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Executive Summary

ECONOMICS:

• Global energy-sector CO₂ emissions are flat for the third year in a row. US emissions are down to mid-1990s levels. These are encouraging trends but are far from “decarbonization” of either energy or the atmosphere.

• Almost all new US power generation capacity is gas or renewable energy. Coal-fired power is now only 30% of the US total, down from 50% in 2007. Gas-fired power is cheaper than gas in major US power markets through 2020.

• US auto buyers prefer light trucks to cars. New vehicle fuel economy has been flat since 2014, after years of improvement. This flattening corresponds exactly with a plunge in gasoline prices.

FINANCE:

• Climate disclosure is now an “investment stewardship engagement priority” for BlackRock. Large fossil fuel emitting companies have more than $10t in long-term assets which both contribute to and are exposed to climate change.

• Single-resource, US-only fossil fuel companies dislike regulation as they add costs. Diversified, global fossil fuel companies are (cautiously) supportive of emissions regulations as those companies prefer stability and certainty across the markets in which they operate.

• One fossil fuel-free index has modestly outperformed the S&P500 since 2013.

POLICY (AND POLITICS):

• Major US emitters and automakers have publicly stated support for removing Obama-era regulations on emissions and efficiency. However, rolling back regulations is a lengthy and litigious process that could outlast the current presidential administration.

• Coal plants continue to be retired, despite the politics and rhetoric in support of coal mining. There are 50,000 coal miners in the US; there are 137,000 solar panel installers.

• States (and cities) will continue their lower-emissions paths, though some states actively discourage discussions of climate change in official planning.

• The US public’s belief in anthropogenic climate change is higher than it has ever been. 68% of Americans now believe that human activity is the cause of global warming, per a recent Gallup poll.
Economics
Global energy-sector emissions are flat for the third year

Global energy-related carbon dioxide emissions

35 Gigatonnes of CO₂

Source: International Energy Agency (IEA)
Economics

US energy-sector emissions are back to early 1990s levels

US total energy emissions

6.5 gigatonnes of CO₂

Source: U.S. Energy Information Administration (EIA)
92% of all new power capacity in the US is gas or renewables

US electric generating capacity additions by fuel type (GW)

Source: EIA, Bloomberg New Energy Finance
Natural gas and renewables are now 50% of power generation

US electric generation by fuel type

- Renewables (including hydro)
- Natural gas
- Nuclear
- Oil
- Coal

Source: EIA
Economics

Gas production has increased 50% in a decade

US natural gas production (Million cubic feet)

Source: Bloomberg
Economics

Coal plant utilization is falling, and gas plant utilization is rising

US coal and gas plant utilization rates

Source: Bloomberg
Natural gas now underprices coal in key power markets

Gas and coal short-run marginal costs in PJM

- Henry Hub - Tetco M3 SRMC basis
- SRMC assuming Henry Hub Gas price
- SRMC assuming Tetco M3 Gas price
- SRMC assuming Big Sandy (Central App) Coal price

Source: EIA
Economics

US car buyers...buy trucks

US car and light truck sales

1,250k vehicles per month

Source: Bloomberg
Economics

US car buyers...buy trucks

US car and light truck sales

300k more cars per month

500k more light trucks per month

Source: Bloomberg
US new car fuel economy is flat, thanks to lower fuel prices

US new car fuel economy and gasoline price

Source: University of Michigan Transport Research Institute, Bloomberg
Finance
Climate risk disclosure is a BlackRock priority

**BLACKROCK** Investment stewardship engagement priorities, 2017-2018

**Governance**
- Board composition, effectiveness, diversity, and accountability remain a top priority.

**Corporate strategy**
- Board review of corporate strategy is key in light of shifting assumptions.

**Compensation**
- Executive pay policies should link closely to long-term strategy and goals.

- Climate risk disclosure
  - Systemic disclosure standards would enhance understanding of the impact of climate change on individual companies, sectors and investment strategies.

- Human capital
  - In a talent constrained environment, human capital management is a competitive advantage.

\$5.1t
Assets under management, 4Q 2016

Source: BlackRock, March 2017
There are more than $10t in fixed assets owned by major emitters

Global fixed assets by sector, December 2016

- Oil & Gas: $4.9 trn
- Electric Utilities: $3 trn
- Chemicals: $926 bn
- Marine transport, rail, transportation services: $898 bn
- Mining: $857 bn

Source: Bloomberg
Private equity has almost no interest in US coal

Energy preferences and investment plans of North America-based natural resources investors

<table>
<thead>
<tr>
<th>General energy preference</th>
<th>Targeted investment in next 12 months</th>
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</thead>
<tbody>
<tr>
<td><strong>Oil</strong></td>
<td><strong>Targeted investment in next 12 months</strong></td>
</tr>
<tr>
<td></td>
<td>91%</td>
</tr>
<tr>
<td><strong>Natural gas</strong></td>
<td>91%</td>
</tr>
<tr>
<td><strong>Renewables</strong></td>
<td>50%</td>
</tr>
<tr>
<td>Coal</td>
<td>9%</td>
</tr>
</tbody>
</table>

| Upstream                  | 56%                                  |
|                           | 42%                                  |
| Midstream                 | 66%                                  |
| Downstream                | 47%                                  |
| Oilfield services         | 46%                                  |
|                           | 38%                                  |

Source: Prequin, November 2016
The Obama Administration inflicted “death by a thousand cuts” on our industry. Under Obama there have been 600+ new regulations for our industry, more than the previous three administrations combined!

