

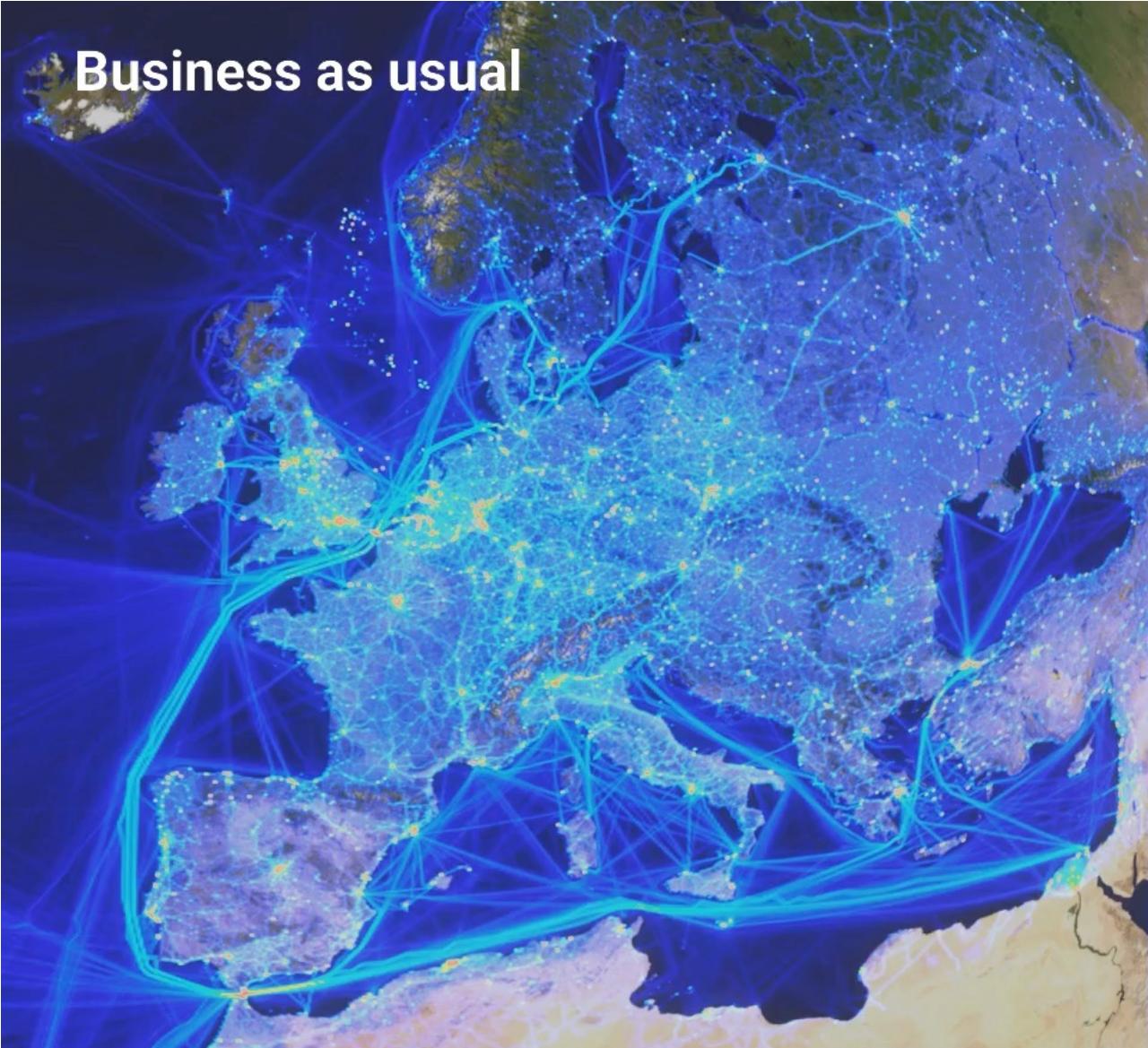


INTERVENTI INTRODUTTIVI

Introduzione al workshop

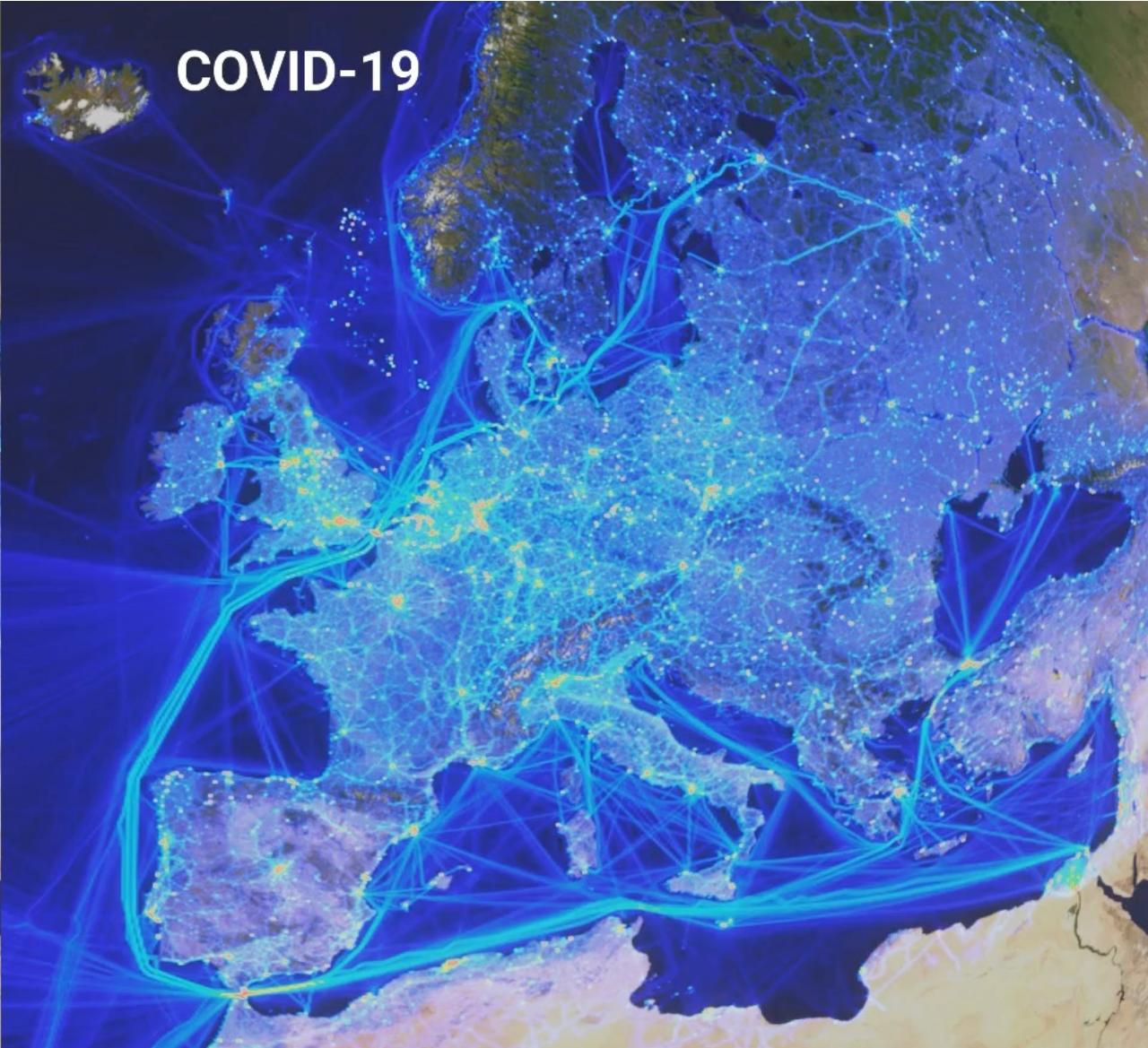
Valter Maggi | Università degli studi di Milano-Bicocca

