

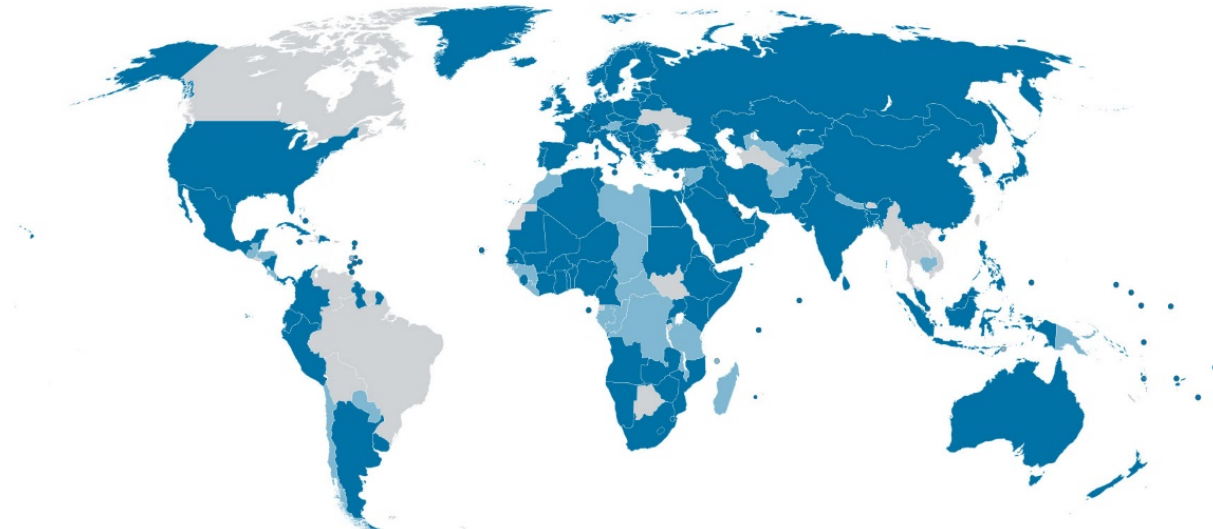
India's Role in Shaping the Transition to a Global Renewable Energy System



Dolf Gielen
WRETC New Delhi
23 August 2015

The International Renewable Energy Agency (IRENA)

Currently 143 members, 29 Signatories/States in Accession



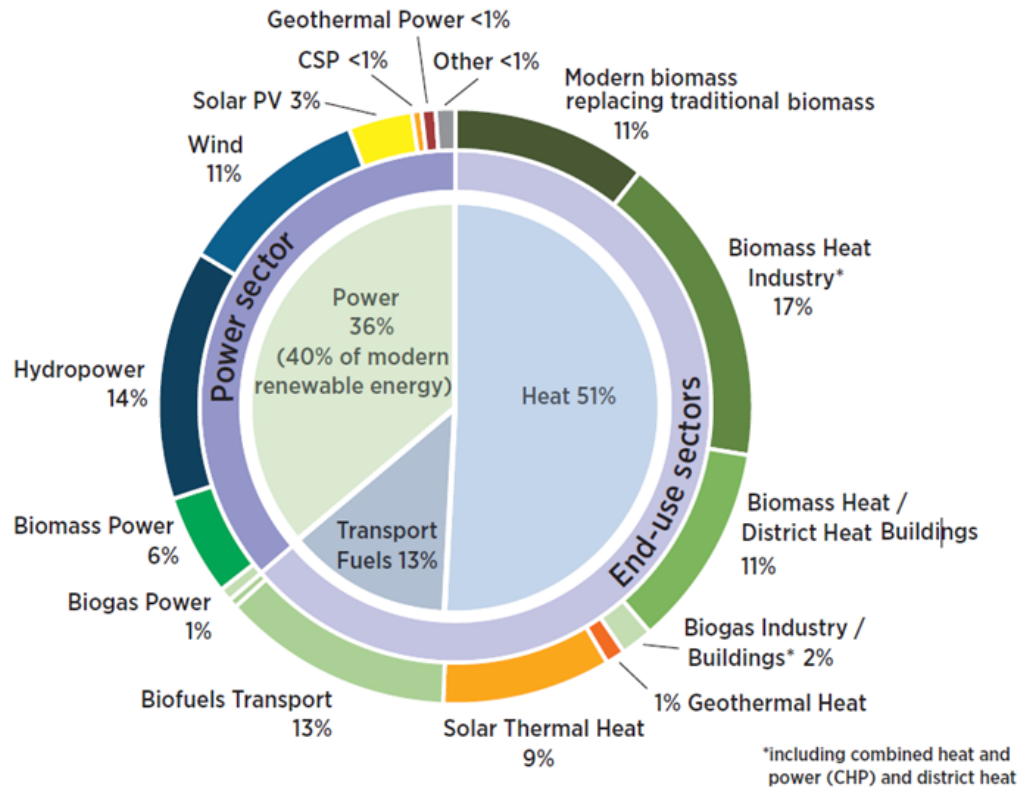
Renewable energy can:

- Meet our goals for **secure, reliable** and **sustainable** energy
- Provide **electricity access** to 1.3 billion people
- Promote **economic development and Jobs (7.7 M jobs today)**
- At an **affordable cost. Solar UAE 6 USct/kWh, Wind Egypt 4 USct/kWh**

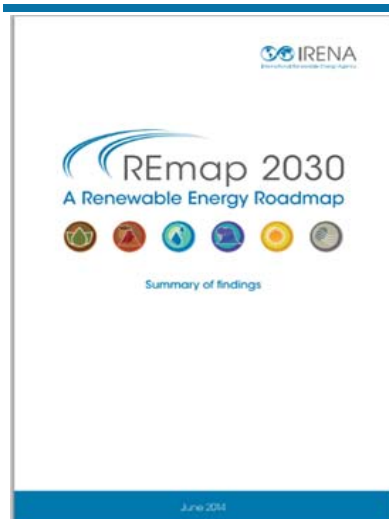
- **Doubling the RE share from 18% in 2010 to 36% in 2030 is feasible with existing technologies**
 - Higher shares in power generation
 - More attention needed for heating and transportation fuels
- **Significant cost effective growth potential; doubling makes economic sense when externalities are accounted for**
 - However these are not reflected in today's prices and markets are distorted because of energy subsidies
 - Macro-economic benefits include more jobs; economic activity; health benefits; a cleaner environment; a higher level of energy security
- **Biomass is key resource**
- **Potential exists in all countries, but options mix and cost vary**

Global RE use in 2030 including REmap Options

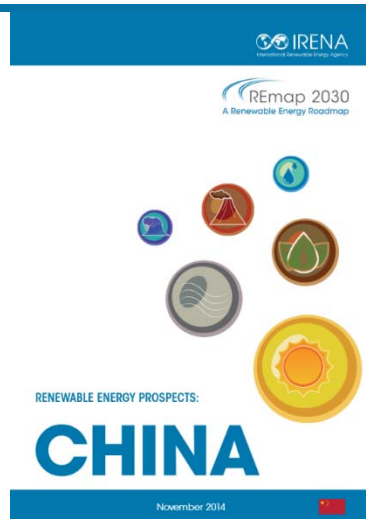
Remap 2030 – 132 EJ (final energy) – transport and heating are key



