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IEA Net Zero Emissions 2050

NZE2050

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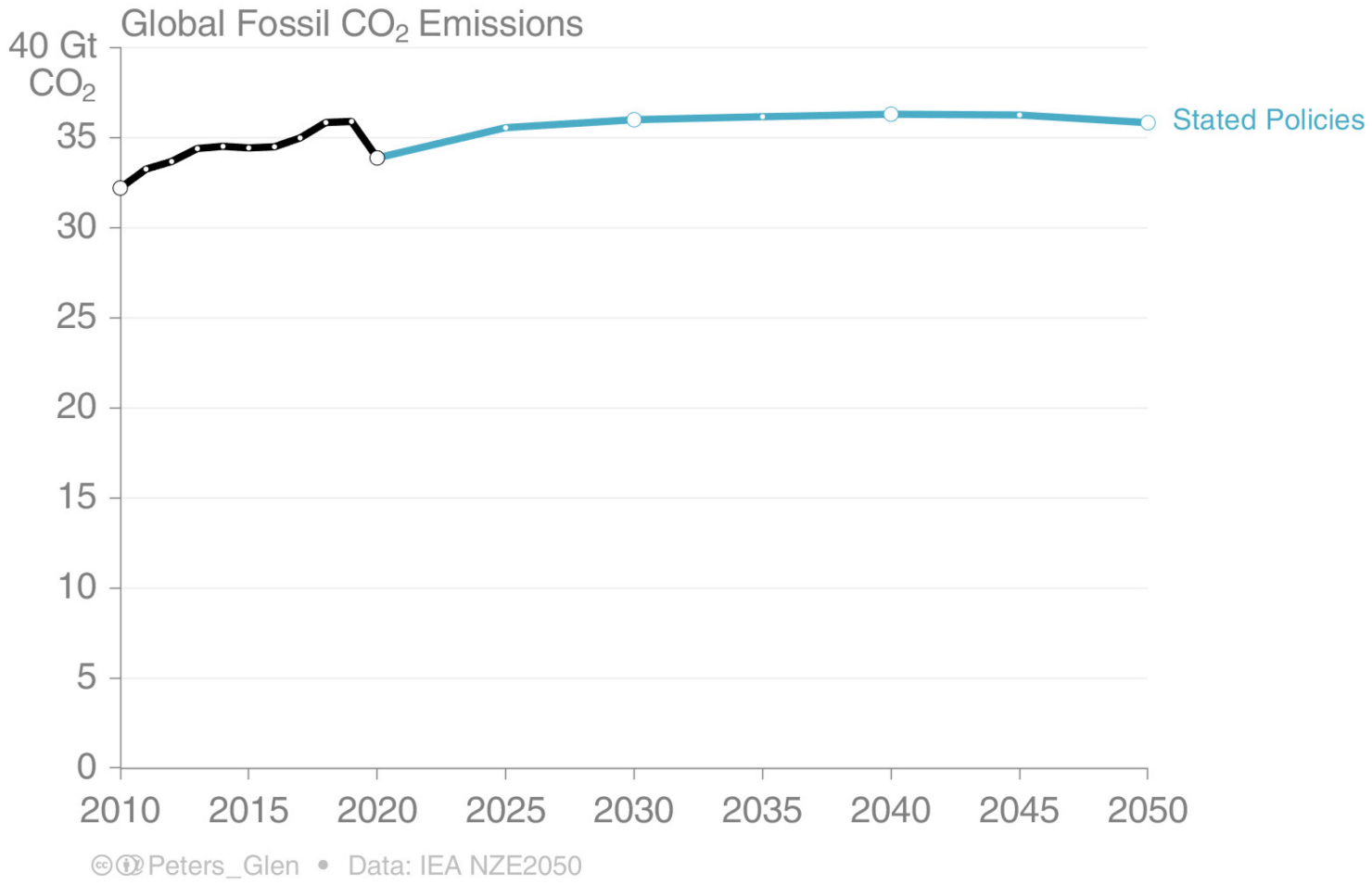
#Klimafrokost: IEAs veikart for «netto null» i energisektoren (Remote, 21/05/2021)

Stated Policies Scenario



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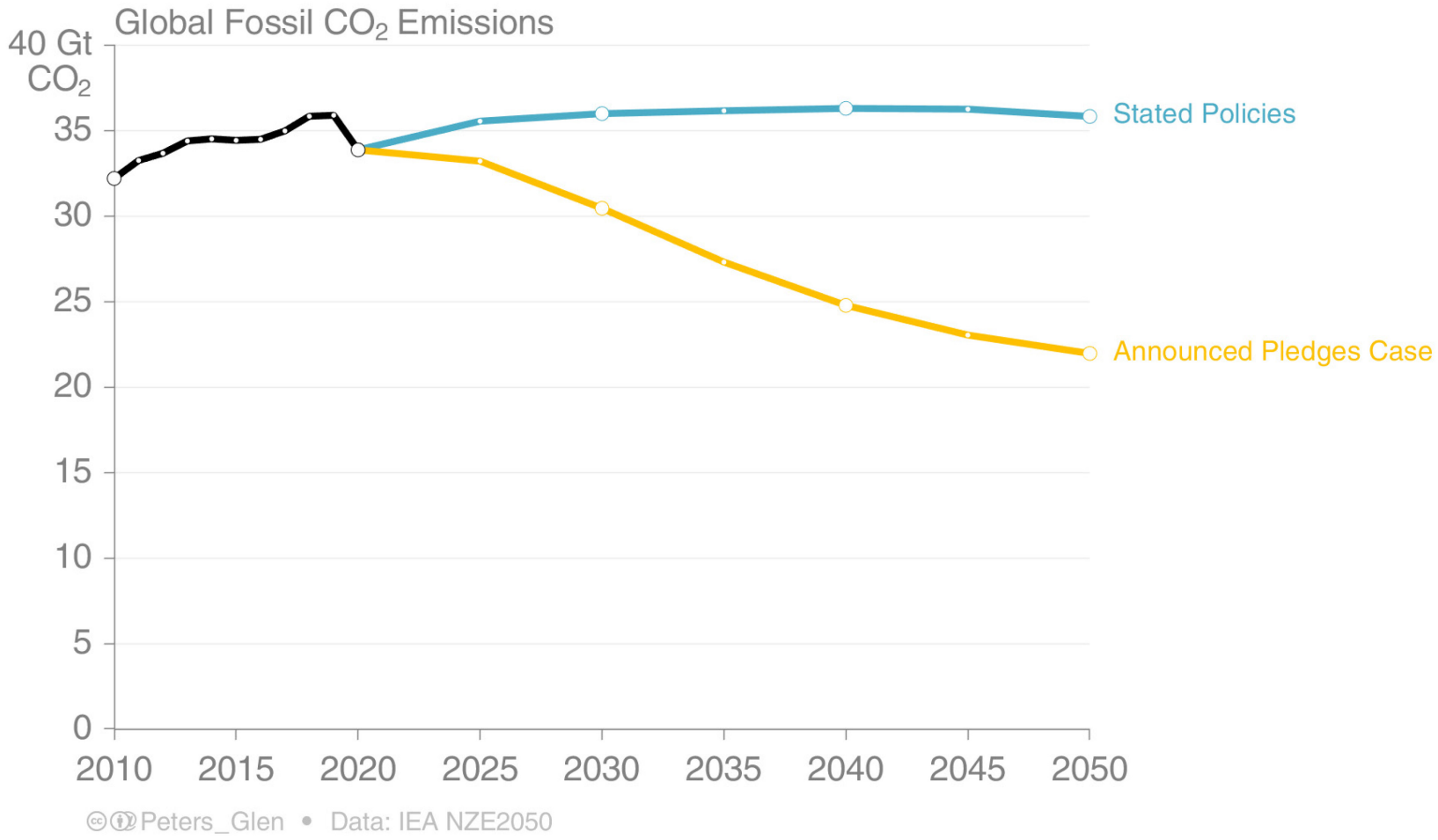
Data: IEA NZE2050

