Opportunities for renewable energy deployment
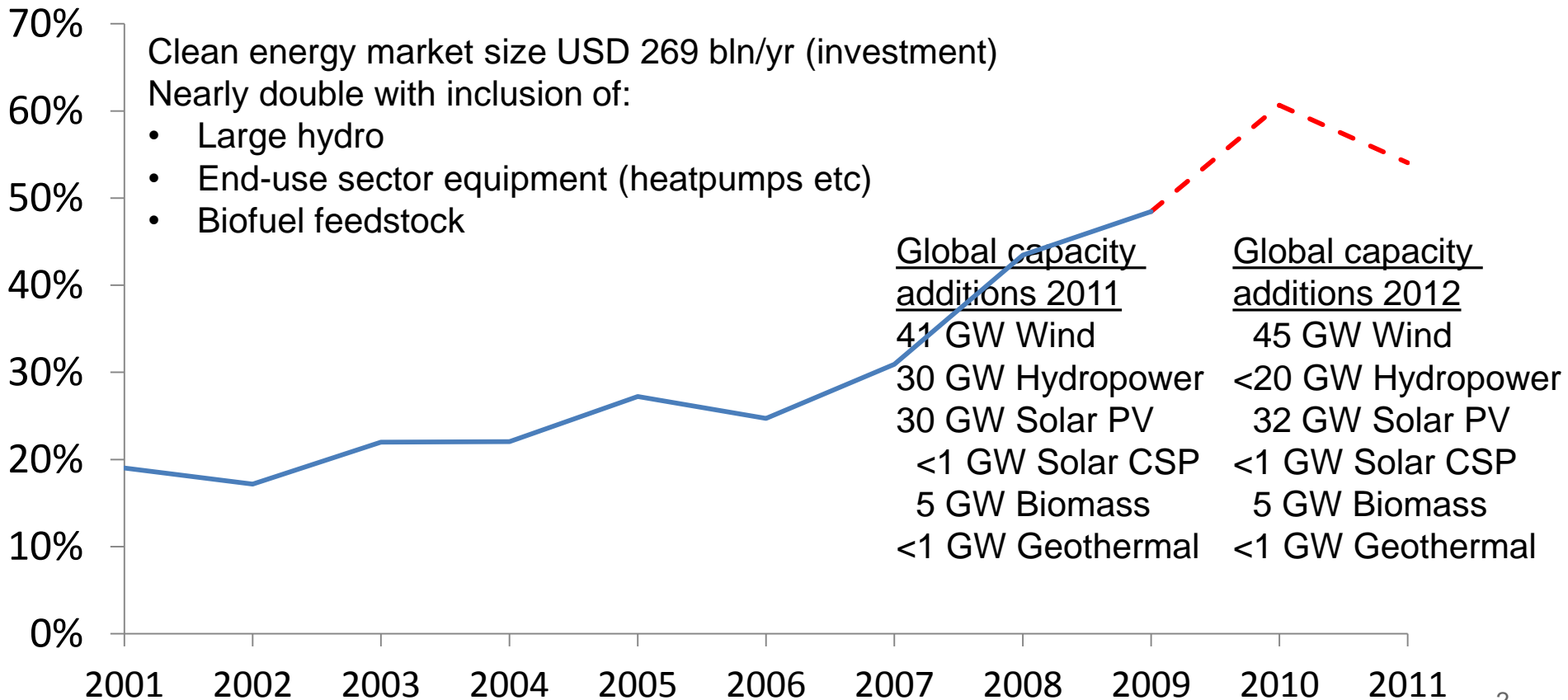
Dolf Gielen
Director IITC

UNFCCC ADP
Bonn, 30 April 2013

About half of the new electricity generation capacity worldwide is based on renewable energy
The share has doubled in recent years

Clean energy market size USD 269 bln/yr (investment)
Nearly double with inclusion of:
- Large hydro
- End-use sector equipment (heatpumps etc)
- Biofuel feedstock

Global capacity additions 2011
41 GW Wind
30 GW Hydropower
30 GW Solar PV
<1 GW Solar CSP
5 GW Biomass
<1 GW Geothermal

Global capacity additions 2012
45 GW Wind
<20 GW Hydropower
32 GW Solar PV
<1 GW Solar CSP
5 GW Biomass
<1 GW Geothermal

