Covid-19 and the Supply-Demand Outlook for Oil up to 2021

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Introduction

The number of people infected with Covid-19 has surpassed 5 million globally, and many countries continue to impose, to varying degrees, lockdowns and restrictions on the movement and outings of people. While around 70,000 to 100,000 new cases are still being recorded each day since April, the lockdown was lifted in Wuhan City in China, where Covid-19 started, on April 8, and has begun to be eased in many other countries. The restarting of economic activity will cause oil demand to recover but could also trigger another outbreak. It is widely assumed that the lockdowns have caused such a large amount of oil demand to evaporate that production cuts by OPEC+ and other oil-producing countries will not be enough to recover the supply-demand balance. This report presents an outlook for the supply-demand balance of oil up to 2021 based on the demand outlook previously released by the IEEJ.

1. Demand outlook

The IEEJ has forecasted the demand for oil up to 2021 using three scenarios based on the World Economic Outlook[2] of the International Monetary Fund (IMF): the Reference Scenario (RS), in which the Covid-19 pandemic will end within 2020; the Longer Pandemic Scenario (LPS), in which the virus continues to spread for longer and has a more serious impact on economic activity; and the Pandemic Second Outbreak Scenario (PSOS), in which the pandemic is prolonged and a second outbreak hits in 2021.[3] According to the forecast, the global oil demand will decrease from 100 mb/d in 2019 to 87.2–90.7 mb/d in 2020, and then increase to 89.0–100.7 mb/d in 2021, both annual averages. Under the RS, demand will bottom out in Q2 of 2020 with 83.3 mb/d and rise to 102.9 mb/d in 2021Q4. Oil demand will bottom out in Q2 of 2020 under the LPS and PSOS as well, but the demand for Q2 will be lower than under the RS, at 82.1 mb/d. Demand will recover to 102.0 mb/d in 2021Q4, but under the PSOS, which anticipates a second outbreak in 2021Q2, demand will be 92.9 mb/d in 2021Q4, falling short of the demand level in 2019Q4.

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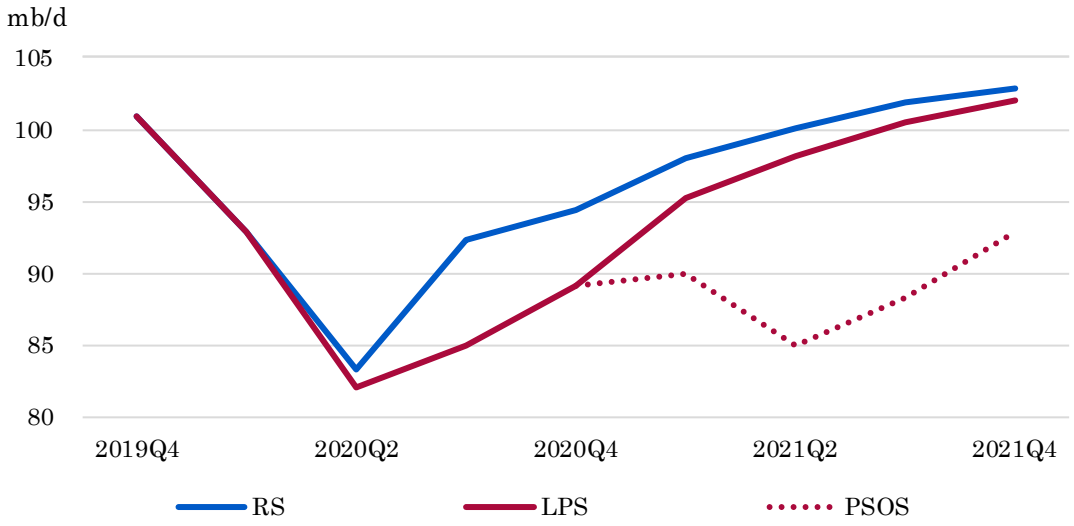
[2] IMF, World Economic Outlook April 2020: The Great Lockdown, https://www.imf.org/en/Publications/WEO/Issues/2020/04/14/weo-april-2020
[3] The Institute of Energy Economics, Japan, "Demand for Oil, Natural Gas, and LNG Facing the Worst Global Economic Conditions since the Great Depression," April 17, 2020; https://eneken.ieej.or.jp/data/8912.pdf, "Covid-19 and the Outlook for Oil, Natural Gas, and LNG Demand in 2021," May 1, 2020, https://eneken.ieej.or.jp/data/8928.pdf

