

# Global Energy and CCUS

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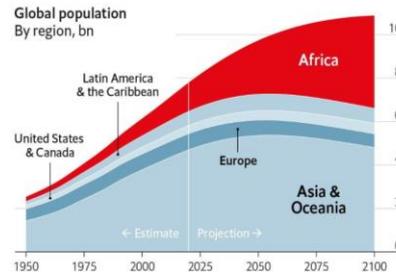
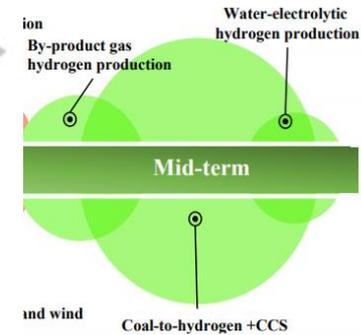
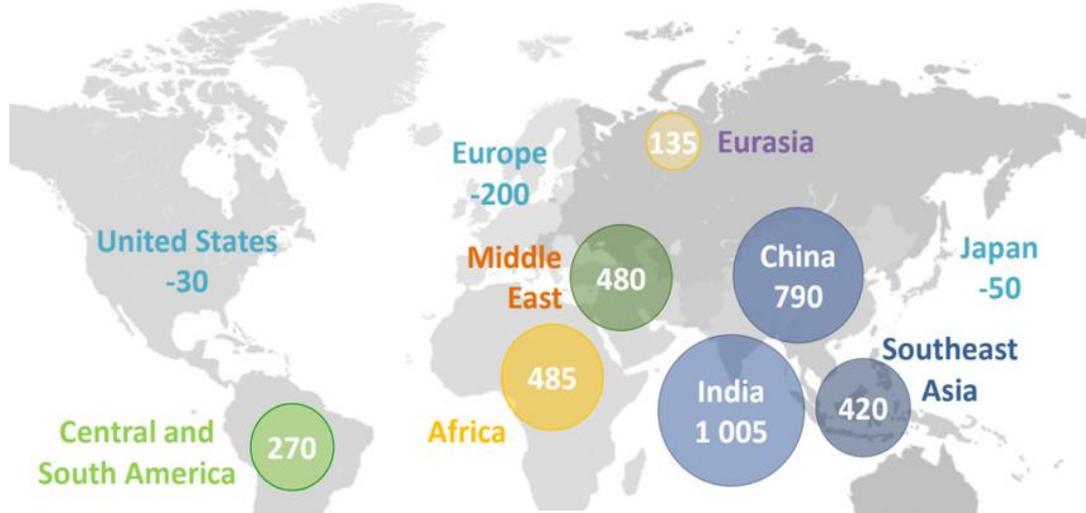
Executive Director, International Energy Agency Gas and Oil Technology Program 

Rice University, 25 September 2019

# Global Energy Demand Outlook

Incremental demand 2016 – 2040 (Mtoe)

