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**INVESTING IN ENERGY**  
DECEMBER 2020

# Institutional Investing in Energy

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- Secular and structural changes are shaping the investing landscape in energy sector
- Types of energy investments:

## ➔ Public Assets

- Energy debt and listed equity (upstream, midstream and downstream industries, \$5t globally)
- Listed Master Limited Partnerships (\$156b in market-cap)
  - Most MLPs operate assets like pipelines and typically pay large periodic cash distributions to unitholders.

## ➔ Private Assets

- Natural Resource LP funds (exploration and production and *mining* assets, \$760b<sup>1</sup> in AUM)
- Energy infrastructure debt and equity funds
  - Growing financing need for emerging renewable resource projects
- Other energy-related infrastructure funds (cargo assets)

<sup>1</sup> Bulk of the AUM in natural resource are in energy (Preqin). AUM also includes energy infrastructure assets.

Source: Datastream, Preqin



# Public Energy Sector Equity Performance

- YTD world equity markets returned 10.2%, but energy sector returned -24.7%<sup>1</sup>
- YTD, Crude E&P returned -36.7%, whereas renewable energy equipment returned 107.3%<sup>1</sup>
- Energy market capitalization represents 5.9% of the total world equity market-cap (as of 11/30/2020)
  - In contrast, at the time of the Global Financial Crisis (as of 3/31/2009), energy market-cap was \$2.8t and represented 10.8% of the world market-cap
  - Correlation of crude oil to traditional oil industries like integrated oil & gas is 0.6, but to renewables it is low (0.4)<sup>1</sup>

World Energy Index Performance <sup>1</sup>	Energy Sector	Integrated Oil & Gas	Crude Exploration & Production	Refiners, Marketing	Equipment & Services	Pipelines	Coal	Alternative Fuels	Renewable Energy Equipment
Market Value (%)	100%	67.7%	6.5%	10.5%	2.0%	8.2%	0.8%	0.2%	3.5%
Index Returns (YTD)	-24.7%	-28.6%	-36.7%	-7.6%	-37.1%	-23.0%	-6.8%	50.1%	107.3%
Annualized Index Returns (5y)	0.0%	1.4%	-4.0%	8.5%	-15.0%	0.2%	0.5%	24.3%	18.2%
Annualized Index Volatility (5y)	23.5%	21.7%	34.3%	22.7%	36.0%	25.3%	21.7%	39.4%	26.5%
Correlations to Spot Oil (5y)	0.63	0.62	0.55	0.47	0.65	0.56	0.44	0.28	0.39

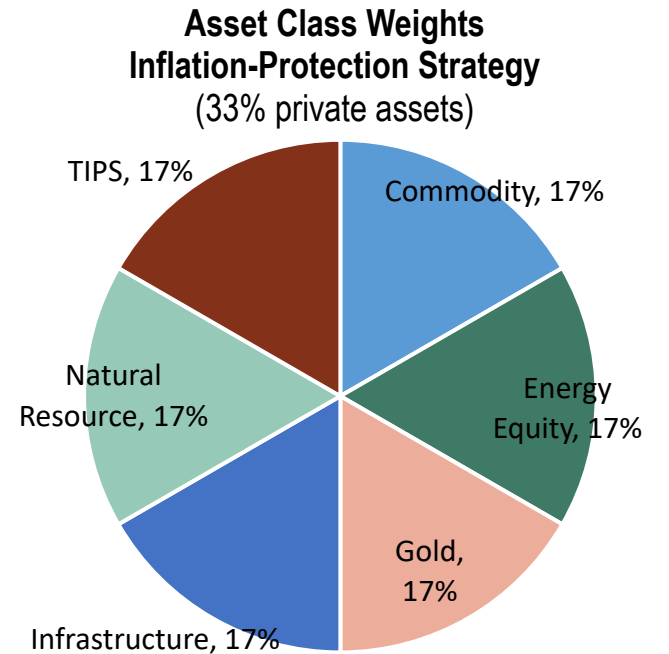
<sup>1</sup> Note: YTD and 5y period as of 11/30/2020. Source: Datastream as of 11/30/2020. Provided for illustrative purposes only.

