Impact of the COVID-19 on Global Energy Market

IAEE Webinar

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Dr. Ken Koyama
Chief Economist and Managing Director
Institute of Energy Economics, Japan
Energy market under demand and supply shock

- Even before pandemic, energy market sees over supply
- COVID-19 outbreak in China developed into pandemic
- World economy, the worst since the Great Depression
- Lockdown destruct oil demand: demand shock
- Supply shock added another pressure when joint production cut collapsed
- Unprecedented oversupply and extreme low price
- Pain and terror resulted in restoration of joint cut, but...
- Emerging inventory bottleneck gives downward pressure
- Supply glut and uncertainty will be the keyword
Oil price plummeted under COVID-19 pandemic

Source: NYMEX and other data

- Continued price runups
- Collapse after Lehman shock
- Rebound from the MENA crisis
- Brent topped 80 $, WTI hit 26$ in Feb 2016
- Demand shock
- OPEC decision to leave price fall
- OPEC Plus cut output
- Brent topped 80 $
### IMF 「World Economic Outlook」

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>World</td>
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<td>3.2</td>
<td>3.8</td>
<td>3.6</td>
<td>2.9</td>
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<td>2.4</td>
<td>2.2</td>
<td>1.7</td>
<td>1.6</td>
<td>-6.1</td>
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<td>1.5</td>
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<td>2.3</td>
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<td>1.9</td>
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<td>Japan</td>
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<td>0.9</td>
<td>1.9</td>
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<td>0.7</td>
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<td>Non-OECD</td>
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<td>4.5</td>
<td>3.7</td>
<td>4.4</td>
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<tr>
<td>China</td>
<td>6.9</td>
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<td>6.9</td>
<td>6.6</td>
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<td>India</td>
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<td>7.1</td>
<td>6.7</td>
<td>6.8</td>
<td>4.8</td>
<td>5.8</td>
<td>1.9</td>
</tr>
</tbody>
</table>

Source: IMF “World Economic Outlook” (April 2020)
Economic crisis: “people”, “goods” and “money”

- Well-functioning of “people”, “goods” and “money” is essential for economic activities

- COVID-19 pandemic:
  - Serious problems for “people” and “goods”: damaged real economy
  - Then “money” problem hit the world, leading to vicious cycle

- Rehman shock 2008-09 financial crisis:
  - Rehman Brothers bankrupted: “money” caused financial crisis
  - Then real economy damaged worldwide

- US-China trade war:
  - Tariff war: “goods” problem caused reduction on world trade
  - Then “money” problem damaged the world economy
World economy contracted by 3%

World GDP growth

<table>
<thead>
<tr>
<th>Year</th>
<th>Growth</th>
</tr>
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<tbody>
<tr>
<td>2017</td>
<td>3.8%</td>
</tr>
<tr>
<td>2018</td>
<td>3.6%</td>
</tr>
<tr>
<td>2019</td>
<td>2.9%</td>
</tr>
<tr>
<td>RS</td>
<td>-3.0%</td>
</tr>
<tr>
<td>LPS</td>
<td>-6.0%</td>
</tr>
</tbody>
</table>

GDP trend by quarter

Source: Koyama and Suehiro (IEEJ, April 2020)
Oil demand under COVID-19 pandemic

World oil demand

<table>
<thead>
<tr>
<th>Year</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
<th>RS</th>
<th>LPS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mb/d</td>
<td>98.1</td>
<td>99.2</td>
<td>100.0</td>
<td>90.7</td>
<td>87.2</td>
</tr>
</tbody>
</table>

Oil demand by quarter

<table>
<thead>
<tr>
<th>Quarter</th>
<th>2020Q1</th>
<th>2020Q2</th>
<th>2020Q3</th>
<th>2020Q4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mb/d</td>
<td>Reference</td>
<td>Longer Pandemic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2020Q1</td>
<td>96</td>
<td>92</td>
<td>88</td>
<td>84</td>
</tr>
<tr>
<td>2020Q2</td>
<td>92</td>
<td>88</td>
<td>84</td>
<td>80</td>
</tr>
<tr>
<td>2020Q3</td>
<td>88</td>
<td>84</td>
<td>80</td>
<td>76</td>
</tr>
<tr>
<td>2020Q4</td>
<td>96</td>
<td>92</td>
<td>88</td>
<td>84</td>
</tr>
</tbody>
</table>

