

Fourth IEF-EU Energy Day

New Approaches to Promote Clean Energy Technologies and Circular Carbon Models

**International Energy Forum
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The Situation

Setting the Stage

Paris Climate Accord: 1.5°C

CCUS

Energy Storage

Affordable Energy 4 All

Renewable Energy

Circular Carbon Economy

Policies

Growing World Population
Growing Energy Demand

Energy
Technology

Conundrum: Affordable Energy 4 All + Achieve Paris Climate Goals
→ Can Only Be Achieved Through **Technology, Policies, Investment & Champions**

The Steps

Chronology

The World As Is



GCC, Europe / China, US, India & ROW



Technology & Policies

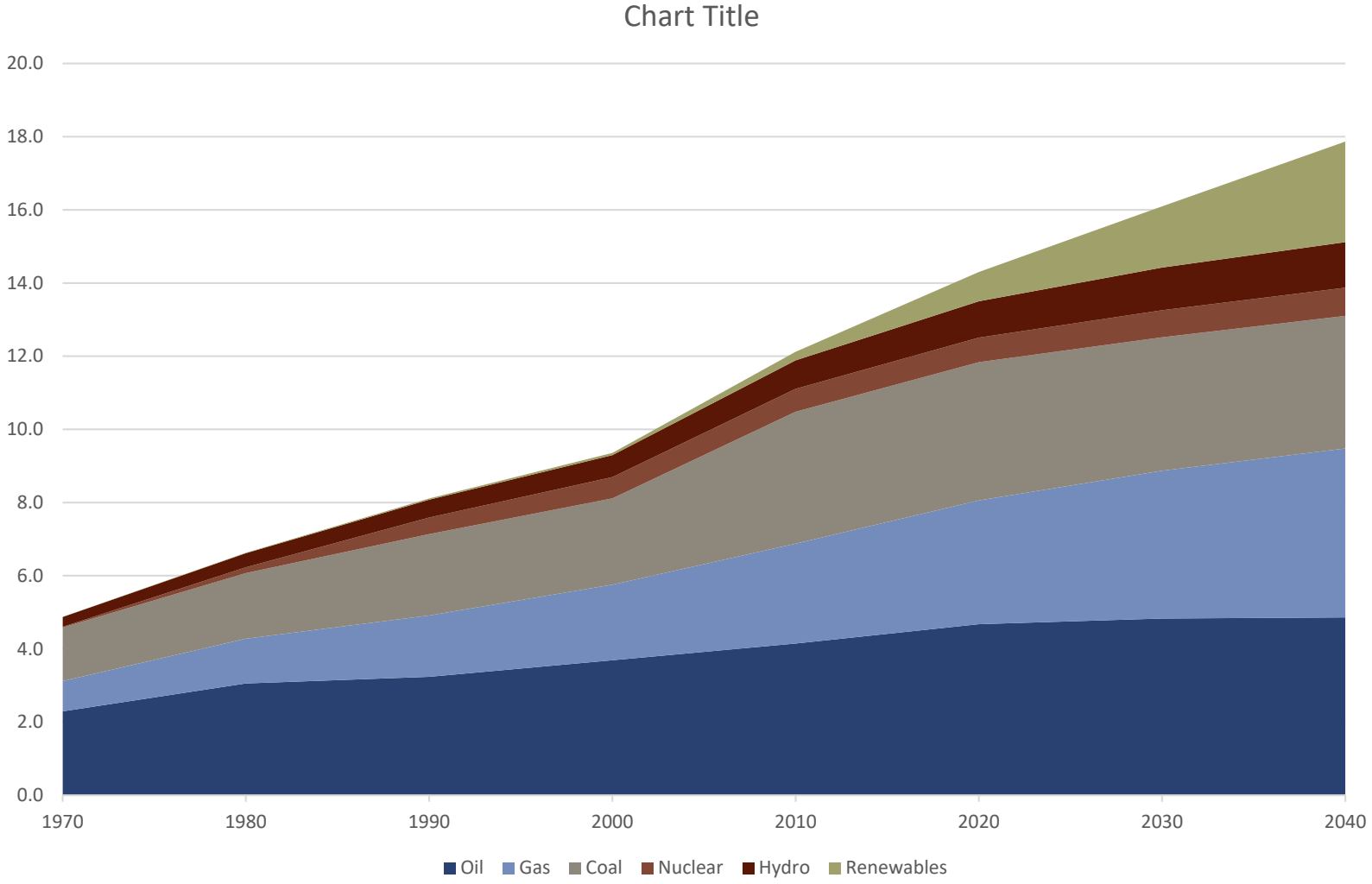


What to Learn / What to Avoid

Need To Identify What Has “The Most Bang For The Buck”