# Portfolio Role of Energy Equities – Hedging Inflation & Growth Risks

- Energy equity and private natural resource have statistically significant and positive sensitivity to both inflation level and surprise
- Both energy equity and natural resource may be considered in an inflation-protection real asset strategy portfolio

**Macroeconomic Sensitivities: Estimated Dimson Betas**  
(1996-2017; and sub periods)

Sensitivity (Beta)	Inflation Level			Inflation Surprise			Real GDP Level			Real GDP Surprise		
	1996 - 2017	1996 - 2007	2008 - 2017	1996 - 2017	1996 - 2007	2008 - 2017	1996 - 2017	1996 - 2007	2008 - 2017	1996 - 2017	1996 - 2007	2008 - 2017
<b>Natural Resource</b>	<b>12.27</b>	7.08	<b>13.08</b>	<b>18.58</b>	<b>10.02</b>	<b>16.13</b>	2.91	-2.27	<b>5.34</b>	3.60	-8.36	<b>12.15</b>
<b>Energy Equity</b>	<b>10.26</b>	4.46	<b>14.48</b>	<b>16.80</b>	11.17	<b>13.62</b>	<b>5.08</b>	2.76	<b>8.08</b>	<b>8.44</b>	1.36	<b>16.78</b>
<i>US Equity (S&amp;P 500)</i>	-1.01	-3.96	1.34	-1.78	0.99	-5.81	<b>5.99</b>	<b>7.87</b>	<b>6.70</b>	<b>11.36</b>	<b>13.76</b>	<b>14.06</b>
<i>US 10y Treasury</i>	0.05	-1.34	0.68	-0.70	<b>-3.14</b>	1.10	-0.18	-0.68	0.01	-0.10	-1.23	-1.25



Source: PGIM IAS, See H. Parikh and W. Zhang, "The Diversity of Real Assets: Portfolio Construction for Institutional Investors." PGIM, June 2019. Note: Provided for illustrative purposes only. Returns for each are regressed on inflation and real GDP levels (QoQ). We also regress asset returns on inflation and GDP surprises. The beta is a sum of lead, current, and lag betas (i.e., Dimson beta). Betas in bold suggests significance at a 90% confidence level. Assets in bold are private and assets in italics are for reference purposes only.



# Energy's Hedging Role Depends on the Investor's Return Horizon

- Correlations of energy equity to both inflation (CPI) and economic growth (CFNAI) increase with the investor's holding period horizon
- In contrast, energy equity remains diversifying with respect to stocks and bonds even as the investor's horizon increases

**US Energy Correlations by Length of Horizon Returns**  
(6m to 5y Horizons, Spearman Correlations; USD Total Returns; January 1973 – January 2019)

Investment Horizon	CPI	CFNAI	US Equity	US Treasury
6m	0.16	0.12	0.56	-0.15
1y	0.22	0.20	0.55	-0.08
2y	0.31	0.40	0.50	-0.08
3y	0.40	0.49	0.45	-0.03
5y	0.41	0.47	0.37	0.13

Source: PGIM IAS. See H. Parikh, "Institutional Gold!" PGIM, November 2019. Note: Provided for illustrative purposes only. Spearman correlations are average values across 10,000 samples. For 5y, CFNAI is a 5y moving average of monthly CFNAI.

# Measuring Energy's Inflation & Growth Betas – Sector-Level RASA™ Sensitivities

- Depending on the industry, RASA sensitivities can differ a lot
- E&P had the highest and significant inflation surprise beta (27.7)
- E&S had the highest inflation level beta (16.6)
- Pipeline industry had the lowest and not significant inflation level and surprise betas (4.5 and 5.1, respectively)
- Integrated Oil & Gas had significant but the lowest equity beta (0.71)

## Macroeconomic Sensitivities (Dimson Betas)

Beta (1996 -2017)	Inflation Level	Growth Level
Exploration & Production	15.34	4.05
Integrated Oil & Gas	6.20	3.94
Oil Equipment & Services	16.60	6.26
Pipeline	4.48	5.51

