



RYSTAD ENERGY

COVID-19 REPORT

6TH EDITION

GLOBAL OUTBREAK OVERVIEW AND ITS IMPACT
ON THE ENERGY SECTOR

15 APRIL 2020
PUBLIC VERSION

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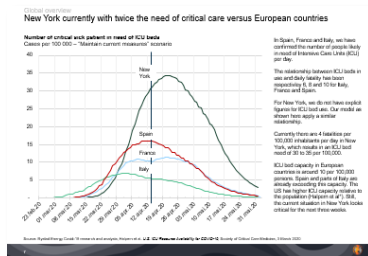
Executive summary

This week the global picture looks like a mixed bag. Several countries in Europe have gained control over the pandemic and are beginning to loosen social distancing measures. In Norway, kindergartens, hairdressers and opticians will be allowed to reopen under certain conditions. Similar plans are rolling forward for Austria, the Czech Republic and Germany. Increased testing combined with the implementation of mobile phone apps for virus tracking will also be introduced to help these societies manage the virus while loosening measures. Monitoring the development of the virus in these countries, as well as in China and South Korea, could serve as an early case study, shedding light on the potential duration of the virus and the depth of impact it may have on the general economy as well as the energy markets.

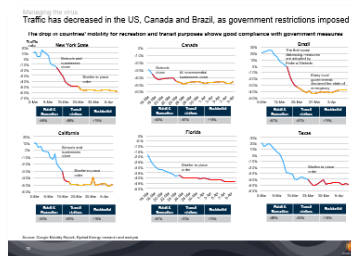
On the other hand, the situation in the UK, Russia and Bangladesh, as well as in US states New York and New Jersey, is rapidly worsening. The worst is still to come in these and many other countries. In New York, daily fatalities are now at 4 per 100,000, more than twice the peak levels seen in Spain and Italy.

Global road traffic this week was at the lowest level seen in many years, down an additional 10% versus last week. The number of passenger flights was down more than 90% for seven key countries, and down 58% for the US. This leads to a global oil demand destruction of 27.5 million barrels per day (bpd) in April, a similar decrease as forecasted in last week's report. Jet fuel demand will probably reach only 2.3 million bpd in May versus pre-Corona estimates of 7.3 million bpd.

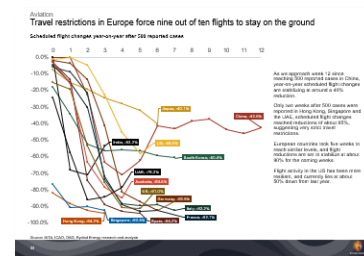
We also anticipate that fields will need to be shut-in globally as storage will quickly fill to its limit. The current OPEC+ deal will contribute to these shut-ins, but the announced cuts are not large enough to secure a market balance. More shut-ins will be necessary, in addition to filling up strategic petroleum reserves. Oil producers will probably still see the business case for such shut-ins as high oil prices are expected in 2022. Nevertheless, some capacity that will be shut-in will still struggle to return online quickly when demand resurges. Additionally, the lower level of infill drilling will result in a base production level that is insufficient when fields are reopened, resulting in an oil shortage in 2022.



ICU bed need in Europe and the US, page 7



Traffic reduction in the US, Canada and Brazil, page 12



*Reduction
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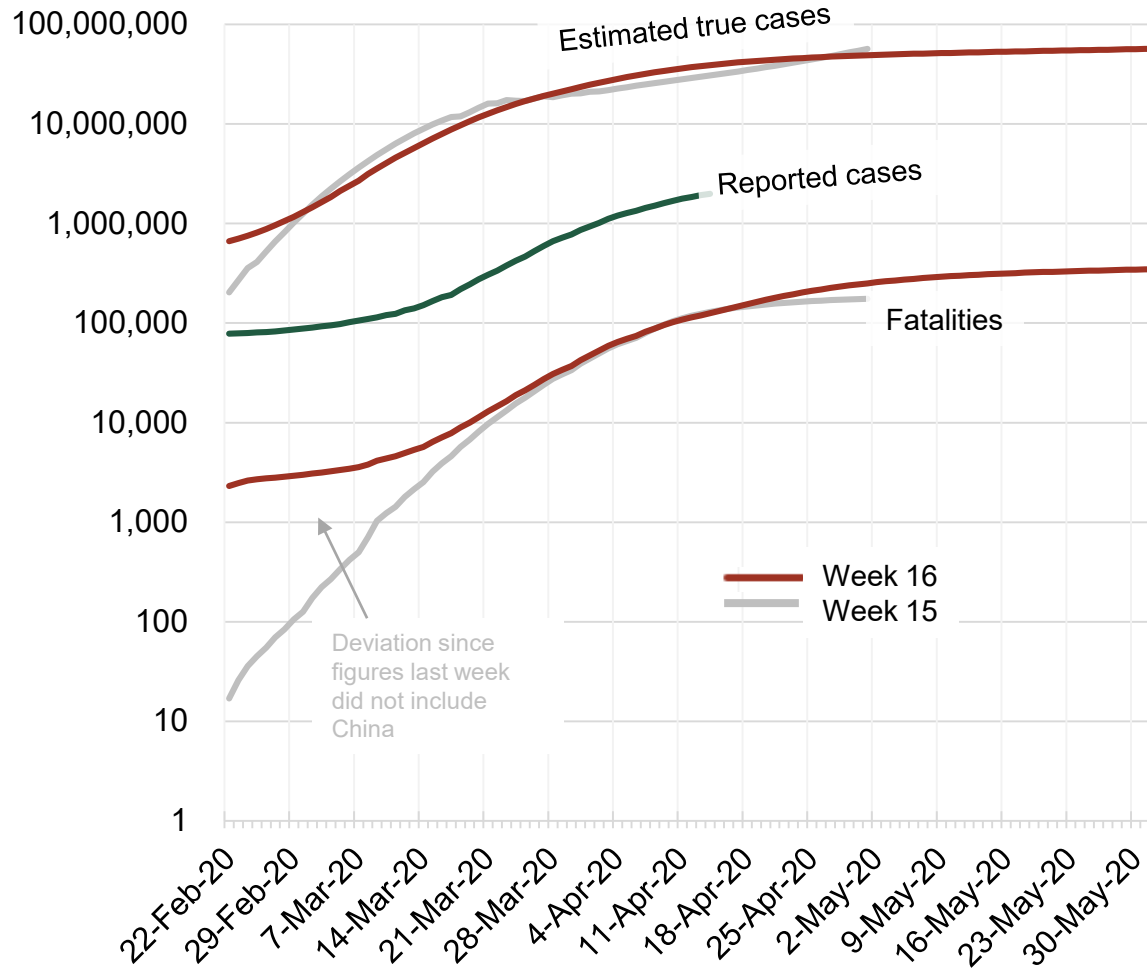
Impact on the oil and gas industry

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The true number of people infected globally is likely 39 million

Number of true and reported cases

Cases (log scale)



As of 14 April, 39 million people have likely been infected with Covid-19, according to our updated model.

Reported cases were approximately 2 million as of 14 April, a number which our analysis suggests represents just 5% of true cases. Reported cases grew last week by 5%, down from 9% growth seen the previous week, and 13% and 17% growth seen respectively over the previous two weeks. This is further evidence that quarantine measures are working. Growth is no longer exponential, but now appears linear, with 80,000 new reported cases per day on average over the last two weeks trending slightly downwards.

Registered fatalities globally were 125,000 as of 14 April, a number which grew by 6% over the last week versus the 11%, 14% and 19% growth seen respectively over the previous three weeks. Since the growth in reported fatalities fell downwards significantly, we have revised the contact rate (CR) under curfew within our models to 2.

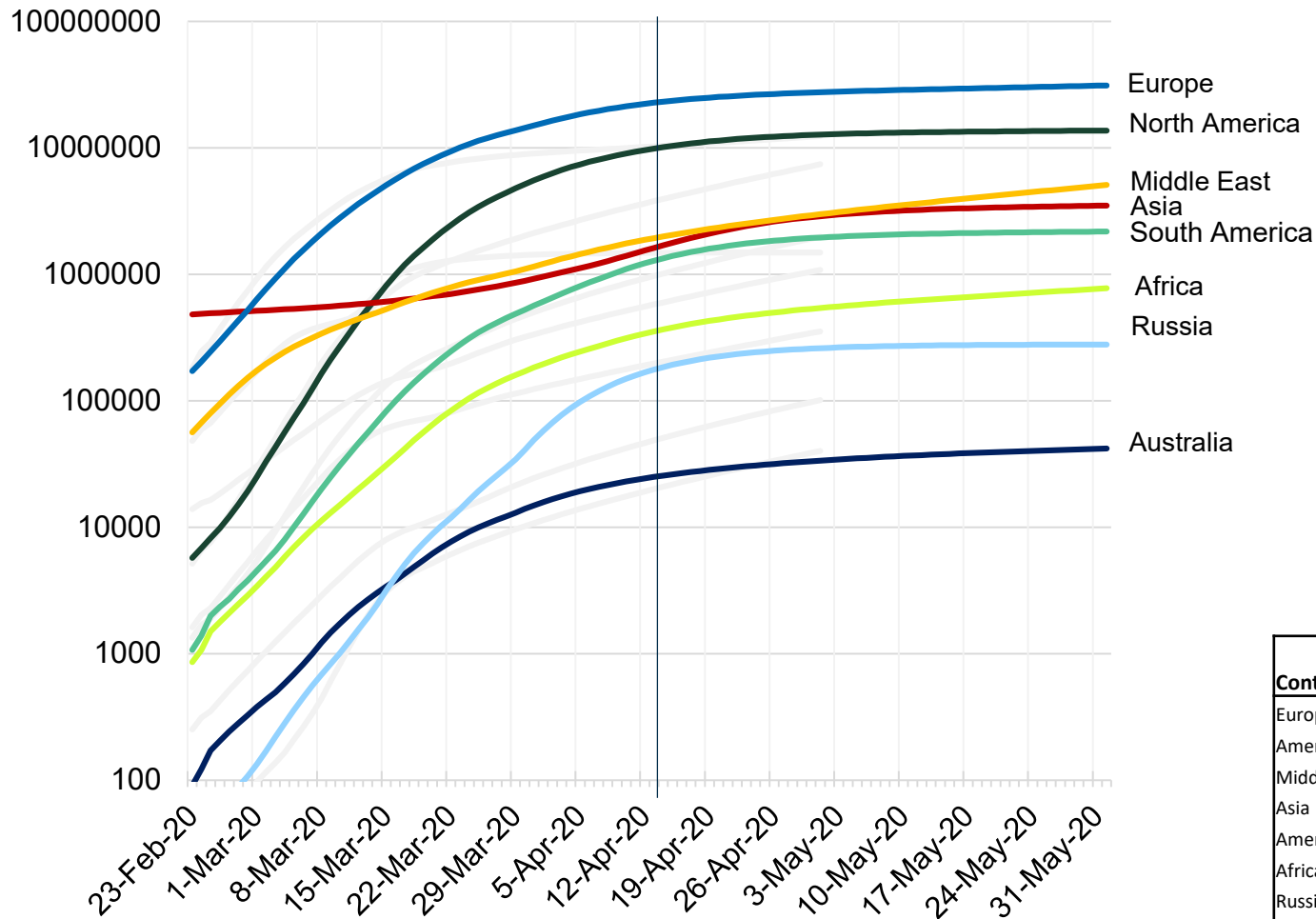
In this edition we present one scenario, wherein current strict measures are maintained. However, in this edition we have extended these measures until 1 June. Since China now comprises a small portion of the total, China is no longer omitted from the figures. In this scenario, 56 million people will be infected across the globe by June 1.