Fig. 1 Outlook for oil demand



Source: Institute of Energy Economics, Japan

2. Supply-demand adjustment scheme for responding to oversupply

Witnessing the oil price crash that occurred after the OPEC+ meetings on March 5 and 6, OPEC+ agreed to curb production by 9.7 mb/d at the meetings on April 9 and 12[4], following the intermediation efforts of President Trump. On April 10, the G20 Energy Ministerial Meeting was held, presided by Saudi Arabia, and the G20 reaffirmed that they will work closer together to stabilize the market and strengthen energy security.[5] However, despite the request by OPEC+, no numerical targets were indicated for production cuts by non-OPEC+ countries, including the United States.[6] Media reports emerged citing sources in OPEC+ that the effective supply-demand adjustment from May (production cut plus absorption of surplus) will exceed 20 mb/d when summing up production reductions by OPEC+ exceeding the agreed level and production curtailment by non-members, as well as additional strategic stockpiling to absorb excess supply from the market.[7] Furthermore, media reports on additional production cuts by Saudi Arabia, the UAE, and Kuwait in June[8] appeared on May 11. The additional cuts will consist of 1.0 mb/d by Saudi Arabia, 0.1 mb/d by the UAE, and 0.08 mb/d by

[4] OPEC, April 12, 2020, https://www.opec.org/opec_web/en/press_room/5891.htm
[5] Ministry of Economy, Trade and Industry, April 11, 2020, https://www.meti.go.jp/press/2020/04/20200411001/20200411001.html
[6] The Nihon Keizai Shimbun, April 11, 2020, https://www.nikkei.com/article/DGXMZO57959490R10C20A4EA5000/?n_cid=SPTMG002
[7] Bloomberg, April 13, 2020, https://jp.reuters.com/article/global-oil-opec-idJPKCN21U0WS?utm_source=34553&utm_medium=partner
[8] Bloomberg, May 11, 2020, https://jp.reuters.com/article/global-oil-saudi-idJPKBN22N1WS

Kuwait. It must be noted that the International Energy Agency (IEA) has played a vital role in building the additional production cut scheme which transcends the conventional framework, by releasing a joint statement with OPEC[9] and proposing that Saudi Arabia host a G20 Energy Ministerial Meeting.[10]

Non-OPEC+ countries including the United States are not under any obligation to cut production, and most of the reduction comes from "natural" decreases as producers suspend or scale back production amid a decline in profitability due to low oil prices. However, the scale of such reduction is not small, with the IEA expecting a possible decrease of approx. 3.5 mb/d in the US and Canada in the coming months.[11] Meanwhile, the government of Alberta, Canada's major oil-producing province, has required that producers within the province cut production by 325,000 b/d in January 2019. The requirement has since been eased, but the reduction is planned to continue until the end of 2020.[12] The Norwegian government will also cut production by 250,000 b/d in June and by 134,000 b/d in July through December 2020.[13] Aside from production cuts, regarding boosting stockpiles to absorb the surplus in the market mentioned earlier, the IEA estimates that China, India, South Korea, and the US can collectively take in 2.0 mb/d in 2020Q2.[14] As such, a scheme transcending the conventional framework, which could be called "OPEC++," has been established to combat the supply glut caused by this unprecedented decline in oil demand.