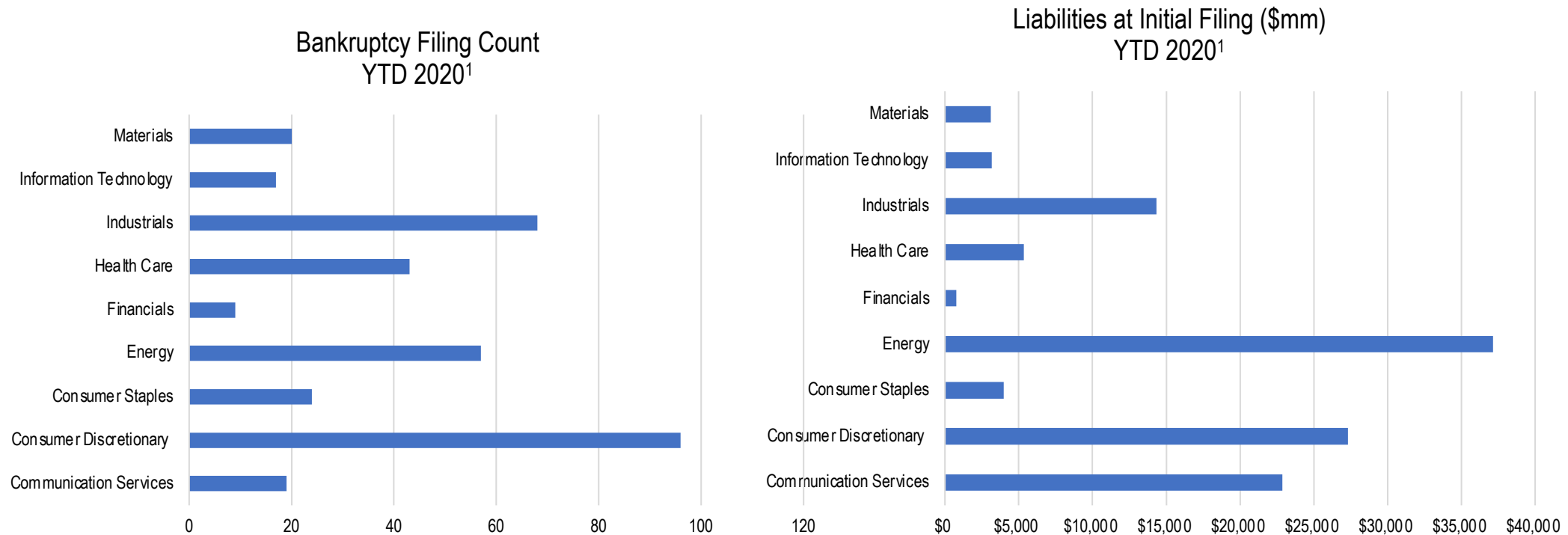
## Market Sensitivities (Dimson Betas)

Beta (1996 -2017)	S&P 500	US 10y Treasury
Exploration & Production	0.84	-0.01
Integrated Oil & Gas	0.71	0.03
Oil Equipment & Services	1.04	-0.43
Pipeline	1.22	1.14

Source: Datastream. Note: Betas are estimated for the period from 1996 – 2017. , See H. Parikh and W. Zhang, "The Diversity of Real Assets: Portfolio Construction for Institutional Investors." PGIM, June 2019. Provided for illustrative purposes only.