Business as usual



21 Feb 2020

COVID-19

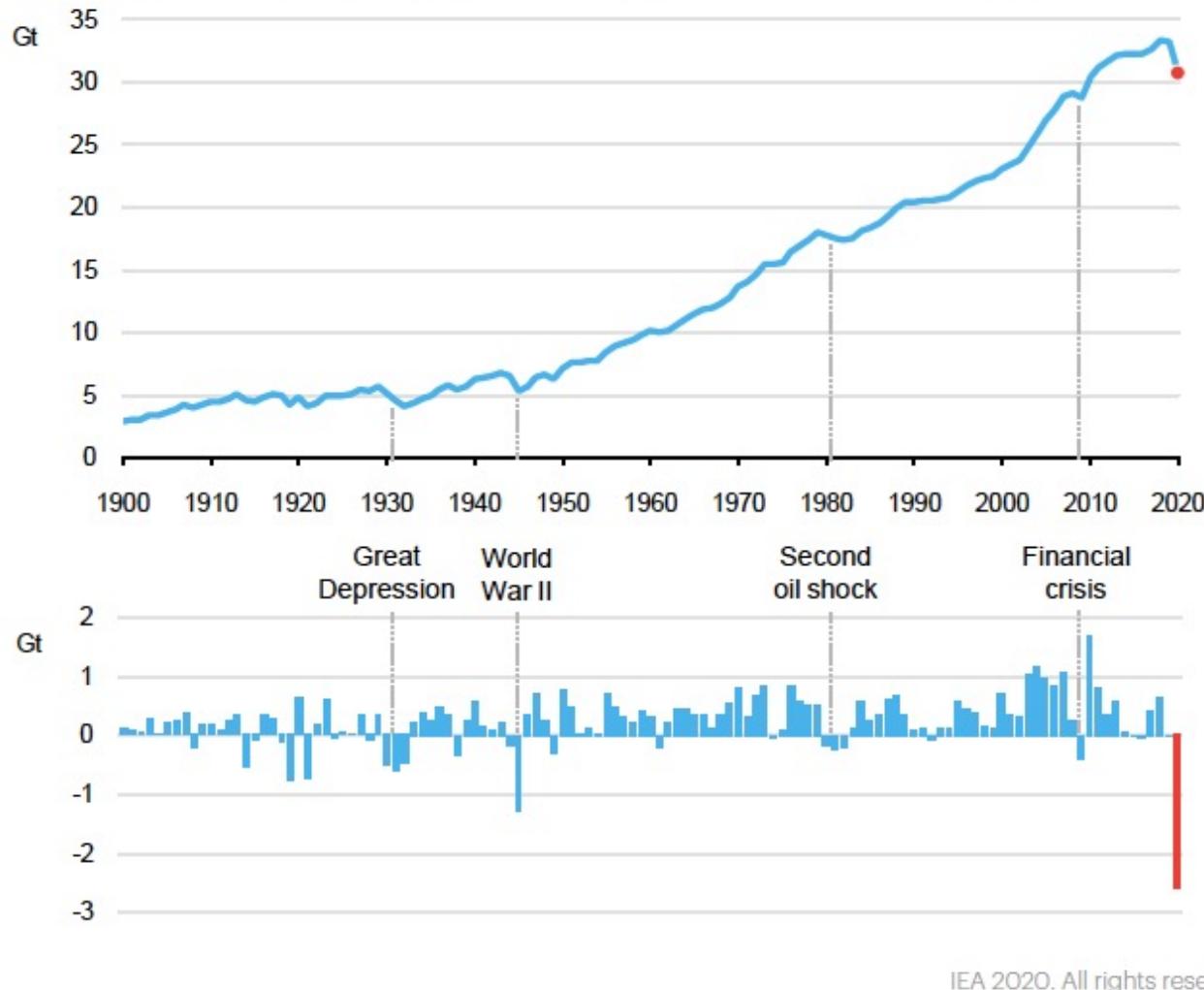


kg NO_x / day

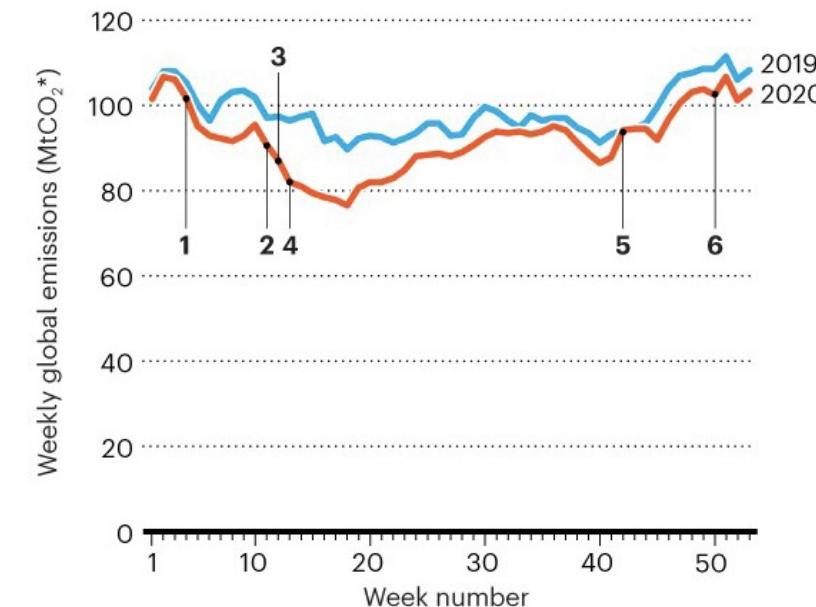
A horizontal color scale bar indicating the amount of NOx emissions in kilograms per day. The scale ranges from 0 to 12,500 kg NO_x / day. The colors transition from dark blue (0) through green and yellow to red (12,500). Below the scale, the text "kg NO_x / day" is written.



Global energy-related CO₂ emissions and annual change, 1900-2020



Global carbon dioxide emissions fell by 6.4%, or 2.3 billion tonnes, in 2020.