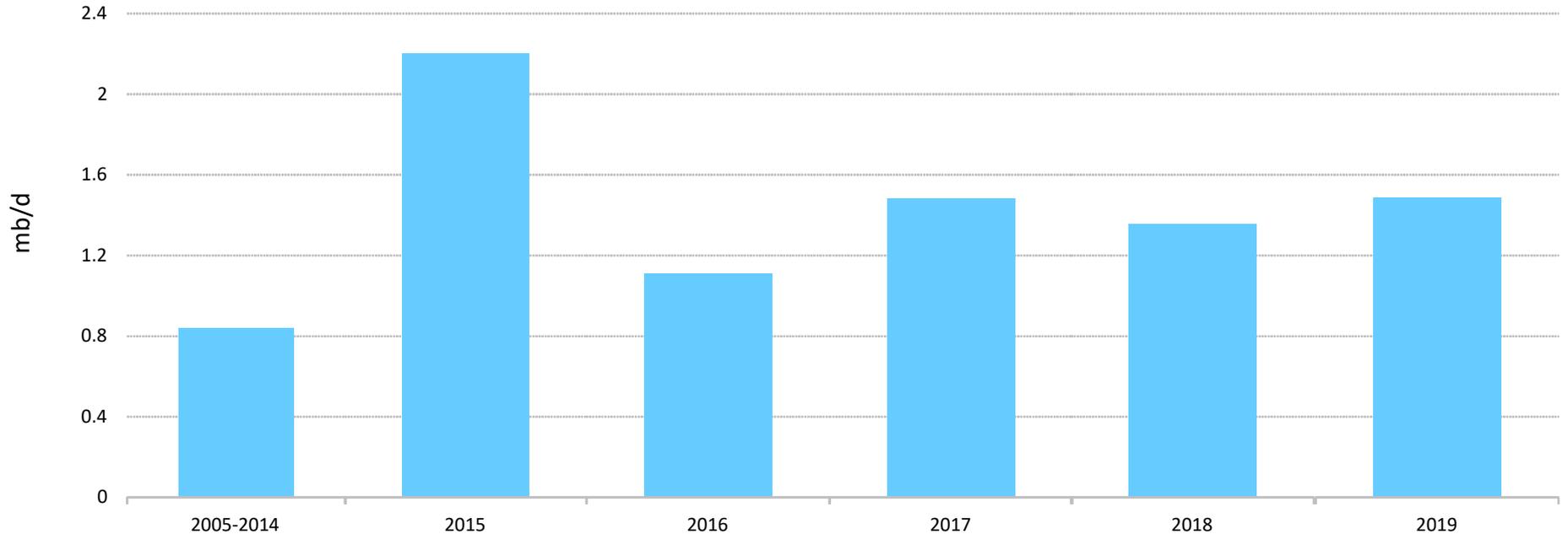
China/H2



Source: UN

Sources:  
 IEA World Energy Outlook  
 China Energy Investment Corporation/  
 China Hydrogen Alliance

# Global oil demand remains robust

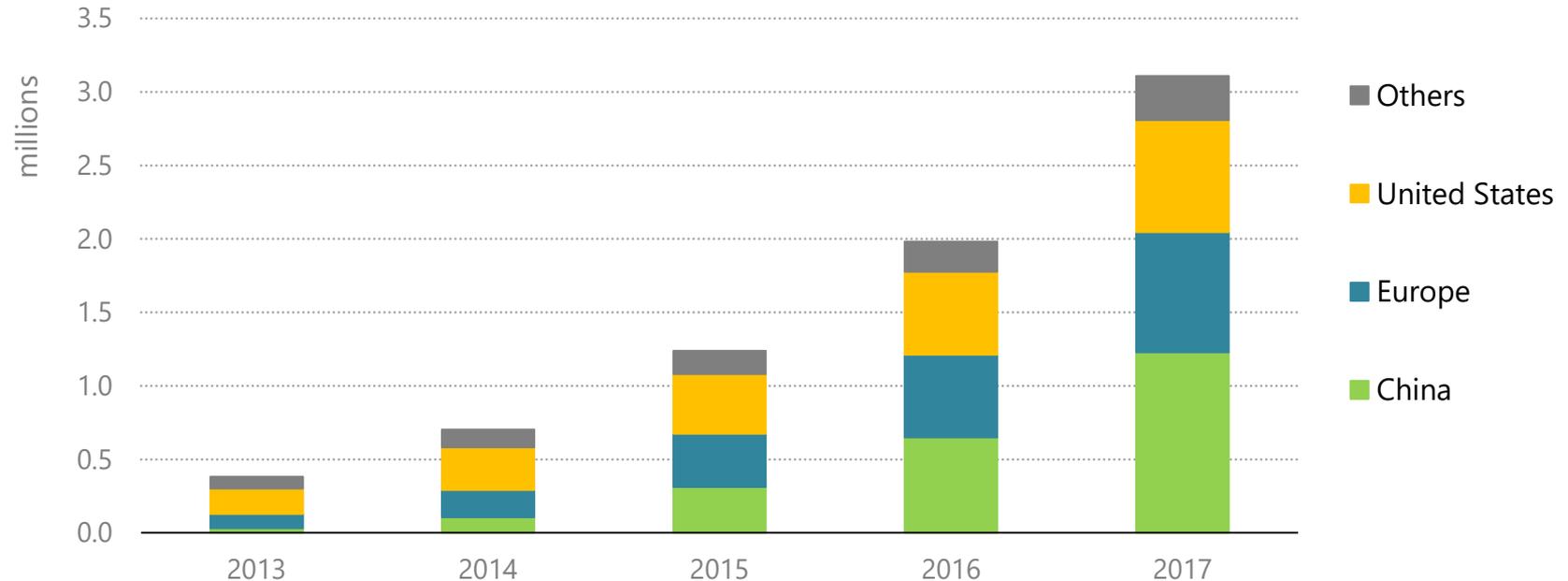


Source: IEA

**Global oil demand is set to rise by 1.5 mb/d in 2019, with China and India accounting for almost half of the increase; Petrochemicals are becoming increasingly important drivers of oil demand**

