



RYSTAD ENERGY

COVID-19 REPORT

9TH EDITION

GLOBAL OUTBREAK OVERVIEW AND ITS IMPACT
ON THE ENERGY SECTOR

7 MAY 2020

PUBLIC VERSION

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Demand floor is behind us, recovery has begun, but waves of new infection are likely ahead

In this week's edition, we have analyzed herd immunity not only at the *country* level globally, but all the way down to the *county* level. We see large differences between counties within each country and region. The largest cities typically have two to three times as many cases of infection as their respective countries, on average. Thus, large cities with dense populations, intense business and cultural interaction, and widely available public transportation seem to be drivers for the spread of the virus. Some special events also appear to drive the spread of Covid-19, such as carnivals, ski holidays or religious festivals; we will touch upon some examples in this report.

In the worst affected countries in Europe the share of infected people relative to the total population varies from 2% to 25%. This is still quite far from herd immunity. Only New York City, with the Bronx, Queens and Kings (Brooklyn) counties, seems to have reached a level that would result in some degree of herd immunity. We are therefore likely to see new waves of infection over the coming months as lockdown measures are now beginning to be loosened.

The trend of loosening lockdown measures is clearly visible in city traffic data as well. Traffic bottomed out globally in mid-April with 16 million barrels per day in road fuel demand destruction and another 12 million barrels per day in destruction from other demand sources. We expect demand will recover significantly month-over-month going forward, but this is unlikely to occur quickly enough to avoid running out of physical storage. Thus, oil prices will remain volatile for the next few weeks and months. Nevertheless, despite extremely compressed prices and diminished profit for oil companies, governmental income from the upstream industry will still be \$0.6 trillion this year, as fiscal income is also based on royalties. This is down from \$1.5 trillion in 2018 and \$1.3 trillion in 2019. Thus, oil dependent nations will need to cut national budgets significantly this year.

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Impact on oil demand

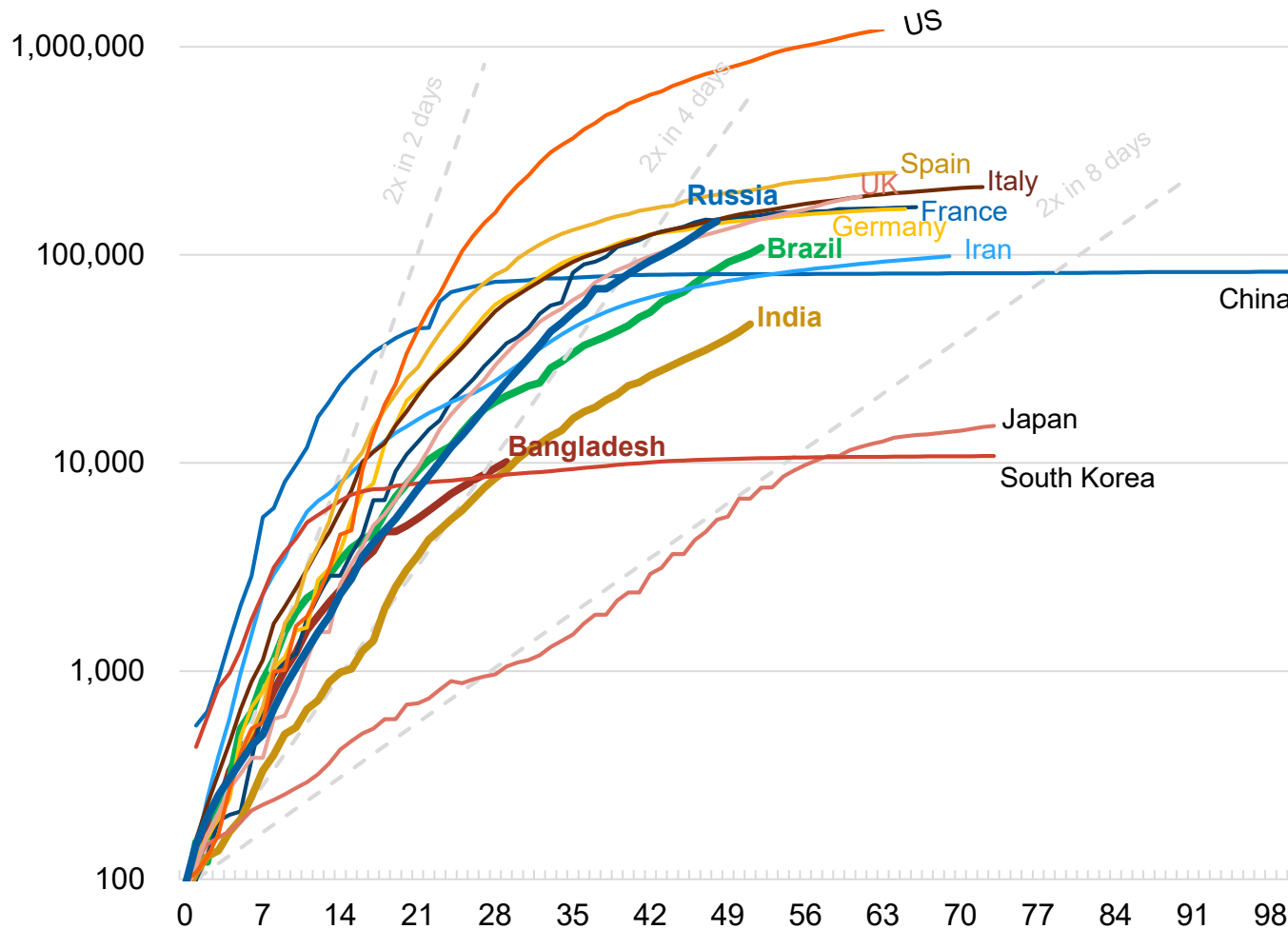
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In Brazil, Russia, India and Bangladesh cases are still doubling every 8 to 10 days

Number of reported cases, key countries

Cases (log scale)



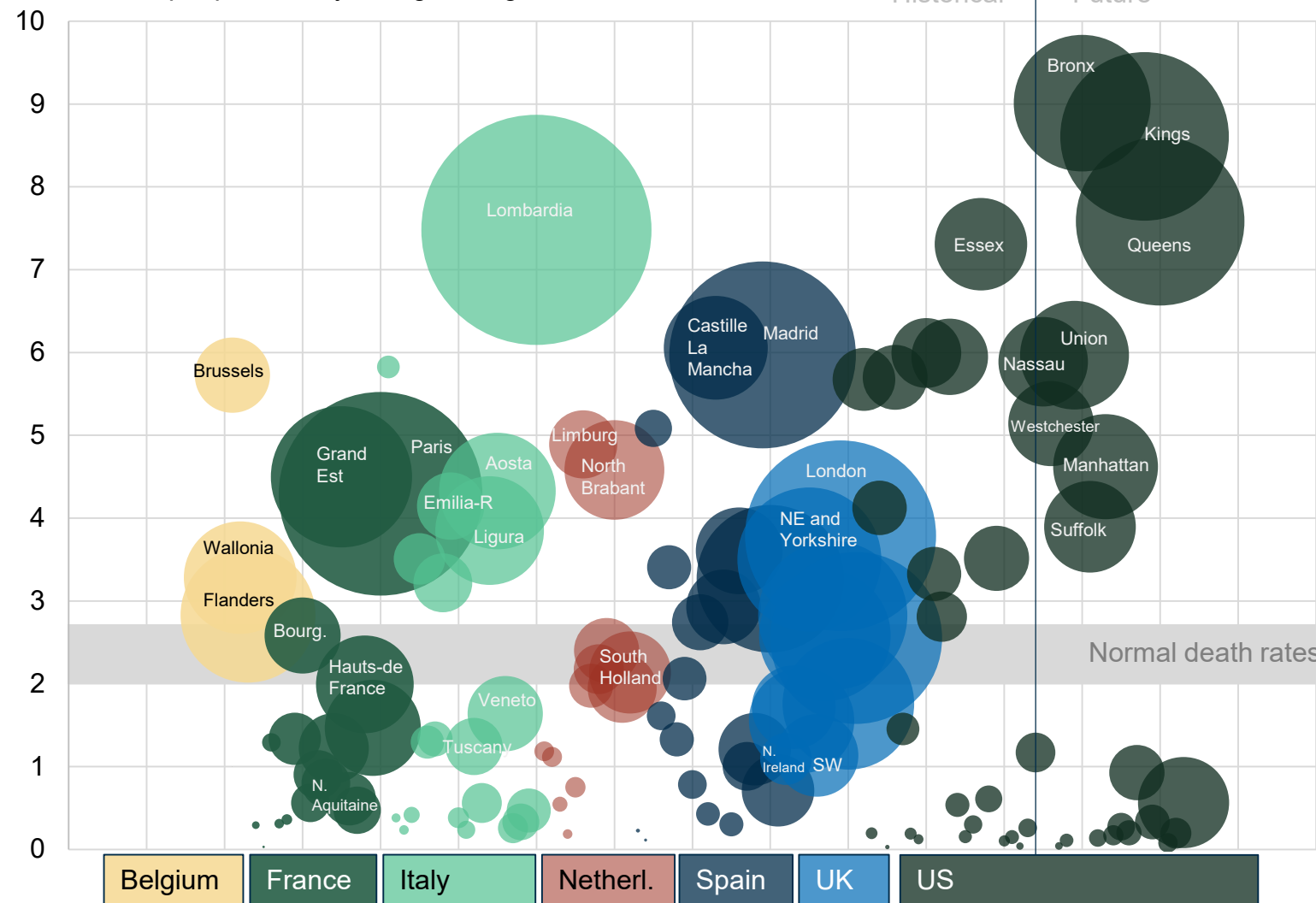
For further details
please see our
Covid-19 dashboard
at rystadenergy.com.