1. China imposes lockdown on Wuhan, where coronavirus was first detected.
2. Slammed by COVID, Italy issues a national lockdown.
3. California becomes first US state to impose a lockdown.
4. India begins its first nationwide lockdown
5. As Europe surpasses 100,000 new daily infections, countries announce new wave of restrictions.
6. California imposes a 3-week lockdown after registering its highest daily total of new infections.

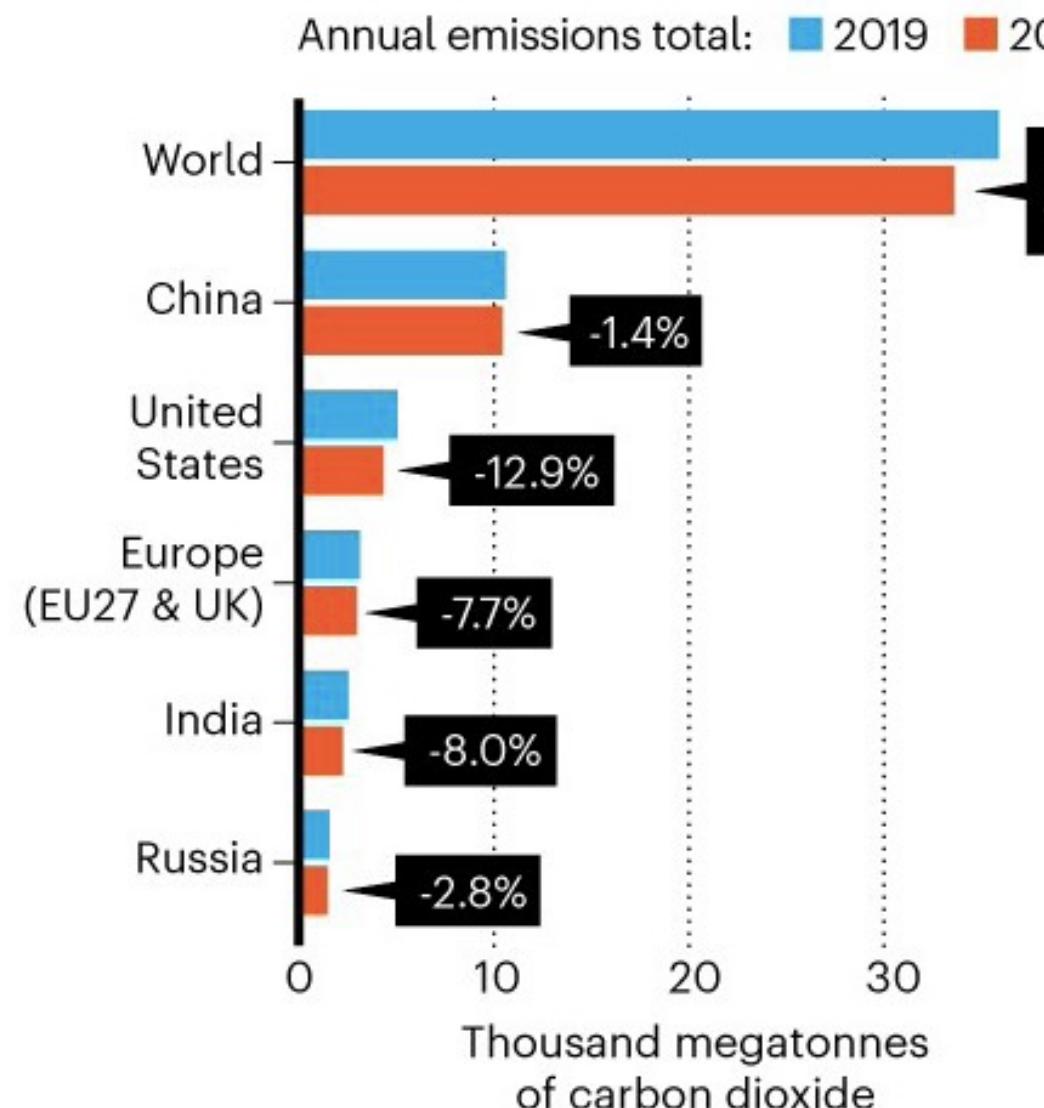
*Megatonnes carbon dioxide.