Source: IRENA

Outlook

- Electricity accounts for less than a quarter of energy use (TFC) in 2030
  - Key market segment but broader scope is needed
- In 2012 renewable power market stabilization at high level
  - Growth of solar, wind capacity additions compared to 2011
- Grid parity – in Spain 30 GW PV proposed by developers - without feed-in tariff !
- Today 5 000 GW installed capacity, about 8 000 – 9 000 GW in 2030
- Likely outcome more than half of all capacity will be renewable in 2030 – *in a business as usual scenario, more is possible*
  - 1500 GW + of hydro (>1000 GW today)
  - 1000 GW + of wind (> 280 GW today)
  - 1000 GW + of solar PV (> 100 GW today)
  - 200 GW + of biomass (biogas, co-combustion, steam boilers, gasification)
  - Plus CSP, geothermal, marine 50 GW +

Sustainable Energy for All SE4ALL

SE4ALL is part of Rio+20 sustainability conference outcome June 2012
2014-2024 UN decade of SE4ALL
1st advisory board meeting 19 April
       Chaired by UN SG and President of World Bank
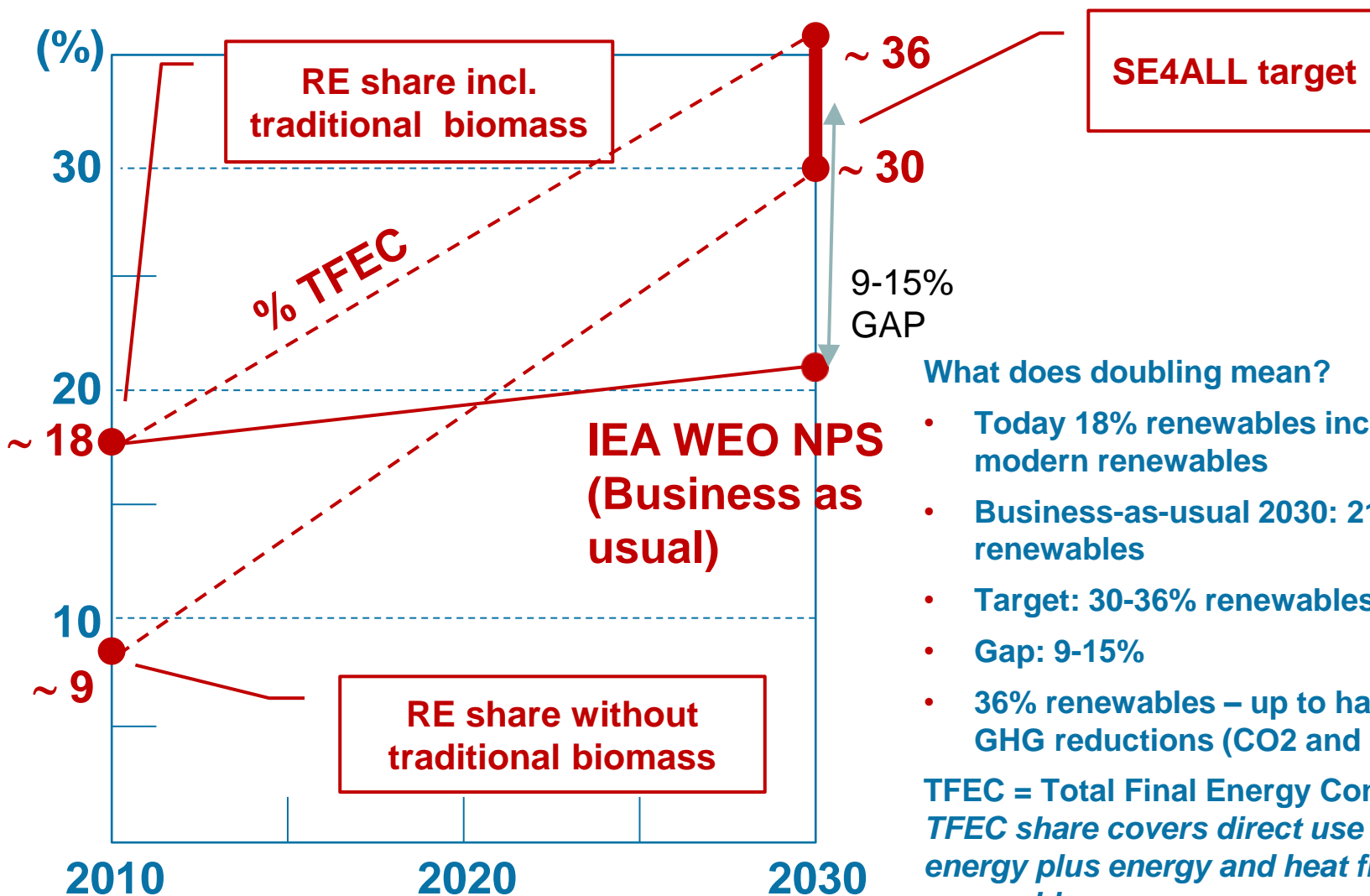   IRENA DG Adnan Amin is an advisory board member
A public-private partnership (governments, finance institutions, equipment manufacturers, utilities, international organizations, NGOs, foundations)