Announced Pledges Case



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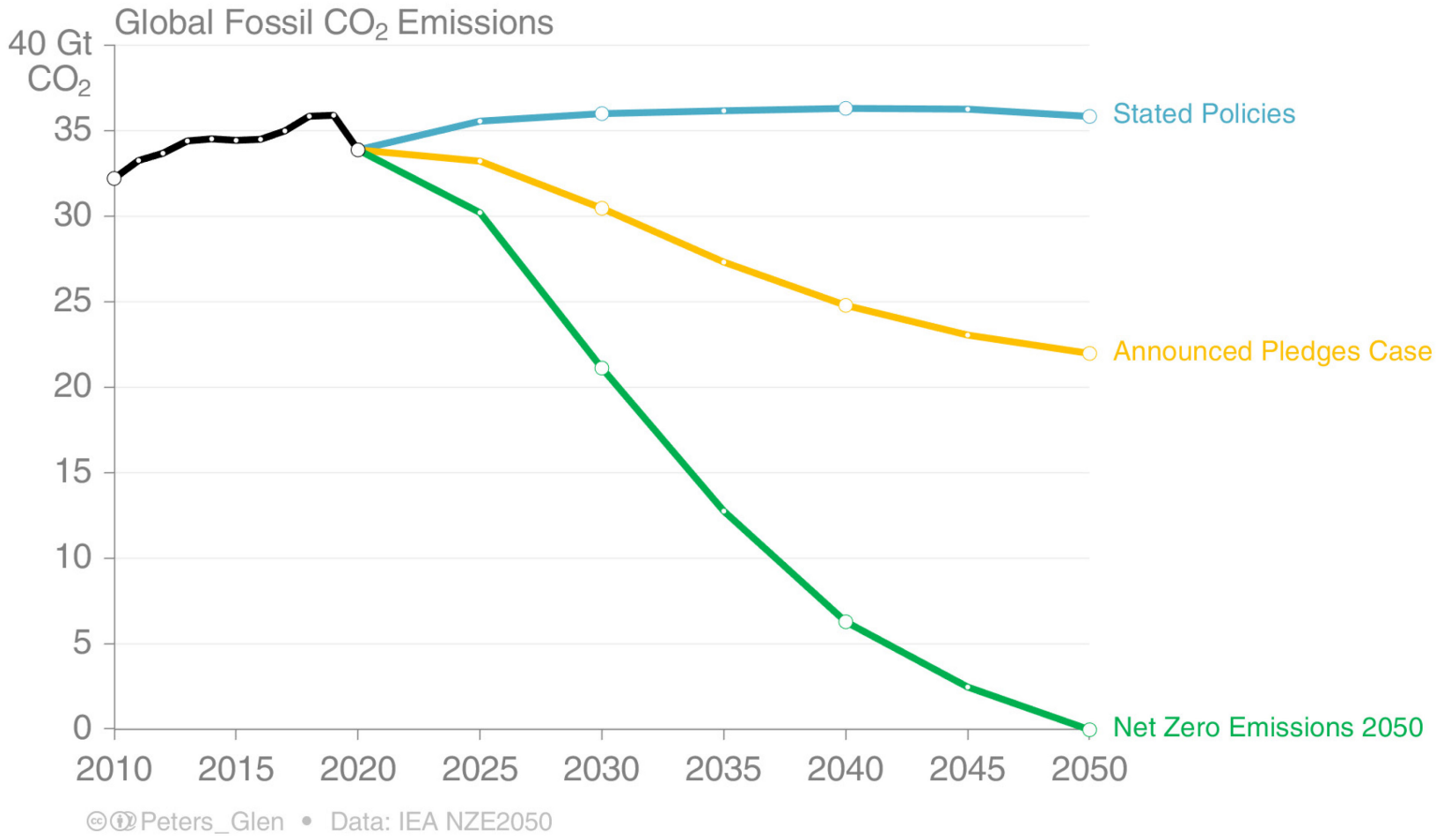
Data: IEA NZE2050

Net Zero Emissions 2050



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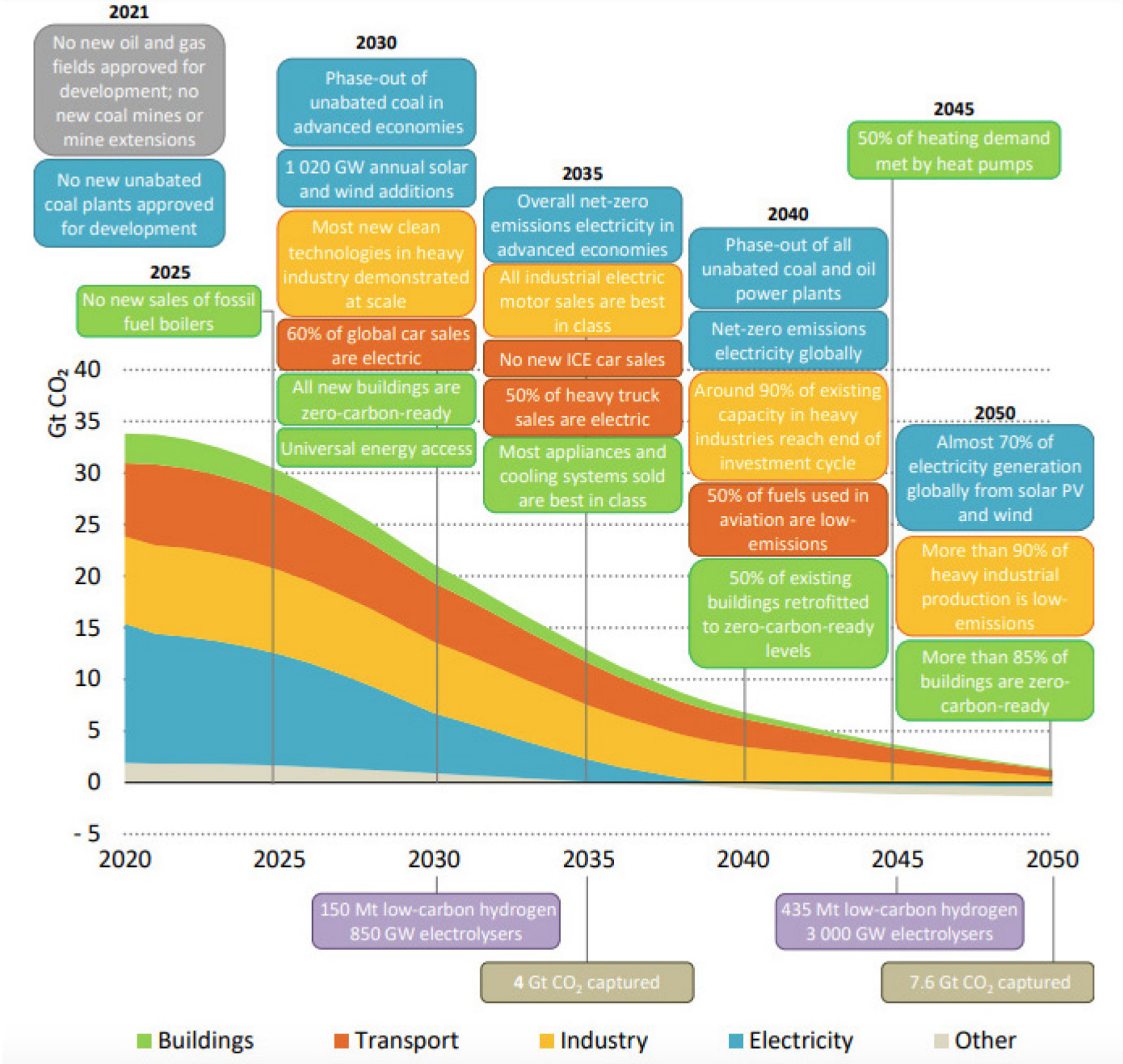


Source: [Carbon Brief (2021)]

2021

No new unabated coal plants approved for development

No new oil and gas fields approved for development; no new coal mines or mine extensions

