



# Hydrocarbons Boom in the Year of Folly and the Hammer |

Colin P. Fenton  
Blacklight Research, LLC  
October 23, 2018 | Santa Fe



From "Winnie"

Smith-tellers are not always palatable.  
There is a preference for  
Candy bars,

— Ewendlyn Brooks

Source: Private papers of Colin Fenton.

# Follies

Political **posturing**, investment policy **confusion**, and regulatory **mistakes** further restrict hydrocarbon supply and put retirement portfolios at grave risk.

## World Bank Group Announcements at One Planet Summit



### PRESIDENT



**Jim Yong Kim**  
President, World Bank Group

Jim Yong Kim became the 12th president of the World Bank Group on July 1, 2012.

**Paris, 12 December, 2017** - At the One Planet Summit convened by President Emmanuel Macron of France, United Nations Secretary General Antonio Guterres, and World Bank Group President Jim Yong Kim, the World Bank Group made a number of new announcements in line with its ongoing support to developing countries for the effective implementation of the Paris Agreement's goals.

### 1. WBG and upstream oil and gas

As a global multilateral development institution, the World Bank Group is continuing to transform its own operations in recognition of a rapidly changing world. To align its support to countries to meet their Paris goals:

The World Bank Group will no longer finance upstream oil and gas, after 2019.

(In exceptional circumstances, consideration will be given to financing upstream gas in the poorest countries where there is a clear benefit in terms of energy access for the poor and the project fits within the countries' Paris Agreement commitments.)



## Egyptian Refinery Projects

| Plant, Location          | Project                                  | \$Mn        | kbd          | Target | Status   |
|--------------------------|--|-------------|--------------|--------|--|
| Asorc, Assiut            | Vapor recovery unit (LPG)                | 25          | 12.7         | 2017   | Fully operational                                |
| ERC, Cairo               | Vacuum distillation and hydrocracking    | 3700        | 81.5         | 2018   | 96% complete in December 2017                    |
| ANRPC, Alexandria        | CCR unit (reformate)                     | 300         | 13.6         | 2018   | Expected startup May 2018                        |
| SOPC, Suez               | Asphalt unit                             | 50          | 7.3          | 2018   | 2017 mechanical completion date missed           |
| Midor, Alexandria        | Crude distillation unit                  | 1400        | 60           | 2018   | Development awarded, completion unlikely by 2020 |
| Midor, Alexandria        | Hydrotreater                             | -           | 45           | 2018   | Development awarded, completion unlikely by 2020 |
| Asorc, Assiut            | Hydrocracker                             | 2900        | 47.7         | 2020   | Mechanical completion scheduled by end 2019      |
| Asorc, Assiut            | Hydrotreater/CCR/isomerization/coker     | 1500        | 14.9         | 2020   | Technologies licensed                            |
|                          | <b>Total</b>                             | <b>9875</b> | <b>282.7</b> |        |  |
| <i>Under negotiation</i> |  |             |              |        |  |
| Amoc, Alexandria         | Hydrocracker                             | 500         | 20           | 2021   | Feasibility study to upgrade HFO to diesel       |
| SOPC, Suez               | Coker revamp/hydrotreater/vapor recovery | 200         |              |        | EBRD financing decision due March 2018           |
|                          | <b>Total</b>                             | <b>700</b>  |              |        |  |

### Egypt's Oil and Gas Funding from Multilateral Institutions

| Recipient                       | \$Mn       | Date    | Purpose   |
|---------------------------------|------------|---------|---|
| <b>IFC (World Bank) Funding</b> | <b>578</b> |         |   |
| Apex International              | 100        | Nov-17  | Development of assets and related infrastructure          |
| Carbon Holdings                 | 25         | May-16  | Development of Tahir Petrochemical Complex                |
| Sonker                          | 144        | Feb-16  | Expand oil storage & bunkering terminal, Ain Sukhna       |
| Pico                            | 75         | Jun-15  | Support e&P   |
| Circle Oil                      | 100        | Nov-13  | Finance capex and operating costs                         |
| Petroceltic                     | 100        | Apr-13  | Support E&P in Egypt, Bulgaria, and Algeria               |
| TransGlobe                      | 34         | Jan-13  | Fund company's 2013 activities in Egypt                   |
| <b>EBRD Funding</b>             | <b>565</b> |         |   |
| EGAS                            | 200        | Pending | Efficiency investments in gas pipeline network            |
| Maridive Oil Services           | 50         | Oct-16  | Modernize fleet of offshore oil drilling support vehicles |
| Pico                            | 100        | Jan-15  | Modernize fleet of offshore oil drilling support vehicles |
| Sonker                          | 94         | Jul-15  | Modernize fleet of offshore oil drilling support vehicles |
| Merion                          | 43         | Jul-15  | Reduce flaring  |
| Ades                            | 28         | Oct-14  | Support local oil services firm                           |
| IPR                             | 50         | Dec-13  | Field development capex                                   |
| <b>MIGA (IMF) Funding</b>       | <b>173</b> |         |   |
| Egypt Refining Co.              | 23         | May-14  | Support \$3,7bn, 91kbd hydrocracker, Mostorod             |
| Apache                          | 150        | Sep-12  | Reinsurance for 200 kbd, Western Desert output            |

### Egypt Power Projects Under Development

| Project (Contractor, Startup Target Date)     | GW           | Fuel    |
|---|--------------|---------|
| Beni Suef (Elsewedt, 2017-20)                 | 4.80         | Gas     |
| Burullus (Orascom, 2017-20)                   | 4.80         | Gas     |
| New Capital City (Orascom, 2017-20)           | 4.80         | Gas     |
| El-Shabab (Techint, 2017)                     | 0.80         | Gas     |
| Suez (PGESCO, 2017)                           | 0.65         | Oil     |
| Assiut (Orascom, 2017)                        | 0.50         | Gas     |
| Mahmoudya (Elsewedy, 2017)                    | 0.33         | Gas/oil |
| Damietta West (Orascom, 2017)                 | 0.25         | Gas     |
| Gebel El Zeit (Gamesa, 2017)                  | 0.22         | Wind    |
| Gebel El Zeit (Gamesa, 2017)                  | 0.16         | Wind    |
| South Helwan (Techint, 2018)                  | 1.95         | Gas/oil |
| Scatec Benban 1-6 (Scatec, 2018)              | 0.40         | Solar   |
| Rhas Garb (Engle/Toyota Tsusho/Orascom, 2019) | 0.25         | Wind    |
| Walideya (Orascom, Date TBC)                  | 0.65         | Gas/oil |
| Dabaa (Rosatom, 2026-29)                      | 4.80         | Nuclear |
| <b>Total under development</b>                | <b>25.36</b> |         |
| Generating capacity, 30 Jun 2016              | 38.16        |         |



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IMPRIMER

7 September 2017

# France, the first country to prohibit exploitation of hydrocarbons

Source: Government of France.  
10/23/2018



# World's biggest sovereign wealth fund proposes ditching oil and gas holdings

**Adam Vaughan**

@adamvaughan\_uk  
Thu 16 Nov 2017 12:52 EST



**Energy industry jolted by advice to Norwegian government from its central bank, which runs \$1tn fund**



The Norwegian central bank, which runs the country's sovereign wealth fund - the world's biggest - has told its government it should dump its shares in oil and gas companies, in a move that could have significant consequences for the sector.

### Investment strategy for the Government Pension Fund Global

The Bank has advised the ministry since the fund's inception on how the investment strategy should be designed in order to achieve the objective of maximising return with moderate risk. The Bank's advice has largely been based on how changes to the investment strategy can be expected to affect risk and return for the fund in isolation. The relationship between the fund and other government wealth has been addressed first and foremost in the discussion on how much of the fund should be invested in equities - see, for example, the Bank's letter of 1 December 2016.

The fund now accounts for a much larger share of government wealth than before, and is an integral part of fiscal policy via the fiscal rule. In its strategy for Norges Bank Investment Management for 2017-2019, the Executive Board states that in future it will adopt a broader wealth perspective when advising the ministry. One question that has been discussed before is whether the Norwegian economy's vulnerability to a permanent drop in oil prices can be reduced by adjusting the composition of the fund away from investments where returns move in line with oil prices. In its letter of 1 December 2016, the Bank wrote that it may return to this issue.

In this letter, we conclude that the vulnerability of government wealth to a permanent drop in oil and gas prices will be reduced if the fund is not invested in oil and gas stocks, and advise removing these stocks from the fund's benchmark index. This advice is based exclusively on financial arguments. It does not reflect any particular view of future movements in oil prices or the profitability or sustainability of the oil and gas sector.

### Oil exposure in government wealth

The value of Norwegian government wealth is sensitive to changes in oil prices. This applies



Regulation December 19, 2017

# UK to Relax Rules for Fossil Fuel Divestment

*Local authority pension plans expected to be earliest to implement new regulations.*



To promote more ESG-based investment decisions, Britain's government will make it easier for the country's £2 trillion pension plans to divest from oil, gas, and coal companies.

After a consultation period, the new government regulations will bring into effect [recommendations made in 2014](#) and earlier this year by the [Law Commissions](#). The *Guardian* reports that these regulations are expected to come into effect in 2018.

In the past, pension plans have had issues with fiduciary duties and legal obligations pushing schemes to focus on finding the strongest returns regardless of climate change. According to the *Guardian*, the regulations will instead allow the plans to “mirror members’ ethical concerns” and “address environmental problems.”

wbur 90.9

h&N Here & Now

## Mayor Bill De Blasio On Why New York City Is Suing 5 Major Oil Companies



**"It's quite clear that it is smart both fiscally and morally to stop investing in fossil fuel industries, and by taking \$5 billion of investments away, it sends a very powerful message to those industries."** — Mayor Bill de Blasio

# Statement from Rockefeller Family Fund

## March 24, 2016

*“While the global community works to eliminate the use of fossil fuels, it makes little sense – financially or ethically – to continue holding investments in these companies. **There is no sane rationale for companies to continue to explore for new sources of hydrocarbons.***

*The science and intent enunciated by the Paris agreement cannot be more clear: far from finding additional sources of fossil fuels, we must keep most of the already discovered reserves in the ground **if there is any hope for human and natural ecosystems to survive and thrive in the decades ahead.**”*

#### RFF'S DECISION TO DIVEST

The Rockefeller Family Fund is proud to announce its intent to divest from fossil fuels. The process will be completed as quickly as possible, as we work around the complications of modern finance, which is increasingly dominated by alternative investments and hedge funds.

While the global community works to eliminate the use of fossil fuels, it makes little sense—financially or ethically—to continue holding investments in these companies. There is no sane rationale for companies to continue to explore for new sources of hydrocarbons. The science and intent enunciated by the Paris agreement cannot be more clear: far from finding additional sources of fossil fuels, we must keep most of the already discovered reserves in the ground if there is any hope for human and natural ecosystems to survive and thrive in the decades ahead.

We would be remiss if we failed to focus on what we believe to be the morally reprehensible conduct on the part of ExxonMobil. Evidence appears to suggest that the company worked since the 1980s to confuse the public about climate change's march, while simultaneously spending millions to fortify its own infrastructure against climate change's destructive consequences and track new exploration opportunities as the Arctic's ice receded. Appropriate authorities will determine if the company violated any laws, but as a matter of good governance, we cannot be associated with a company exhibiting such apparent contempt for the public interest.

To operationalize this decision, the Board has instructed its advisors, effective immediately, to eliminate holdings of ExxonMobil, and all coal, and tar sands-based companies outside the portions of the portfolio managed by third parties, and to keep exposures for these three categories of investment below 1 percent across the entire portfolio. The Family Fund's Finance Committee will soon be entering the second phase of its divestment work, which will entail seeking suitable alternatives to certain commingled funds now held. The field of Socially Responsible Investing is dynamic and growing and we are confident that a variety of options will soon emerge for mid-sized endowments such as ours.

Needless to say, the Rockefeller family has had a long and profitable history investing in the oil industry, including ExxonMobil. These are not decisions, therefore, that have been taken lightly or without much consideration of their import. But history moves on, as it must. Indeed, it is past time for all people of good will to do everything in their collective power to make our new path one that recognizes the deep interdependence between humanity's future and the health of our natural systems.

Source: Rockefeller Family Fund, downloaded on February 20, 2017 from <http://www.rffund.org/divestment>

Note: webpage still online as of September 11, 2018, as confirmed by Blacklight Research.



- 1 Agricultural pipe
- 2 Aircraft deicer
- 3 Ammonia
- 4 Anesthetics
- 5 Antifreeze
- 6 Antihistamines
- 7 Antiseptics
- 8 Aspirin
- 9 Balloons
- 10 Ballpoint pens
- 11 Bandages
- 12 Bicycle helmets and jerseys
- 13 Buttons
- 14 Cafeteria trays
- 15 Cameras
- 16 Camping tents
- 17 Candles
- 18 Canteens
- 19 Car battery cases
- 20 Carpets and rugs
- 21 Children's toys
- 22 Clear plastic bags
- 23 Clothing
- 24 Contact lenses (soft)
- 25 Cortisone
- 26 Crayons
- 27 Denture adhesive
- 28 Elastic threads
- 29 Engine coolant
- 30 Eyeglasses and sunglasses
- 31 Fan belts
- 32 Fencing
- 33 Fertilizer 10/23/2018
- 34 Fishing rods, lures, and boots

- 35 Fleece vests and jackets
- 36 Flip top bottles
- 37 Flooring
- 38 Food preservatives
- 39 Footballs and football helmets
- 40 Furniture
- 41 Glycerin
- 42 Grocery bags
- 43 Guitar strings
- 44 Hair coloring
- 45 Handbags
- 46 Headlight lenses
- 47 Heart valves
- 48 Industrial filters
- 49 Insecticides and insect repellants
- 50 Kayaks
- 51 Kevlar clothing
- 52 Laboratory equipment
- 53 Life jackets
- 54 Linoleum
- 55 Lipstick
- 56 Loudspeakers
- 57 Mats
- 58 Microfiber clothing
- 59 Milk jugs
- 60 Mops
- 61 Movie film
- 62 Nail polish
- 63 Nylon
- 64 Paint and paint brushes
- 65 Panty hose
- 66 Parachutes
- 67 Perfumes

- 68 Pharmacy prescription bottles
- 69 Pillows
- 70 Plastic utensils
- 71 Playground equipment
- 72 Polymer banknotes
- 73 Recycling bins
- 74 Refrigerants
- 75 Roofing
- 76 Ropes
- 77 Rubber (synthetic)
- 78 Safety shields and glasses
- 79 Shoes and shoe polish
- 80 Siding for home construction
- 81 Skis and ski helmets
- 82 Sleeping bags
- 83 Smart phones and tablets
- 84 Soft drink bottles
- 85 Styrofoam
- 86 Surf boards
- 87 Tennis rackets
- 88 Thermal underwear
- 89 Tires
- 90 Toilet seats
- 91 Toothbrushes
- 92 Tote bags
- 93 Transparent tape
- 94 Umbrellas
- 95 Upholstery
- 96 Vitamin capsules
- 97 Wallets
- 98 Waste baskets
- 99 Water pipes
- 100 Yoga mats and yoga clothing



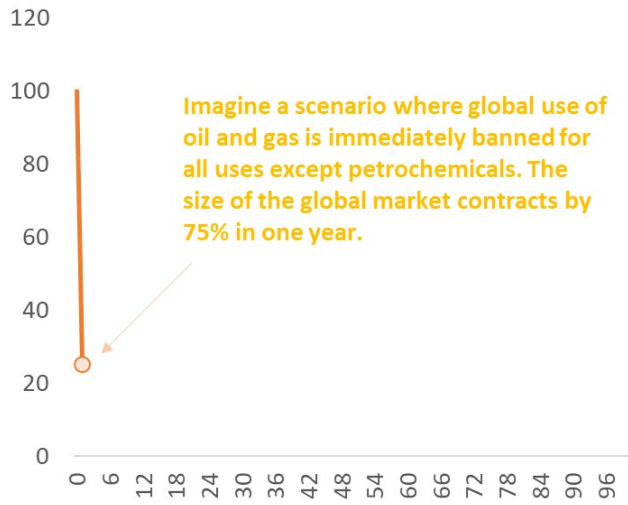


## Kayaktivists protest a Kinder Morgan project, Vancouver, 28-Oct-2017

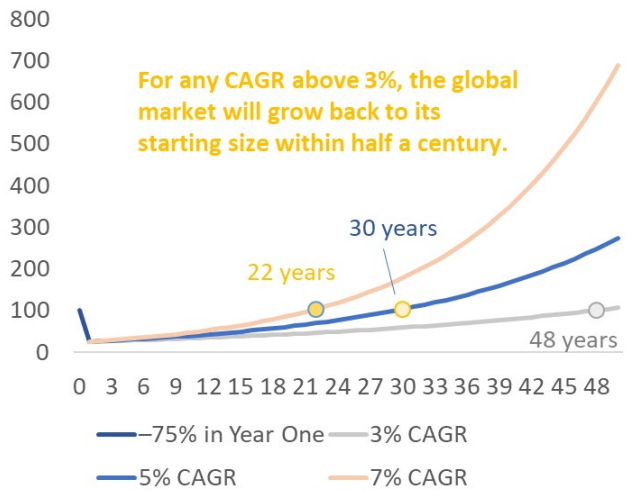


Source: 350.org.  
 Note: every person in this image is wearing apparel made from hydrocarbons and is sitting in a kayak made of polyethylene.

### One scenario for global oil & gas demand Index Year 0 = 100

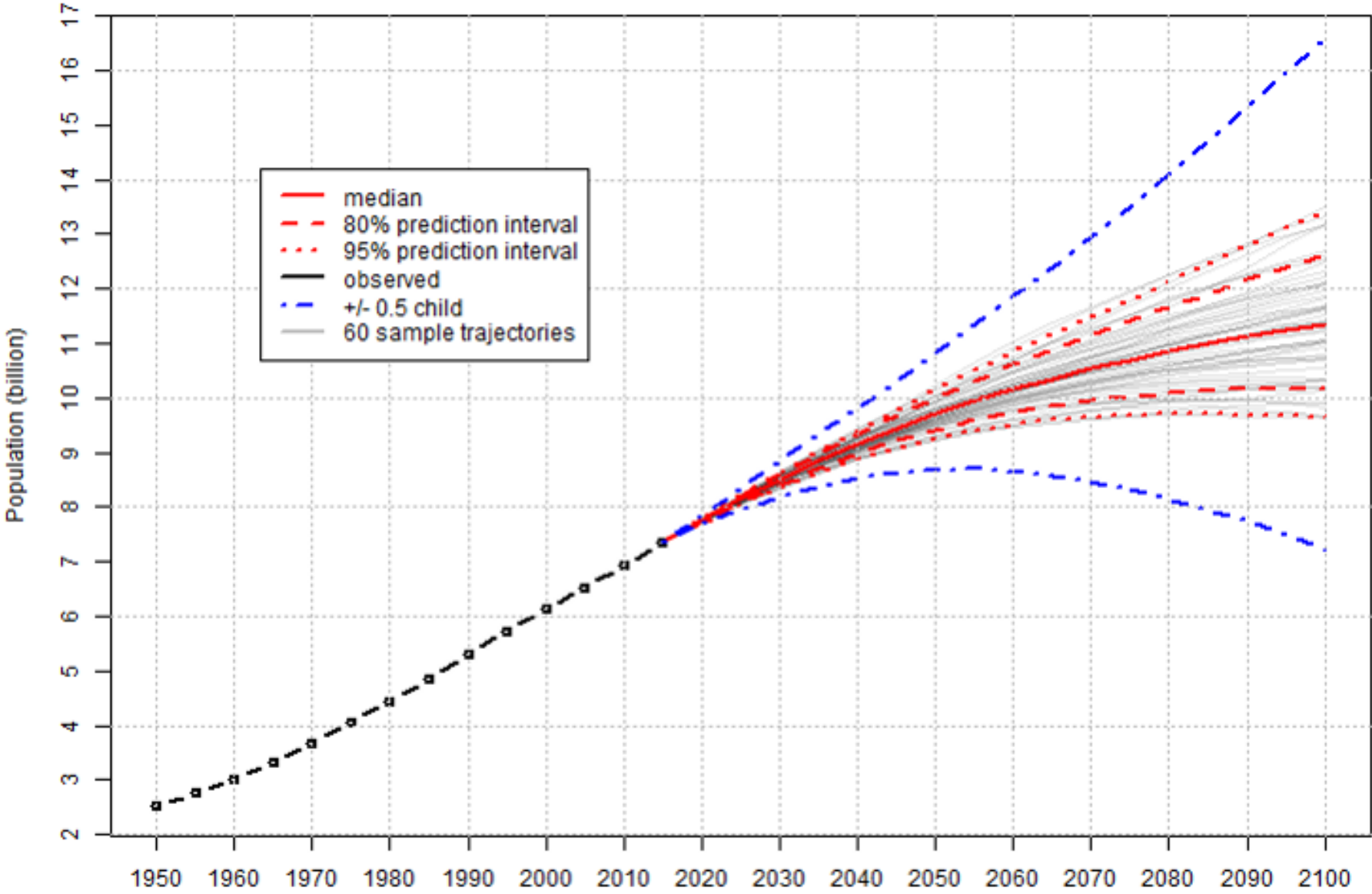


### Recovery is often only a matter of time Index Year 0 = 100



Source: Blacklight Research. Oil & gas are *burned and used*. Each scenario results in 100% non-fuel use that still yields GHGs.

**WORLD: Total Population**



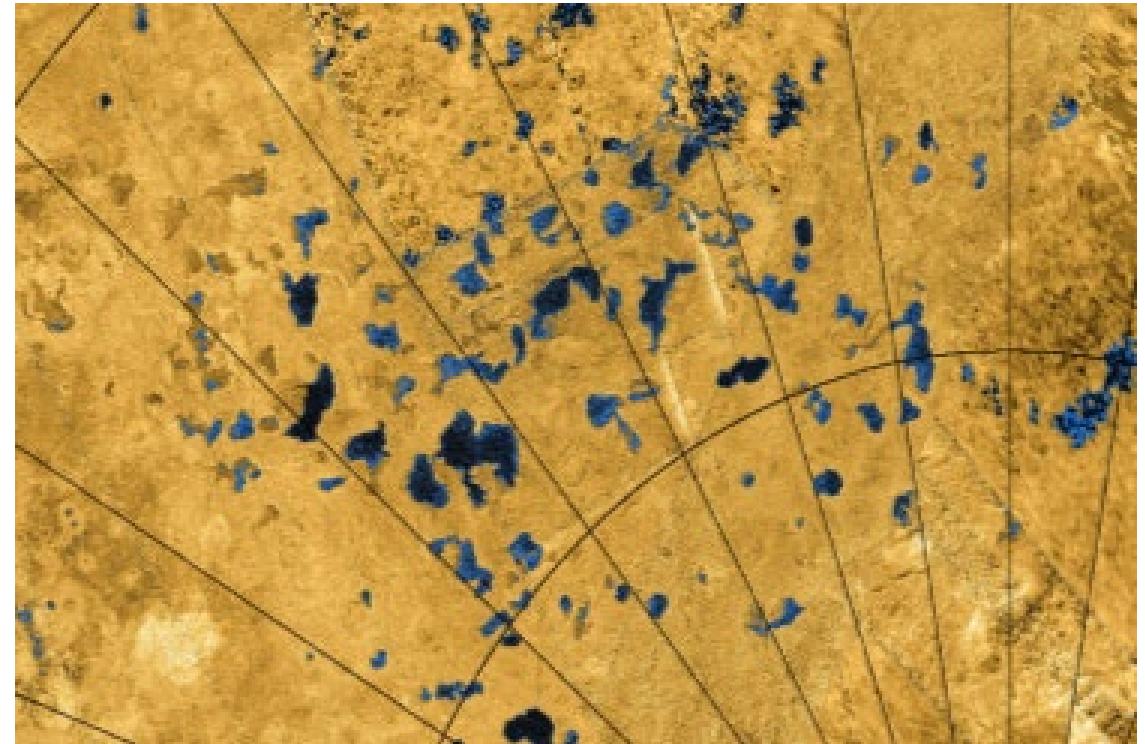
Source: United Nations, Department of Economic and Social Affairs, Population Division (2015).  
*World Population Prospects: The 2015 Revision.* <http://esa.un.org/unpd/wpp/>

Demand fact: electric cars are fabricated from gas-based feedstock & other hydrocarbons



Source: Consumer Reports.

Supply fact: deep lakes of liquid methane (LNG) dot Titan's surface



Source: NASA/JPL-Caltech/ASI/USGS.











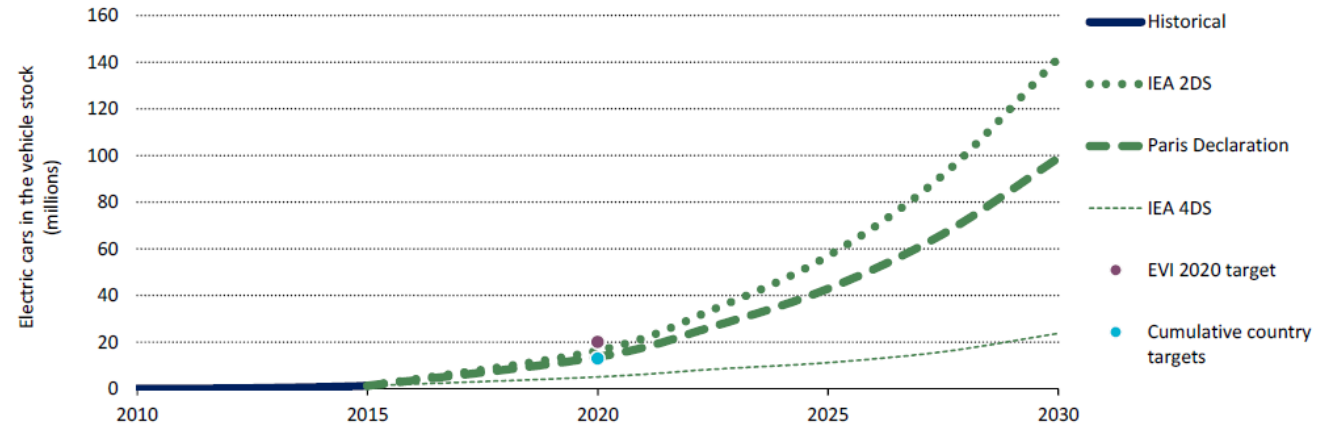
# Facts & Assumptions about Electrical Vehicles

Electric car stock (BEV and PHEV) by country, 2005-15 (thousands)

|                | 2005        | 2006        | 2007        | 2008        | 2009        | 2010         | 2011         | 2012          | 2013          | 2014          | 2015           |
|----------------|-------------|-------------|-------------|-------------|-------------|--------------|--------------|---------------|---------------|---------------|----------------|
| Canada         |             |             |             |             |             |              | 0.52         | 2.60          | 5.71          | 10.78         | 18.45          |
| China          |             |             |             |             |             | 1.43         | 6.50         | 16.40         | 31.74         | 104.91        | 312.29         |
| France         | 0.01        | 0.01        | 0.01        | 0.01        | 0.11        | 0.30         | 2.93         | 9.25          | 18.88         | 31.50         | 54.29          |
| Germany        | 0.02        | 0.02        | 0.02        | 0.09        | 0.10        | 0.25         | 2.34         | 6.13          | 13.25         | 26.03         | 49.22          |
| India          |             |             |             | 0.37        | 0.53        | 0.88         | 1.33         | 2.76          | 3.13          | 4.02          | 6.02           |
| Italy          | 0.53        | 0.53        | 0.53        | 0.60        | 0.60        | 0.64         | 0.76         | 1.42          | 2.47          | 3.99          | 6.13           |
| Japan          |             |             |             |             | 1.08        | 3.52         | 16.14        | 40.58         | 69.46         | 101.74        | 126.40         |
| Korea          |             |             |             |             |             | 0.06         | 0.34         | 0.85          | 1.45          | 1.52          | 4.33           |
| Netherlands    |             |             |             | 0.01        | 0.15        | 0.27         | 1.14         | 6.26          | 28.67         | 43.76         | 87.53          |
| Norway         |             |             |             | 0.25        | 0.39        | 0.79         | 2.80         | 7.21          | 15.42         | 35.21         | 70.82          |
| Portugal       |             |             |             |             |             | 0.02         | 0.22         | 0.32          | 0.53          | 0.82          | 2.00           |
| South Africa   |             |             |             |             |             |              |              | 0.03          | 0.05          | 0.29          |                |
| Spain          |             |             |             |             |             | 0.07         | 0.65         | 1.20          | 2.21          | 3.66          | 5.95           |
| Sweden         |             | 0.12        | 0.13        | 0.13        | 0.16        | 0.19         | 0.37         | 1.25          | 2.65          | 7.09          | 14.53          |
| United Kingdom |             |             |             |             | 0.19        | 0.29         | 1.37         | 3.78          | 7.28          | 21.86         | 49.67          |
| United States  | 1.12        | 1.12        | 1.12        | 2.58        | 2.58        | 3.77         | 21.50        | 74.74         | 171.44        | 290.22        | 404.09         |
| Others*        |             |             |             |             |             |              | 1.73         | 4.48          | 8.76          | 19.59         | 44.89          |
| <b>Total</b>   | <b>1.67</b> | <b>1.78</b> | <b>1.79</b> | <b>4.04</b> | <b>5.89</b> | <b>12.48</b> | <b>60.65</b> | <b>179.23</b> | <b>383.09</b> | <b>706.77</b> | <b>1256.90</b> |

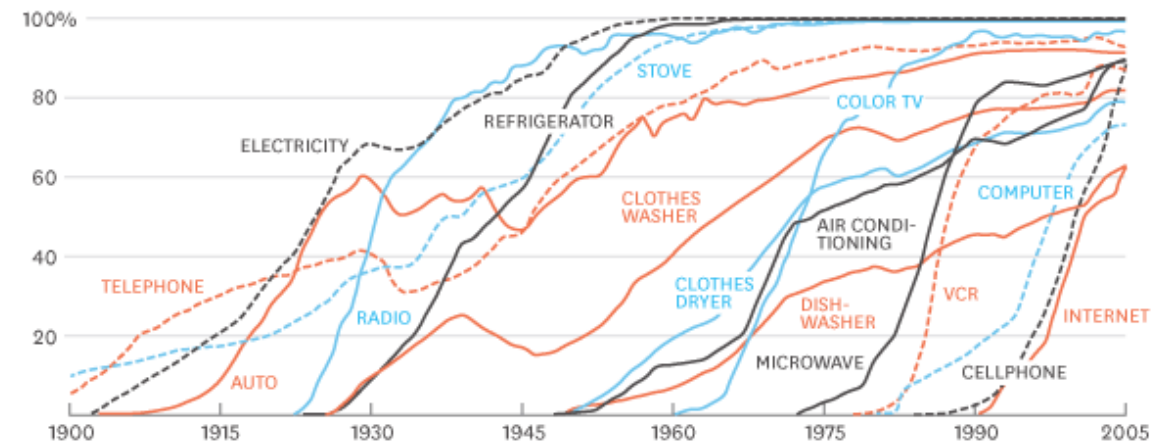
\* Others: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Greece, Hungary, Iceland, Latvia, Liechtenstein, Luxembourg, Malta, Poland, Romania, Slovak Republic, Slovenia, Switzerland, Turkey.

Deployment scenarios for the stock of electric cars to 2030



Note: 2DS = 2°C Scenario; 4DS = 4°C Scenario.

PERCENT OF U.S. HOUSEHOLDS



SOURCE MICHAEL FELTON, THE NEW YORK TIMES

HBR.ORG

### Electric vehicle impact on oil demand

|                                     | 2018        | 2050p<br>w/EV | 2050p<br>w/o EV | 2050p<br>w/o EV |
|-------------------------------------|-------------|---------------|-----------------|-----------------|
| <b>Global on-road vehicle fleet</b> |             | millions      |                 |                 |
| Heavy trucks and buses              | 600         | 824           | 824             | 824             |
| Cars and light trucks (ex-EV)       | 597         | 1416          | 1576            | 1576            |
| Cars and light trucks (EV)          | 3           | 160           | 0               | 0               |
| <b>Total</b>                        | <b>1200</b> | <b>2400</b>   | <b>2400</b>     | <b>2400</b>     |

### Petroleum demand by scenario

| <b>Average miles traveled</b>        |              | miles        |              |              |
|--------------------------------------|--------------|--------------|--------------|--------------|
| United States                        | 13,476       | 6,000        | 6,000        | 13,000       |
| OECD                                 | 9,000        | 6,000        | 6,000        | 9,000        |
| Non-OECD                             | 2,000        | 6,000        | 6,000        | 6,000        |
| <b>Average miles traveled, world</b> | <b>3,650</b> | <b>6,000</b> | <b>6,000</b> | <b>7,500</b> |

| <b>Fuel economy</b>                    |           | miles per gallon |           |           |
|--|-----------|------------------|-----------|-----------|
| Cars & light trucks, USA               | 25        | 50               | 50        | 50        |
| <b>Cars &amp; light trucks, World</b>  | <b>25</b> | <b>50</b>        | <b>50</b> | <b>50</b> |
| <b>Heavy trucks &amp; buses, World</b> | <b>10</b> | <b>25</b>        | <b>25</b> | <b>25</b> |

Source: Blacklight Research.

10/23/2018

|                                     |              | million barrels per day |              |              |
|-------------------------------------|--------------|-------------------------|--------------|--------------|
| <b>Oil demand, on-road vehicles</b> | <b>25.58</b> | <b>23.98</b>            | <b>25.24</b> | <b>31.55</b> |


# What is the probability hydrogen fuel cells—not electric batteries—are the winning next-gen tech?

**October 2017:** H2 Mobility—a joint venture of Daimler, Shell, and Linde—opened the first hydrogen filling island in an existing Shell fuel station in the German city of Bremen (photo). The station is located just off the autobahn a short distance away from Daimler’s Mercedes-Benz plant in Bremen, one of the world’s largest automobile factories. Refilling a Mercedes GLC F-CELL vehicle with hydrogen takes just three to five minutes, according to marketing materials from the venture. The experience is designed to feel like refueling a conventional vehicle with gasoline or diesel.



Source: H2 Mobility.



**to:** Leading Nature Conservancy Supporters  
**from:** Mark R. Tercek   
President and Chief Executive Officer  
**date:** January 5, 2018  
**subject:** **President's Report: Your Investments in Nature 2017-2018**

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Today – more than ever in our lifetime – nature needs us. It's up to each of us to protect our natural world because we need nature, too.

For example, groundbreaking research published by The Nature Conservancy and our partners last October shows that conserving and restoring carbon-storing powerhouses like forests, grasslands and wetlands can deliver up to 37 percent of the emissions reductions we need to curb climate change by 2030. **That's equivalent to halting the burning of oil!**

**Fossil fuel  
divestment**



**Damian Carrington**  
*Environment editor*

@dpcarrington

Thu 12 Jul 2018 11.12 EDT



103,764

# Ireland becomes world's first country to divest from fossil fuels

Bill passed by parliament means more than €300m shares in coal, oil, peat and gas will be sold 'as soon as practicable'



▲ A message to the Irish government to divest from fossil fuels is spelled out in lights in front of the lower house of parliament. Photograph: Sasko Lazarov/Photocall Ireland/Trócaire/350.org

The Republic of Ireland will become the world's first country to sell off its investments in fossil fuel companies, after a bill was passed with all-party support in the lower house of parliament.

Éamonn Meehan, executive director of international development charity Trócaire, said: "Today the Oireachtas [Irish parliament] has sent a powerful signal to the international community about the need to speed up the phase-out of fossil fuels."

Meehan said: "Just last month Ireland was ranked the second worst European country for climate action, so the passing of this bill is good news. But it has to mark a significant change of pace on the issue."

Gerry Liston at Global Legal Action Network, who drafted the bill, said: "Governments will not meet their obligations under the Paris agreement on climate change if they continue to financially sustain the fossil fuel industry. Countries the world over must now urgently follow Ireland's lead and divest from fossil fuels."





AN BILLE UM DHÍFHEISTIÚ BREOSLA IONTAISE, 2016  
FOSSIL FUEL DIVESTMENT BILL 2016

## Bill

*entitled*

An Act to amend the National Treasury Management Agency (Amendment) Act 2014 requiring the Agency to divest the Ireland Strategic Investment Fund, currently under the remit of the Agency, of its assets in fossil fuel companies within five years of the commencement of this Act to precipitate a timely decarbonisation process in line with Ireland's climate change commitments under Article 2 of the Paris Agreement.

- (2) (a) The Agency shall endeavour to ensure that the assets of the Fund are not directly invested in a fossil fuel undertaking.
- (b) Where the Agency becomes aware that an undertaking in which the assets of the Fund are directly invested is or becomes a fossil fuel undertaking, the Agency shall divest the assets of the Fund from such investment as soon as practicable.
- (3) The Agency shall endeavour to ensure that the assets of the Fund are not invested in an indirect investment at any time after the commencement of this section, unless it is satisfied on reasonable grounds that such indirect investment is unlikely to have in excess of 15 per cent of its assets, or such lower percentage as the Minister may prescribe by order made under this section, invested in a fossil fuel undertaking.

(4) Notwithstanding subsections (2) and (3), the Agency may invest the assets of the Fund in a fossil fuel undertaking or in a collective investment undertaking the assets of which are invested or will be invested in a fossil fuel undertaking, where the Agency has satisfied itself on reasonable grounds that the investment is intended to be consistent with—

- (a) the achievement of the national transition objective,
- (b) the implementation of the State's climate change obligations, and
- (c) the policy of the Government, as may be communicated to the Agency from time to time by the Minister for Communications, Climate Action and the Environment, in relation to climate change and climate change objectives.

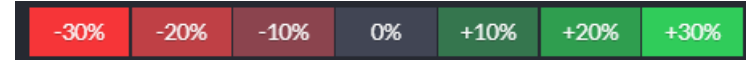
(5) Where the Agency makes an investment which, but for subsection (4), it would be prohibited from making, it shall when publishing the fact of the investment and the name of the fossil fuel undertaking or collective investment undertaking concerned, publish the fact that the investment is made under subsection (4)."

'indirect investment' means an investment of the assets of the Fund in an investment product or in a collective investment undertaking but does not include financial derivative instruments, exchange traded funds or hedge funds;

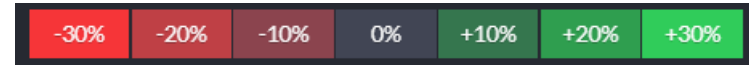


# Hammers

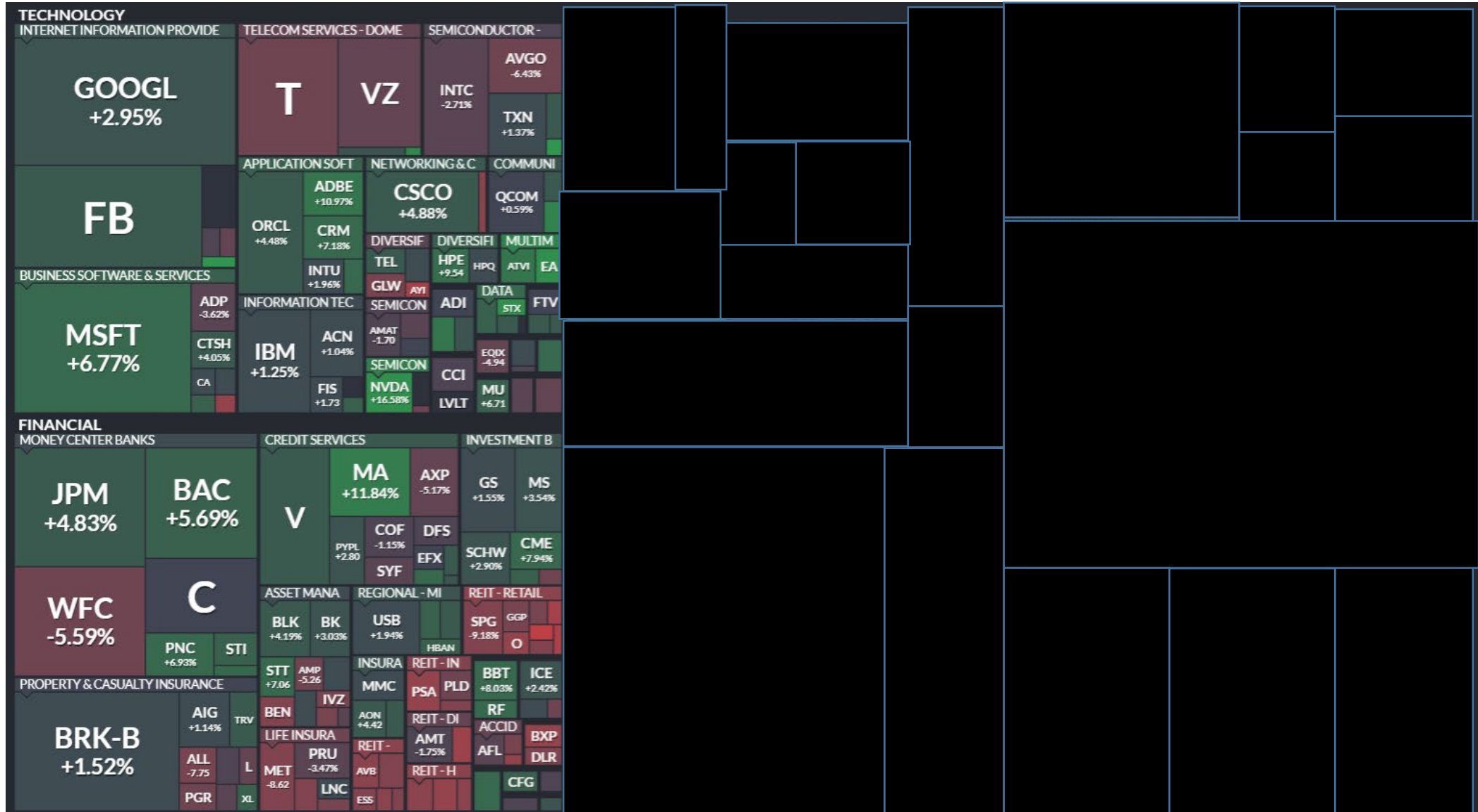
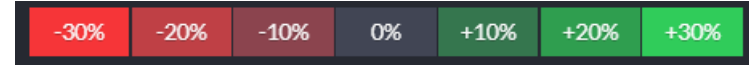
Equity, bond, and F/X valuations will likely suffer fierce corrections on hammers wielded by the [invisible hand](#), the [market hand](#), and the [regulatory hand](#).