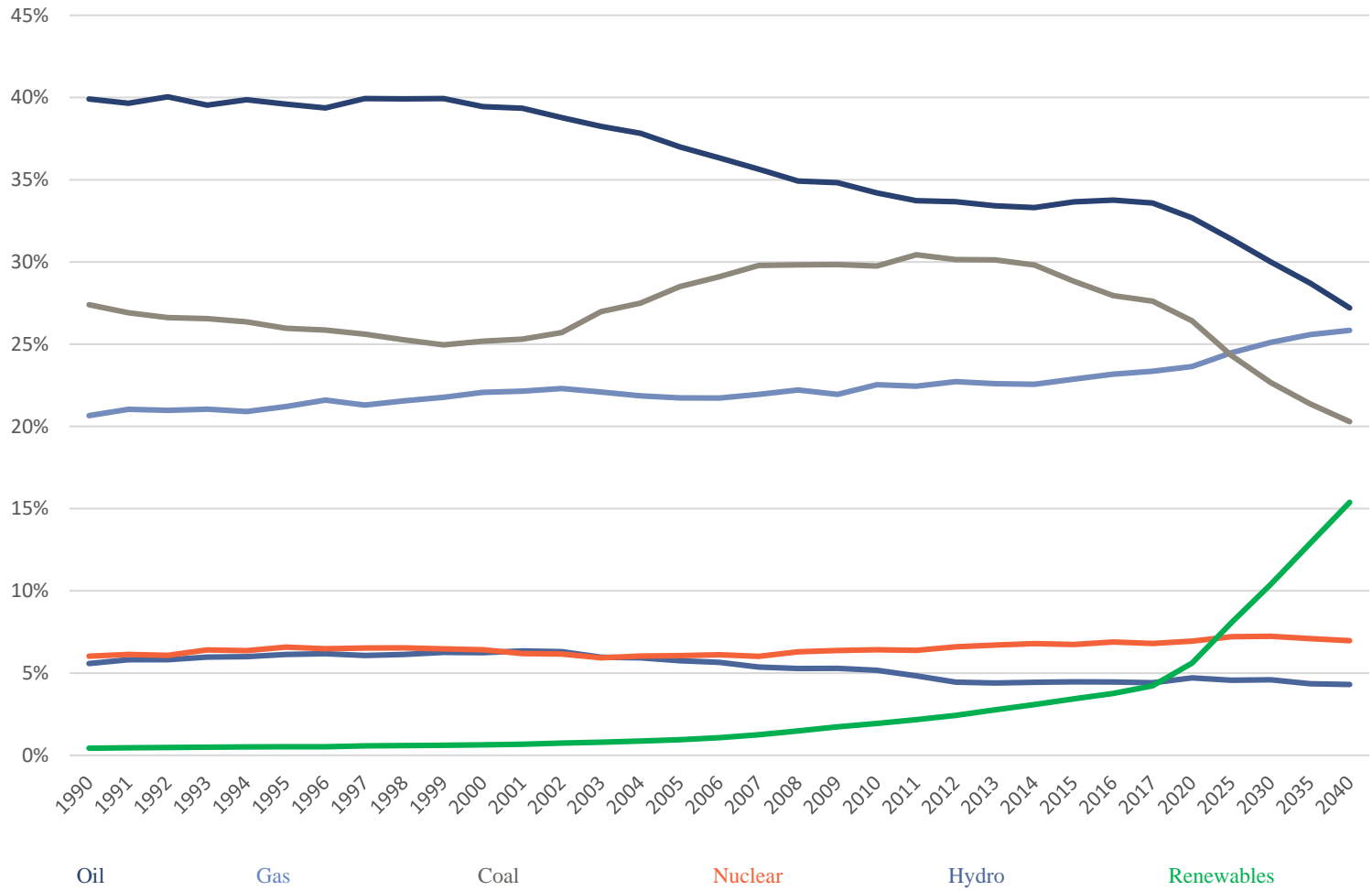
The World As Is

Primary Energy Demand 1970 - 20140



Growth Until 2040= Old Scenario -> Balance Of Power Is Shifting!