Source: Rystad Energy Covid-19 research and analysis; Worldometer

Subregions have seen fatality rates exceed normal levels by a factor of four

Number of new reported Covid-19 fatalities per day

Per 100,000 people, 14 day rolling average



This plot shows the level of peak daily fatalities from Covid-19. Normal fatality levels, without the influence of the novel coronavirus, are 2.0 to 2.7 for older populations like the US and Europe. Here we see that peak fatalities per day from Covid-19 alone exceed the regular death rate by a factor of up to 4.

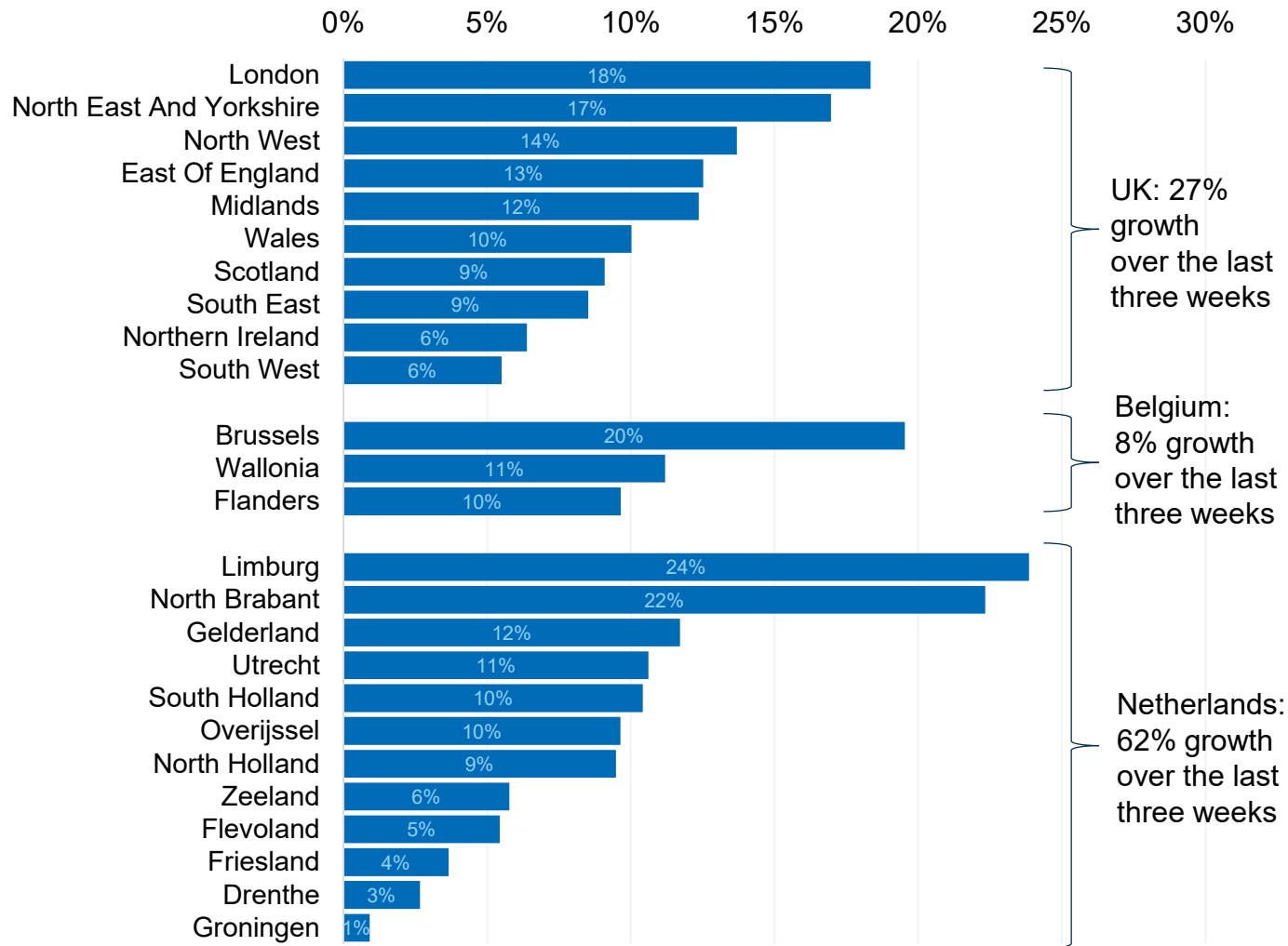
In all countries there is a large spread between regions, especially when considering metropolitan areas with the largest populations and highest death rates, such as London, New York, Madrid and Paris.

More rural areas usually see fewer people infected.

Source: Rystad Energy Covid-19 model

Still many months ahead until herd immunity could be achieved in Northwest Europe

Share of population infected as of 5 May 2020



The true share of the population already infected with Covid-19 as of 5 May is shown here, split by region within each country.

This shows that about 12% of the population is infected, a figure which has grown significantly in the UK and the Netherlands over the last three weeks, while not showing much growth in Belgium.

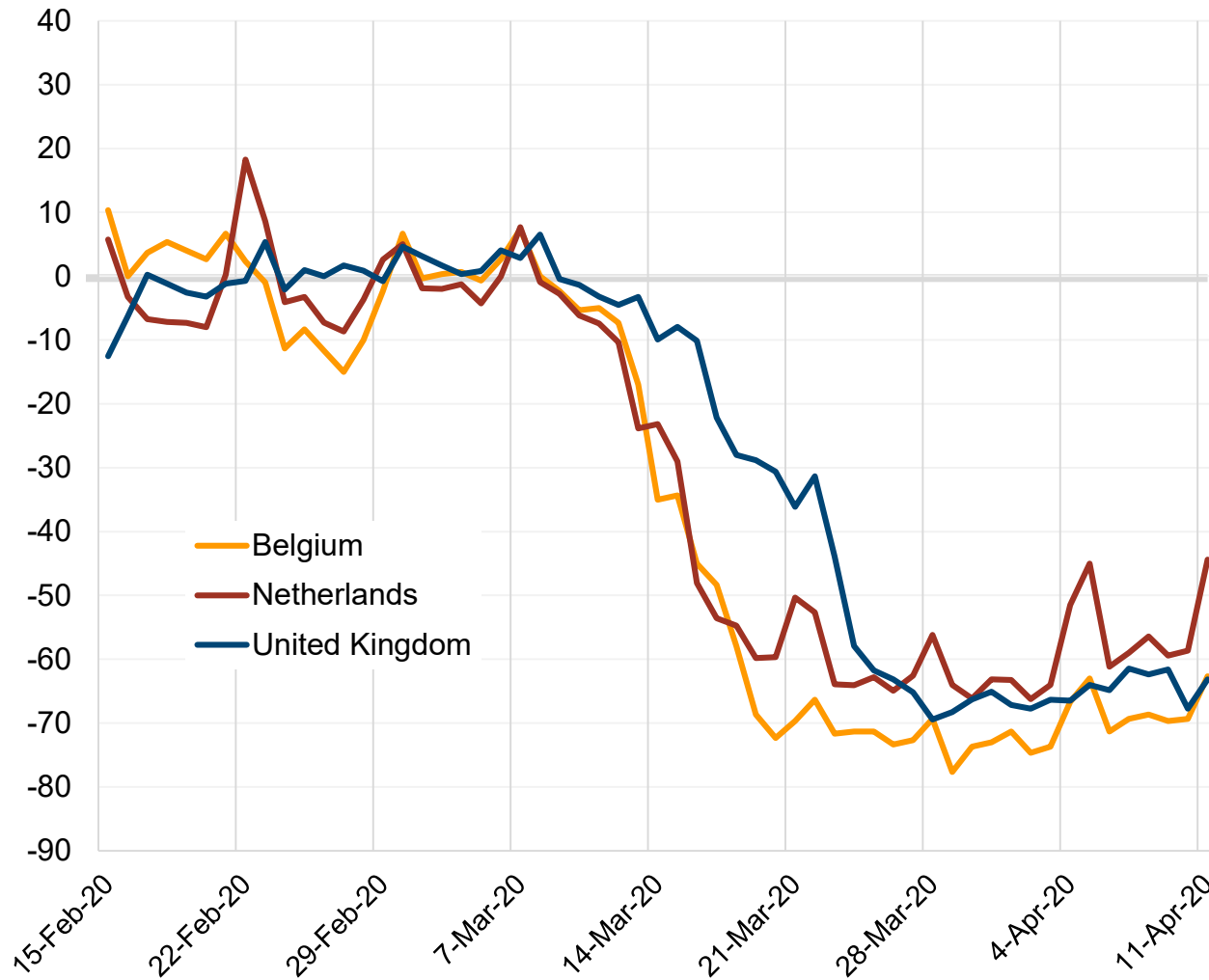
To achieve herd immunity, these countries would need to accept looser social distancing measures and a higher mortality rate for another 40 weeks.

Alternatively, countries could keep current quarantine measures while waiting for a vaccine.

Transit station mobility data sheds light on infection growth differences between countries

Transit station activity (subway, bus or train stations)

Percent above or below normal levels based on google mobility data



We observe that Belgium has recently seen a slower growth of infected cases, while the UK and the Netherlands saw faster growth.