Source: Koyama and Suehiro (IEEJ, April 2020)
Oil demand reduction versus 2020 level

By region

<table>
<thead>
<tr>
<th>Region</th>
<th>Mb/d</th>
</tr>
</thead>
<tbody>
<tr>
<td>OECD Americas</td>
<td>-3</td>
</tr>
<tr>
<td>OECD Europe</td>
<td>-2</td>
</tr>
<tr>
<td>OECD Asia Oceania</td>
<td>-1</td>
</tr>
<tr>
<td>FSU &amp; Other Europe</td>
<td>0</td>
</tr>
<tr>
<td>China</td>
<td>0</td>
</tr>
<tr>
<td>Other Non-OECD Asia</td>
<td>0</td>
</tr>
<tr>
<td>Non-OECD Americas</td>
<td>0</td>
</tr>
<tr>
<td>Middle East</td>
<td>0</td>
</tr>
<tr>
<td>Africa</td>
<td>0</td>
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</table>

By product

<table>
<thead>
<tr>
<th>Product</th>
<th>Mb/d</th>
</tr>
</thead>
<tbody>
<tr>
<td>LPG &amp; ethane</td>
<td>0</td>
</tr>
<tr>
<td>Naphtha</td>
<td>-1</td>
</tr>
<tr>
<td>Gasoline</td>
<td>-2</td>
</tr>
<tr>
<td>Jet &amp; kerosene</td>
<td>-3</td>
</tr>
<tr>
<td>Gasoil</td>
<td>-4</td>
</tr>
<tr>
<td>Residual fuel</td>
<td>0</td>
</tr>
<tr>
<td>Other products</td>
<td>0</td>
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</tbody>
</table>

Source: Koyama and Suehiro (IEEJ, April 2020)
Natural gas demand under COVID-19 pandemic

Natural gas demand

<table>
<thead>
<tr>
<th>Year</th>
<th>Demand (Bcm)</th>
</tr>
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<tbody>
<tr>
<td>2017</td>
<td>3654</td>
</tr>
<tr>
<td>2018</td>
<td>3849</td>
</tr>
<tr>
<td>2019</td>
<td>3969</td>
</tr>
<tr>
<td>2020</td>
<td>3682</td>
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Natural gas demand by quarter

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Reference</th>
<th>Longer Pandemic</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020Q1</td>
<td>600</td>
<td>600</td>
</tr>
<tr>
<td>2020Q2</td>
<td>800</td>
<td>800</td>
</tr>
<tr>
<td>2020Q3</td>
<td>1000</td>
<td>1000</td>
</tr>
<tr>
<td>2020Q4</td>
<td>1200</td>
<td>1200</td>
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Source: Koyama and Suehiro (IEEJ, April 2020)
LNG demand under COVID-19 pandemic

LNG demand

<table>
<thead>
<tr>
<th>Year</th>
<th>LNG-Mt</th>
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</thead>
<tbody>
<tr>
<td>2017</td>
<td>288</td>
</tr>
<tr>
<td>2018</td>
<td>316</td>
</tr>
<tr>
<td>2019</td>
<td>353</td>
</tr>
<tr>
<td>2020</td>
<td>325</td>
</tr>
</tbody>
</table>

LNG demand by quarter

<table>
<thead>
<tr>
<th>Quarter</th>
<th>LNG-Mt</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020Q1</td>
<td>Reference: 80, Longer Pandemic: 70</td>
</tr>
<tr>
<td>2020Q2</td>
<td>Reference: 50, Longer Pandemic: 40</td>
</tr>
<tr>
<td>2020Q3</td>
<td>Reference: 70, Longer Pandemic: 60</td>
</tr>
<tr>
<td>2020Q4</td>
<td>Reference: 90, Longer Pandemic: 80</td>
</tr>
</tbody>
</table>

Source: Koyama and Suehiro (IEEJ, April 2020)
Gas/LNG demand reduction versus 2020 level

**Natural gas**

- OECD Americas
- OECD Europe
- OECD Asia Oceania
- FSU & Other Europe
- China
- Other Non-OECD Asia
- Non-OECD Americas
- Middle East
- Africa

**LNG**

- OECD Americas
- OECD Europe
- OECD Asia Oceania
- FSU & Other Europe
- China
- Other Non-OECD Asia
- Non-OECD Americas
- Middle East
- Africa

Source: Koyama and Suehiro (IEEJ, April 2020)
Energy demand reduction by “Lockdown” (1)