* Reason for 0.5% given in the methodology chapter "Calibrating ICU bed capacity"
Source: Rystad Energy Covid-19 research and analysis

Europe alone has more cases than the rest of world, but other continents are growing faster

Number of cases by region

Cases (log scale); assumes "Current measures" scenario



As of 14 April, an estimated 23 million people were infected in Europe, 10.2 million in North America and 6 million in the rest of the world.

All figures have been adjusted upwards versus 1 April figures due to a larger than expected increase in fatalities and reported cases.

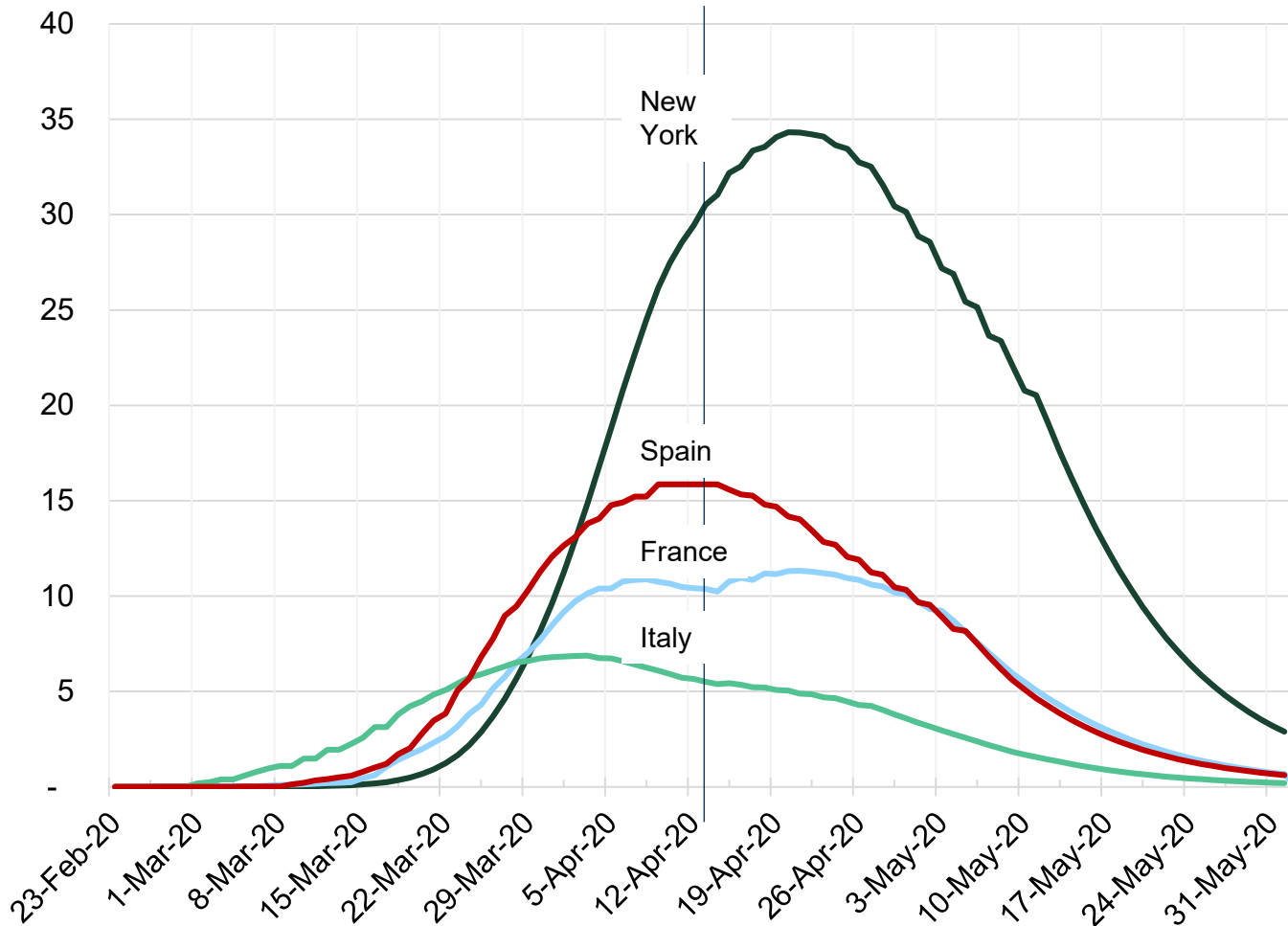
In the scenario shown here, which factors in all currently implemented measures, the number of true cases will flatten out towards 1 June.

Continent	True cases 14 April	Reported cases 14 april	Share reported
Europe	23 202 881	914 523	3.9 %
America N	10 145 494	640 921	6.3 %
Middle East	1 993 316	172 236	8.6 %
Asia	1 695 666	148 897	8.8 %
America S	1 340 470	66 820	5.0 %
Africa	366 883	16 403	4.5 %
Russia	184 958	21 102	11.4 %
Australia	25 597	7 857	30.7 %

New York currently has twice the need of critical care versus European countries

Number of critical sick patient in need of ICU beds

Cases per 100 000 – “Maintain current measures” scenario



In Spain, France and Italy, we have confirmed the number of people likely in need of Intensive Care Units (ICU) per day.

The relationship between ICU beds in use and daily fatality has been respectively 6, 8 and 10 for Italy, France and Spain.

For New York, we do not have explicit figures for ICU bed use. Our model, as shown here, applies a similar relationship.

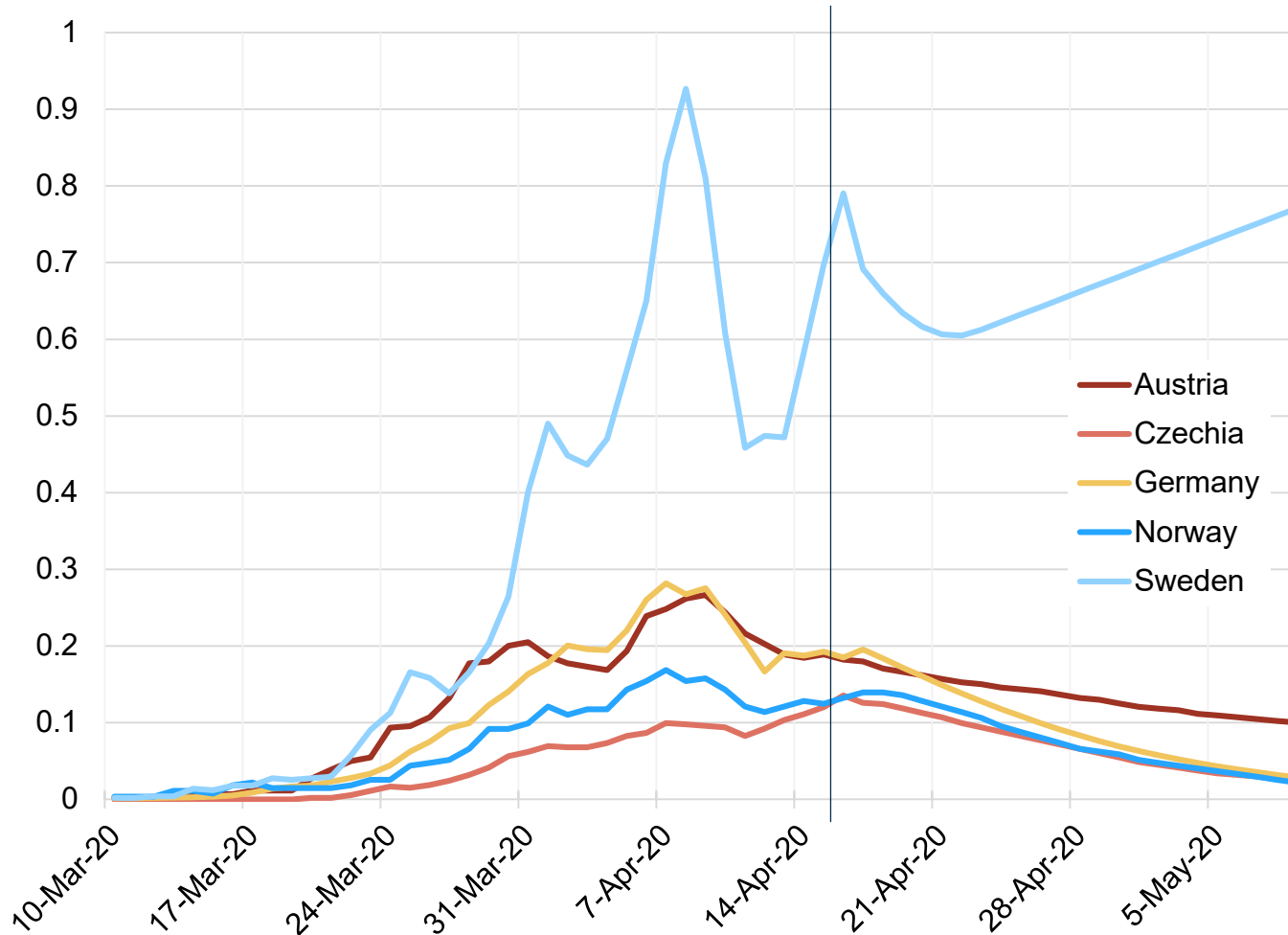
Currently there are 4 fatalities per 100,000 inhabitants per day in New York, which results in an ICU bed need of 30 to 35 per 100,000.