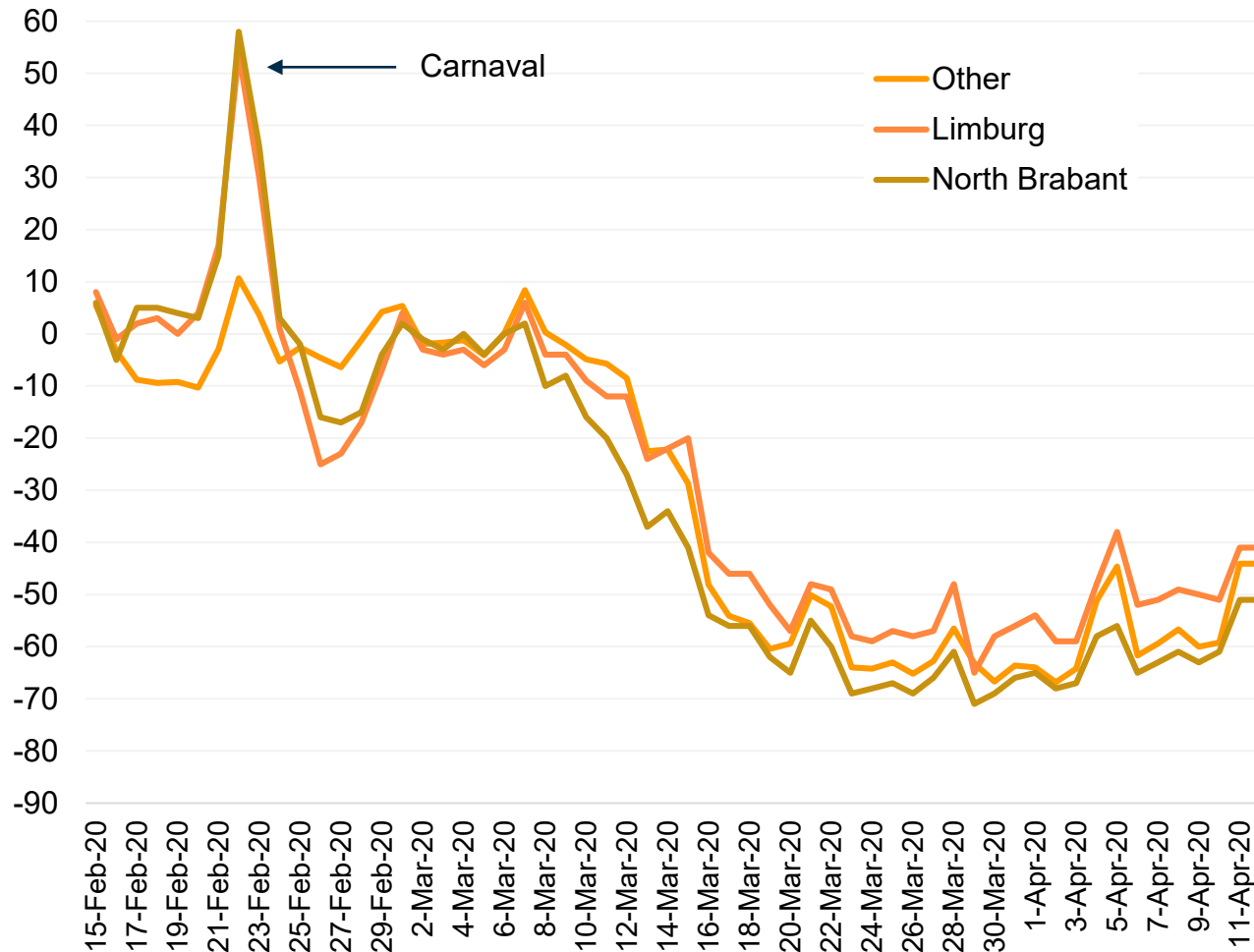
This can be understood by analyzing mobility data for transit stations, such as train stations, bus stops and subway stations. This shows that Belgium went into a deeper level of lockdown than the Netherlands, and that the UK lagged one week behind Belgium in terms of implementing a lockdown. The UK also did not implement as strict lockdowns as Belgium, explaining faster fatality growth in the UK in the last three weeks.

Source: Rystad Energy Covid-19 model; Google Mobility data

Transit mobility data also shows important regional differences within the Netherlands

Transit station activity in the Netherlands (subway, bus or train stations)

Percent above or below normal levels based on google mobility data

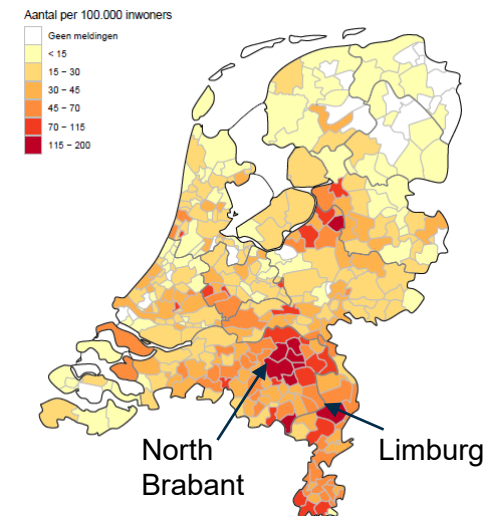


Limburg and North Brabant have the strongest traditions for carnival celebrations in the Netherlands, a festival which begun this year on 23 February.

Predictably, the day before the carnival saw very high activity at public transit stations.

As of 9 March, one-third of the 321 reported cases in the Netherlands were in North Brabant.

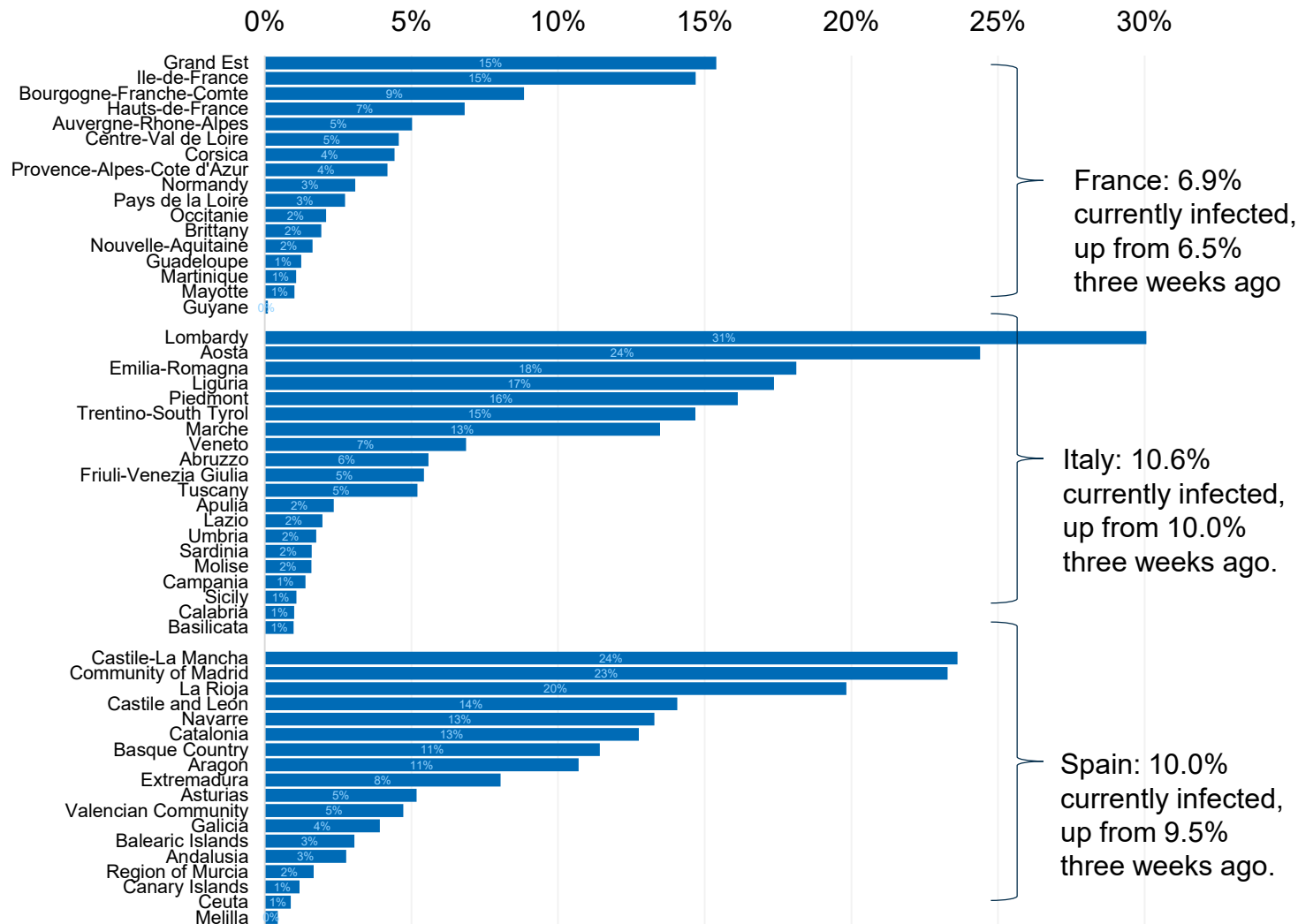
As of 5 May, this region had the highest mortality rate in the Netherlands, as shown below.



Source: Rystad Energy Covid-19 model; Epidemiologische situatie COVID-19 in Nederland; Rijksinstituut voor Volksgezondheid en Milieu - RIVM 05 mei 2020

Herd immunity will be nearly impossible in Southern Europe, except perhaps in Lombardia

Share of the population infected as of 5 May 2020



France: 6.9%
currently infected,
up from 6.5%
three weeks ago

Italy: 10.6%
currently infected,
up from 10.0%
three weeks ago.