©nature

Note(s): Worldwide; 2020

Further information regarding this statistic can be found on [page 8](#).

Source(s): Enerdata; [ID 1201040](#)



©nature

Source: Carbon Monitor programme/Nature analysis

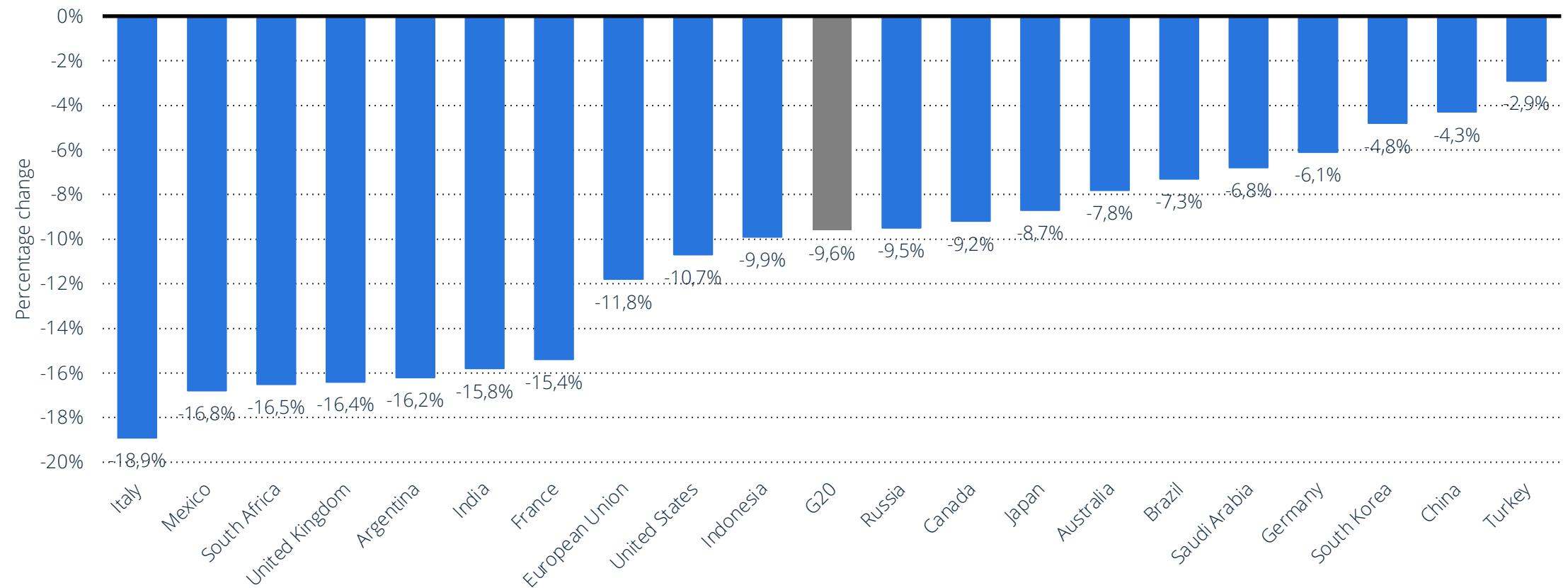
Note(s): Worldwide; 2020

Further information regarding this statistic can be found on [page 8](#).

Source(s): Enerdata; [ID 1201040](#)

Projected change in transportation sector emissions worldwide in 2020, by select country*

Transportation sector emission reductions worldwide 2020, by country



Note(s): Worldwide; 2020

Further information regarding this statistic can be found on [page 8](#).

Source(s): Enerdata; [ID 1201040](#)



A

Temple University FY 2020 Greenhouse Gas Emissions Summary
prepared by the Office of Sustainability

| | Emissions Source | FY2006 | FY2007 |
|-------------------------------------|---|-----------|-----------|
| Scope 1 Emissions (MT CO2E) | Stationary (oil, natural gas, propane) | 57,174 | 55,351 |
| | Mobile (University Fleet) | 625 | 645 |
| | Refrigerants & Chemicals | 1,930 | 1,868 |
| | Fertilizer | 10 | 7 |
| | Total Gross Emissions Scope 1 | 59,738 | 58,052 |
| Scope 2 Emissions (MT CO2E) | Purchased Electricity | 104,559 | 97,958 |
| | Purchased Steam | 278 | 318 |
| | Total Gross Emissions Scope 2 | 104,837 | 98,276 |
| Scope 3 Emissions (MT CO2E) | Faculty Commuting | 2,177 | 2,113 |
| | Staff Commuting | 3,959 | 3,949 |
| | Student Commuting | 12,325 | 12,319 |
| | University Financed Travel | 5,582 | 6,031 |
| | Solid Waste | 13,760 | 13,109 |
| Scope 1-3 Gross Emissions (MT CO2E) | Transmission & Distribution Losses | 10,353 | 9,917 |
| | Total Gross Emissions Scope 3 | 48,155 | 47,437 |
| | Total Gross Emissions | 212,731 | 203,765 |
| | Gross Square Footage (GSF)1 | 8,266,175 | 8,271,765 |
| | Full-Time Equivalent Students (FTE) | 27,055 | 27,560 |
| Scope 1-3 Net Emissions (MT CO2E) | Total Gross Emission Intensity/1000 GSF | 26 | 25 |
| | Total Gross Emission Intensity/FTE | 8 | 7 |
| | Offsets (On-site Compost) | (3) | (5) |
| | Total Net Emissions | 212,728 | 203,760 |
| | Total Net Emission Intensity/1000 GSF | 26 | 25 |
| Scope 1-3 Net Emissions (MT CO2E) | Total Net Emission Intensity/FTE | 8 | 7 |