[9] IEA, March 16, 2020, https://www.iea.org/news/iea-executive-director-and-opec-secretary-general-discussed-the-current-situation-in-global-oil-markets
[10] IEA, April 10, 2020, https://www.iea.org/news/executive-director-s-speech-to-extraordinary-g20-energy-ministerial
[11] IEA, Oil Market Report, April 2020, p4
[12] Government of Alberta, https://www.alberta.ca/oil-production-limit.aspx
[13] Government.no, April 29, 2020, https://www.regjeringen.no/en/aktuelt/reducing-oil-production-on-the-norwegian-continental-shelf/id2700542/
[14] Platts Oilgram News, April 16, 2020

Fig. 2 OPEC++ market stabilization scheme

mb/d

	Baseline Production	Production	Production Target			
		Apr 2020	May 2020	Jun 2020	Jul-Dec 2020	Jan 2021-Apr 2022
OPEC						
Saudi Arabia	11.00	11.90	8.49	7.49	8.99	9.50
Iraq	4.65	4.50	3.59		3.80	4.02
UAE	3.17	3.85	2.45	2.35	2.59	2.74
Kuwait	2.81	3.05	2.17	2.09	2.30	2.43
Nigeria	1.83	1.76	1.41		1.50	1.58
Angola	1.53	1.32	1.18		1.25	1.32
Algeria	1.06	1.00	0.82		0.86	0.91
Congo	0.33	0.33	0.25		0.27	0.28
Gabon	0.19	0.20	0.14		0.15	0.16
Equatorial Guinea	0.13	0.12	0.10		0.10	0.11
Iran		1.99				
Venezuela		0.63				
Libya		0.08				
Total OPEC	26.68	30.73	20.60	19.42	21.82	23.03
Non-OPEC						
Azerbaijan	0.72	0.68	0.55		0.59	0.62
Kazakhstan	1.71	1.58	1.32		1.40	1.48
Mexico	1.75	1.75	1.65		1.65	1.65
Oman	0.88	0.96	0.68		0.72	0.76
Russia	11.00	10.44	8.49		8.99	9.50
Malaysia	1.11	1.04	0.85		0.90	0.96
Bahrain						
Brunei						
Sudan						
South Sudan						
Total Non-OPEC	17.17	16.25	13.55	13.55	14.26	14.96
Total OPEC+	43.85	44.28	34.15	32.97	36.07	37.99

	Baseline Production	Production	Production Target		
		Mar 2020	Apr-Jun 2020	Jun 2020	Jul-Dec 2020
Alberta, Canada	N.A.	3.47	3.81		N.A.
Norway	1.86	2.10		1.61	1.73
			Stock Fill		
China, India, Korea,			2.00		

Sources: OPEC, IEA, the government of Alberta, the government of Norway, Bloomberg

Needless to say, whether this new scheme can achieve its goal depends crucially on whether the pandemic will be contained soon. Also important is whether supply and demand will even out in the United States, the world's largest producer and consumer of oil. Prior to the OPEC+ meeting on April 9, Saudi Arabia and Russia had named the US' participation in the production cut as a condition for a

larger production cut by OPEC+.[15] On the US side, the energy regulators of Texas, the key oil-producing state, considered cutting the state's output by 1.0 mb/d (20%)[16], but the idea of setting a mandatory reduction target was abandoned due to staunch opposition by those who believed that output adjustment should be left to market forces.[17] With no moves toward mandatory reductions in other states, the direction of policy is toward further stockpiling[18], financial assistance for producers[19], and consideration of suspending oil imports from Saudi Arabia[20] by the federal government.