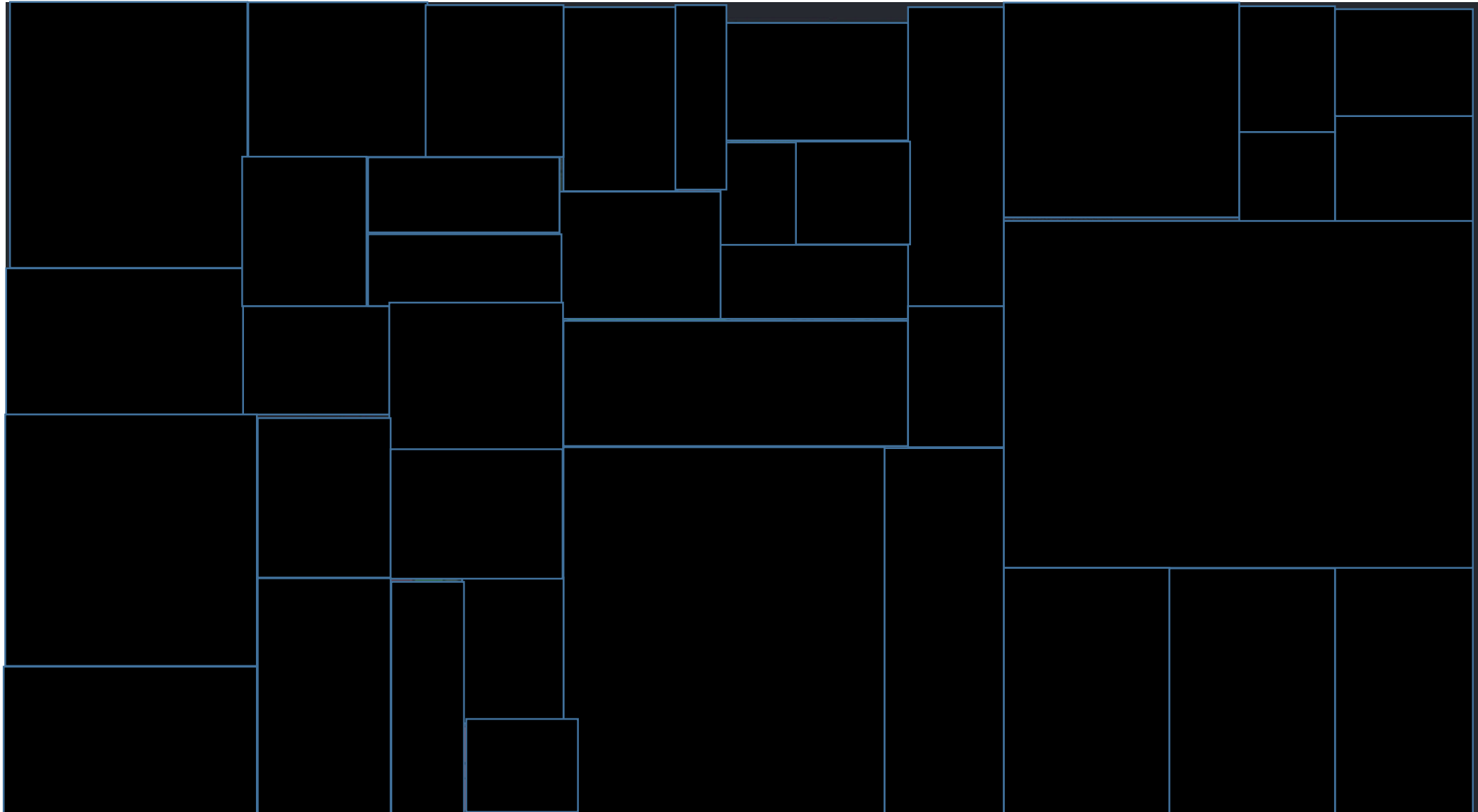
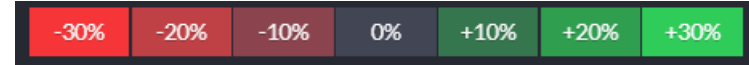










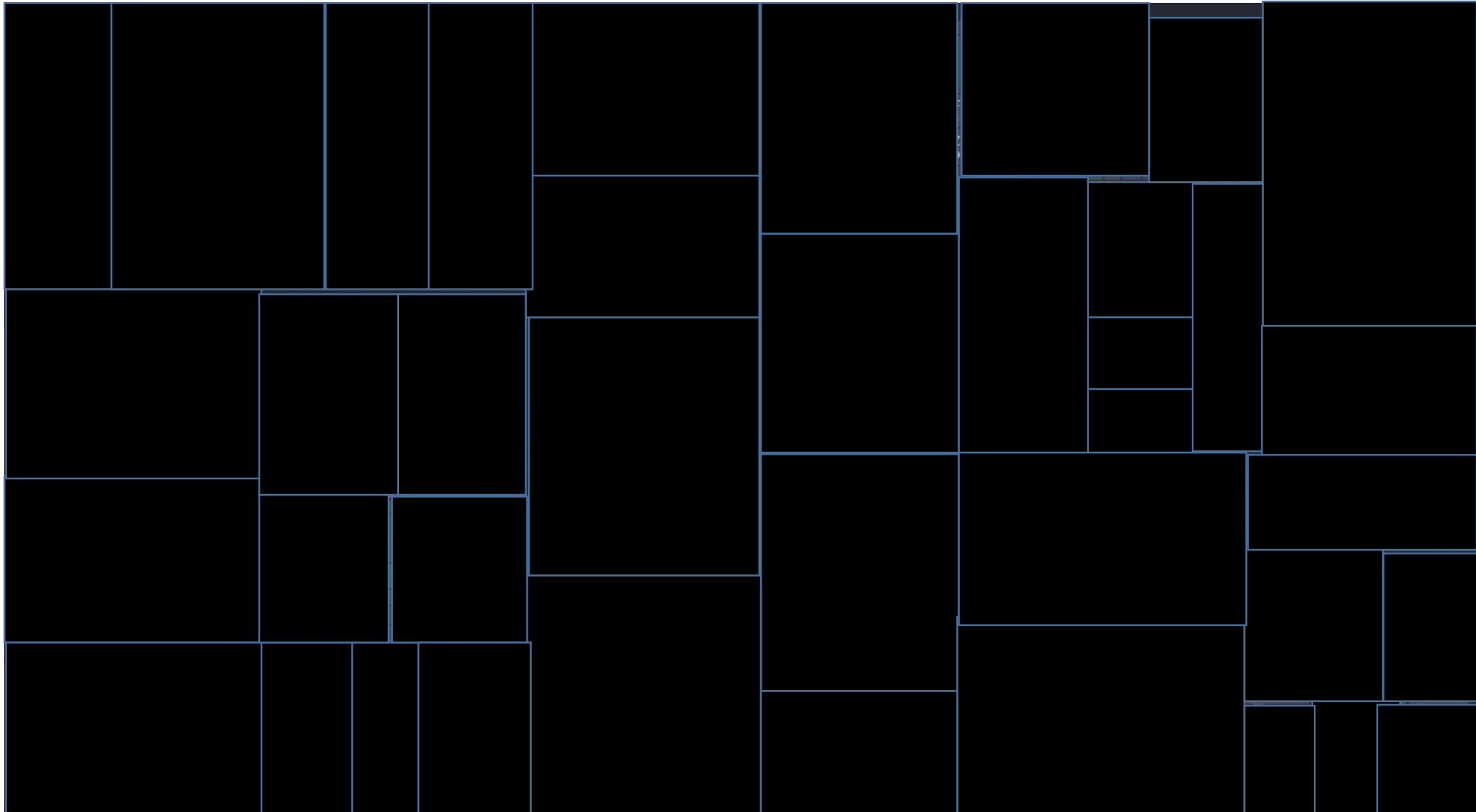
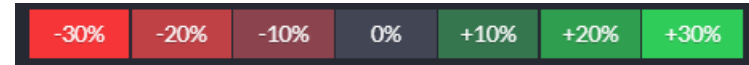








# ETFs





# Bitcoin







# Markets see: **scientific illiteracy** and **managerial incompetence**

Ban elements of the universe (2018)

**Periodic Table of the Elements**

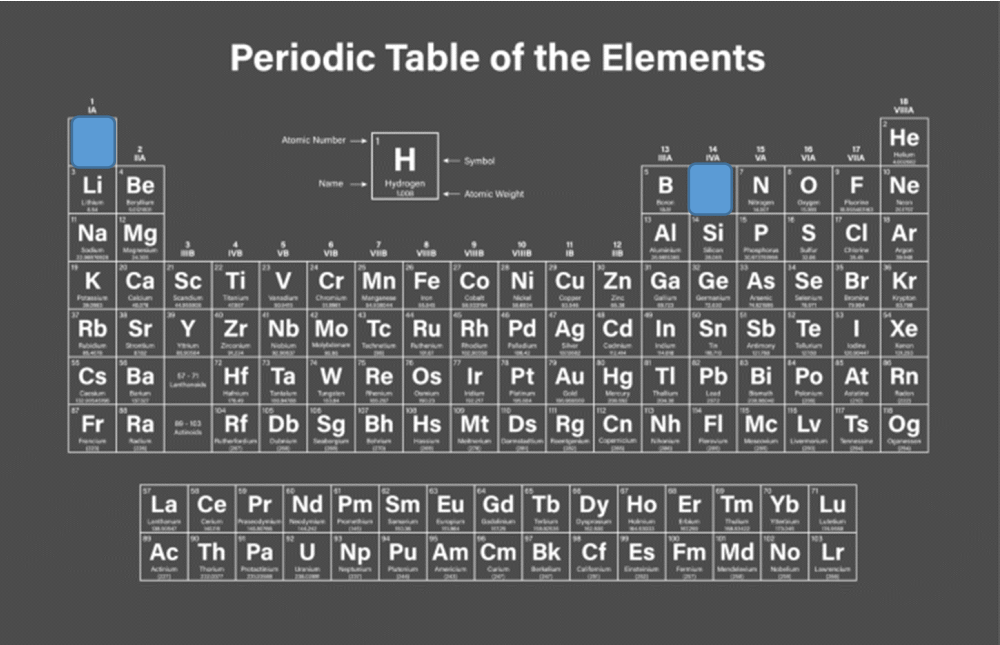


Photo Credit: Humdan.

Ban a transcendental number (1897)



Bill 246, Indiana General Assembly

$$\pi = 3.2$$

Source: Chicago Tribune and Bill #246, 1897 sitting of Indiana General Assembly. This bill passed the full House 67-0 on February 5, 1897. Referred to a Senate committee, February 11, 1897. Indefinitely postponed on February 12, 1897 after the intercession of Professor Clarence A. Waldo, head of the Purdue University mathematics department.



## MACY'S THANKSGIVING DAY PARADE

# 2017

Formerly the star of 13 Macy's Parades, this big balloon brontosaurus (one of the few "life-sized" balloons) made his original debut in 1963 to promote the New York World's Fair and its famed Dinoland attraction.

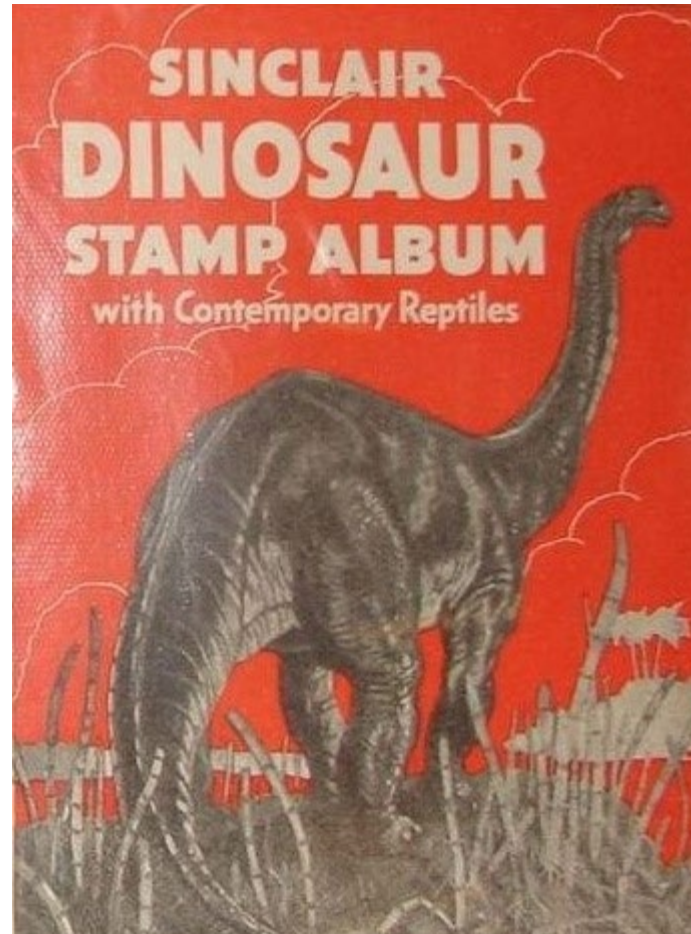
Sinclair's Dino®  
Sinclair Oil  
Corporation



Sinclair and Dino are lovingly parodied as the fictional Dinoco brand in multiple Pixar movies, including *Toy Story* and *Cars*.





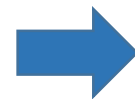
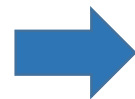
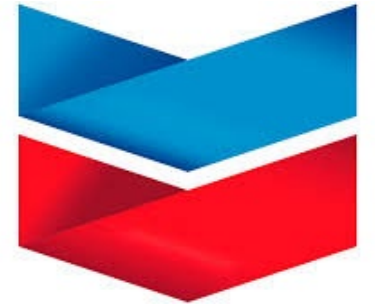
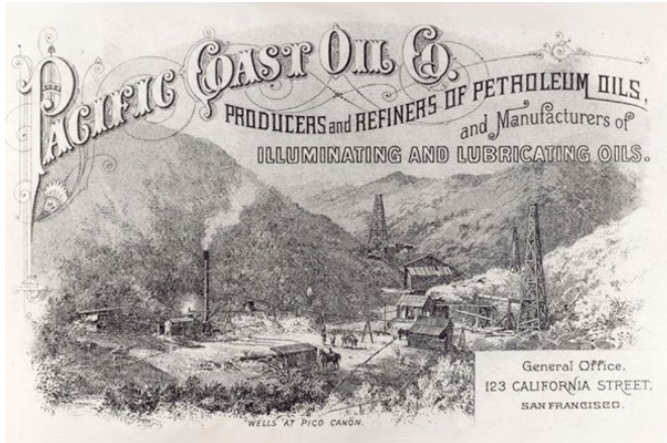
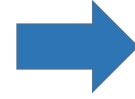
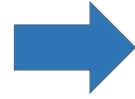
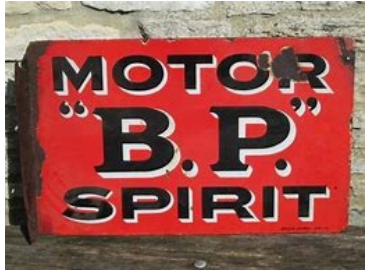


1930











## Canada's first retail hydrogen filling station opens in Vancouver: June 2018



The hydrogen station integrates seamlessly on an island that also offers pumps for gasoline.

Unlike EV, refueling time and customer experience are comparable to filling a gasoline- or diesel-powered vehicle.

## Canada's first retail hydrogen fuelling station opens in Vancouver

Shell has opened a public hydrogen fuelling station in Vancouver, with plans for 2 more

Rafferty Baker - CBC News - Posted: Jun 15, 2018 7:11 PM PT | Last Updated: June 15

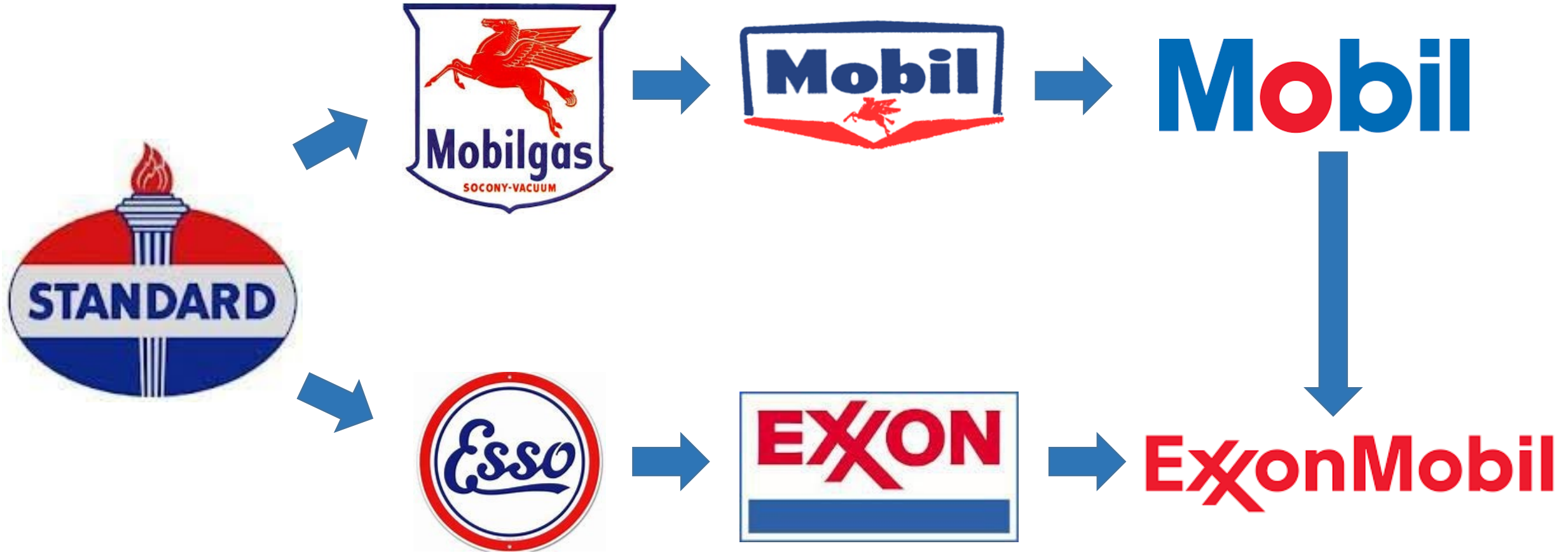


Oliver Bishop, general manager of hydrogen at Shell, manipulates a hydrogen refuelling station in Vancouver while a photographer takes a photo during the station's launch. (Rafferty Baker/CBC)

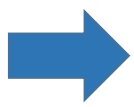
Source: CBC

10/23/2018

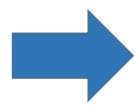




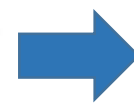




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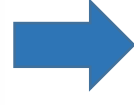


**aws**

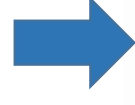


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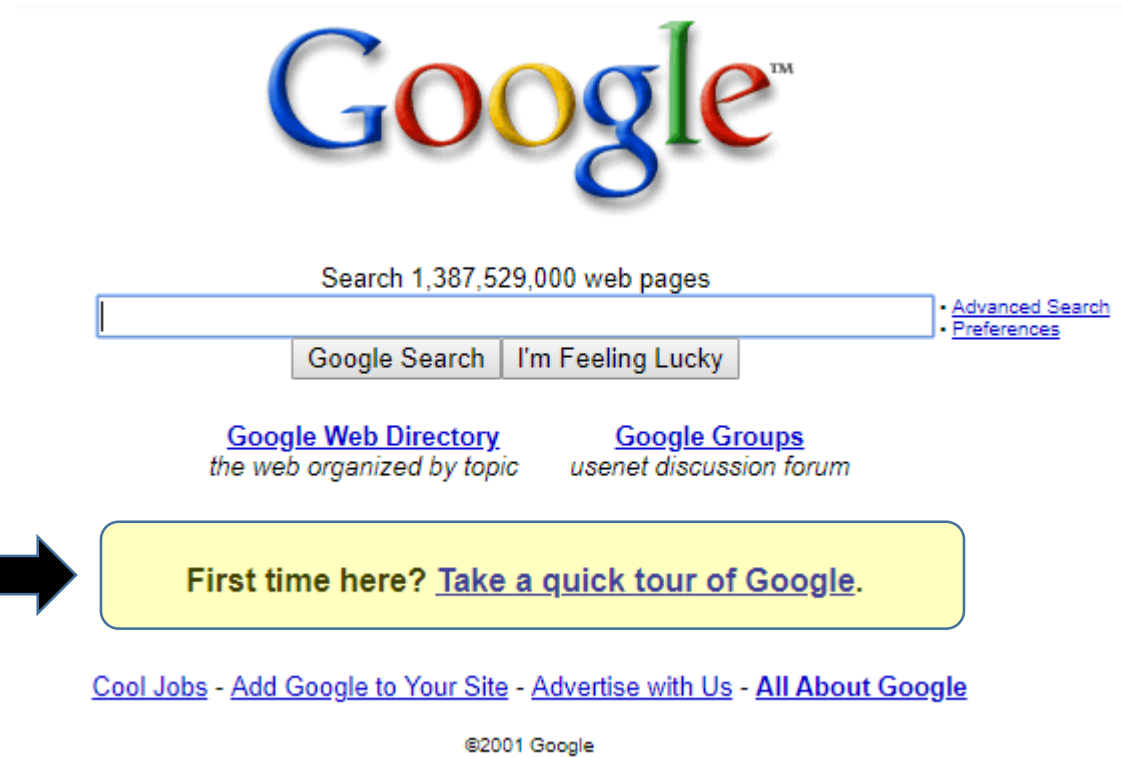


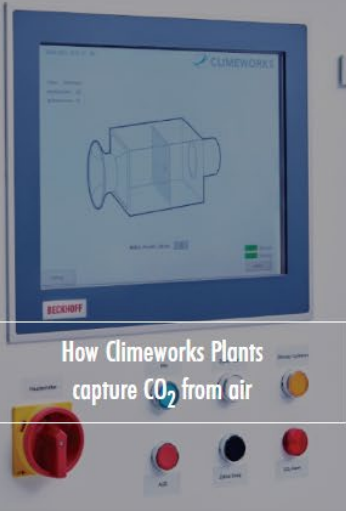
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How Climeworks Plants capture CO<sub>2</sub> from air



How to reverse my CO<sub>2</sub> emissions



The benefits of using Climeworks CO<sub>2</sub>

“Carbon-dioxide removal has become an inescapable part of limiting climate change to safe levels.”

Dr. Joeri Rogeli, International Institute for Applied Systems Analysis



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# The world's first "negative emissions" plant has begun operation—turning carbon dioxide into stone

Akshat Rathi | October 12, 2017

12/13/2017

The world's first "negative emissions" plant has opened in Iceland—turning carbon dioxide into stone — Quartz



📷 Direct air capture unit along with the cooling towers of the geothermal power plant in Hellisheidi, Iceland. (Climeworks/Zev Starr-Tambor)

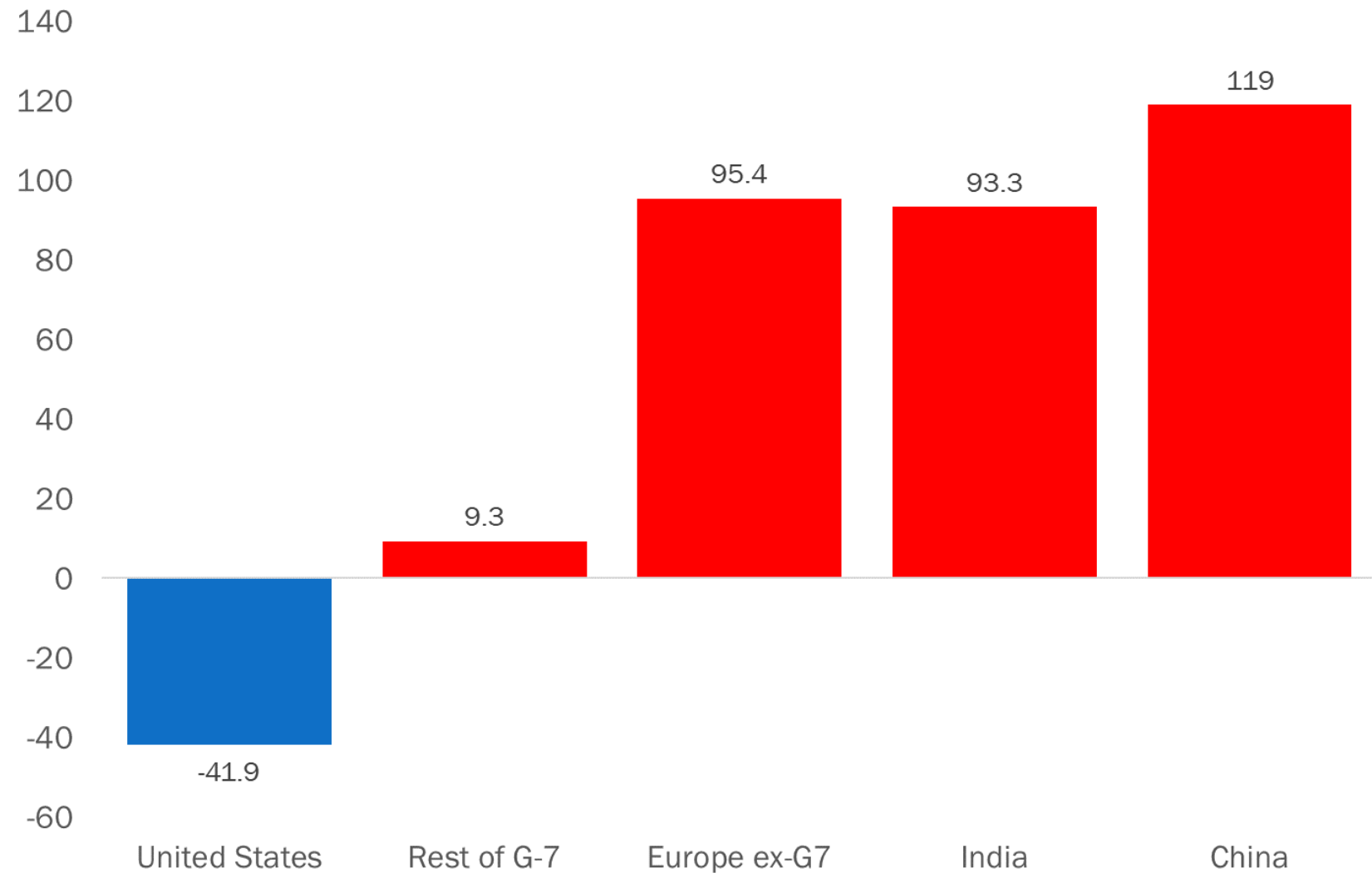
Source: Quartz.

10/23/2018

Oil and Gas Boom in the Year of Folly and the Hammer

## Growth in carbon dioxide emissions (2017)

million tonnes CO<sub>2</sub>



Source: BPSR, Blacklight Research.

10/23/2018

Oil and Gas Boom in the Year of Folly and the Hammer

## Growth in carbon dioxide emissions (2017)

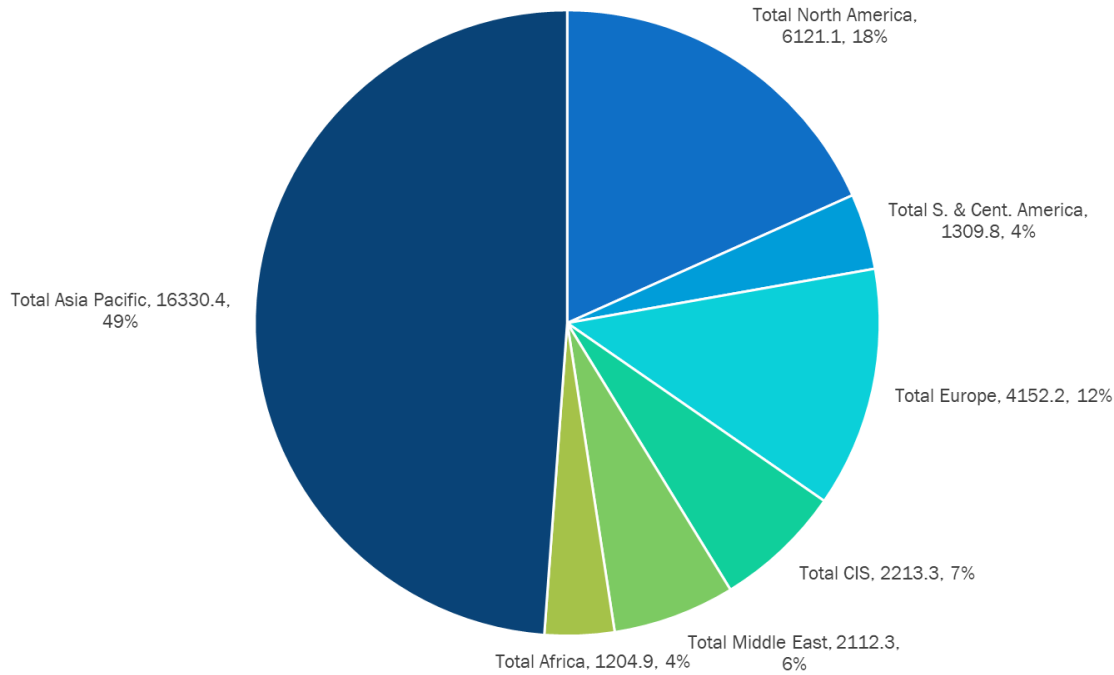
million tonnes CO<sub>2</sub>



Source: BPSR, Blacklight Research.



Carbon dioxide emissions by region (2017)  
million tonnes and world share



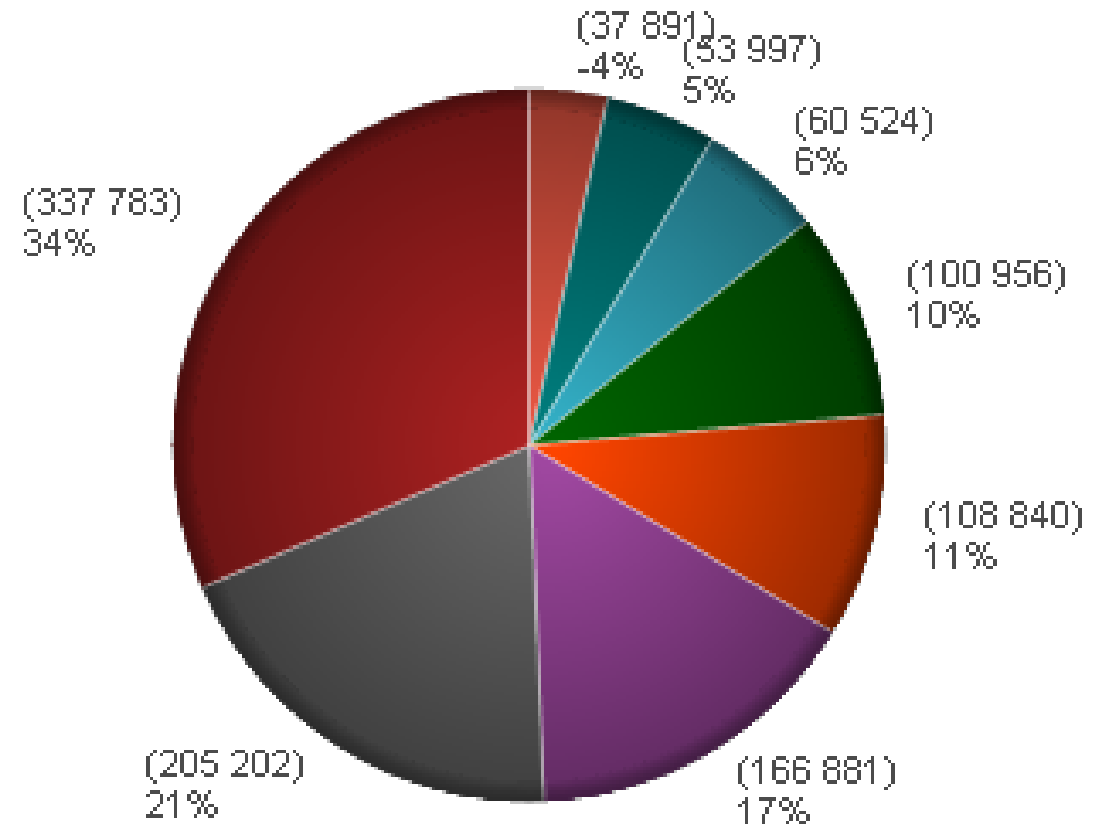
Carbon dioxide emissions by region (2017)

|                                     | CO2 emissions<br>million tonnes | Change<br>% YoY |
|-------------------------------------|---------------------------------|-----------------|
| <b>Total North America</b>          | <b>6,121</b>                    | <b>-0.4%</b>    |
| <b>Total S. &amp; Cent. America</b> | <b>1,310</b>                    | <b>-1.0%</b>    |
| <b>Total Europe</b>                 | <b>4,152</b>                    | <b>2.5%</b>     |
| <b>Total CIS</b>                    | <b>2,213</b>                    | <b>0.3%</b>     |
| <b>Total Middle East</b>            | <b>2,112</b>                    | <b>2.9%</b>     |
| <b>Total Africa</b>                 | <b>1,205</b>                    | <b>1.9%</b>     |
| <b>Total Asia Pacific</b>           | <b>16,330</b>                   | <b>2.3%</b>     |
| <b>Total World</b>                  | <b>33,444</b>                   | <b>1.6%</b>     |

### World GHG Emissions from All Sectors from 1961 to 2010 (MtCO<sub>2</sub>eq)

Sector

- Land-Use Change & Forestry
- Other Fuel Combustion
- Other Sectors
- Agriculture
- Residential
- Transport
- Manufacturing, Construction and Industrial Process
- Electricity/Heat

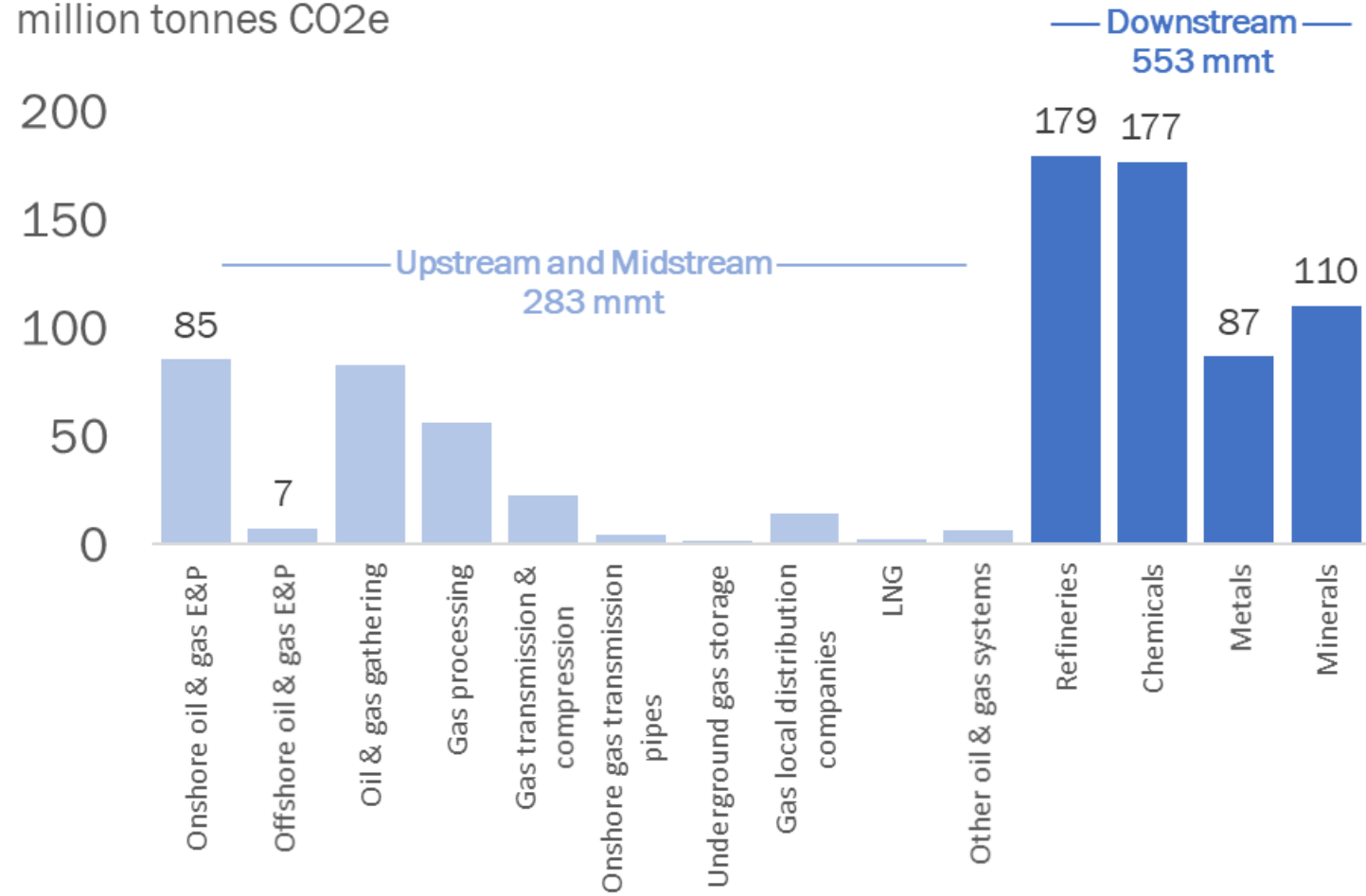


**Total = 996292,3 MtCO<sub>2</sub>eq**



## US emissions by industry

million tonnes CO<sub>2</sub>e



Source: EPA. Note: this survey is a subset of total industry and of total consumption (e.g., excludes airlines, transportation companies, etc).