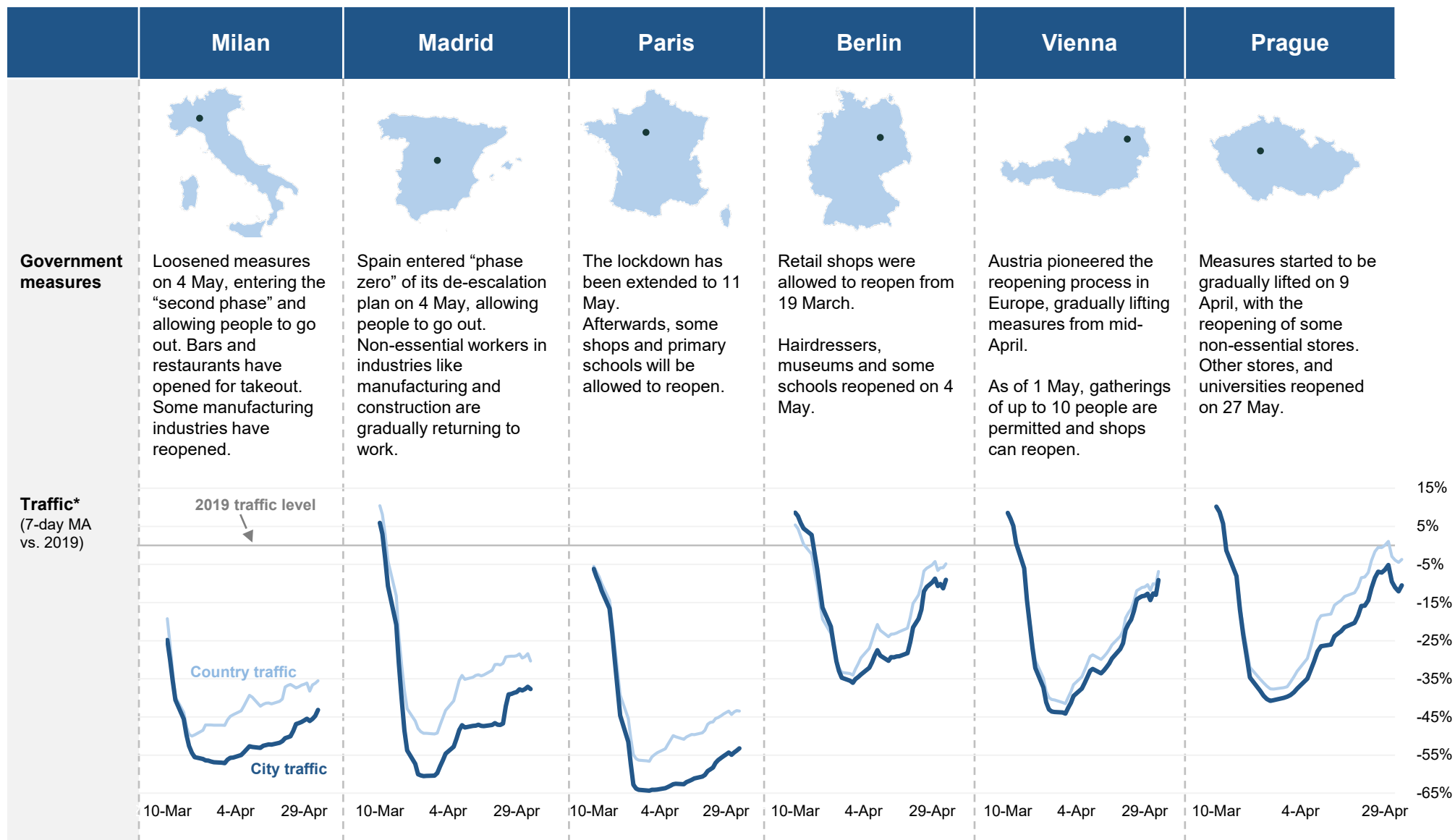
Spain: 10.0%
currently infected,
up from 9.5%
three weeks ago.

The true share of the population that has been infected as of 5 May is shown here, split by region within each country.

About 10% of the population has been infected in the selected regions, a figure which has been very flat over the last three weeks due to strict lockdowns.

More than 23% of the population has been infected in two regions in Italy and two in Spain. These areas could potentially achieve herd immunity after a potential second outbreak.

Most European countries have loosened measures and increased mobility in April

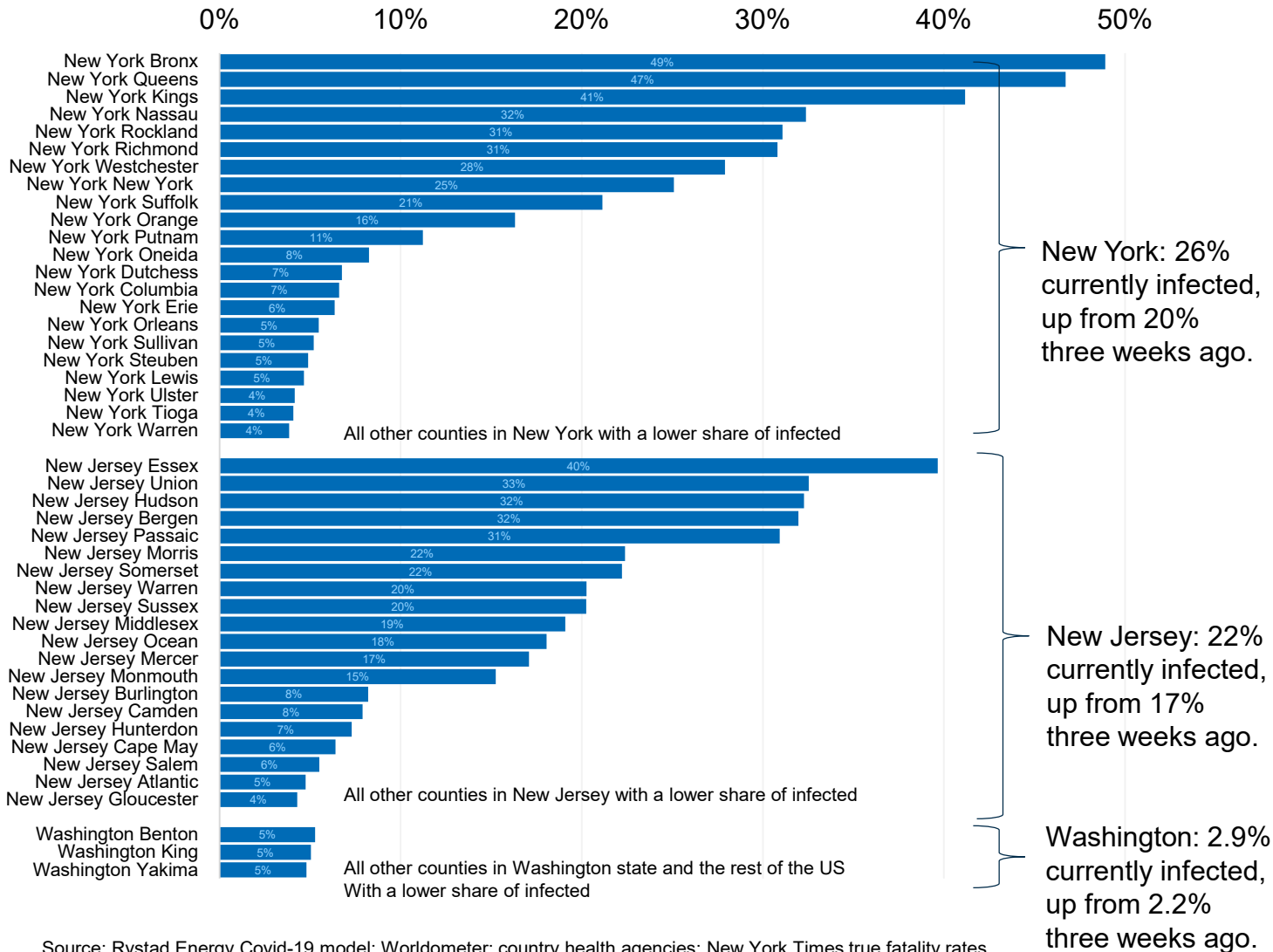


*Traffic includes light-duty vehicle traffic only.

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

Herd immunity close in parts of New York and New Jersey

Share of the population infected as of 5 May 2020



The true share of the population that has been infected in the US states of New York, New Jersey and Washington as of 5 May is shown here, split by county.