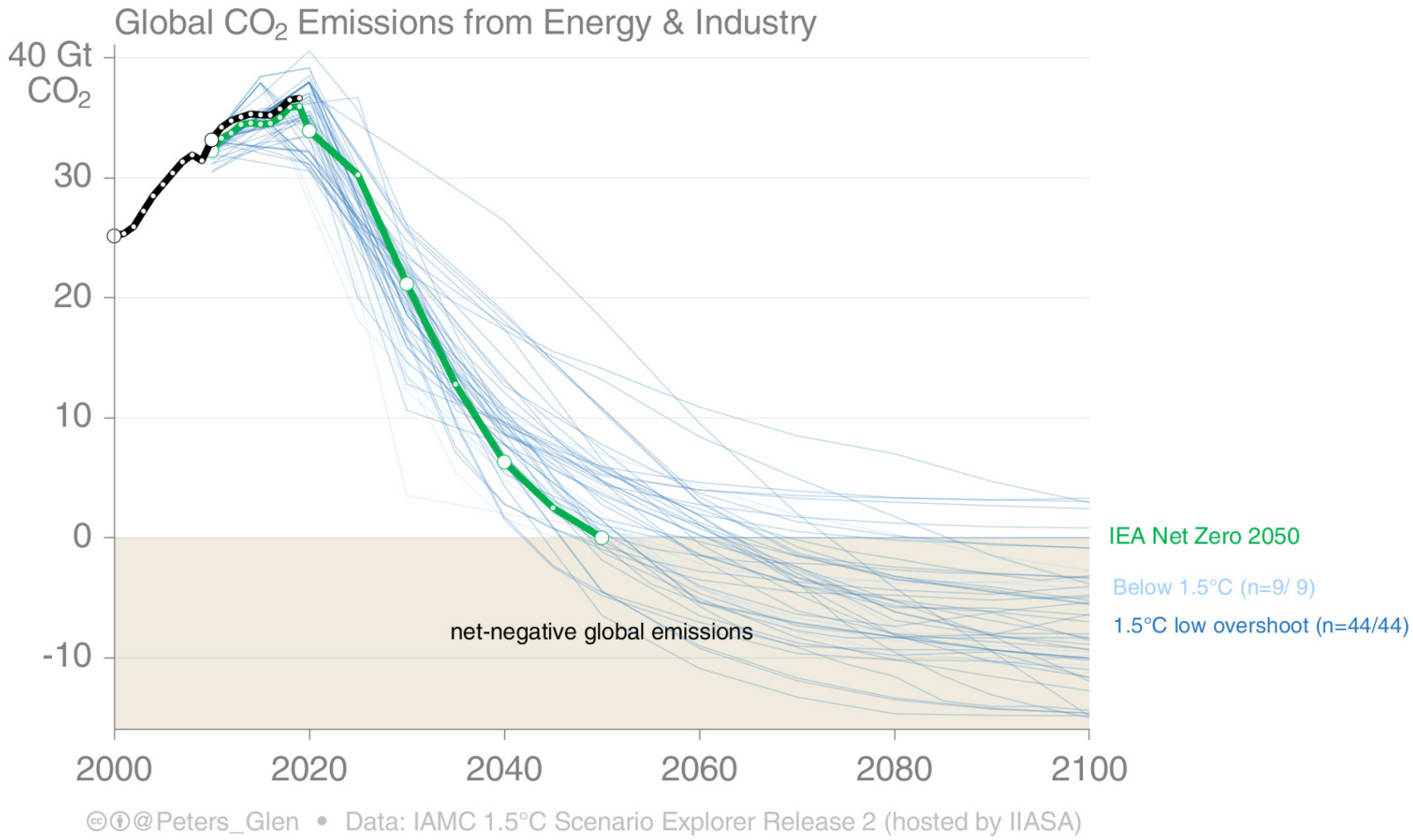
Our new NZE Scenario should not be mistaken as *the* path to net-zero...

Rather, it is *a* path…

How does the IEA compare with IPCC?

Net Fossil CO_2 emissions

The IEA NZE2050 reaches net zero fossil CO_2 emissions in 2050, which is much earlier than scenarios assessed by the IPCC that are consistent with 1.5°C with no or low temperature overshoot.



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Data: IEA NZE2050; IAMC 1.5°C Scenario Explorer (hosted by IIASA)

Net emissions

=

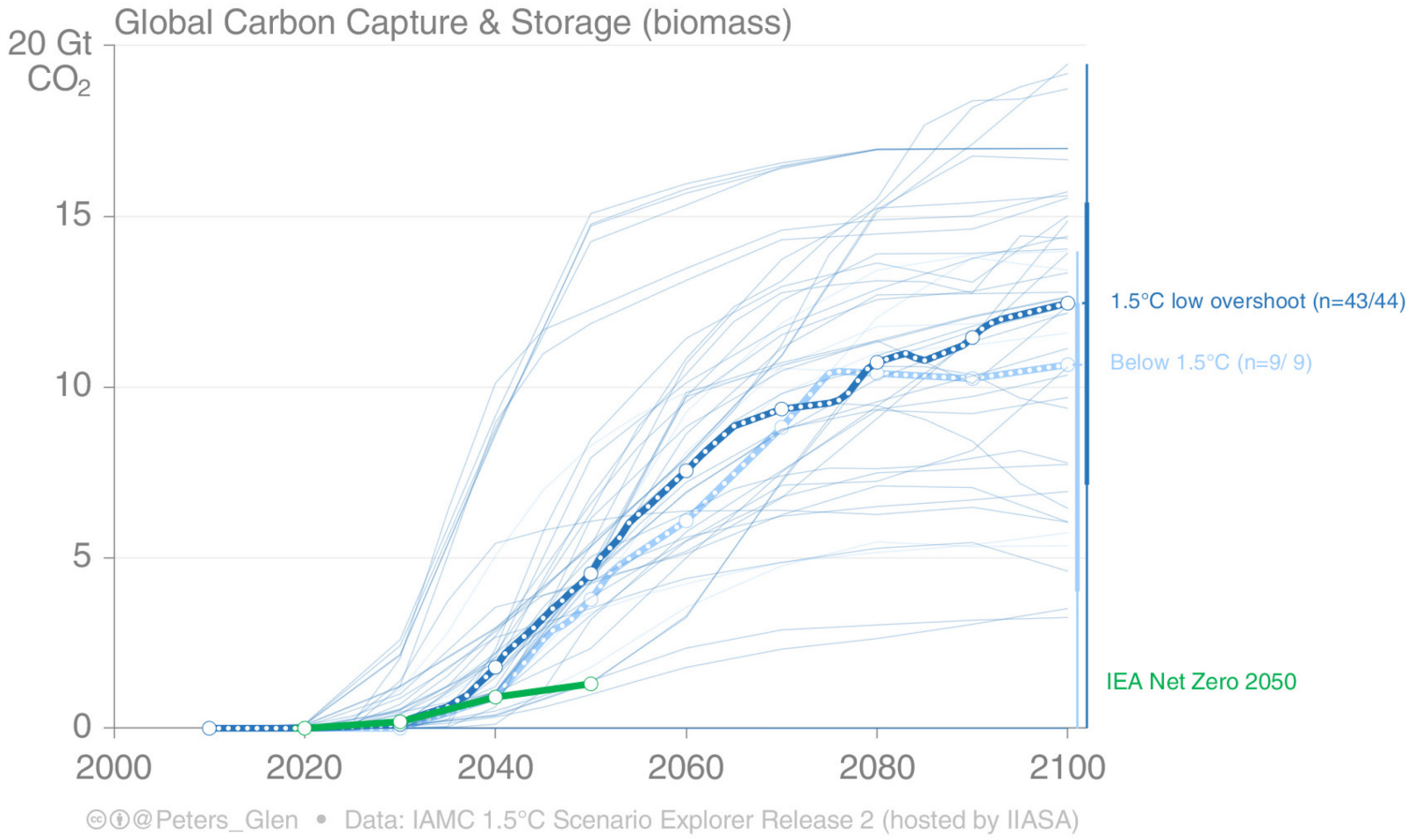
Emissions (e.g., fossil fuels)

+

Removals (e.g., direct air capture)

Carbon Dioxide Removal (BECCS)

The IEA has considerably less Bioenergy with Carbon Capture & Storage (BECCS) than the IPCC assessed scenarios



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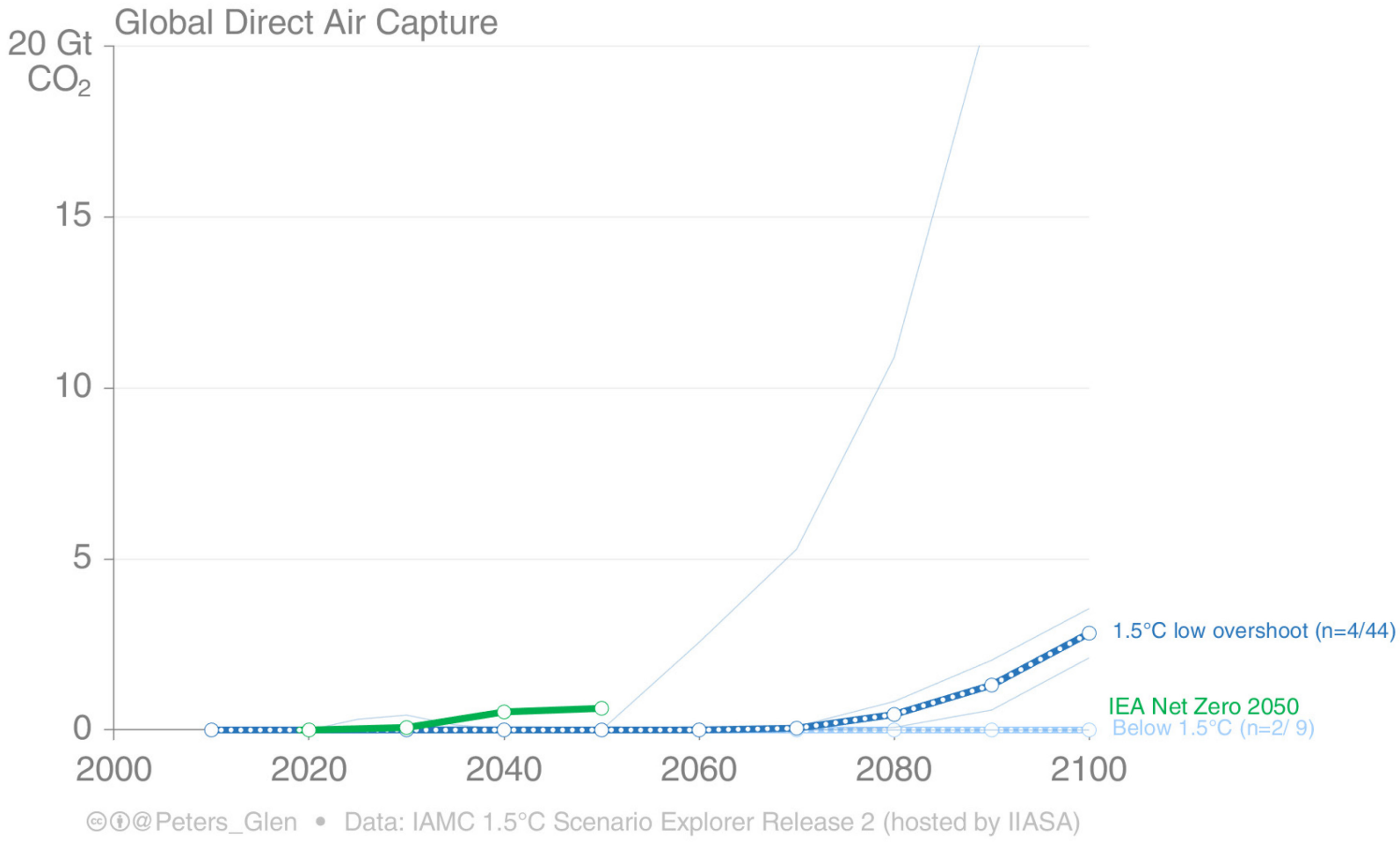
Data: IEA NZE2050; IAMC 1.5°C Scenario Explorer (hosted by IIASA)