| Emissions Source | FY2019 | FY2020 | Difference FY19 to FY20 | % Change FY06 to FY20 | %Change FY19 to FY20 |
|-------------------------------------|---|------------|-------------------------|-----------------------|----------------------|
| Scope 1 Emissions (MT CO2E) | Stationary (oil, natural gas, propane) | 54,810 | 51,795 | (3,014) | -9% |
| | Mobile (University Fleet) | 874 | 724 | (150) | 16% |
| | Refrigerants & Chemicals | 763 | 432 | (331) | -78% |
| | Fertilizer | 2 | 3 | 1 | -71% |
| | Total Gross Emissions Scope 1 | 56,448 | 52,954 | (3,494) | -11% |
| Scope 2 Emissions (MT CO2E) | Purchased Electricity | 50,090 | 44,279 | (5,811) | -58% |
| | Purchased Steam | 694 | 694 | - | 150% |
| | Total Gross Emissions Scope 2 | 50,784 | 44,973 | (5,811) | -57% |
| Scope 3 Emissions (MT CO2E) | Faculty Commuting | 5,871 | 2,064 | (3,806) | -5% |
| | Staff Commuting | 12,052 | 8,902 | (3,150) | 125% |
| | Student Commuting | 22,863 | 17,162 | (5,701) | 39% |
| | University Financed Travel | 7,877 | 6,251 | (1,627) | 12% |
| | Solid Waste | 1 | 1 | (0) | -100% |
| Scope 1-3 Gross Emissions (MT CO2E) | Transmission & Distribution Losses | 3,335 | 3,054 | (281) | -71% |
| | Total Gross Emissions Scope 3 | 51,998 | 37,433 | (14,565) | -22% |
| | Total Gross Emissions | 159,230 | 135,360 | (23,870) | -36% |
| Scope 1-3 Net Emissions (MT CO2E) | Gross Square Footage (GSF)1 | 10,908,684 | 11,349,154 | 440,470 | 37% |
| | Full-Time Equivalent Students (FTE) | 36,423 | 35,641 | (782) | 32% |
| | Total Gross Emission Intensity/1000 GSF | 15 | 12 | (3) | -54% |
| | Total Gross Emission Intensity/FTE | 4 | 4 | (1) | -52% |
| | Offsets (On-site Compost) | - | - | - | -100% |
| Scope 1-3 Net Emissions (MT CO2E) | Total Net Emissions | 159,230 | 135,360 | (23,870) | -36% |
| | Total Net Emission Intensity/1000 GSF | 15 | 12 | (3) | -54% |
| | Total Net Emission Intensity/FTE | 4 | 4 | (1) | -52% |
| | Total Net Emission Intensity | - | - | - | -15% |

BOURNEMOUTH UNIVERSITY

IS A MID-SIZED PUBLIC INSTITUTION OF HIGHER EDUCATION IN BOURNEMOUTH AND POOLE, DORSET, UK. FOUNDED IN 1992

Table 2
Inventory data and carbon footprint estimates.

| Item | Unit of primary data | Primary data (see appropriate units) | | | Carbon footprint data (kg CO2e) | | |
|--|---------------------------|--------------------------------------|--------------------|--------------------|---------------------------------|------------------|-----------------|
| | | April–June 2018 | April–June 2019 | April–June 2020 | Apr–June 2018 | Apr–June 2019 | Apr–Jun 2020 |
| Electricity | kWh | 2,153,514 | 2,036,539 | 1,233,087 | 661,560 | 564,732 | 312,205 |
| Gas | kWh | 1,161,083 | 1,058,149 | 512,735 | 213,593 | 194,541 | 94,277 |
| Water supply | m ³ | 11,076 | 9734 | 4549 | 3810 | 3348 | 1565 |
| Water treatment | m ³ | 10,522.2 | 9247.3 | 4321.55 | 7450 | 6547 | 3060 |
| Fleet | kg CO2e | 5666 | 3262 | 0 | 5666 | 3262 | 0 |
| Food waste | kg | 12,690 | 15,080 | 0 | 129 | 154 | 0 |
| Other solid waste | kg | 102,100 | 98,900 | 2500 | 2176 | 2112 | 53 |
| Employee commute | kg CO2e | 285,932 | – | 0 | 285,932 | 285,932 | 0 |
| Student commute | kg CO2e | – | 873,568 | 0 | 873,568 | 873,568 | 0 |
| Business travel | Rail (Eurostar) km | 6010.55 | 11,841.44 | 0 | 74 | 71 | 0 |
| Business travel | Rail (Domestic) km | 200,721 | 194,011.28 | 0 | 8880 | 7984 | 0 |
| Business travel | Flight (Domestic) km | 3961.85 | 8259.59 | 0 | 129 | 1114 | 0 |
| Business travel | Flight (International) km | 842,699.69 | 662,441.51 | 0 | 12,919 | 48,488 | 0 |
| Business travel | Flight (Short Haul) km | 2,147,456.28 | 388,547.21 | 0 | 37,580 | 31,989 | 0 |
| Business travel | Flight (Long Haul) km | 342,866.1 | 1,462,006.4 | 0 | 6113 | 115,791 | 0 |
| Work from home, academic staff | kg CO2e | – | – | – | – | – | 49,316 |
| Work from home, professional and support staff | kg CO2e | – | – | – | – | – | 56,690 |
| Study from home, students | kg CO2e | – | – | – | – | – | 1,004,224 |
| Total | | | | | 2,119,580 | 2,139,633 | 1,521,390 |

