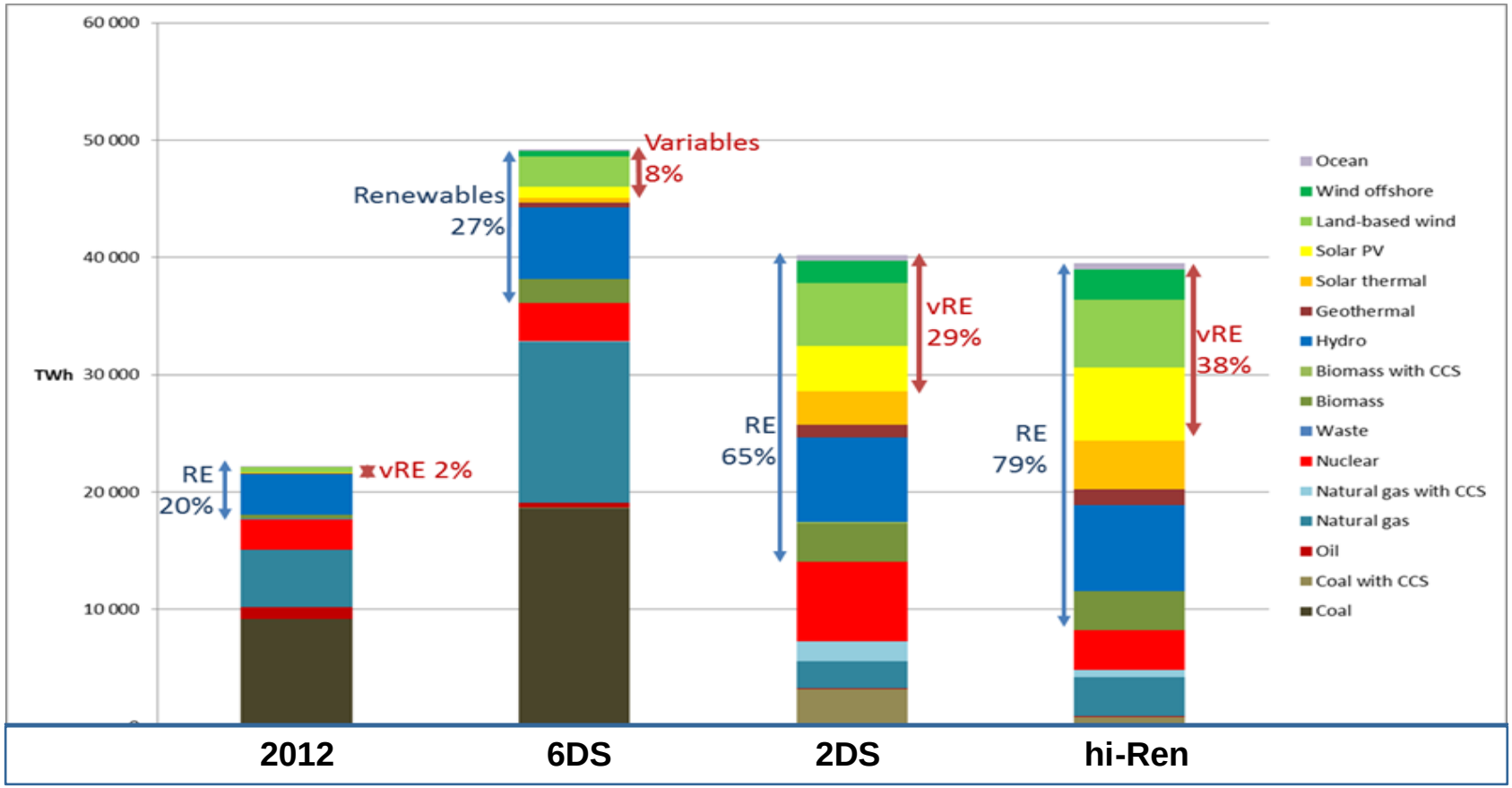
A shift reversal

ETP 2014

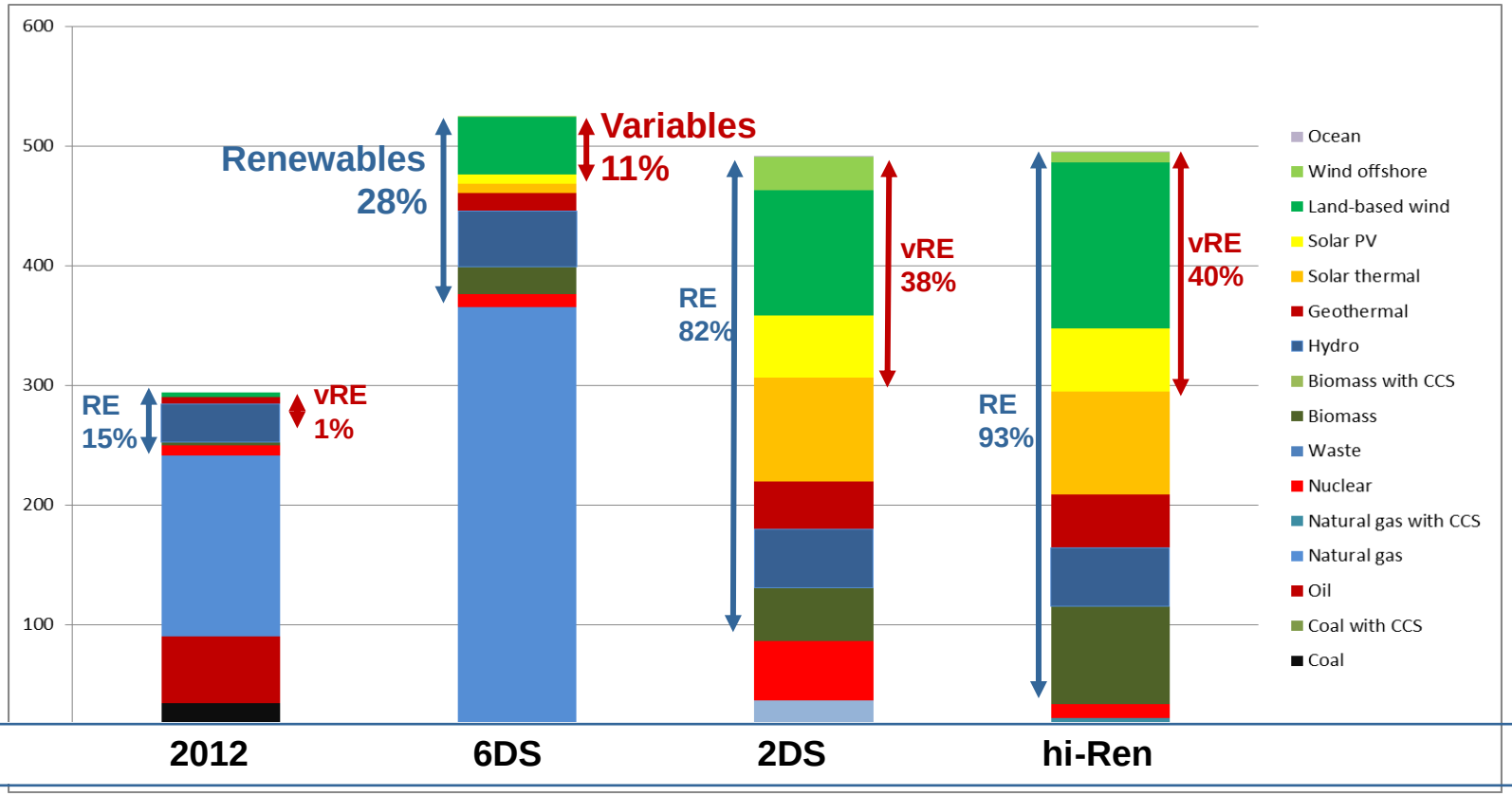


- **Generation today:**
  - **Fossil fuels: 68%**
  - **Renewables: 20%**
- **Generation 2DS 2050/hi-Ren:**
  - **Renewables: 65 - 79%**
  - **Fossil fuels: 20 - 12%**

International Energy Agency

Possible power mixes of Mexico by 2050 in ETP model

ETP 2014



- **Generation today:**
  - **Fossil fuels: 68%**
  - **Renewables: 15%**
- **Generation 2DS 2050/hi-Ren:**
  - **Renewables: 82 - 93%**
  - **Fossil fuels: 20 - 12%**