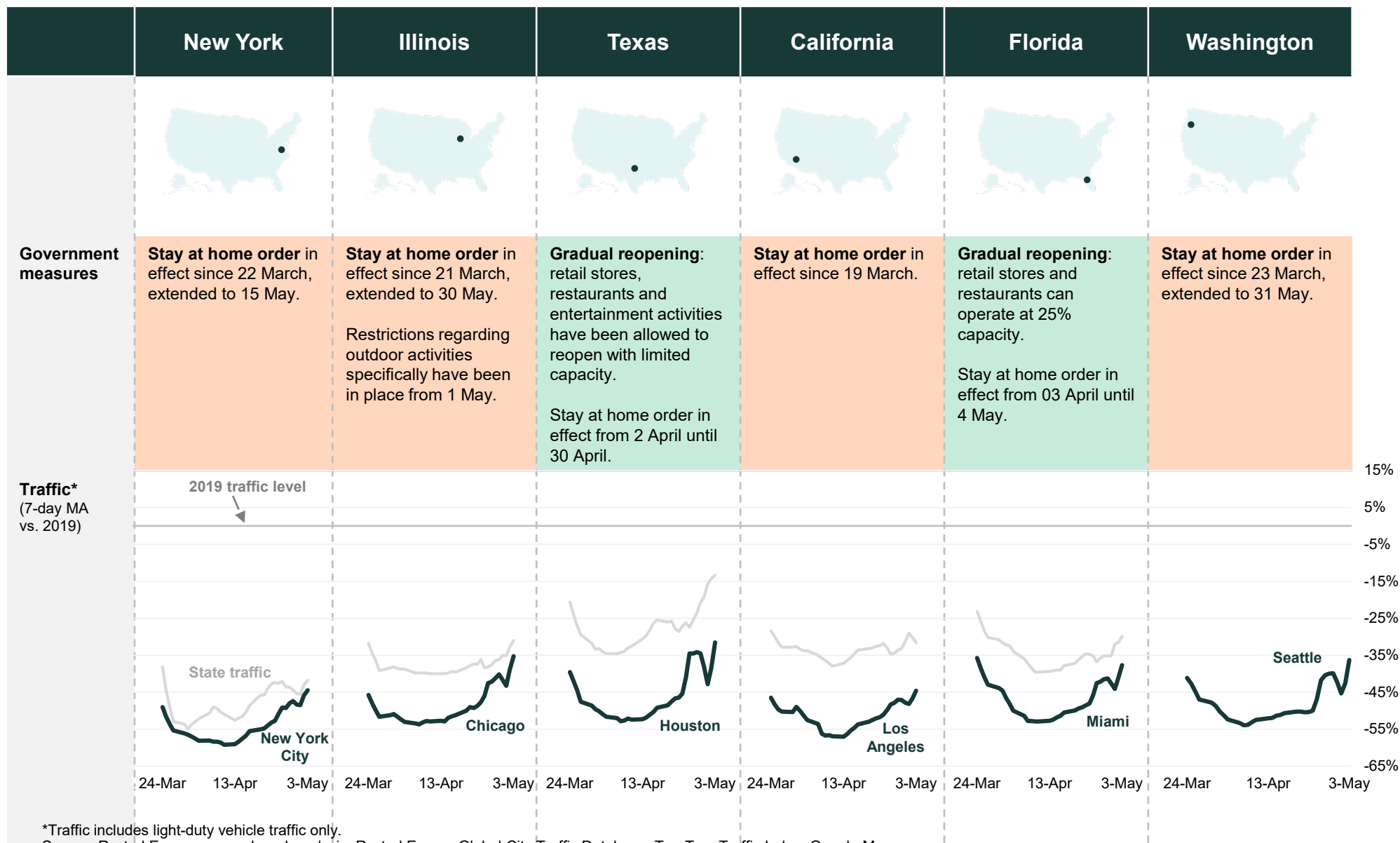
26% of the population in New York state and 22% in New Jersey have been infected.

In New York City, counties such as the Bronx, Queens and Kings (Brooklyn) have seen between 41% and 49% of the population likely infected, which means these counties are likely to achieve herd immunity soon.

There are no other counties in the US with more than 5% of the population infected. I.e. other states and counties risk experiencing severe outbreaks in the future and/or seeing the continuation of rather strong social distancing measures.

Source: Rystad Energy Covid-19 model; Worldometer; country health agencies; New York Times true fatality rates

Activity levels in the US are picking up pace amid loosening measures



*Traffic includes light-duty vehicle traffic only.

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

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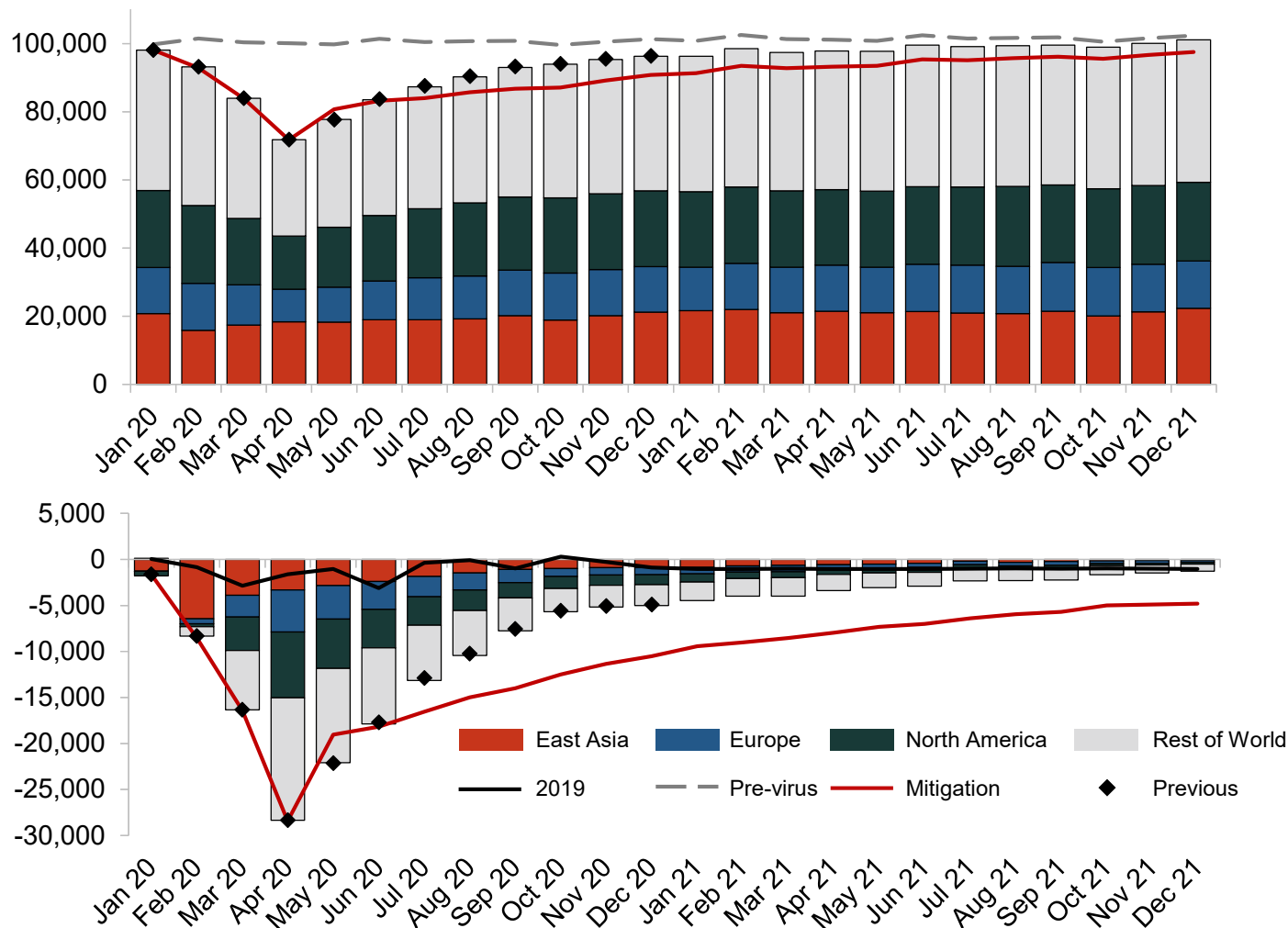
Impact on the oil and gas industry

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Global oil demand recovers by 6 million bpd in May vs April

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

Thousand barrels per day



Remaining barrels

We see a V-shaped route in oil demand, reaching a low point in April 2020 and improving in May. However, further recovery has some downside risks into 2021.

Average demand for 2020 is expected at 88.7 million bpd, a drop of 10.9% from 2019.

Europe is the worst hit, with demand down 33.5% year-over-year in April, and on track for a 12.5% demand decline for 2020 as a whole.

Lost barrels

About 4 billion barrels will be removed from global oil demand during 2020.

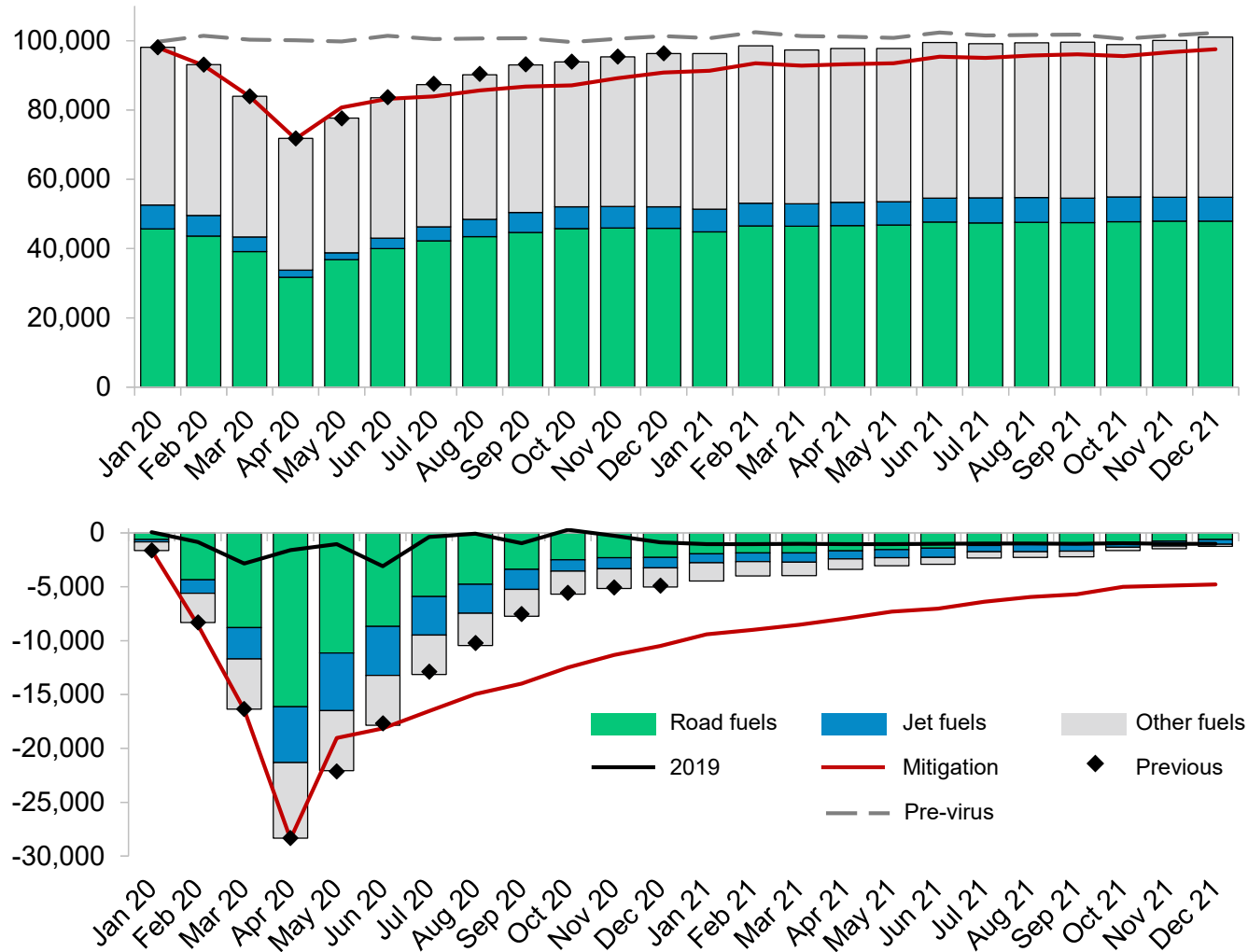
More than half of this decline comes from areas outside the main demand pools of East Asia, Europe and North America.