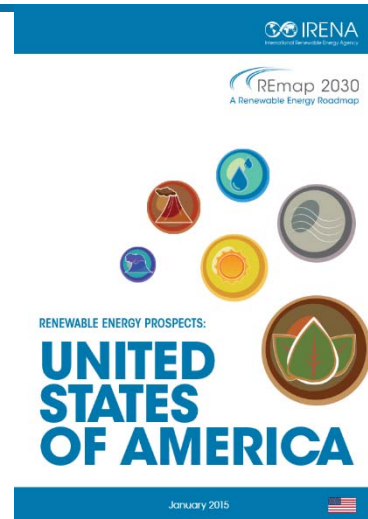
REmap deep country dives



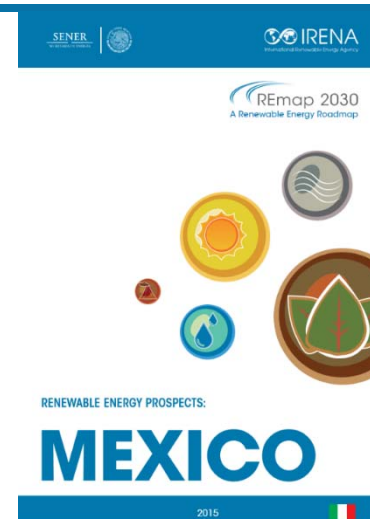
June 2014



November 2014



January 2015

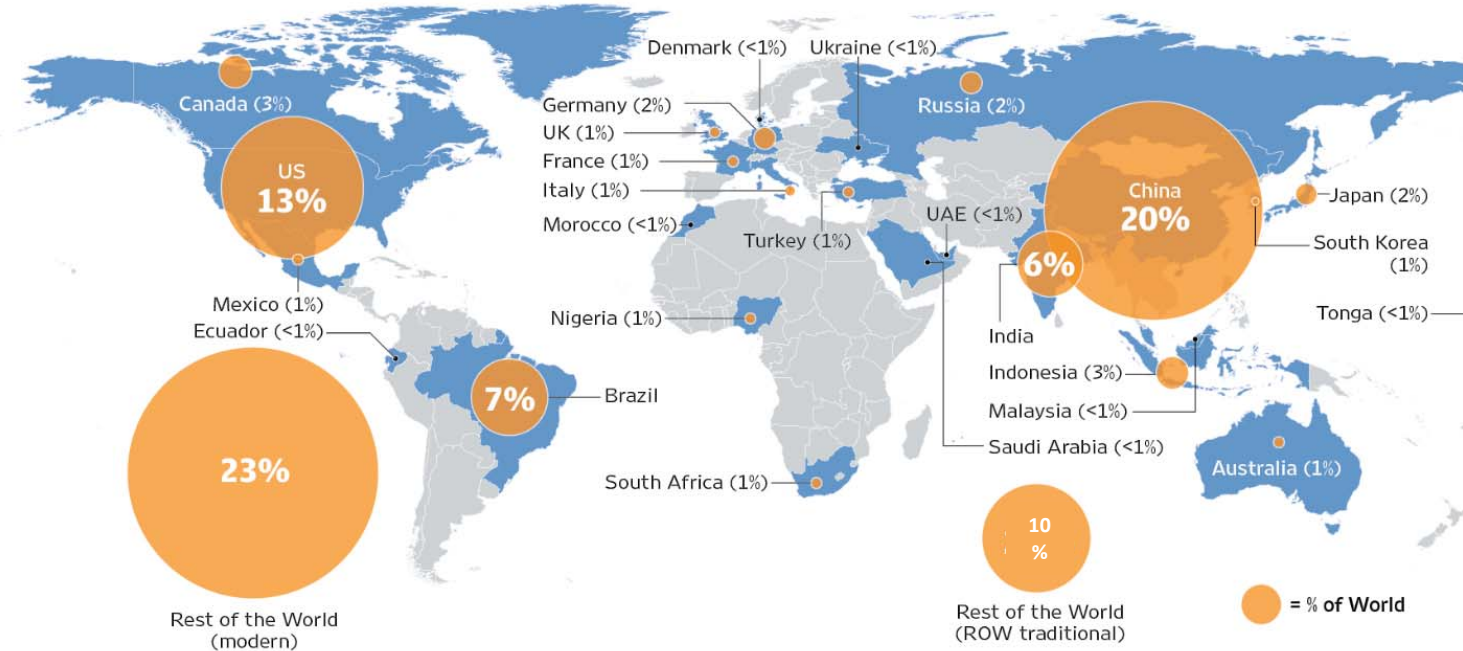


May 2015

- Translate analysis into actionable options for a major share of global energy use
- Poland and Ukraine working papers