# Electric car sales continue to break records

Global electric car stock

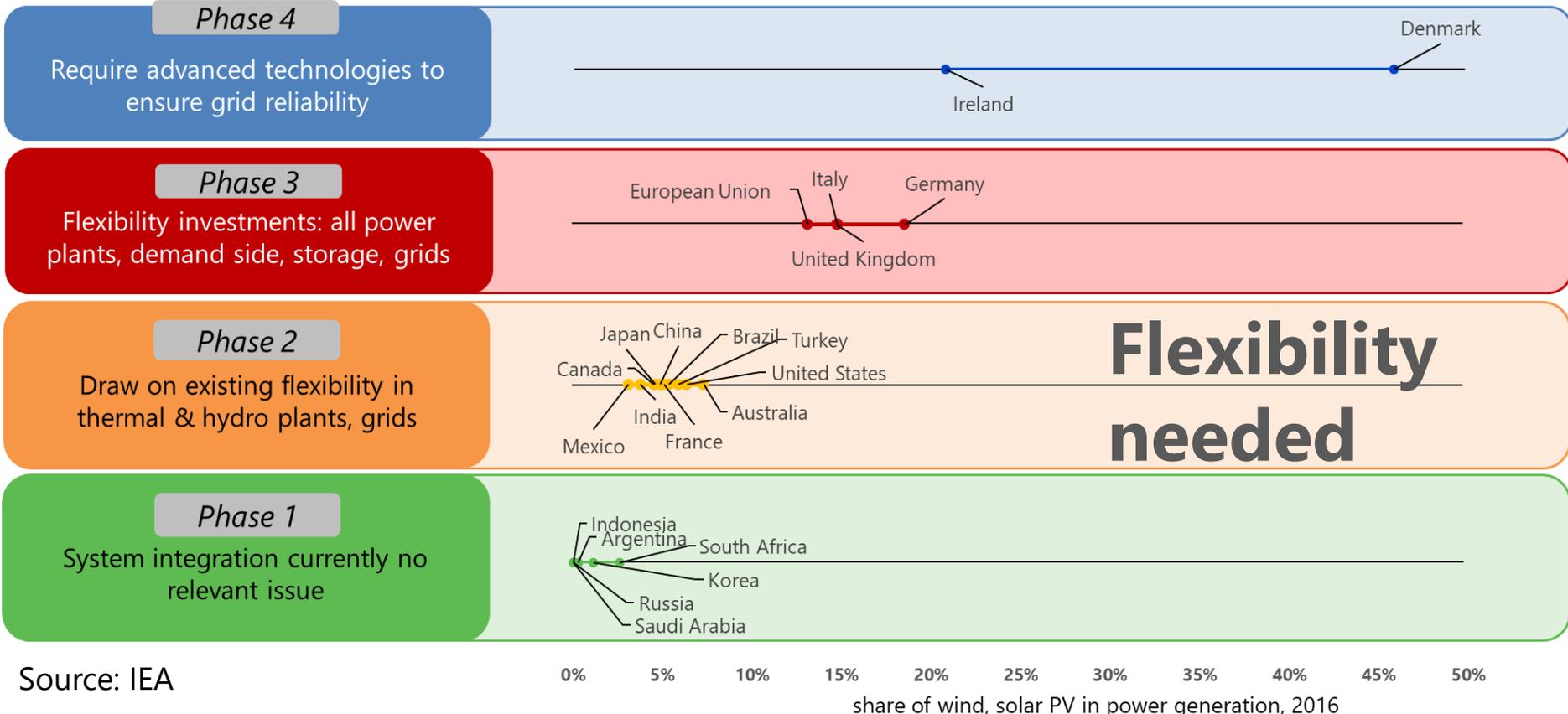


Source: IEA

**The number of passenger electric cars on the road passed 3 million in 2017, yet they still represent just 1% of global car sales**