In our downside scenario, we see global demand impact remaining down by 10.5 million bpd in December 2020 and 4.8 million bpd in December 2021.

Road fuel is down 11% for the year, jet fuel down 33% and all other fuels down 7% vs 2019

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

Thousand barrels per day



Global demand for road fuel was 31.7 million bpd in April, jet fuel demand was 2.1 million bpd, and demand for all other fuels stood at 37.9 million bpd.

About 16.1 million bpd was removed from road fuel demand in April, while the decline was 5.2 million bpd for jet fuel and 7 million bpd for all other fuels.

Source: Rystad Energy research and analysis

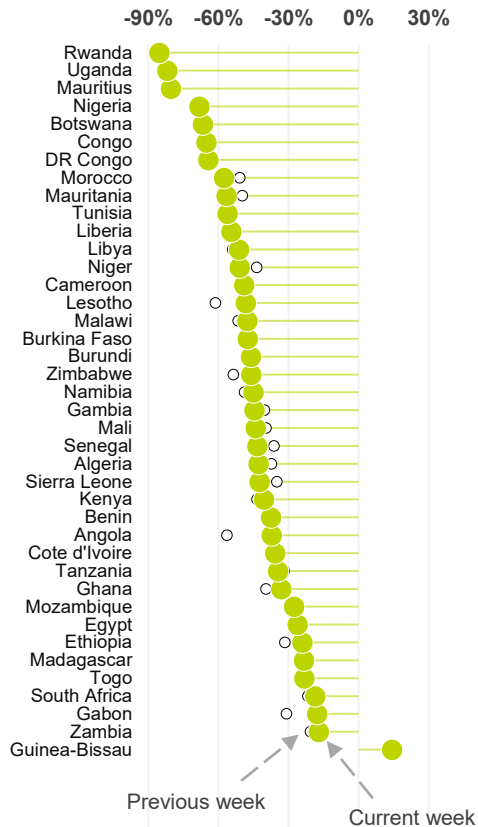
Traffic increasing in the US, China remains flat at around -18%

Rystad Energy Global City Traffic Database
covers road traffic in 1,200+ cities
and 150+ countries

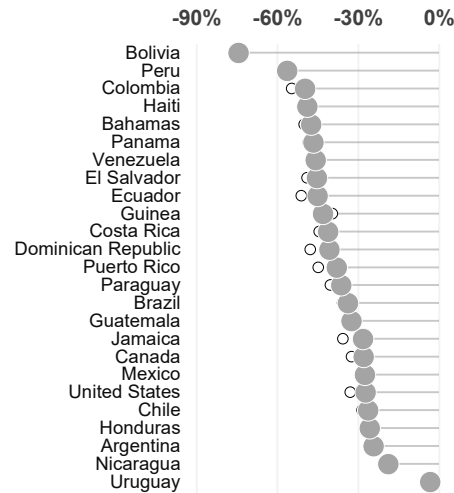
Traffic levels versus normal levels for last 7 days

Percent difference, year-on-year, all days

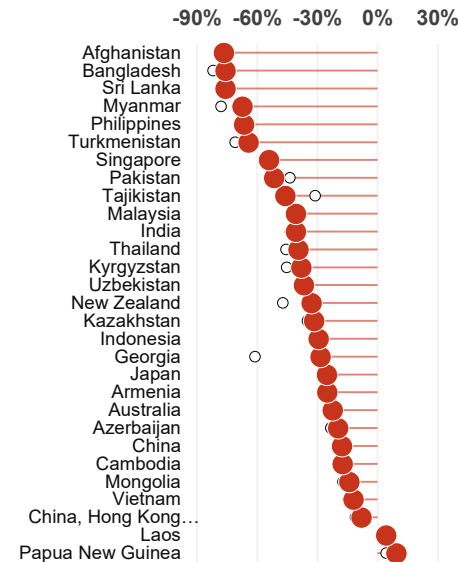
Africa



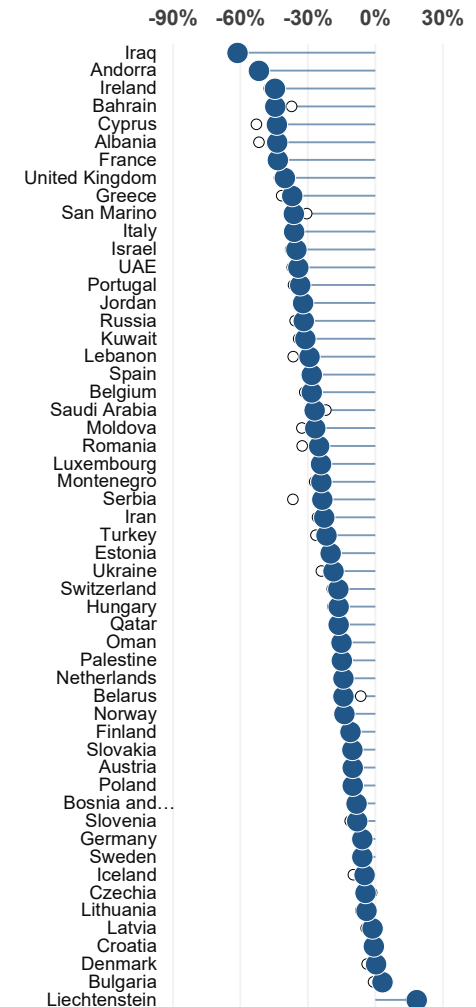
Americas



Asia & Australia



Europe & Middle East



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

Summary data table for total liquids demand in a Covid-19 “effective prevention” case

	MMbbl/d										Change year-on-year								
				2020				2020 Q1						2020			2020 Q1		
	2019	2020	2021	1Q	2Q	3Q	4Q	April	May	June	2020	2021	1Q	2Q	3Q	4Q	April	May	June
Global	99.5	88.7	98.8	91.7	77.7	90.2	95.2	71.8	77.7	83.5	-10.9%	11.4%	-7.6%	-21.2%	-10.0%	-5.0%	-27.1%	-21.3%	-15.0%
Road	47.4	42.1	47.1	42.8	36.2	43.5	45.9	31.7	36.8	40.0	-11.1%	11.8%	-8.3%	-23.6%	-9.2%	-3.5%	-33.0%	-22.3%	-15.6%
Aviation	7.2	4.8	6.9	5.7	2.3	4.9	6.2	2.1	1.9	3.0	-33.6%	43.2%	-17.8%	-67.7%	-35.0%	-12.9%	-70.5%	-72.9%	-59.9%
Other	44.9	41.8	44.8	43.2	39.1	41.8	43.1	37.9	38.9	40.5	-7.0%	7.2%	-5.4%	-10.8%	-6.5%	-5.3%	-13.8%	-11.8%	-6.8%
United States	20.5	18.3	20.3	19.2	15.6	18.8	19.8	13.9	15.6	17.1	-10.5%	10.6%	-5.4%	-23.4%	-9.2%	-3.9%	-30.8%	-22.8%	-16.8%
Road	11.2	10.0	11.1	10.3	8.5	10.5	10.8	7.1	8.8	9.6	-10.9%	10.4%	-6.2%	-25.4%	-8.2%	-3.3%	-36.9%	-22.5%	-17.1%
Aviation	1.7	1.2	1.6	1.5	0.6	1.2	1.5	0.5	0.4	0.8	-32.0%	33.3%	-10.6%	-67.1%	-32.5%	-15.8%	-72.9%	-75.5%	-53.2%
Other	7.5	7.1	7.6	7.4	6.5	7.1	7.5	6.3	6.4	6.7	-4.9%	7.1%	-3.1%	-9.4%	-5.3%	-2.0%	-10.7%	-10.2%	-7.2%
China*	15.1	13.8	15.7	12.7	13.7	14.3	14.4	13.5	13.5	14.2	-8.7%	13.7%	-15.8%	-7.3%	-5.5%	-6.0%	-6.9%	-12.8%	-1.9%
Road	6.1	5.6	6.5	4.8	5.5	6.0	6.2	5.2	5.4	5.8	-8.0%	16.1%	-22.6%	-7.7%	-3.1%	1.4%	-9.8%	-13.3%	0.5%
Aviation	0.9	0.7	1.0	0.6	0.5	0.7	0.8	0.5	0.4	0.5	-28.9%	50.2%	-35.4%	-45.7%	-25.4%	-10.0%	-41.8%	-50.8%	-44.4%
Other	8.1	7.5	8.2	7.4	7.8	7.5	7.4	7.8	7.7	7.9	-6.8%	8.8%	-8.6%	-2.7%	-4.9%	-10.9%	-1.1%	-8.4%	1.6%
Europe	14.2	12.5	13.7	13.1	10.4	12.8	13.6	9.6	10.3	11.4	-12.5%	10.2%	-7.3%	-26.6%	-12.4%	-3.8%	-33.5%	-26.5%	-19.6%
Road	7.0	6.3	6.8	6.4	5.3	6.5	6.8	4.6	5.3	5.9	-11.0%	8.5%	-5.7%	-24.9%	-10.2%	-3.4%	-34.7%	-24.0%	-16.0%
Aviation	1.5	0.9	1.4	1.1	0.2	0.9	1.3	0.2	0.2	0.3	-39.2%	55.0%	-14.1%	-84.8%	-42.2%	-10.2%	-88.4%	-88.2%	-78.4%
Other	5.7	5.3	5.5	5.5	4.9	5.3	5.5	4.8	4.8	5.1	-7.5%	4.7%	-7.6%	-13.1%	-6.7%	-2.8%	-18.1%	-13.3%	-7.5%