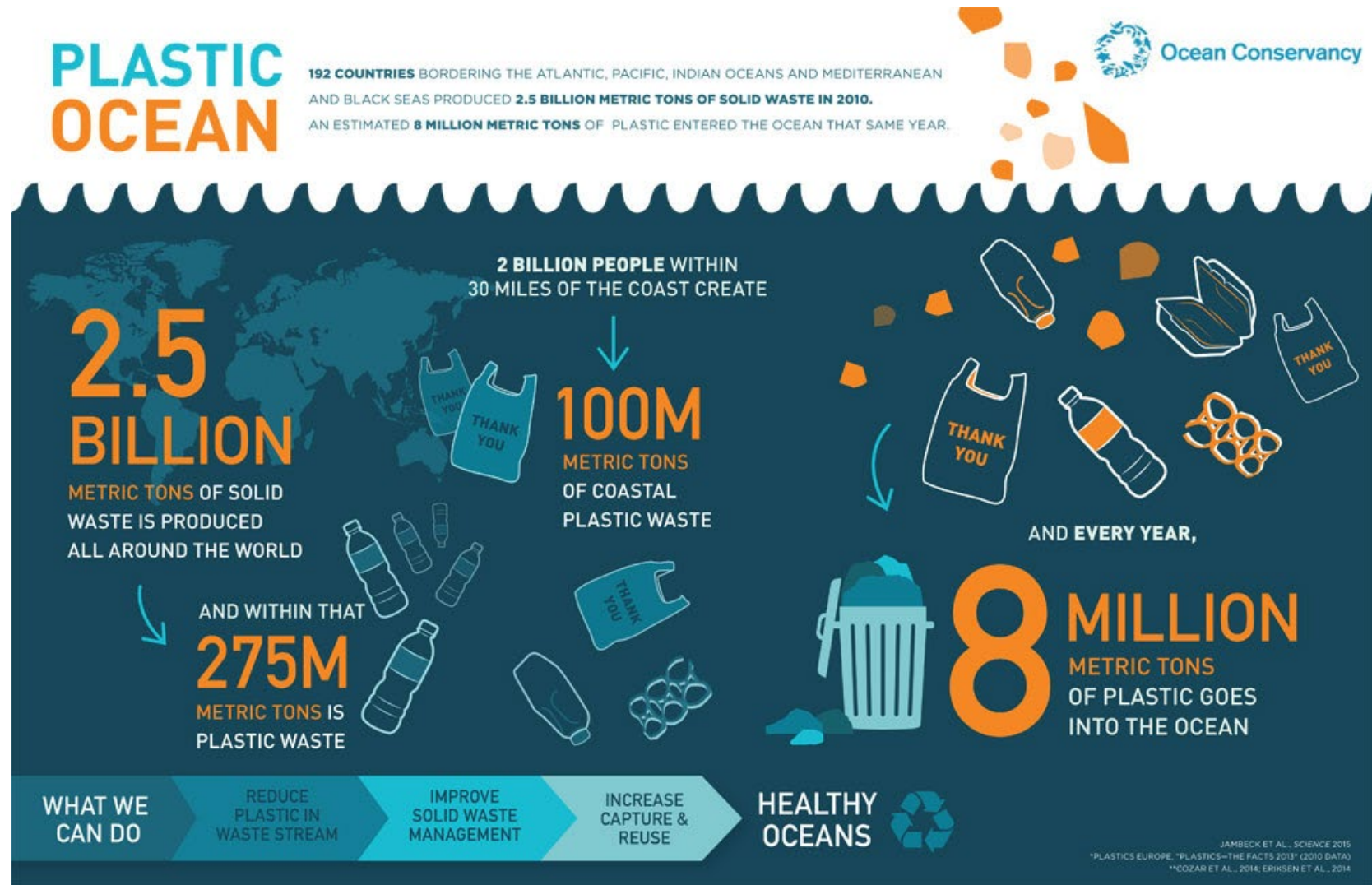
## Non-Fuel uses produce more CO<sub>2</sub> *per unit* of volume or mass than do fuel uses

**Carbon Dioxide Emissions Coefficients by Fuel**

| Carbon Dioxide (CO <sub>2</sub> ) Factors:          | Pounds CO <sub>2</sub>     | Kilograms CO <sub>2</sub> | Pounds CO <sub>2</sub> | Kilograms CO <sub>2</sub> | Carbon Dioxide (CO <sub>2</sub> ) Factors: | Pounds CO <sub>2</sub>     | Kilograms CO <sub>2</sub> | Pounds CO <sub>2</sub> | Kilograms CO <sub>2</sub> |
|---|----------------------------|---------------------------|------------------------|---------------------------|--|----------------------------|---------------------------|------------------------|---------------------------|
|   | Per Unit of Volume or Mass | Volume or Mass            | Million Btu            | Million Btu               |  | Per Unit of Volume or Mass | Volume or Mass            | Million Btu            | Million Btu               |
| <b>For homes and businesses</b>                     |                            |                           |                        |                           | <b>Nonfuel uses</b>                        |                            |                           |                        |                           |
| Propane   | 12.70/gallon               | 5.76/gallon               | 139.05                 | 63.07                     | Asphalt and Road Oil                       | 26.34/gallon               | 11.95/gallon              | 166.70                 | 75.61                     |
| Butane  | 14.80/gallon               | 6.71/gallon               | 143.20                 | 64.95                     | Lubricants                                 | 23.62/gallon               | 10.72/gallon              | 163.60                 | 74.21                     |
| Butane/Propane Mix                                  | 13.70/gallon               | 6.21/gallon               | 141.12                 | 64.01                     | Petrochemical Feedstocks                   | 24.74/gallon               | 11.22/gallon              | 156.60                 | 71.03                     |
| Home Heating and Diesel Fuel (Distillate)           | 22.40/gallon               | 10.16/gallon              | 161.30                 | 73.16                     | Special Naphthas (solvents)                | 20.05/gallon               | 9.10/gallon               | 160.50                 | 72.80                     |
| Kerosene  | 21.50/gallon               | 9.75/gallon               | 159.40                 | 72.30                     | Waxes                                      | 21.11/gallon               | 9.57/gallon               | 160.10                 | 72.62                     |
| Coal (All types)                                    | 4,631.50/short ton         | 2,100.82/short ton        | 210.20                 | 95.35                     | <b>Coal by type</b>                        |                            |                           |                        |                           |
| Natural Gas   | 117.10/thousand cubic feet | 53.12/thousand cubic feet | 117.00                 | 53.07                     | Anthracite                                 | 5,685.00/short ton         | 2,578.68/short ton        | 228.60                 | 103.70                    |
| Gasoline  | 19.60/gallon               | 8.89/gallon               | 157.20                 | 71.30                     | Bituminous                                 | 4,931.30/short ton         | 2,236.80/short ton        | 205.70                 | 93.30                     |
| Residual Heating Fuel (Businesses only)             | 26.00/gallon               | 11.79/gallon              | 173.70                 | 78.79                     | Subbituminous                              | 3,715.90/short ton         | 1,685.51/short ton        | 214.30                 | 97.20                     |
| <b>Other transportation fuels</b>                   |                            |                           |                        |                           | Lignite                                    | 2,791.60/short ton         | 1,266.25/short ton        | 215.40                 | 97.70                     |
| Jet Fuel  | 21.10/gallon               | 9.57/gallon               | 156.30                 | 70.90                     | Coke                                       | 6,239.68/short ton         | 2,830.27/short ton        | 251.60                 | 114.12                    |
| Aviation Gas  | 18.40/gallon               | 8.35/gallon               | 152.60                 | 69.20                     | <b>Other fuels</b>                         |                            |                           |                        |                           |
| <b>Industrial fuels and others not listed above</b> |                            |                           |                        |                           | Geothermal (average all generation)        | NA                         | NA                        | 16.99                  | 7.71                      |
| Flared natural gas                                  | 120.70/thousand cubic feet | 54.75/thousand cubic feet | 120.60                 | 54.70                     | Municipal Solid Waste                      | 5,771.00/short ton         | 2,617.68/short ton        | 91.90                  | 41.69                     |
| Petroleum coke                                      | 32.40/gallon               | 14.70/gallon              | 225.10                 | 102.10                    | Tire-derived fuel                          | 6,160.00/short ton         | 2,794.13/short ton        | 189.54                 | 85.97                     |
| Other petroleum & miscellaneous                     | 22.09/gallon               | 10.02/gallon              | 160.10                 | 72.62                     | Waste oil                                  | 924.0/barrel               | 419.12/barrel             | 210.00                 | 95.25                     |

Source: EIA estimates. To convert to carbon equivalents, multiply by 12/44. Coefficients may vary slightly with estimation method and over time.

# Public opinion is likely to get even more focused on the extensive waste in single-use plastics.







10/23/2018

Oil and Gas Boom in the Year of Folly and the Hammer

SCIENCE

## Climate Change Can Be Stopped by Turning Air Into Gasoline

A Harvard professor says his company should be able to suck carbon dioxide out of the atmosphere, at industrial scales, by 2021.

The Atlantic

ROBINSON MEYER JUN 7, 2018

A team of scientists from Harvard University and the company Carbon Engineering announced on Thursday that they have found a method to cheaply and directly pull carbon-dioxide pollution out of the atmosphere.

If their technique is successfully implemented at scale, it could transform how humanity thinks about the problem of climate change. It could give people a decisive new tool in the race against a warming planet, but could also unsettle the issue's delicate politics, making it all the harder for society to adapt.

Their research seems almost to smuggle technologies out of the realm of science fiction and into the real. It suggests that people will soon be able to produce gasoline and jet fuel from little more than limestone, hydrogen, and air. It hints at the eventual construction of a vast, industrial-scale network of carbon scrubbers, capable of removing greenhouse gases directly from the atmosphere.

Above all, the new technique is noteworthy because it promises to remove carbon dioxide *cheaply*. As recently as 2011, a panel of experts estimated that it would cost at least \$600 to remove a metric ton of carbon dioxide from the atmosphere.

The new paper says it can remove the same ton for as little as \$94, and for no more than \$232. At those rates, it would cost between \$1 and \$2.50 to remove the carbon dioxide released by burning a gallon of gasoline in a modern car.

"If these costs are real, it is an important result," said Ken Caldeira, a senior scientist at the Carnegie Institution for Science. "This opens up the possibility that we could stabilize the climate for affordable amounts of money without changing the entire energy system or changing everyone's behavior."





# Unilever commits to 100% recyclable plastic packaging by 2025

16/01/2017

Today we announce a commitment to ensure that all of our plastic packaging is fully reusable, recyclable or compostable by 2025, and call on the FMCG industry to accelerate progress towards the circular economy.

## The scale of the challenge

According to the [Ellen MacArthur Foundation \(EMF\)](#), just 14% of the plastic packaging used globally makes its way to recycling plants, while 40% ends up in landfill and a third in fragile ecosystems. By 2050, it is estimated there will be more plastic than fish in the world's oceans.

Treating plastic packaging as a valuable resource to be managed efficiently and effectively is key to achieving [Sustainable Development Goal 12](#) (Sustainable Consumption & Production) and, in doing so, shifting away from a 'take-make-dispose' model of consumption to one which is fully circular.

## Tackling the issue on a number of fronts

To help transform global plastic packaging material flows, we have made a commitment to ensure that all of our plastic packaging is fully reusable, recyclable or compostable by 2025.

We will also renew our membership of EMF for another three years and endorse and support their New Plastics Economy initiative. And as part of this, we will publish the full 'palette' of plastics materials used in our packaging by 2020 to help create a plastics protocol for the industry.

Unilever has already committed to reduce the weight of the packaging we use by one third by 2020, and increase our use of recycled plastic content in packaging to at least 25% by 2025.

As part of this new commitment, Unilever will ensure that by 2025, it is technically possible for our plastic packaging to be reused or recycled and that there are established, proven examples of it being commercially viable for plastics reprocessors to recycle the material.

“ULTIMATELY, WE WANT ALL OF THE INDUSTRY’S PLASTIC PACKAGING TO BE FULLY CIRCULAR”

**Paul Polman, CEO**

# Novelis

## Novelis Total

Operations: 24 in 10 countries  
FRP Shipments: 3,123 kt  
Employees: 11,591

\*Annual shipments of flat rolled products for fiscal year 2016 by region includes intersegment shipments eliminated in total; kt = one kilotonne or 1,000 metric tonnes



## Quick Facts

**95** percent fewer greenhouse gas emissions (GHGs) produced, 95% less energy used in recycling aluminum versus primary aluminum production

**53** percent of Novelis inputs in the last year came from recycled materials

**180** current vehicle models use Novelis automotive aluminum sheet

**700** pounds lighter and more fuel efficient is the Ford F-150 made with Novelis aluminum

**60** billion used beverage cans recycled by Novelis annually – please, remember to recycle

**14** percent of the world's supply of aluminum rolled sheet is made by Novelis, making us the world's largest single producer and industry leader

## Recycling and Sustainability

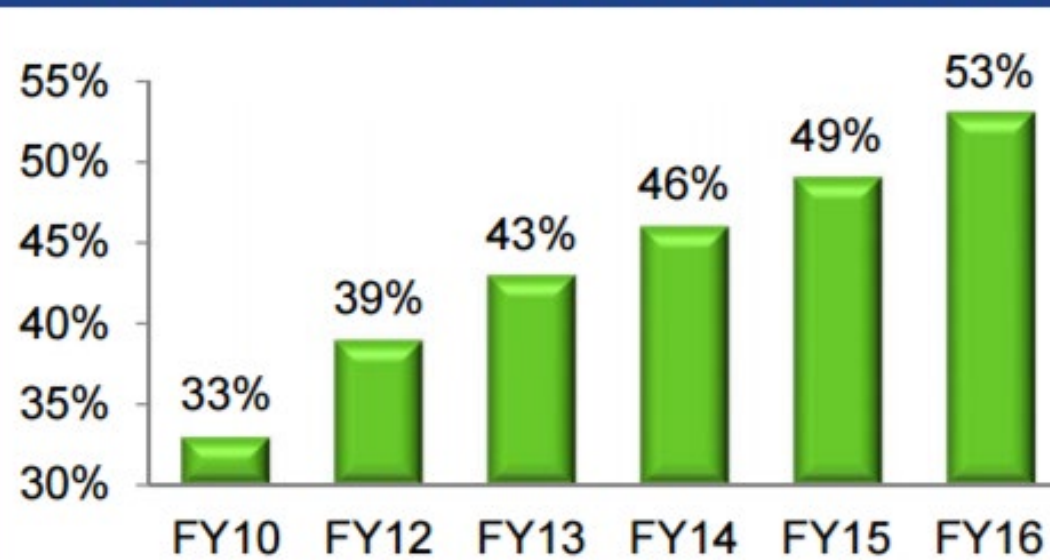
Novelis is the global leader in aluminum recycling, with recycling operations on four continents. In 2014, we opened the world's largest and most technologically advanced aluminum recycling facility, located in Germany.

Aluminum is infinitely recyclable, and the recycling process is much more sustainable than primary aluminum production. Recycling also provides supply chain security and helps our customers achieve their sustainability goals. For this reason, Novelis uses as much recycled content in our products as possible.

In fiscal year 2016, Novelis used 53% recycled inputs in our products.



## Average Recycled Content in Products



Oil and Gas Boom in the Year of Folly and the Hammer

Can't have this...or *gas-fired heat*...in  
the ban hydrocarbons world



How many people  
would watch the  
Food Channel or dine  
at Mesa Grill if Bobby  
Flay had to cook on  
an electric stove  
rather than over  
natural gas burners?

Photo Credit: Roman Pelesh



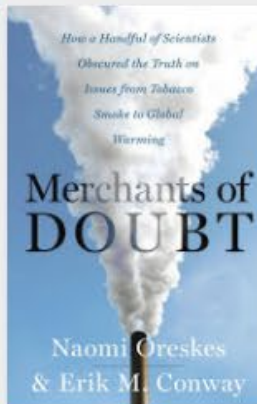
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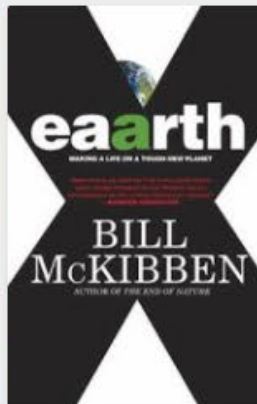


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*Heads in the Sand*

HAYDN WASHINGTON and JOHN COOK

Climate Change Denial  
Haydn Washington

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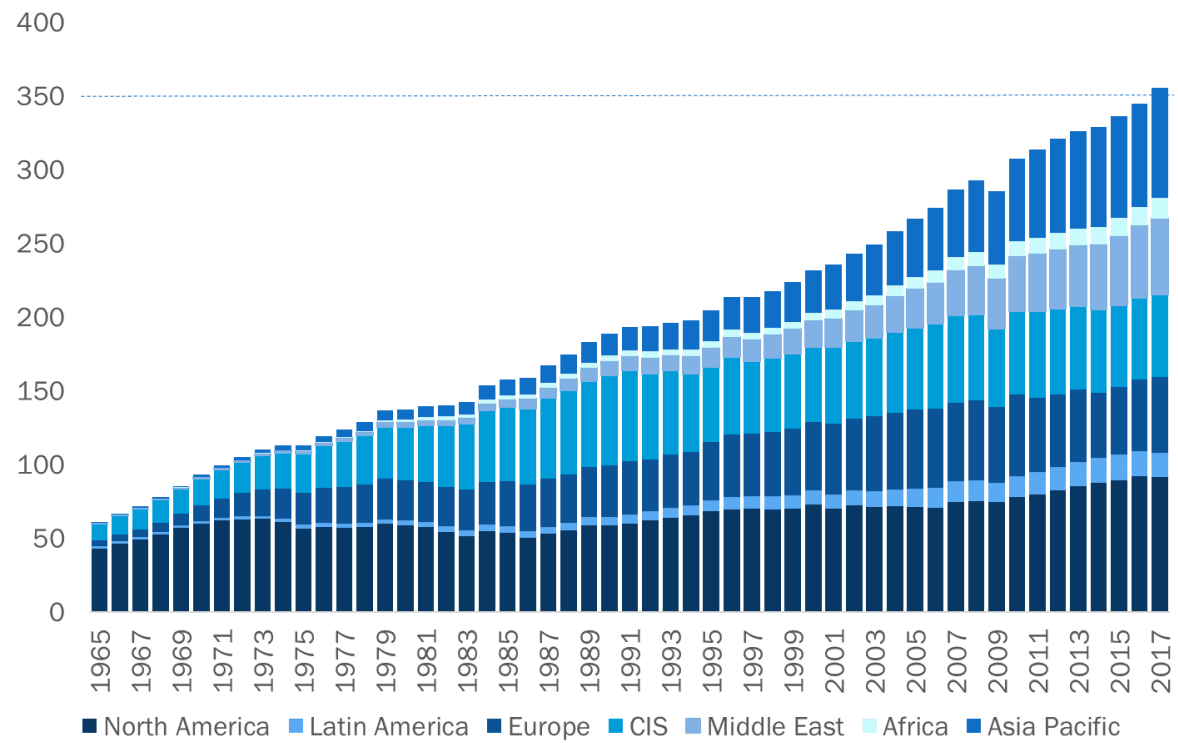
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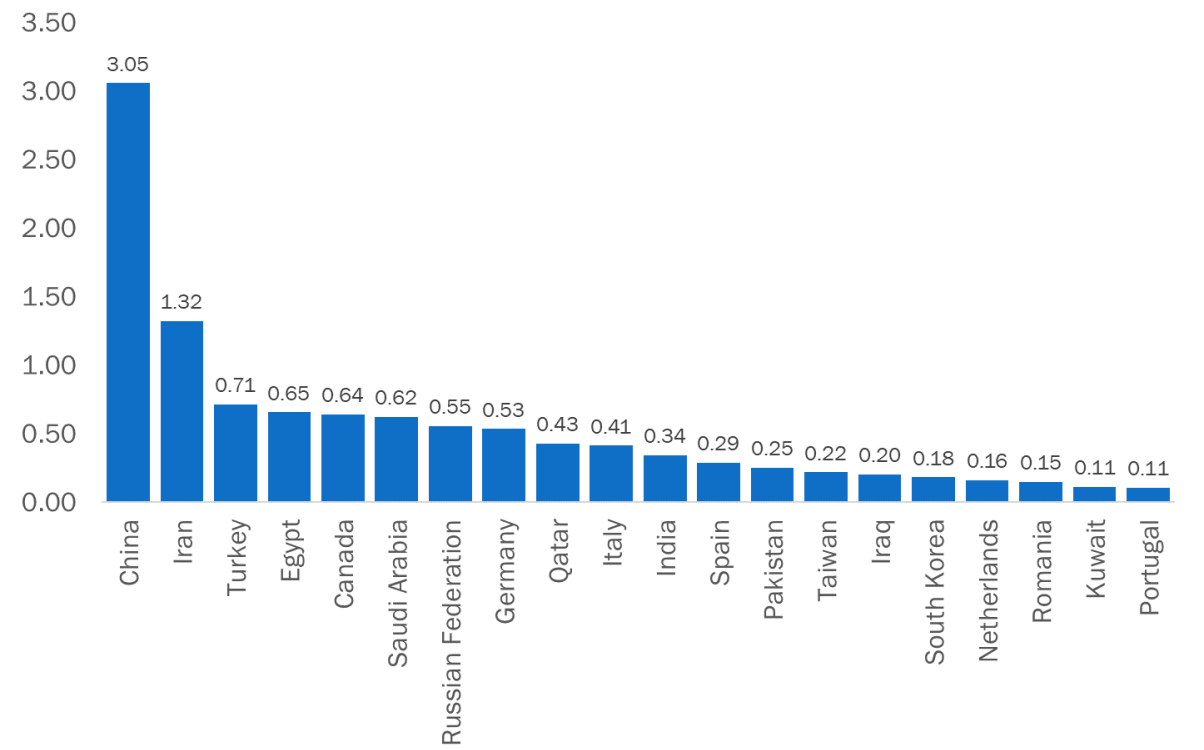
### Global natural gas consumption

billion cubic feet per day



### Growth in natural gas consumption (2017)

billion cubic feet per day, top twenty countries

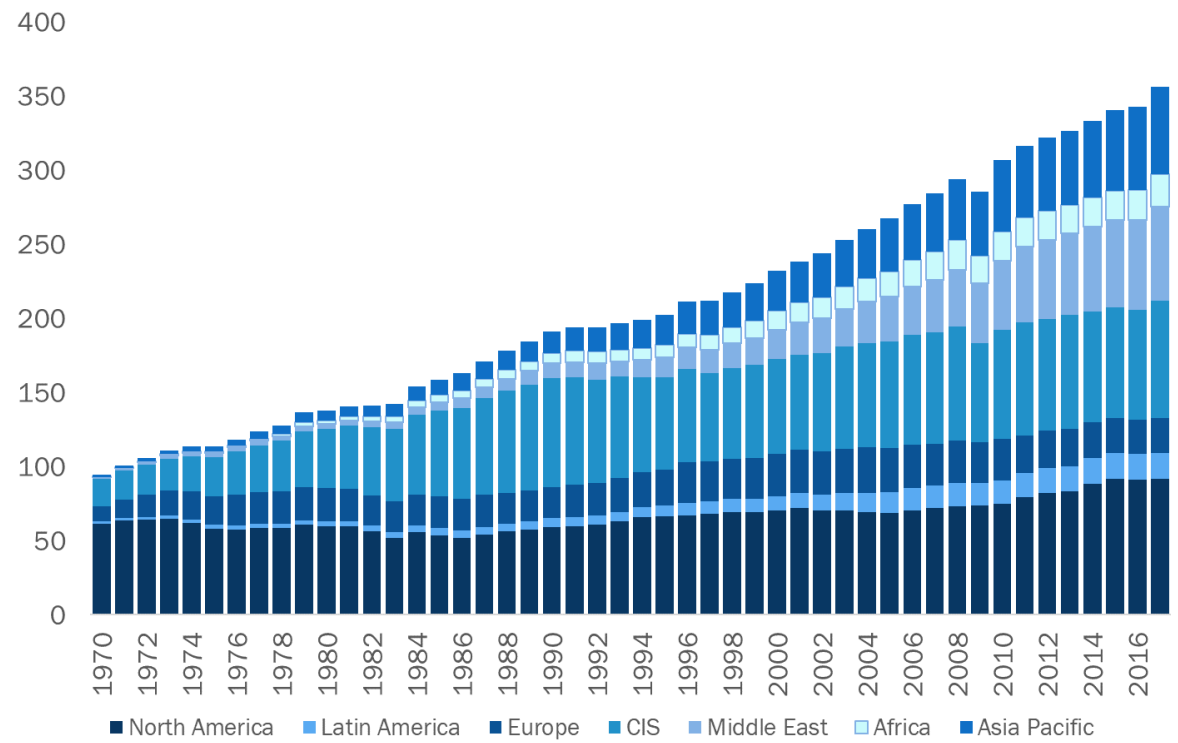


Source: BPSR, Blacklight Research.



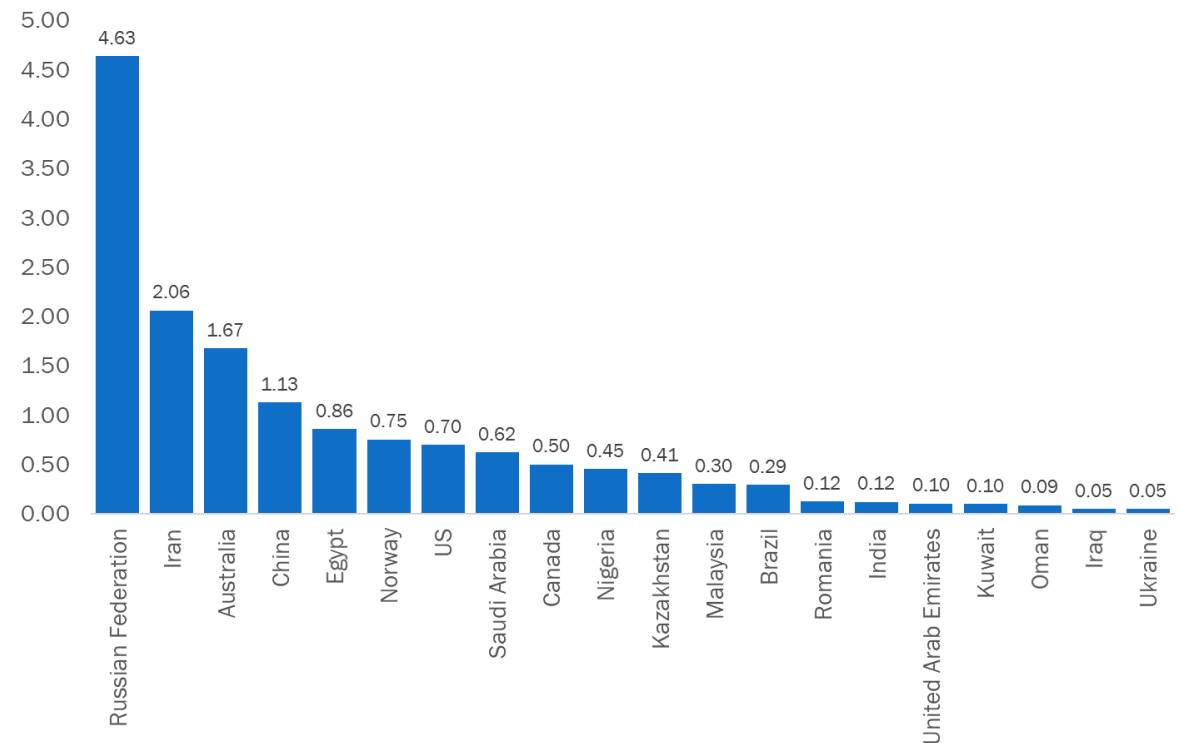
### Global natural gas production

billion cubic feet per day



### Growth in natural gas production (2017)

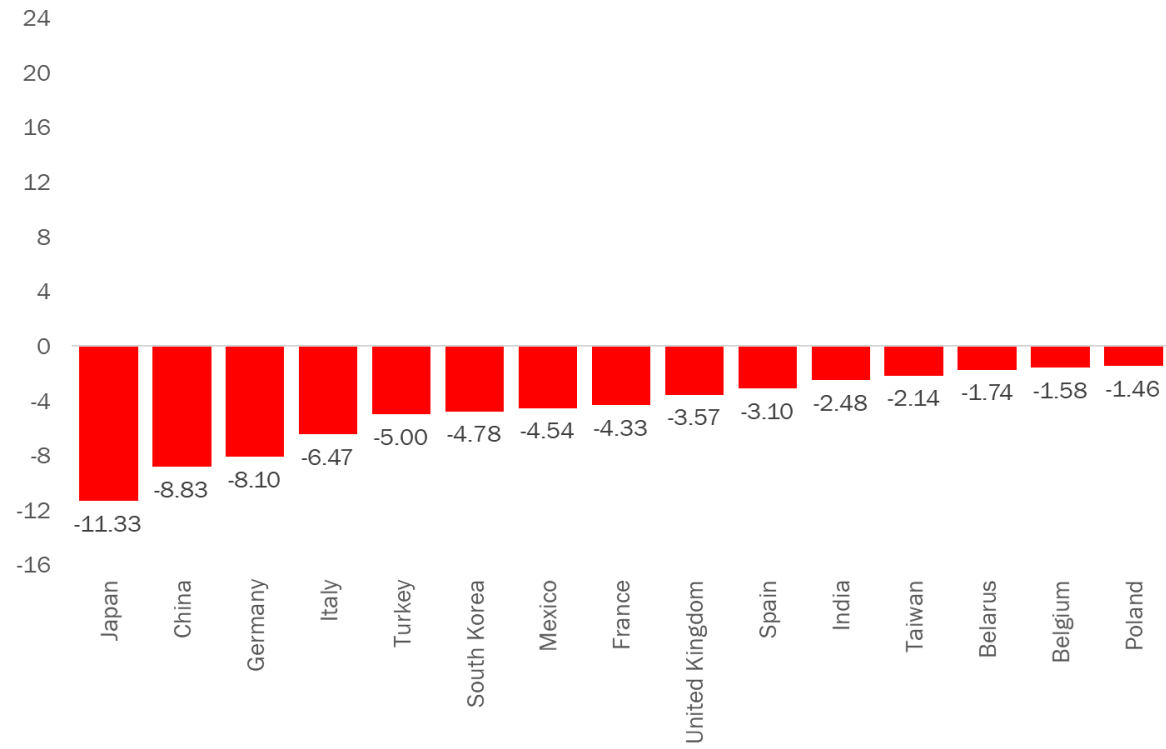
billion cubic feet per day, top twenty countries



Source: BPSR, Blacklight Research.

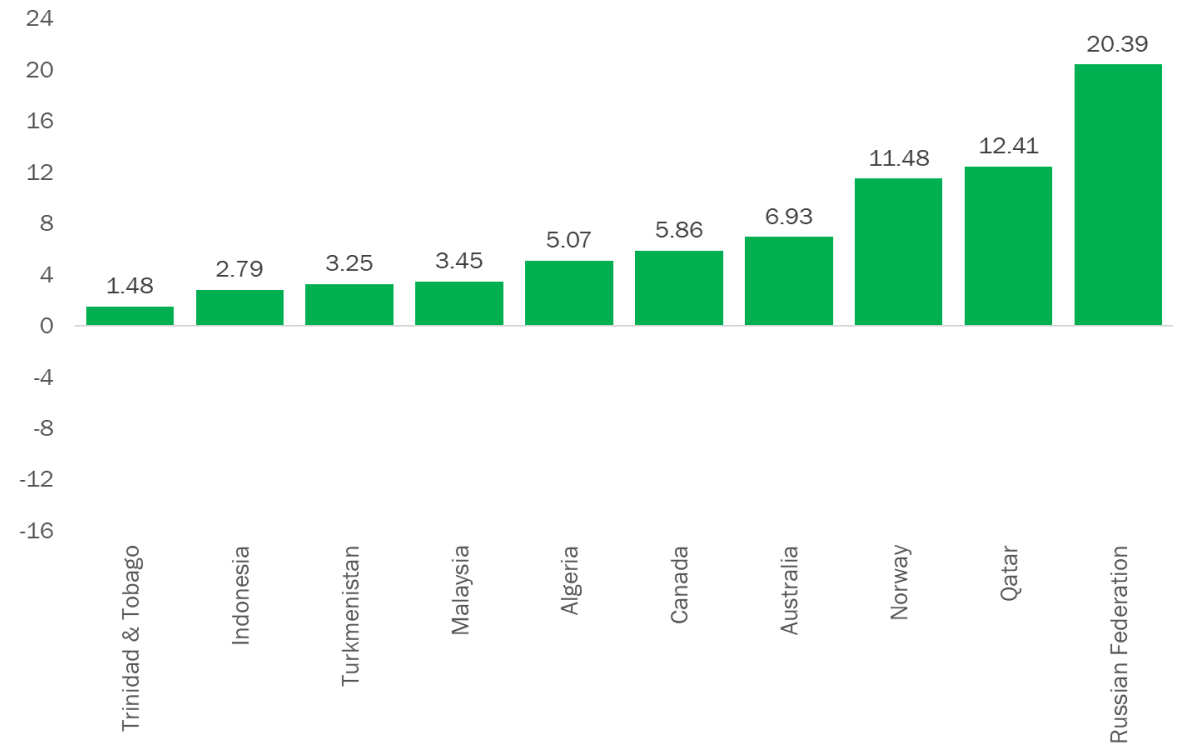
### Largest natural gas deficits

domestic balance in billion cubic feet per day



### Largest natural gas surpluses

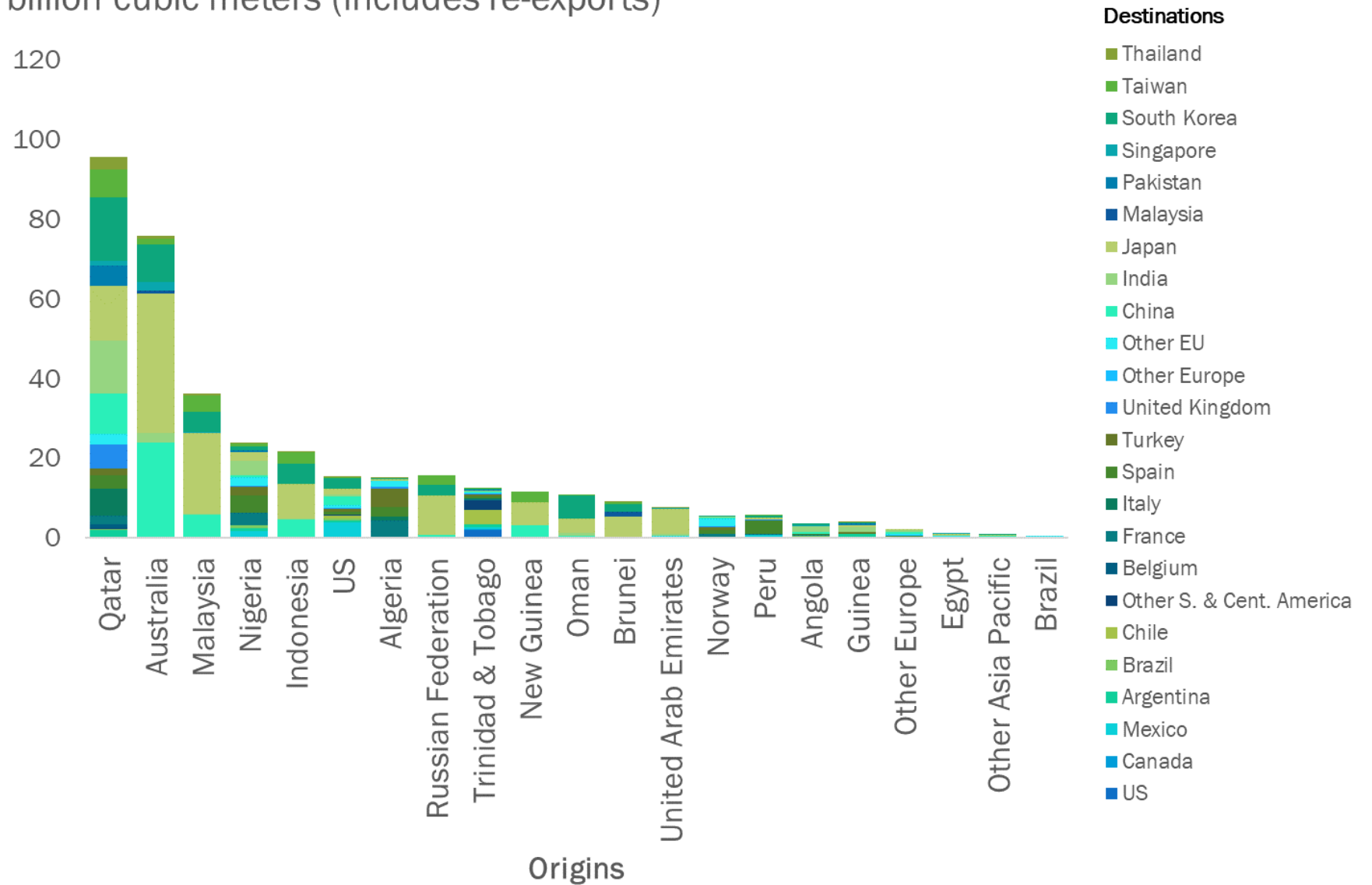
domestic balance in billion cubic feet per day



Source: BPSR, Blacklight Research.

# LNG shipments by origin to destination (2017)

billion cubic meters (includes re-exports)



Source: BPSR, Blacklight Research.



**United States Senate**  
WASHINGTON, DC 20510

May 23, 2018

The President  
The White House  
Washington, DC 20500

Dear Mr. President:

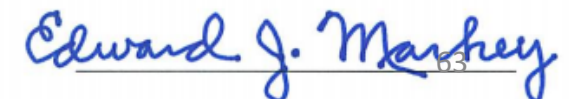
World crude oil prices increased over 75 percent in the past year, with some market analysts expecting prices to approach \$100 per barrel in the coming months. Elevated fuel prices are a burden on every family, business, and farm and threaten our nation's continued economic growth and global competitiveness. Today, we call on you to use all of your authority to take timely action to pressure the Organization of the Petroleum Exporting Countries (OPEC) and cooperating countries to increase world oil supplies in order to lower prices at the pump during the upcoming summer driving season.

Last month, you said it was unacceptable for OPEC to artificially inflate oil prices. We agree and urge you to work with our international partners to take the following actions to make sure OPEC does not continue to suppress world crude oil supplies, and to protect domestic policies that help consumers:

- Leverage your personal relationship with Saudi Crown Prince Mohammad bin Salman to urge Saudi Arabia to use their swing capacity to increase world oil supplies.
- Send Energy Secretary Perry to the June 22, 2018, OPEC meeting in Vienna, Austria to personally communicate the importance of maintaining stable crude oil prices.
- Initiate World Trade Organization dispute proceedings against countries engaged in anticompetitive practices that artificially inflate world oil prices.
- Work with our European allies and China, which last year surpassed the United States as the world's largest oil importer, to put pressure on oil exporting nations.
- Direct the Federal Trade Commission, Commodities Futures Trading Commission, and the Department of Justice to exercise vigorous oversight over oil markets.
- Maximize the use of more environmentally friendly and domestically produced biofuel alternatives by protecting the Renewable Fuel Standard.
- Abandon your Administration's stated plan to roll back fuel economy standards that otherwise will save the average car owner more than \$6,000 over the life of the car and cut the nation's oil consumption by over two million barrels per day by 2025.

The current run up in world oil prices is effectively a tax on every American family's discretionary budget, except that the money goes to the OPEC cartel rather than the U.S. Treasury. Adding to our constituents' pocketbook concerns is their understanding that our nation's continued dependence on oil is at the heart of many of our nation's greatest economic, environmental, and national security challenges.

Sincerely,



The New York Times

## *Judge Dismisses Suit Against Oil Companies Over Climate Change Costs*



By John Schwartz

June 25, 2018



A federal judge on Monday threw out a closely watched lawsuit brought by two California cities against fossil fuel companies over the costs of dealing with climate change. The decision is a stinging defeat for the plaintiffs, San Francisco and Oakland, and raises warning flags for [other local governments around the United States](#) that have filed similar suits, [including New York City](#).

The judge, William Alsup of Federal District Court in San Francisco, acknowledged the science of global warming and the great risks to the planet, as did the oil and gas companies being sued. But in his ruling, Judge Alsup said the courts were not the proper place to deal with such global issues, and he rejected the legal theory put forth by the cities.

“The problem deserves a solution on a more vast scale than can be supplied by a district judge or jury in a public nuisance case,” Judge Alsup wrote in [a 16-page opinion](#).

The cities wanted the defendants — including BP, Chevron, ConocoPhillips, Exxon Mobil and Royal Dutch Shell — to help pay for projects like protecting coastlines from flooding.



PRESS RELEASE

## Green Climate Fund B.20 meeting press release

**(Songdo, 4 July 2018)** – The 20th meeting of the GCF Board ended today in Songdo, following four days of challenging and difficult discussions between Board members. The Board meeting was Chaired by Lennart Båge, in the absence of Co-Chair Paul Oquist.

Whilst positive decisions were made on important issues, such as a financial plan to manage the Commitment Authority of the Fund as it approaches replenishment, the Board was not able to add to its portfolio of 76 projects. Nor was the Board able to reach consensus on new policies in support of its investment criteria, or to add new partners as Accredited Entities.