ICU bed capacity in European countries is around 10 per 100,000 persons. Spain and parts of Italy are already exceeding this capacity. The US has higher ICU capacity relative to the population (Halpern et al*). Still, the current situation in New York looks critical for the next three weeks.

Time to loosen up for some countries?

Number of fatalities per day per 100,000 for five European countries

New fatalities per 100,000 – “Maintaining current measures” scenario



Here we show five European countries, of which four have implemented fairly strict social distancing measures, while Sweden has had looser measures.

The effect of the measures are very visible here – fatalities seem to have peaked and the infection seems to be under control for the four countries with strict measures. Sweden has stopped the exponential growth of the virus, however the country has seen a higher level of fatalities.

Germany, Sweden, Norway and the Czech Republic are all planning to somewhat loosen social distancing measures, for example by opening kindergartens and allowing some needed professions, such as hairdressers, to go back to work*.

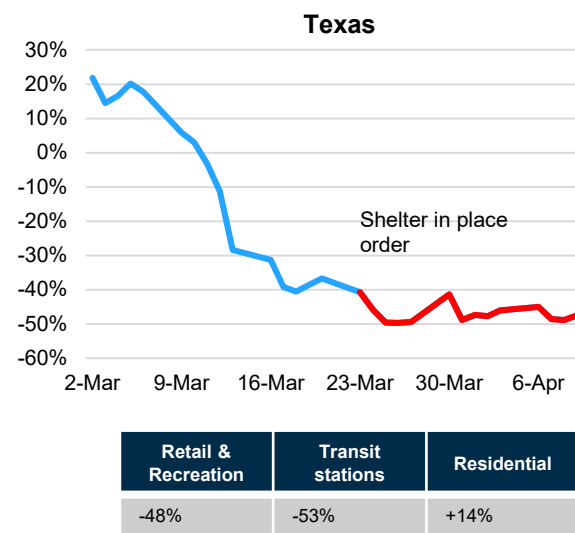
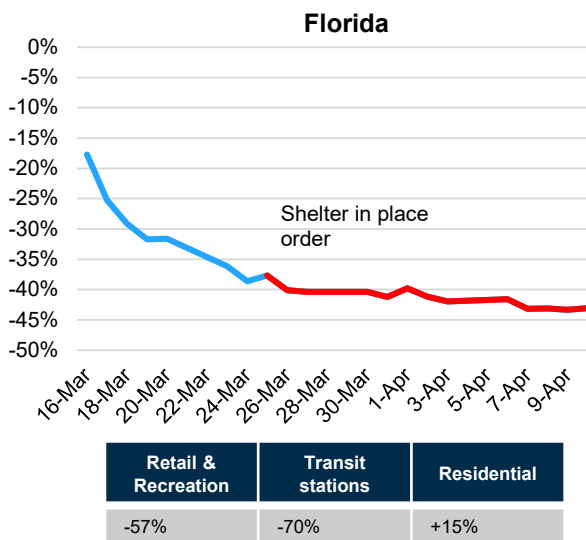
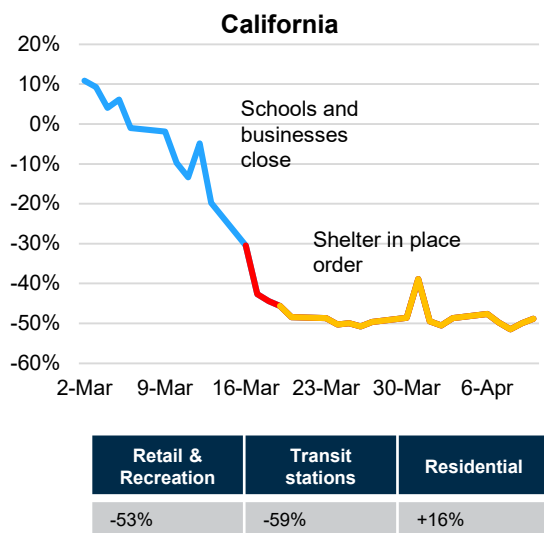
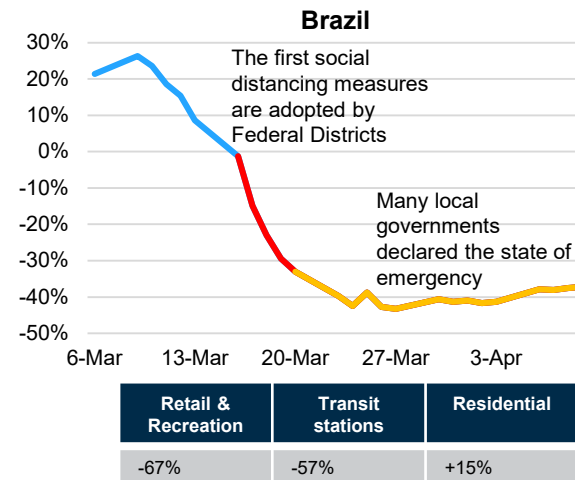
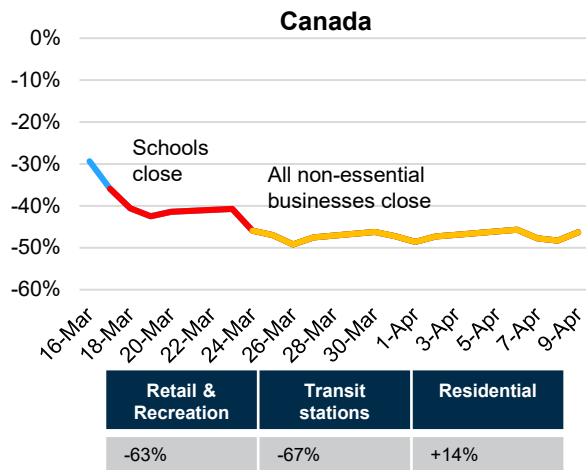
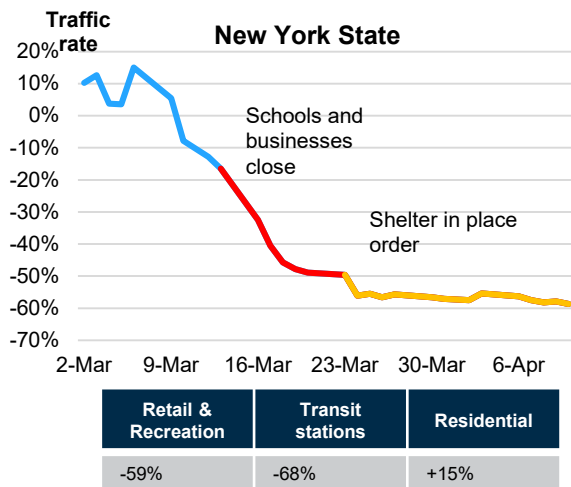
With extensive testing and new mobile phone apps that aid in tracking, these countries expect to continue to have the spread of the virus under control, and do not expect to return to infection levels on-par with Sweden.

Thus, following the development of the virus in these countries will be a crucial case study for other global societies looking to test the waters and return to more normal economic activity.