Three objectives:
- Universal access to modern energy by 2030
- Doubling of rate of energy efficiency gains
- Doubling the renewable energy share
  - *IRENA is the hub for renewable energy*

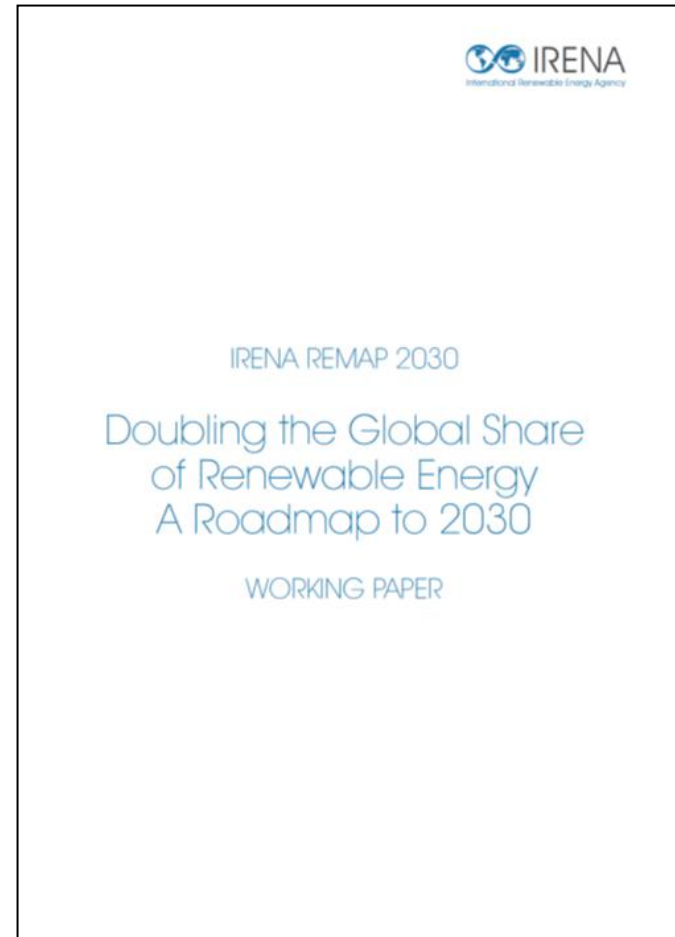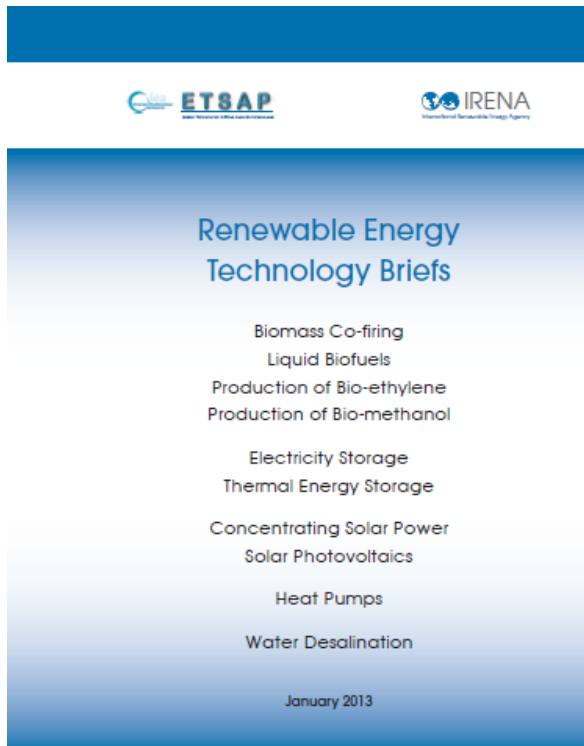# What does it mean to double the RE share?