*Includes Mainland China, Hong Kong and Taiwan
Source: Rystad Energy research and analysis

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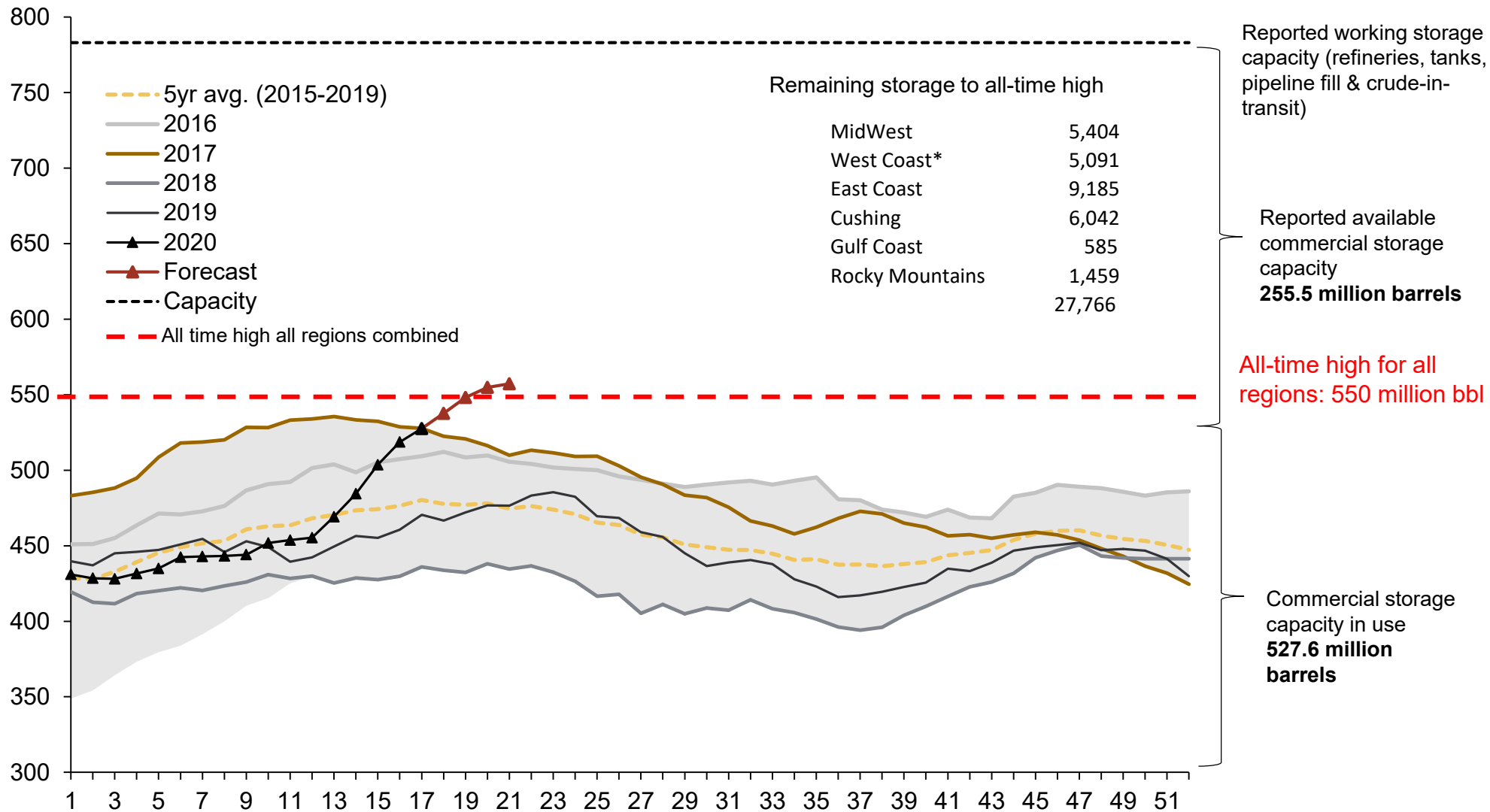
Impact on the oil and gas industry

- Global market outlook
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US commercial crude inventories are approaching all-time high