The Chair expressed his regret to the observer organisations, Accredited Entities and other stakeholders that travelled to Songdo.

“This has been a very difficult and disappointing Board meeting for all of us, but most importantly for those people who are most vulnerable to climate change impacts, and who depend on the activities of the Fund.”



# Statement by President Trump on the Paris Climate Accord

ENERGY & ENVIRONMENT | Issued on: June 1, 2017



Thus, as of today, the United States will cease all implementation of the non-binding Paris Accord and the draconian financial and economic burdens the agreement imposes on our country. This includes ending the implementation of the nationally determined contribution and, very importantly, the Green Climate Fund which is costing the United States a vast fortune.

Compliance with the terms of the Paris Accord and the onerous energy restrictions it has placed on the United States could cost America as much as 2.7 million lost jobs by 2025 according to the National Economic Research Associates. This includes 440,000 fewer manufacturing jobs — not what we need — believe me, this is not what we need — including automobile jobs, and the further decimation

Even if the Paris Agreement were implemented in full, with total compliance from all nations, it is estimated it would only produce a two-tenths of one degree — think of that; this much — Celsius reduction in global temperature by the year 2100. Tiny, tiny amount. In fact, 14 days of carbon emissions from China alone would wipe out the gains from America — and this is an incredible statistic — would totally wipe out the gains from America’s expected reductions in the year 2030, after we have had to spend billions and billions of dollars, lost jobs, closed factories, and suffered much higher energy costs for our businesses and for our homes.

Source: The White House.

Washington D.C.  
June 2017

10/23/2018

## The Immediate Response June 2017

### Trump's Paris pullout leaves America's global leadership in flames

BY JEFFREY SACHS

NEW YORK DAILY NEWS  
Updated: Thursday, June 1, 2017, 4:52 PM

Today is the day that America's global leadership ends. Congratulations, Washington, you have become worse than useless. You are now positively dangerous. [Leaving the Paris Climate Agreement](#) is leaving the civilized world.

Hyperbole? Not so. Global warming is an existential threat. Every literate person knows it, including the management of ExxonMobil, Chevron and

### Tom Steyer: Trump's Paris exit a 'traitorous act of war'



#### De Blasio signs executive order committing NYC to Paris climate agreement

BY BRANDON CARTER · 06/01/17 08:50 AM EDT

Just In...

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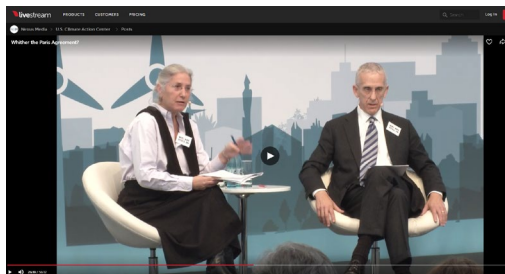
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Retired officers warn US "falling behind" on advanced energy defense — 05:50 AM

Romney to interview Biden at GOP retreat: report EUGENE STRONG ROOM — 07M 18S AGO

Hugh Jackman dodges political talk at DC benefit IN THE KNOW — 10:5M AGO

Pence on NATO: 'Our commitment is unwavering'



Sue Biniaz: "They [Trump Administration] have not specified anything that's actually, specifically wrong with the Paris Agreement."

Oil and Gas Boom in the Year of Folly and the Hammer

Later...

Bonn  
Nov. 2017



Madeleine Cuff  
06 November 2017

POLITICO

Paris  
Dec. 2017



Songdo  
July 2018

### Green Climate Fund meeting 'disappointing', chief quits



Paris  
Aug. 2018

Bangkok  
Sep. 2018

Asia & Pacific

### Bangkok meet fails to finalize draft on climate change rules

## Are rich nations breaking their promise on climate finance?

### Climate activists sour on Paris accord

Bonn was supposed to be a technical summit, but many are pushing existential questions on agenda.

By SARA STEFANINI | 11/10/17, 4:30 PM CET | Updated 11/13/17, 11:45 AM CET

## At the start of 'One Planet Summit' today, Paris Agreement still heading for 3 degrees warming

Two years after the Paris Agreement, and with the impacts of climate change devastating lives, the world's countries' inadequate pledges mean we are on track to deliver a catastrophic 3 degrees of warming, or more.

12 Dec 2017 | 2 minute read



France Inter @franceinter

Nicolas Hulot : "Je prends la décision de quitter le gouvernement"

#le79inter cc @leasalame @ndemorand

2:28 AM - Aug 28, 2018

10.2K 9,645 people are talking about this

## **CONTEXT OF SUPPLY**

# Capex and D&A for 1,063 oil & gas firms worldwide

| Segment                     | QUARTILE 1 |                     |                   |                    |                     |             |            |  |
|-----------------------------|------------|---------------------|-------------------|--------------------|---------------------|-------------|------------|--|
|                             | # Firms    | Capex               | D&A               | Capex-D&A          | Marketcap           | Capex/D&A   | Capex/MC   |  |
| E&P                         | 137        | \$ (116,295)        | \$ 78,571         | \$ (37,724)        | \$ 765,434          | 1.48        | 15%        |  |
| Integrations                | 12         | \$ (186,668)        | \$ 186,725        | \$ 57              | \$ 1,658,037        | 1.00        | 11%        |  |
| Machinery and Equipment     | 11         | \$ (464)            | \$ 1,124          | \$ 660             | \$ 21,141           | 0.41        | 2%         |  |
| Refining and Marketing      | 32         | \$ (33,547)         | \$ 17,505         | \$ (16,043)        | \$ 441,687          | 1.92        | 8%         |  |
| Oil & Gas Drilling          | 11         | \$ (3,961)          | \$ 4,899          | \$ 938             | \$ 27,200           | 0.81        | 15%        |  |
| Oilfield Services           | 34         | \$ (7,498)          | \$ 12,857         | \$ 5,359           | \$ 178,613          | 0.58        | 4%         |  |
| Pipelines                   | 18         | \$ (51,477)         | \$ 20,117         | \$ (31,360)        | \$ 407,417          | 2.56        | 13%        |  |
| Retail - Petroleum Products | 8          | \$ (531)            | \$ 311            | \$ (220)           | \$ 5,275            | 1.71        | 10%        |  |
| Seismic Data Collection     | 4          | \$ (142)            | \$ 781            | \$ 638             | \$ 266              | 0.18        | 53%        |  |
| <b>TOTAL</b>                | <b>267</b> | <b>\$ (400,584)</b> | <b>\$ 322,890</b> | <b>\$ (77,695)</b> | <b>\$ 3,505,071</b> | <b>1.24</b> | <b>11%</b> |  |

| Segment                     | QUARTILE 2 |                    |                  |                   |                   |             |            |  |
|-----------------------------|------------|--------------------|------------------|-------------------|-------------------|-------------|------------|--|
|                             | # Firms    | Capex              | D&A              | Capex-D&A         | Marketcap         | Capex/D&A   | Capex/MC   |  |
| E&P                         | 137        | \$ (3,535)         | \$ 3,481         | \$ (55)           | \$ 30,182         | 1.02        | 12%        |  |
| Integrations                | 12         | \$ (33,887)        | \$ 26,820        | \$ (7,067)        | \$ 259,110        | 1.26        | 13%        |  |
| Machinery and Equipment     | 11         | \$ (46)            | \$ 92            | \$ 47             | \$ 1,462          | 0.49        | 3%         |  |
| Refining and Marketing      | 32         | \$ (2,243)         | \$ 2,930         | \$ 687            | \$ 57,159         | 0.77        | 4%         |  |
| Oil & Gas Drilling          | 11         | \$ (730)           | \$ 2,682         | \$ 1,952          | \$ 4,691          | 0.27        | 16%        |  |
| Oilfield Services           | 34         | \$ (884)           | \$ 2,460         | \$ 1,576          | \$ 36,172         | 0.36        | 2%         |  |
| Pipelines                   | 18         | \$ (8,949)         | \$ 5,097         | \$ (3,852)        | \$ 127,731        | 1.76        | 7%         |  |
| Retail - Petroleum Products | 8          | \$ (58)            | \$ 40            | \$ (19)           | \$ 1,068          | 1.46        | 5%         |  |
| Seismic Data Collection     | 4          | \$ (31)            | \$ 162           | \$ 131            | \$ 211            | 0.19        | 15%        |  |
| <b>TOTAL</b>                | <b>267</b> | <b>\$ (50,362)</b> | <b>\$ 43,764</b> | <b>\$ (6,598)</b> | <b>\$ 517,786</b> | <b>1.15</b> | <b>10%</b> |  |

| Segment                     | QUARTILE 3 |                    |                  |                 |                   |             |           |  |
|-----------------------------|------------|--------------------|------------------|-----------------|-------------------|-------------|-----------|--|
|                             | # Firms    | Capex              | D&A              | Capex-D&A       | Marketcap         | Capex/D&A   | Capex/MC  |  |
| E&P                         | 137        | \$ (223)           | \$ 328           | \$ 105          | \$ 6,843          | 0.68        | 3%        |  |
| Integrations                | 12         | \$ (7,769)         | \$ 7,283         | \$ (487)        | \$ 90,674         | 1.07        | 9%        |  |
| Machinery and Equipment     | 11         | \$ (12)            | \$ 55            | \$ 42           | \$ 355            | 0.23        | 3%        |  |
| Refining and Marketing      | 32         | \$ (197)           | \$ 335           | \$ 138          | \$ 8,637          | 0.59        | 2%        |  |
| Oil & Gas Drilling          | 11         | \$ (96)            | \$ 579           | \$ 483          | \$ 831            | 0.17        | 12%       |  |
| Oilfield Services           | 34         | \$ (191)           | \$ 838           | \$ 647          | \$ 9,974          | 0.23        | 2%        |  |
| Pipelines                   | 18         | \$ (2,311)         | \$ 2,279         | \$ (31)         | \$ 51,645         | 1.01        | 4%        |  |
| Retail - Petroleum Products | 8          | \$ (13)            | \$ 10            | \$ (4)          | \$ 201            | 1.39        | 7%        |  |
| Seismic Data Collection     | 4          | \$ (9)             | \$ 131           | \$ 121          | \$ 369            | 0.07        | 2%        |  |
| <b>TOTAL</b>                | <b>267</b> | <b>\$ (10,822)</b> | <b>\$ 11,837</b> | <b>\$ 1,015</b> | <b>\$ 169,531</b> | <b>0.91</b> | <b>6%</b> |  |

| Segment                     | QUARTILE 4 |                 |                 |               |                  |             |           |  |
|-----------------------------|------------|-----------------|-----------------|---------------|------------------|-------------|-----------|--|
|                             | # Firms    | Capex           | D&A             | Capex-D&A     | Marketcap        | Capex/D&A   | Capex/MC  |  |
| E&P                         | 135        | \$ (5)          | \$ 92           | \$ 87         | \$ 4,772         | 0.06        | 0%        |  |
| Integrations                | 13         | \$ (363)        | \$ 600          | \$ 236        | \$ 11,067        | 0.61        | 3%        |  |
| Machinery and Equipment     | 9          | \$ (1)          | \$ 13           | \$ 12         | \$ 165           | 0.06        | 1%        |  |
| Refining and Marketing      | 30         | \$ (14)         | \$ 50           | \$ 36         | \$ 1,453         | 0.28        | 1%        |  |
| Oil & Gas Drilling          | 12         | \$ (4)          | \$ 233          | \$ 228        | \$ 170           | 0.02        | 3%        |  |
| Oilfield Services           | 33         | \$ (17)         | \$ 159          | \$ 143        | \$ 1,690         | 0.10        | 1%        |  |
| Pipelines                   | 17         | \$ (245)        | \$ 386          | \$ 141        | \$ 13,494        | 0.63        | 2%        |  |
| Retail - Petroleum Products | 8          | \$ (1)          | \$ 5            | \$ 4          | \$ 136           | 0.19        | 1%        |  |
| Seismic Data Collection     | 5          | \$ (2)          | \$ 39           | \$ 37         | \$ 161           | 0.05        | 1%        |  |
| <b>TOTAL</b>                | <b>262</b> | <b>\$ (653)</b> | <b>\$ 1,578</b> | <b>\$ 925</b> | <b>\$ 33,108</b> | <b>0.41</b> | <b>2%</b> |  |

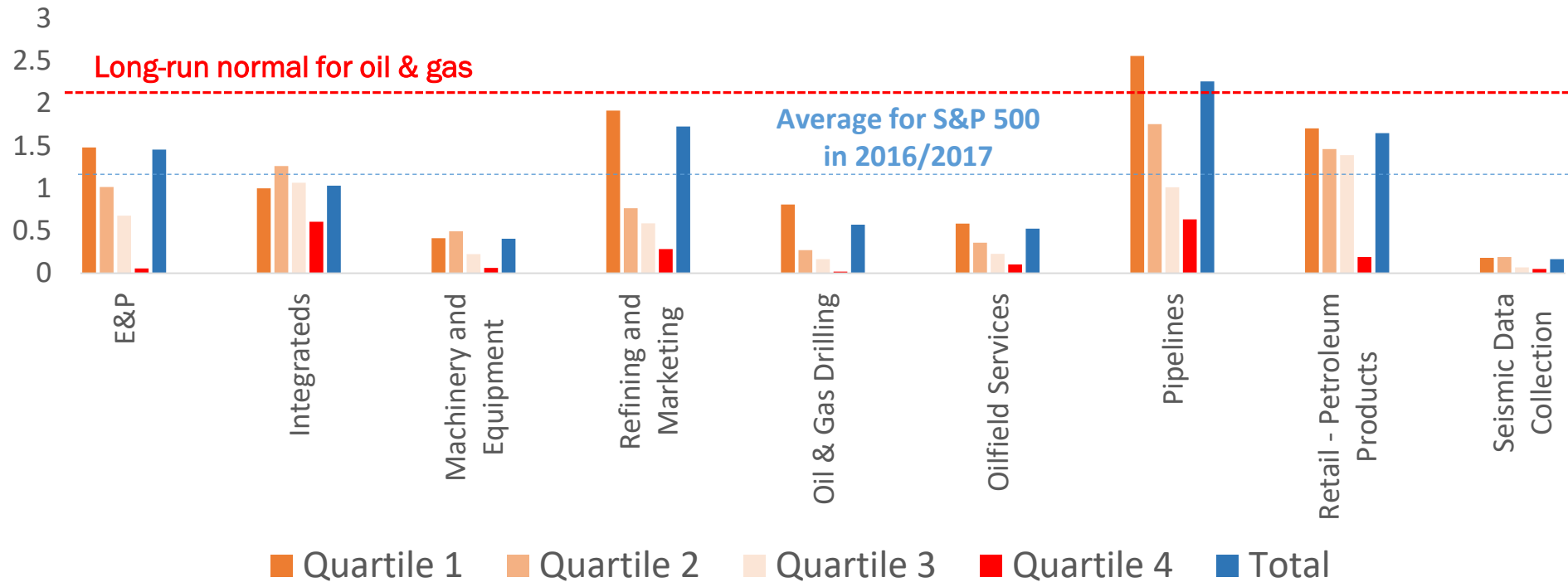
**Fourth quartile D&A now exceeds capex in all market segments.  
 Total 4th quartile D&A exceeds total capex by 2.42 to 1.**

Source: Company reports, Bloomberg, Blacklight Research LLC. Capex, D&A, and marketcap data in millions USD, as of 3Q17.



# The shortfall in upstream investment in global oil & gas is wide and deep

## Capex-to-D&A Ratio by market segment



Source: Company reports, Bloomberg, NYU, Goldman Sachs, Blacklight Research LLC. N=1,063 public oil & gas firms, with total marketcap of US\$4.3 trillion, as of 3Q17.

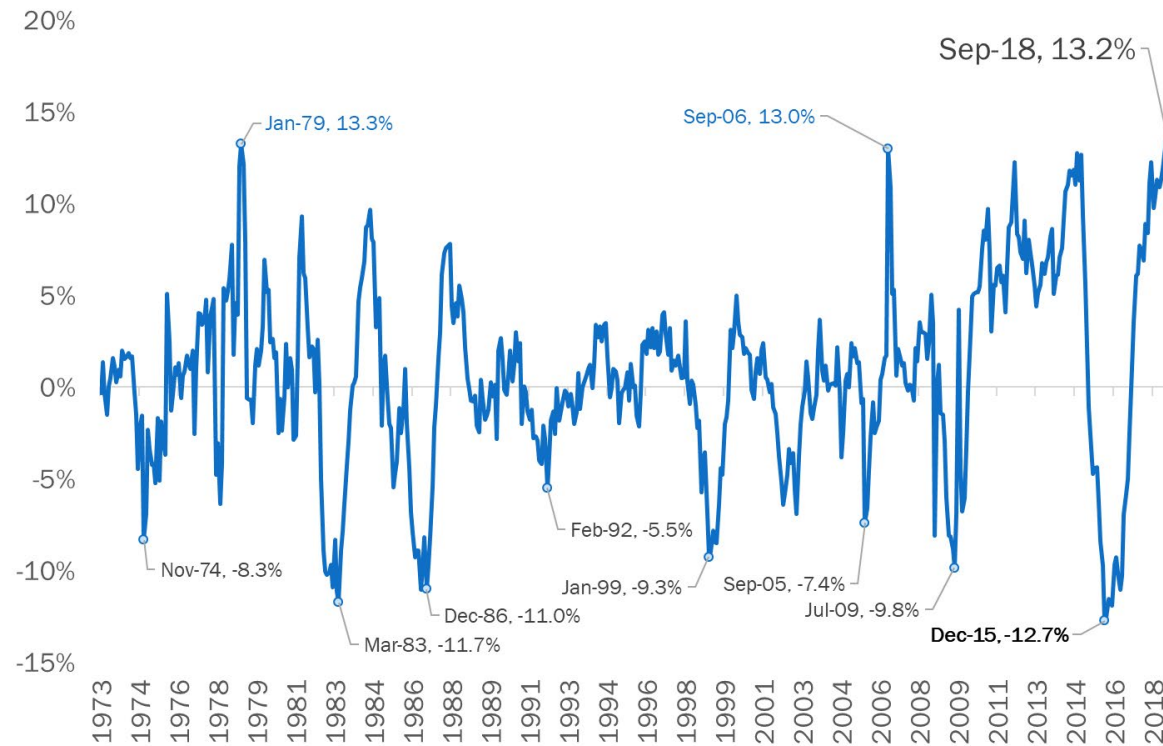
# Results for Alternative Energy, Batteries, and Power Conversion (n=254, \$113Bn marketcap)

| Segment                       | GLOBAL TOTAL — ALL QUARTILES |                    |                  |                    |                   |             |            |
|-------------------------------|------------------------------|--------------------|------------------|--------------------|-------------------|-------------|------------|
|                               | # Firms                      | Capex              | D&A              | Capex-D&A          | Marketcap         | Capex/D&A   | Capex/MC   |
| Alternative Energy Production | 194                          | \$ (25,845)        | \$ 4,286         | \$ (21,559)        | \$ 79,632         | 6.03        | 32%        |
| Batteries and Energy Storage  | 39                           | \$ (637)           | \$ 451           | \$ (186)           | \$ 14,262         | 1.41        | 4%         |
| Power Conversion Equipment    | 21                           | \$ (1,263)         | \$ 829           | \$ (434)           | \$ 19,340         | 1.52        | 7%         |
| <b>Subtotal</b>               | <b>254</b>                   | <b>\$ (27,745)</b> | <b>\$ 5,566</b>  | <b>\$ (22,179)</b> | <b>\$ 113,234</b> | <b>4.98</b> | <b>25%</b> |
| Coal Production               | 114                          | \$ (6,713)         | \$ 6,602         | \$ (111)           | \$ 96,736         | 1.02        | 7%         |
| <b>GRAND TOTAL</b>            | <b>368</b>                   | <b>\$ (34,458)</b> | <b>\$ 12,168</b> | <b>\$ (22,291)</b> | <b>\$ 209,969</b> | <b>2.83</b> | <b>16%</b> |

Source: Company reports, Bloomberg, Blacklight Research LLC. Capex, D&A, and marketcap data in millions USD, as of 3Q17.

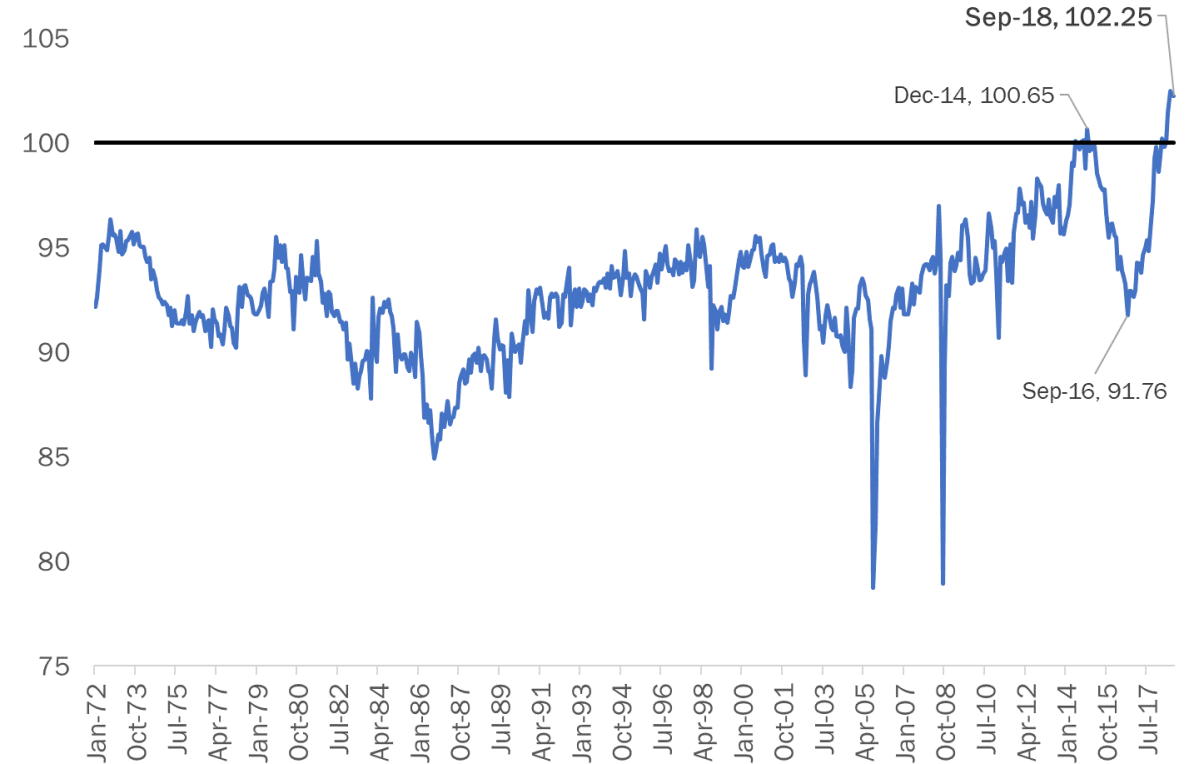
### US production growth, oil and gas extraction

% change yoy, NSA



### Capacity utilization, US oil and gas extraction

percent of capacity

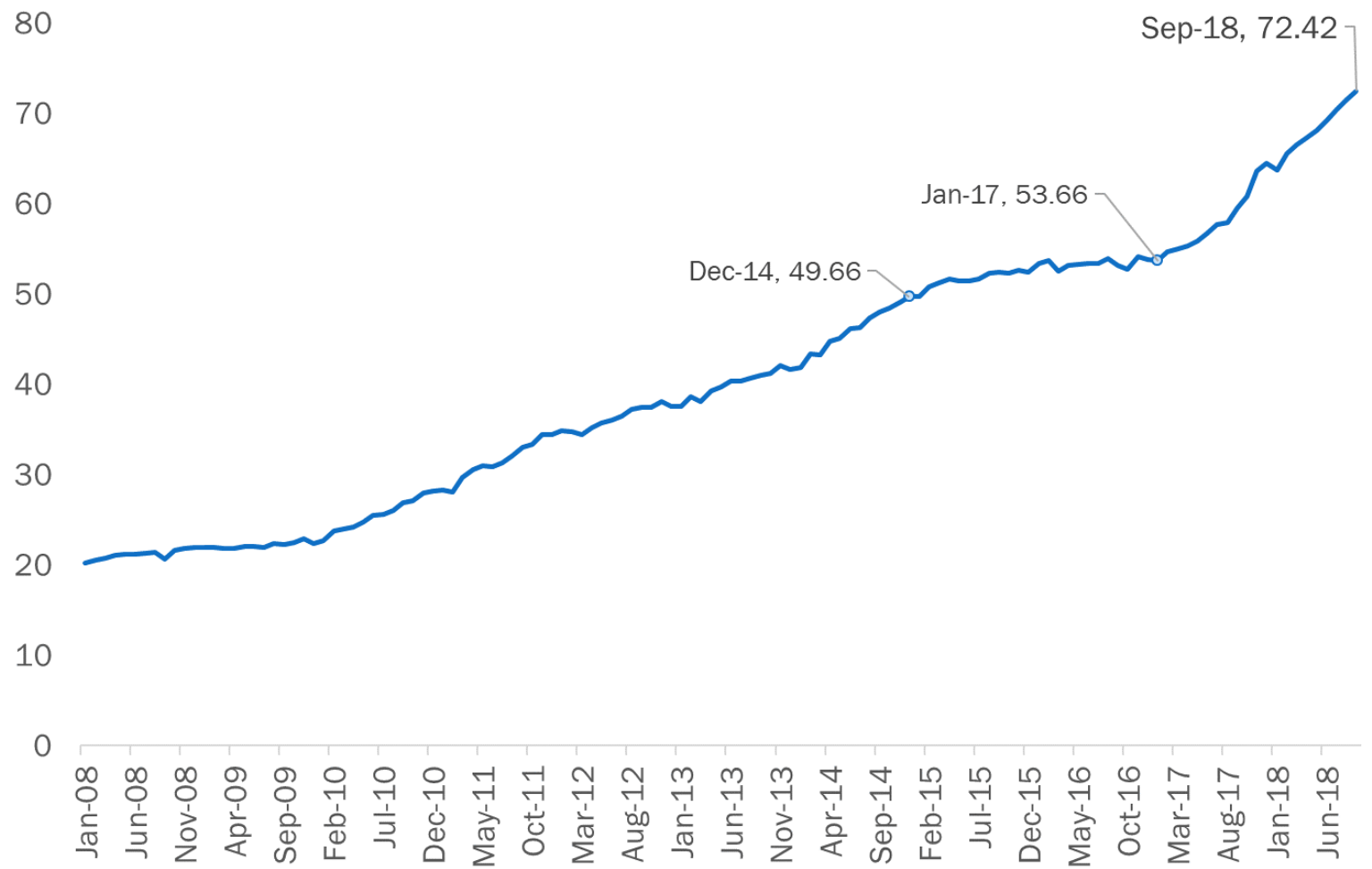


Source: Federal Reserve, Blacklight Research.



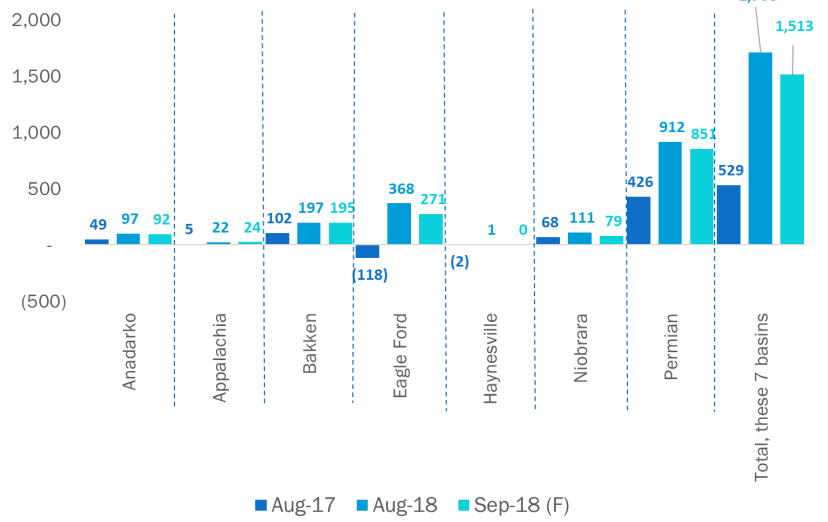
## Gas production, main US shale gas plays

Bcf/d



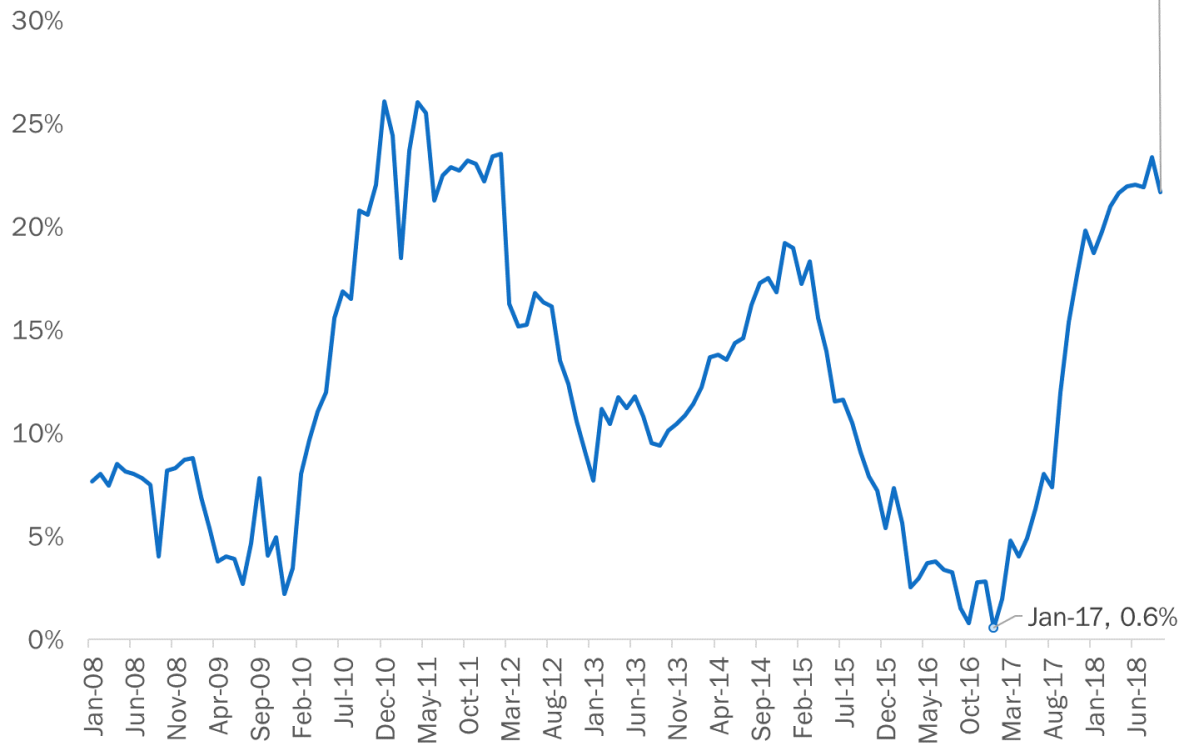
### US LTO Production Growth

yoY change by US basin in thousand b/d



Source: EIA, Blacklight Research. Note: included regions are Anadarko, Appalachia, Bakken, Eagle Ford, Haynesville, Niobrara, Permian.

**Net production growth rate, US shale gas plays**  
YoY % change in net production *with* new investment



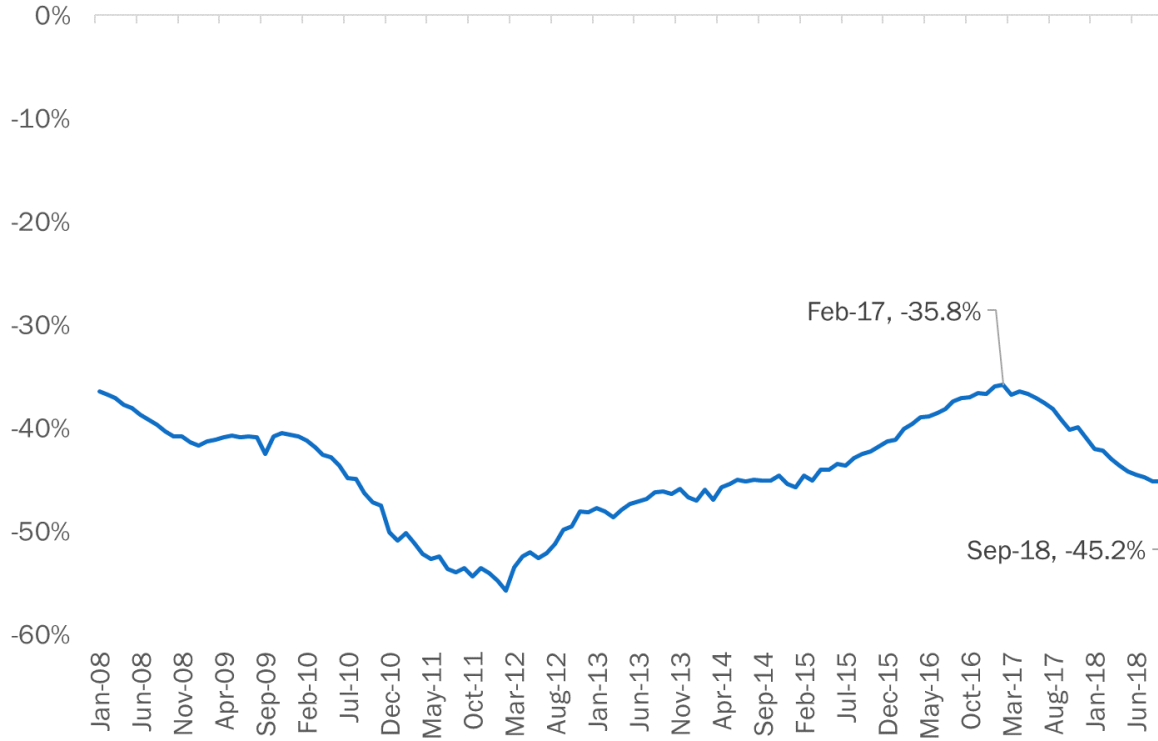
**Net production growth, US shale gas plays**  
YoY change in Bcf/d



Source: EIA, Blacklight Research. Note: included regions are Anadarko, Appalachia, Bakken, Eagle Ford, Haynesville, Niobrara, Permian.

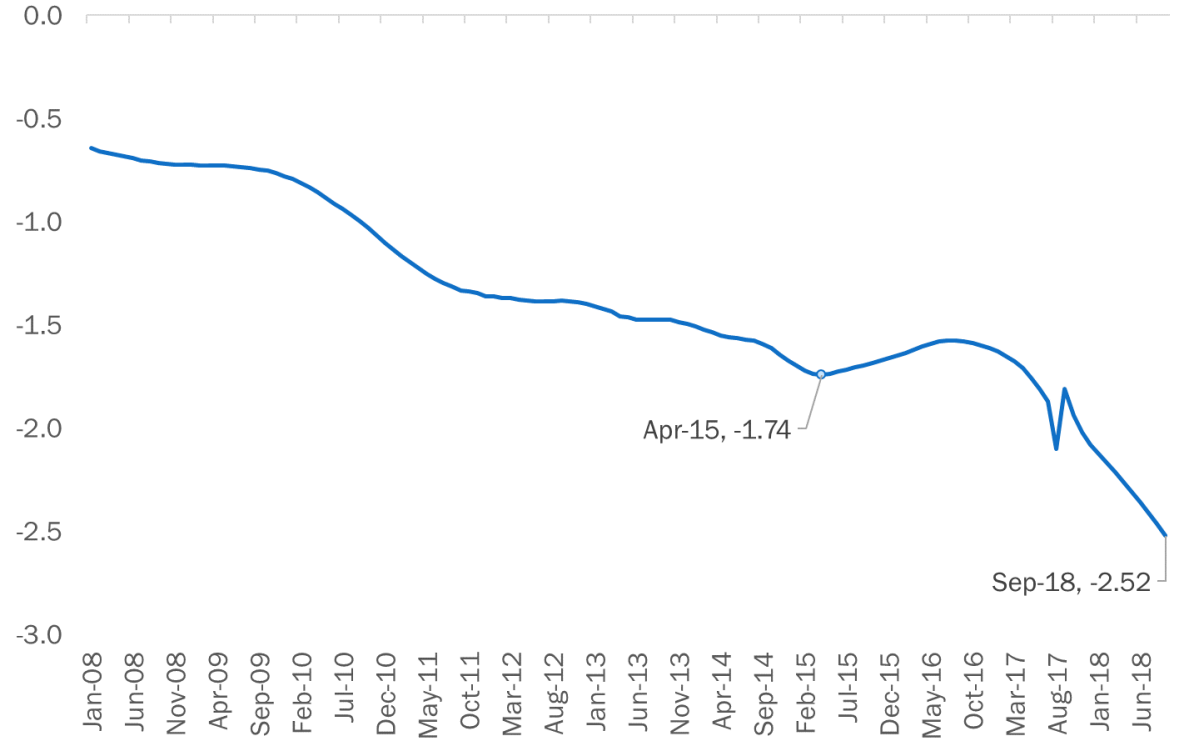
### Decline rate in US shale gas plays

YoY % change in legacy production before new investment



### Decline rate in US shale gas plays

MoM change in Bcf/d, legacy production before new investment

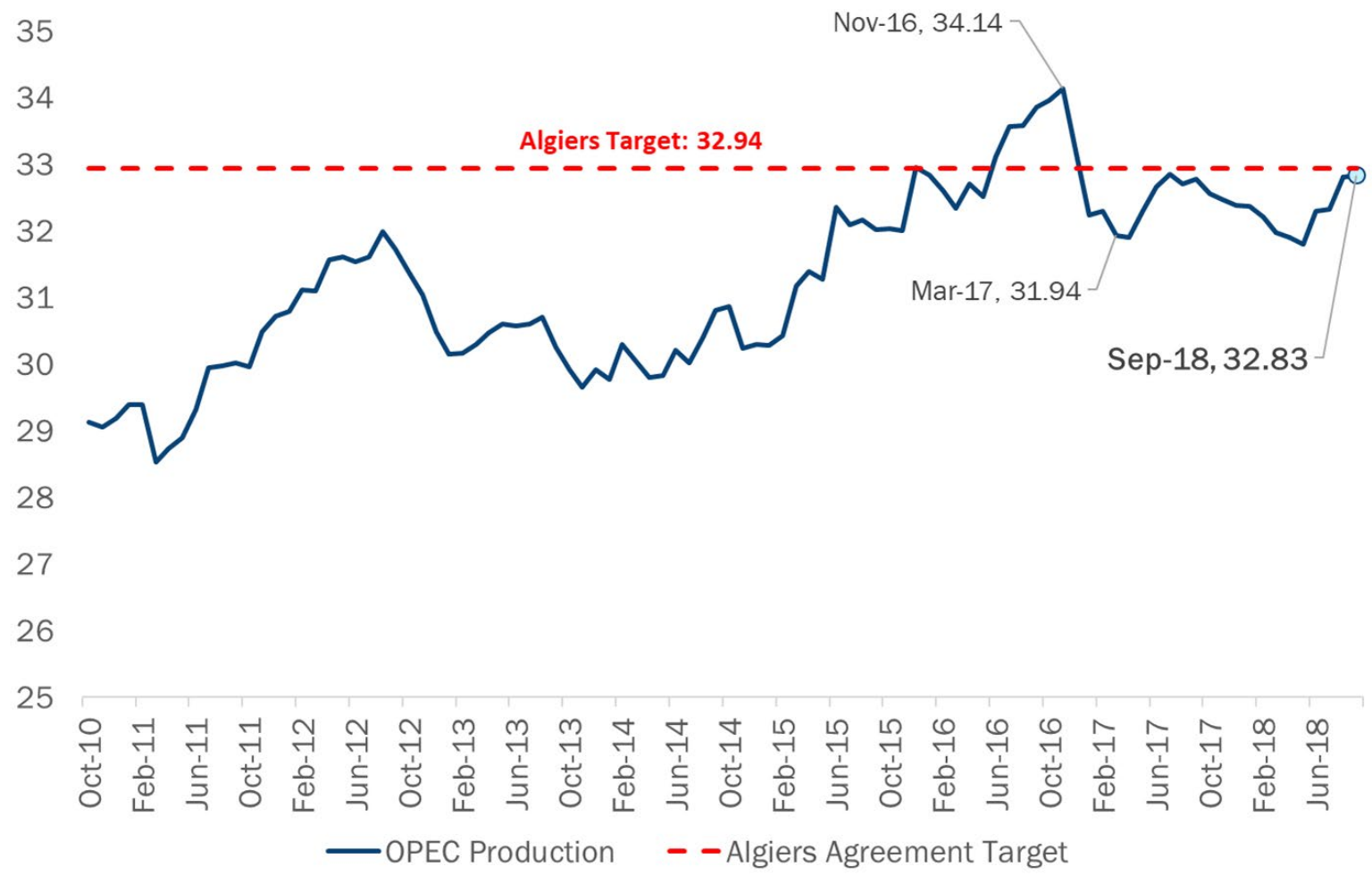


Source: EIA, Blacklight Research. Note: included regions are Anadarko, Appalachia, Bakken, Eagle Ford, Haynesville, Niobrara, Permian.



