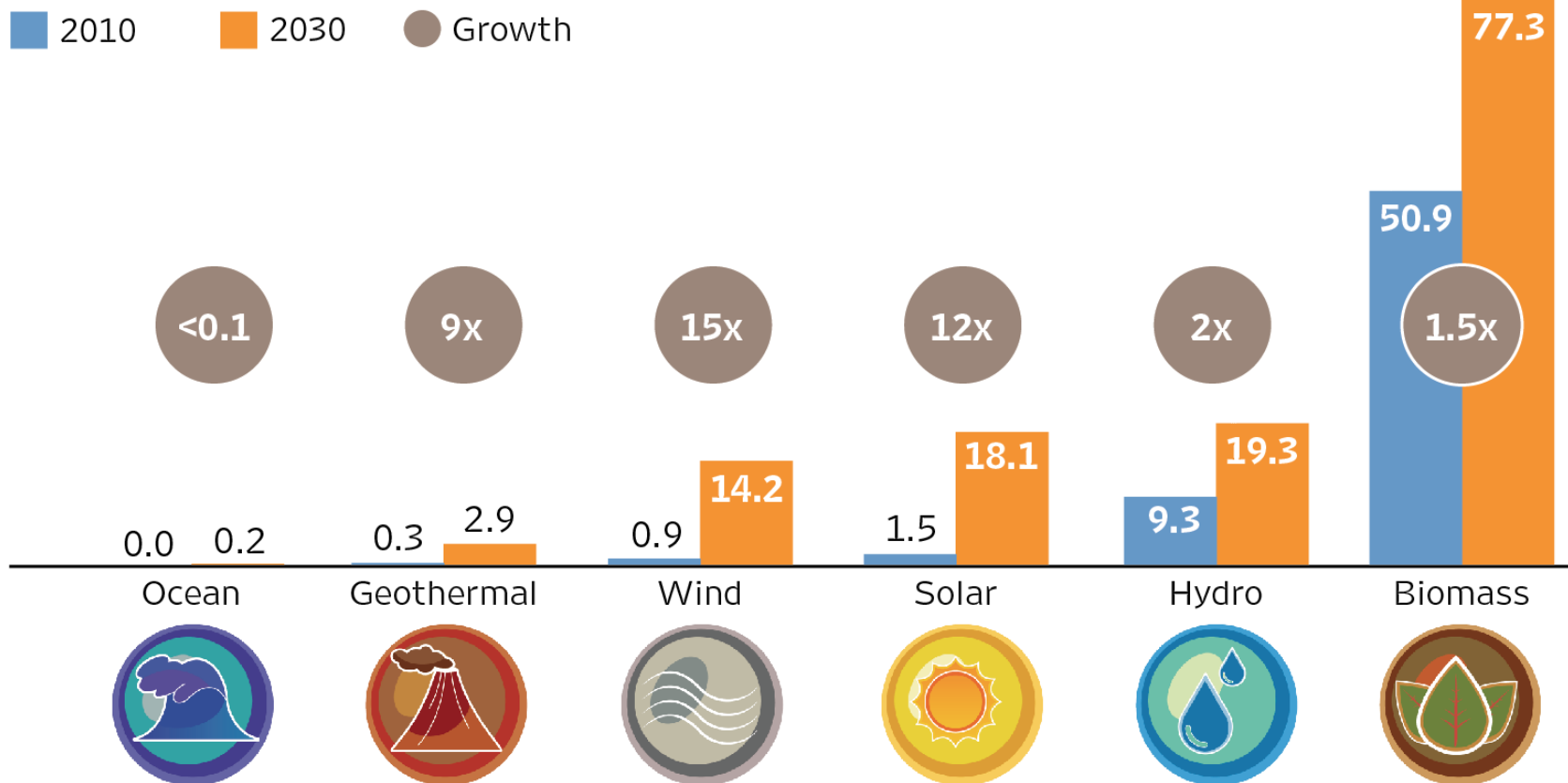
Renewables can grow significantly in every sector