V. Filimonau, D. Archer, L. Bellamy et al. Science of the Total Environment 756 (2021) 143964

BOURNEMOUTH UNIVERSITY

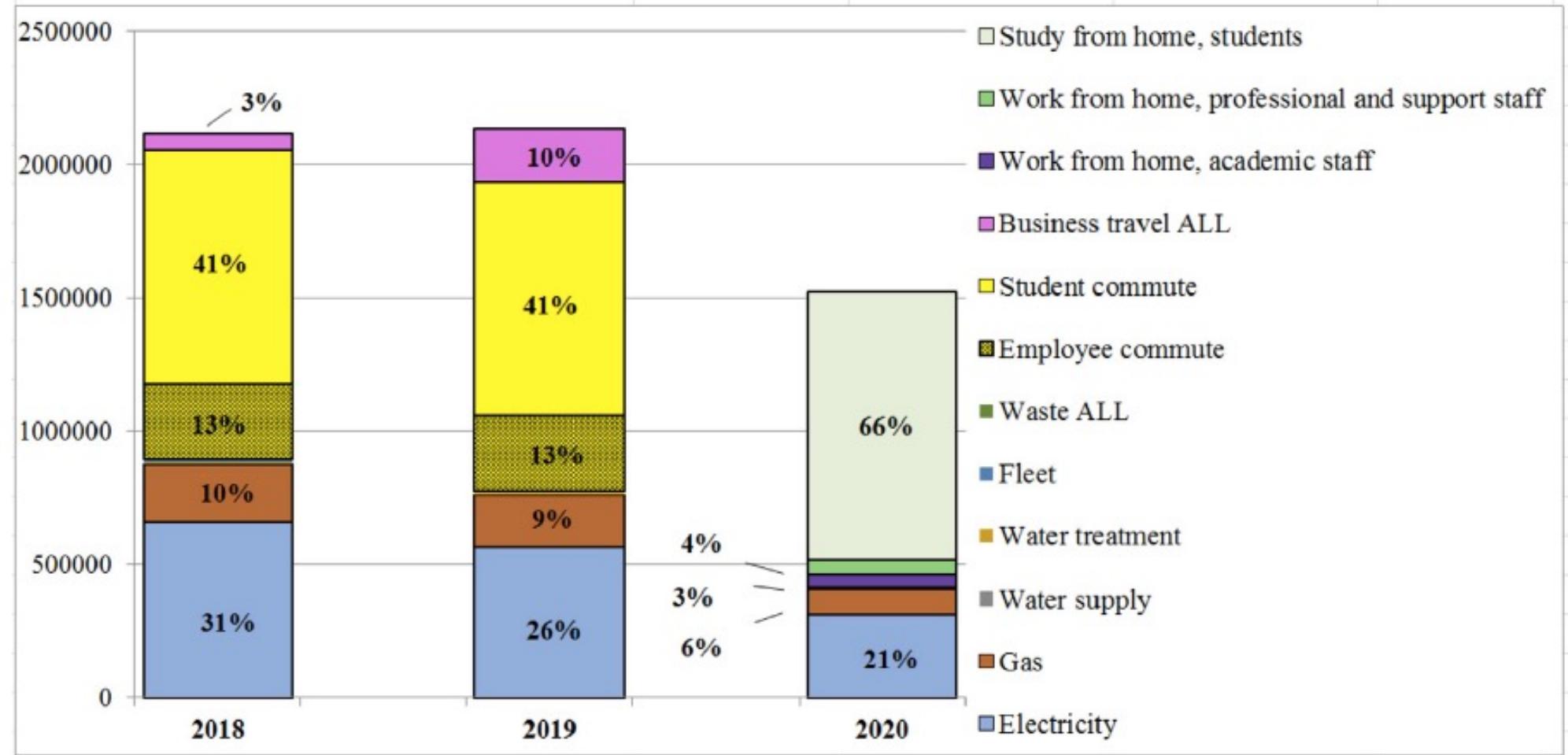


Fig. 4. Comparative analysis of carbon footprint in April–June 2018, 2019 and 2020 (in kg of CO₂-e).

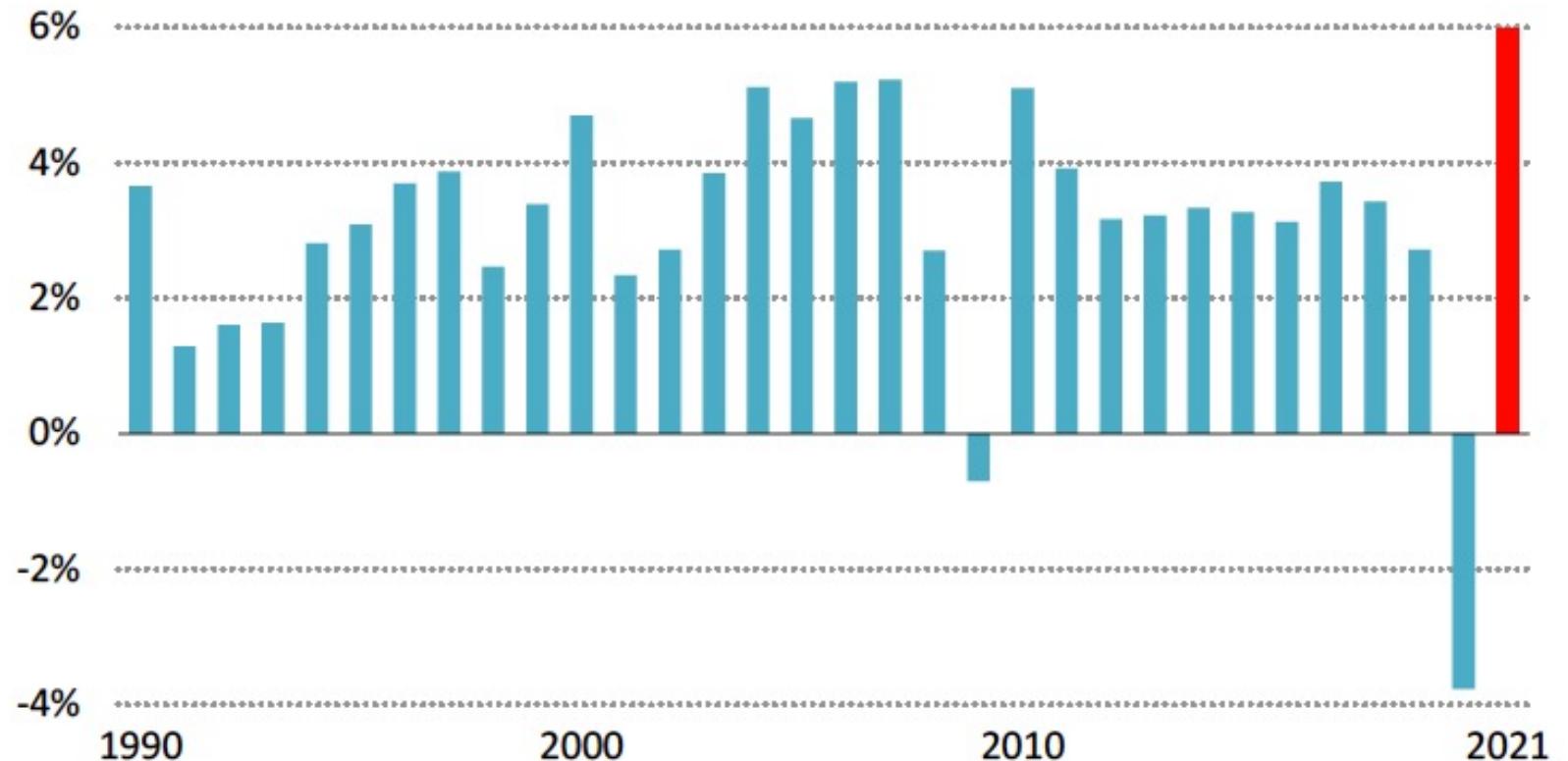
NEXT?