IRENA
International Renewable Energy Agency

SE4ALL target

- **(%)**
- RE share incl. traditional biomass
- ~ 36
- ~ 30
- % TFEC
- 30
- 9-15% GAP
- 20
- ~ 18
- **IEA WEO NPS (Business as usual)**
- 10
- ~ 9
- RE share without traditional biomass
- 2010
- 2020
- 2030

What does doubling mean?

- Today 18% renewables including 9% modern renewables
- Business-as-usual 2030: 21% renewables
- Target: 30-36% renewables
- Gap: 9-15%
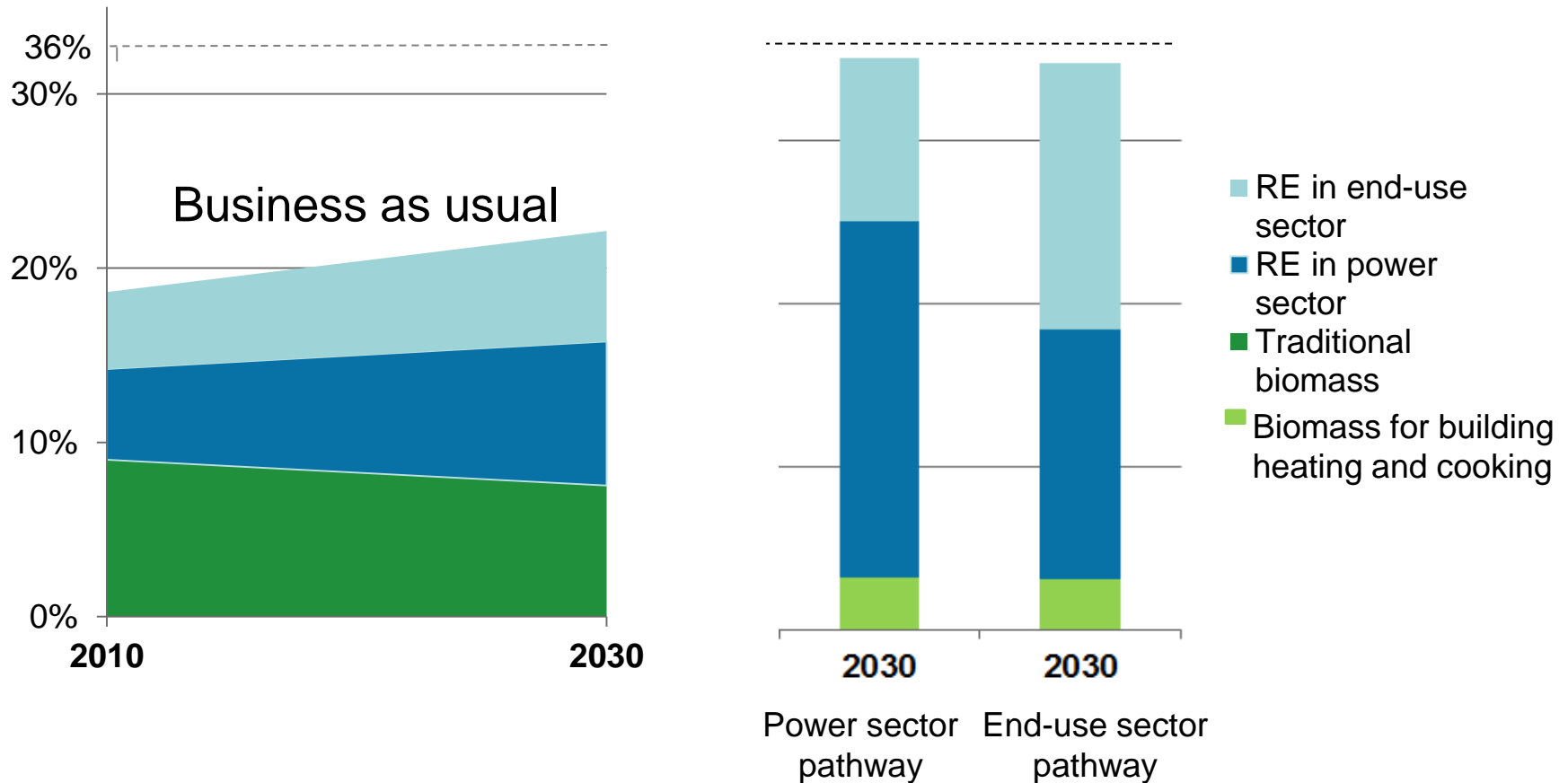- 36% renewables – up to half of global GHG reductions (CO_2 and CH_4)

TFEC = Total Final Energy Consumption
TFEC share covers direct use of renewable energy plus energy and heat from renewable sources
Global Tracking Framework – May 2013

HOW TO FILL THE GAP?