Primary Energy Demand: Change in Relative Shares



Will Not Achieve A Carbon Neutral World By 2050

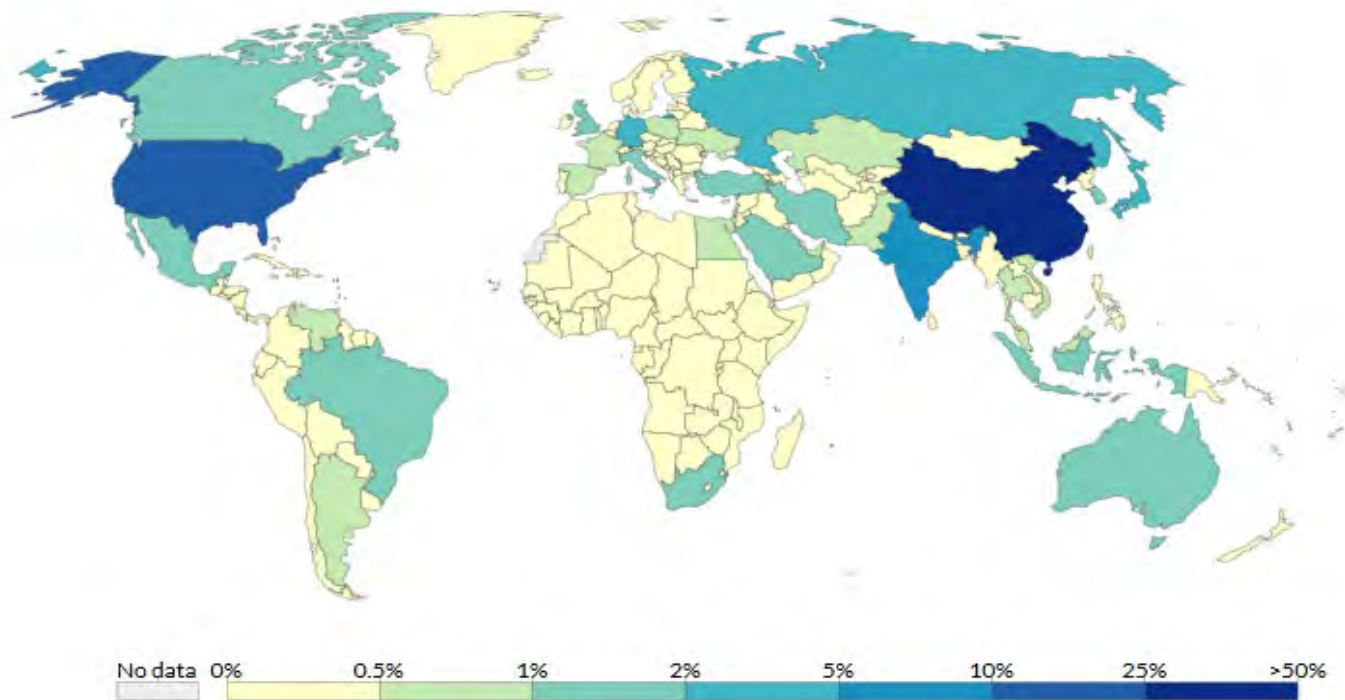
Backdrop

- 52 GT
- Current trajectory: 52 – 58 GT in 2030
- For 1.5 °C : 25 – 30 GT in 2030
- Net 0 emissions by 2050