Carbon Dioxide Removal (DACCS)

The IEA uses a decent amount of Direct Air Capture with Carbon Storage (DACCS) than the IPCC assessed scenarios
Very few IPCC assessed scenarios *currently* use DACCS, though the potential is significant.



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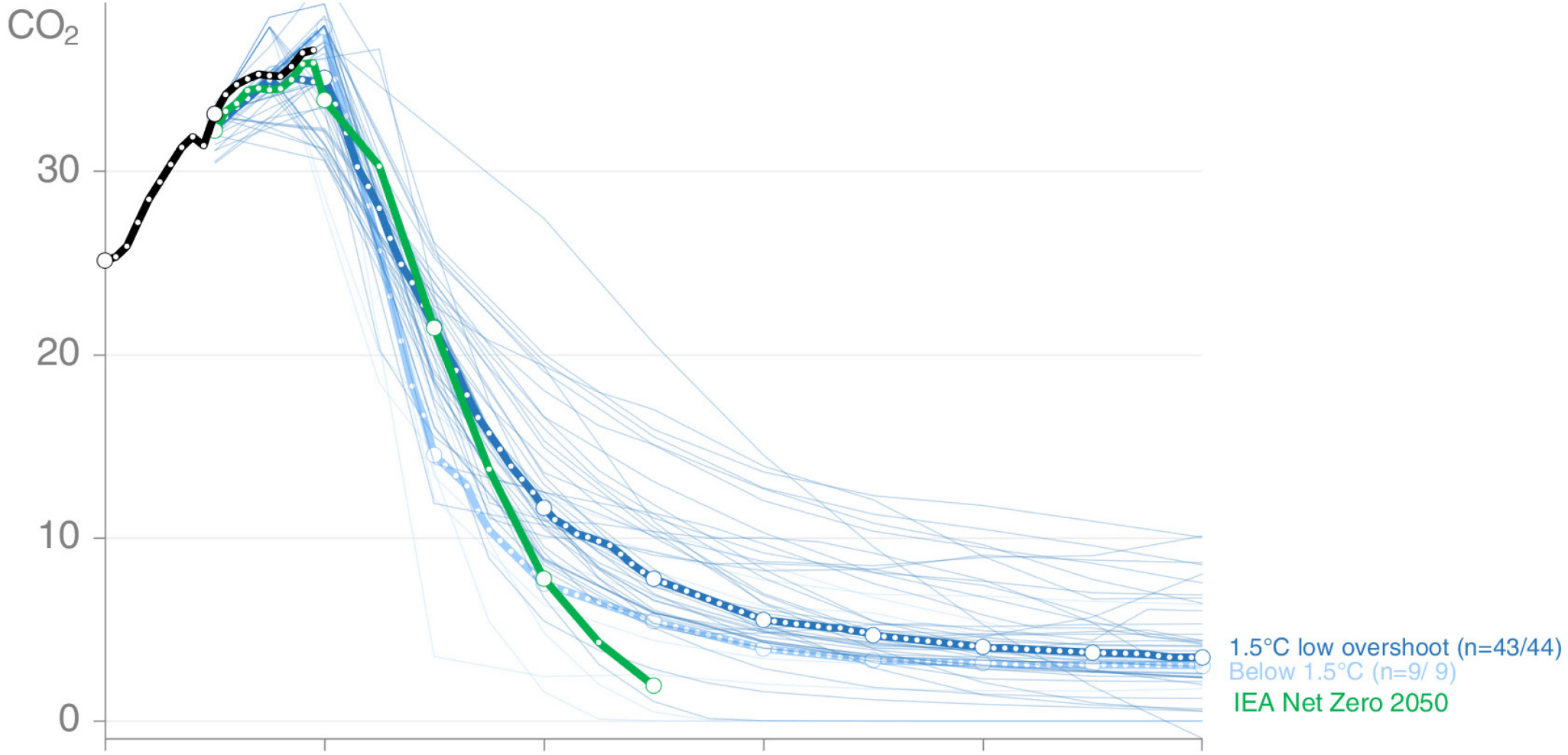
Data: IEA NZE2050; IAMC 1.5°C Scenario Explorer (hosted by IIASA)

Residual fossil CO_2 emissions

Net emissions = (residual) emissions + removals

The IPCC & IEA scenarios are very similar in the next decade, but differ in 2040-2050 as the IEA has less removals



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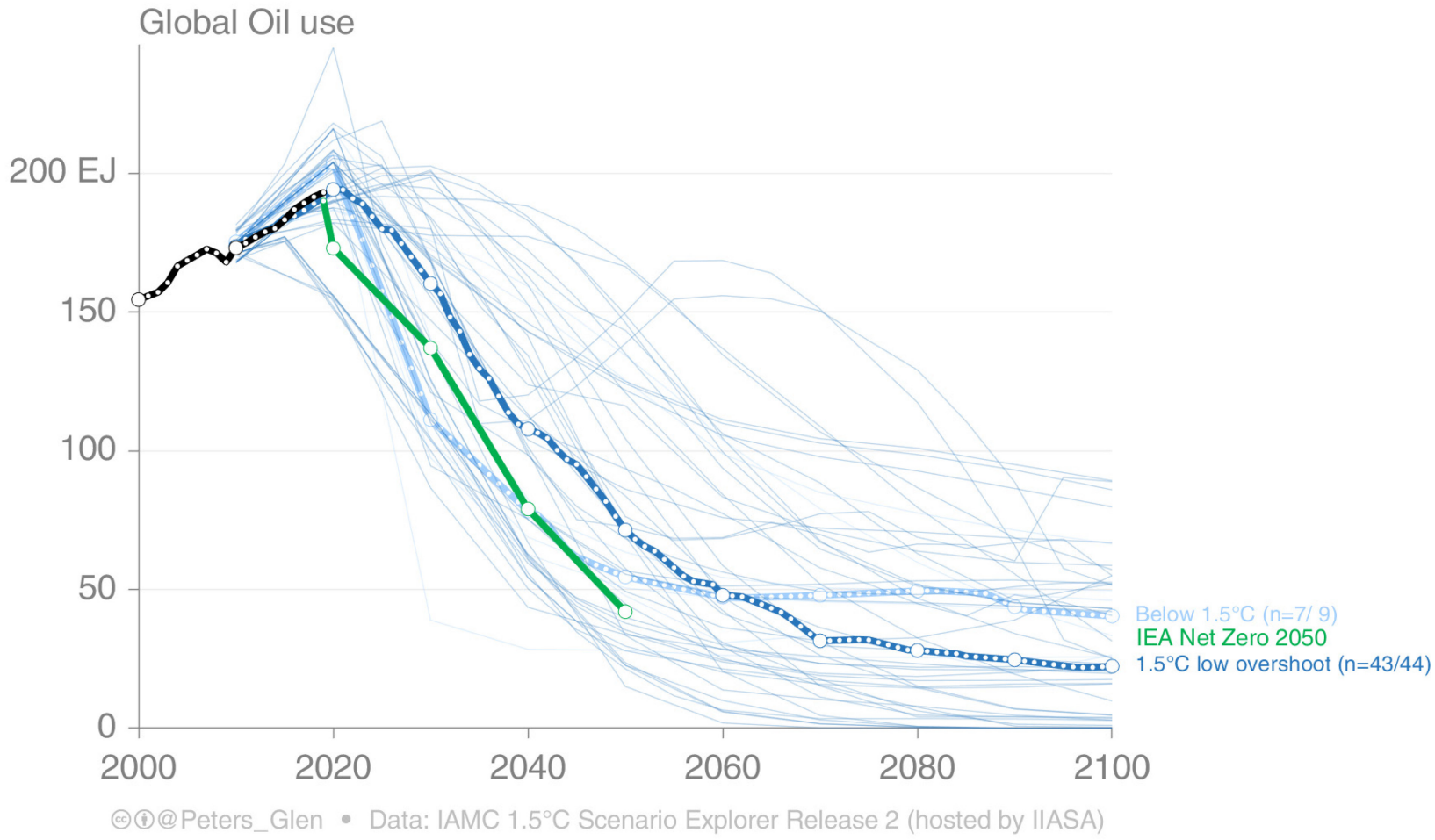
Data: IEA NZE2050; IAMC 1.5°C Scenario Explorer (hosted by IIASA)