In the US, crude production finally peaked and began to decrease in the second week of March with 13.1 mb/d. Between then and the second week of May, production decreased by 1.5 mb/d.[21] The EIA predicts that annual average US oil production will decrease by 0.55 mb/d from the previous year's average to 11.69 mb/d in 2020, and by 0.79 mb/d to 109.0 mb/d in 2021.[22] These figures by the EIA are used as the production volume of the US in our supply scenario described later. Meanwhile, the IEA had forecasted an increase of approx. 1.0 mb/d for US crude production in 2020 in its monthly Oil Market Report released in March this year, but drastically revised the forecast to a year-on-year decrease of 400,000 b/d in its April report. Some consider that this difference of 1.4 mb/d caused by plummeting oil prices could arguably be regarded as the US' contribution to supply-demand stability in the form of reduction of production.

3. Storage capacity constraints

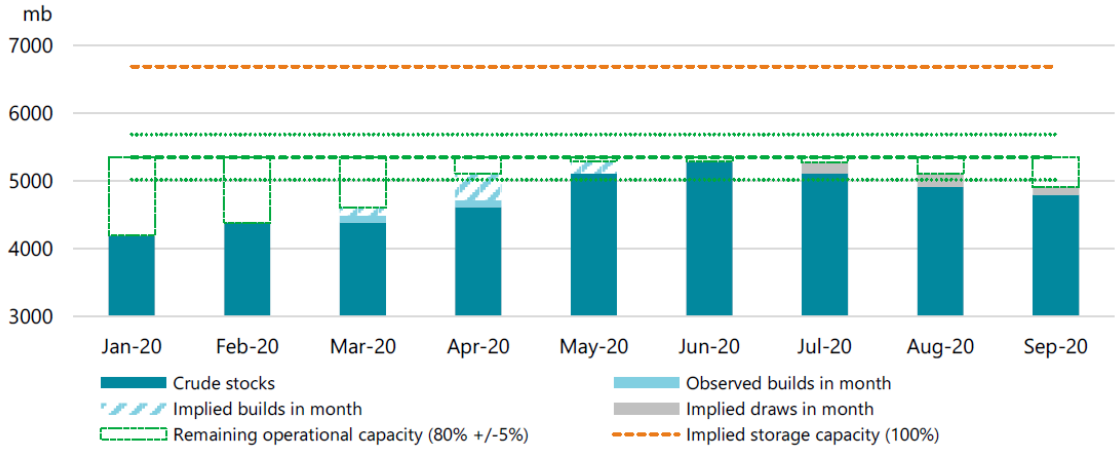
In forecasting the size of production reduction, we must consider not only price levels but also constraints on storage capacity. On April 20, the US WTI oil futures fell into negative territory as ETFs and other non-commercial players, who do not have real demand or means to trade oil, are forced to sold more as the May contract approached expiry, but there were no buyers due to a lack of tanks to store the crude.[23] The EIA forecasts that US demand will begin to recover in May and industry stocks will start to decrease in July, but any delay in the pace of decrease in output or recovery of demand would immediately put pressure on storage capacity and force deeper production cuts. There

[15] Bloomberg, April 7, 2020, https://jp.reuters.com/article/oil-opec-usa-idJPKBN21O2X8
[16] Platts, April 14, 2020, https://www.spglobal.com/platts/en/market-insights/latest-news/oil/041420-texas-oil-regulator-weighs-20-production-cuts-against-free-market-opposition
[17] Platts, May 4, 2020, https://www.spglobal.com/platts/en/market-insights/latest-news/natural-gas/050420-texas-railroad-commissioner-declares-idea-to-limit-oil-production-dead
[18] Department of Energy, April 14, 2020, https://www.energy.gov/articles/doe-announces-crude-oil-storage-contracts-help-alleviate-us-oil-industry-storage-crunch
[19] Reuters, April 24, 2020, https://jp.reuters.com/article/usa-oil-mnuchin-idJPKCN22605Q
[20] The Nihon Keizai Shimbun, April 20, 2020, https://www.nikkei.com/article/DGXMZO58292270R20C20A4000000/
[21] EIA, Weekly Petroleum Status Report, May 13, 2020, https://www.eia.gov/petroleum/supply/weekly/
[22] EIA, Short-Term Energy Outlook, May 12, 2020, https://www.eia.gov/outlooks/steo/report/
[23] The Nihon Keizai Shimbun, April 27, 2020, https://www.nikkei.com/article/DGXMZO58525420X20C20A4QM8000/