* Kindergarten open 20 April, Hairdressers etc. open 27 April in Norway.
Source: Rystad Energy Covid-19 research and analysis

Traffic has decreased in the US, Canada and Brazil, as government restrictions imposed

The drop in countries' mobility for recreation and transit purposes shows good compliance with government measures

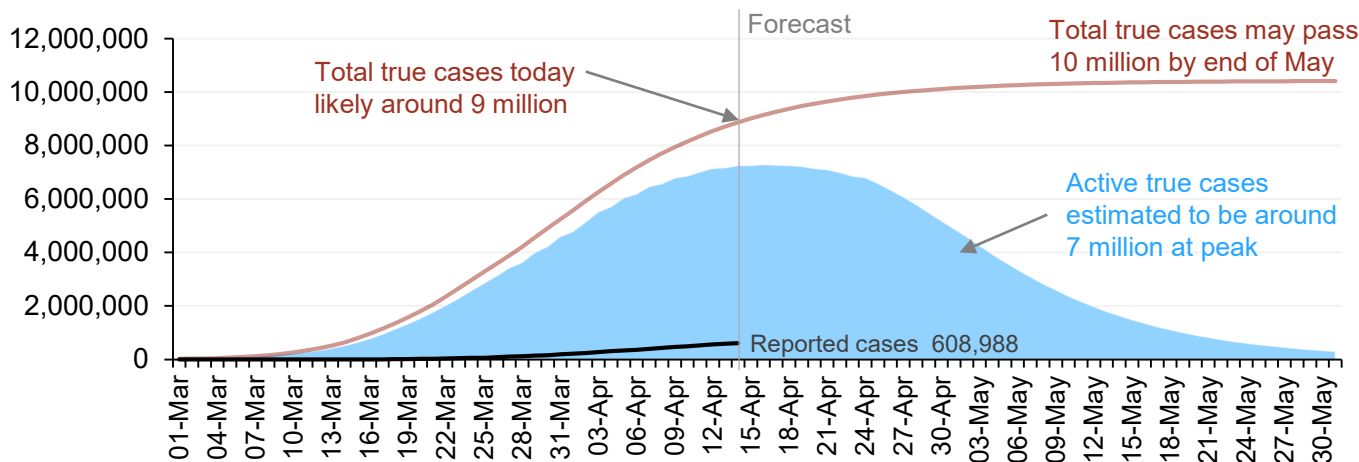


Source: Google Mobility Report; Rystad Energy research and analysis

US may have passed peak active cases, assuming measures are not eased too much

United States, estimated total and active true cases

Number of cases; Current measures scenario*



The last step-up in preventive measures in the US came in mid/late March (varying by state), after we had seen a steep increase in the number of reported new cases per day. Reports are stating that 90% of Americans are now “sheltered at home”. Essential business continues, while many companies have reverted to remote work from home where possible.

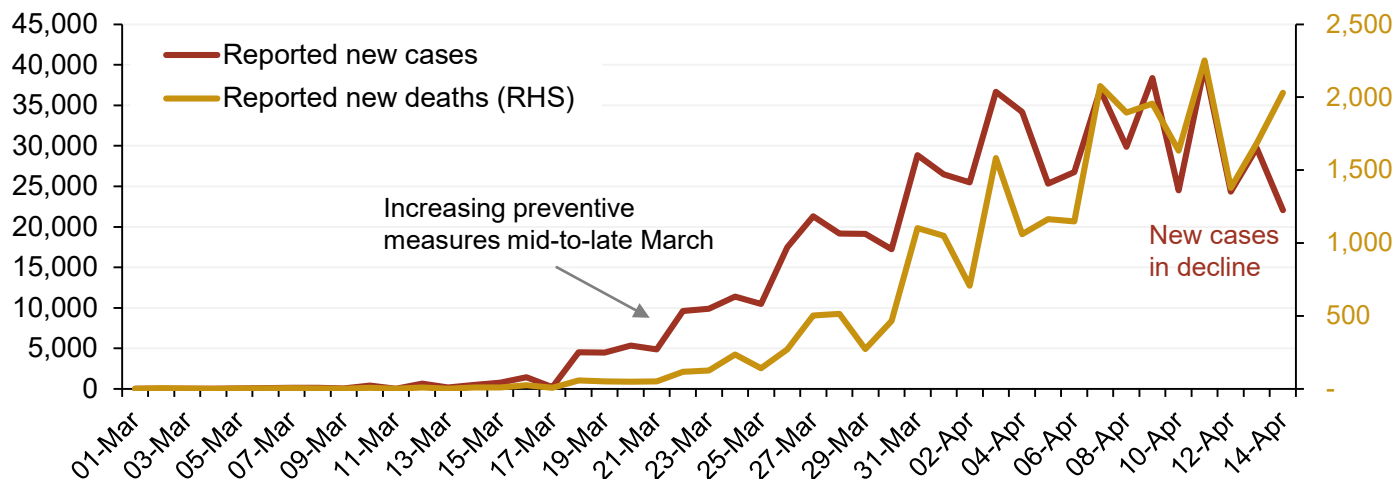
Over the last few days we have started seeing the effect of these strictest measures in the reported numbers. The number of new cases has been relatively flat since early April and has been declining over the last few days.

Our forecast assumes that current preventive measures will remain in place during the forecast period. This may not be the most likely outcome as the US administration has signaled easing of measures from 4 May, but gives an indication of a spread that is currently at peak and under control. If the administration slowly eases measures they will probably maintain control.

Please note there are large regional differences between each state and city.

For further details please see our Covid-19 dashboard at rystadenergy.com.

Daily new cases and deaths

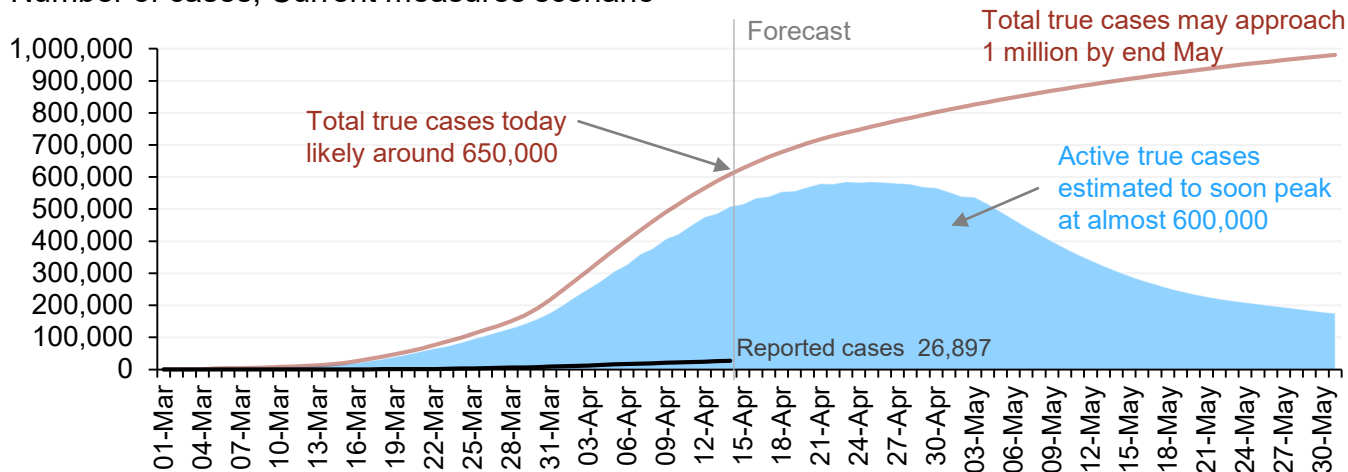


*Assumes current measures remain in place during forecasting interval
Source: Rystad Energy research and analysis; Worldometer

Canada is likely about to peak – easing of measures unlikely in April

Canada, estimated total and active true cases

Number of cases; Current measures scenario*

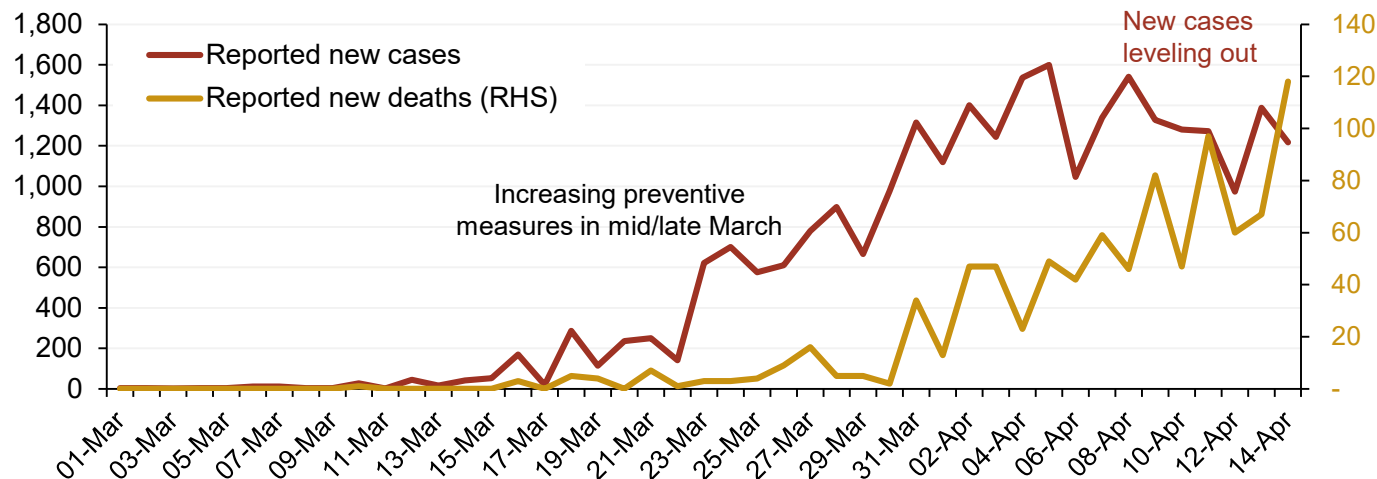


In Canada, provinces and territories enacted health and/or provincial states of emergencies beginning on 13 March in Quebec, with other provinces adding declarations over the following days. These have involved closures of all schools and public institutions/areas. Generally, non-essential businesses are closed along with other restrictions on movements and requirements for social distancing. These measures remain in place until mid-April in some cases, and until May in others. The effect on the economy has been devastating and pressure is building to relax restrictions.

Our forecast assumes that current preventive measures will remain during the forecast period. The measures seem to be working and over the last few days we have seen the number of cases leveling out.

The central provinces of Quebec and Ontario are seeing the bulk of the infections, with the western provinces somewhat less and the lowest numbers in the eastern provinces, generally in line with the population density of the country.