Key figures for Norway

Oil

Oil declines a little faster than many IPCC scenarios, though IEA makes the explicit point that this can be met from existing fields (including new investments in existing fields), **but no new fields**



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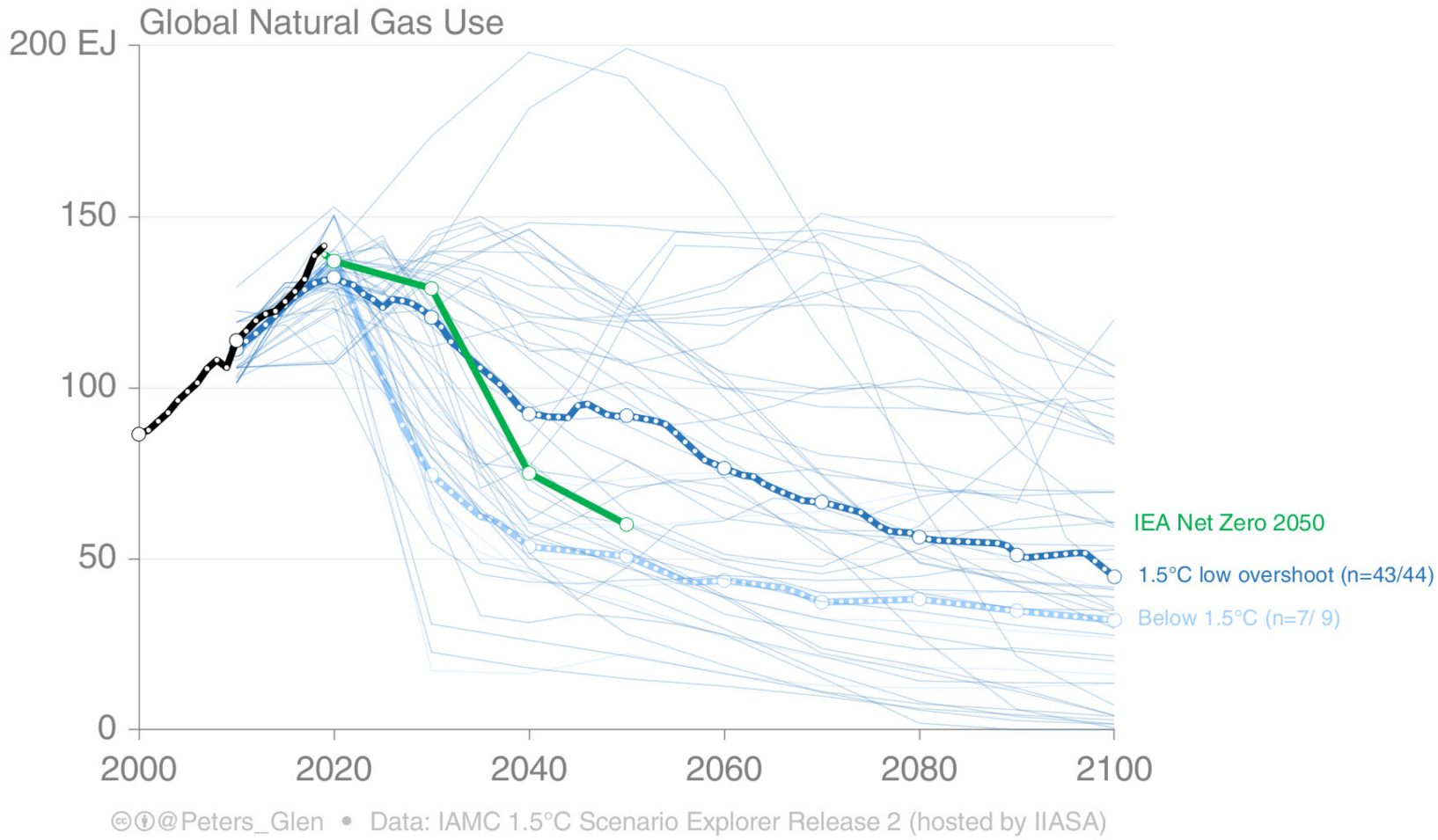
Data: IEA NZE2050; IAMC 1.5°C Scenario Explorer (hosted by IIASA)

Gas

Gas is very much in the range of many IPCC scenarios, though with large uncertainties. IEA makes the explicit point that this can be met from existing fields (including new investments in existing fields), **but no new fields**



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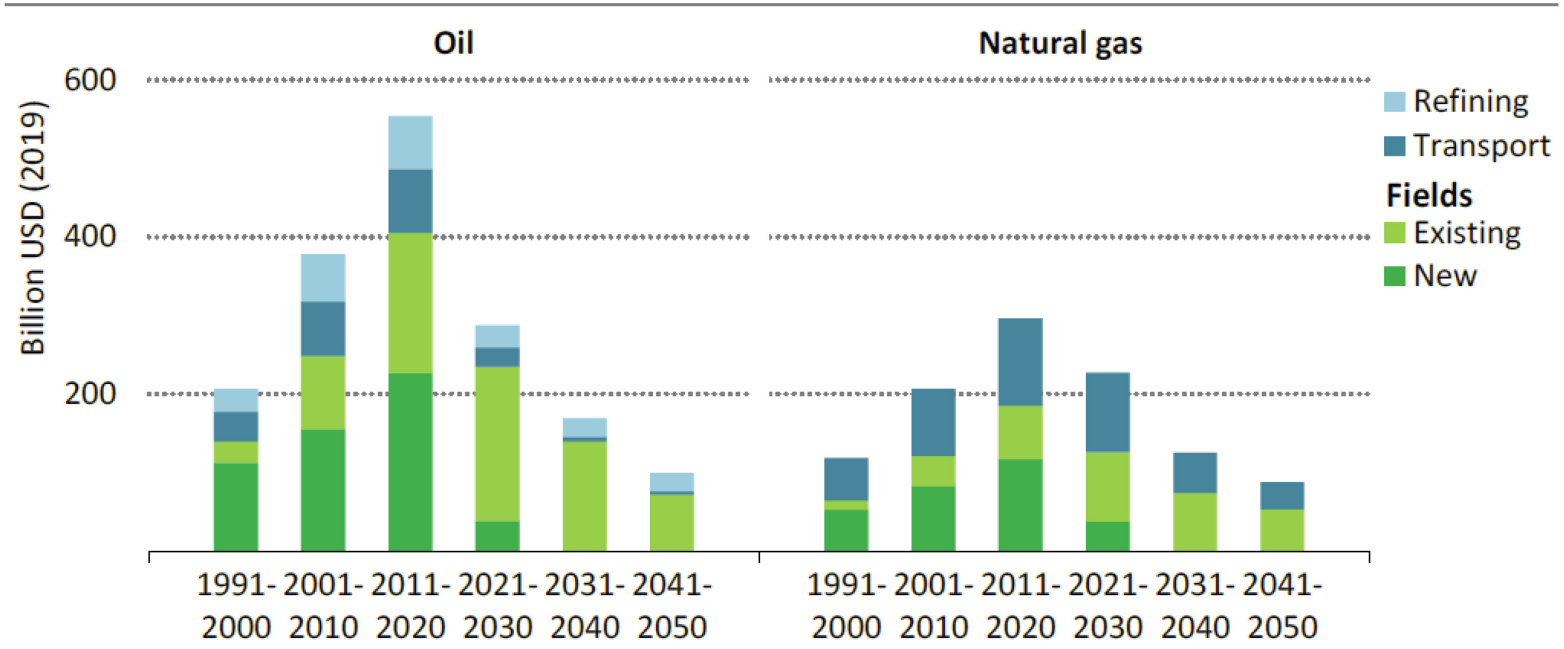
Data: IEA NZE2050; IAMC 1.5°C Scenario Explorer (hosted by IIASA)

Oil and gas investments

Investments in **new fields** stop (the new investments in 2020-2030 are already committed). Investments in existing fields continue. Investments in 2015-2020 already lower than 2010-2015.



