Energy is the economy & oil dominates energy. The economy does not run on money; it runs on energy.

Most people, policy makers & economists are energy blind & can’t see what is happening.

The old economy is gone. Its energy substrate will be different going forward.

Oil production & price may never regain November 2018 levels.

OPEC+ has managed oil markets since 2016. The underlying over-supply is why all price rallies have failed. The relative success of rallies depended on depth of potential threat to supply security.

Prices were collapsing before the Coronavirus economic closure.

2020 oil demand will fall 16 mmb/d. World GDP will fall 15-20%.

Energy choices will default to the cheapest, most efficient sources: oil, natural gas and coal. The push toward renewables will languish.

The world will need oil more than ever because it provides the greatest productivity gain of any energy source. It will be cheap and abundant until it is not. Almost no one is thinking about that.
Five oil rallies failed from mid-2018 to early 2020
2018 oil-price collapse was strongest possible signal to producers
Prices fell to $30 from OPEC+ failure before Coronavirus national emergency

Source: Quandl & Labyrinth Consulting Services, Inc.

Oil & Gas General/Futures & Future Spreads/CL1&CL7 Futures
Markets have already priced-in coming inventory increase
Similar pattern to 2008, 2014 and 2018
but this time there is greater certainty about timing & levels

Source: EIA & Labyrinth Consulting Services, Inc.
Crude storage will take 19 weeks (August) to reach capacity at current rate of increase.

U.S. storage increased +19 mmb (+2.4%) to 64% of capacity week ending April 10.

Does not include available capacity in strategic petroleum reserve.

<table>
<thead>
<tr>
<th>Stocks</th>
<th>Pct Capacity</th>
</tr>
</thead>
<tbody>
<tr>
<td>4/10/20</td>
<td>504</td>
</tr>
<tr>
<td>4/3/20</td>
<td>484</td>
</tr>
<tr>
<td>Change</td>
<td>19</td>
</tr>
</tbody>
</table>

Source: EIA & Labyrinth Consulting Services, Inc.
**OPEC+ production agreement is largely irrelevant**

Producers will be forced to cut production because of low price and low demand

Supply-demand balance will improve in 2H 2020 but markets will remain over-supplied

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### Year-over-Year

<table>
<thead>
<tr>
<th>Year-over-Year</th>
<th>Q22019</th>
<th>Q32019</th>
<th>Q42019</th>
<th>Q12020</th>
<th>Q22020</th>
<th>Q32020</th>
<th>Q42020</th>
<th>2020 AVG</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUPPLY GROWTH</td>
<td>0.80</td>
<td>-2.01</td>
<td>-1.56</td>
<td>-0.60</td>
<td>-9.54</td>
<td>-11.31</td>
<td>-14.28</td>
<td>-8.93</td>
</tr>
<tr>
<td>DEMAND GROWTH</td>
<td>0.40</td>
<td>1.10</td>
<td>1.90</td>
<td>-14.97</td>
<td>-17.90</td>
<td>-14.90</td>
<td>-16.10</td>
<td>-15.97</td>
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<tr>
<td>SUPPLY BALANCE</td>
<td>0.80</td>
<td>-1.91</td>
<td>-0.66</td>
<td>15.27</td>
<td>9.16</td>
<td>1.68</td>
<td>1.16</td>
<td>6.82</td>
</tr>
</tbody>
</table>

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**Source:** OPEC, IEA, EIA, Vitol, Trafigura, Goldman Sachs & Labyrinth Consulting Services

EIA International/EIA Supply & Demand Master
OPEC+ production cut is a fiction that only removes 2.6 mmb/d from world supply.
Cuts based on October 2018 levels 7.1 mmb/d higher than present.
9.7 mmb/d cut only 2.6 mmb/d less than March levels.

Source: EIA & Labyrinth Consulting Services, Inc.
EIA/EIA International/International_data MASTER_2020
EIA expects WTI spot price to average $30 in 2020 and $41 in 2021
Brent expected to average $33 in 2020 and $46 in 2021

Source: EIA STEO & Labyrinth Consulting Services, Inc.
Comparative Inventory (C.I.)

- Supply Less Certain
  - Higher Price Needed to Maintain Supply

- Supply More Certain
  - Lower Price Needed to Maintain Supply

Yield Curve

Mid-Cycle Price
Marginal barrel or mmBtu price at the 5-year average needed to maintain supply

Source: Aperio Energy Research & Labyrinth Consulting Services, Inc.
Nine Price Cycles Defined by Comparative Inventory vs WTI Price from 1995-2019

Source: EIA & Labyrinth Consulting Services, Inc. - Aperio Energy Research
WTI ~ $20 under-priced at $25 spot price based on green C.I. yield curve
Front-month price of $19.44 is $29 under-priced
2020 price-discovery excursion ~50% vs late 2015-16 excursion ~33%