Renewable energy share indicators by sector



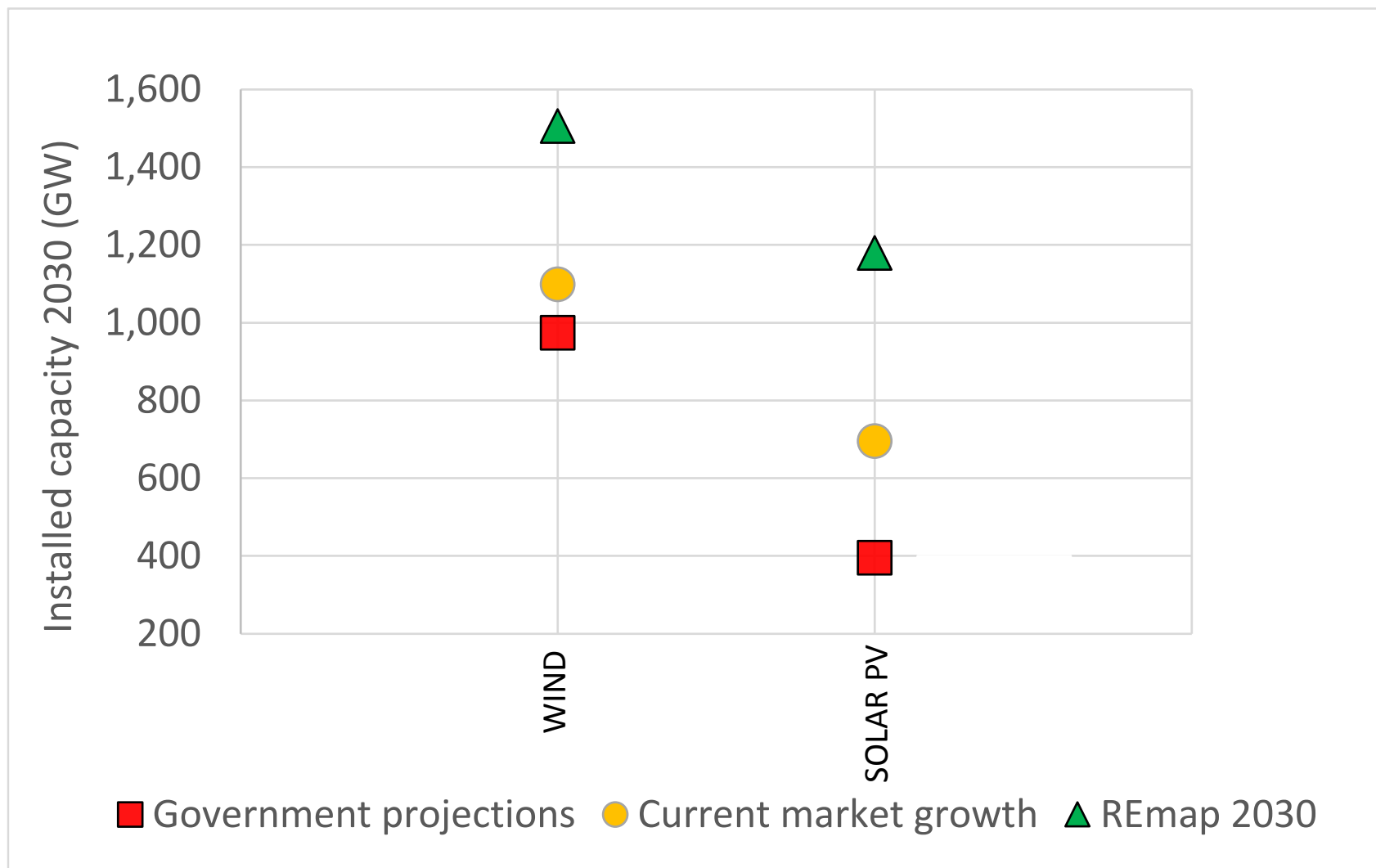
Scaling-up all renewable energy sources

Global renewable energy use by resource (EJ/year)