# Wind & solar making strong inroads, but new challenges may emerge

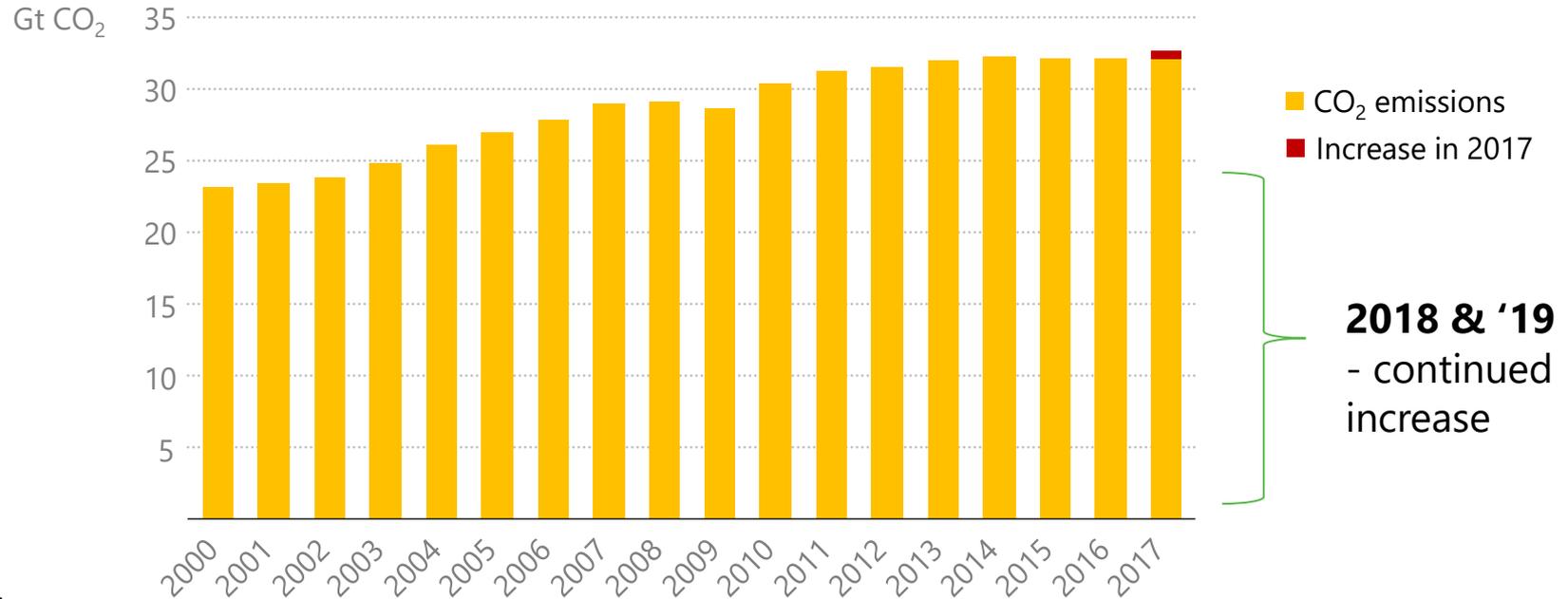
## Four phases of wind and solar integration