ETSAP   IRENA

Renewable Energy Technology Briefs

Biomass Co-firing
Liquid Biofuels
Production of Bio-ethylene
Production of Bio-methanol

Electricity Storage
Thermal Energy Storage

Concentrating Solar Power
Solar Photovoltaics

Heat Pumps

Water Desalination

January 2013

IRENA
International Renewable Energy Agency

IRENA REMAP 2030

Doubling the Global Share of Renewable Energy
A Roadmap to 2030

WORKING PAPER

January 2013
www.irena.org

Possible pathways towards 2030

Share of renewables in global final energy consumption

Business as usual

2010 — 2030

Power sector pathway

End-use sector pathway

- RE in end-use sector
- RE in power sector
- Traditional biomass
- Biomass for building heating and cooking

The target is technically feasible
There is no single "true" pathway
Power sector and end-use sector action needed
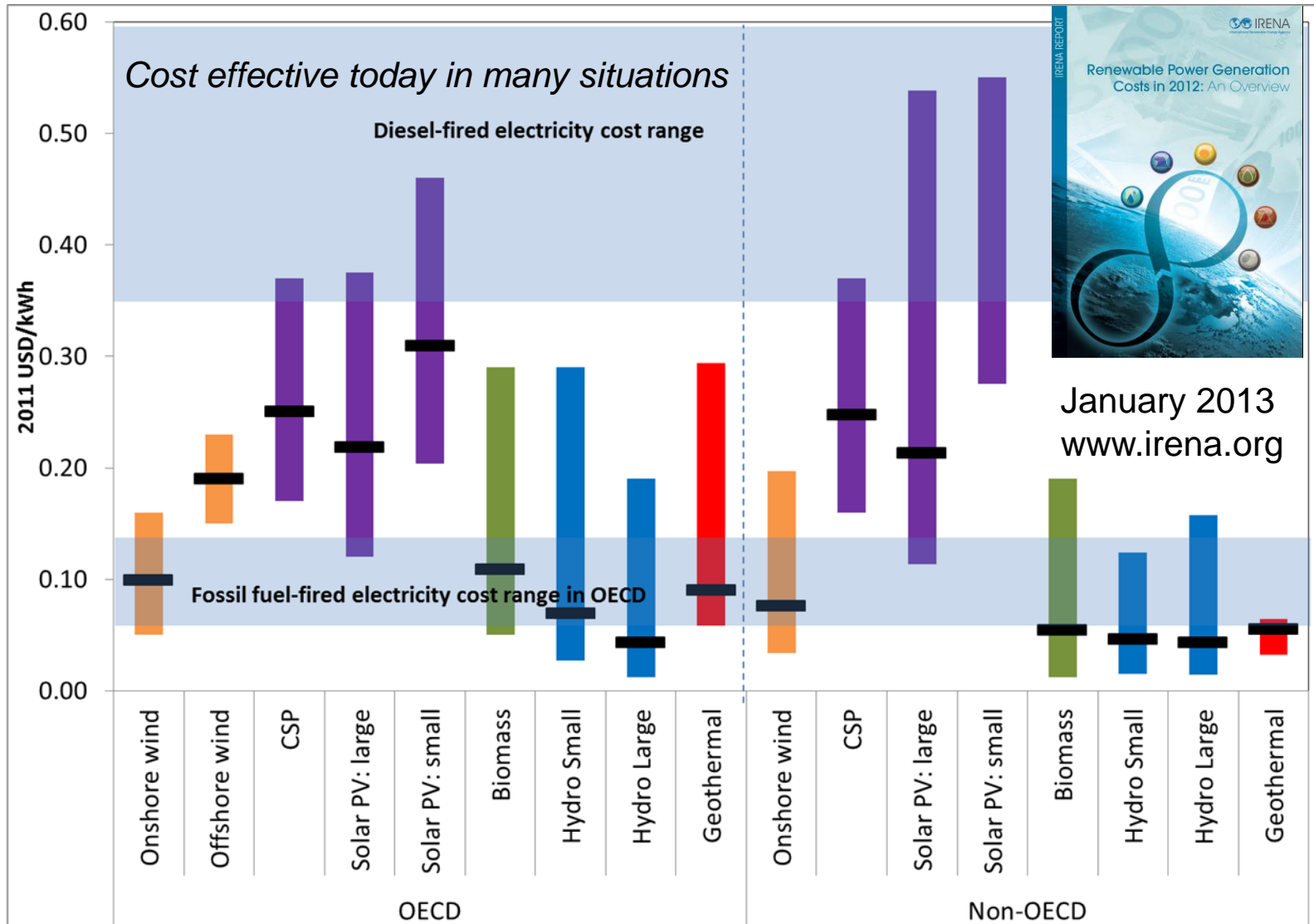
7