is even a possibility that the US may stop importing oil from Saudi Arabia to alleviate the oversupply. Were this situation to occur, it would worsen US-Saudi relations and could cause Saudi Arabia to walk out of the production cut agreement and the OPEC++ scheme to collapse.

Storage capacity constraints are not only a US problem. According to the IEA, the working global crude storage capacity, factoring in tank operation constraints[24], is 5.0–5.7 billion barrels.[25] The IEA estimates there are 4.6 billion barrels in stock as of the end of April 2020, and the number will rise to around 5.3 billion barrels in June before starting to decline.[26] Floating storage on tankers is also being employed to deal with the storage capacity crunch, and the IEA estimates that floating storage of 130–155 million barrels is possible considering unoccupied space caused by recent demand loss.[27] However, as the IEA themselves point out, there is insufficient data on storage capacity and these assumptions should be considered with a considerable margin.

Fig. 3 World implied crude storage capacity



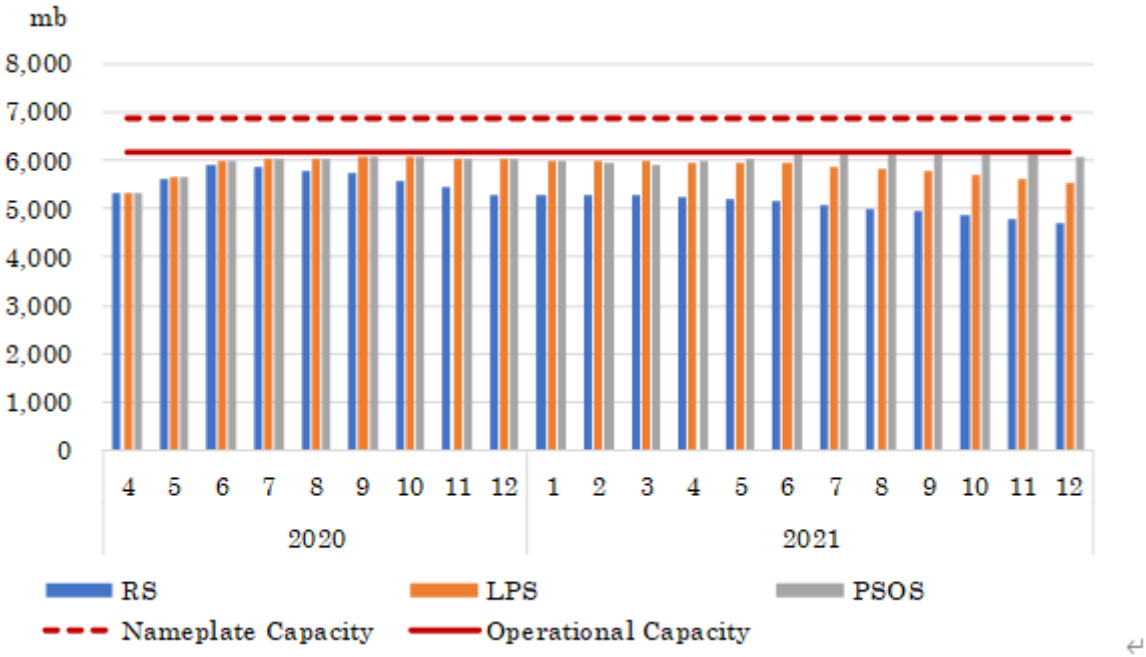
Source: IEA Oil Market Report

Storage capacity constraints will start to ease from 2020Q3 under the RS in which demand bottoms out in Q2. However, under the LPS in which recovery will be slower and the PSOS with a second outbreak, production cuts will need to be more persistently due to storage capacity constraints. If the constraints become tight, storage capacity will have to be increased even by sacrificing tank operation