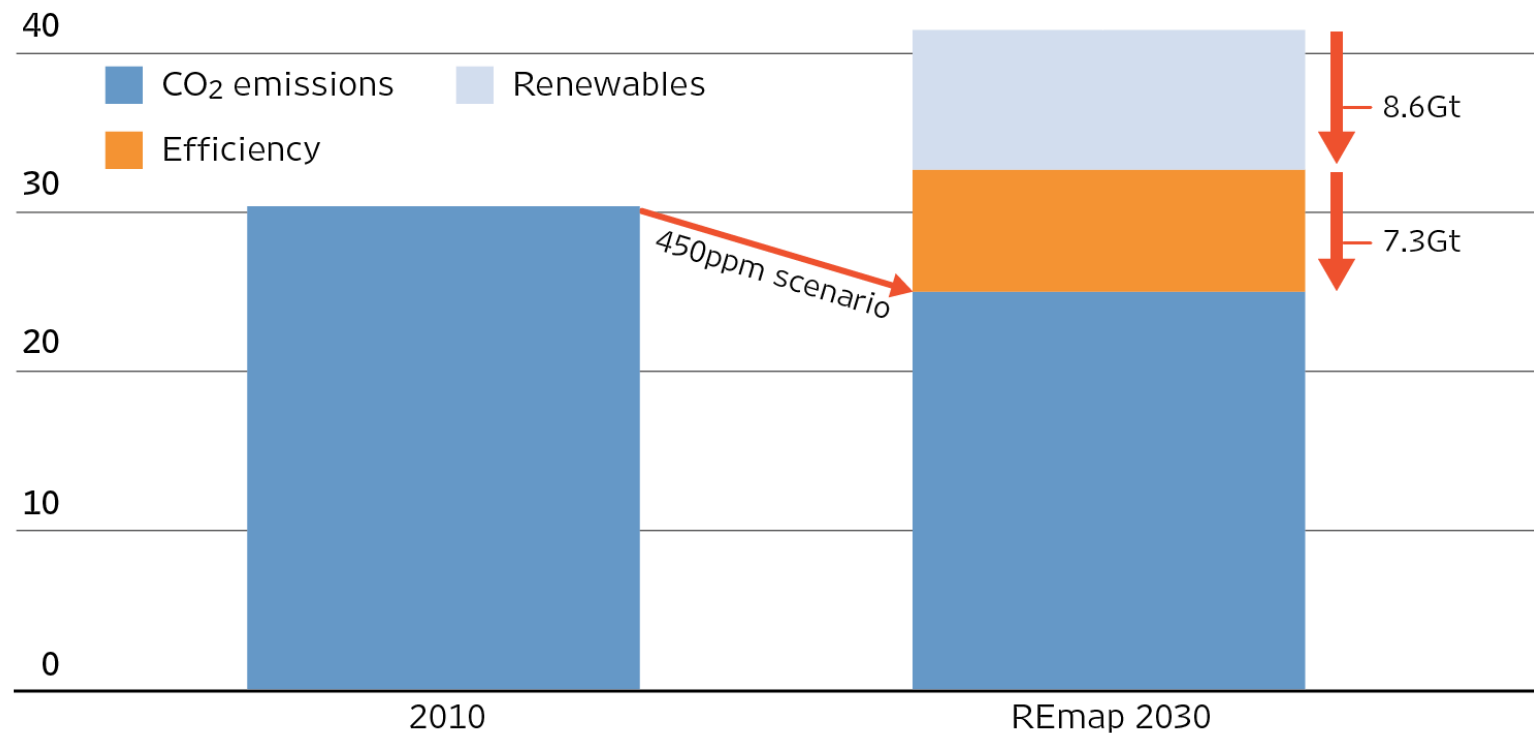
Total global RE use in REmap 2030: 132 EJ/yr