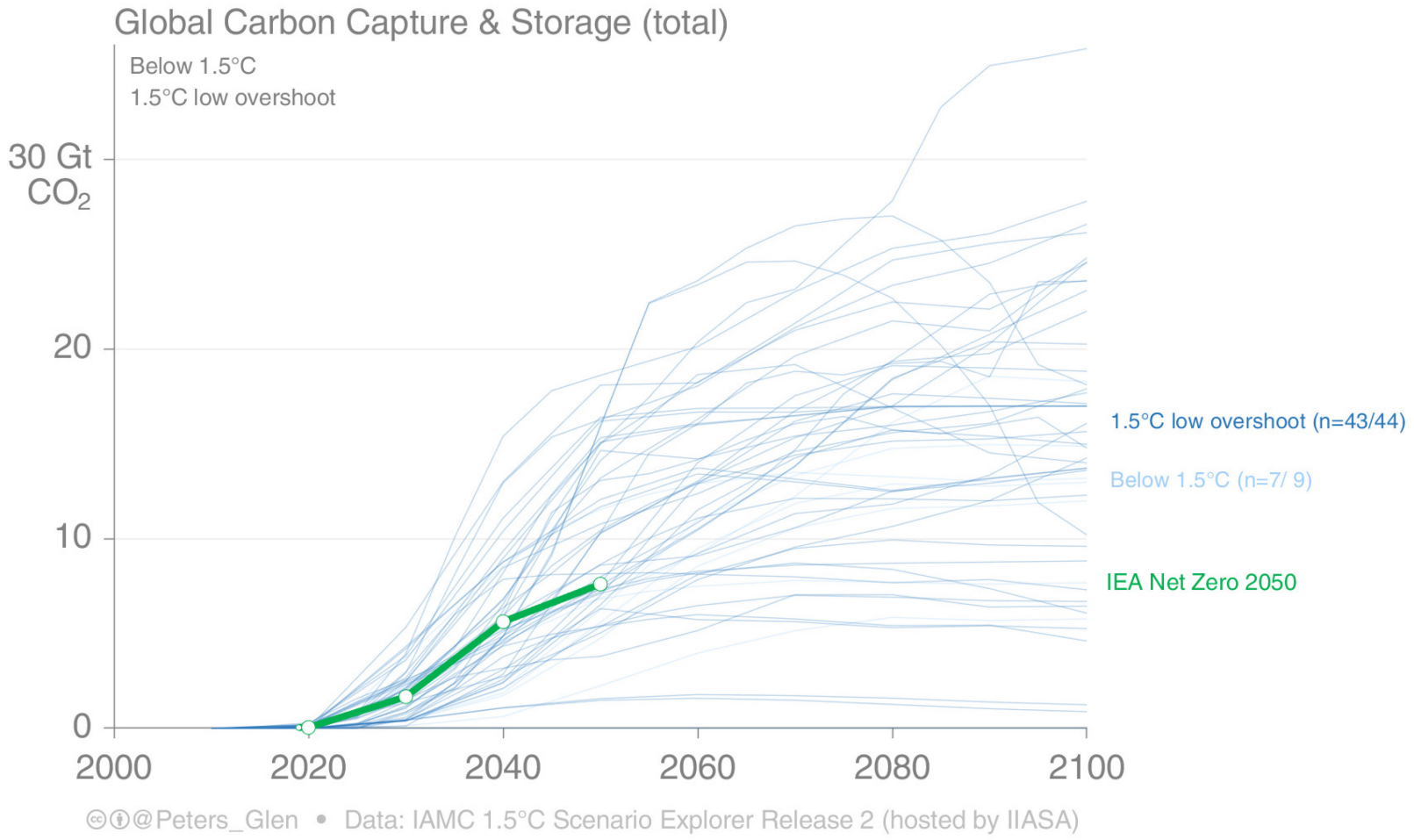
Once fields under development start production, all upstream oil and gas investment is spent on maintaining production at existing fields

Note: Investment in new fields in the 2021-2030 period is for projects that are already under construction or have been approved.

Data: IEA NZE2050

Carbon Capture & Storage (longship)

The IEA requires large-scale CCS through to 2050, though a little less than IPCC.
Building five CCS facilities of size 1MtCO_2 (Sleipner) every week from now to 2050 gives 7.5GtCO_2/yr in 2050



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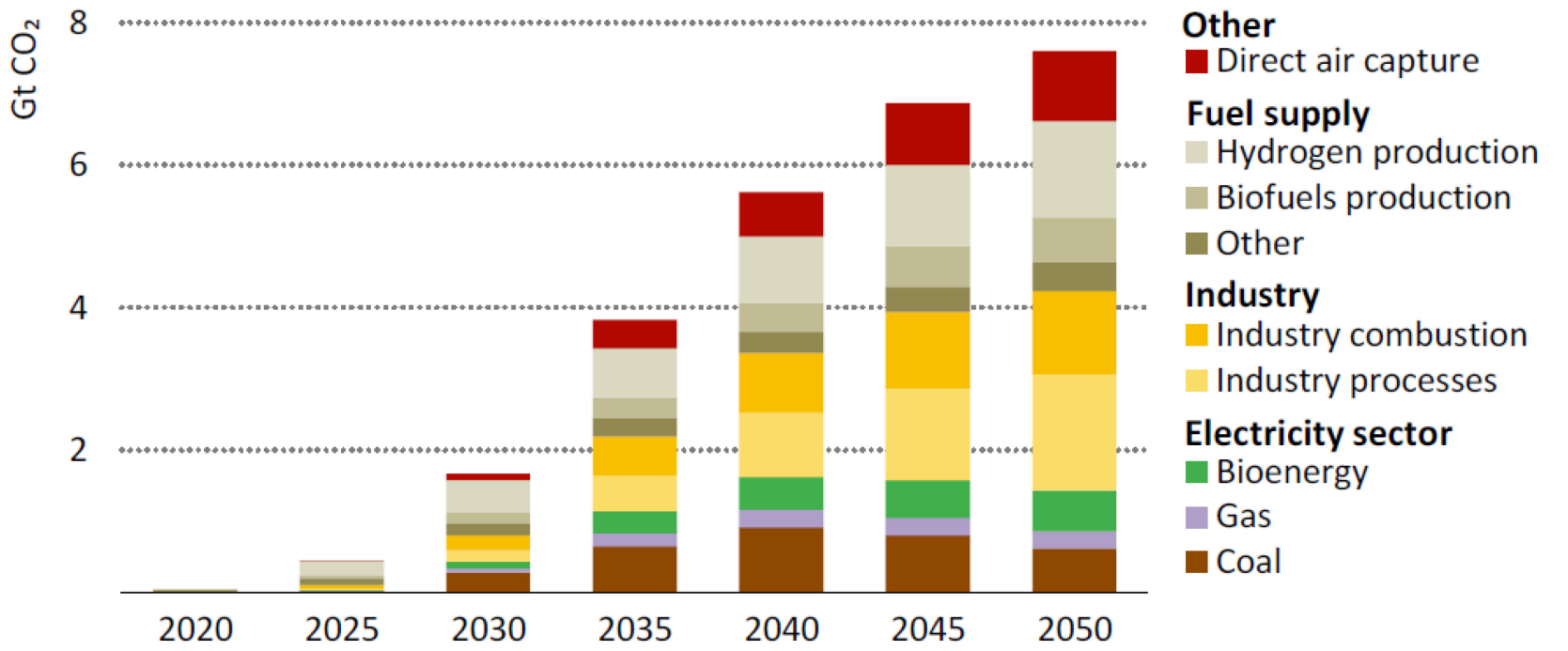
Data: IEA NZE2050; IAMC 1.5°C Scenario Explorer (hosted by IIASA)

Carbon Capture & Storage (longship)

Most CCS goes to industry and fuel supply (e.g. hydrogen), very little in electricity generation