Daily new cases and deaths



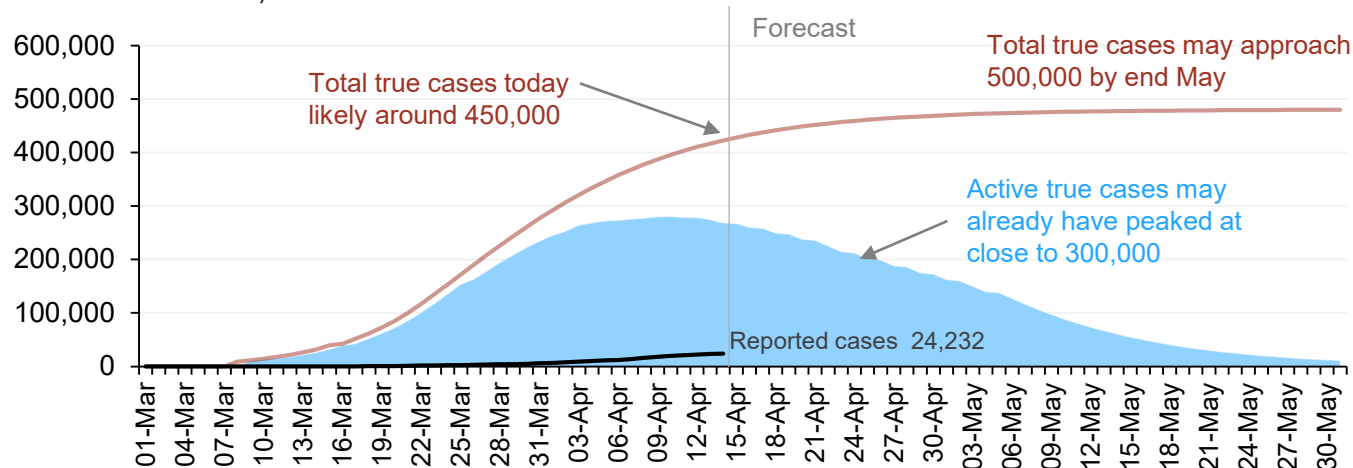
*Assumes current measures remain in place during forecasting interval
Source: Rystad Energy research and analysis; Worldometer

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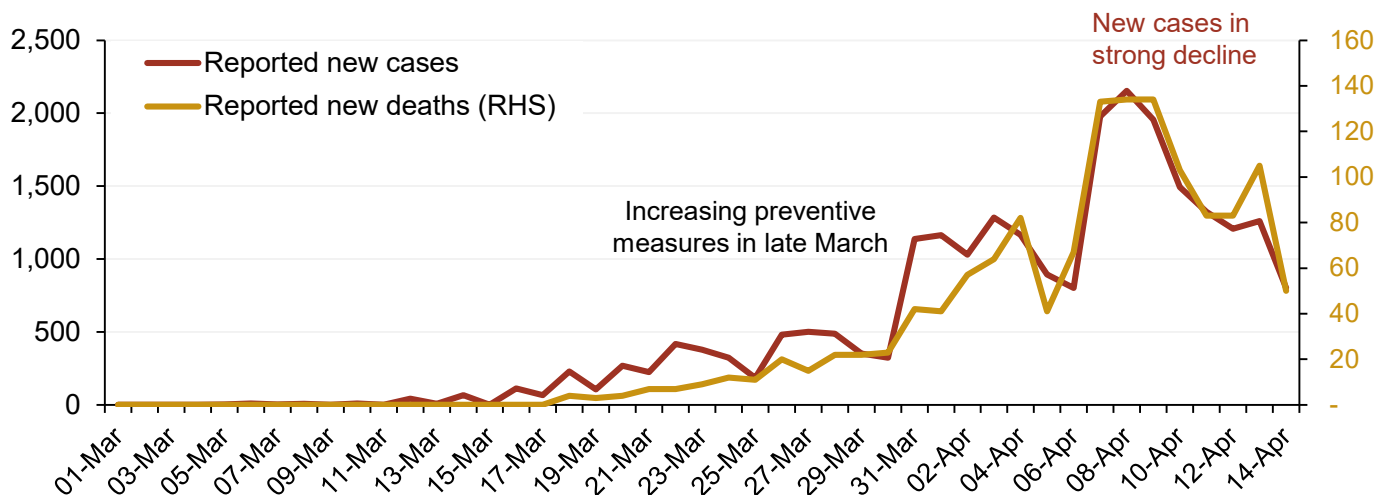
Brazil is seeing a strong decline in new cases – too good to be true?

Brazil, estimated total and active true cases

Number of cases; Current measures scenario*



Daily new cases and deaths



In Brazil, the pandemic has triggered a variety of responses from federal, state and local governments, with an impact on politics, education and the economy. On 27 March Brazil announced a temporary ban on foreign air travelers, and most state governors have imposed quarantines to prevent the spread of the virus.

Human Rights Watch has stated that President Jair Bolsonaro is putting Brazilians in grave danger by urging them not to comply with social distancing and other measures from state governments and his own Health Ministry. They also claim he has acted recklessly by disseminating misleading information about the pandemic. This provides increased uncertainty to our forecast, which assumes that current preventive measures will remain in place during the forecast period.

The measures seem to be working and over the last few days we have seen a strong decline in new cases. However, as this strong decline has not been evident in any other countries we do question the numbers.

Most cases are located in the state of São Paulo, followed by Rio de Janeiro.

For further details please see our Covid-19 dashboard at rystadenergy.com.

Source: Rystad Energy research and analyses; Worldometer; *Assumes current measures in place during forecasting interval

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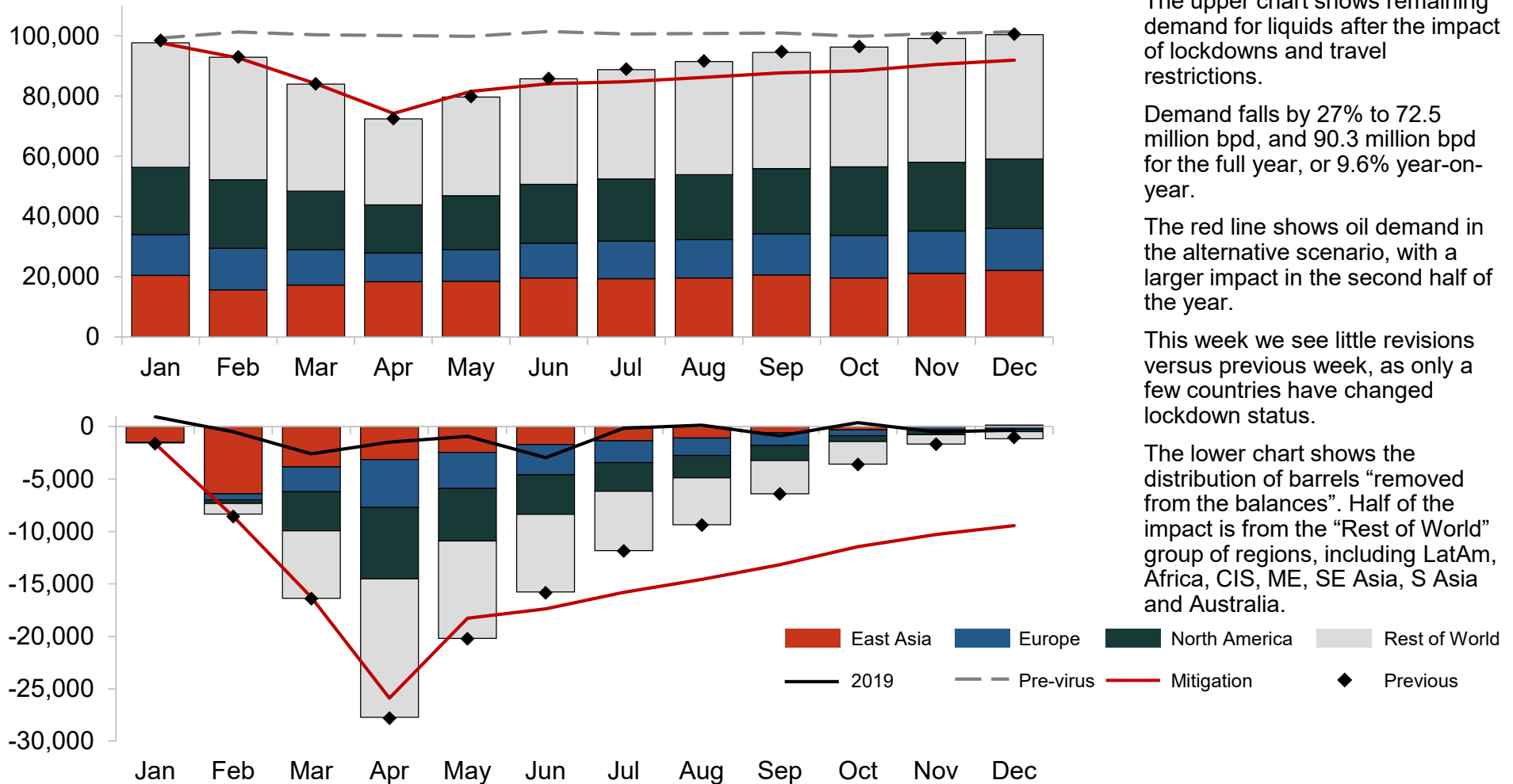
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Global oil demand drops from 100 to 72.5 million bpd in April, 90.3 million bpd for the year

Global oil demand impact analysis Covid-19, levels and changes vs. pre-virus estimates