# Recent Developments in the Energy Sector

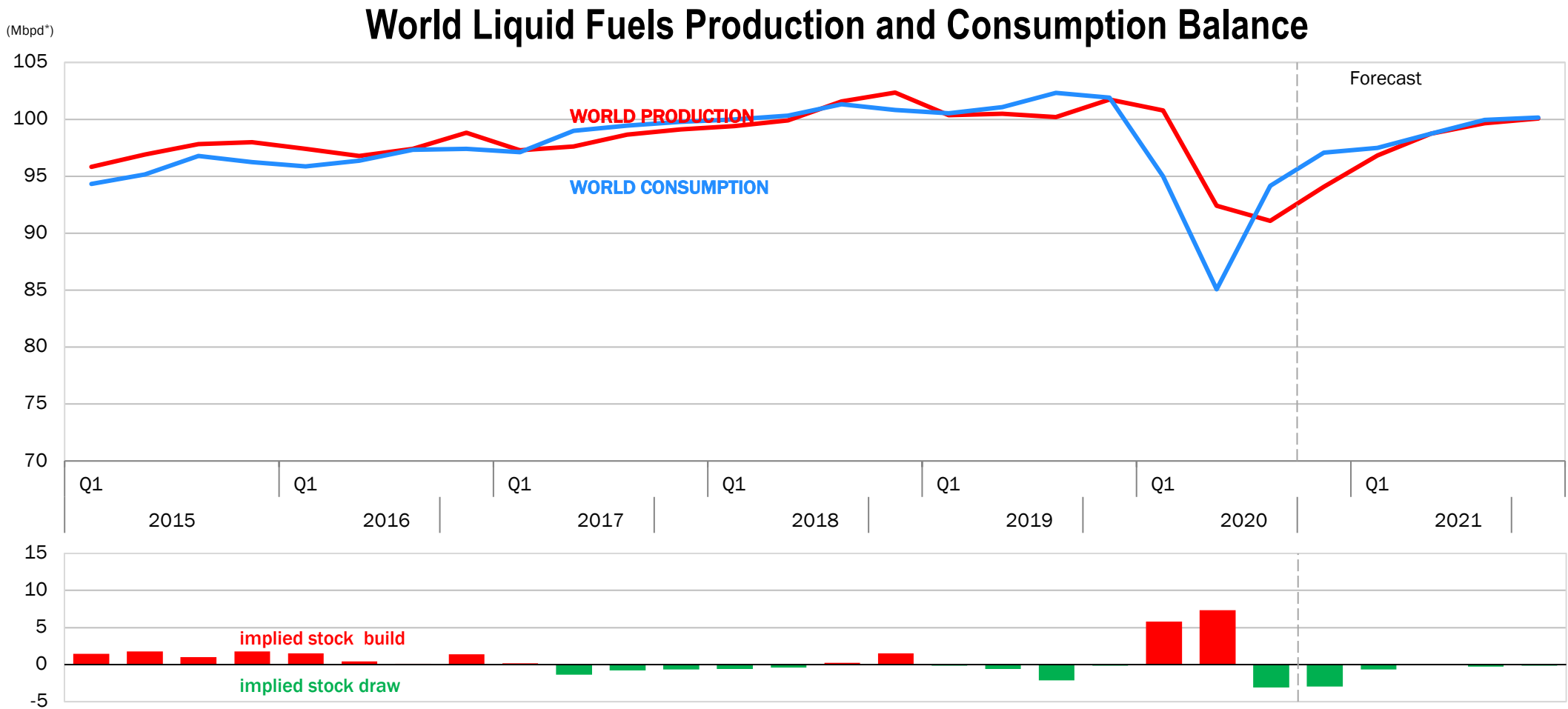
- Highest amount of liabilities at initial bankruptcy filing for energy sector
- Producers are stressed, Dallas Fed Survey suggests DUC wells to be completed if WTI crude prices above \$45.
- Rig counts would increase substantially if prices above \$50/b



<sup>1</sup> YTD period as of 10/31/2020. Source: S&P Capital IQ . Provided for illustrative purposes only.



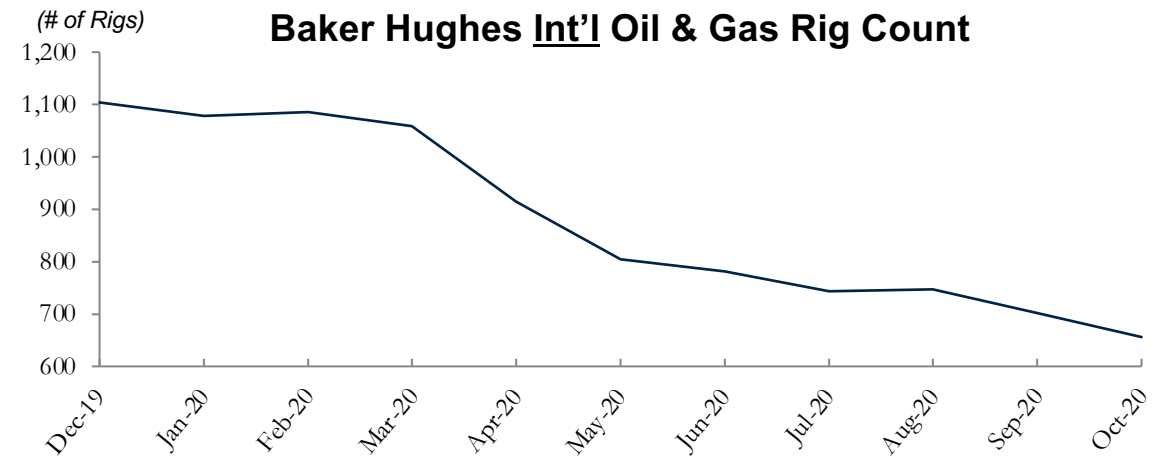
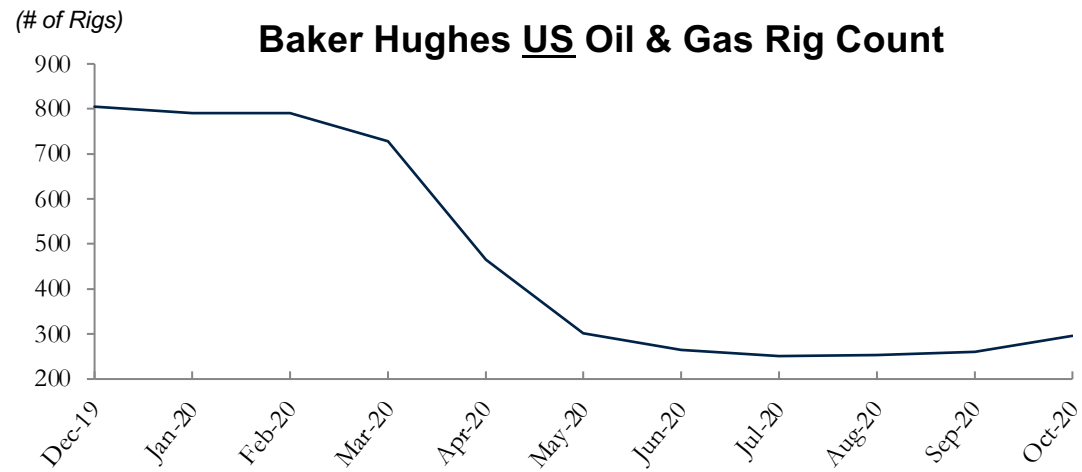
# Global Liquid Fuel Production and Consumption on the Rise