### OPEC oil production

million b/d

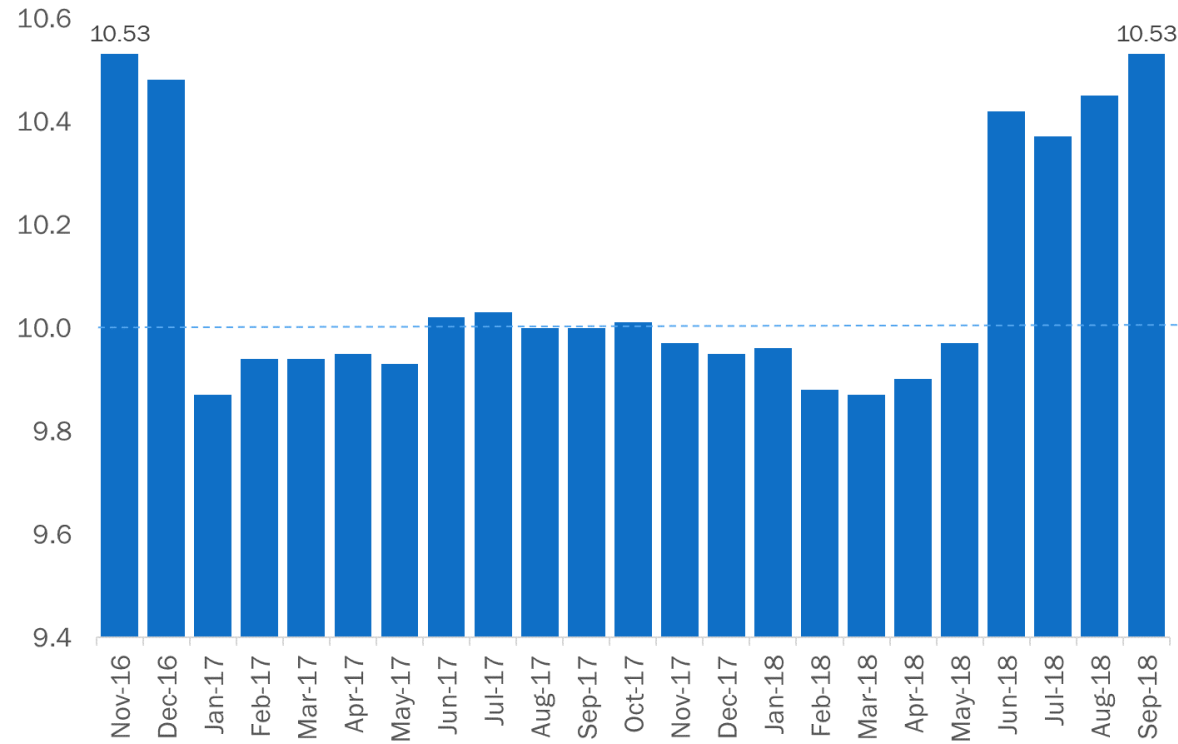


Source: OPEC, Blacklight Research.

10/23/2018

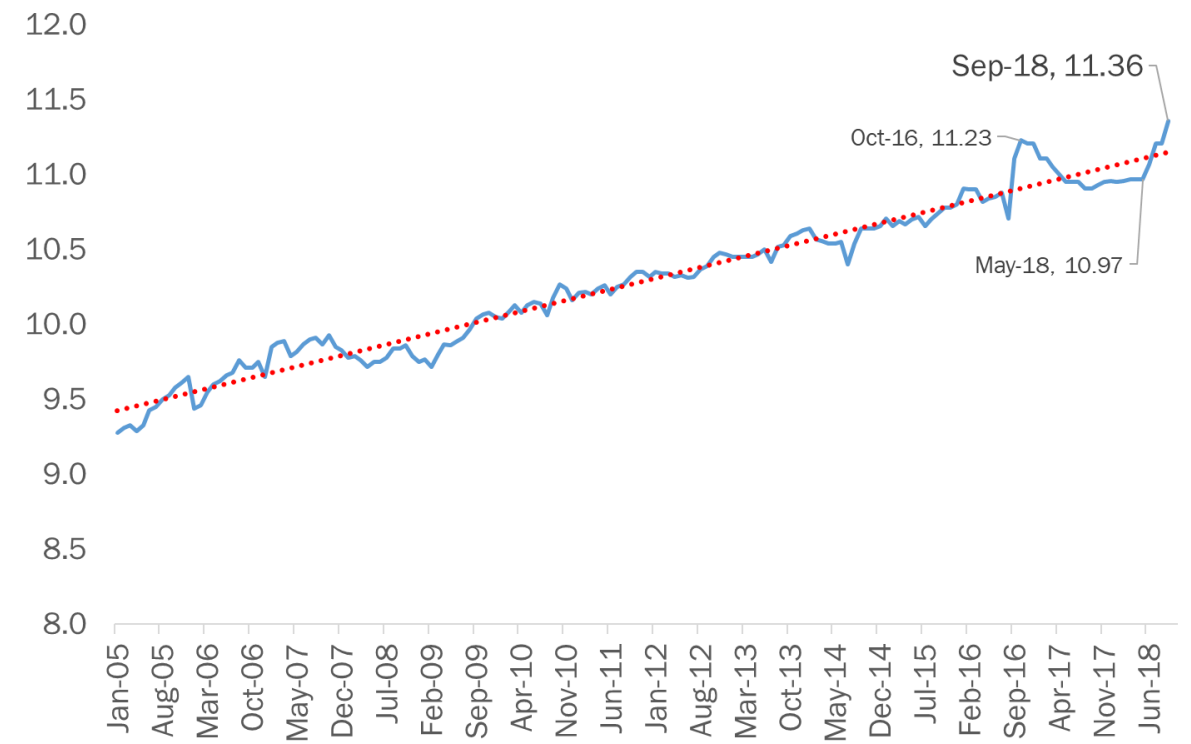
### Crude oil production – Saudi Arabia

million b/d



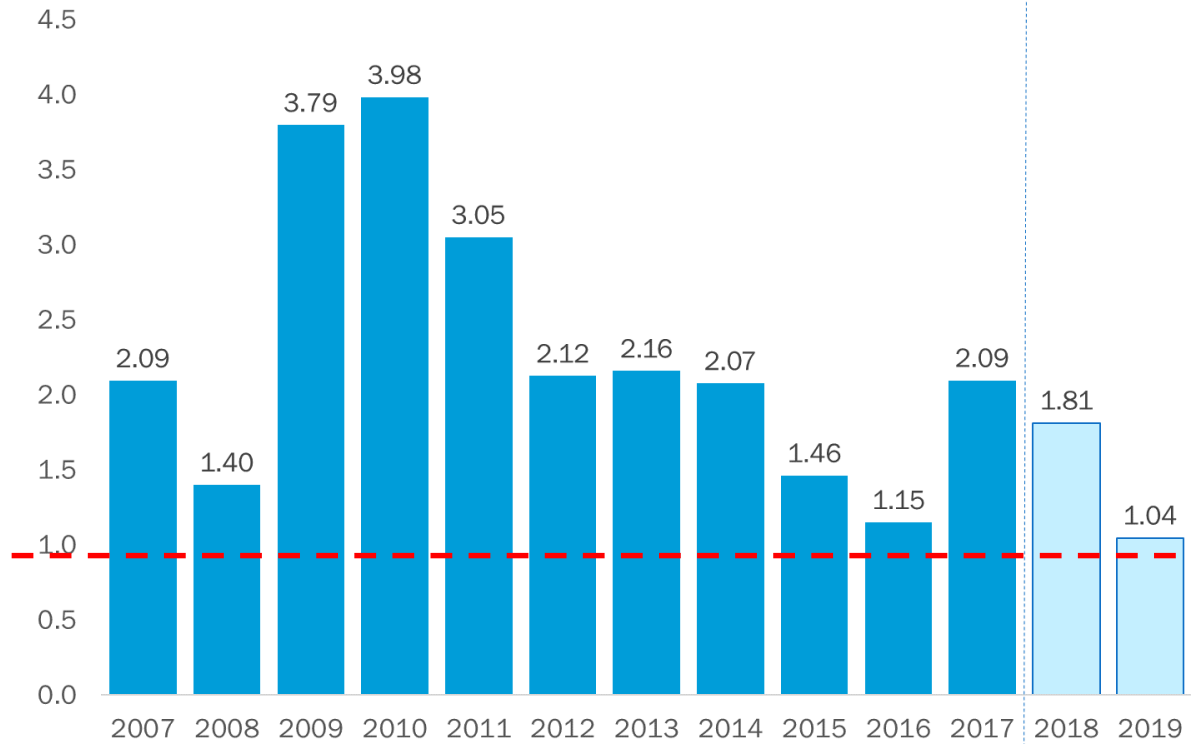
### Crude oil production – Russia

million b/d

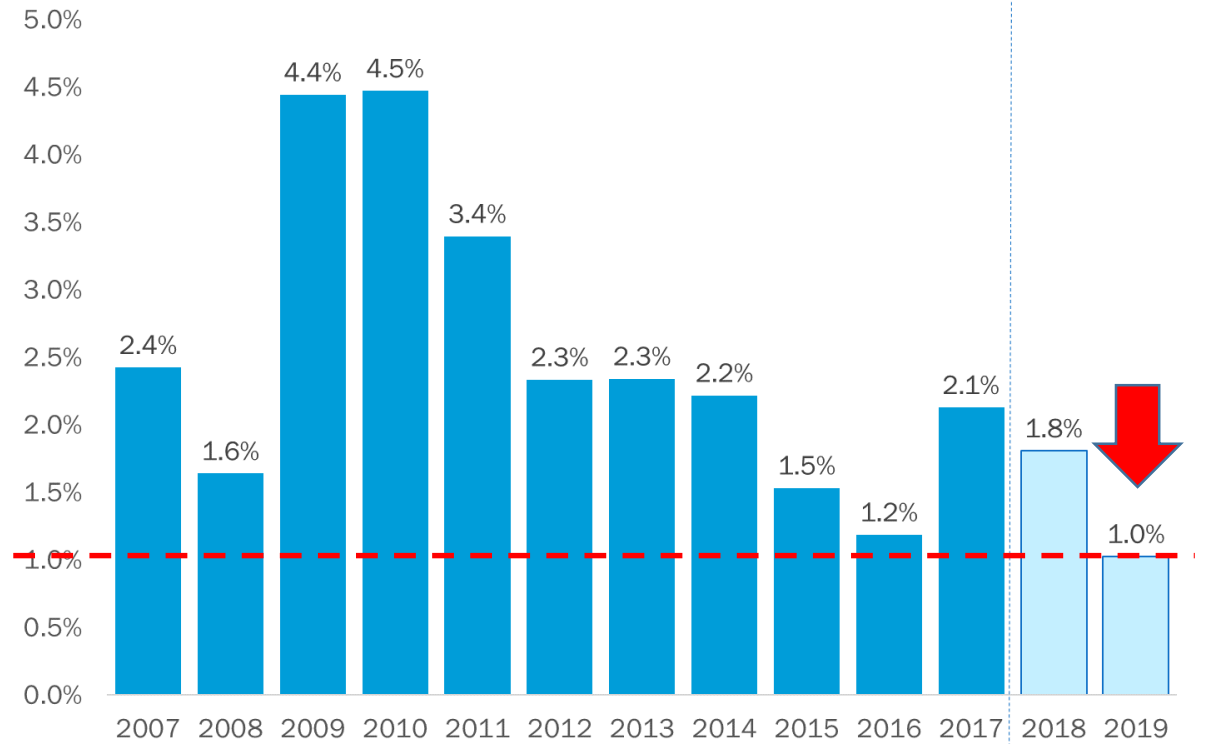


Source: OPEC, CDU-TEK, Blacklight Research.

OPEC spare production capacity  
million b/d



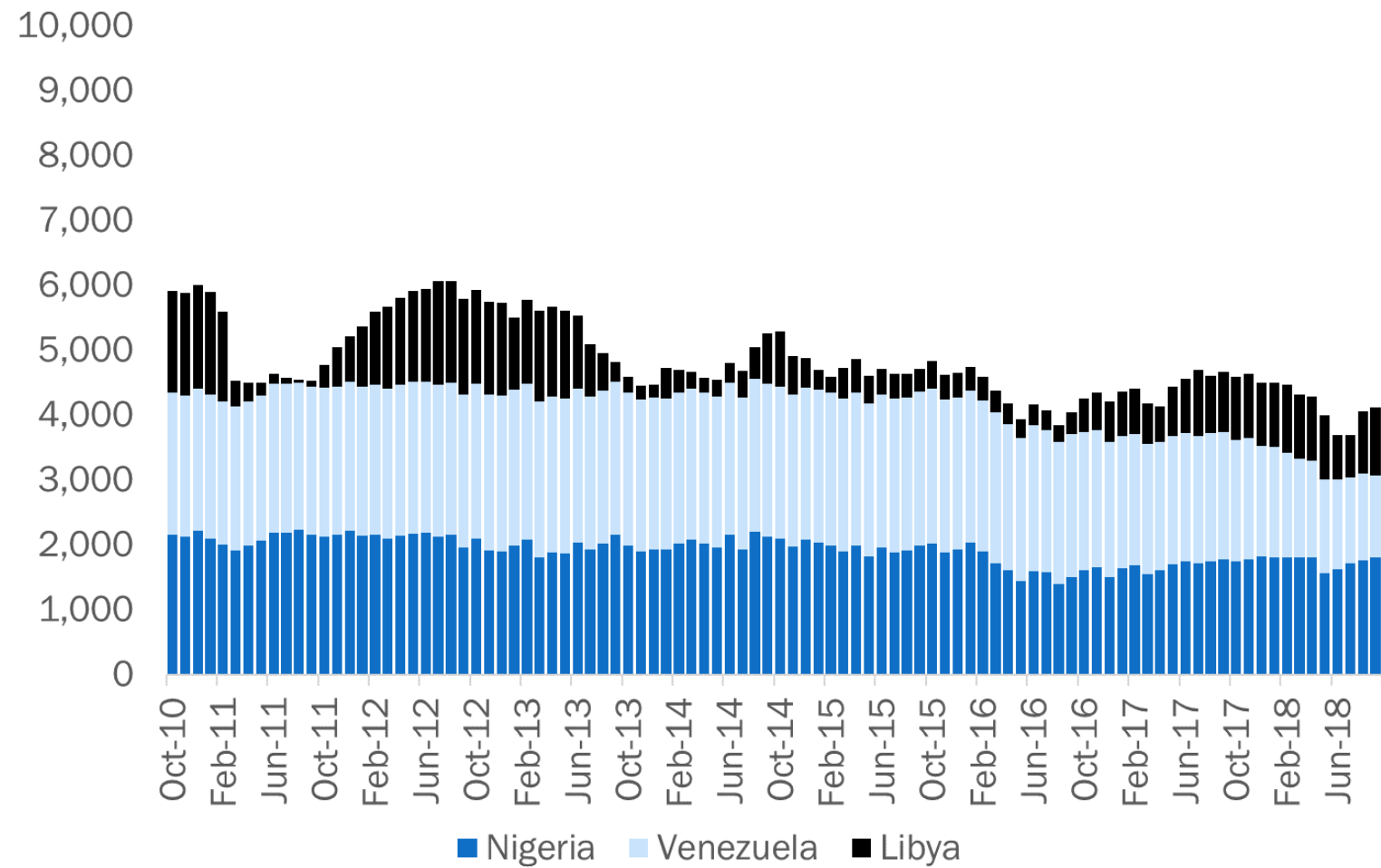
OPEC spare production capacity  
as % of global liquids consumption





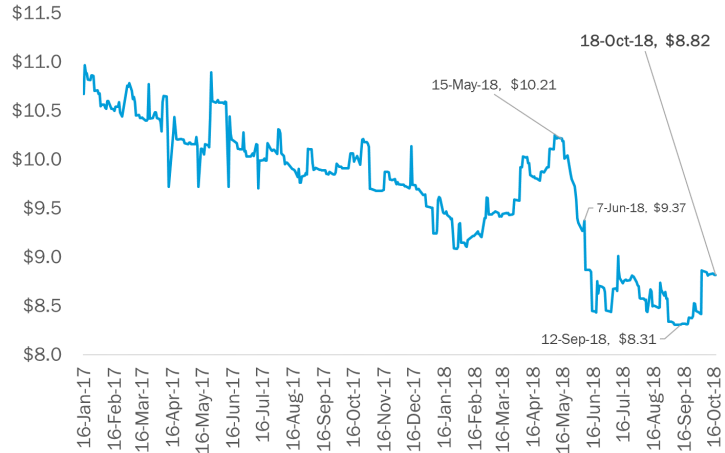
## Crude oil production: troubled streams

thousand b/d

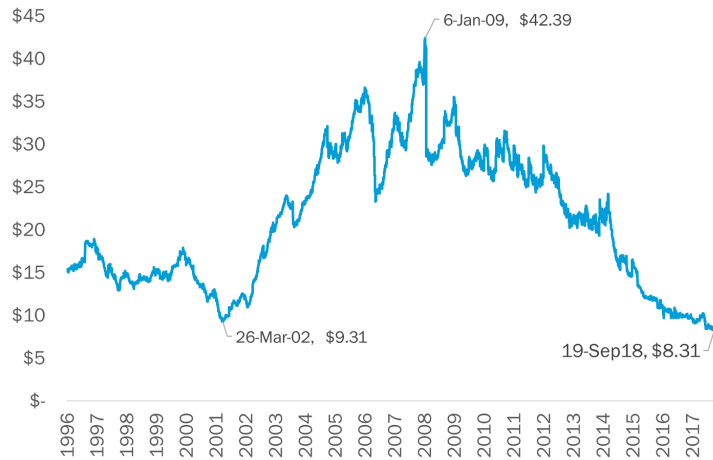


Source: OPEC, Blacklight Research.

International reserves, Venezuela  
billions USD



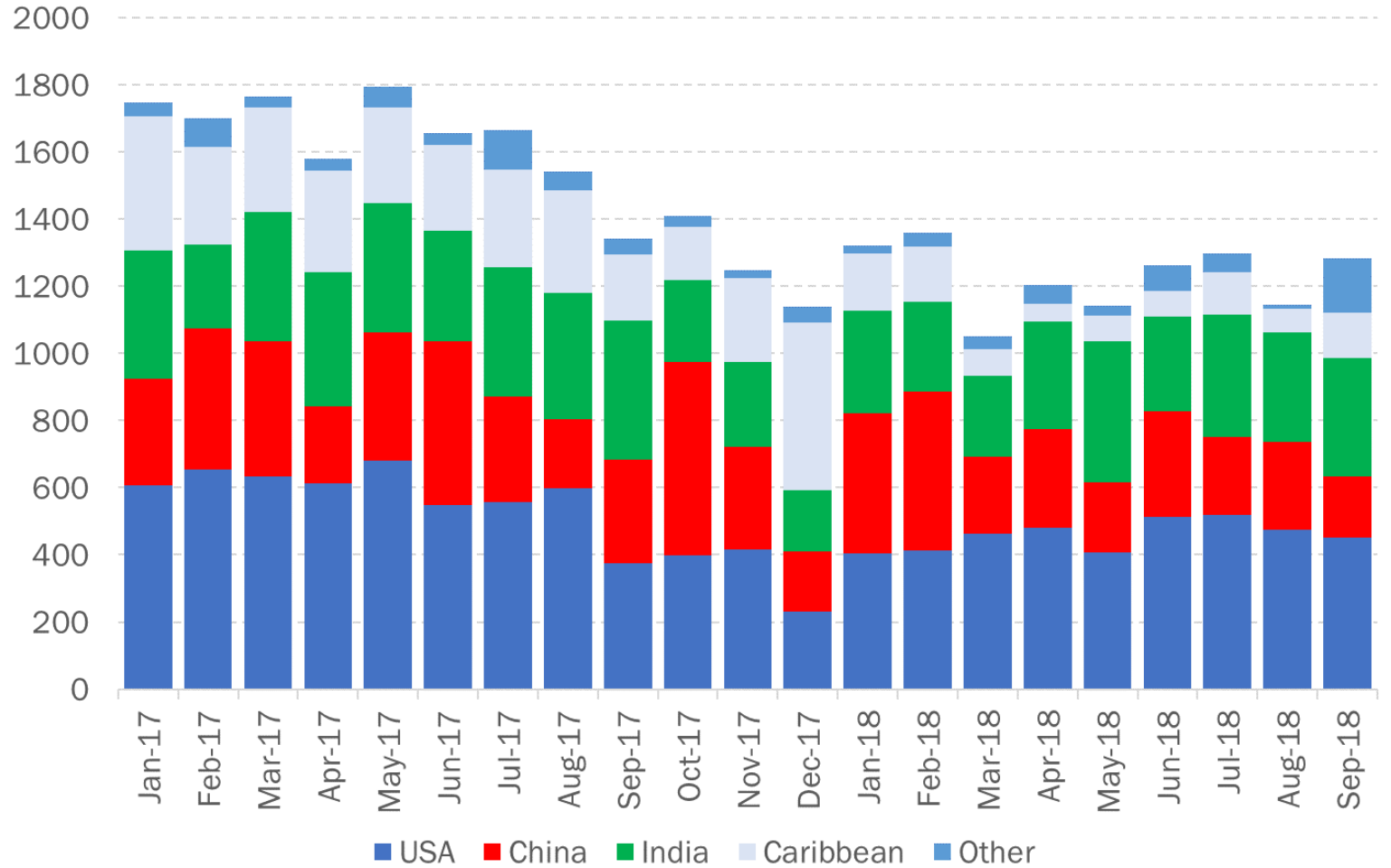
International reserves, Venezuela  
billions USD



Source: Banco Central de Venezuela.

10/23/2018

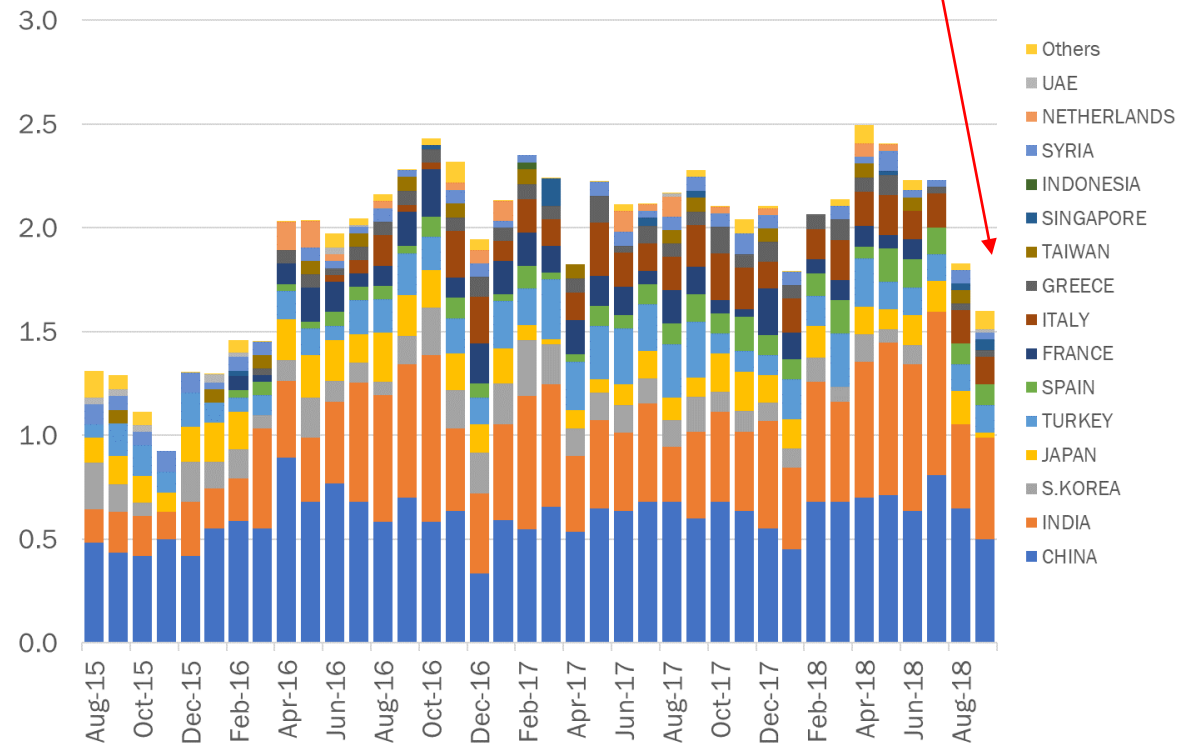
Venezuela's crude exports by destination  
thousand b/d



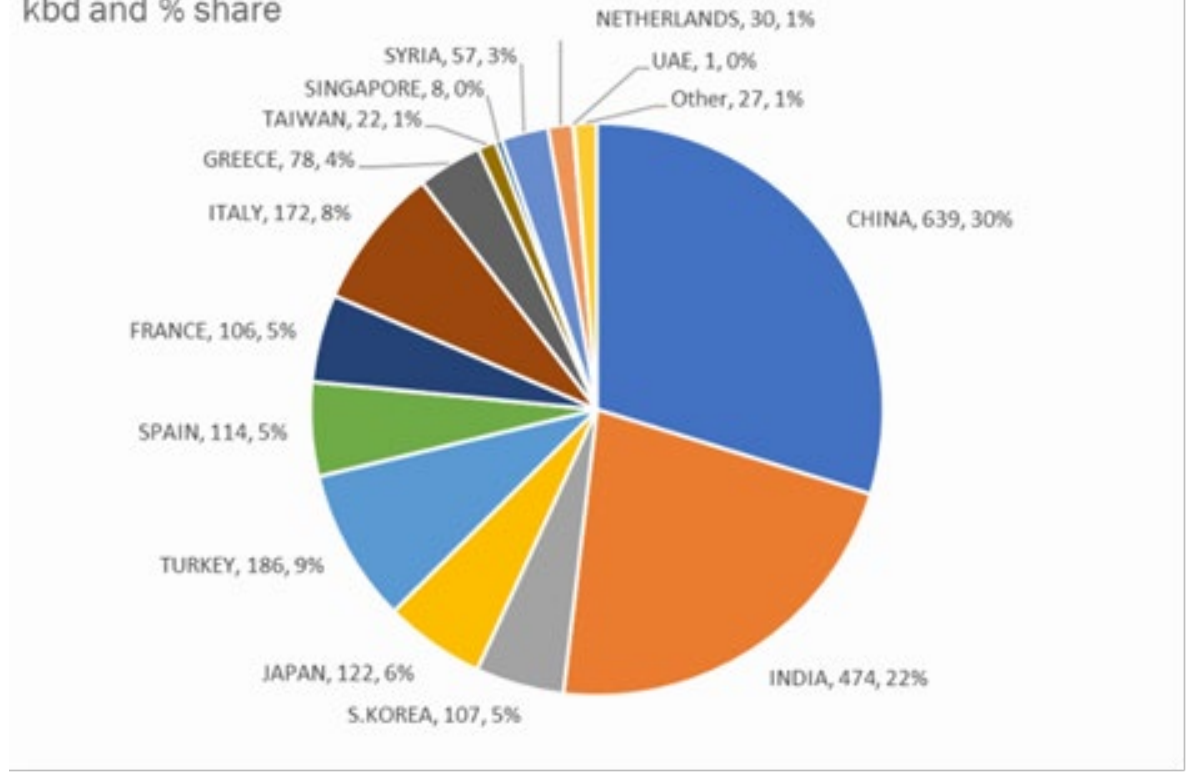
Source: Banco Central de Venezuela.

Oil and Gas Boom in the Year of Folly and the Hammer

### Iran's crude oil exports to the world million b/d



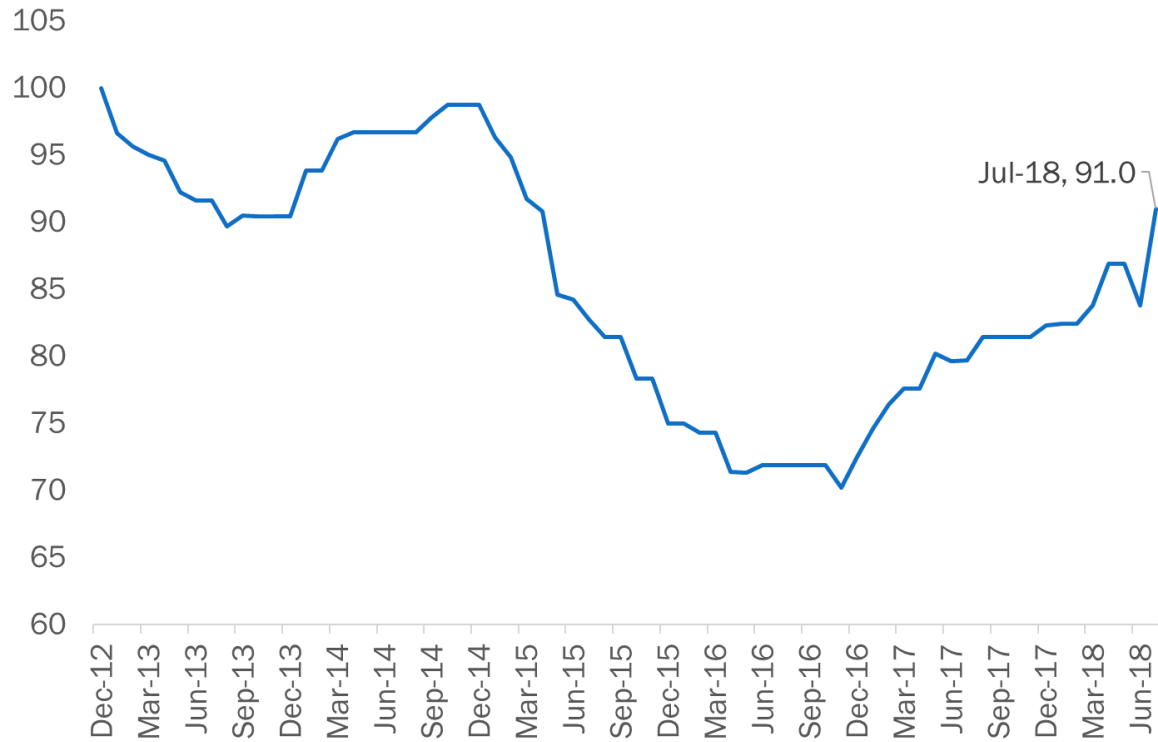
### Iran's crude oil exports (12-month avg, May-18) kbd and % share



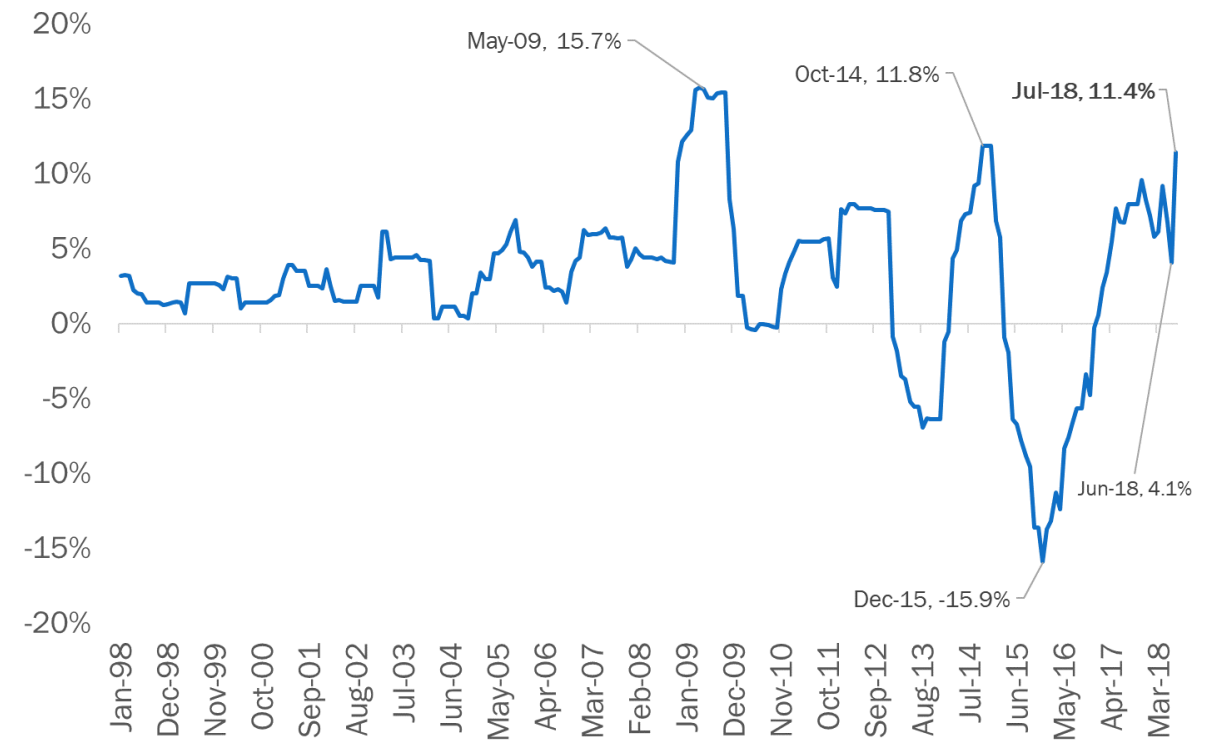
Source: NIOC, OPEC, Blacklight Research.



US producer price, hydraulic fracturing sand  
Index Dec-2012 = 100, NSA

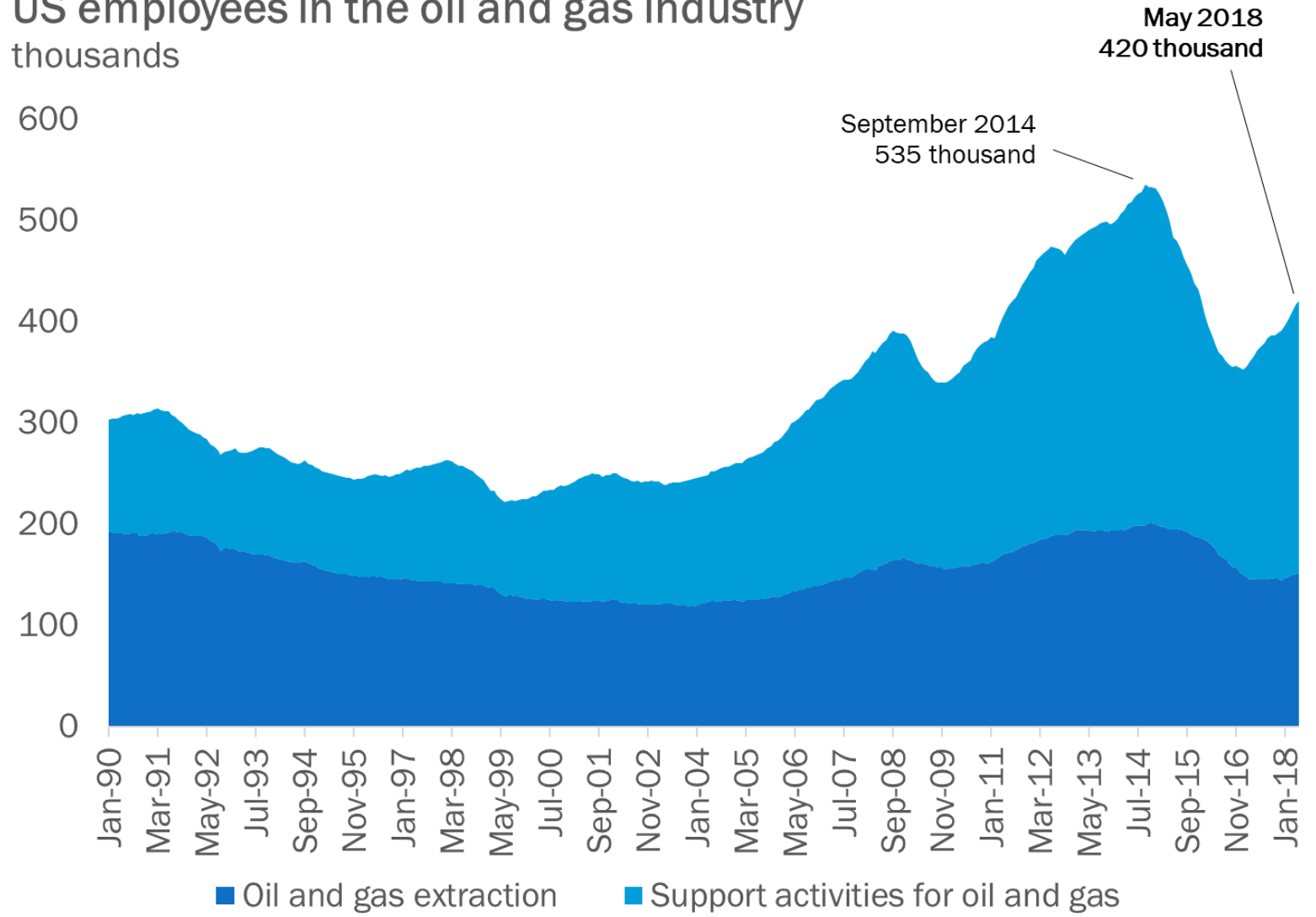


US producer price, frac sand & other industrial sands  
% change YoY



Source: BLS, Blacklight Research.

## US employees in the oil and gas industry thousands



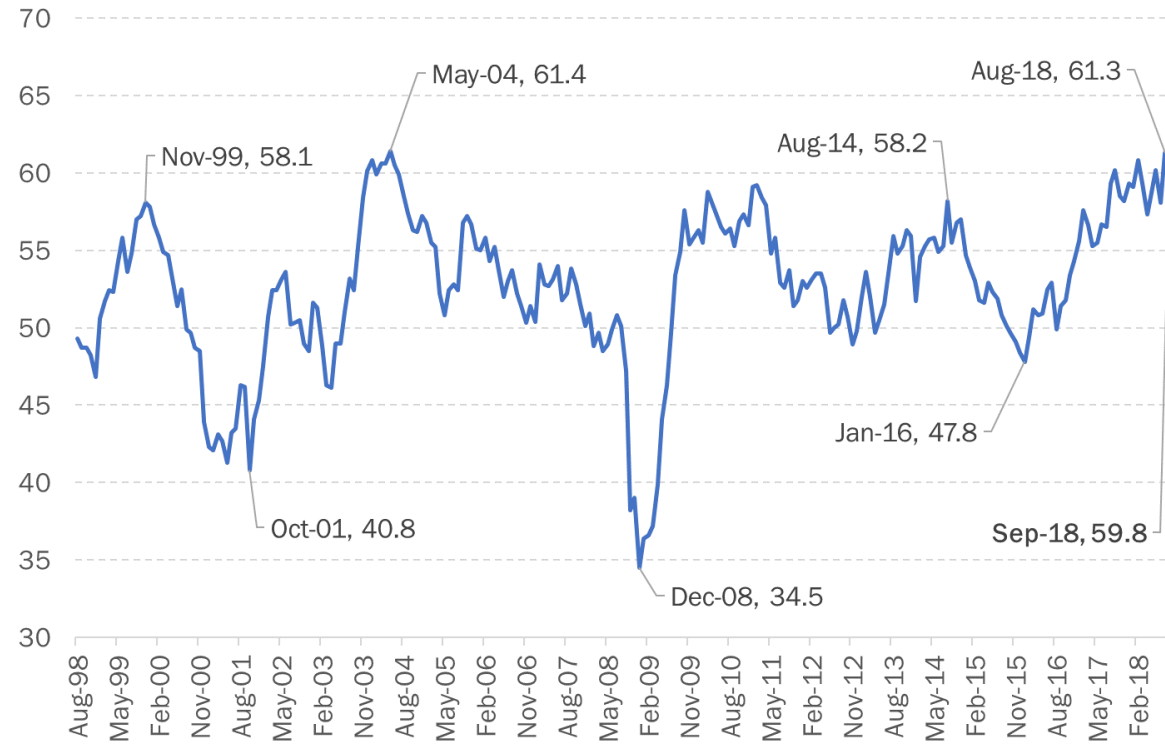
Source: BLS, Blacklight Research.