Source: IEA

# After plateauing for 3 years, global emissions are on the rise again

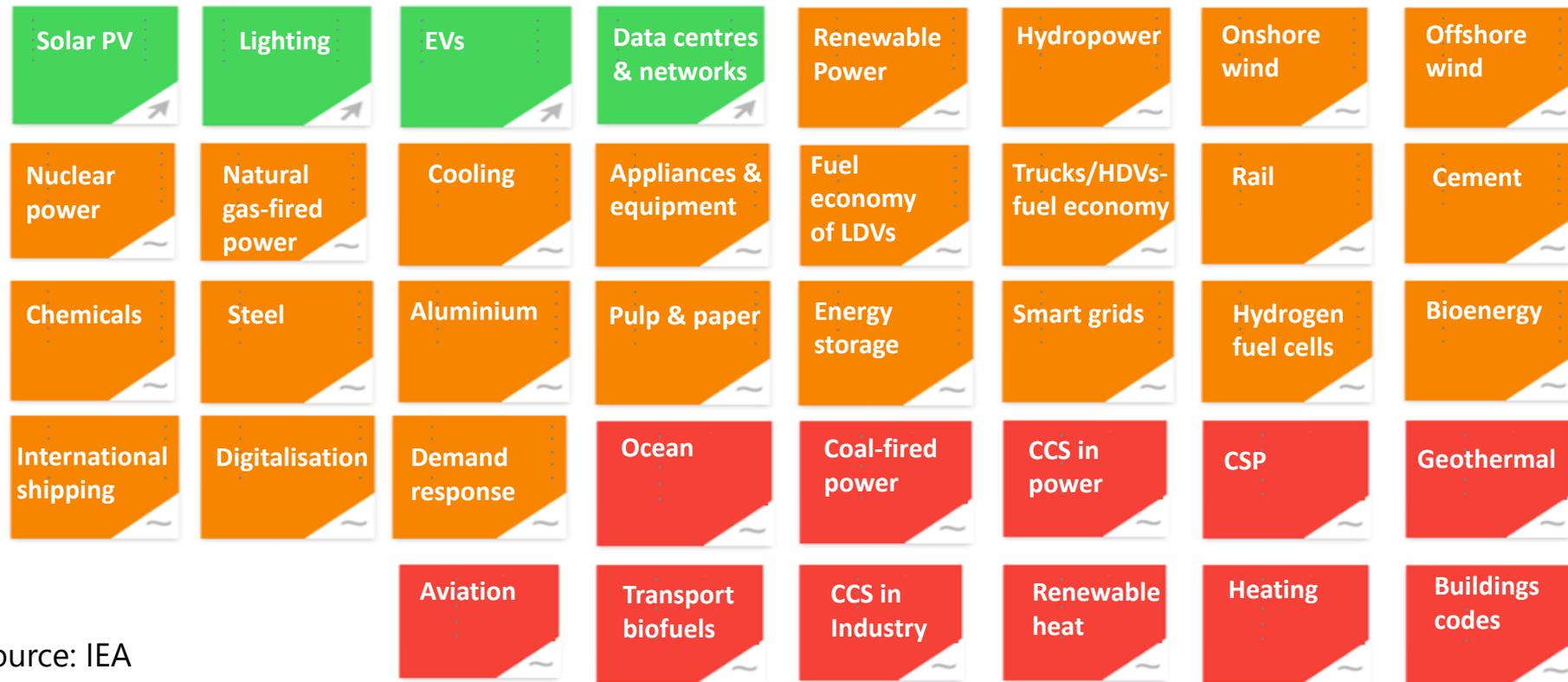
Global energy-related CO<sub>2</sub> emissions