TWO QUESTIONS RISE:

1) THE GHG IN ATM

2) THE 2021

Annual rate of change in world GDP 1990-2021

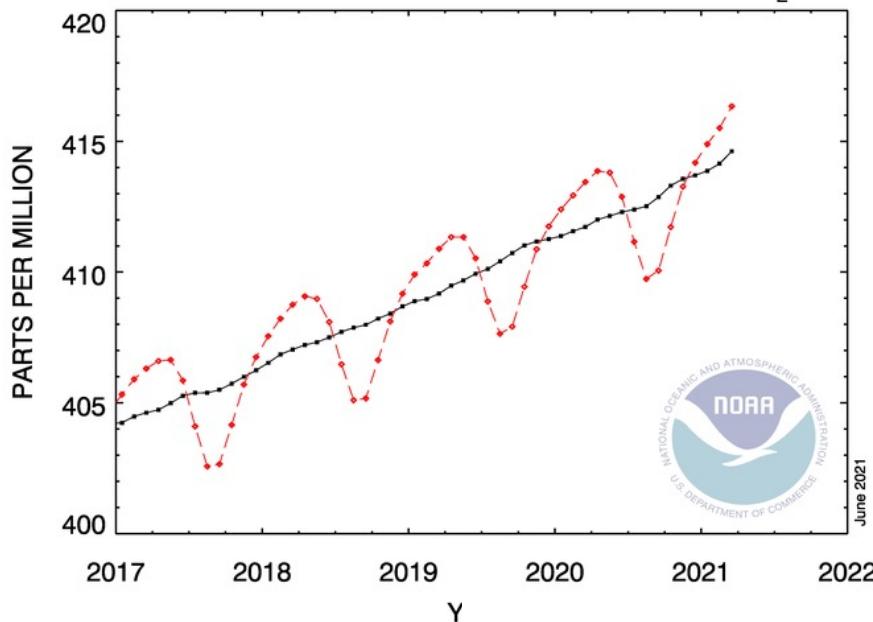


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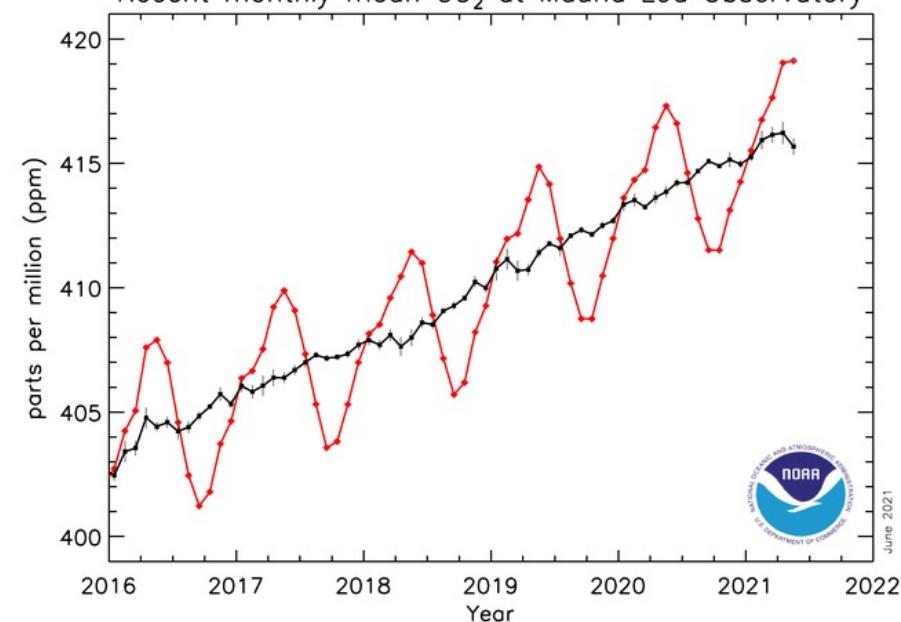
Source: IEA analysis based on economic data from the IMF and Oxford Economics.

GHG Atm.

