



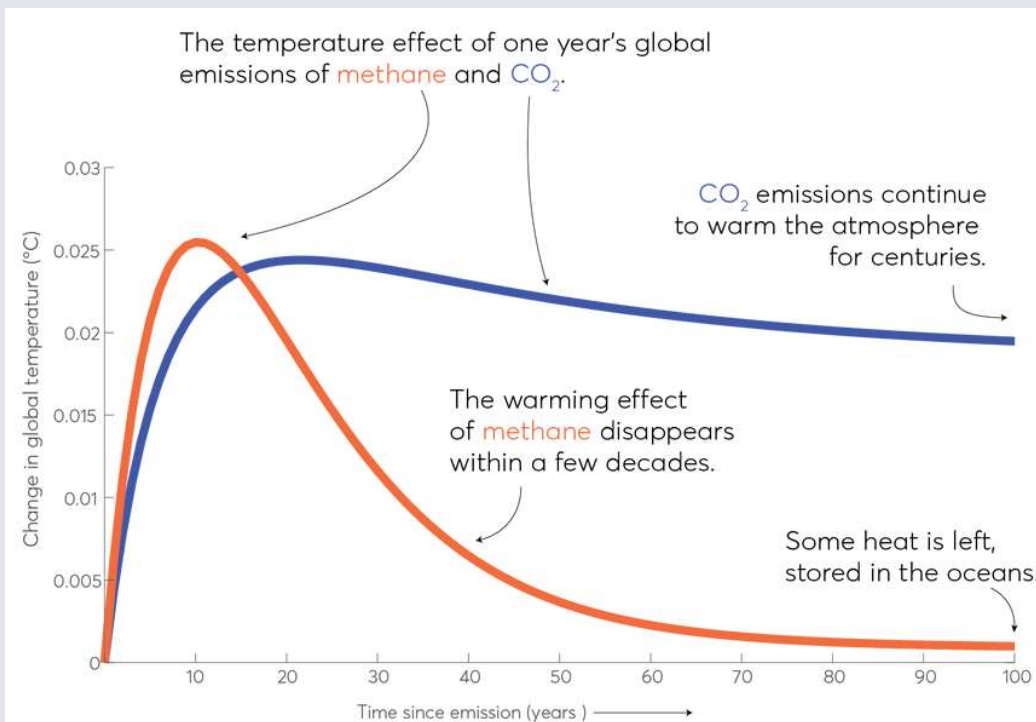
**Addressing methane  
emissions via the Energy  
System Integration &  
Hydrogen Strategies**