Only Possible With Massive Technology Deployment Across The Globe

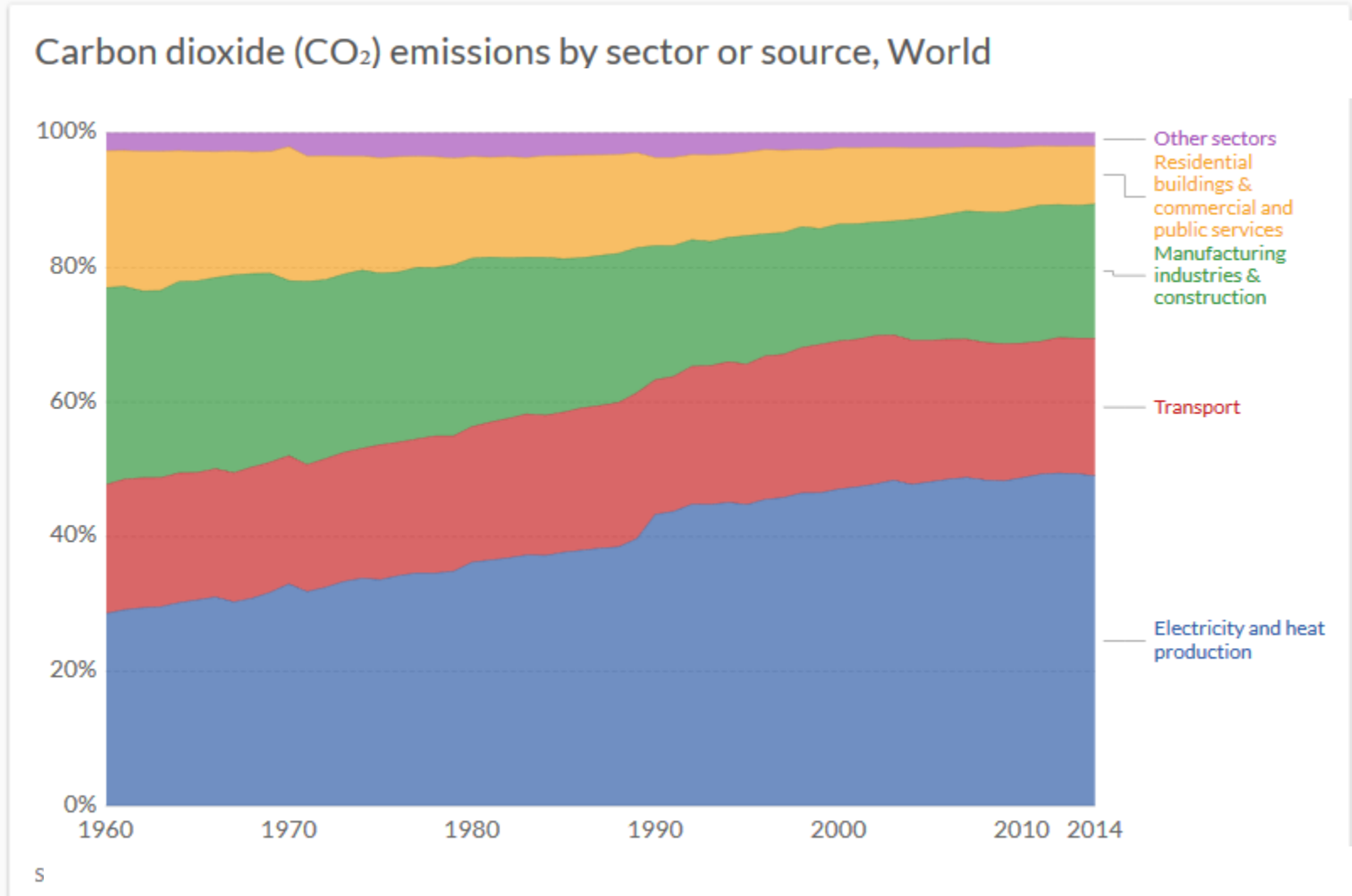
CO2: The Culprits

Annual share of global CO₂ emissions, 2016



It Is About China, North America, India & Russia

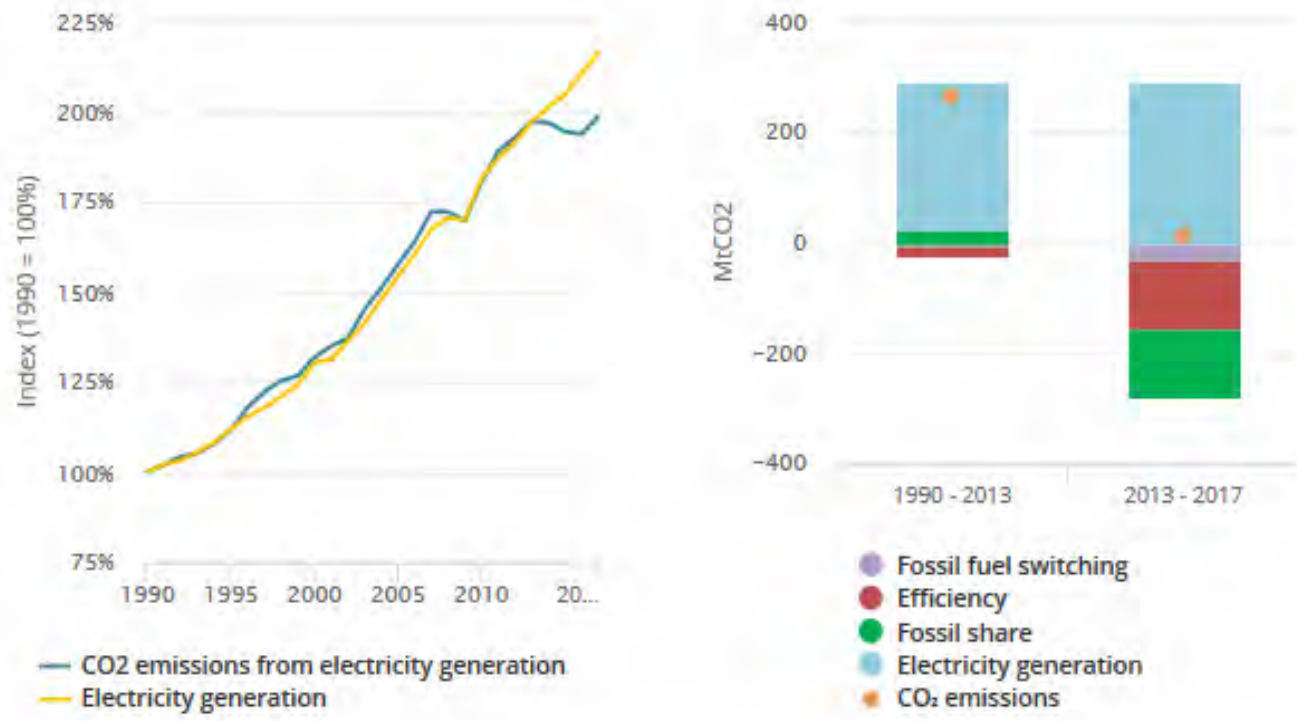