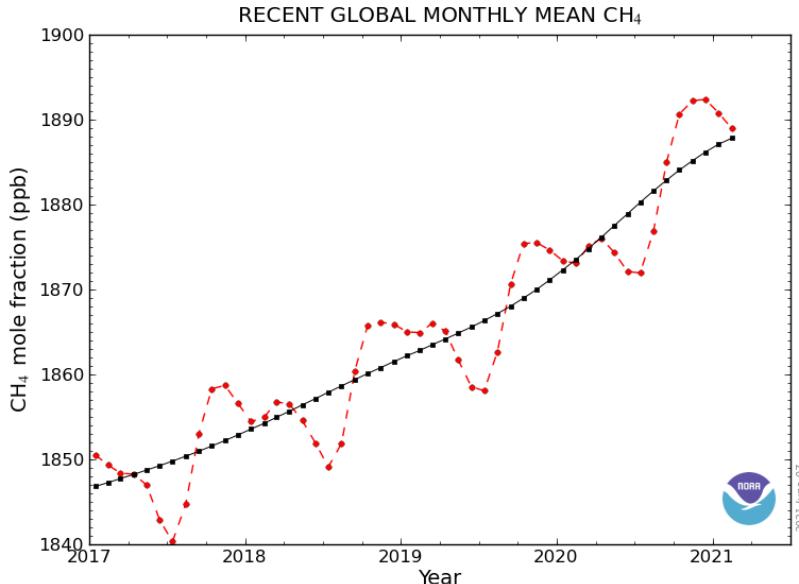
RECENT GLOBAL MONTHLY MEAN CO₂



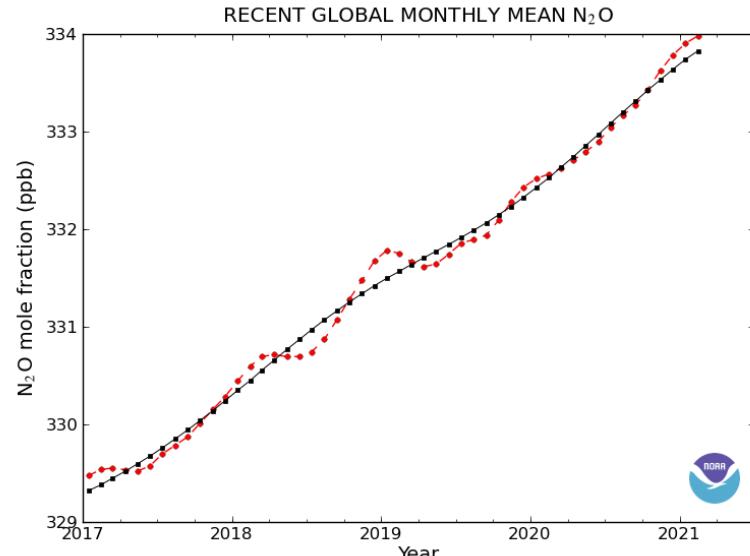
Recent monthly mean CO₂ at Mauna Loa Observatory



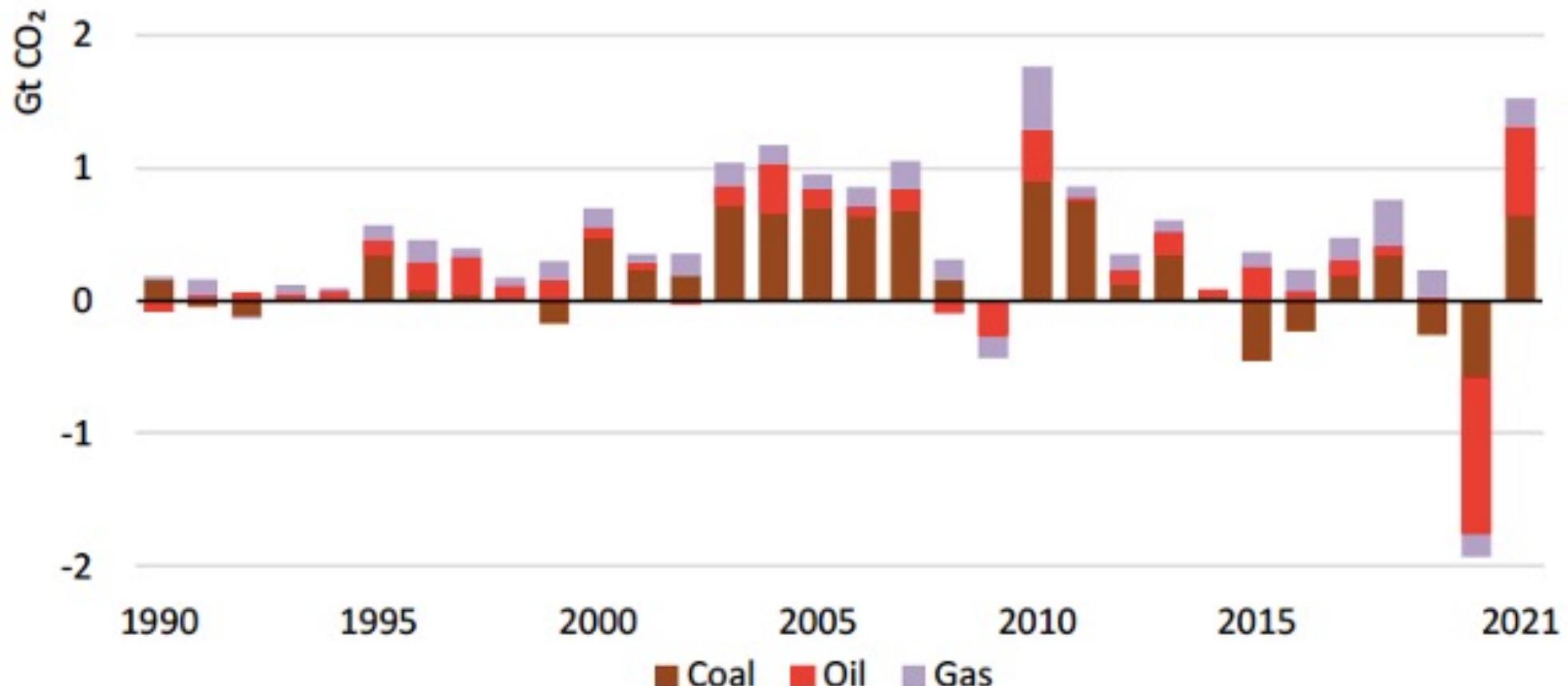
RECENT GLOBAL MONTHLY MEAN CH₄



RECENT GLOBAL MONTHLY MEAN N₂O



THE 2021! WHAT HAPPENS?????



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INTERVENTI INTRODUTTIVI

La gestione efficiente dell'energia per la decarbonizzazione degli atenei italiani

Alberto Poggio | Coordinatore GdL RUS Energia | Politecnico di Torino

Le emissioni dei trasporti e gli interventi per la mobilità sostenibile nelle università italiane

Matteo Colleoni | Coordinatore GdL RUS Mobilità | Università degli studi di Milano-Bicocca