Andreas Graf

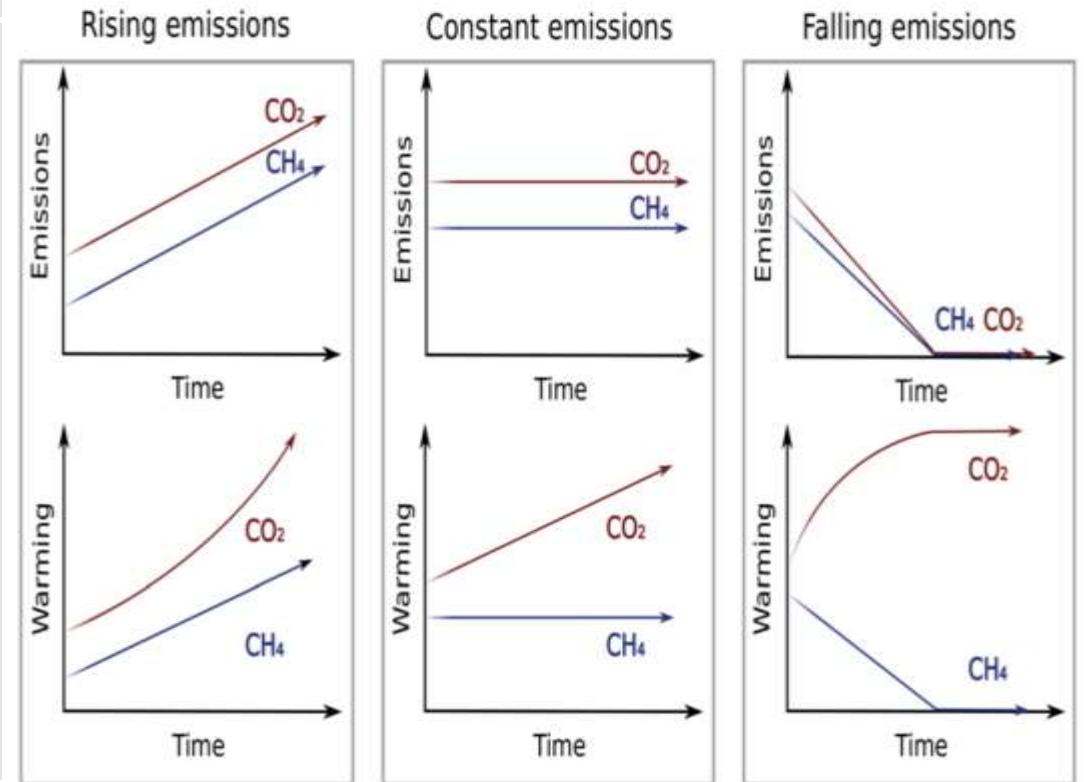
1.12.2020

# The differences between CH<sub>4</sub> and CO<sub>2</sub> with regards to global warming continue to be underappreciated. Mitigating one is not more important than the other, but there are tradeoffs.