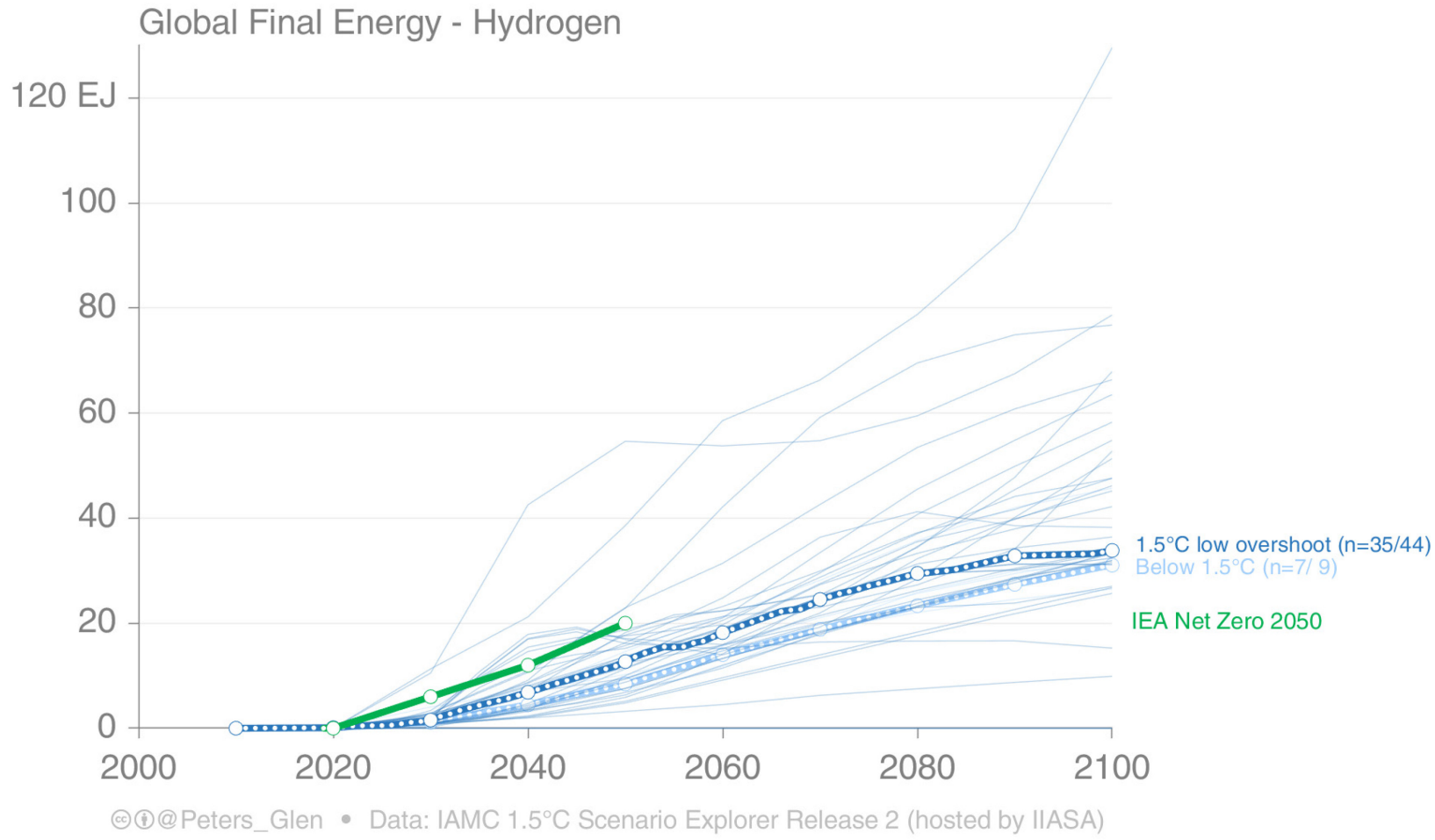


By 2050, 7.6 Gt of CO_2 is captured per year from a diverse range of sources. A total of 2.4 Gt CO_2 is captured from bioenergy use and DAC, of which 1.9 Gt CO_2 is permanently stored.

Data: IEA NZE2050

Hydrogen

The IEA is relatively high on hydrogen. This is an opportunity for Norway (gas with CCS or electricity)
The hydrogen produced by gas is already included in the declining use of gas overall.



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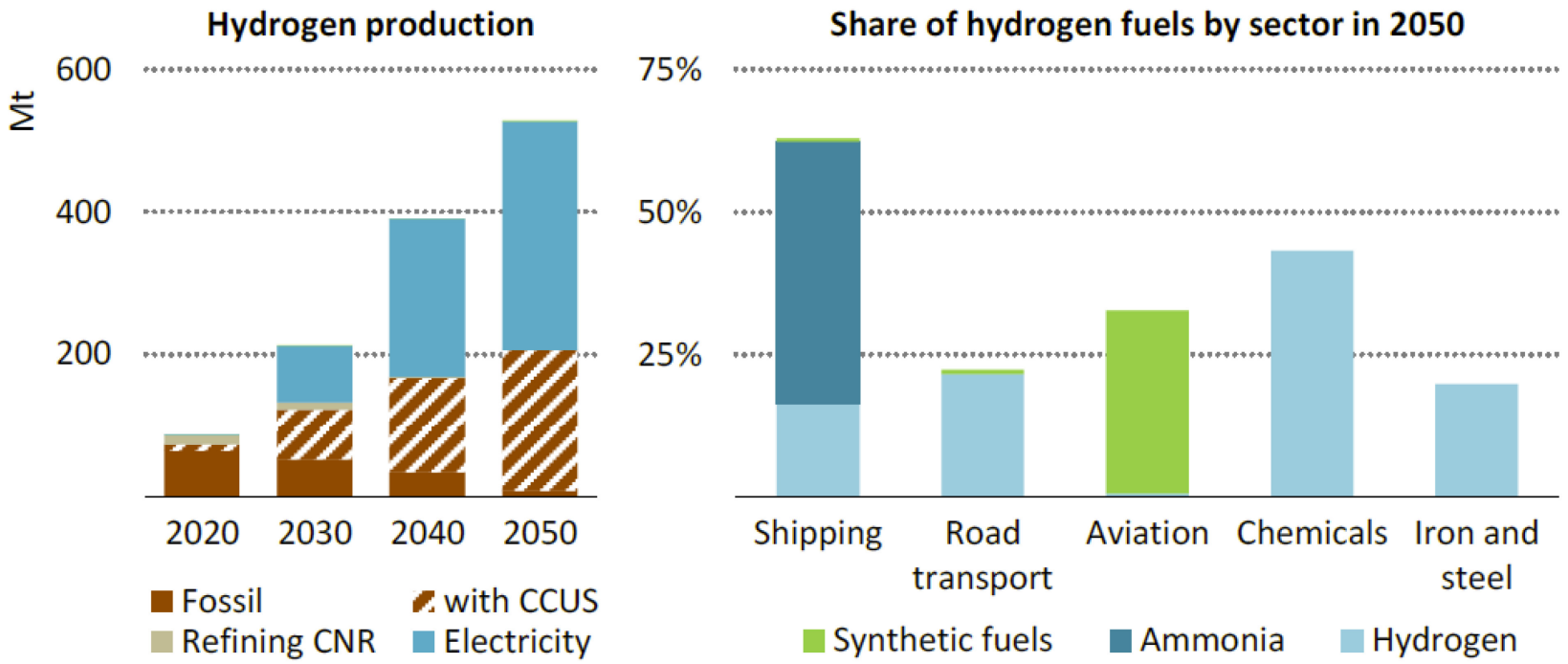
Data: IEA NZE2050; IAMC 1.5°C Scenario Explorer (hosted by IIASA)

Hydrogen

A sizeable share of fossil gas is used to produce hydrogen, though over time electricity dominates
The use of hydrogen is distributed across sectors, but mainly transport and industry (not electricity)



Hydrogen production jumps sixfold by 2050, driven by water electrolysis and natural gas with CCUS, to meet rising demand in shipping, road transport and heavy industry