## **CONTEXT OF DEMAND**



### US Manufacturing PMI: ISM

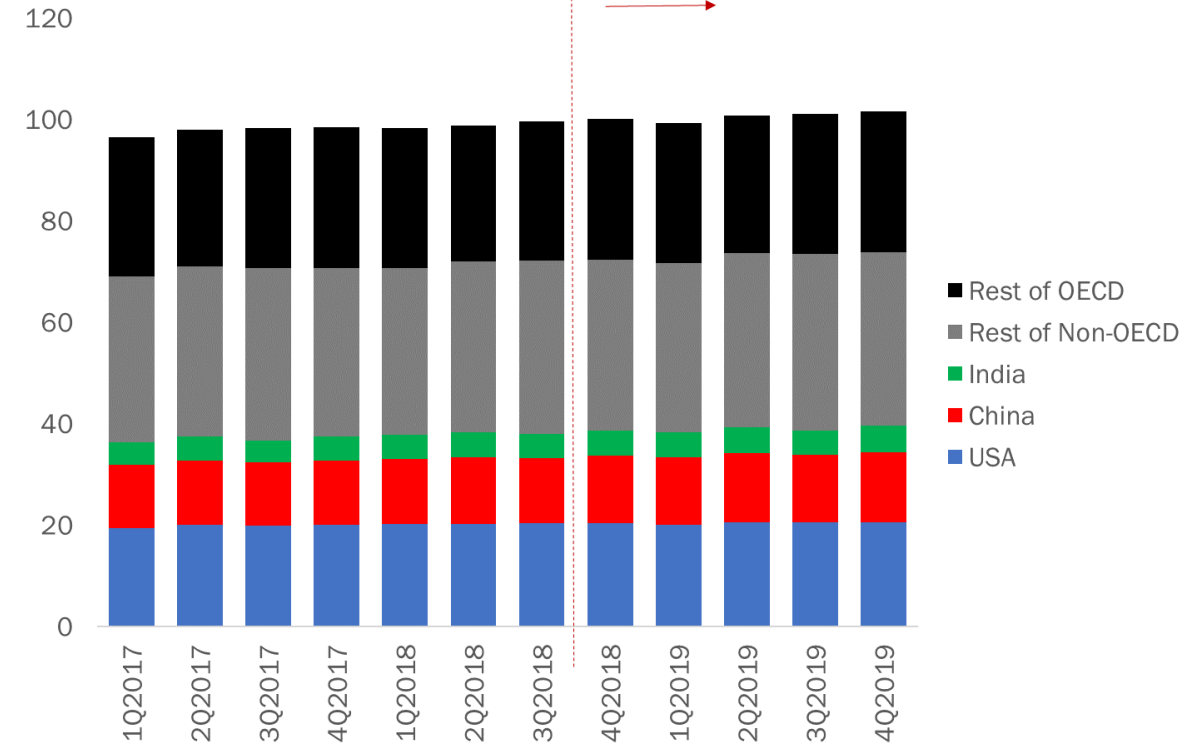
SA, diffusion index



Source: Institute for Supply Management, Blacklight Research LLC.

### Global liquids demand

million b/d



Source: IEA, Blacklight Research LLC.

|                   | Jan-16 | Feb-16 | Mar-16 | Apr-16 | May-16 | Jun-16 | Jul-16 | Aug-16 | Sep-16 | Oct-16 | Nov-16 | Dec-16 | Jan-17 | Feb-17 | Mar-17 | Apr-17 | Jun-17 | Jul-17 | Aug-17 | Sep-17 | Oct-17 | Nov-17 | Dec-17 | Jan-18 | Feb-18 | Mar-18 | Apr-18 | May-18 | Jun-18 | Jul-18 | Aug-18 | Sep-18 |
|-------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| UNITED STATES     | 47.8   | 49.4   | 51.2   | 50.8   | 50.9   | 52.5   | 52.9   | 49.9   | 51.4   | 51.8   | 53.4   | 54.3   | 55.6   | 57.6   | 56.6   | 55.3   | 56.7   | 56.5   | 59.3   | 60.2   | 58.5   | 58.2   | 59.3   | 59.1   | 60.8   | 59.3   | 57.3   | 58.7   | 60.2   | 58.1   | 61.3   | 59.8   |
| CHINA             | 48.4   | 48.0   | 49.7   | 49.4   | 49.2   | 48.6   | 50.6   | 50.0   | 50.1   | 51.2   | 50.9   | 51.9   | 51.0   | 51.7   | 51.2   | 50.3   | 50.4   | 51.1   | 51.6   | 51.0   | 51.0   | 50.8   | 51.5   | 51.5   | 51.6   | 51.0   | 51.1   | 51.1   | 51.0   | 50.8   | 50.6   | 50.0   |
| JAPAN             | 52.3   | 50.1   | 49.1   | 48.2   | 47.7   | 48.1   | 49.3   | 49.5   | 50.4   | 51.4   | 51.3   | 52.4   | 52.7   | 53.3   | 52.4   | 52.7   | 52.4   | 52.1   | 52.2   | 52.9   | 52.8   | 53.6   | 54.0   | 54.8   | 54.1   | 53.1   | 53.8   | 52.8   | 53.0   | 52.3   | 52.5   | 52.5   |
| GERMANY           | 52.3   | 50.5   | 50.7   | 51.8   | 52.1   | 54.5   | 53.8   | 53.6   | 54.3   | 55.0   | 54.3   | 55.6   | 56.4   | 56.8   | 58.3   | 58.2   | 59.6   | 58.1   | 59.3   | 60.6   | 60.6   | 62.5   | 63.3   | 61.1   | 60.6   | 58.2   | 58.1   | 56.9   | 55.9   | 56.9   | 55.9   | 53.7   |
| UNITED KINGDOM    | 52.2   | 50.9   | 51.1   | 50.0   | 50.6   | 53.1   | 48.6   | 53.3   | 55.3   | 53.9   | 51.3   | 55.6   | 55.2   | 54.6   | 54.1   | 57.7   | 54.3   | 55.5   | 57.0   | 55.6   | 56.2   | 58.5   | 56.0   | 55.1   | 54.9   | 54.9   | 53.9   | 54.3   | 54.2   | 53.9   | 53.0   | 53.8   |
| FRANCE            | 50.0   | 50.2   | 49.6   | 48.0   | 48.4   | 48.3   | 48.6   | 48.3   | 49.7   | 51.8   | 51.7   | 53.5   | 53.6   | 52.2   | 53.3   | 55.1   | 54.8   | 54.9   | 55.8   | 56.1   | 56.1   | 57.7   | 58.8   | 58.4   | 55.9   | 53.7   | 53.8   | 54.4   | 52.5   | 53.3   | 53.5   | 52.5   |
| BRAZIL            | 47.4   | 44.5   | 46.0   | 42.6   | 41.6   | 43.2   | 46.0   | 45.7   | 46.0   | 46.3   | 46.2   | 45.2   | 44.0   | 46.9   | 49.6   | 50.1   | 50.5   | 50.0   | 50.9   | 50.9   | 51.2   | 53.5   | 52.4   | 51.2   | 53.2   | 53.4   | 52.3   | 50.7   | 49.8   | 50.5   | 51.1   | 50.9   |
| ITALY             | 53.6   | 53.8   | 51.2   | 52.1   | 49.8   | 51.9   | 52.0   | 52.3   | 50.7   | 51.0   | 53.3   | 52.3   | 52.4   | 54.1   | 52.9   | 56.2   | 53.6   | 56.3   | 55.1   | 53.2   | 52.1   | 54.7   | 55.4   | 57.7   | 55.0   | 52.6   | 53.1   | 54.3   | 54.0   | 52.6   | 53.3   | 53.3   |
| INDIA             | 51.1   | 51.1   | 52.4   | 50.5   | 50.7   | 51.7   | 51.8   | 52.6   | 52.1   | 54.4   | 52.3   | 49.6   | 50.4   | 50.7   | 52.5   | 52.5   | 50.9   | 47.9   | 51.2   | 51.2   | 50.3   | 52.6   | 54.7   | 52.4   | 52.1   | 51.0   | 51.6   | 51.2   | 53.1   | 54.3   | 52.0   | 52.2   |
| RUSSIA            | 49.8   | 49.3   | 48.3   | 48.0   | 49.6   | 51.5   | 49.5   | 50.8   | 51.1   | 52.4   | 53.6   | 53.7   | 54.7   | 52.5   | 52.4   | 50.8   | 50.3   | 52.7   | 51.6   | 51.9   | 51.1   | 51.5   | 52.0   | 52.1   | 50.2   | 50.6   | 51.3   | 49.8   | 49.5   | 48.1   | 48.9   | 50.0   |
| CANADA            | 49.3   | 49.4   | 51.5   | 52.2   | 52.1   | 51.8   | 51.9   | 51.1   | 50.3   | 51.1   | 51.5   | 51.8   | 53.5   | 54.7   | 55.5   | 55.9   | 54.7   | 55.5   | 54.6   | 55.0   | 54.3   | 54.4   | 54.7   | 55.9   | 55.6   | 55.7   | 55.5   | 56.2   | 57.1   | 56.9   | 56.8   | 54.8   |
| AUSTRALIA         | 41.3   | 45.5   | 38.6   | 47.8   | 46.0   | 0.0    | 60.7   | 49.5   | 43.8   | 48.3   | 46.6   | 49.1   | 55.4   | 60.5   | 59.5   | 60.4   | 56.5   | 54.0   | 55.5   | 47.6   | 44.1   | 53.9   | 57.7   | 60.2   | 56.6   | 64.2   | 63.3   | 57.6   | 49.5   | 46.9   | 52.1   | 59.1   |
| SOUTH KOREA       | 49.5   | 48.7   | 49.5   | 50.0   | 50.1   | 50.5   | 50.1   | 48.6   | 47.6   | 48.0   | 48.0   | 49.4   | 49.0   | 49.2   | 48.4   | 49.4   | 50.1   | 49.1   | 49.9   | 50.6   | 50.2   | 51.2   | 49.9   | 50.7   | 50.3   | 49.1   | 48.4   | 48.9   | 49.8   | 48.3   | 49.9   | 51.3   |
| SPAIN             | 53.4   | 54.1   | 53.4   | 53.5   | 51.8   | 52.2   | 51.0   | 51.0   | 52.3   | 53.3   | 54.5   | 53.3   | 55.6   | 54.8   | 53.9   | 54.5   | 54.7   | 54.0   | 52.4   | 54.3   | 55.8   | 56.1   | 55.8   | 55.2   | 56.0   | 54.8   | 54.4   | 53.4   | 53.4   | 52.9   | 53.0   | 51.4   |
| MEXICO            | 52.2   | 53.1   | 53.2   | 52.4   | 53.6   | 51.1   | 50.6   | 50.9   | 51.9   | 51.8   | 51.1   | 50.2   | 50.8   | 50.6   | 51.5   | 50.7   | 52.3   | 51.2   | 52.2   | 52.8   | 49.2   | 52.4   | 51.7   | 52.6   | 51.6   | 52.4   | 51.6   | 51.0   | 52.1   | 52.1   | 50.7   | 51.7   |
| INDONESIA         | 48.9   | 48.7   | 50.6   | 50.9   | 50.6   | 51.9   | 48.4   | 50.4   | 50.9   | 48.7   | 49.7   | 49.0   | 50.4   | 49.3   | 50.5   | 51.2   | 49.5   | 48.6   | 50.7   | 50.4   | 50.1   | 50.4   | 49.3   | 49.9   | 51.4   | 50.7   | 51.6   | 51.7   | 50.3   | 50.5   | 51.9   | 50.7   |
| NETHERLANDS       | 52.4   | 51.7   | 53.6   | 52.6   | 52.7   | 52.0   | 53.2   | 53.5   | 53.4   | 55.7   | 57.0   | 57.3   | 56.5   | 58.3   | 57.8   | 57.8   | 58.6   | 58.9   | 59.7   | 60.0   | 60.4   | 62.4   | 62.2   | 62.5   | 63.4   | 61.5   | 60.7   | 60.3   | 60.1   | 58.0   | 59.1   | 59.8   |
| TURKEY            | 50.9   | 50.3   | 49.2   | 48.9   | 49.4   | 47.4   | 47.6   | 47.0   | 48.3   | 49.8   | 48.8   | 47.7   | 48.7   | 49.7   | 52.3   | 51.7   | 54.7   | 53.6   | 55.3   | 53.5   | 52.8   | 52.9   | 54.9   | 55.7   | 55.6   | 51.8   | 48.9   | 46.4   | 46.8   | 49.0   | 46.4   | 42.7   |
| SAUDI ARABIA      | 53.9   | 54.4   | 54.5   | 54.2   | 54.8   | 54.4   | 56.0   | 56.6   | 55.3   | 53.2   | 55.0   | 55.5   | 56.7   | 57.0   | 56.4   | 56.5   | 54.3   | 55.7   | 55.8   | 55.5   | 55.6   | 57.5   | 57.3   | 53.0   | 53.2   | 52.8   | 51.4   | 53.2   | 55.0   | 54.9   | 55.1   | 53.4   |
| SWITZERLAND       | 50.2   | 51.1   | 53.0   | 53.1   | 55.3   | 51.5   | 51.5   | 51.7   | 54.5   | 55.2   | 55.5   | 55.9   | 55.0   | 58.1   | 57.5   | 58.3   | 60.0   | 60.3   | 61.4   | 62.2   | 61.5   | 64.6   | 65.6   | 65.3   | 65.5   | 60.3   | 63.6   | 62.4   | 61.6   | 61.9   | 64.8   | 59.7   |
| SWEDEN            | 55.4   | 51.6   | 53.1   | 54.0   | 54.1   | 53.0   | 55.4   | 51.2   | 54.9   | 58.5   | 57.2   | 60.2   | 62.1   | 60.8   | 65.2   | 62.6   | 62.4   | 60.3   | 54.8   | 63.7   | 59.3   | 63.2   | 65.0   | 56.9   | 59.8   | 55.9   | 54.5   | 55.7   | 54.2   | 57.4   | 52.5   | 55.2   |
| POLAND            | 50.9   | 52.8   | 53.8   | 51.0   | 52.1   | 51.8   | 50.3   | 51.5   | 52.2   | 50.2   | 51.9   | 54.3   | 54.8   | 54.2   | 53.5   | 54.1   | 53.1   | 52.3   | 52.5   | 53.7   | 53.4   | 54.2   | 55.0   | 54.6   | 53.7   | 53.7   | 53.9   | 53.3   | 54.2   | 52.9   | 51.4   | 50.5   |
| TAIWAN            | 50.6   | 49.4   | 51.1   | 49.7   | 48.5   | 50.5   | 51.0   | 51.8   | 52.2   | 52.7   | 54.7   | 56.2   | 55.6   | 54.5   | 56.2   | 54.4   | 53.3   | 53.6   | 54.3   | 54.2   | 53.6   | 56.3   | 56.6   | 56.9   | 56.0   | 55.3   | 54.8   | 53.4   | 54.5   | 53.1   | 53.0   | 50.8   |
| NORWAY            | 50.1   | 49.4   | 48.4   | 50.4   | 52.8   | 53.5   | 53.9   | 51.2   | 53.5   | 53.3   | 48.0   | 52.7   | 52.2   | 53.8   | 55.3   | 54.6   | 55.9   | 59.1   | 54.8   | 52.0   | 54.3   | 57.4   | 57.9   | 58.5   | 56.7   | 54.7   | 56.1   | 56.0   | 56.2   | 48.9   | 60.5   | 55.7   |
| AUSTRIA           | 51.2   | 51.9   | 52.8   | 52.0   | 52.0   | 54.5   | 53.4   | 52.1   | 53.5   | 53.9   | 55.4   | 56.3   | 57.3   | 57.2   | 56.8   | 58.1   | 60.7   | 60.0   | 61.1   | 59.4   | 59.4   | 61.9   | 64.3   | 61.3   | 59.2   | 58.0   | 58.0   | 57.3   | 56.6   | 56.8   | 56.4   | 55.0   |
| UAE               | 52.7   | 53.1   | 54.5   | 52.8   | 54.0   | 53.4   | 55.3   | 54.7   | 54.1   | 53.3   | 54.2   | 55.0   | 55.3   | 56.0   | 56.2   | 56.1   | 55.8   | 56.0   | 57.3   | 55.1   | 55.9   | 57.0   | 57.7   | 56.8   | 55.1   | 54.8   | 55.1   | 56.5   | 57.1   | 55.8   | 55.0   | 55.3   |
| SOUTH AFRICA      | 49.6   | 49.1   | 47.0   | 47.9   | 50.2   | 49.6   | 49.9   | 49.8   | 50.7   | 50.5   | 50.8   | 51.6   | 51.3   | 50.5   | 50.7   | 50.3   | 49.0   | 50.1   | 49.8   | 48.5   | 49.6   | 48.8   | 48.4   | 49.0   | 51.4   | 51.1   | 50.4   | 50.0   | 50.9   | 49.3   | 47.2   | 48.0   |
| MALAYSIA          | 48.6   | 47.8   | 48.4   | 47.1   | 47.2   | 47.1   | 48.1   | 47.4   | 48.6   | 47.2   | 47.1   | 47.1   | 48.6   | 49.4   | 49.5   | 50.7   | 46.9   | 48.3   | 50.4   | 49.9   | 48.6   | 52.0   | 49.9   | 50.5   | 49.9   | 49.5   | 48.6   | 47.6   | 49.5   | 49.7   | 51.2   | 51.5   |
| SINGAPORE         | 52.5   | 51.6   | 52.0   | 49.4   | 50.1   | 52.3   | 50.7   | 52.3   | 52.9   | 50.5   | 52.8   | 52.0   | 51.6   | 51.4   | 52.2   | 52.6   | 50.7   | 51.3   | 53.2   | 53.2   | 54.2   | 55.4   | 52.1   | 53.6   | 55.3   | 53.7   | 55.6   | 56.8   | 56.0   | 53.0   | 51.1   | 49.6   |
| ISRAEL            | 48.1   | 48.6   | 49.0   | 50.5   | 49.4   | 48.8   | 50.1   | 57.0   | 52.1   | 51.1   | 54.3   | 67.2   | 62.6   | 61.2   | 54.8   | 52.0   | 50.3   | 54.3   | 58.4   | 57.2   | 53.2   | 49.7   | 53.4   | 53.5   | 53.6   | 54.7   | 54.0   | 49.6   | 52.6   | 58.0   | 50.4   | 50.0   |
| EGYPT             | 48.0   | 48.1   | 44.5   | 46.9   | 47.6   | 47.5   | 48.9   | 47.0   | 46.3   | 42.0   | 41.8   | 42.8   | 43.3   | 46.7   | 45.9   | 47.4   | 47.2   | 48.6   | 48.9   | 47.4   | 48.4   | 50.7   | 48.3   | 49.9   | 49.7   | 49.2   | 50.1   | 49.2   | 49.4   | 50.3   | 50.5   | 48.7   |
| IRELAND           | 54.3   | 52.9   | 54.9   | 52.6   | 51.5   | 53.0   | 50.2   | 51.7   | 51.3   | 52.1   | 53.7   | 55.7   | 55.5   | 53.8   | 53.6   | 55.0   | 56.0   | 54.6   | 56.1   | 55.4   | 54.4   | 58.1   | 59.1   | 57.6   | 56.2   | 54.1   | 55.3   | 55.4   | 56.6   | 56.3   | 57.5   | 56.3   |
| GREECE            | 50.0   | 48.4   | 49.0   | 49.7   | 48.4   | 50.4   | 48.7   | 50.4   | 49.2   | 48.6   | 48.3   | 49.3   | 46.6   | 47.7   | 46.7   | 48.2   | 50.5   | 50.5   | 52.2   | 52.8   | 52.1   | 52.2   | 53.1   | 55.2   | 56.1   | 55.0   | 52.9   | 54.2   | 53.5   | 53.5   | 53.9   | 53.6   |
| CZECH REPUBLIC    | 56.9   | 55.5   | 54.3   | 53.6   | 53.3   | 51.8   | 49.3   | 50.1   | 52.0   | 53.3   | 52.2   | 53.8   | 55.7   | 57.6   | 57.5   | 57.5   | 56.4   | 55.3   | 54.9   | 56.6   | 58.5   | 58.7   | 59.8   | 59.8   | 58.8   | 57.3   | 57.2   | 56.5   | 56.8   | 55.4   | 54.9   | 53.4   |
| VIETNAM           | 51.5   | 50.3   | 50.7   | 52.3   | 52.7   | 52.6   | 51.9   | 52.2   | 52.9   | 51.7   | 54.0   | 52.4   | 51.9   | 54.2   | 54.6   | 54.1   | 52.5   | 51.7   | 51.8   | 53.3   | 51.6   | 51.4   | 52.5   | 53.4   | 53.5   | 51.6   | 52.7   | 53.9   | 55.7   | 54.9   | 53.7   | 51.5   |
| HUNGARY           | 53.1   | 54.6   | 51.7   | 52.1   | 52.2   | 50.9   | 53.8   | 51.7   | 57.2   | 57.1   | 56.3   | 52.8   | 57.0   | 59.4   | 55.9   | 56.2   | 56.9   | 54.2   | 56.8   | 59.3   | 58.3   | 58.8   | 60.5   | 61.1   | 57.2   | 56.6   | 53.3   | 55.2   | 52.9   | 53.3   | 56.0   | 53.8   |
| KENYA             | 56.4   | 55.2   | 52.6   | 54.8   | 54.0   | 51.5   | 53.3   | 53.5   | 53.5   | 52.0   | 53.3   | 54.1   | 52.0   | 50.1   | 48.5   | 50.3   | 47.3   | 48.1   | 42.0   | 40.9   | 44.4   | 42.8   | 53.0   | 52.9   | 54.7   | 55.7   | 56.4   | 55.4   | 55.0   | 53.6   | 54.6   | 52.7   |
| HONG KONG         | 46.1   | 46.4   | 45.5   | 45.3   | 47.2   | 45.4   | 47.2   | 49.0   | 49.3   | 48.2   | 49.5   | 50.3   | 49.9   | 49.6   | 49.9   | 51.1   | 51.1   | 51.3   | 49.7   | 51.2   | 50.3   | 50.7   | 51.5   | 51.1   | 51.7   | 50.6   | 49.1   | 47.8   | 47.7   | 48.2   | 48.5   | 47.9   |
| DEVELOPED MARKETS | 52.1   | 50.8   | 50.9   | 50.5   | 50.3   | 51.1   | 51.4   | 51.2   | 51.5   | 52.6   | 52.9   | 53.8   | 54.1   | 54.1   | 53.9   | 54.1   | 53.8   | 53.9   | 54.2   | 54.6   | 55.2   | 55.8   | 56.2   | 56.3   | 55.7   | 54.9   | 55.1   | 54.7   | 54.4   | 54.0   | 53.8   | 53.6   |
| EMERGING MARKETS  | 49.4   | 48.9   | 50.2   | 49.6   | 49.6   | 49.3   | 50.3   | 50.1   | 50.4   | 51.1   | 50.8   | 51.1   | 50.8   | 51.3   | 51.6   | 50.9   | 50.8   | 50.9   | 51.7   | 51.4   | 51.2   |        |        |        |        |        |        |        |        |        |        |        |



#### WHAT PREMIER SAYS

We will implement a larger tax cut and more fee reductions, including a significant reduction in social insurance premium rates, and reduce the burden on enterprises.

-- Holding talks with Summer Davos representatives in Tianjin on Sept 20



#### **September 27, 2018: GAC announces**

- "The General Administration of Customs (GAC) announced new measures on Sept 27 to expedite cargo clearance and cut administrative charges as part of the efforts to facilitate foreign trade. Clearance documents subject to verification at ports will be reduced from 86 to 48 by Nov 1, Zhang Guangzhi, a senior GAC official, told a press briefing."

#### **September 26, 2018: GAC announces, effective November 1, 2018**

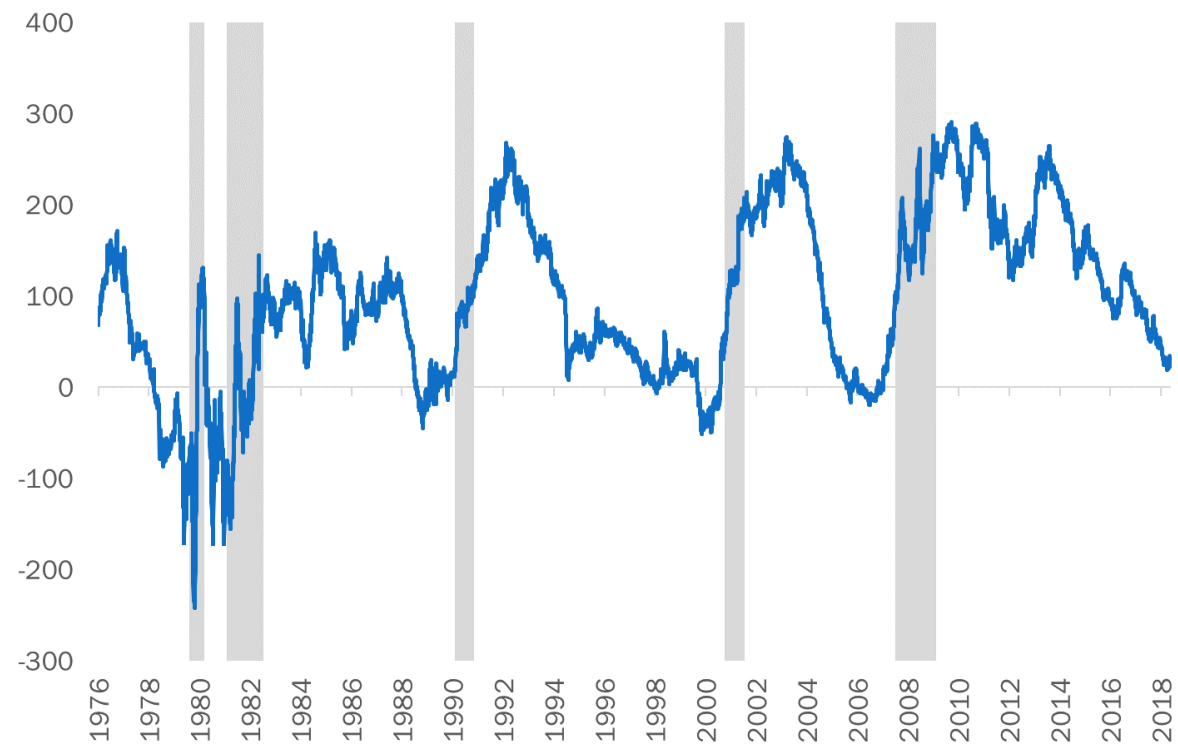
- Applies to about 1,585 items.
- Electromechanical equipment will be reduced to 8.8% from 12.2%.
- Textiles and construction materials will be lowered to 8.4% from 11.5%.
- Paper will be lowered to 5.4% from 6.6%.
- China's overall tariff level will be lowered to 7.5% from 9.8% in 2017.

#### **May 30, 2018: GAC announces reduction of average import tariff rates, effective July 1, 2018**

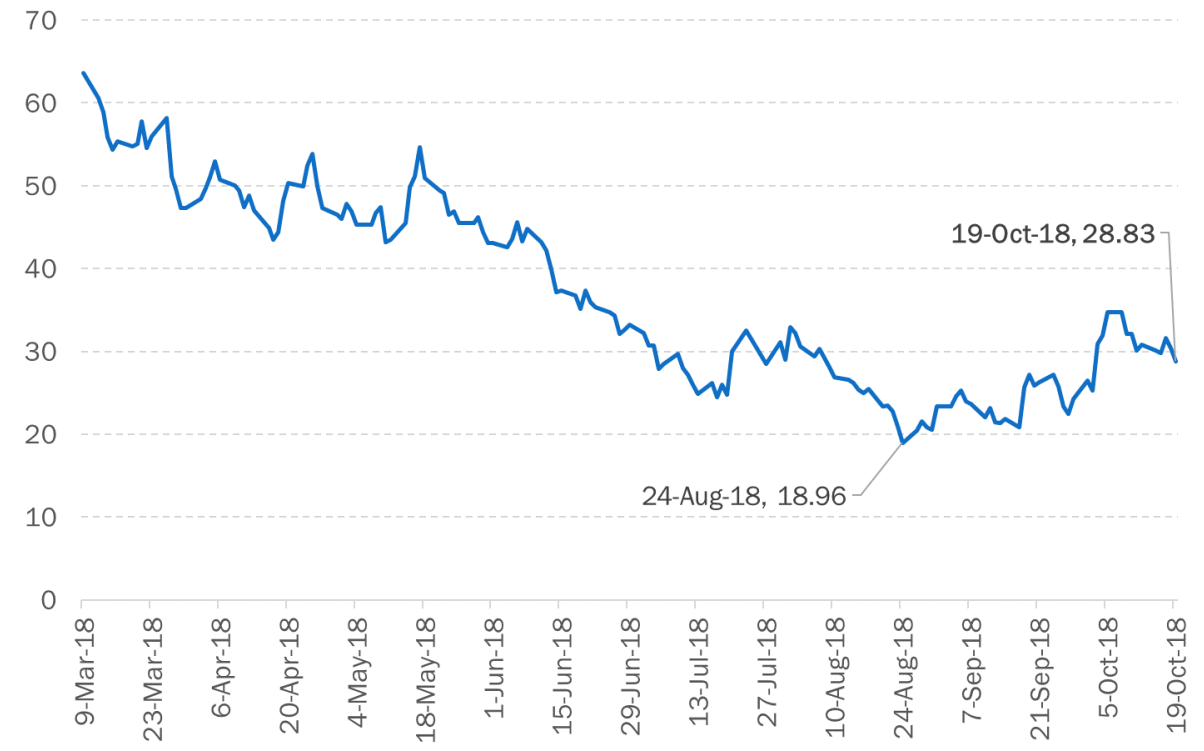
- "Clothing, shoes, hats, kitchens and sports and fitness products will be reduced from 15.9% to 7.1%.
- Household appliances such as washing machines and refrigerators will be reduced from 20.5% to 8.0%.
- Processed foods such as farmed, caught aquatic products and mineral water decreased from 15.2% to 6.9%.
- Detergents and skin care, hairdressing and other cosmetics and some medical and health products was 8.4% dropped to 2.9%."



UST 10Y-2Y Spread  
basis points



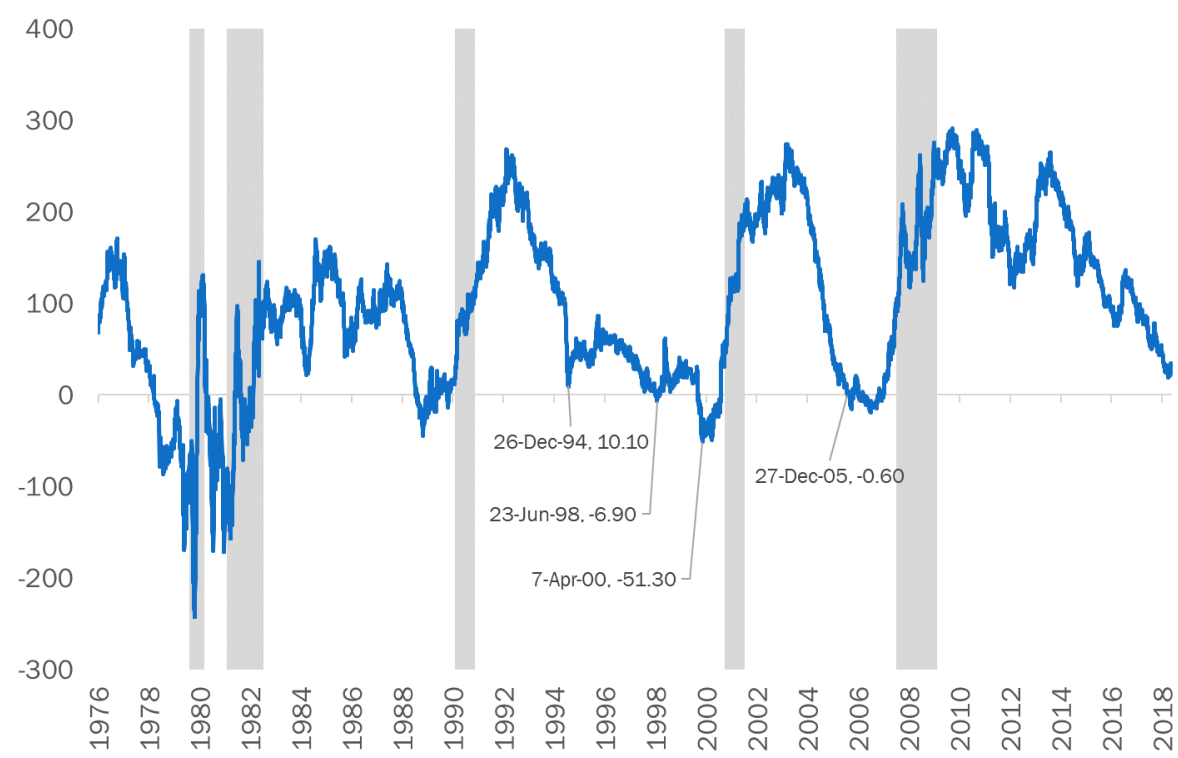
UST 10Y-2Y Spread  
basis points



Source: Bloomberg, Federal Reserve, Blacklight Research.

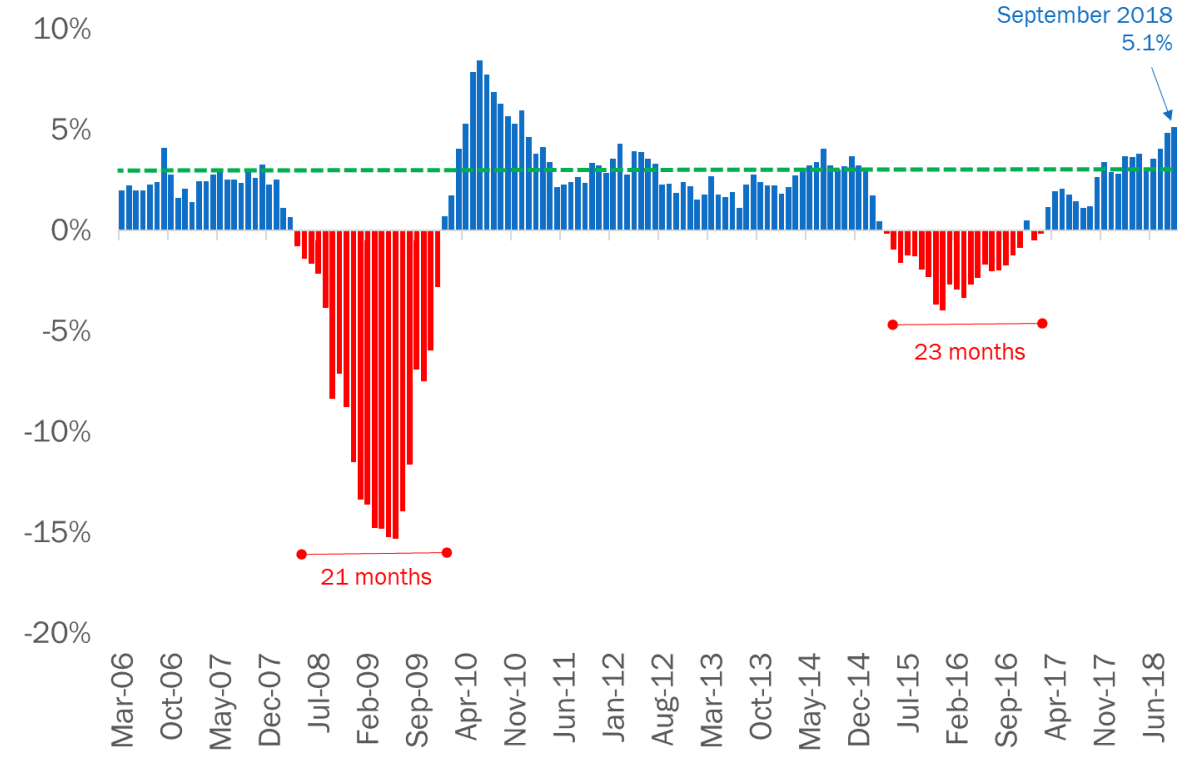
### UST 10Y-2Y Spread

basis points



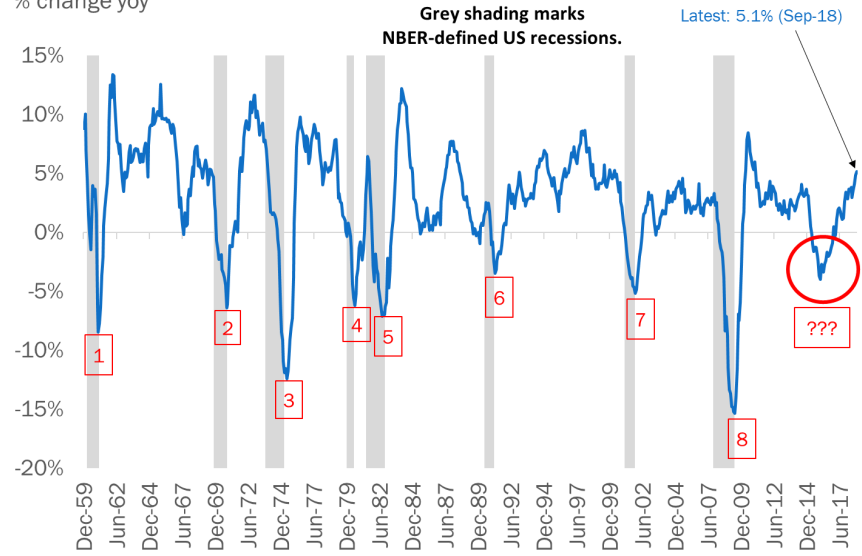
### US industrial production

YoY percentage change



Source: Bloomberg, Federal Reserve, Blacklight Research.

US industrial production  
% change yoy



Blacklight TV

Calamity Frame

Episode 43: September 24, 2018

Click [here](#) or the play button below to watch our video: [Calamity](#).

Click [here](#) for an associated 9-page chartbook.

- Nearly everyone now seems to believe a US recession arrives 'within the next two years'.
- What if it's six?

Fears of US recession—and forecasts of imminent calamity—are becoming increasingly commonplace. Nearly everyone now seems to expect the next US recession 'within two years'.

In global markets, universality of opinion often means the **expected outcome** is unlikely to be the **actual outcome**.

The data show the United States experienced meaningful contractions in its manufacturing output and exports in 2015-16. U.S. same-store sales simultaneously dived to near-zero growth, consistent with the 2001 recession.

What if the 'next recession' already happened *two years ago*?

If so, then the previous expansion (2009-2015) was shorter, and the current one (2016-now) is younger, than commonly understood.



10/23/2018

Oil and Gas Boom in the Year of Folly and the Hammer

# The Invisible Recession Of 2016

10/23/2018

## **TheUpshot**

### *The Most Important Least-Noticed Economic Event of the Decade*

A localized recession in manufacturing-heavy areas can explain a lot of things.



By Neil Irwin

Sept. 29, 2018

**The New York Times**



Sometimes the most important economic events announce themselves with huge front-page headlines, stock market collapses and frantic intervention by government officials.

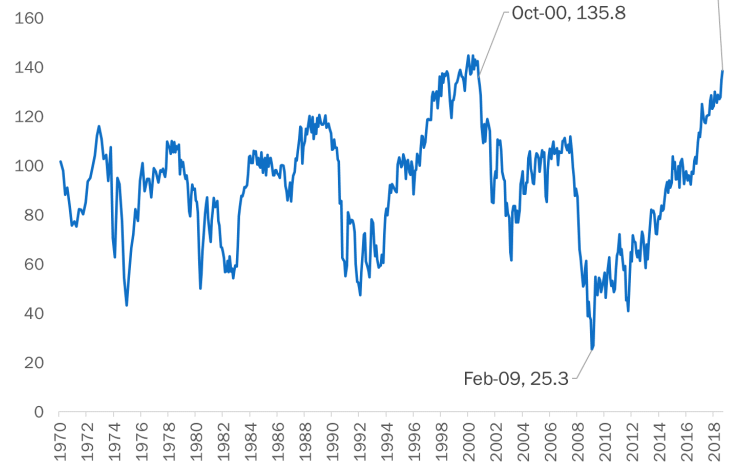
Other times, a hard-to-explain confluence of forces has enormous economic implications, yet comes and goes without most people even being aware of it.