- Germany, **India**, Russia, South Africa, Turkey country reports in preparation. Other country reports under discussion
- Input for G20 discussions

Mapping out the Renewable Energy Transition

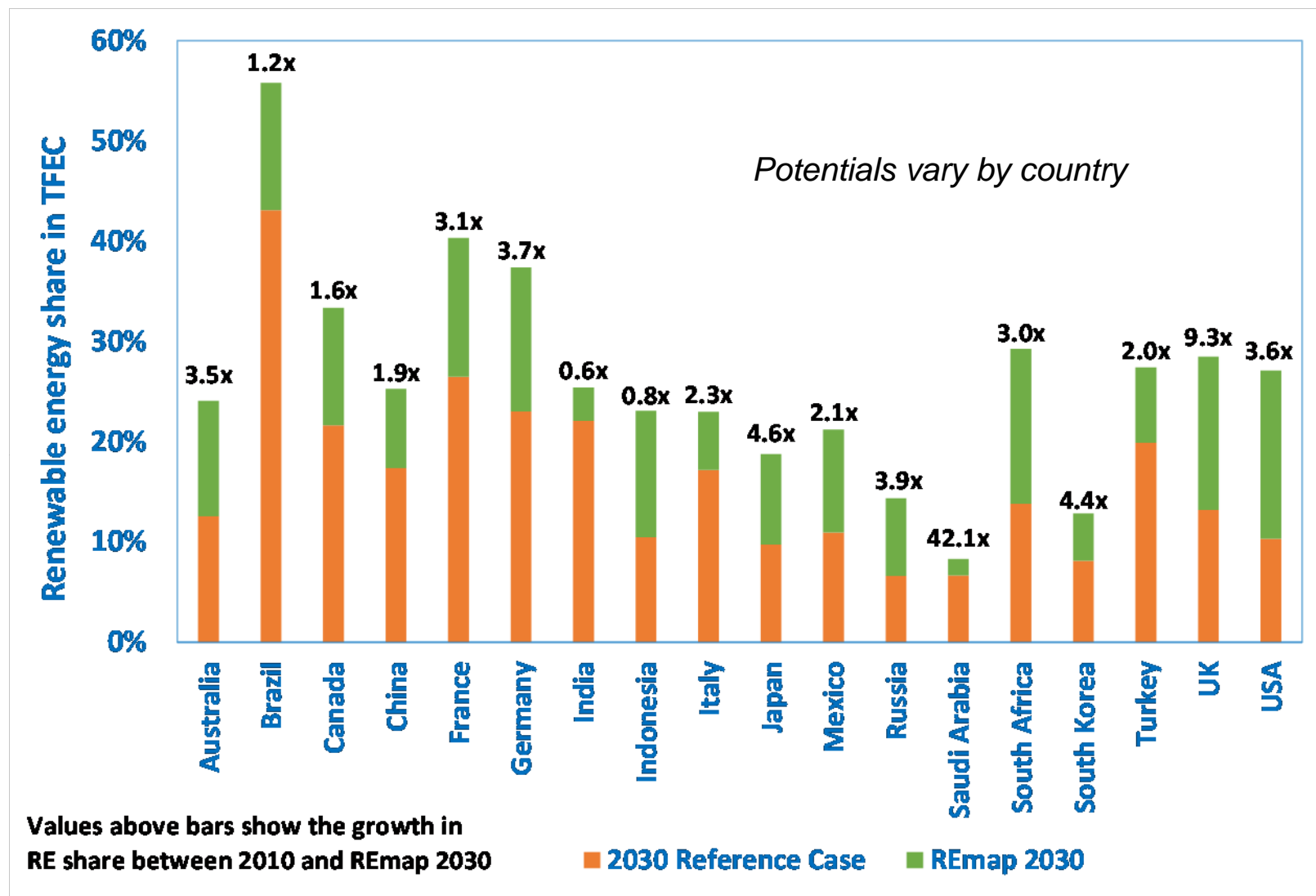
Breakdown of Total Global Renewable Energy Use in 2030 (%)