Country Analysis: Timeline and Scope

❑ Questions:

- Cost and benefits of an RE transition

- How to fill the gap - Country, sector, technology potentials

- Global consequences of national action

❑ 20 countries invited in the first phase covering 70% of energy use

❑ DRAFT results to be presented at the IRENA Council June 2013

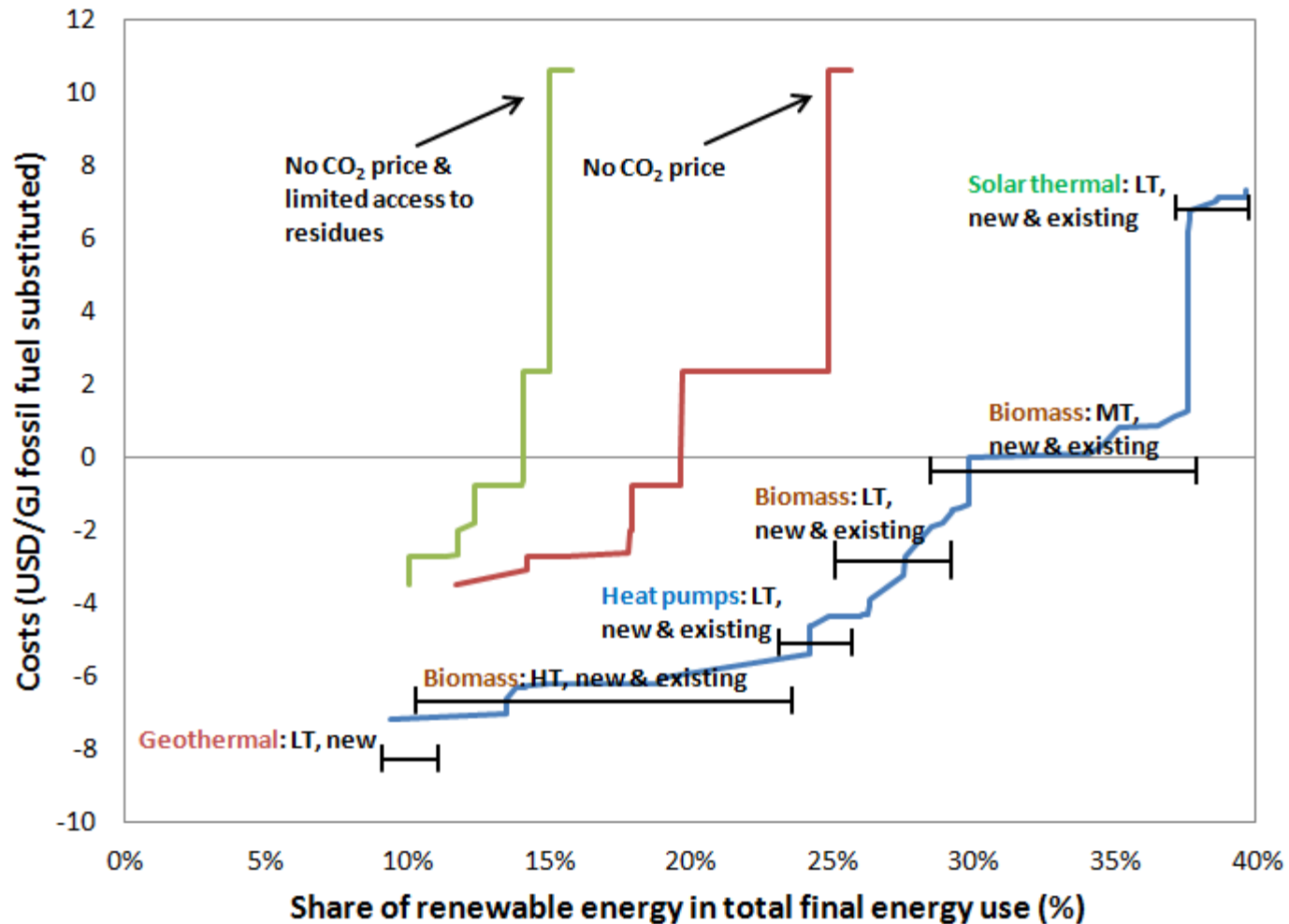❑ Final results to be presented at the IRENA Assembly in January 2014