In 2015 and 2016, the United States experienced the second type of event.

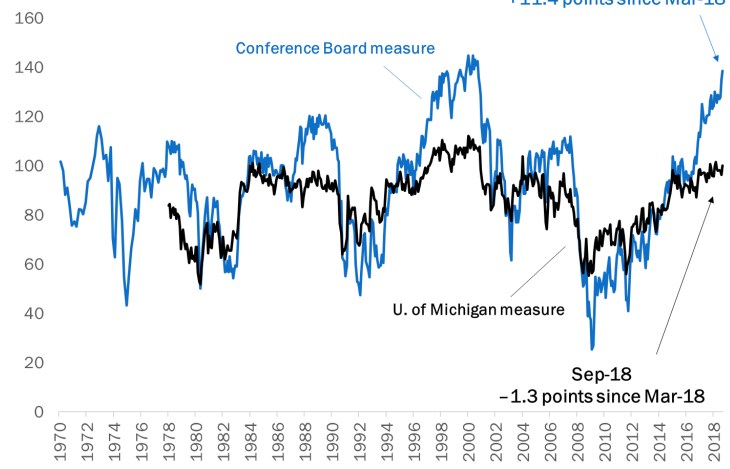
There was a sharp slowdown in business investment, caused by an interrelated weakening in emerging markets, a drop in the price of oil and other commodities, and a run-up in the value of the dollar.



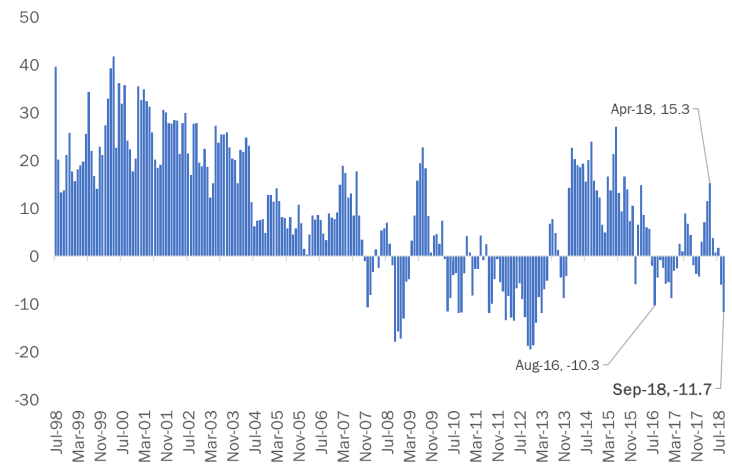
**US Consumer Confidence**  
Index 1985 = 100 (SA)



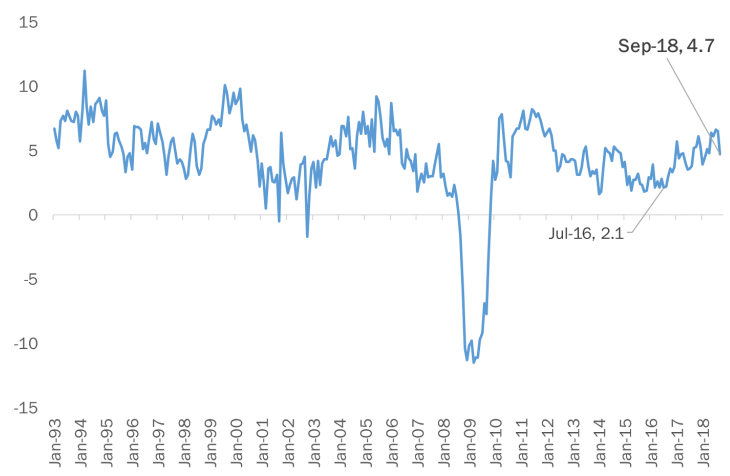
**US Consumer Confidence**  
Index 1985 = 100 (SA); Index Dec-1966 = 100



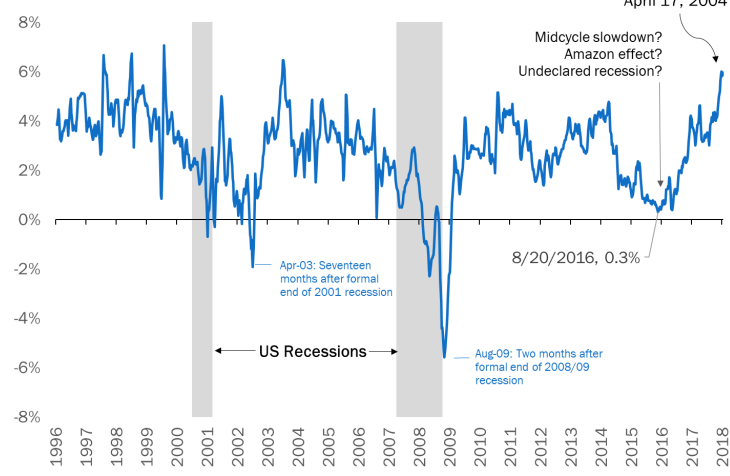
**State Street Confidence Index**  
Difference from 100, Index 2000=100 (NSA)



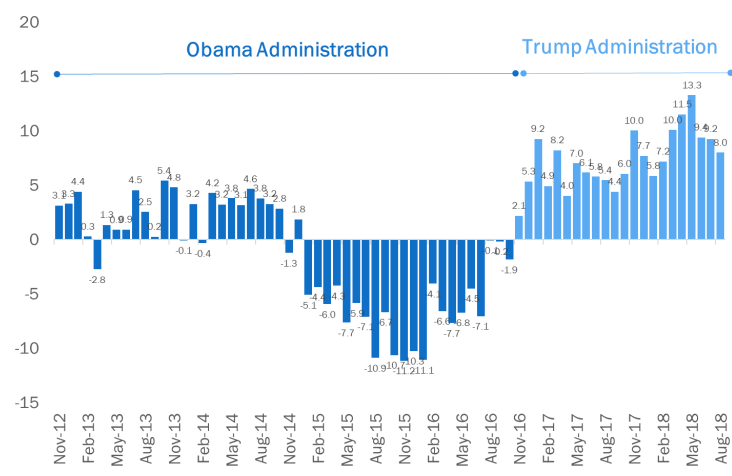
**US retail sales**  
% change YoY SA



**Johnson Redbook Same Store Sales**  
4-week moving average in the weekly yoy % change

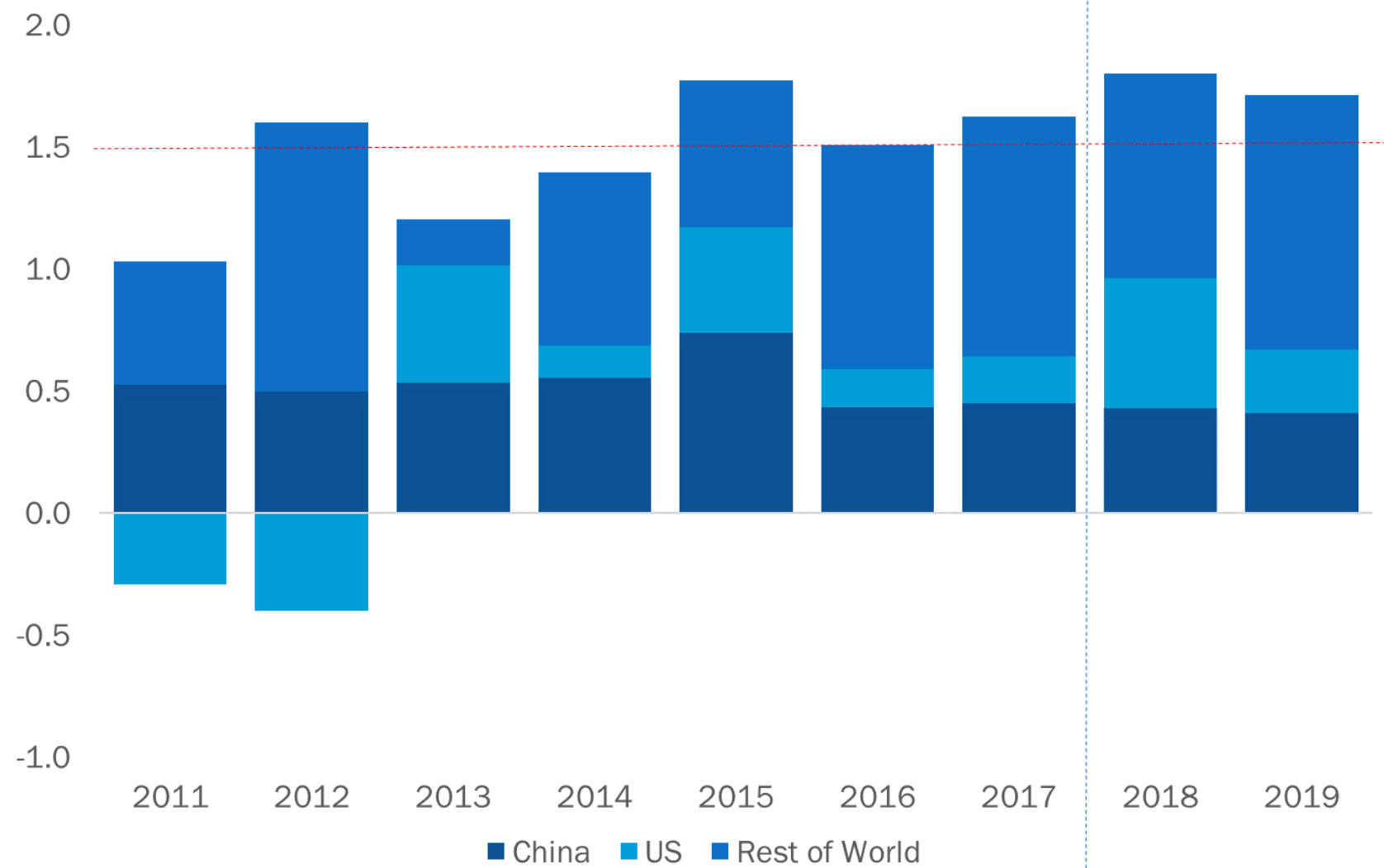


**US Exports**  
% change YoY



Source: Conference Board, Univ. of Michigan, US Census Bureau, Redbook.

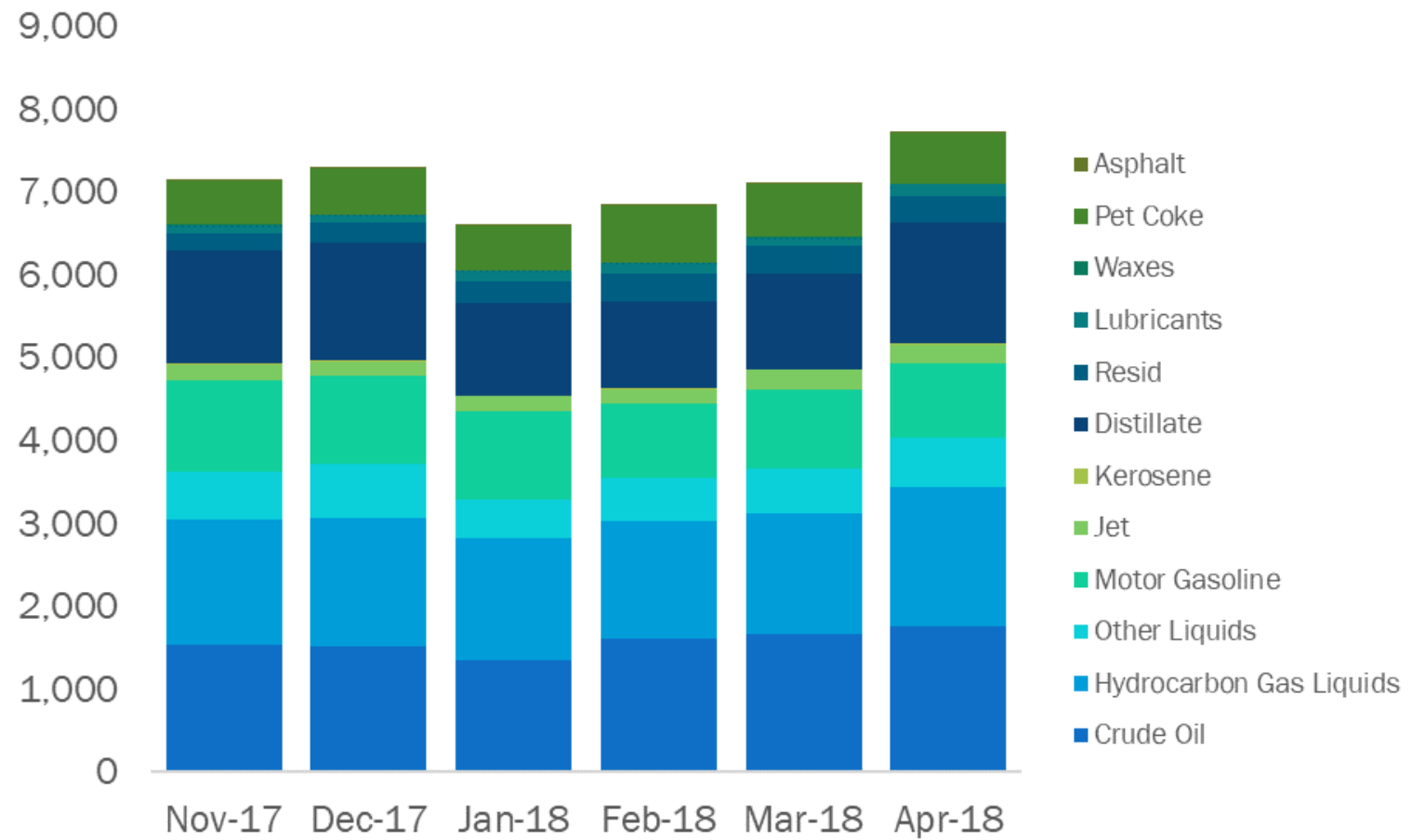
### Change in global liquids consumption million b/d



Source: EIA, IEA, BP, Blacklight Research.

## US petroleum exports

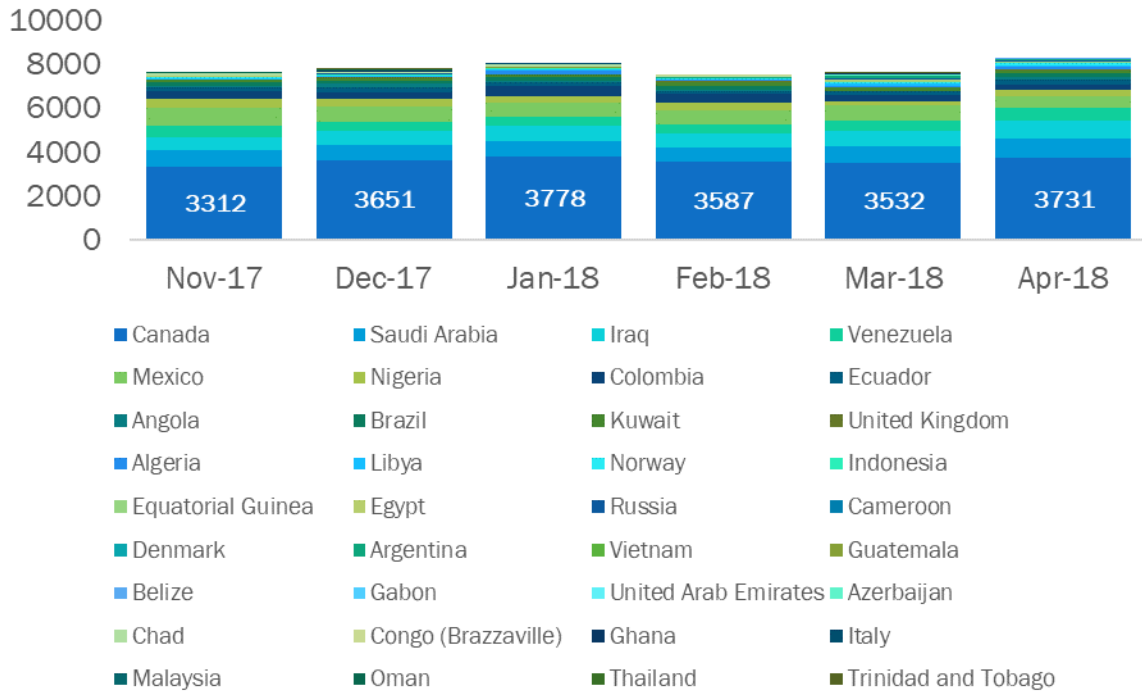
thousand b/d



Source: EIA, Blacklight Research.

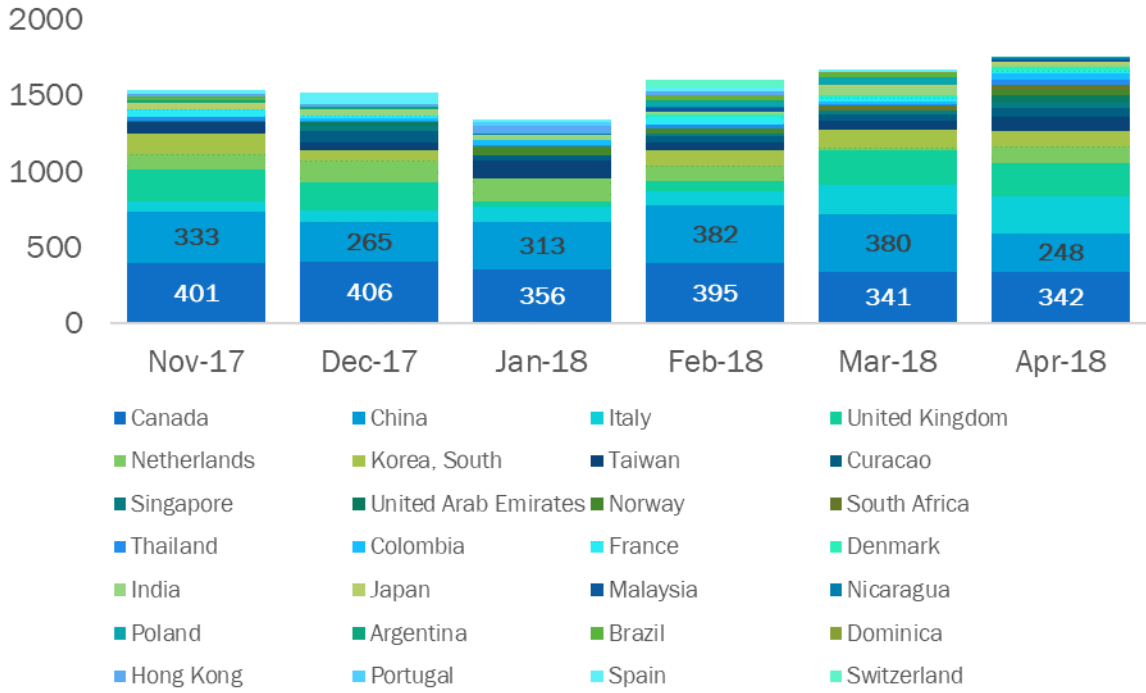
### US crude oil imports by origin

thousand b/d



### US crude oil exports by destination

thousand b/d



Source: EIA, Blacklight Research.



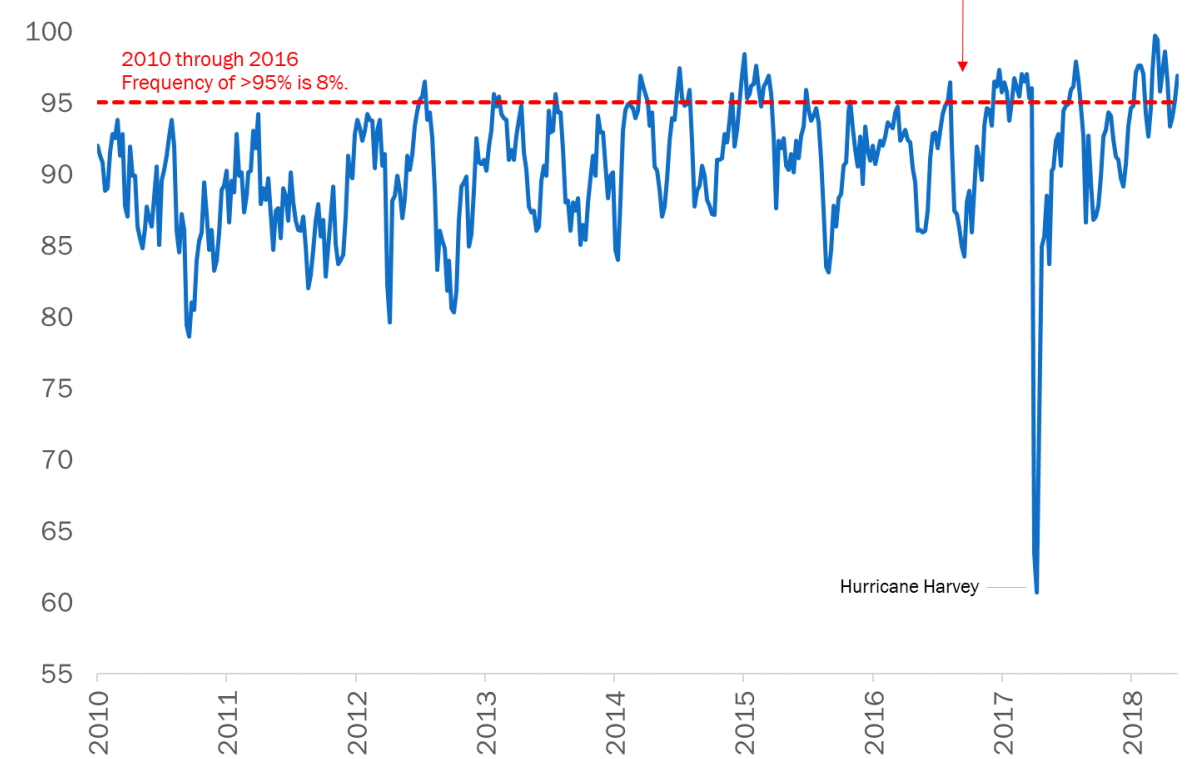
### WTI Houston (Argus) diff to NYM WTI M1

\$ per bbl



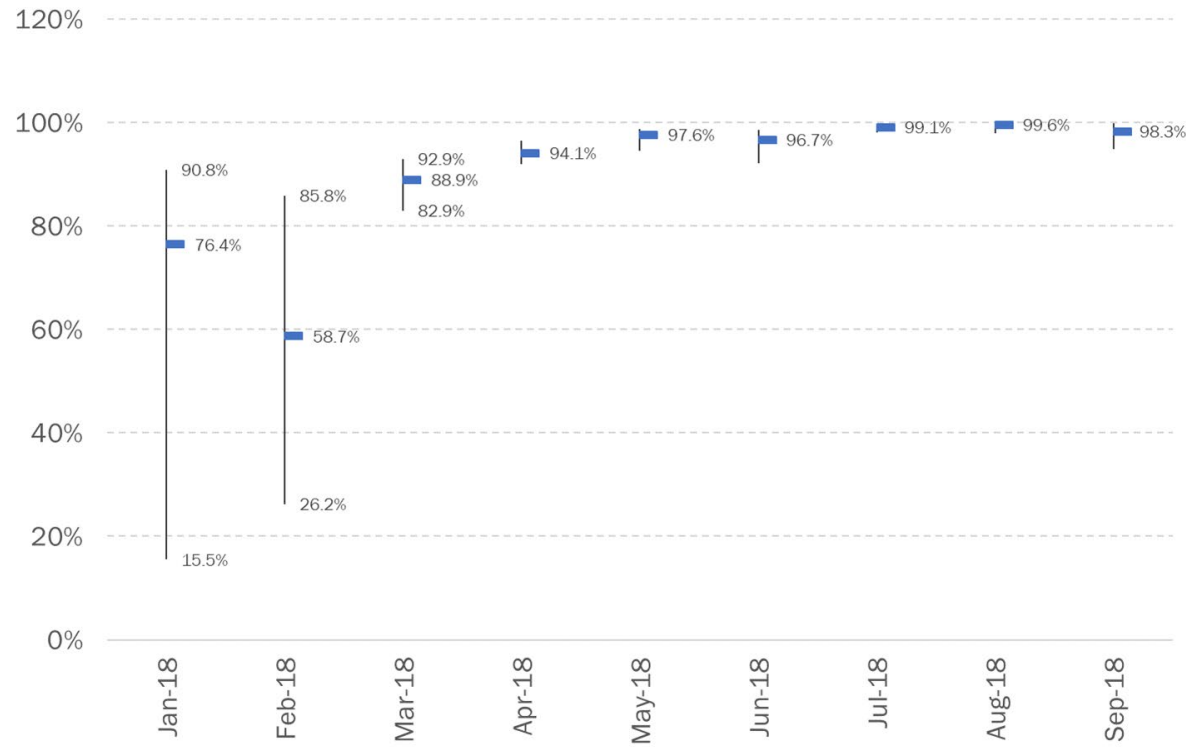
### Refinery utilization, PADD 3

% of operable capacity



### Range of daily utilization, USGC crude pipelines

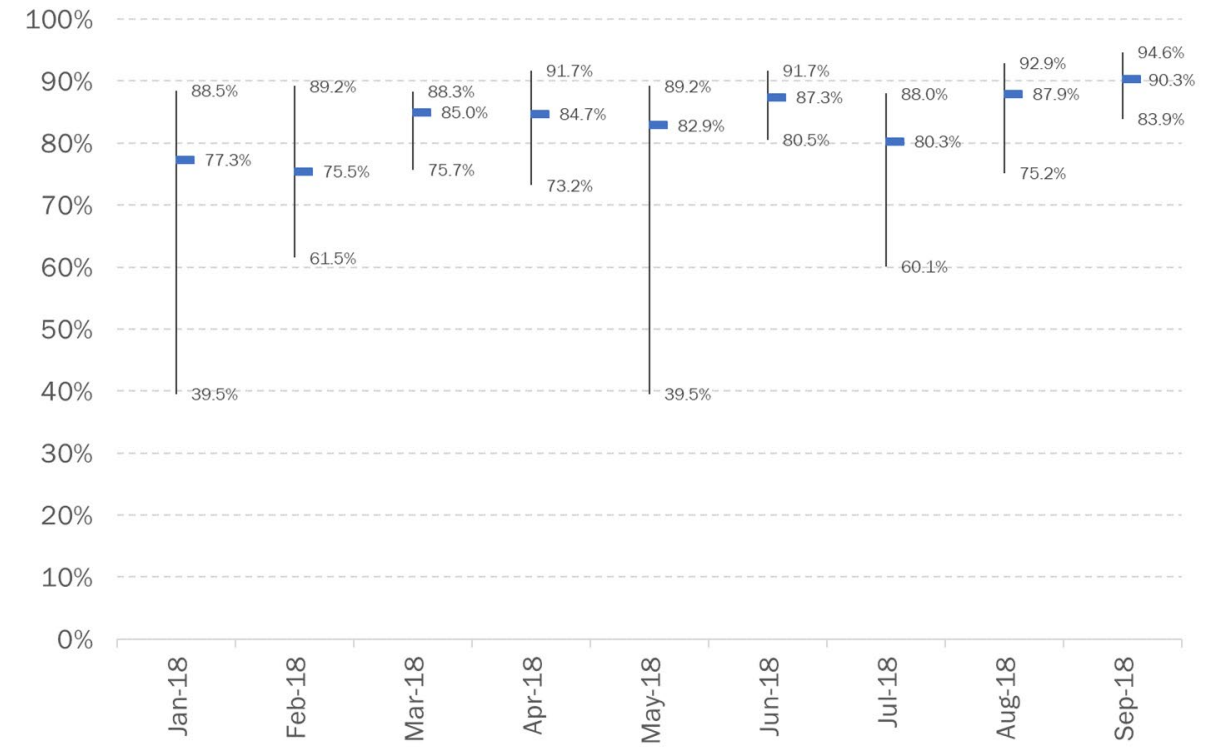
% of capacity, as estimated through WTI price spreads



Source: Blacklight Research, LLC.

### Range of utilization, USGC gas pipelines

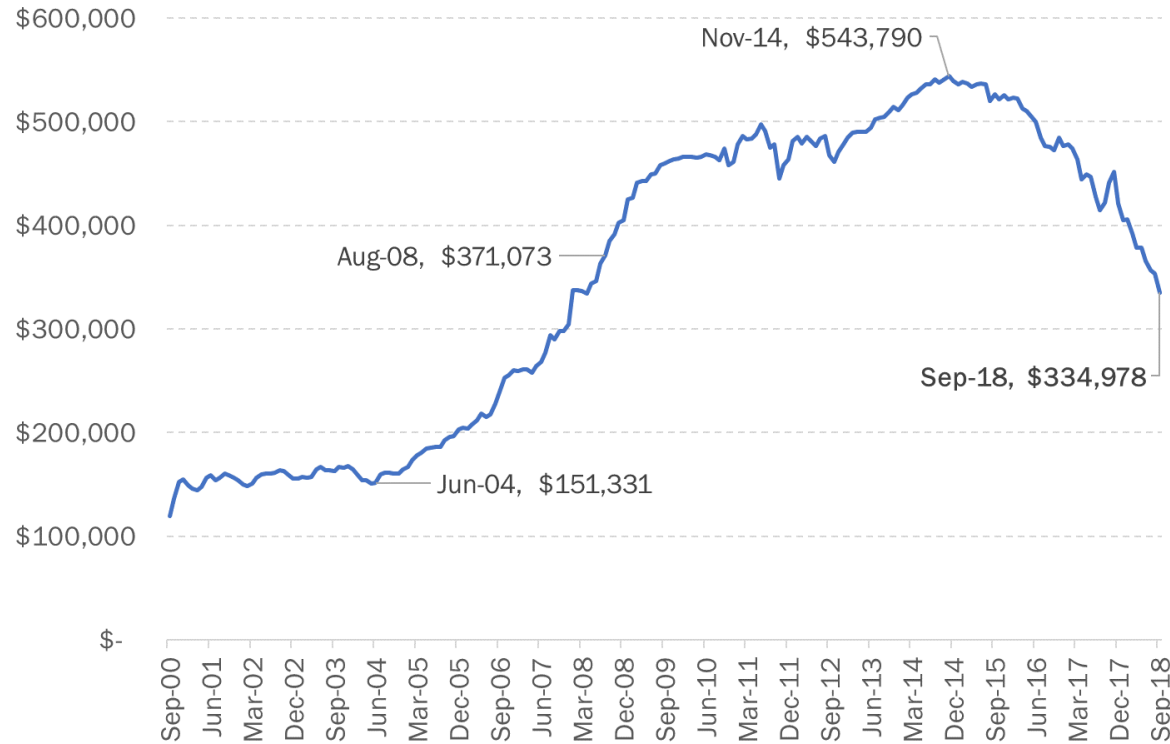
% of capacity, as estimated through Waha basis



Source: Blacklight Research, LLC.

### Average day rate for drillships in >8000' water

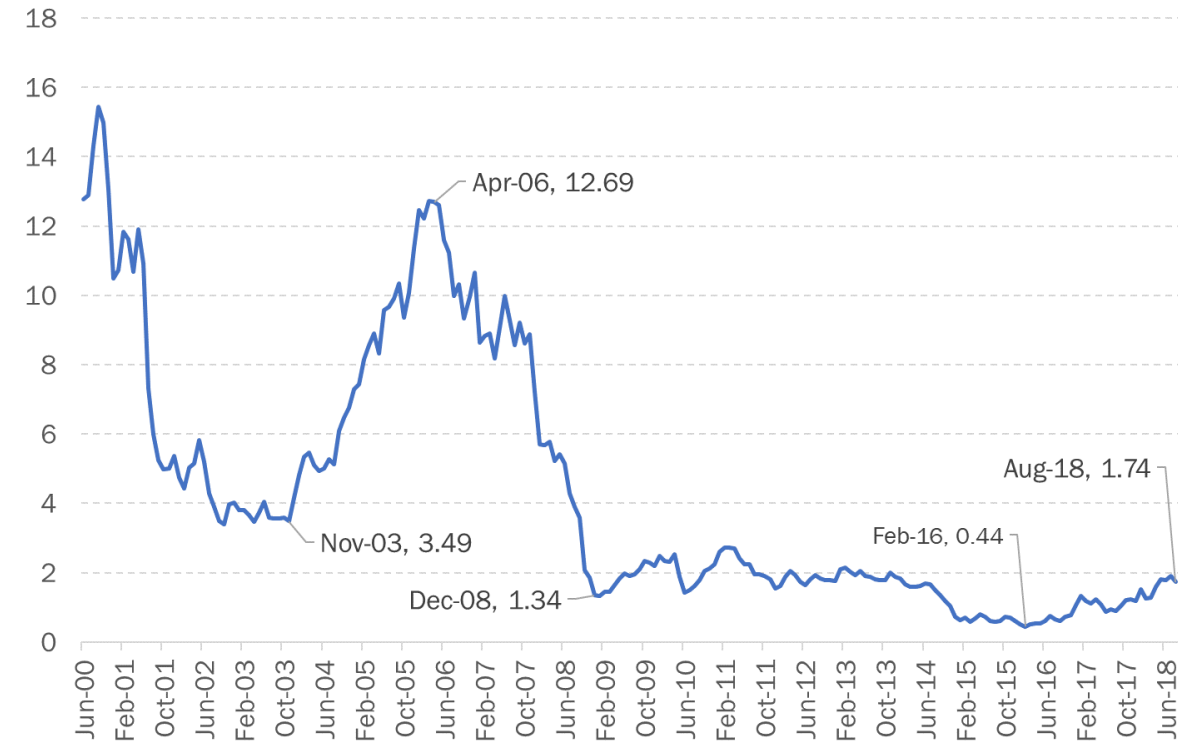
\$ per day



Source: Rigzone.

### Transocean, Ltd. (RIG)

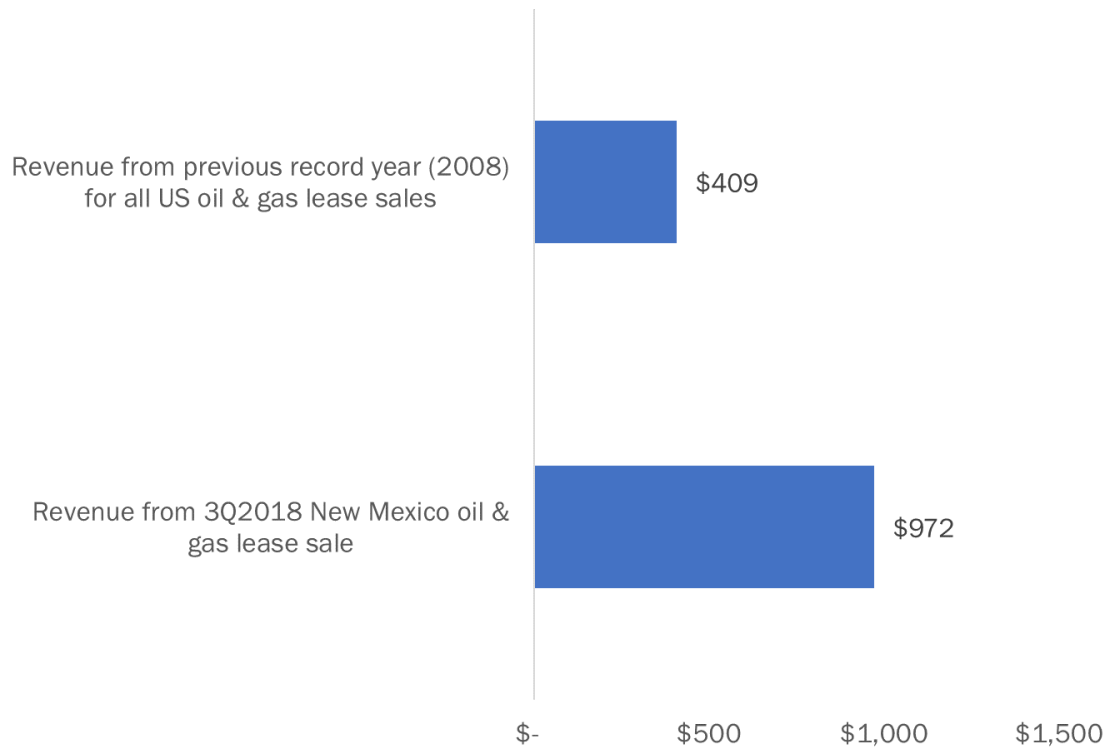
Price-to-sales ratio



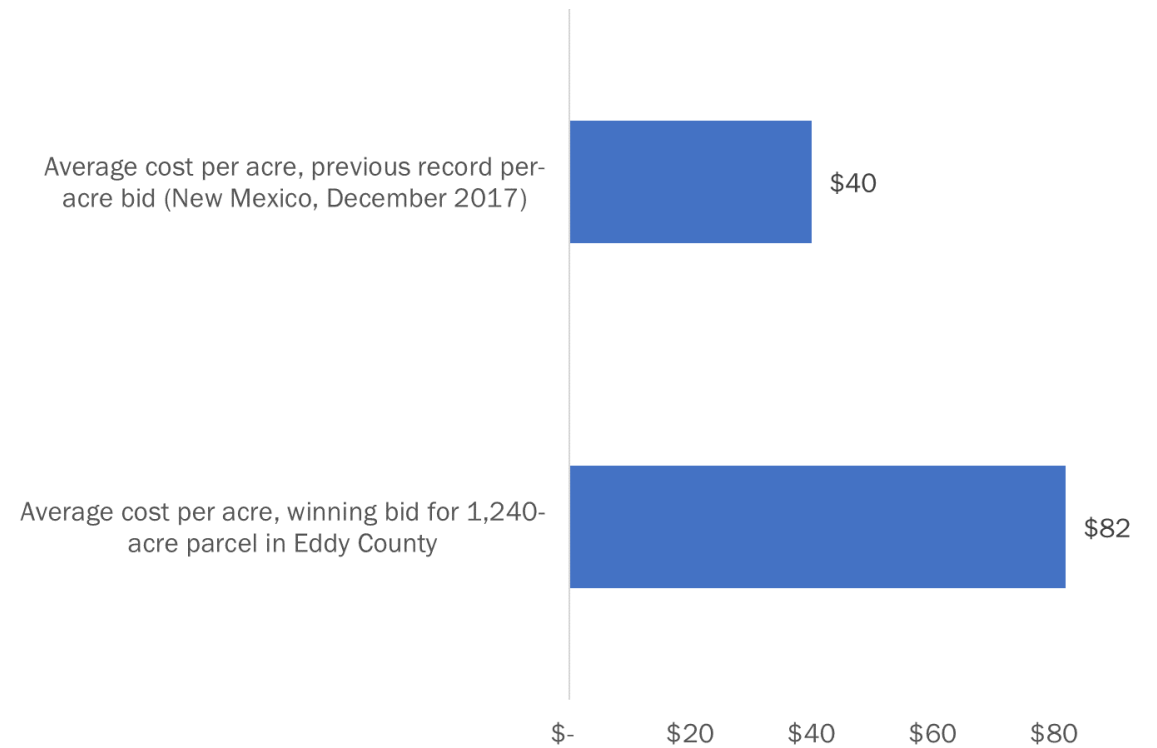
Source: Rigzone.