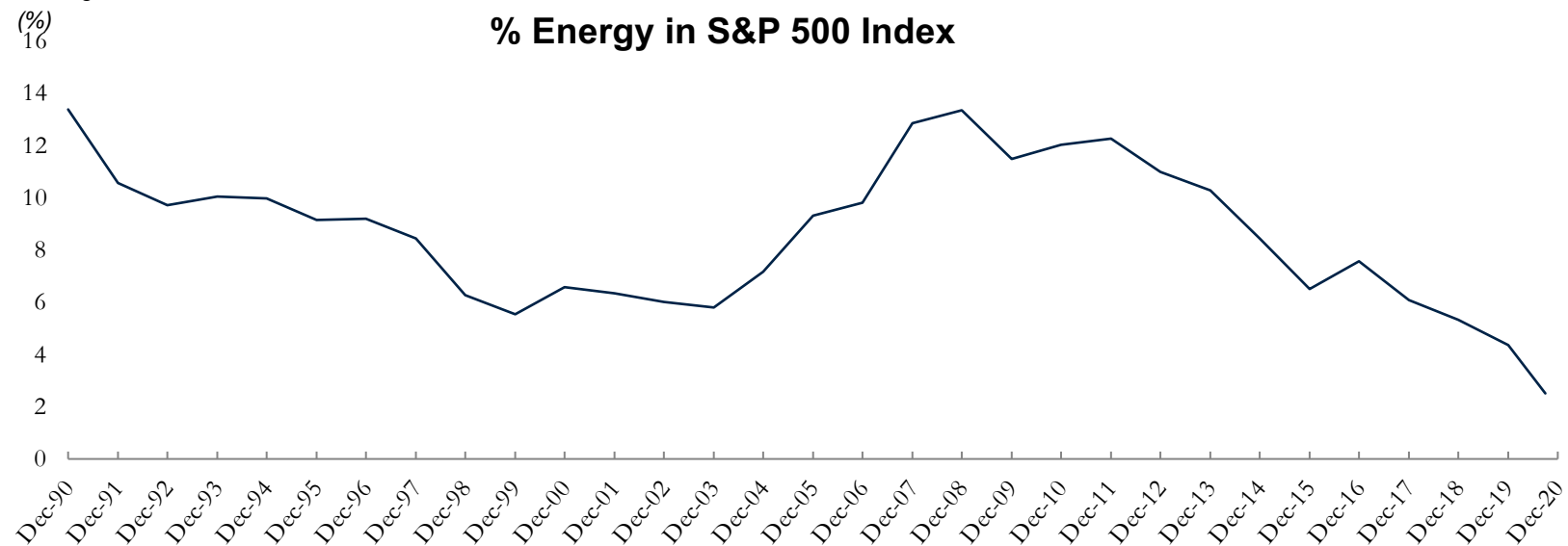
As of 10/6/20.