Warming from CH<sub>4</sub> decreases sharply after ten years

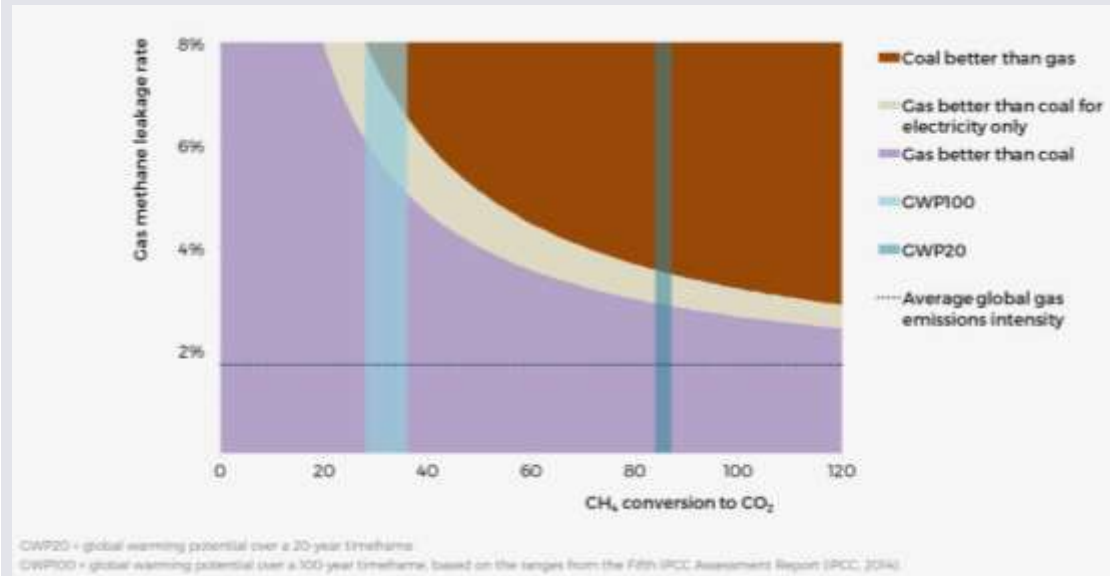


Bargar Aamaas, CICERO



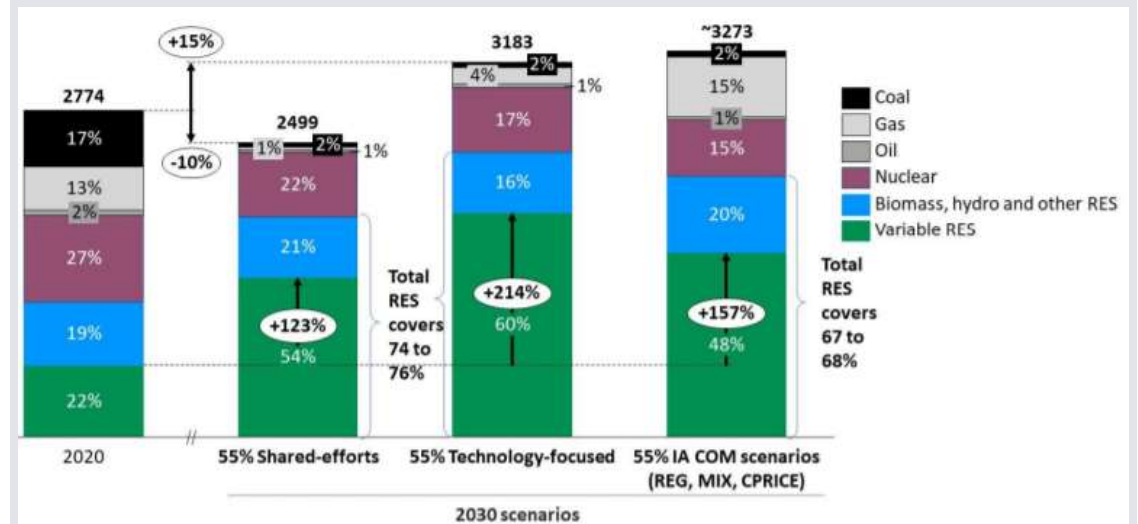
**Much of the methane leakage discussion in the past has been very narrowly focused on the trade-off coal vs gas. But that is beginning to change with higher 2030 climate ambition and net-zero as accelerated coal phase out becomes consensus.**

GHG-intensity of natural gas compared with coal



IEA (2017): The environmental case for natural gas

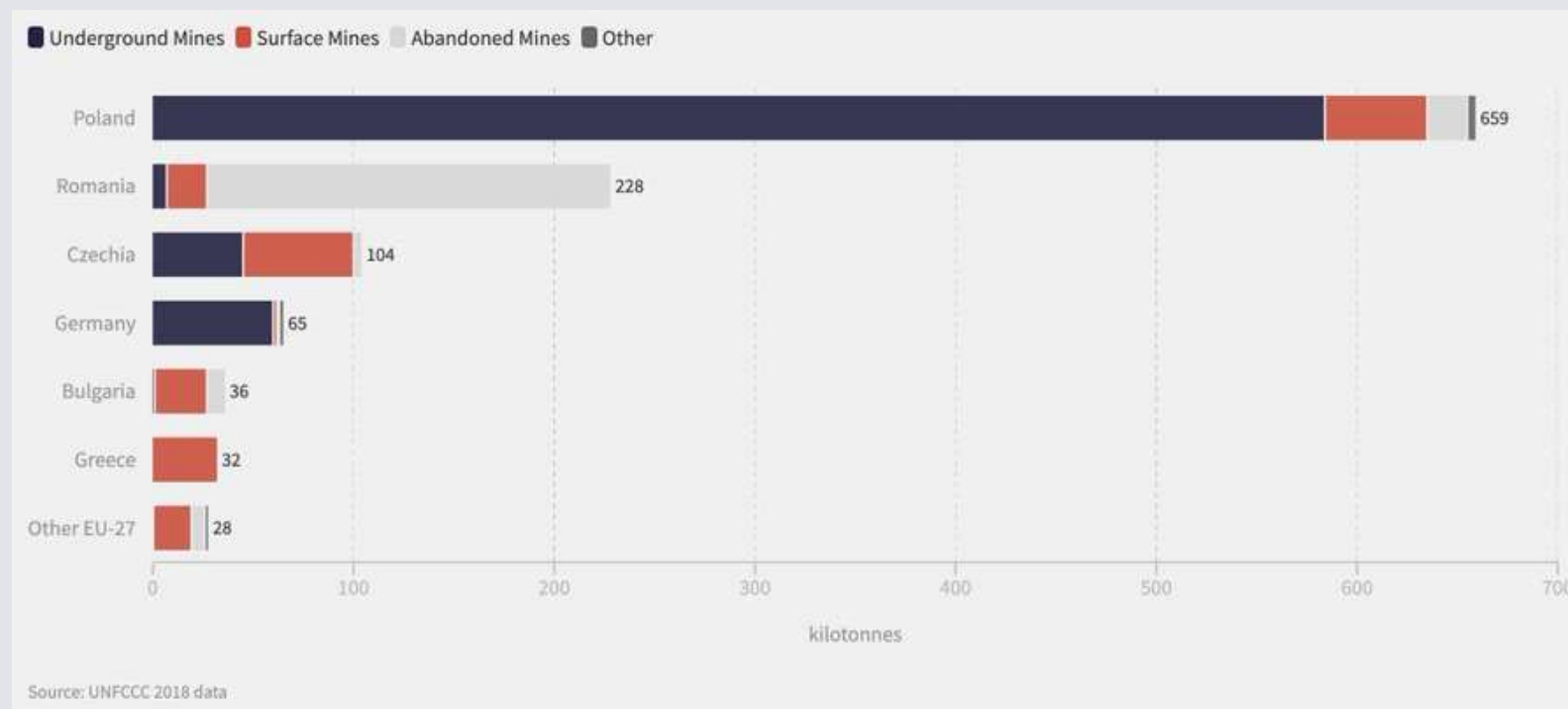
Power generation (TWh) in the two CTI scenarios and the IA scenarios (estimates)