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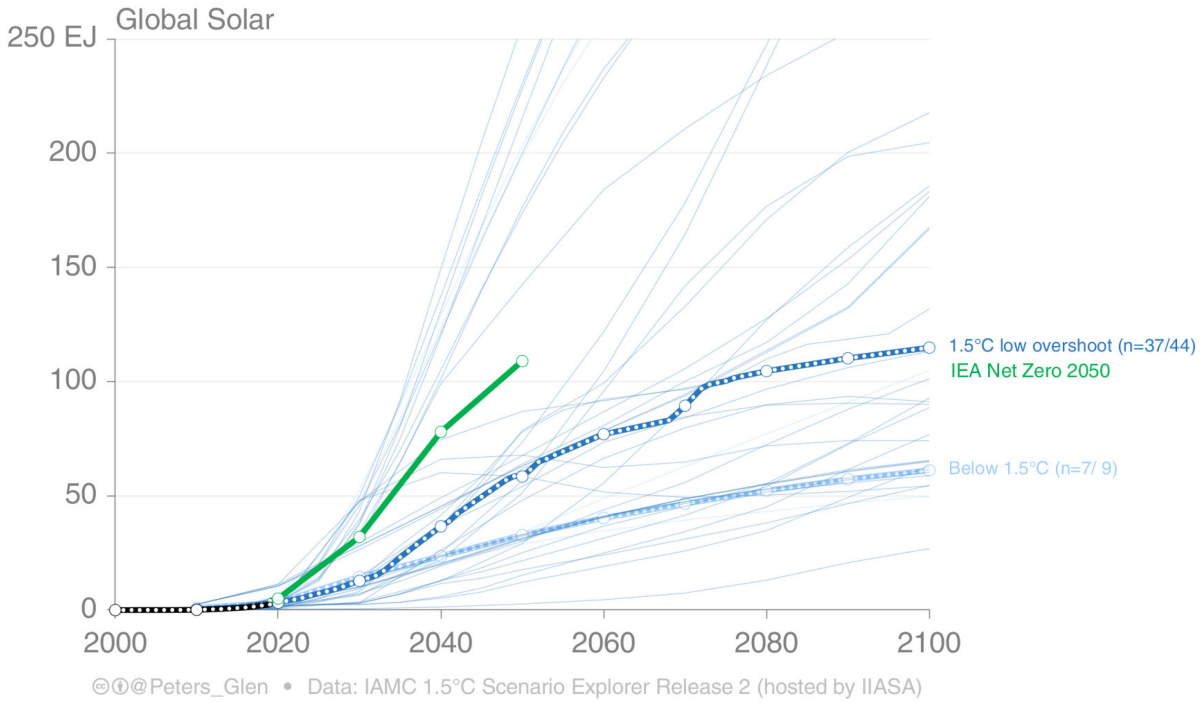
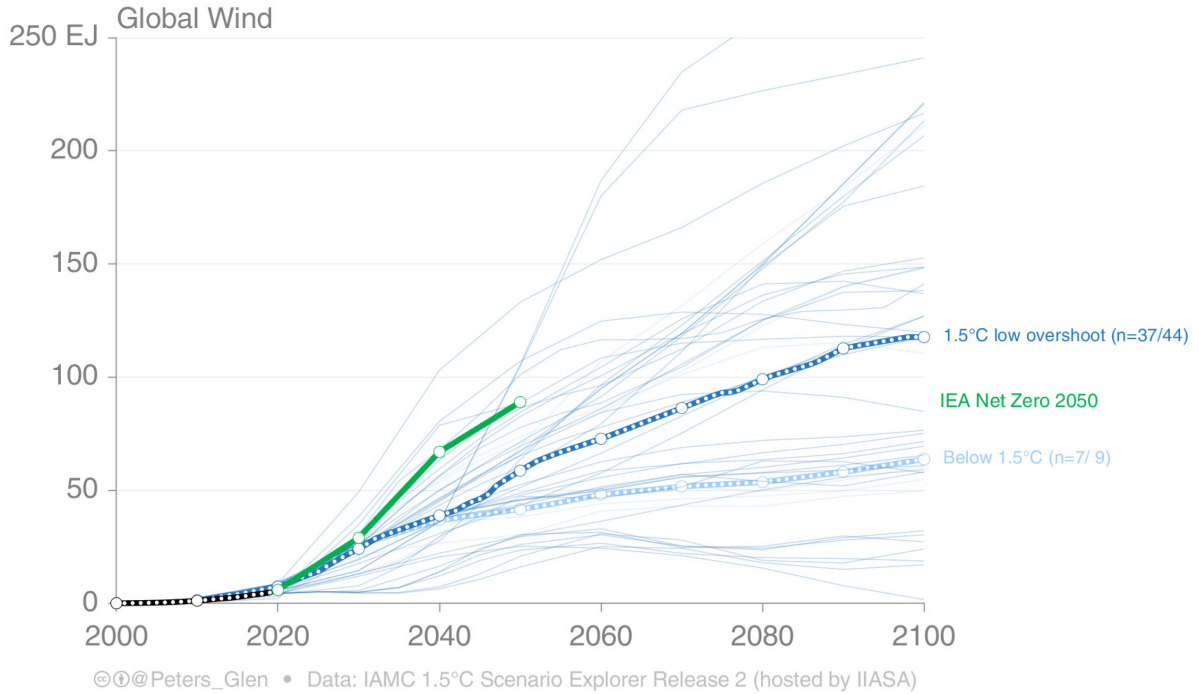
Data: IEA NZE2050

Solar and Wind

The IEA is sees more solar and wind than most scenarios assessed by the IPCC
Overall, a similar amount of electricity from solar and wind in 2050





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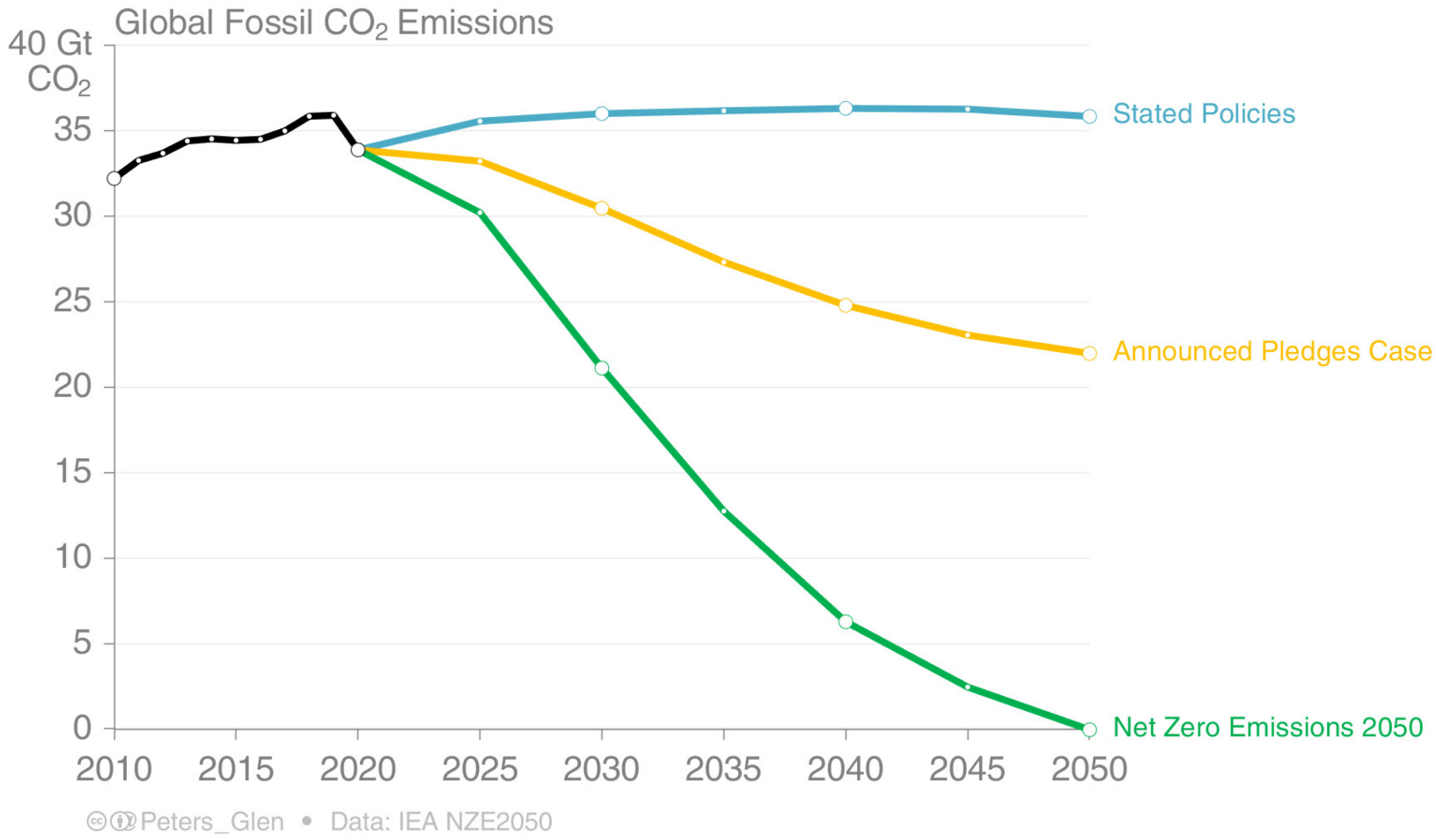
Some key messages

Some key messages

- The IEA has dealt with many criticisms of IPCC scenarios
  - Carbon dioxide removal (not really carbon capture & storage)
- We have the tools
  - All the tools are in the market to reduce emissions by 2030
  - From 2030 to 2050 about half technologies under development
- Lots of jobs and mitigation can boost the economy
- There is no need for investment in new fossil fuel supply
- Cooperation is important, equity challenges, just transition

Remains a significant ‘emissions gap’



Data: IEA NZE2050

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