COST OF RENEWABLE POWER

Cost effective today in many situations

Diesel-fired electricity cost range

Fossil fuel-fired electricity cost range in OECD

January 2013
www.irena.org

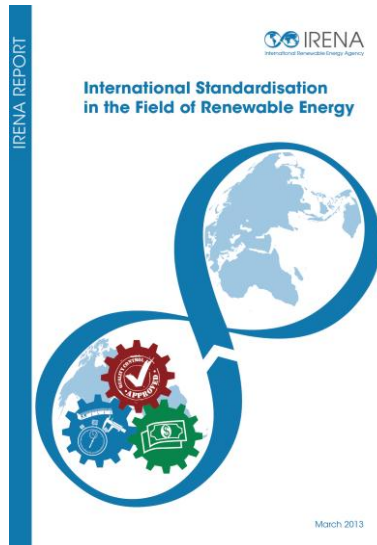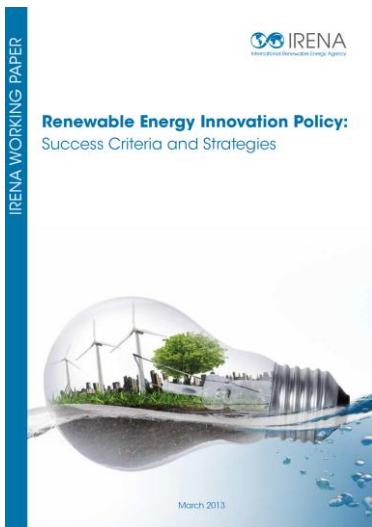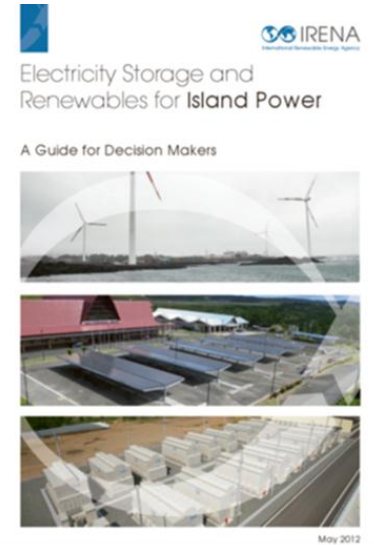Note: assumes a 10% cost of capital

Source: IRENA

DRAFT Cost curve for renewables in manufacturing industry (REMAP)

Other ongoing IRENA work

- Abu Dhabi Fund for Development
  - USD 350 M for innovative project financing
- Renewables readiness assessment
- Project development navigator
- Policy instruments and financing
- Global renewable energy islands network GREIN
  - Island roadmap and grid stability clusters

- Roadmaps grids and storage for Renewable Energy integration
- Innovation cluster: IPR, standards, policy frameworks, technology transfer

About IRENA

International Renewable Energy Agency

Established April 2011

The intergovernmental RE agency

Mission: Accelerate deployment of renewable energy

Scope: Hub, voice and source of objective information for renewable energy

Members: 160 partner countries; 109 ratifications

Mandate: Sustainable deployment of the six RE resources (Biomass, Geothermal, Hydro, Ocean, Solar, Wind)

Location: Headquarters in Abu Dhabi, United Arab Emirates Innovation and Technology Centre IITC, Bonn, Germany

Director-General: Adnan Amin

THANK YOU!
WWW.IRENA.ORG