Source: IEA

**After remaining flat for 3 years, global CO<sub>2</sub> emissions rose again in 2017, to an all-time high**

# How is clean energy technology progressing ?



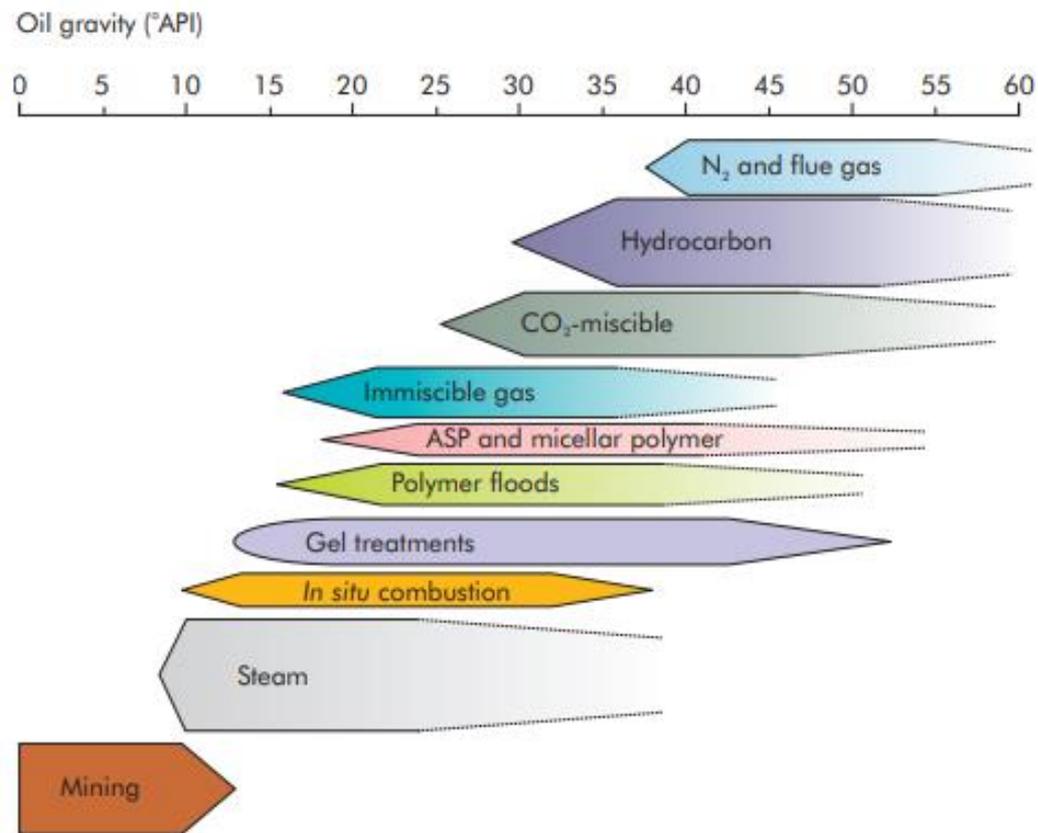
Source: IEA

**Out of the 38 technologies included in *Tracking Clean Energy Progress (TCEP) 2018*, only 4 are on track, 23 need improvement**

**Ageing oil fields lose more than 3 mb/d per year despite slowing decline rates**

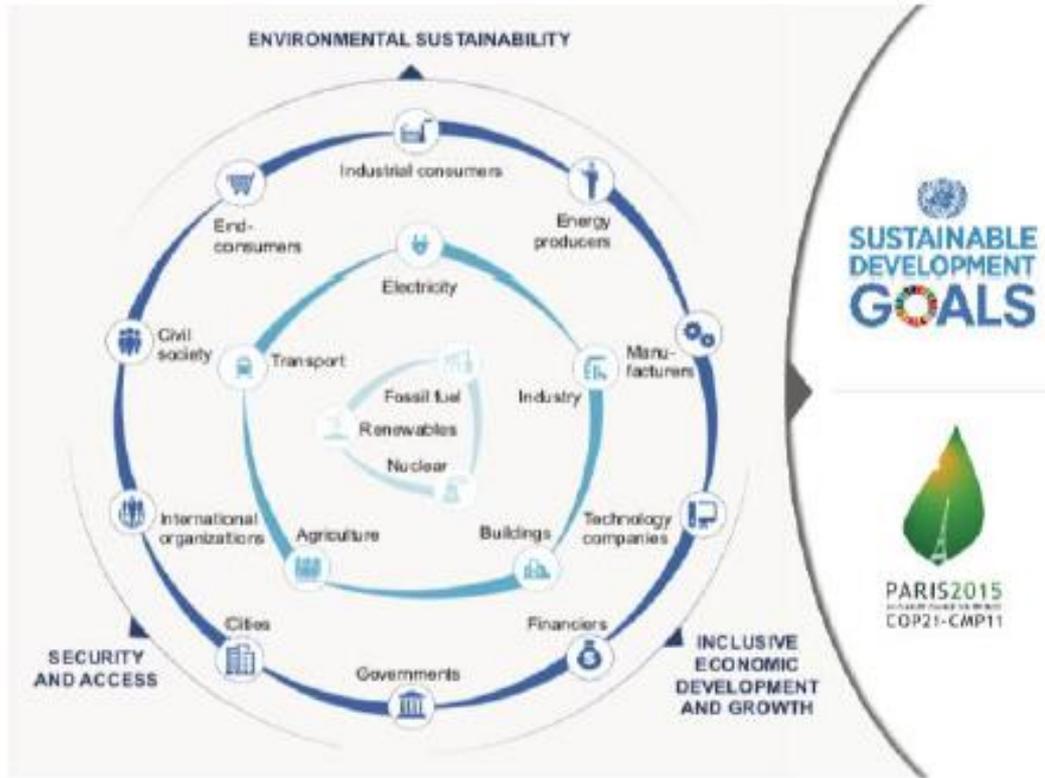
Source: IEA

# Effectiveness of EOR measures



Source: Taber, Martin and Seright, 1997.

# Energy Choice Project: Options (LCA) og Implications and Choices for Plausible Energy Futures



National Choices

Investor Choices

Implications for Technology

Source: World Economic Forum

- The need for investment in oil has not diminished, given continued growth in demand & 3 mb/d of declines from mature fields each year.
- Strong action is needed to overcome challenges of energy access, local air pollution & climate change.
- Matching local circumstances, CCUS will continue to be important in global energy developments.