Governments underestimate growth of renewables

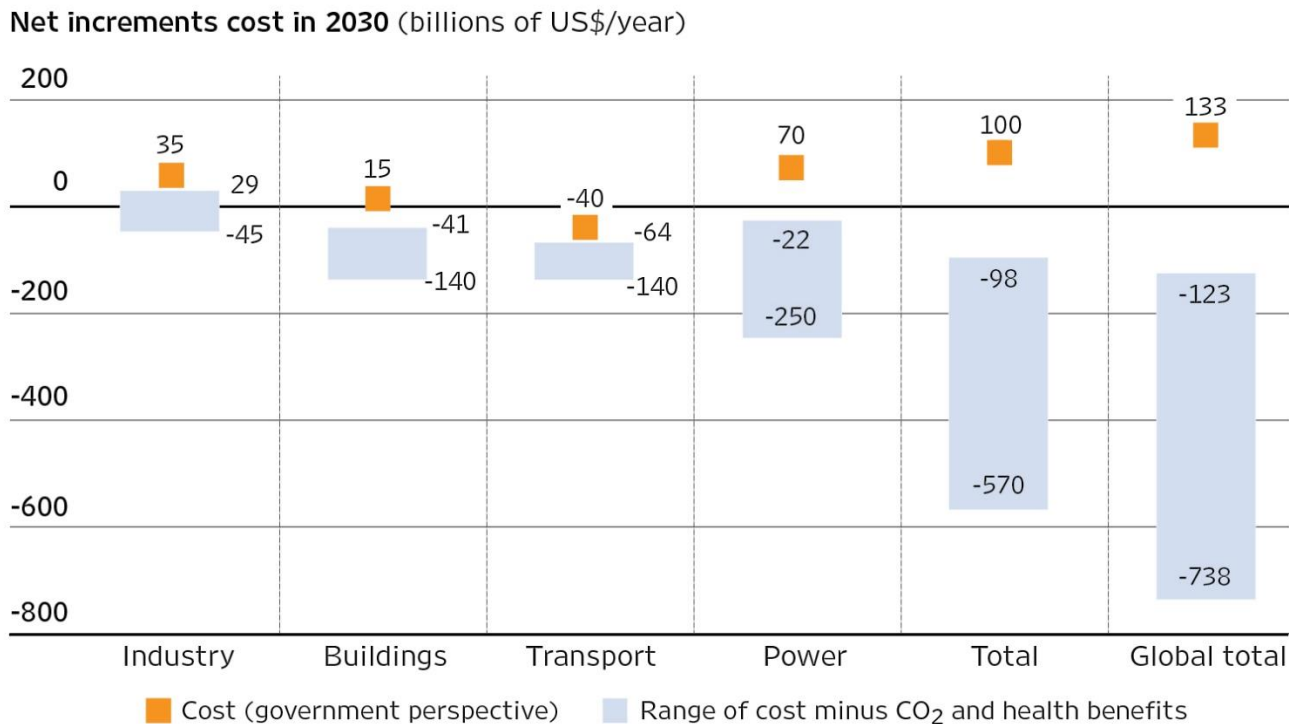


With Renewables + Efficiency we can achieve a 450ppm Path

Annual global energy-related CO₂ emissions (Gt/year)



The energy transition is affordable



USD 265 bln/yr net incremental investment – USD 315 bln/yr RE subsidies
RE saves up to USD 740 billion per year in 2030

3 THE ROLE OF RD&D

Innovation of RE Technologies in LAC

Identification



R&D initiatives and main actors in LAC

Analysis



Overview of gaps in innovation

Recommendations



Cooperation to close the gap

This study is a first step to identify the needs in the region. Practical support to IRENA Member Countries on priority areas will follow in 2014 and 2015

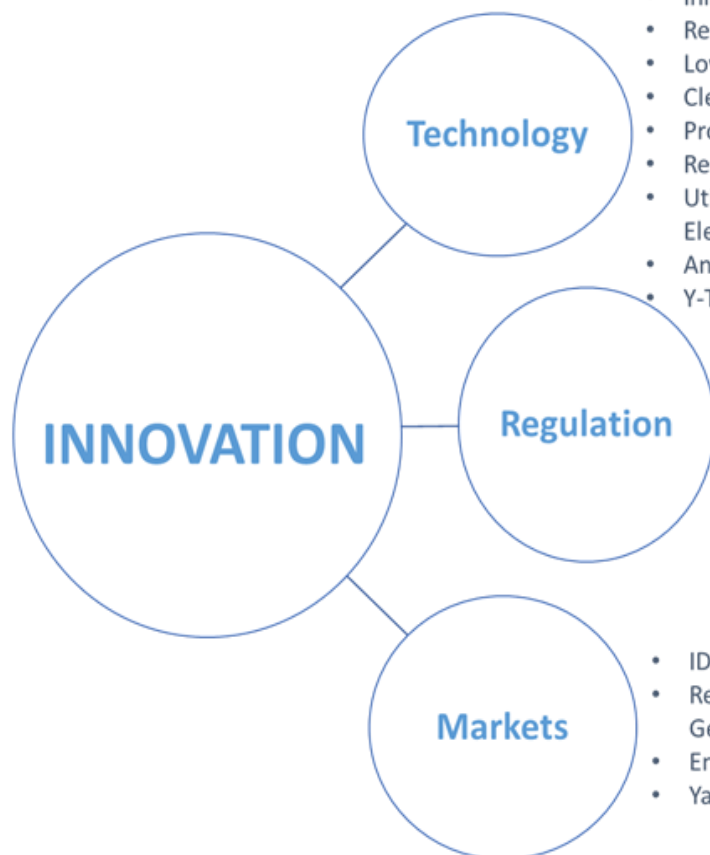
Identification of Initiatives and Main Actors