Thousand bpd

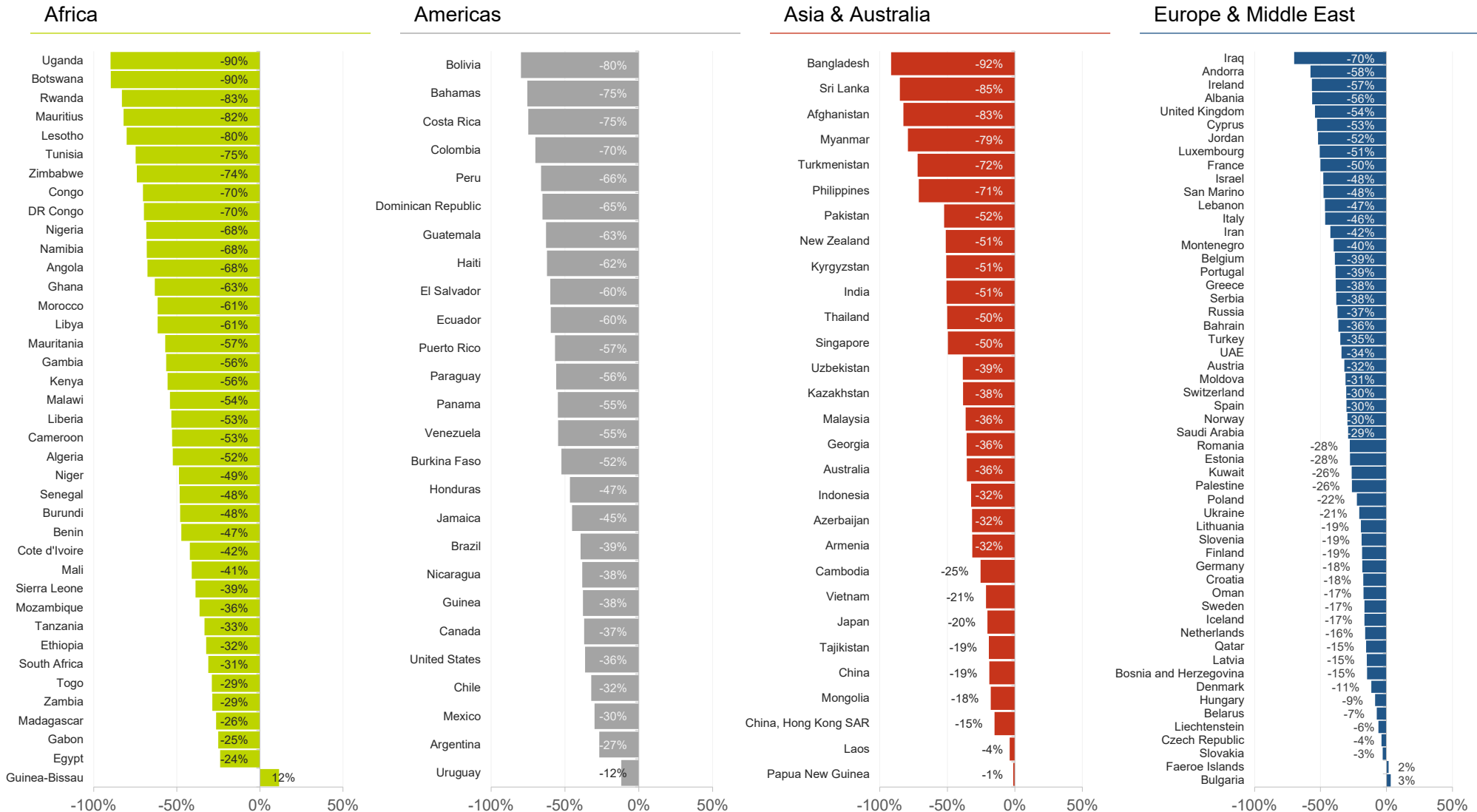


Source: OilMarketCube and Oil Market Weekly Analytics by Rystad Energy

Road traffic activity last week was down across all continents

Traffic levels versus normal for last 7 days

Percent difference, year-on-year, all days

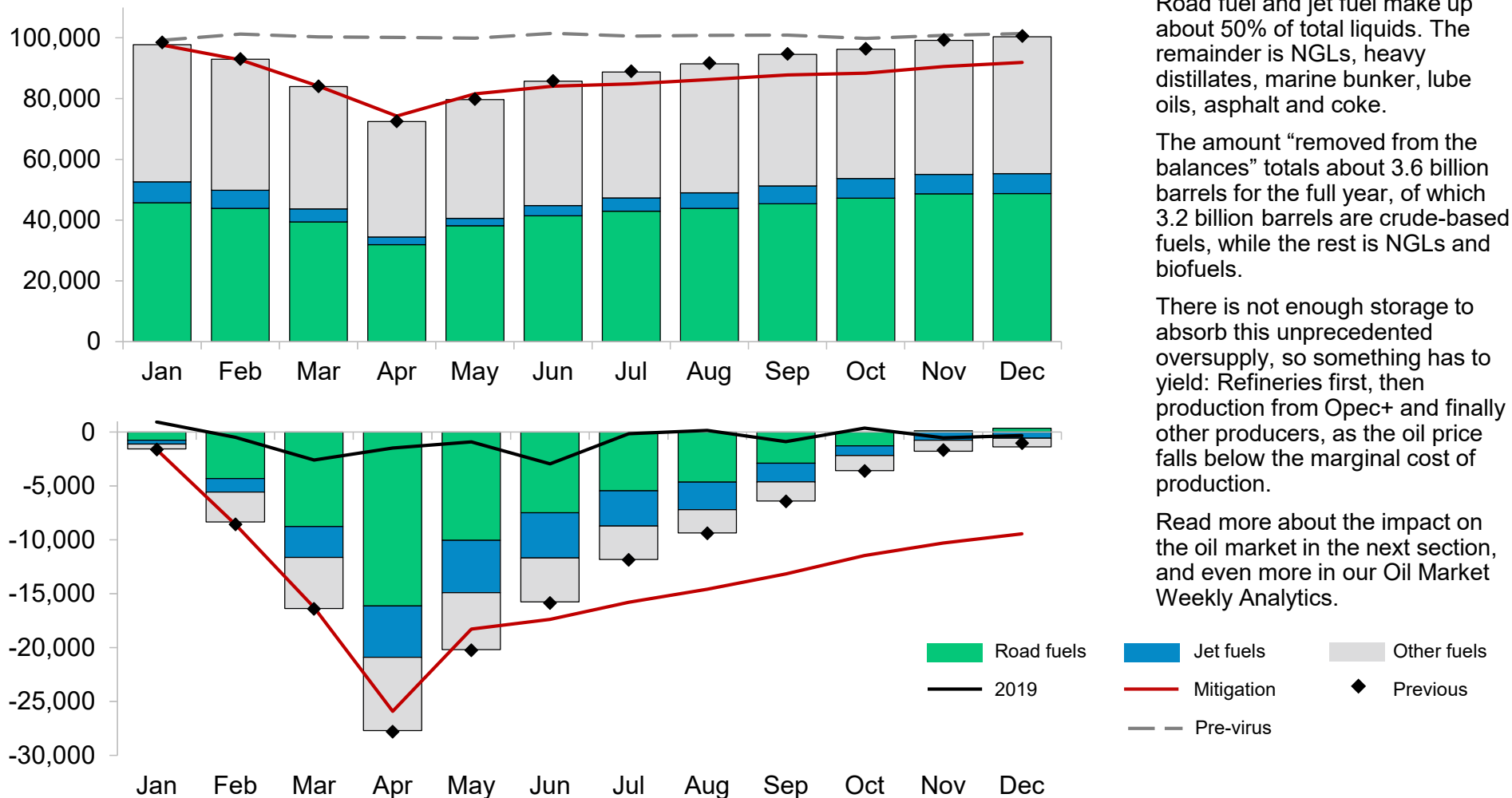


Source: Rystad Energy Global City Traffic Database; TomTom Traffic Index; Google Maps; Rystad Energy research and analysis

Demand for road fuel is down by 16.3 million bpd in April, while jet fuel is down 65%

Global oil demand impact analysis Covid-19, levels and changes vs. pre-virus estimates