[24] The IEA estimates the physical capacity to be 6.7 billion barrels but that the capacity that can actually be used is around 75–85% (i.e. 5.0–5.7 billion barrels) considering operational constraints such as the change in volume with changes in temperature and oil blending constraints.
[25] IEA, Oil Market Report, May 2020, p39
[26] Same as above.
[27] IEA, Oil Market Report, May 2020, p40

efficiency. However, even assuming an effective storage capacity of 6.155 billion barrels[28], to avoid a storage capacity crunch, production will have to be cut by an additional 1.5 mb/d on average from RS levels from 2020Q3 to 2021Q1, 2021 under the LPS, and by 7.6 mb/d on average from 2020Q3 to 2021Q4 under the PSOS. Note that the storage capacity discussed here is on a global basis, but in reality, storage capacity constraints differ by region. Therefore, even if stocks are still below the global storage capacity, some regions could already be facing insufficient capacity.

Fig. 4 Crude stocks and storage capacity



Note: Production is cut additionally by 1.5 mb/d on average from 2020Q3 to 2021Q1 for the LPS and by 7.6 mb/d on average from 2020Q3 to 2021Q4 for the PSOS, both from the supply levels under the RS. Construction of new storage capacity is not considered.

Sources: Created by the IEEJ based on IEA Oil Market Report, EIA Short-Term Energy Outlook, and "Demand for Oil, Natural Gas, and LNG under the Worst Global Economic Conditions since the Great Depression" and "Covid-19 and the Demand Outlook for Oil, Natural Gas, and LNG in 2021" by the IEEJ.