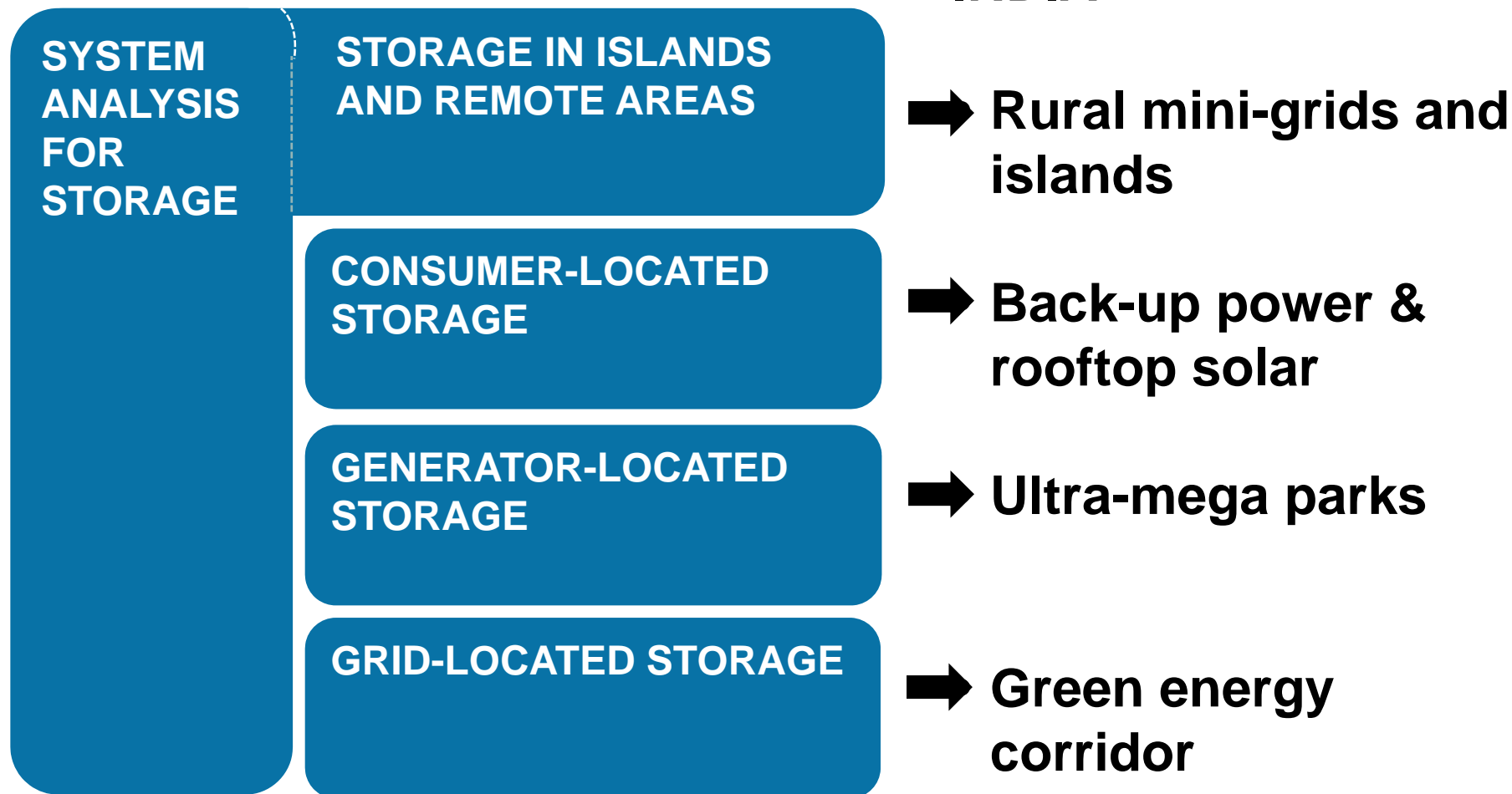
26 countries – 75% of global energy consumption – Realistic potential to scale-up renewables