The Culprits: Sectors



Electricity, Transport, Manufacturing & Buildings

CO2 & Electricity Generation

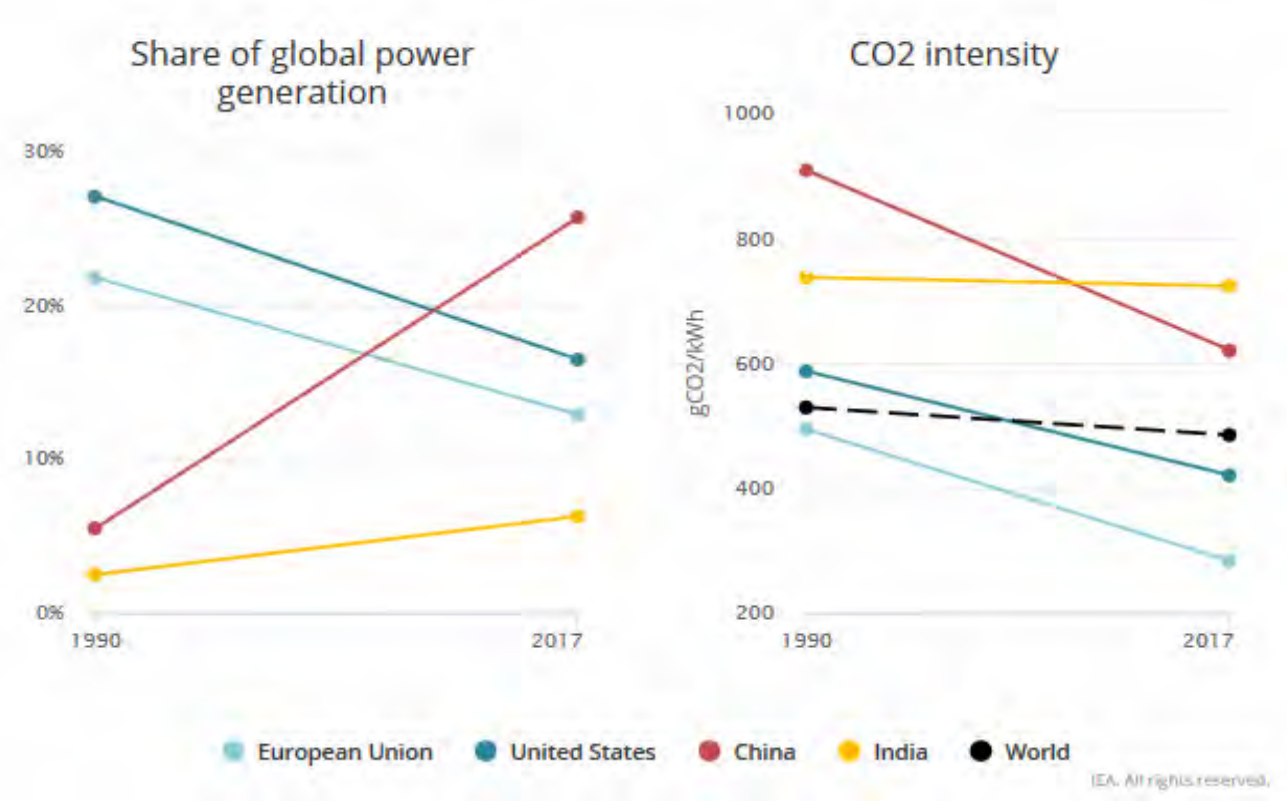
Decoupling between electricity generation and related CO2 emissions, and key contributing factors