Million barrels

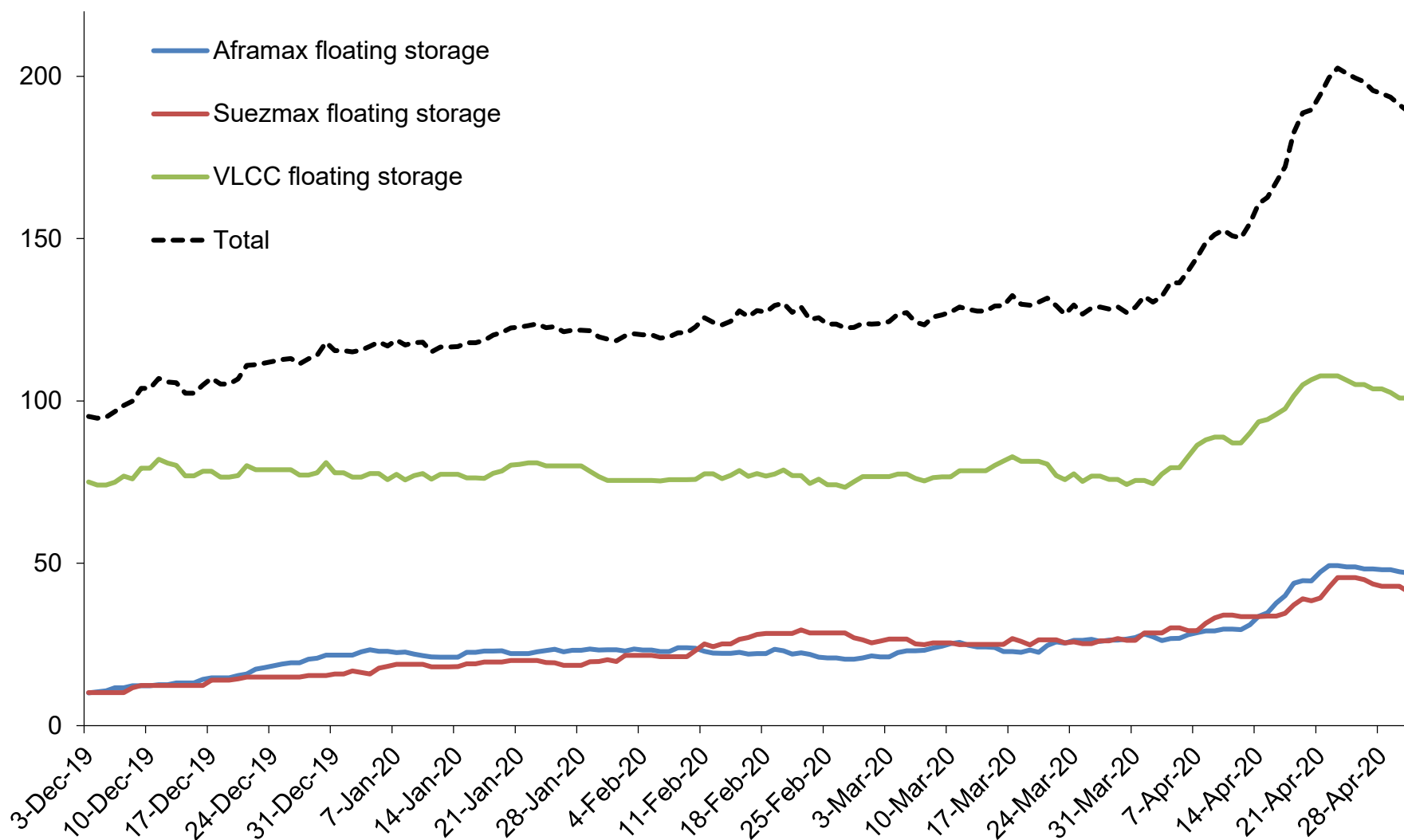


Source: Rystad Energy research and analysis, EIA

* West coast was higher in the 1990s, but those tanks are likely not operational

Global floating storage has apparently stalled, as contango weakens

Million barrels



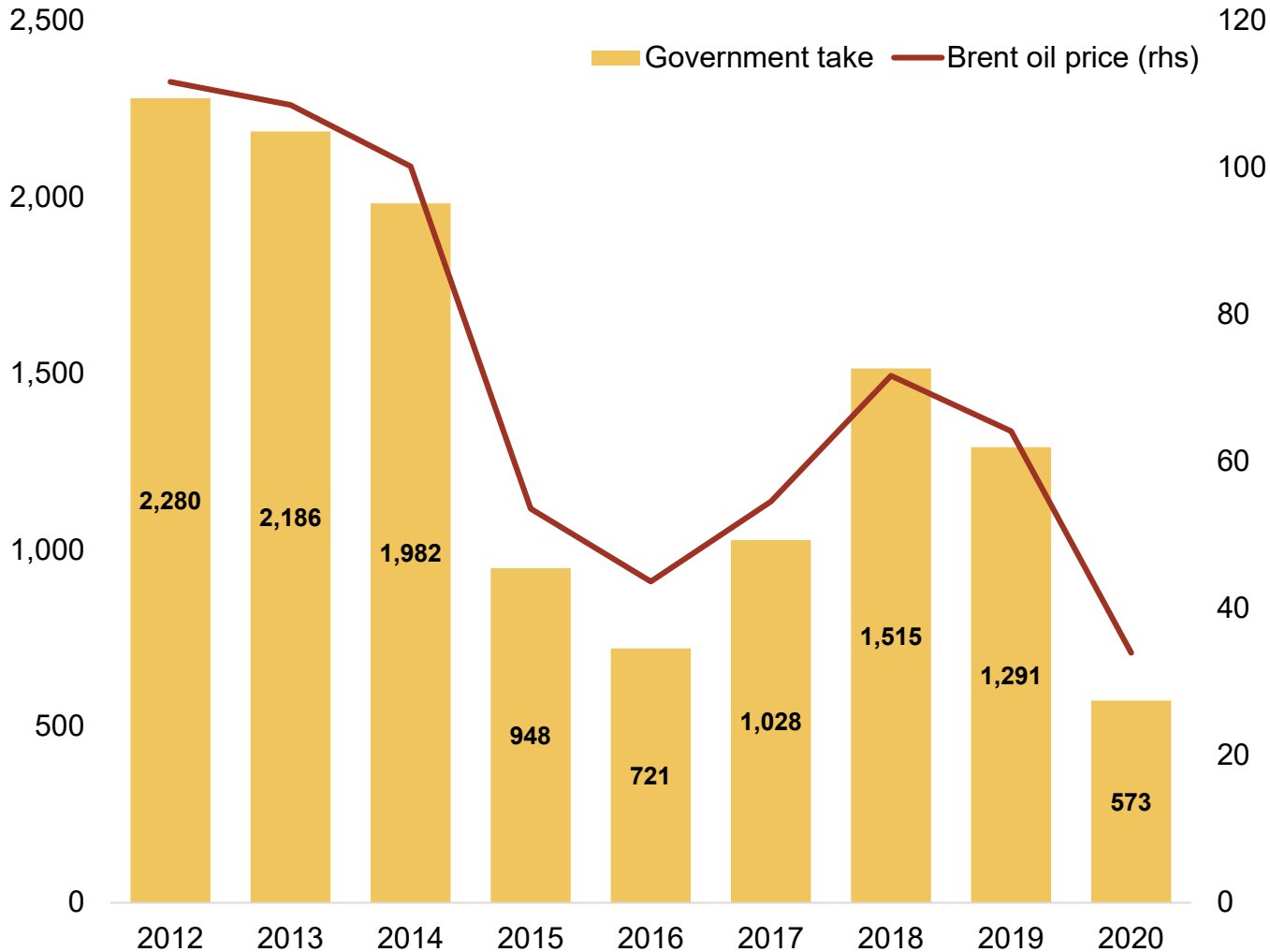
Source: Rystad Energy research and analysis, Refinitiv

The upstream industry will generate \$700 billion less cash to governments this year

Global income to governments from upstream activity and Brent oil price (RHS)

Billion USD

USD/bbl



Falling oil and gas prices will mean lower cash from the upstream industry to various host governments.

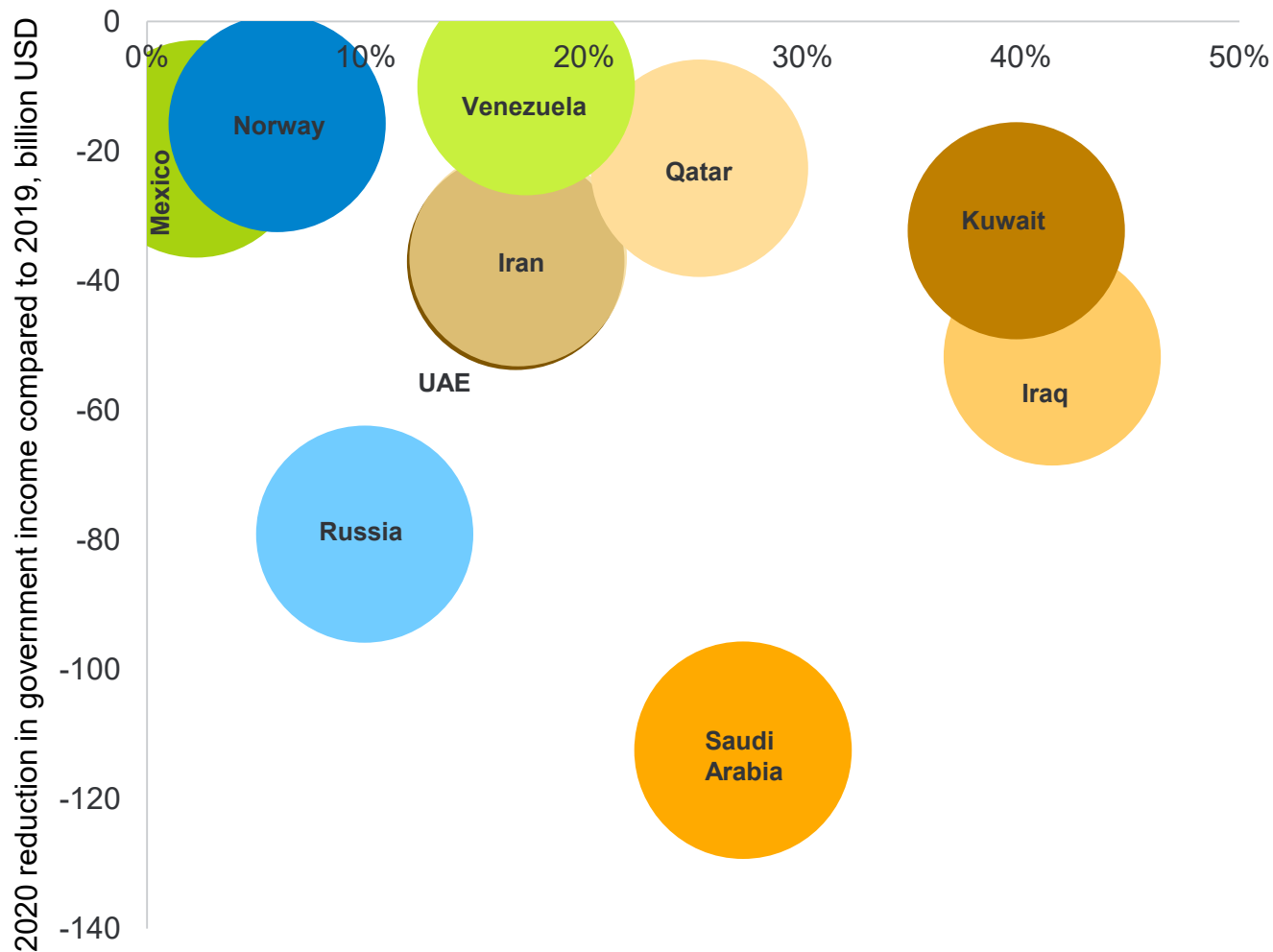
Rystad Energy expects total upstream cash to the governments will be reduced by \$700 billion from 2019 levels, or 55%.

Government income also includes income by NOCs.

Source: Rystad Energy UCube

OPEC countries are most exposed to lower oil prices

2019 government income from oil and gas as a percentage of 2019 total GDP



The chart to the right depicts the reduction in government income from oil and gas in 2020 compared to 2019. It also shows how government income contributed to a country's total GDP in 2019.

Saudi Arabia's 2020 income from oil and gas is expected to be \$110 billion lower than in 2019. In 2019 the income from oil and gas made up close 30% of total GDP.

OPEC countries are the most exposed to income from oil and gas are the. For UAE, Iraq, Kuwait and Saudi Arabia, income from E&P activities made up more than 25% of total GDP.

*The estimates assume a 2020 Brent oil price of \$34 per bbl. Gvt income also includes income by NOCs.
Source: Rystad Energy UCube, IMF

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OIL MARKET WEEKLY

RYSTAD ENERGY PRODUCT RELEASE



ANALYTICS

OIL MARKET WEEKLY – Demand report, a weekly report with:

- An overview of **global oil demand**
- Oil demand impact in two **COVID-19 mitigation scenarios**
- Impact of oil demand in **aviation, ground transportation and road fuels**



ANALYTICS LIBRARY

OIL MARKET WEEKLY – Balances report:

- A weekly **Commentary** with the latest oil market observations
- A weekly **Executive Summary** on the oil market balances, oil supply and demand, and the overall oil market view



CUBE DASHBOARDS

OIL MARKET DASHBOARDS and Excel data on:

- **Oil demand analysis dashboard**: split by country, transport type, aviation
- **COVID-19 dashboard**: oil demand impacting two COVID-19 mitigation scenarios



RYSTAD ENERGY

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