Inventory of R&D initiatives in LAC

+ 20 initiatives

30 active countries

+ 120 institutions

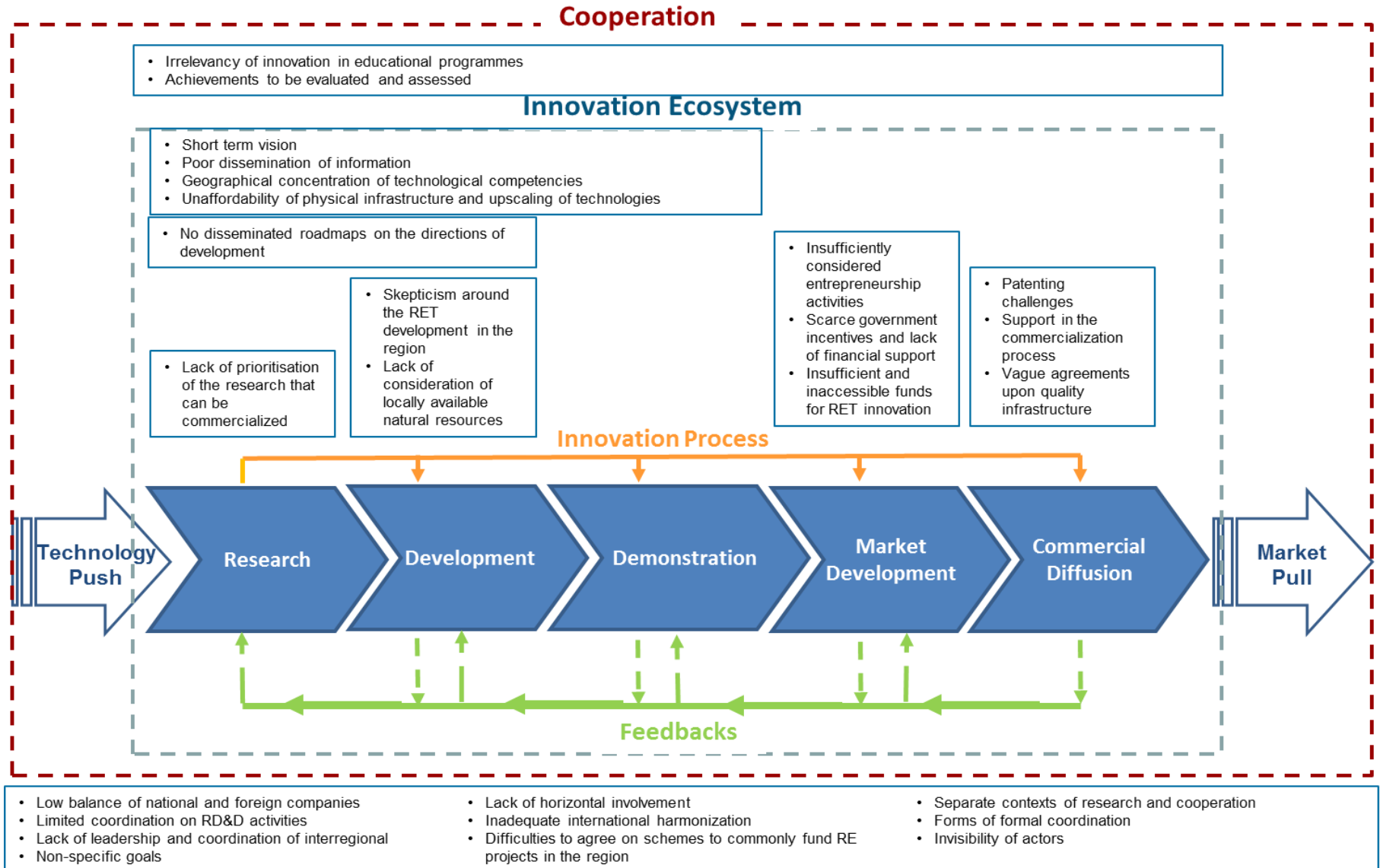


- Innovation and Research of Renewable Energy Technologies
- Renewable Energy Generation in South America (REGSA)
- Low Carbon Communities of the Americas (LCCA): Dominica Wind Project
- Clean Energy ESB
- Proethanol 2G
- Research for development of low-temperature geothermal energy
- Utilization of Coffee Biomass for Production of Biofuel and Generation of Electricity
- Analysis of a Wind Farm Behaviour Operating Under Extreme Wind Conditions
- Y-TEC Marine Technology, Laboratory of Hydrogen and Renewable Energy

- Ibero-American Programme of Innovation
- Fostering EU-Caribbean Research and Innovation Networks
- European Union - Latin America Joint Initiative for Research and Innovation (JIRI)
- Ibero-American Programme for Science, Technology and Development

- IDEAS: Energy Innovation Contest
- Regional Initiative on Innovation for Development of Technologies for Generation of Renewable Energy and Energy Efficiency
- Energy Innovation Centre
- Yachai: The City of Knowledge

Overview of Innovation Gaps



Closing the gap: Areas to Strengthen Cooperation



RD&D requires interconnection with other innovation related policy fields



Alignment of national and local governments to foster local innovation and facilitate bureaucracy in RD&D