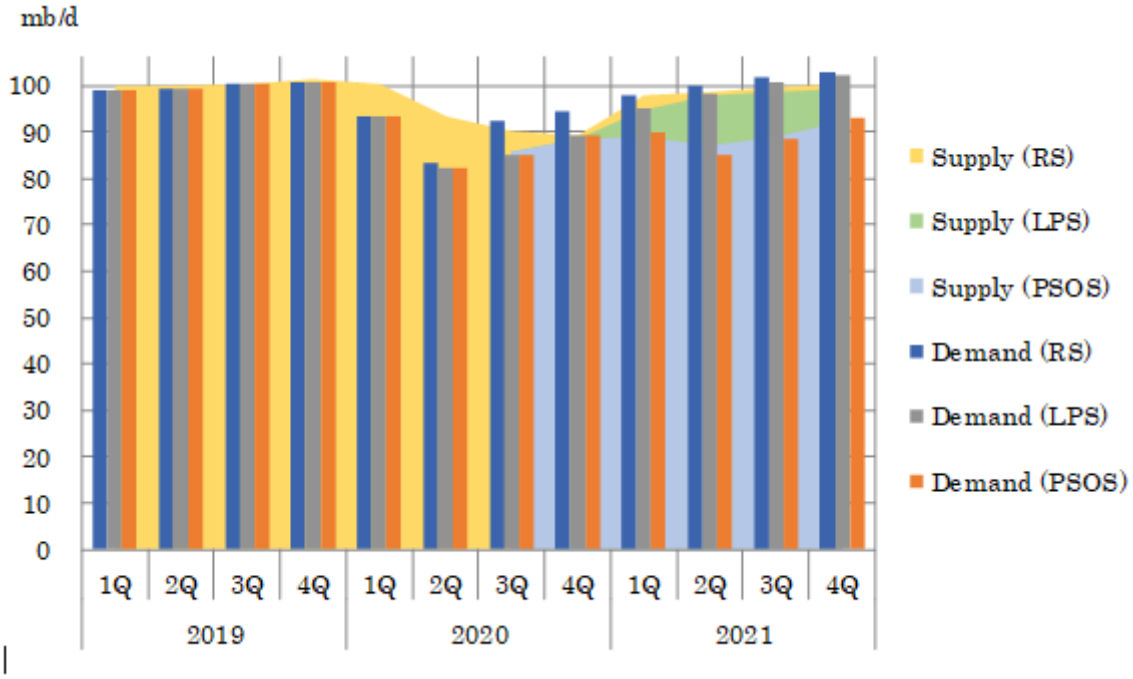
4. Supply-demand balance outlook

The chart below shows the supply-demand balance factoring in the demand outlook described above, the OPEC++ scheme for restoring supply-demand stability, production forecasts in countries without production cut obligations including the US, and storage capacity constraints. Here, the rate of compliance with the OPEC++ supply-demand stabilization scheme is assumed to be 100%. In the RS

[28] 90% of the physical capacity of land-based facilities (6.0 billion barrels) plus the maximum floating storage capacity (0.155 billion barrels).

in which Covid-19 will end in 2020Q2, demand will exceed supply in 2020Q3 and remain so into 2021Q4. There will be no need for additional production cuts so long as the OPEC++ scheme is observed. However, for the LPS with a slower recovery and the PSOS with a second outbreak, additional production cuts from the RS' supply levels will be necessary, as described earlier.

Fig. 5 Outlook for oil balance



Note: Production is cut by an additional 1.5 mb/d on average from 2020Q3 to 2021Q1 for the LPS and by 7.6 mb/d on average from 2020Q3 to 2021Q4 for the PSOS, both from the supply levels under the RS.

Sources: Created by the IEEJ based on IEA Oil Market Report, EIA Short-Term Energy Outlook, and "Demand for Oil, Natural Gas, and LNG under the Worst Global Economic Conditions since the Great Depression" and "Covid-19 and the Demand Outlook for Oil, Natural Gas, and LNG in 2021" by the IEEJ.

5. Conclusion

The number of new cases of Covid-19 infection remains high but the pace of increase has slowed significantly from March, and many countries are easing their lockdowns and restrictions on movement and outings. If the current trend continues, demand will start to recover from Q3, and if the OPEC++ scheme functions properly, the constraints on storage capacity will indeed ease. This is consistent with the RS. However, it is not at all clear how the pandemic will develop. Some fear that easing restrictions on movement and outings and the restarting of economic activity would lead to a second outbreak and a third, which may have a serious impact. Even if the world proceeds along the future path anticipated under the RS, the oil price crash has already dealt a devastating blow to oil-

producing economies: the IEA estimates that even Saudi Arabia and other Gulf oil-producers with relatively large financial buffers will suffer a fiscal deficit of 10–12% and a funding shortage of $150–170 billion in 2020.[29] Regardless of how large or small the probability, actually implementing the extreme production cut that would be necessary under the PSOS for a sustained period of time would not only spell economic disaster for most oil-producing economies countries but could even shake each nation's system.

Oil prices have been relatively stable since the start of May, albeit at low levels. The main factor behind this is the mounting expectations for a recovery in demand as restrictions are eased and economic activity restarts. Under the RS, which predicts that demand will steadily recover from Q3, oil prices are expected to rise as the supply-demand nears balanced. However, prices would once again face downward pressure under LPS and PSOS.

Since a severe scenario like the PSOS cannot be ruled out, the highest priority is for the entire world to continue to focus to end the pandemic. The US did not commit to mandatory production cuts in April, but under the PSOS, the country may be forced to reconsider its policy. Meanwhile, the absence of reliable global data on storage capacity is a serious problem, particularly if the LPS or PSOS becomes a reality. To prevent storage capacity constraints and panic in the market, governments will need to assess the precise capacities of their storage facilities quickly and share the information with the rest of the world.

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[29] IEA, Oil Market Report, April 2020, p17