Source: Suehiro and Koyama (IEEJ, April 2020)
Energy demand reduction by “Lockdown” (2)

Final energy reduction

by energy

by sector

Primary energy reduction

Total (Mtoe/d)

Oil (Mb/d)

Gas (Bcm/d)

Coal (Mtce/d)

Source: Suehiro and Koyama (IEEJ, April 2020)
Supply shock: Collapse and restoration of joint production cut

- March 6, Russia rejected the joint production cut
- Saudi reversed the oil policy to increase the production
- Price war broke out
- March 9, WTI declined by 10$ to 31.13$
- March 30, WTI further declined to 20.09$ under demand shock
- April 2, Trump stated Russia and Saudi will cut production
- Saudi called for an emergency OPEC plus meeting
- April 9, OPEC plus agreed to restore joint production cut
- G20 discuss the measures for market stabilization
- April 12, OPEC plus decided 9.7 MB/D production cut from May
Russian situation

- OPEC plus cut benefits US shale oil (high cost producer)
- Benefit to US (shale) unacceptable for Russian national interest
- Russia argued Russia can bare low oil price longer than Saudi
- The impact of low price much bigger than anticipation
- Pandemic damaged European market, Russian main outlet
- The pain was too acute for Russia
Saudi situation

- Various conditions suggest preference to higher price
- Emphasis on “joint production cut” (never be a swing producer)
- But joint production cut collapsed by Russian rejection
- This lead to Saudi reversal to market share strategy/price war

- “Lose a battle to win a war” strategy
- The pain of low price, a driver for restoration of joint cut

- But the pain was beyond anticipation
- The importance of the call from Trump
- Actually, joint cut was restored (as originally aimed at)
US situation

- US shale oil, high production cost oil
- Oil price, not affecting US gov. budget deficit/surplus, but...

- Below 20$ caused serious damages to shale revolution
- Destructive impact on US shale industry
- Low oil price caused lower NY stock price
- Economic pain was too strong for Trump

- Mediation for Russia/Saudi price war
- US production likely to be in the hand of “market mechanism”
OECD Company oil inventory

Oil inventory build put strong downward pressure on oil price

Source: Prepared by author based on IEA data
Short-term outlook for oil market

- 10 MB/D joint production cut is not enough
- Some uncertainty over the future of joint production cut
- Current oil demand may contract by more than 20 MB/D
- The shared “terror” contributed to restoration of joint cut
- Global inventory capacity may be filled up sometime in 2Q
- Thus oil price under strong downward pressure
- 2 critical factors: future of demand destruction and joint cut
- If pandemic stabilizes and economic recovery in 2H this year with continued joint cut, oil price may head for 30$
- If pandemic continues to destabilize the world with uncertainty over joint cut, oil price may go down to be below 10$
Reduced LNG demand accelerates supply glut

Even without pandemic, 2020 market sees supply surplus...

Note: 2020 RS assumes 3% minus for world GDP, while LPS assumes 6% minus

Source: Koyama and Suehiro (IEEJ, April 2020)
Regional gas/LNG price in the world

Asia spot price declined significantly. JCC indexed price will follow

Data Sources: Customs Statistics, ICE, PRAs
Short-term outlook for LNG market

- LNG market sees supply surplus even before the demand shock
- Main reason was substantial increase in LNG supply
- Chinese LNG demand reduced after the COVID-19 outbreak
- Pandemic further reduced global LNG demand: Demand shock
- Large-scale supply glut and decline in LNG spot price
- Oil price collapsed and term LNG price decline with time-lag
- Asian LNG price will be lowered as a whole
- Price gap between term LNG price and spot price?
- Competitiveness of US LNG (HH price plus fixed costs)?
- There is no “OPEC plus” in LNG market
- Source for supply flexibility: US LNG supply?
- Over-supplied market remain longer than anticipated
Long-term implication of COVID-19 pandemic

- Transportation demand may structurally restrained
- Digitalization may substitute transportation demand
- Oil demand restrained, acceleration of “electrification”
- Any shift in the priority of “3E”?  
- Implication on decarbonization and energy security?
- Pandemic shed lights on the importance of “big government”
- The rise of “me-first” trend and its impact on geopolitics
- The meaning of priority to “self-sufficiency”
- Crisis management efficiency: Democracy vs authoritarian
Thank you very much for your kind attention.