Renewable energy prospects

Important untapped economic potential



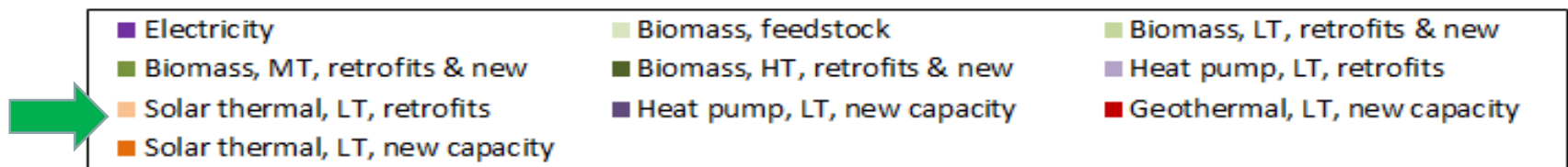
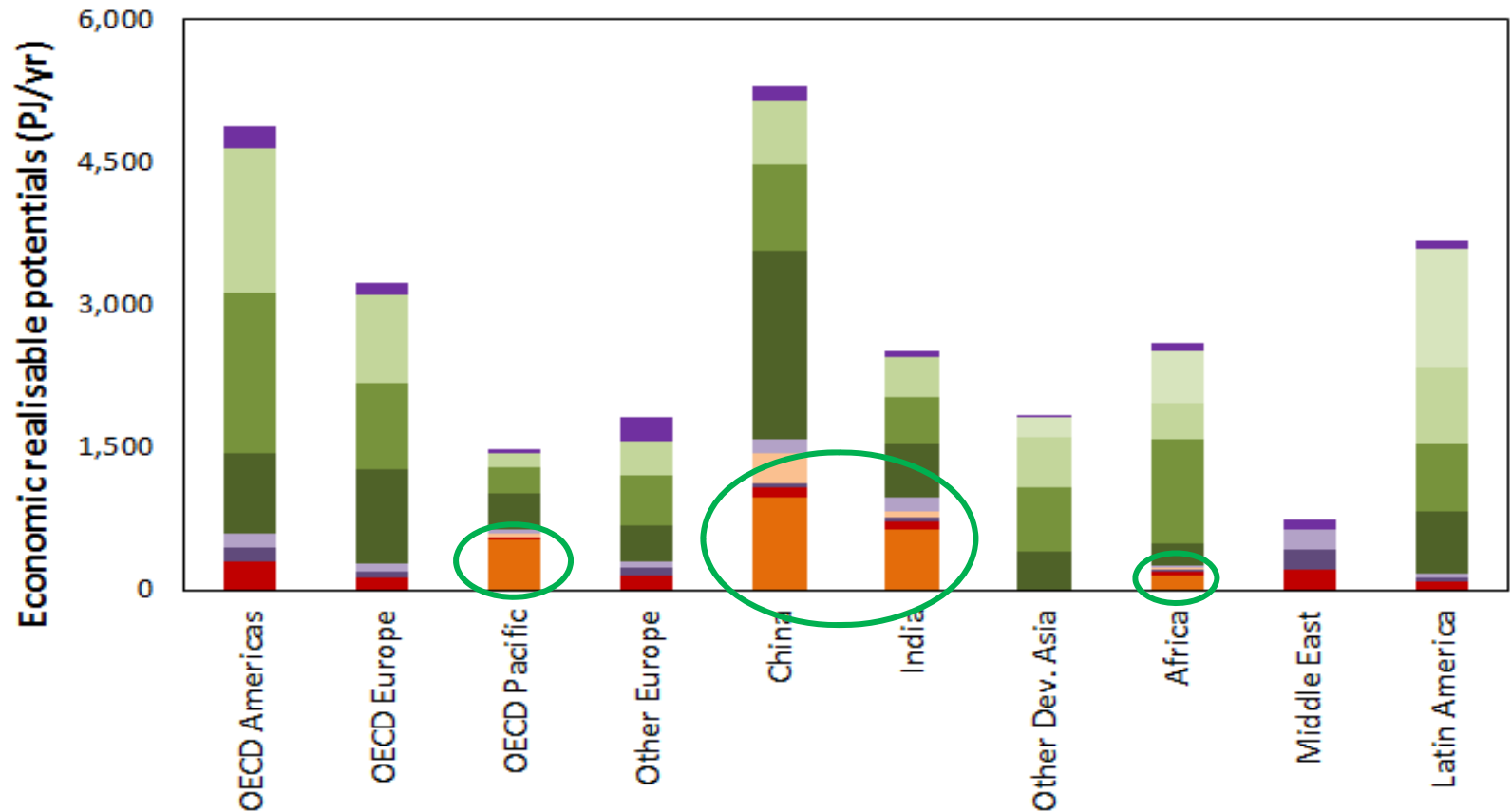
- Modern renewables can grow from 17% to 25%
- Renewable power can grow from 14 to 35% (incl large hydro) – 538 GW potential in 2030
- 36% of potential in power sector, 64% in end use sectors – 10 EJ modern renewables
- Average cost USD 5 bln – benefits USD 80-200 bln in 2030
 - 750 Mt CO₂ reduction
 - Important health benefits
 - A major share of electricity access
- USD 45 bln/yr renewables investment needs until 2030
- Potential and cost findings are comparable to those for other countries
- Drivers are different:



Opportunities in SMEs in India

Sector	Opportunities	Barriers	Solutions/Strategies
Dairy	<ul style="list-style-type: none"> - Production in areas with high solar radiation - 6% reaches market place - Hot water for hygiene 	<ul style="list-style-type: none"> - 75% of farmers are small/poor - Highly diverse players within supply chain - Quality first - No measurements 	<ul style="list-style-type: none"> - Renewable energy technologies can support changes in supply chain structures
Tea	<ul style="list-style-type: none"> - Energy = 40% of costs - 49% energy from wood - Mandated fuel switch - Add-on solutions - Improvement of product quality 	<ul style="list-style-type: none"> - Conservative - Shortage in cash flow - Land leases - Labour shortage - Monthly variations - 24-hour operations 	<ul style="list-style-type: none"> - Research and development (R&D) for reduction in labour processes - Interstate wheeling and banking of wind energy
Foundry	<ul style="list-style-type: none"> - Short payback times - 95% in SME clusters 	<ul style="list-style-type: none"> - Small percentage of costs - Highly competitive - Education levels are low 	<ul style="list-style-type: none"> - Technology transfer between clusters
Textile	<ul style="list-style-type: none"> - Large energy replacement potential in spinning, weaving and finishing - Low productivity, low quality - Heat/Power ratio ideal 	<ul style="list-style-type: none"> - Delivery total demand - Improvement of product quality is only concern - Unorganised sector 	<ul style="list-style-type: none"> - Data sharing can become part of Memorandum of Understandings to support renewable energy applications

RE Potentials in Industry



Thank You!