3Q2018 New Mexico lease sale more than doubled the previous *annual* record (million USD)



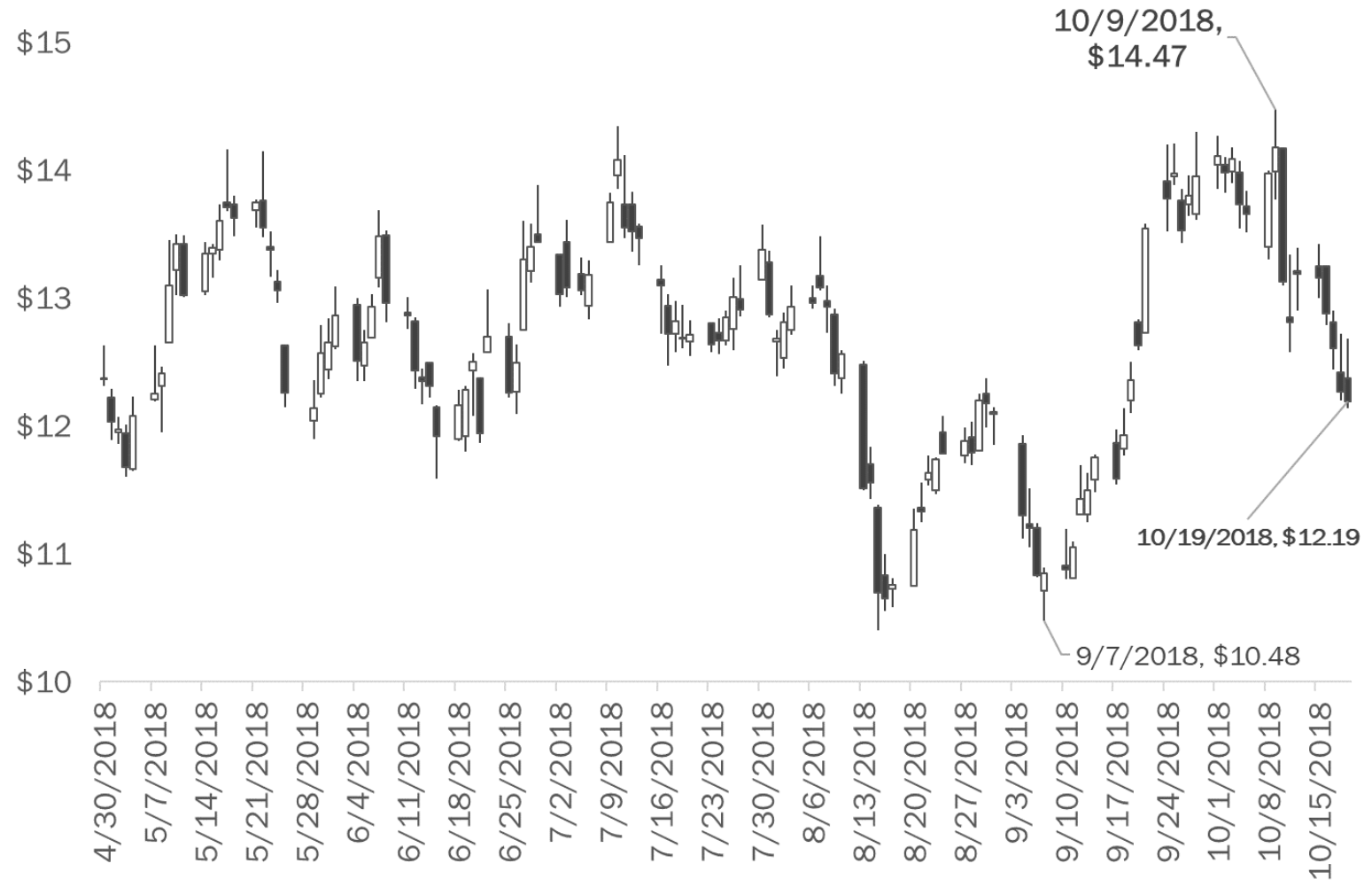
3Q2018 New Mexico lease sale also doubled previous record for per acre cost (thous \$ per acre)



Source: Bureau of Land Management, Blacklight Research LLC.



### Transocean Ltd. (RIG) \$ per common share



Source: Bloomberg.



Newsmakers August 28, 2018

## Norway Commission Recommends Against Oil Divestment

*Panel says divestment would not protect against a permanent drop in oil prices.*



A commission appointed by the Norway government has recommended against the country's \$1.04 trillion Government Pension Fund Global (GPF) divesting petroleum stocks, saying it wouldn't do much to protect the fund against sell-off in oil, while at the same time complicating its investment strategy.

"Divestment of the energy stocks in the Government Pension Fund Global (GPF) is not an effective insurance against a permanent decline in oil prices," commission chair Øystein Thøgersen said in a release. "The energy stocks only contribute marginally to Norway's oil price risk."

Last November, Norway's central bank, Norges Bank, which manages the fund, recommended that oil stocks be removed from the fund's benchmark index. It said the vulnerability of the country's assets to a permanent reduction in oil and gas prices would be reduced if the fund were not invested in energy stocks.

At the time, the bank said that its conclusion was based solely on financial arguments, and did not reflect potential future movements in the oil price, or the profitability or sustainability of the sector.

Source: Chief Investment Officer.



Risk October 12, 2018

## Columbia Endowment Reports 9.0% Return for 2018

*Investment gains were lowest among any Ivy League endowment.*



Columbia University endowment's investment portfolio returned 9% in fiscal year 2018, down from 13.7% in 2017, and below that of any other Ivy League school endowment this year. The total value of the endowment rose to \$10.9 billion as of the end of June, up from just under \$10 billion at the same time last year.

Columbia was the last of the Ivy League schools to report fiscal 2018 returns, and despite having the third-highest among them last year, was last behind Princeton's 14.2%, Brown's 13.2%, University of Pennsylvania's 12.9%, Dartmouth's 12.2%, Yale's 12.3%, Cornell's 10.6%, and Harvard's 10%.

However, the endowment was still ahead of Cambridge Associates' median return of 8.3% for colleges and universities. It also reported 10-year annualized returns of 8%.

Columbia University's endowment consists of approximately 5,500 separate funds established over time for a wide variety of purposes. It includes permanent endowments, term endowments, and funds designated by the board of trustees to function as endowments. Its investments are managed by The Columbia Investment Management Co., which is a wholly owned subsidiary of the university, and is run by CEO Peter Holland and CIO Tim Donohue.

Although Columbia Investment Management Co. doesn't provide details on asset allocation, according to the university's 2018 financial report, the endowment's investment strategy is intended to produce performance that exceeds each asset class' relevant indices while assuming a moderate level of investment risk.

**Table 1.1. Overview of the World Economic Outlook Projections**  
(Percent change, unless noted otherwise)

|   | 2017       | Projections |            | Difference from July 2018 WEO Update <sup>a</sup> |             | Difference from April 2018 WEO <sup>1</sup> |             |
|---|------------|-------------|------------|---|-------------|---|-------------|
|   |            | 2018        | 2019       | 2018  | 2019        | 2018  | 2019        |
| <b>World Output</b>                                       | <b>3.7</b> | <b>3.7</b>  | <b>3.7</b> | <b>-0.2</b>                                       | <b>-0.2</b> | <b>-0.2</b>                                 | <b>-0.2</b> |
| <b>Advanced Economies</b>                                 | <b>2.3</b> | <b>2.4</b>  | <b>2.1</b> | <b>0.0</b>  | <b>-0.1</b> | <b>-0.1</b>                                 | <b>-0.1</b> |
| United States   | 2.2        | 2.9         | 2.5        | 0.0   | -0.2        | 0.0   | -0.2        |
| Euro Area   | 2.4        | 2.0         | 1.9        | -0.2  | 0.0         | -0.4  | -0.1        |
| Germany   | 2.5        | 1.9         | 1.9        | -0.3  | -0.2        | -0.6  | -0.1        |
| France  | 2.3        | 1.6         | 1.6        | -0.2  | -0.1        | -0.5  | -0.4        |
| Italy   | 1.5        | 1.2         | 1.0        | 0.0   | 0.0         | -0.3  | -0.1        |
| Spain   | 3.0        | 2.7         | 2.2        | -0.1  | 0.0         | -0.1  | 0.0         |
| Japan   | 1.7        | 1.1         | 0.9        | 0.1   | 0.0         | -0.1  | 0.0         |
| United Kingdom  | 1.7        | 1.4         | 1.5        | 0.0   | 0.0         | -0.2  | 0.0         |
| Canada  | 3.0        | 2.1         | 2.0        | 0.0   | 0.0         | 0.0   | 0.0         |
| Other Advanced Economies <sup>2</sup>                     | 2.8        | 2.8         | 2.5        | 0.0   | -0.2        | 0.1   | -0.1        |
| <b>Emerging Market and Developing Economies</b>           | <b>4.7</b> | <b>4.7</b>  | <b>4.7</b> | <b>-0.2</b>                                       | <b>-0.4</b> | <b>-0.2</b>                                 | <b>-0.4</b> |
| Commonwealth of Independent States                        | 2.1        | 2.3         | 2.4        | 0.0   | 0.2         | 0.1   | 0.3         |
| Russia  | 1.5        | 1.7         | 1.8        | 0.0   | 0.3         | 0.0   | 0.3         |
| Excluding Russia  | 3.6        | 3.9         | 3.6        | 0.3   | -0.1        | 0.4   | 0.0         |
| Emerging and Developing Asia                              | 6.5        | 6.5         | 6.3        | 0.0   | -0.2        | 0.0   | -0.3        |
| China   | 6.9        | 6.6         | 6.2        | 0.0   | -0.2        | 0.0   | -0.2        |
| India <sup>3</sup>  | 6.7        | 7.3         | 7.4        | 0.0   | -0.1        | -0.1  | -0.4        |
| ASEAN-5 <sup>4</sup>                                      | 5.3        | 5.3         | 5.2        | 0.0   | -0.1        | 0.0   | -0.2        |
| Emerging and Developing Europe                            | 6.0        | 3.8         | 2.0        | -0.5  | -1.6        | -0.5  | -1.7        |
| Latin America and the Caribbean                           | 1.3        | 1.2         | 2.2        | -0.4  | -0.4        | -0.8  | -0.6        |
| Brazil  | 1.0        | 1.4         | 2.4        | -0.4  | -0.1        | -0.9  | -0.1        |
| Mexico  | 2.0        | 2.2         | 2.5        | -0.1  | -0.2        | -0.1  | -0.5        |
| Middle East, North Africa, Afghanistan, and Pakistan      | 2.2        | 2.4         | 2.7        | -1.1  | -1.2        | -1.0  | -1.0        |
| Saudi Arabia  | -0.9       | 2.2         | 2.4        | 0.3   | 0.5         | 0.5   | 0.5         |
| Sub-Saharan Africa  | 2.7        | 3.1         | 3.8        | -0.3  | 0.0         | -0.3  | 0.1         |
| Nigeria   | 0.8        | 1.9         | 2.3        | -0.2  | 0.0         | -0.2  | 0.4         |
| South Africa  | 1.3        | 0.8         | 1.4        | -0.7  | -0.3        | -0.7  | -0.3        |
| <b>Memorandum</b>   |            |             |            |   |             |   |             |
| European Union  | 2.7        | 2.2         | 2.0        | -0.2  | -0.1        | -0.3  | -0.1        |
| Low-Income Developing Countries                           | 4.7        | 4.7         | 5.2        | -0.3  | -0.1        | -0.3  | -0.1        |
| Middle East and North Africa                              | 1.8        | 2.0         | 2.5        | -1.2  | -1.3        | -1.2  | -1.1        |
| World Growth Based on Market Exchange Rates               | 3.2        | 3.2         | 3.1        | -0.1  | -0.2        | -0.2  | -0.2        |
| <b>Commodity Prices (US dollars)</b>                      |            |             |            |   |             |   |             |
| Oil <sup>5</sup>  | 23.3       | 31.4        | -0.9       | -1.6  | 0.9         | 13.4  | 5.6         |
| Nonfuel (average based on world commodity export weights) | 6.8        | 2.7         | -0.7       | -3.3  | -1.2        | -2.9  | -1.2        |
| <b>Consumer Prices</b>                                    |            |             |            |   |             |   |             |
| Advanced Economies  | 1.7        | 2.0         | 1.9        | -0.2  | -0.3        | 0.0   | 0.0         |
| Emerging Market and Developing Economies <sup>6</sup>     | 4.3        | 5.0         | 5.2        | 0.3   | 0.7         | 0.2   | 0.7         |

<sup>5</sup>Simple average of prices of UK Brent, Dubai Fateh, and West Texas Intermediate crude oil. The average price of oil in US dollars a barrel was \$52.81 in 2017; the assumed price, based on futures markets, is \$69.38 in 2018 and \$68.76 in 2019.



- The forecast for demand growth in 2018 and 2019 has been reduced for both years by 110 kb/d to 1.3 mb/d and 1.4 mb/d, respectively. This is due to a weaker economic outlook, trade concerns, higher oil prices and a revision to Chinese data.
- OECD demand, supported by a strong 1Q18 and robust US growth, will expand by 300 kb/d in 2018, slowing to 130 kb/d in 2019. Non-OECD demand will grow by 1 mb/d in 2018, led by China and India, which together account for 60% of the global increase.

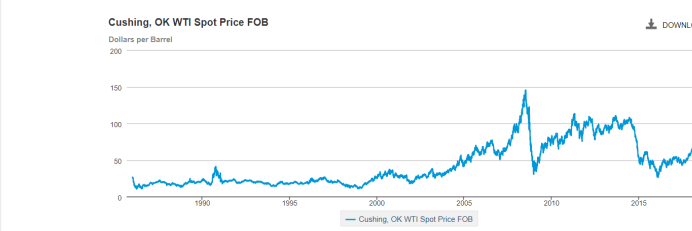
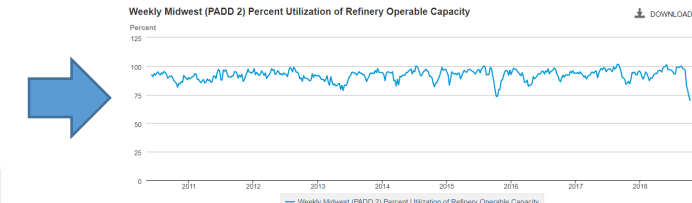


World oil demand is projected to increase by 1.54 mb/d in 2018, a downward revision of around 80 tb/d from the previous month's report. Total global oil consumption for the year is expected to average 98.79 mb/d.

Oil demand growth in the OECD region was revised lower by around 30 tb/d in 2018, due to slower-than-expected data in OECD Europe and Asia Pacific. In OECD Europe, diesel oil requirements in 2Q18 weakened amid lower-than-expected demand for automotive diesel and heating oil in Germany and France, leading to a downward revision in oil demand growth in OECD Europe by around 20 tb/d for the year. Following a solid 1H18, demand growth declined during the month of July 2018 in South Korea. This, combined with a continuation of the sluggish oil requirements from Japan, resulted in a downward revision of oil demand in OECD Asia Pacific by around 20 tb/d for 2018. On the other hand, firm oil demand data for July 2018 supported an upward revision for the year in OECD America by around 10 tb/d.

In the non-OECD region, oil demand growth was also revised lower by around 45 tb/d in 2018, mainly reflecting the slower momentum in Latin America and the Middle East. Weaker-than-expected demand from Brazil, Argentina, Venezuela and Saudi Arabia resulted in a downward revision by around 20 tb/d for each region.

In 2019, world oil demand is anticipated to grow by 1.36 mb/d to average 100.15 mb/d, a downward revision of 50 tb/d from last month's report. OECD Europe and Latin America were revised down by 20 tb/d and 30 tb/d, respectively, amid a slight easing of economic growth expectations in those regions next year. Most of the oil demand growth is anticipated to originate from Other Asia, led by India, followed by China, then OECD Americas. OECD countries are forecast to see a rise in oil demand growth by 0.25 mb/d while non-OECD countries will drive oil demand growth by adding an estimated 1.11 mb/d.

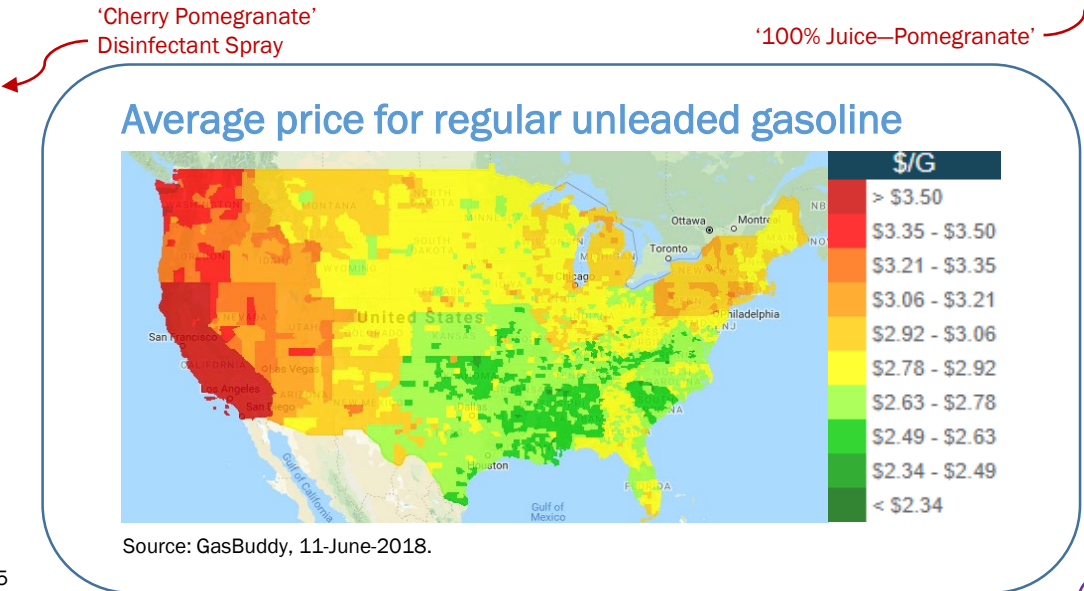


## **OUTLOOK FOR PRICE AND RISK**

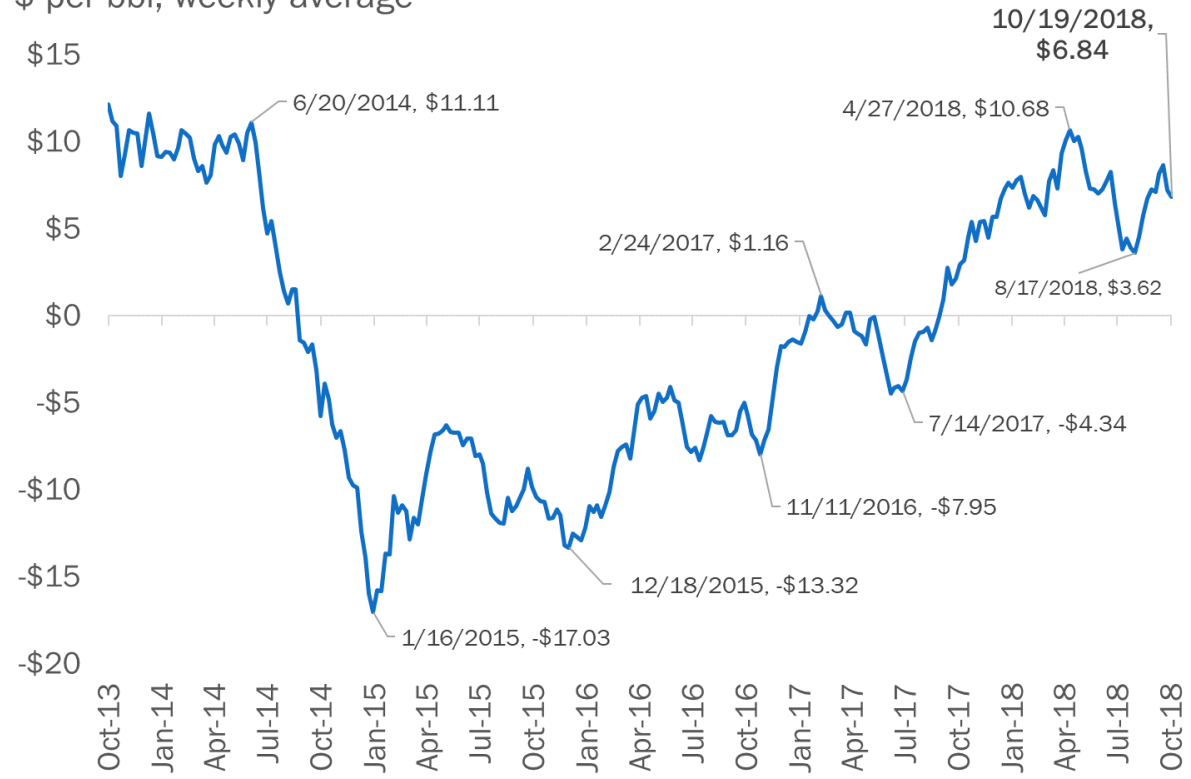


# Which liquid is more bubbly?

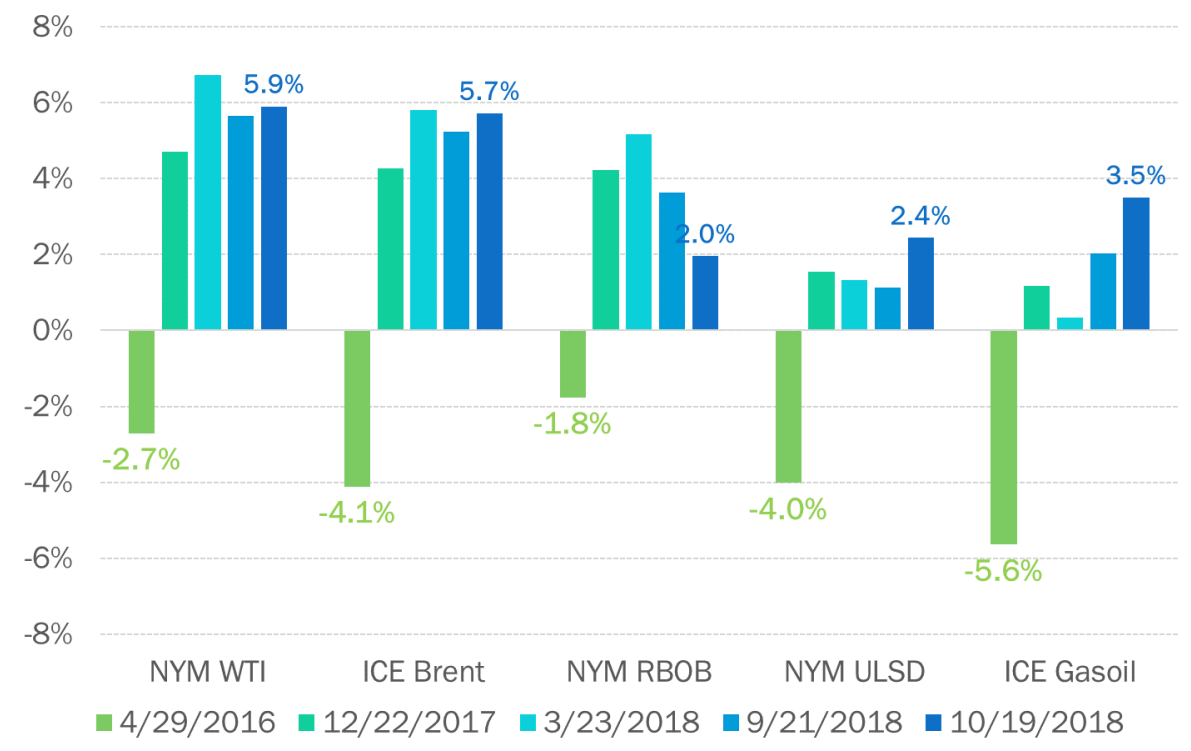
Gasoline prices or consumer prices from AmazonPrime for the San Francisco Bay Area on June 11, 2018.  
All prices are in \$ per gallon.



**ICE Brent crude oil timespread (M1-M24)**  
\$ per bbl, weekly average



**M12/M24 Timespreads by Market**  
% difference in price



Source: Bloomberg, NYM, Blacklight Research.



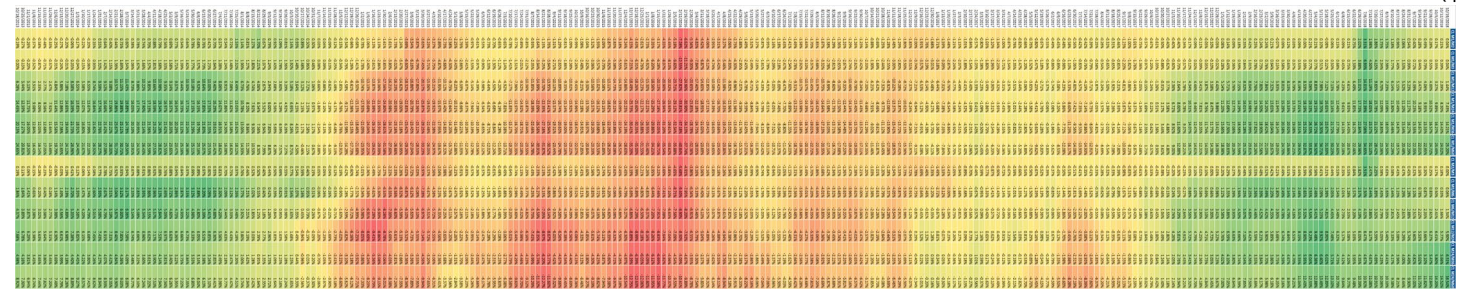
# Heatmap of petroleum timespreads

(weekly averages, 10/18/2013 through 10/19/2018)

10/18/2013

10/19/2018

NYM WTI crude oil

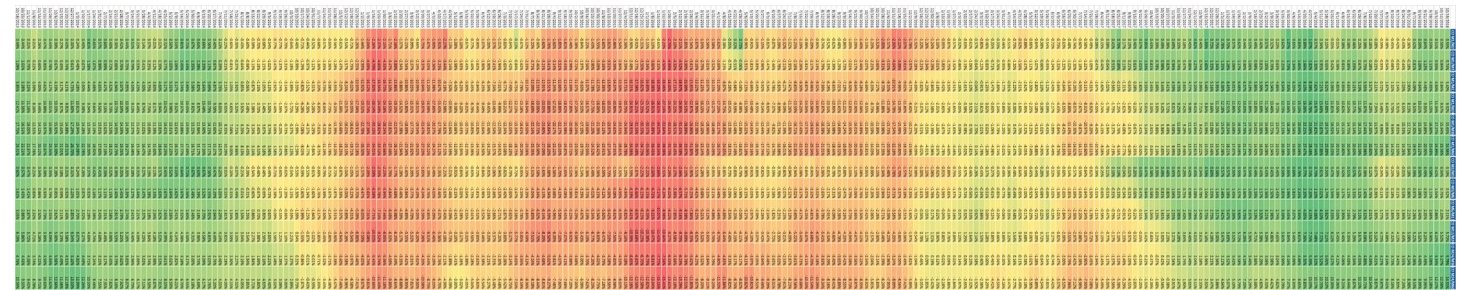


Fronts-to-fronts



Fronts-to-backs

ICE Brent crude oil

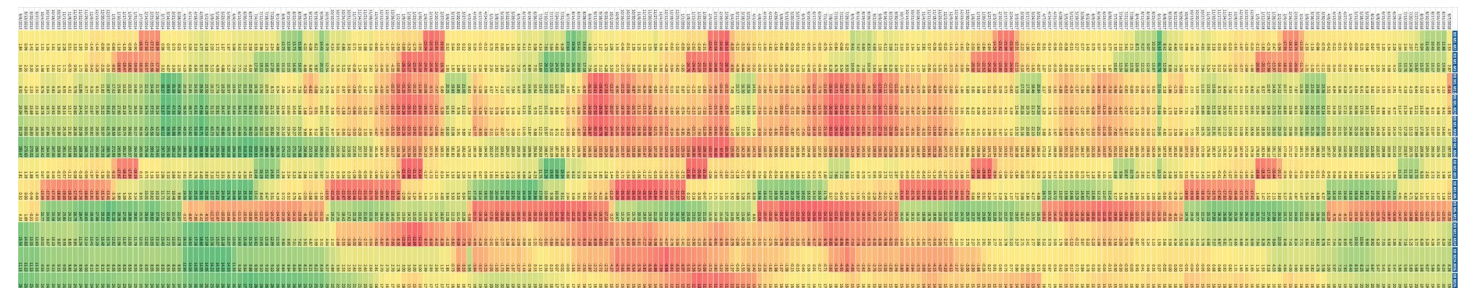


Fronts-to-fronts



Fronts-to-backs

NYM RBOB gasoline

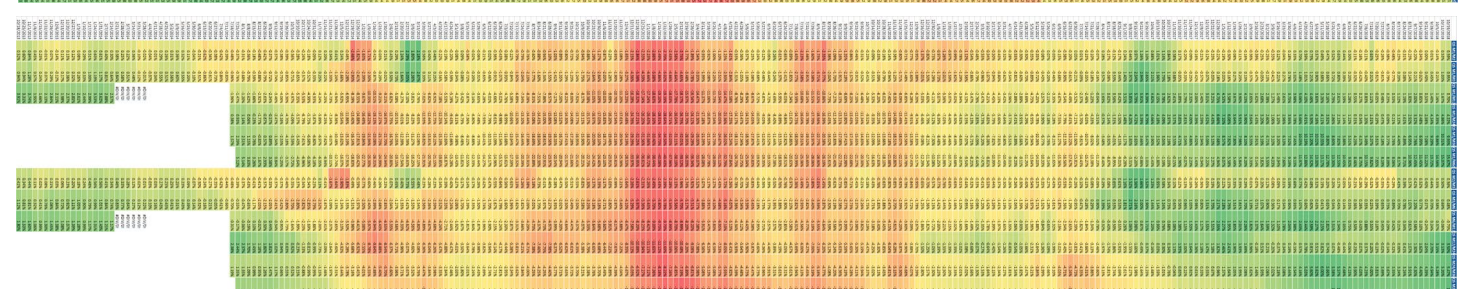


Fronts-to-fronts



Fronts-to-backs

ICE gasoil



Fronts-to-fronts

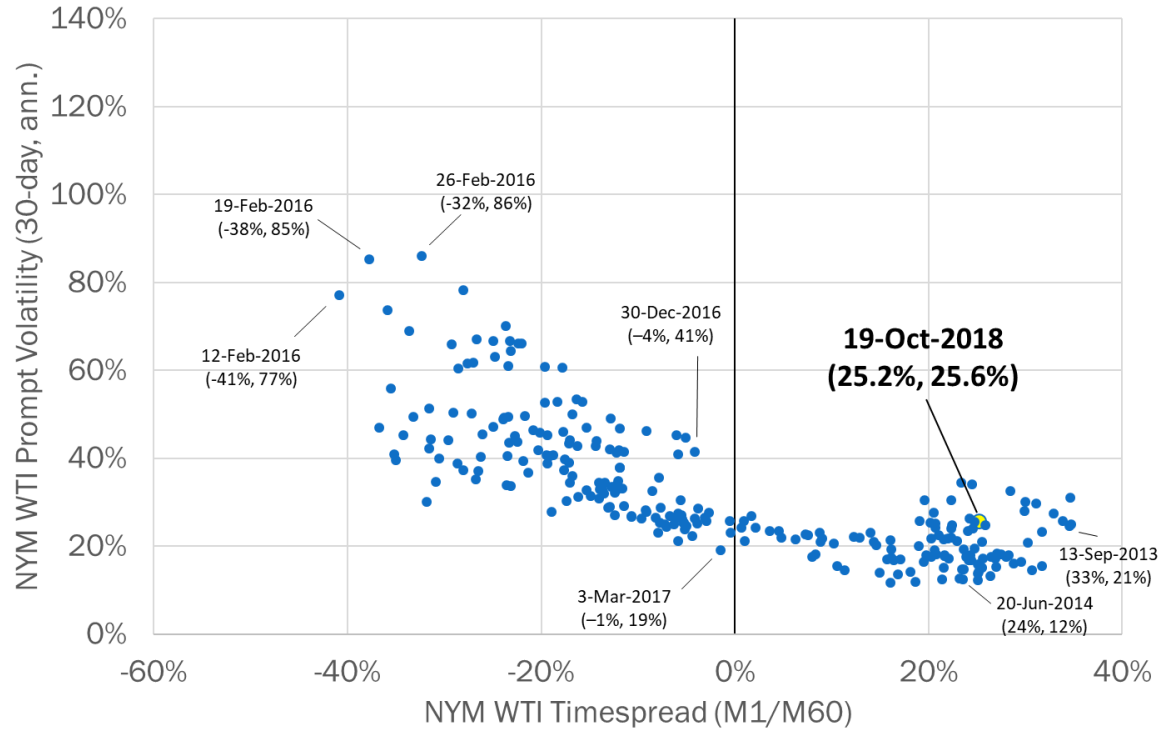


Fronts-to-backs

Green = bullish term structure  
 Red = bearish term structure  
 White = no data

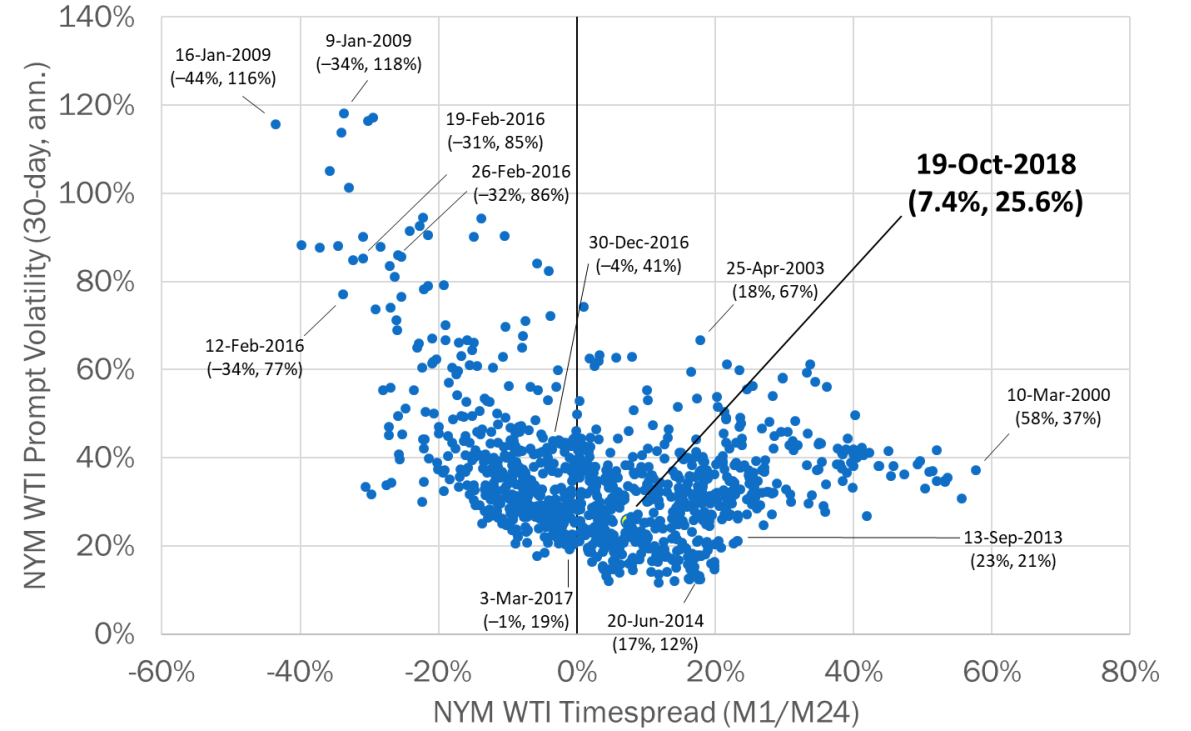
### Fundamental balance drives structure and volatility

5-year trailing scatter plot of weekly averages



### Fundamental balance drives structure and volatility

20-year trailing scatter plot of weekly averages (1998-2018)



Source: Bloomberg, Blacklight Research.



## DEC-19 NYM WTI CRUDE OIL (CLZ9)

|                   | CLZ9            | p10             | p25             | p50             | p75             | p90             |
|-------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| <b>10/19/2018</b> | <b>\$ 68.78</b> | <b>\$ 45.45</b> | <b>\$ 54.20</b> | <b>\$ 65.90</b> | <b>\$ 80.15</b> | <b>\$ 95.60</b> |
| 7/19/2018         | \$ 61.87        | \$ 38.65        | \$ 47.10        | \$ 58.65        | \$ 73.05        | \$ 89.00        |
| 4/19/2018         | \$ 59.15        | \$ 33.75        | \$ 42.45        | \$ 54.80        | \$ 70.65        | \$ 88.85        |
| 1/19/2018         | \$ 56.80        | \$ 35.95        | \$ 43.55        | \$ 54.00        | \$ 66.90        | \$ 81.10        |
| <b>10/19/2017</b> | <b>\$ 50.35</b> | <b>\$ 28.20</b> | <b>\$ 35.80</b> | <b>\$ 46.60</b> | <b>\$ 60.70</b> | <b>\$ 77.00</b> |
| % Change YoY      | 37%             | 61%             | 51%             | 41%             | 32%             | 24%             |

The former baseline expectation has now become the downside case.

Source: Blacklight Research. Note: calculations by Blacklight using NYM options prices.

## Jan-19 NYM WTI Crude Oil (CLF9)

| Closing Price |          | Prices associated with these p values |          |          |          |          |
|---------------|----------|---------------------------------------|----------|----------|----------|----------|
|               |          | 10%                                   | 25%      | 50%      | 75%      | 90%      |
| 10/19/2018    | \$ 69.35 | \$ 58.40                              | \$ 63.10 | \$ 68.75 | \$ 74.95 | \$ 80.95 |
| 10/18/2018    | \$ 68.75 | \$ 57.55                              | \$ 62.35 | \$ 68.15 | \$ 74.45 | \$ 80.70 |
| 10/17/2018    | \$ 69.72 | \$ 58.30                              | \$ 63.20 | \$ 69.10 | \$ 75.55 | \$ 81.85 |
| 10/16/2018    | \$ 71.70 | \$ 60.05                              | \$ 65.05 | \$ 71.05 | \$ 77.65 | \$ 84.10 |
| 10/15/2018    | \$ 71.53 | \$ 59.65                              | \$ 64.75 | \$ 70.85 | \$ 77.60 | \$ 84.15 |
| 10/12/2018    | \$ 71.08 | \$ 59.10                              | \$ 64.20 | \$ 70.40 | \$ 77.20 | \$ 83.90 |
| 10/11/2018    | \$ 70.69 | \$ 58.40                              | \$ 63.60 | \$ 69.95 | \$ 76.95 | \$ 83.85 |
| 10/10/2018    | \$ 72.91 | \$ 60.35                              | \$ 65.70 | \$ 72.20 | \$ 79.30 | \$ 86.35 |

## Jan-19 NYM Natural Gas (NGF9)

| Closing Price |         | Prices associated with these p values |         |         |         |         |
|---------------|---------|---------------------------------------|---------|---------|---------|---------|
|               |         | 10%                                   | 25%     | 50%     | 75%     | 90%     |
| 10/19/2018    | \$ 3.39 | \$ 2.40                               | \$ 2.78 | \$ 3.28 | \$ 3.87 | \$ 4.48 |
| 10/18/2018    | \$ 3.33 | \$ 2.37                               | \$ 2.74 | \$ 3.23 | \$ 3.79 | \$ 4.39 |
| 10/17/2018    | \$ 3.44 | \$ 2.44                               | \$ 2.83 | \$ 3.33 | \$ 3.93 | \$ 4.56 |
| 10/16/2018    | \$ 3.37 | \$ 2.41                               | \$ 2.79 | \$ 3.28 | \$ 3.85 | \$ 4.44 |
| 10/15/2018    | \$ 3.39 | \$ 2.41                               | \$ 2.79 | \$ 3.29 | \$ 3.87 | \$ 4.48 |
| 10/12/2018    | \$ 3.31 | \$ 2.34                               | \$ 2.72 | \$ 3.20 | \$ 3.78 | \$ 4.38 |
| 10/11/2018    | \$ 3.35 | \$ 2.38                               | \$ 2.76 | \$ 3.25 | \$ 3.83 | \$ 4.44 |
| 10/10/2018    | \$ 3.40 | \$ 2.43                               | \$ 2.81 | \$ 3.30 | \$ 3.88 | \$ 4.49 |

Source: Blacklight Research. Note: calculations by Blacklight using NYM options prices.

| Folly   | Hammer (actual and potential)                              |
|---|--|
| World Bank ban on financing of upstream oil & gas             | Spot oil prices advance 80% in year from June 2017         |
| UK relaxes fiduciary standard: politics over returns          | Class action suits against negligence of asset managers    |
| Large public pension funds divest from hydrocarbons           | Class action suits against negligence of political leaders |
| Max exposure to oil consumers, none to oil producers          | Reactionary moves by central banks                         |
| CA & NY govt. lawsuits blame oil majors for climate           | Courts and consumers come to defense of suppliers          |
| Rich nations promise \$100Bn/yr in climate finance            | Reputational damage to policymakers & apologists           |
| Dogma: electric vehicles' triumph is 100% 'secured'           | Toyota, fuel cells, and NGVs eat Tesla's lunch             |
| Resistance to any strategy for geoengineering                 | Private equity shifts from renewables to carbon capture    |
| Failure to see hydrocarbons are both <i>burned &amp; used</i> | Public relations backlash against bias and histrionics     |
| Bullish bitcoin at \$19,000 and SPX at 30+ multiple           | Reactionary moves by banks, investors, & policymakers      |
|   |  |

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Russian rouser — October 22, 2018



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