Focus of RD&D efforts on national macro-objectives



Intensifying regional information exchange on RD&D of RET



Technology centers, networks and skilled management catalyze cooperation in RD&D

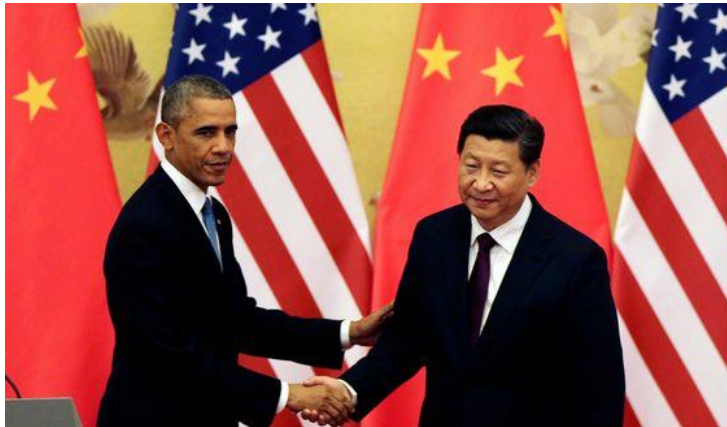


Diversifying the funding portfolio for RD&D



Implementation of incentives to reward research of RET

4 SUPPORTING INTERNATIONAL COOPERATION



U.S.-China Joint Announcement on Climate Change



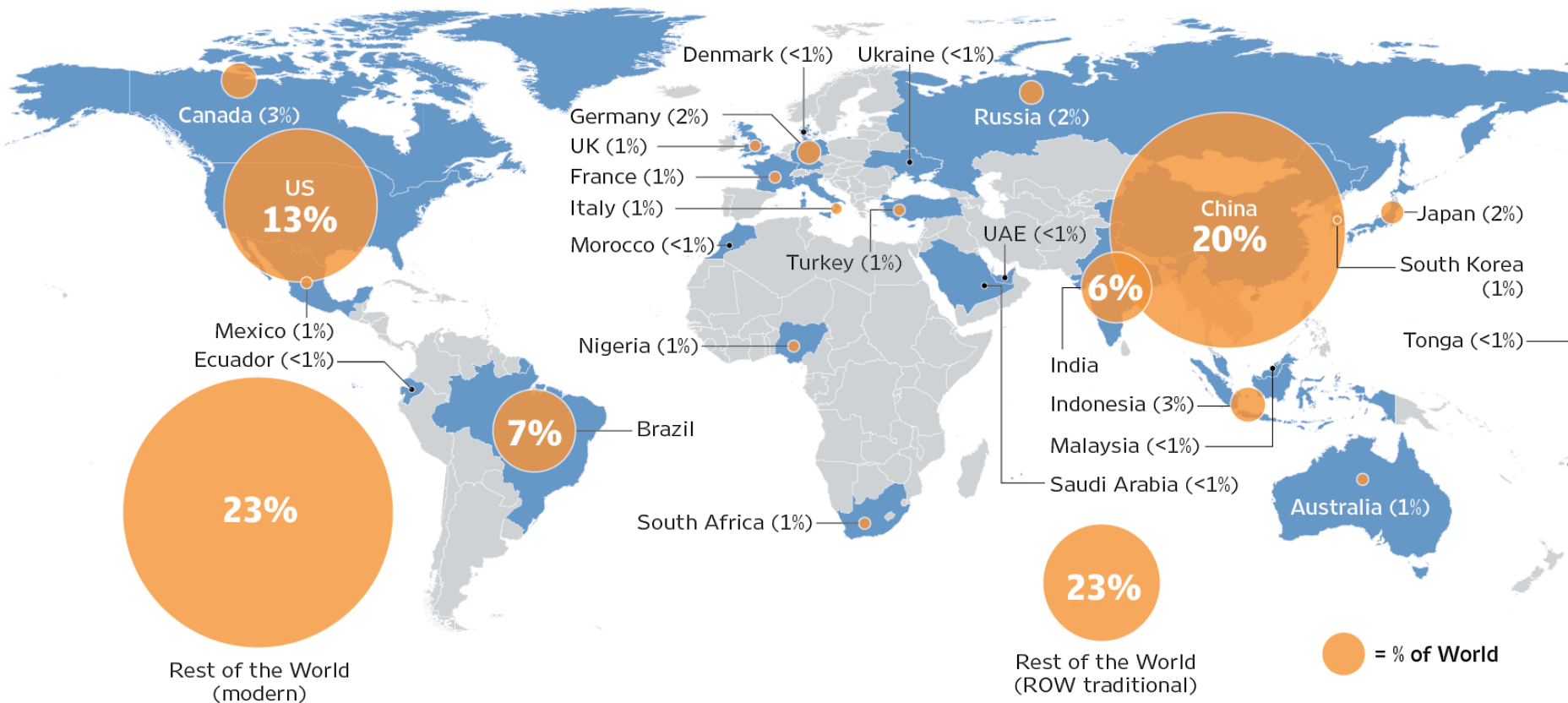
“We support strong and effective action to address climate change, consistent with the United Nations framework convention on climate change and its agreed outcomes.”