Accelerated Shift To Renewable Energy & CCUS

CO2 & Power Generation

How are new players in power generation affecting the global carbon intensity of electricity?



***US, China & India Is Where It Is At:
Problem Cannot Be Solved Without CCUS***

What It Takes

To Achieve Paris Climate Change Goals

- Energy:
 - 1) Renewables: PV / wind
 - 2) Nuclear
 - 3) Hydro
 - 4) **But also oil, gas → in comes: Circular Carbon Economy**
- Buildings:
 - 1) Retrofitting
 - 2) Smart buildings
 - 3) Smart cities
- **Smart Grids / AI**
- Transportation
- Food & consumption / supply chains

Decarbonization & Digitization → Surge In Electricity Demand

Europe Versus GCC

Europe:

EU “European Green Deal” :

- Europe climate neutral by 2050
- Circular Economy Action Plan by March 2030
- 0 pollution
- Ecosystems & biodiversity
- Farm to fork
- Transport (towards 0 emissions by 2050)
- Investment (transition fund, etc.)
- R&D / innovation
- External relations

Germany:

- EU Green Deal provides push

UK:

- Left EU, **BUT** climate neutral by 2050

Austria:

- Climate neutral by 2040

GCC:

- **Electricity from renewables most cost competitive**
- Will save GCC economies US\$ 76 billion by 2060
- Strong new regulatory frameworks
- New renewable targets
- IRENA in UAE

UAE:

- **Political will**
- Aggressive deployment of renewables
- World’s largest solar facility 1.2 GW
- Transport
- Champion: Masdar!

KSA:

- **Political will**
- Vision 2030
- Circular carbon economy (4Rs)

Needed: Political Will, Strong Frameworks & Champions

What To Avoid

Economic Performance of Utilities

Share Price of German Utilities



Need Strong Utilities To Achieve Goals

Political Pressure:

- The „Greta Effect“
- Recent election surge of green parties
- BUT also „gilets jaune“
- Governemnts will have to triagulate between environmental imperative and the economically weak → have to walk a narrow line

Predictable Policies

- Transport:
 - 1) Clear framework for phase out of gasoline powerd cars, etc.
 - 2) Rural infrastructure
- Buildings:
 - 1) Affordable retrofitting
 - 2) Clear policies on heating

Ensure That Economically Weak Are Not Left Behind

Global Outlook

Global vs. Regional Approach

Global Outlook:

- Climate change = global problem → needs global solution.
- US resigned from Paris Agreement → More difficult to get global consensus
- Regional approaches will probably be the way forward

Regional Approaches:

- Europe (EU): Will lead the way
- GCC: Strong policies and champions circular carbon economy
- Asia: China and India will continue to rely on coal → need CCUS
- Africa has the potential to be strong in renewables
- US efforts at state regional and municipal level.
- Ensure LDCs are not left behind

Funding:

- ESG fastest growing asset class
 1. Ramifications for getting green projects funded
 2. Ramifications for utilities oil companies, etc.

***Climate Change = Global Problem → Global Solutions Needed
Regional Approaches More Likely***

Conclusion

Conclusion

Climate Change = Global Problem → Needs Global Solution



Regional solutions / Approaches More Likely



EU Leads The Way / GCC Champions Renewables & Circular Carbon Economy



Beware Of Poverty Trap

***The World Has Changed Over The Last 18 Months
Climate Neutrality = Universally Accepted & Financeable Goal***

Thank You!
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