Ecologic Institut & Climact (2020)

**In the power sector, we are also beginning to look more seriously at the issue of coal mine methane emissions.**

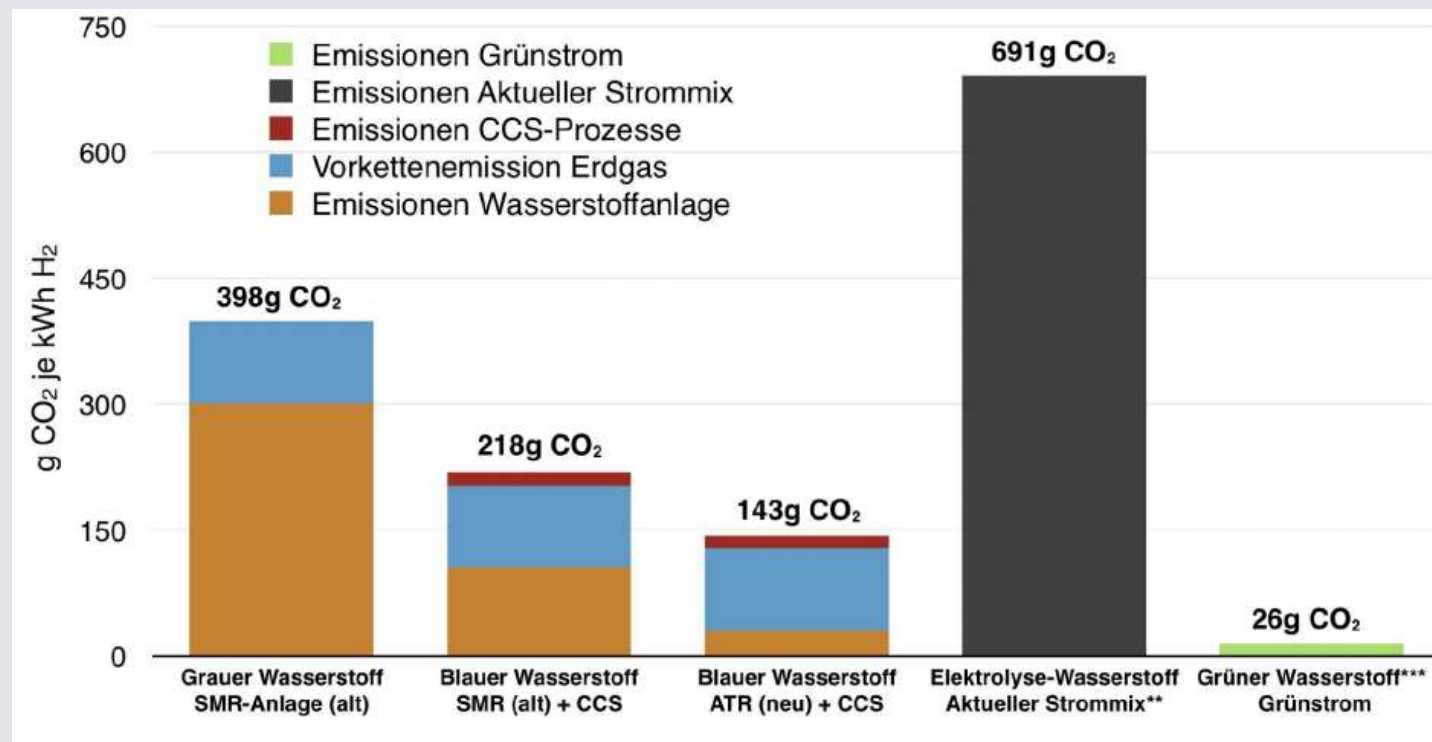
Coal mine methane emissions by country, 2018