International Energy Agency

Possible renewables for power in Mexico by 2030

ETP 2014

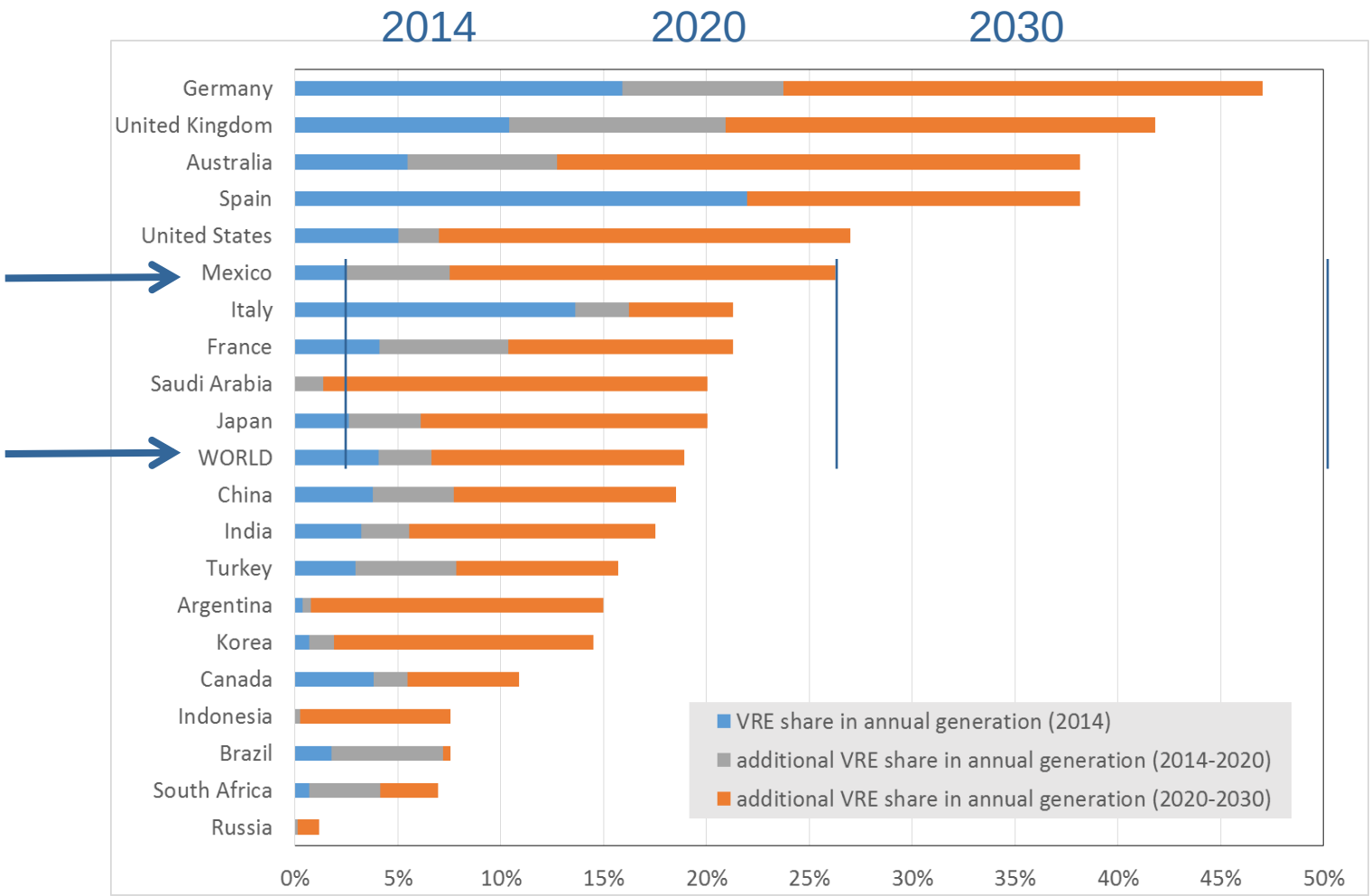
- IEA's 2DS hi-REN scenario is about halving global energy-related CO2 emissions by 2050, with constraints on nuclear and CCS.
- IRENA's Remap 2030 scenario is about doubling the share of renewables in the global energy mix by 2030

GW	IRENA REMap by 2030	IEA hi-REN by 2030	IEA hi-REN By 2050
Hydropower	25.3	15	16
Biopower	2.8	3	11
Geothermal	4.3	3	6
Wind power	31	23	53
Photovoltaics	30	7	37
STE/CSP	1.5	3	17

International Energy Agency

Shares of vRE in annual generation

ETP 2014



International Energy Agency

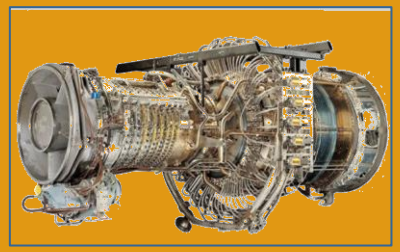
vRE integration requies flexibility

Technology spread

Geograph spread

Design of power plants

System friendly VRE



Investments

Operations

2.3 Challenges Caused by Industries Electrification

- Distribution grid upgrade required by industries electrification
  - Impacts of DER and EV to distribution grid
  - Demand for expansion of LV-Grid
  - More smart control performance
- Interaction with industrial users
  - Change of load characteristic
  - User resource dispatching
  - Information exchange between grid and industrial users
  - Policy and business