Harold Hamm, CEO
"I believe, and my company believes, that climate risks warrant action and it’s going to take all of us – business, governments and consumers – to make meaningful progress.

Darren Woods, CEO

Source: Exxon Mobil, February 2017
Diversified resources firms have more nuanced climate positions

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**Continental Resources**

$2.1bn 2016 revenue

- **Upstream**: 100%
- **Downstream**: 100%
- **US**: 100%

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**ExxonMobil**

$198bn 2016 revenue

- **Upstream**: 10%
- **Chemicals**: 13%
- **Downstream**: 77%

- **Non-US**: 61%
- **US-based taxes**: 9%
- **US**: 31%

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Source: Bloomberg
One non-fossil index outperforms the S&P500 since 2013

Fossil Free Index US versus S&P 500, rebased to 100 January 2007
Policy (and politics)
By restarting this review [of 2022-25 vehicle fuel economy standards], analysis rather than politics will produce a final decision consistent with the process we all agreed to.

Mitch Bainwol, President & CEO

Source: Alliance of Automobile Manufacturers, March 2017
“Certainly more coal is good for us… [if US power generation becomes] technology neutral, that’ll be very, very good for coal. It’ll increase the capacity factor for coal and those coal miners will need to go back to work.

Robert Flexon, CEO

Source: Bloomberg News, December 2016
Many coal-related regulations are unlikely to be altered...

### Likelihood of Altering Coal Regulations

<table>
<thead>
<tr>
<th>Coal-focused Regulations</th>
<th>Stage</th>
<th>Odds of Being Altered by Trump Administration</th>
</tr>
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<tbody>
<tr>
<td>Cross-State Air Pollution Rule (requirements for sulfur dioxide and nitrogen oxide emissions)</td>
<td>Final Rule (August 2011)</td>
<td>Low</td>
</tr>
<tr>
<td>Coal Combustion Residuals Rule (also called the &quot;coal ash&quot; rule)</td>
<td>Final Rule (April 2015)</td>
<td>Low</td>
</tr>
<tr>
<td>Mercury and Air Toxics Standards (MATS)</td>
<td>Final Rule (February 2012)</td>
<td>Low</td>
</tr>
<tr>
<td>National Ambient Air Quality Standards for Ozone</td>
<td>Final Rule (October 2015)</td>
<td>Medium</td>
</tr>
<tr>
<td>Clean Power Plan</td>
<td>Final Rule (October 2015)</td>
<td>High</td>
</tr>
<tr>
<td>The Interior Department’s Coal Leasing Review</td>
<td>Proposed Rule</td>
<td>High</td>
</tr>
</tbody>
</table>

*Source: Bloomberg Intelligence*
...and changing regulation will go on for years, and be challenged.
Coal plants are being retired, with or without the Clean Power Plan

US coal plant retirements by year

Source: Bloomberg New Energy Finance
Politics and policy have not derailed coal plant closures

Announcement from Dayton Power & Light, March 20 2017

DP&L to shut down 2 Ohio plants

Kara Driscoll - Staff Writer
12:21 p.m Monday, March 20, 2017 Filed in Business

“We have completed a thorough review of our options and it has become clear that, without significant changes in market conditions, the plants will not be economically viable beyond mid-2018.

Company statement
US coal mining employs only 12% as many people as in the 1920s

US coal mining employment (all types) since 1900
1m miners employed annually

Source: US Department of Labor
Targeting this group is politically expedient…but for how long?

Tweet from Count on Coal, March 7 2017

Blocking the CLEAN POWER PLAN will save:

27,700 mining jobs &
99,700 supply chain jobs.

Source: NMA using MSHA jobs and EIA estimate (1/5/17) of CPP cutting 28 percent of coal production.

Source: @countoncoal
There are more than twice as many solar installers as coal miners

Source: US Department of Labor, US Department of Energy, Solar Foundation
States continue their leadership

Press release from California State Water Resources Control Board, March 7 2017

State Water Board Adopts Climate Change Resolution

Action Focuses Board on Reducing Greenhouse Gas Emissions and Building Resilience to Climate Change Impacts

FOR IMMEDIATE RELEASE
March 7, 2017

Today the State Water Resources Control Board adopted a resolution requiring a proactive approach to climate change in all Board actions, including drinking water regulation, water quality protection, and financial assistance.

Contact: George Kostyrko
george.kostyrko@waterboards.ca.gov
US believe in anthropogenic climate change is higher than ever

Americans’ view on the cause of global warming

Source: Gallup, March 2017
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