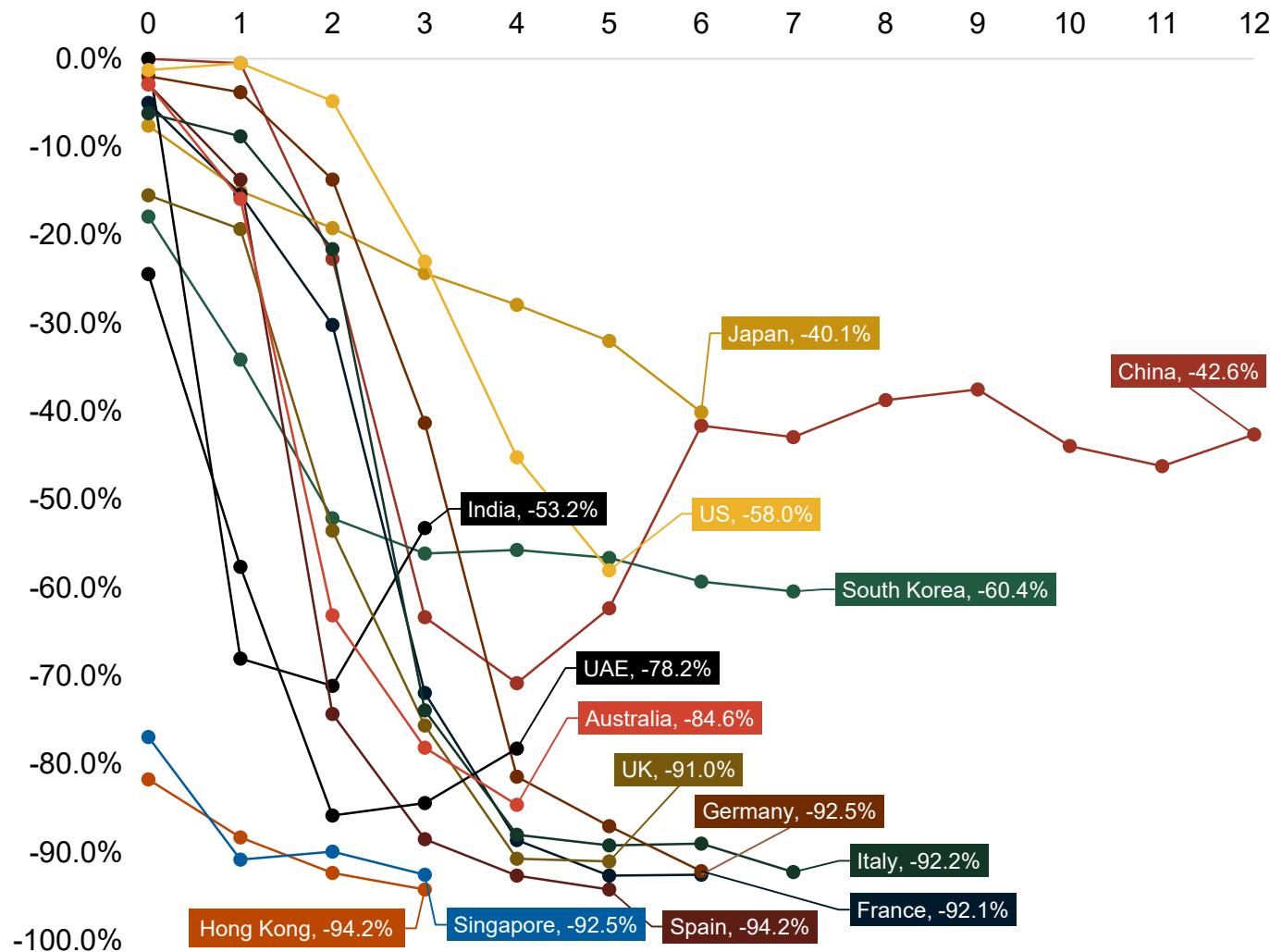
Thousand bpd



Source: Oil Market Cube and Oil Market Weekly Analytics by Rystad Energy

Travel restrictions in Europe force nine out of ten flights to stay on the ground

Scheduled flight changes year-on-year after 500 reported cases



As we approach week 12 since reaching 500 reported cases in China, year-on-year scheduled flight changes are stabilizing at around a 40% reduction.

Only two weeks after 500 cases were reported in Hong Kong, Singapore and the UAE, scheduled flight changes reached reductions of about 85%, suggesting very strict travel restrictions.

European countries took five weeks to reach similar levels, and flight reductions are set to stabilize at about 90% for the coming weeks.

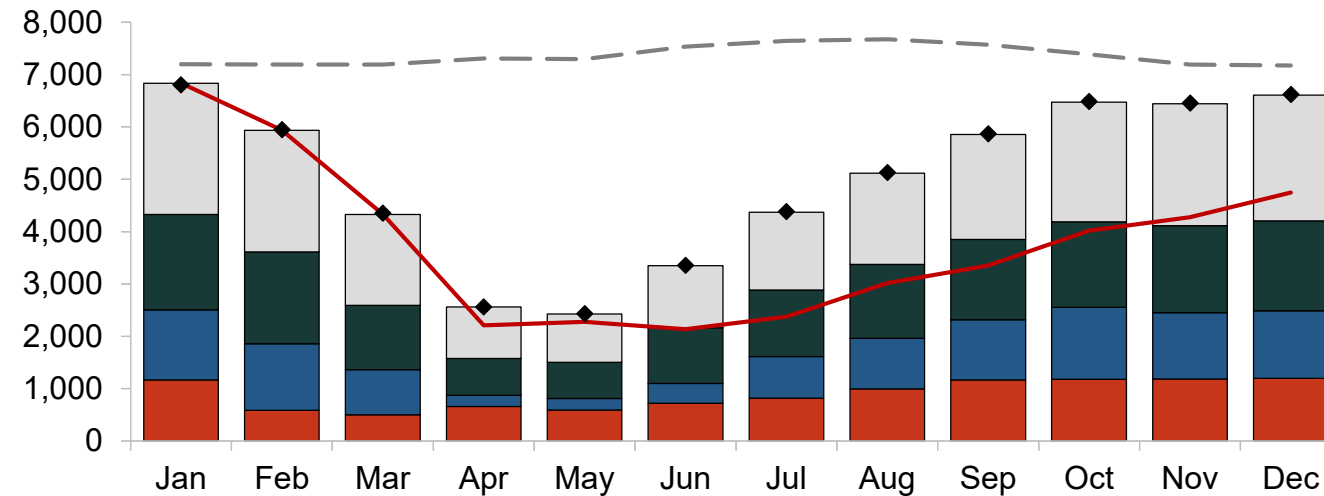
Flight activity in the US has been more resilient, and currently lies at about 50% down from last year.

Source: IATA, ICAO, OAG, Rystad Energy research and analysis

Global demand for jet fuel is down by 65% year-on-year in April and May

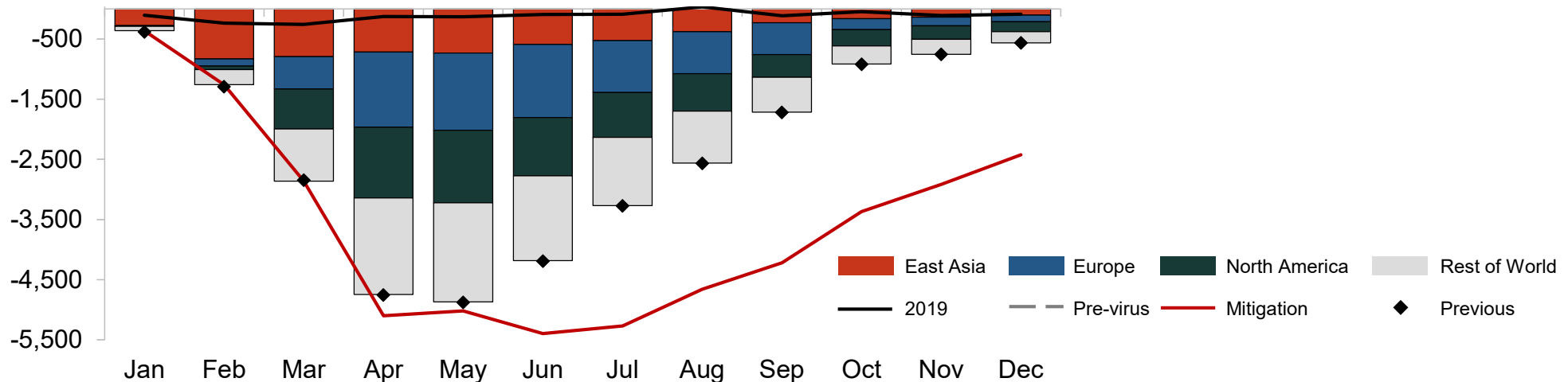
Global oil demand impact analysis Covid-19, levels and changes vs. pre-virus estimates

Thousand bpd



Jet fuel demand has fallen dramatically, from 7 million bpd to only 2.5 million bpd in April and May.

Due to excessive supply from refineries, jet fuel – a rather flexible middle distillate – is now being used for other purposes and reprocessed to gasoline for storage.



Source: Oil Market Cube and Oil Market Weekly Analytics by Rystad Energy

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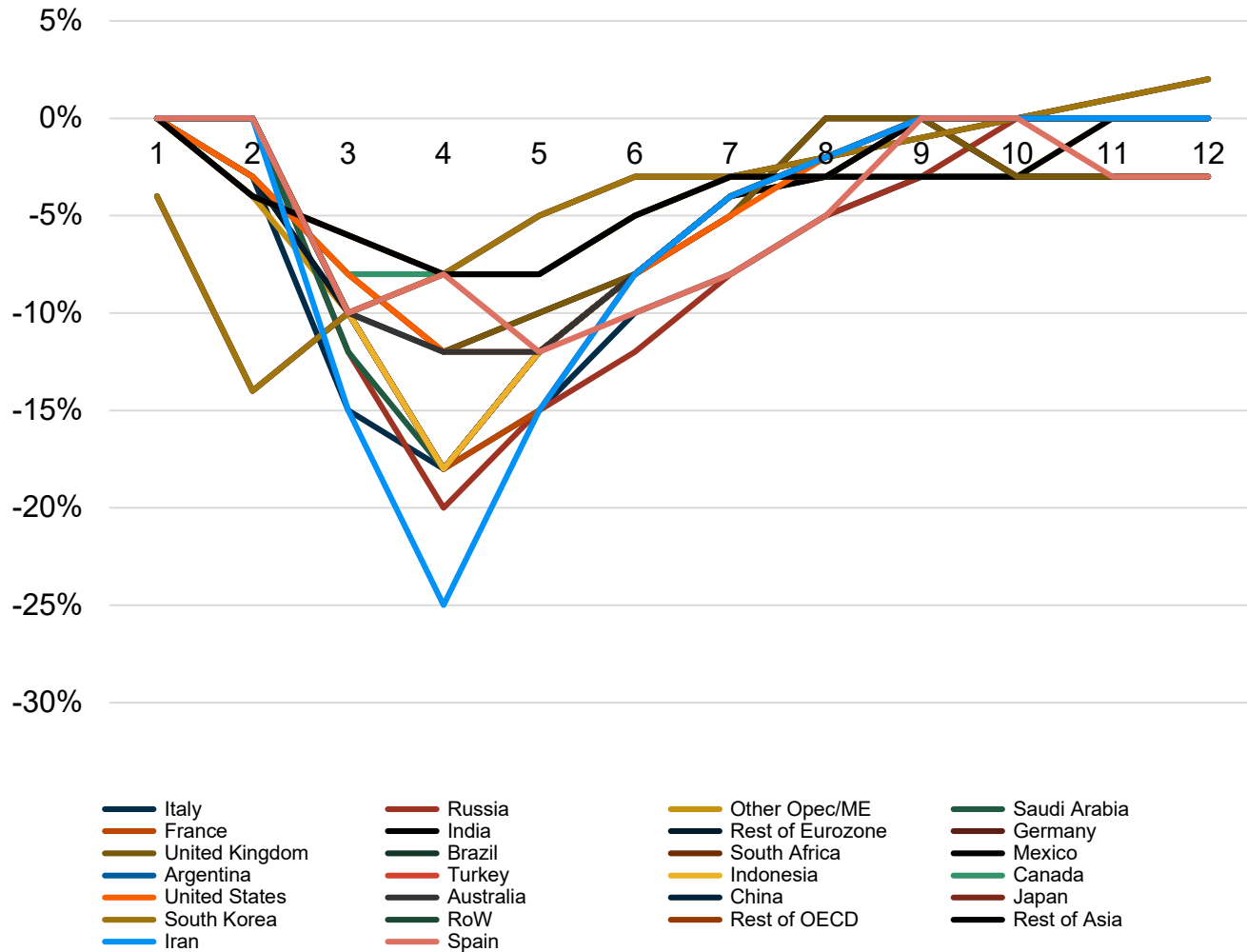
Impact on the oil and gas industry