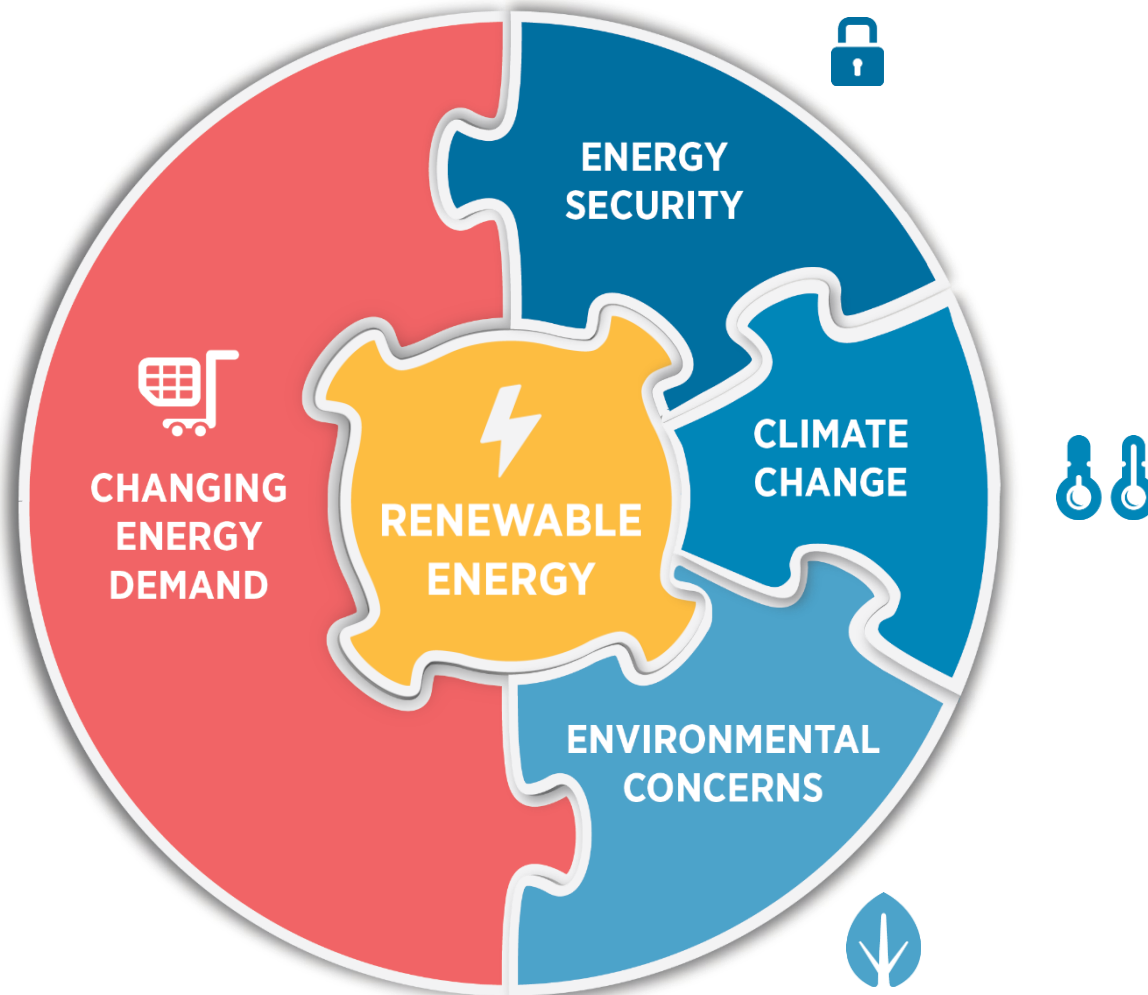


RENEWABLES CLUB "We in Germany do not stand alone with our Energiewende, but are a part of a strong group of leaders."

Contribution to global RE use in REmap 2030

Breakdown of Total Global Renewable Energy Use in 2030 (%)