Ember (2020)

**However, trade-offs remain in the power sector with regards to avoiding gas lock-in and with the push towards clean hydrogen and deep decarbonization new ones are emerging in industry.**

Emissions from Hydrogen Production in g CO<sub>2</sub> / kWh H<sub>2</sub>

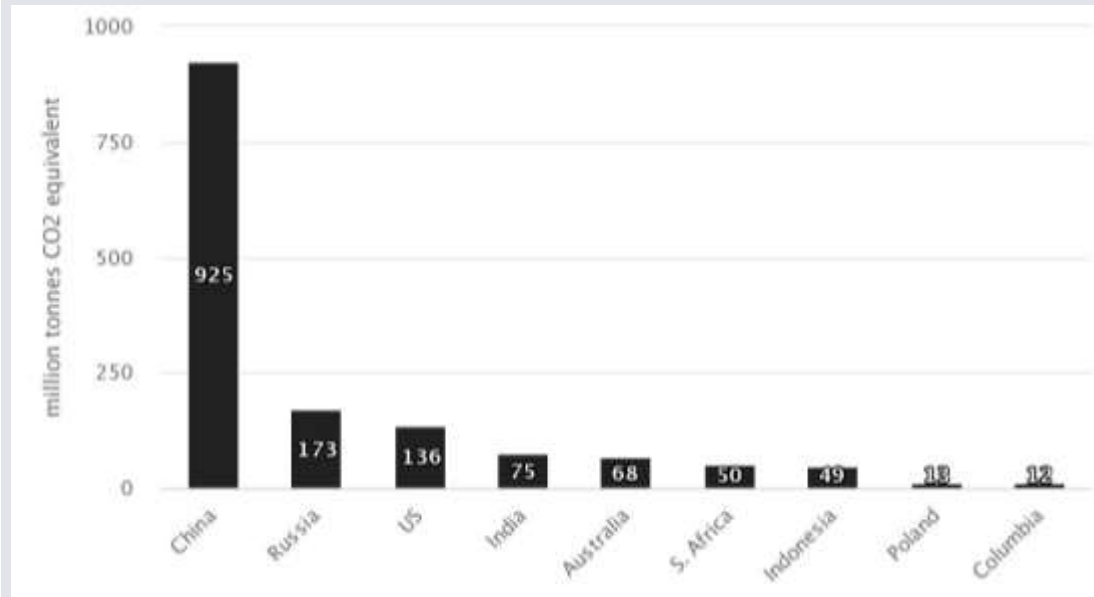


1 kg H<sub>2</sub> = 33,3 kWh (H<sub>2</sub>)  
German electricity mix (2018) = 474 gCO<sub>2</sub>/kWh

Greenpeace Energy (2020)

# The EU Methane Strategy and the US electoral result imply that a global strategy for tackling methane emissions in the energy sector are now possible. But it is far from inevitable.

Absolute upstream emissions from coal mines



Ember (2019) based on IEA WEO 2019



Satellite observations of large-scale methane leaks



IEA WEO (2020)

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An aerial photograph of a vast, snow-covered mountain slope. A long, single-file line of hikers is visible, stretching across the lower right portion of the frame. The hikers are wearing various colored gear, and their shadows are cast on the snow. The background shows rugged, rocky terrain with patches of snow and a small stream or path winding through it.

**Thank you for  
your attention!**

Questions or Comments? Feel free to contact me:

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