- Global market outlook
- Market segment focus

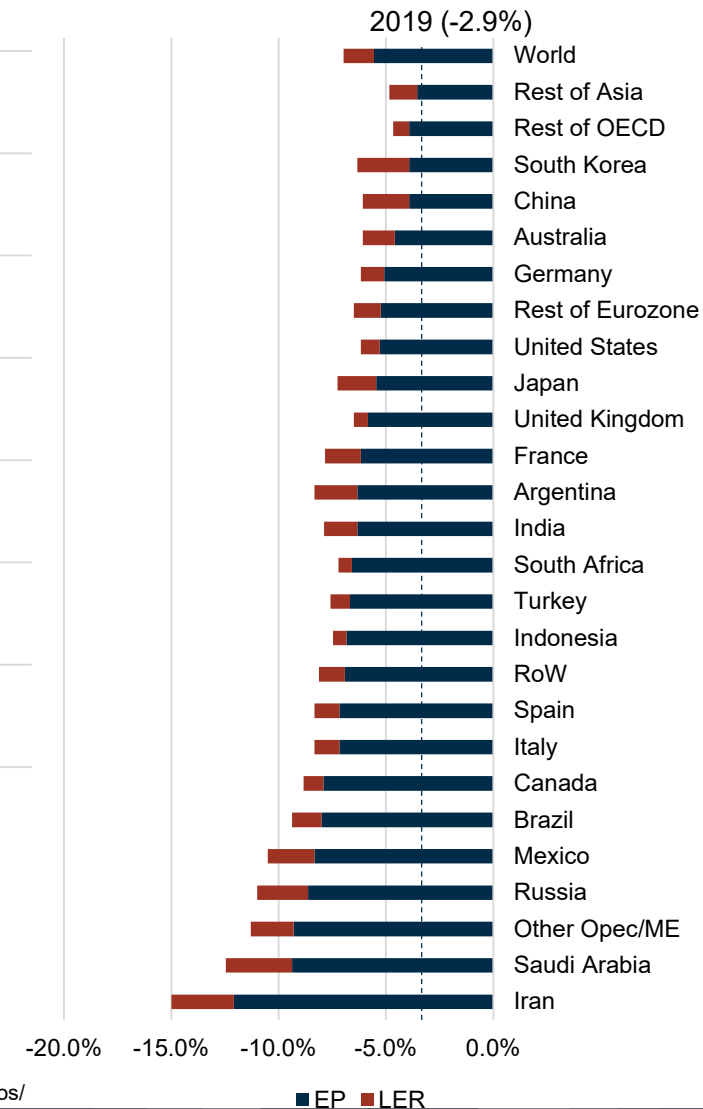
Appendix

For 2020 we now see a y/y GDP contraction of 2.6%, “other fuels” demand decrease of 2.9%

Assumed GDP impact by country, monthly and for the year 2020



2020 GDP impact
assumed for other fuels demand



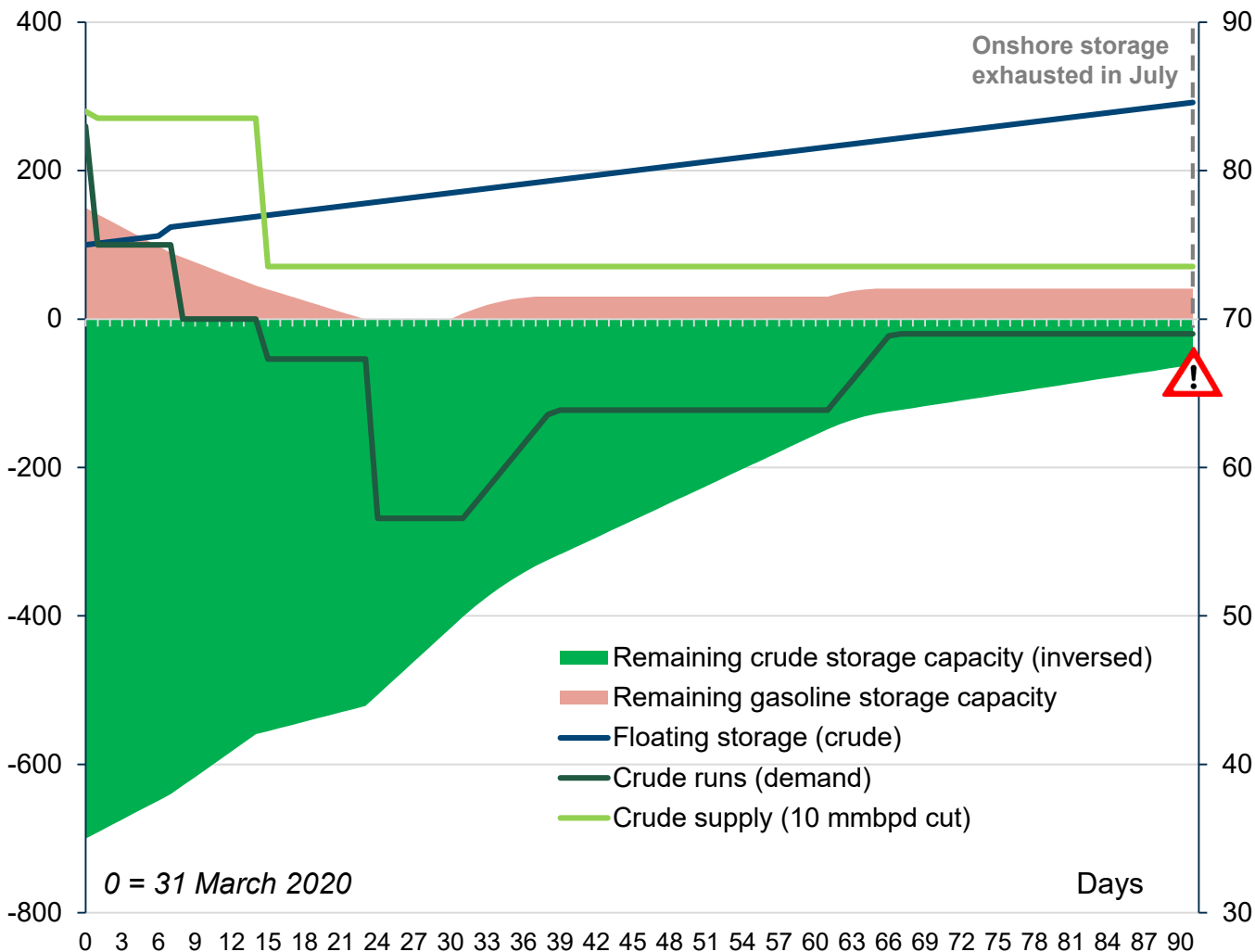
Source: Rystad Energy, Brookings <https://www.brookings.edu/research/the-global-macroeconomic-impacts-of-covid-19-seven-scenarios/>

A 10 million bpd supply cut is not enough, but will delay oil market chaos until July

Crude and condensate balancing scenario in “10 million bpd cut scenario” (Day 0 = 31 March 2020)

Storage or capacity (Million barrels)

Runs or crude supply (Million barrels per day)



Staring into the 21 million bpd oversupply for 2Q20, the 10 million bpd cut OPEC+ has agreed to is not sufficient to avoid further downwards pressure in spot prices. However, it would give the market more time to prepare for a situation where oil storage capacity becomes depleted, thus forcing large uncontrolled production shut-ins during May. In fact, our model indicates that the cut could delay the reckoning until July, a time when global oil demand is expected to be much stronger if the world manages to control the Covid-19 spread..

This will help global E&Ps better prepare and support oil prices – although, even in this scenario, we believe crude prices will still fall from the \$33 Brent price seen today.

We find that a double-digit immediate supply cut will delay the market from “hitting a wall” by 2 months or more. This would allow more time for demand to improve, for companies to prepare supply chains and activity plans, to reduce costs and to avoid an uncontrolled dismantling of parts of the industry. This would only come back to haunt the market with risk of price spikes 18-24 months down the line.

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