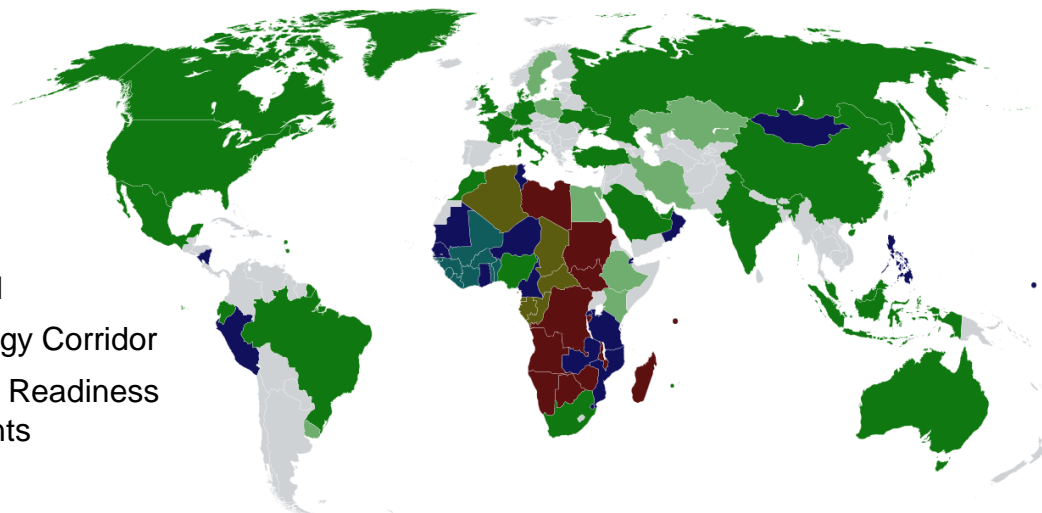
IRENA's role in international cooperation

VOICE



ADVISORY ROLE

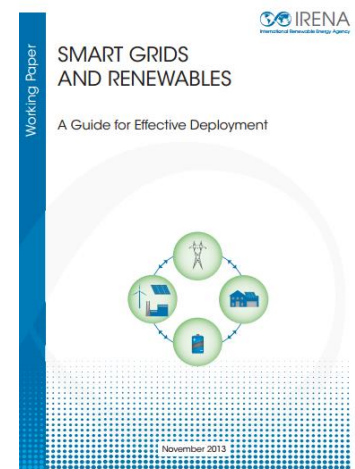
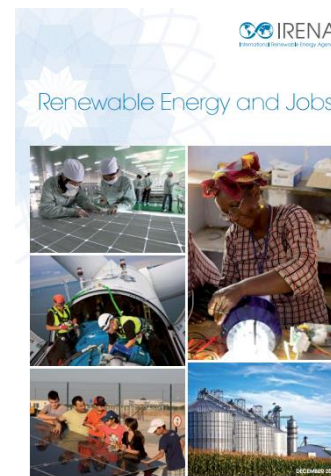
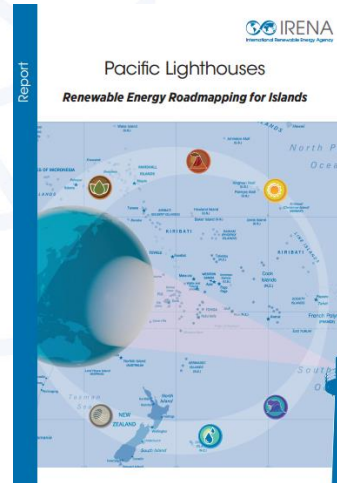
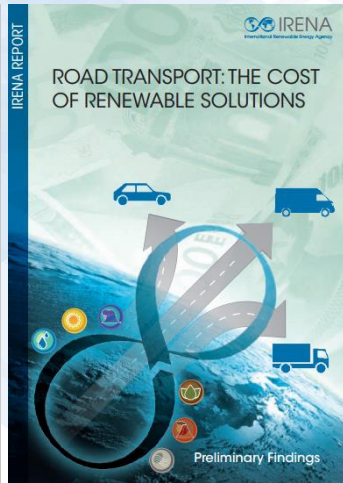
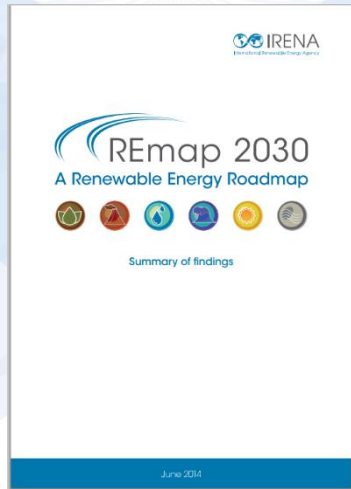
-  REmap 26
-  REmap +11
-  Clean Energy Corridor
-  Renewable Readiness Assessments
-  WAPP
-  CAPP



KNOWLEDGE HUB

The screenshot shows the IRENA Knowledge Hub website. It features a navigation menu with 'GlobalAtlas' and 'Overview of Solar and Wind Maps'. The main content area includes sections for 'About Costing', 'In Focus', 'Publications', 'Charts', 'Patents', 'Renewable Energy Costs', 'Technology Costs', 'Presentations', 'Events', and 'IRENA Renewable Costing Alliance'. The footer includes 'Fast facts' and 'Advanced bar charts to be competitive with'.

Thank You



www.irena.org