C.I. is current crude + products stock level minus 5-yr avg

<table>
<thead>
<tr>
<th>Date</th>
<th>C.I.</th>
<th>WTI</th>
</tr>
</thead>
<tbody>
<tr>
<td>4/10/20</td>
<td>55.96</td>
<td>$25.20</td>
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<tr>
<td>4/3/20</td>
<td>33.13</td>
<td>$21.69</td>
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<tr>
<td>Change</td>
<td>22.83</td>
<td>$3.51</td>
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</table>

Source: EIA, HSNO & Labyrinth Consulting Services, Inc. - Aperio Energy Research
EIA Current/Weekly Updates/Crude Oil & Refined Products Inventories & CI

Early 2014 Optimism
C.I. MIN
May 4
$71.25

MAX Price 2015-19
Oct 5 2018 $75.34

2014-2017

Mar-June 2015
False Optimism

Dec '16 - Apr '17
Production-Cut Optimism

U.S. Crude + products comparative Inventory (C.I.) Millions of Barrels

Source: EIA, HSNO & Labyrinth Consulting Services, Inc. - Aperio Energy Research
Global driving has decreased -58% compared to mid-January baseline

Source: Apple & Labyrinth Consulting Services, Inc.

Oil & Gas General/Apple Mobility Trends
U.S. GDP expected to contract 30-35% based on estimates by 17 investment analysts

<table>
<thead>
<tr>
<th>Source: Charles Schwab &amp; Labyrinth Consulting Services, Inc.</th>
<th>Oil &amp; Gas General/GDP/2020 GDP Estimates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bloomberg Economics</td>
<td>-9</td>
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<tr>
<td>TS Lombard</td>
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<td>Wells Fargo</td>
<td>22.3</td>
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<td>Connerstone Macro</td>
<td>-25</td>
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<tr>
<td>JP Morgan</td>
<td>-25</td>
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<td>UBS</td>
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<td>IHS Economics</td>
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<tr>
<td>BoA ML</td>
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<td>Oxford Economics</td>
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<td>Deutsche Bank</td>
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<tr>
<td>Strategas</td>
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<td>Credit Suisse</td>
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<td>Goldman Sachs</td>
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<td>Barclays</td>
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<td>Morgan Stanley</td>
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<tr>
<td>Capital Economics</td>
<td>-40</td>
</tr>
<tr>
<td>Evercore ISI</td>
<td>-50</td>
</tr>
</tbody>
</table>
GDP is proportional to oil consumption

Logarithmic Scales

Source: EIA, World Bank & Labyrinth Consulting Services, Inc.

Oil & Gas General/GDP VS OIL CONSUMPTION 2017
-16% contraction in global GDP is likely based on strong correlation between oil consumption and GDP.

2008 Financial Collapse

Annual Growth

Positive Demand Growth

2020 Covid-19 & OPEC+ failure

<table>
<thead>
<tr>
<th></th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>84.33</td>
<td>81.40</td>
<td>86.20</td>
<td>85.30</td>
<td>84.31</td>
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<tr>
<td>2019</td>
<td>99.30</td>
<td>99.30</td>
<td>101.10</td>
<td>101.40</td>
<td>100.28</td>
</tr>
<tr>
<td>Pct Change</td>
<td>-15%</td>
<td>-18%</td>
<td>-15%</td>
<td>-16%</td>
<td>-16%</td>
</tr>
</tbody>
</table>

Source: OPEC, IEA, EIA, Vitol, Trafigura, Rystad, IHS Markit & Labyrinth Consulting Services

EIA International/EIA Supply & Demand Master
October 2018 was probably the peak of global oil production
Created by artificial supply urgency by U.S. withdrawal from Iran nuclear pact
Failure to deliver on sanctions caused a major price collapse

~85 mmb/d
2004-2008
Production Plateau

Liquids Production

Source: EIA STEO & Labyrinth Consulting Services, Inc.
U.S. oil production increased +10 kb/d to 12.7 mmb/d in March
Negative production growth expected through October
with year-end production -1.5 mmb/d lower at 11.1 mmb/d

Production (RHS)

Positive Growth (LHS)

Negative Growth (LHS)

Source: EIA STEO & Labyrinth Consulting Services, Inc.

EIA Current/STEO/STEO Master.xlsx
Tight oil rig count has fallen -122 (-24%) to 389 in first 2 weeks of April. It may fall another 200 in coming months based on WTI spot price-to-lagged rig count correlation.

Source: Baker Hughes, EIA DPR, Drilling Info & Labyrinth Consulting Services, Inc.
March U.S. tight oil production decreased -10 kb/d from 7.07 to 7.06 mmb/d
April output estimated at 6.93 mmb/d
April & May growth expected to average -137 kb/d
The old economy is gone. Re-opening is only a partial solution with unknown, unintended outcomes.

Oil markets will adjust & prices will increase slowly once there is a path out of economic closure & a partial restoration of employment.

Managing oil markets has failed & needs to be avoided in future.

The world in depression will need oil more than ever. Less emphasis on renewable energy & climate change.

Greatest near-term risks are crash of financial system from cascading defaults & collapse of developing world.