\*Mbpd = Millions of barrels per day. Source: Energy Information Administration. Short-Term Energy Outlook, October 2020. See Portfolio. Forecasts may not be achieved and are not a guarantee or reliable indicator of future results. Although Jennison believes that the expectations reflected in such forward looking statements are based on reasonable assumptions, actual results may differ materially from those projected.

# Energy Production Prospects and % Energy in S&P 500 Index



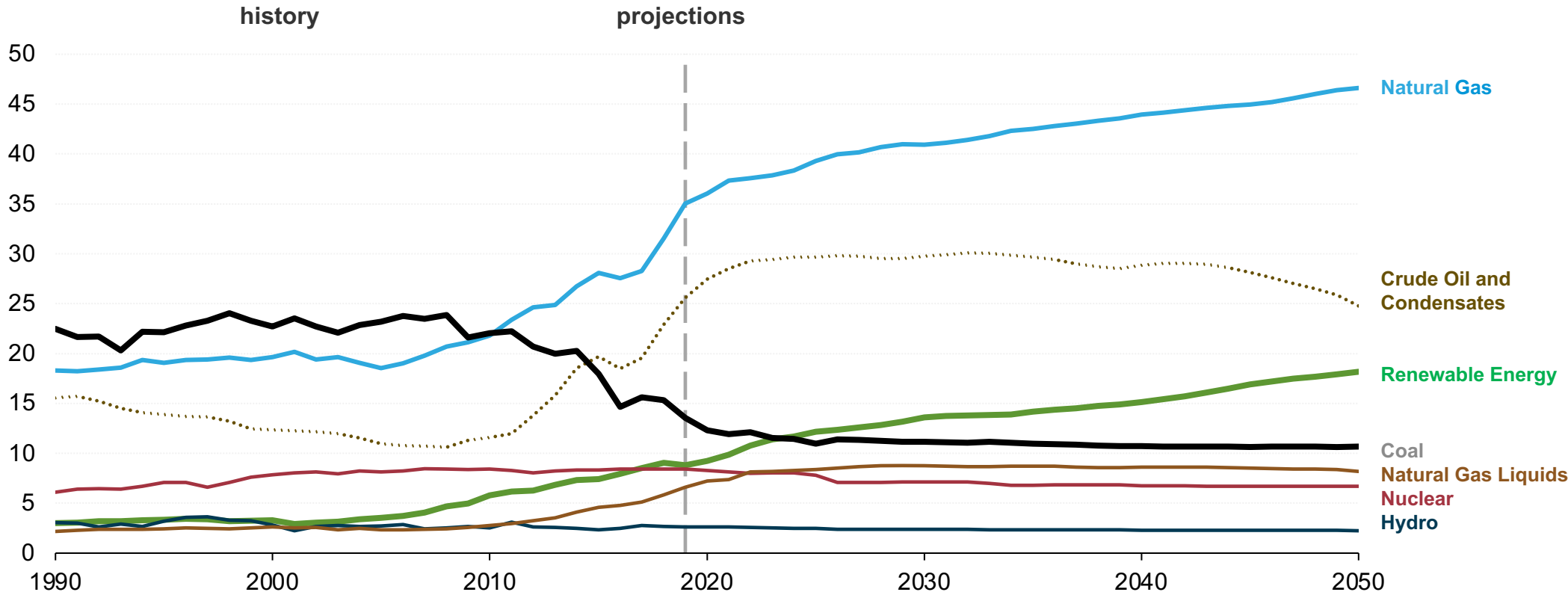
Source: Baker Hughes, Bloomberg. As of 10/31/2020.



Source: S&P, Bloomberg. As of 9/30/2020.

# US Energy Transition

Energy production  
quadrillion British thermal units



Source: US Energy Information Administration. Annual Energy Outlook 2020. Provided for illustrative purposes only.



# IAS Real Asset Research Program



PGIM Institutional Advisory & Solutions

## REAL ASSETS RESEARCH PROGRAM

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#### What's In Your Real Assets Portfolio? Introducing RASA

Using our RASA™ framework, investors can identify real asset funds and construct real asset portfolios that



#### Institutional Gold!

Is there a role for gold investments in an institutional portfolio? Although gold has not performed well compared to other institutional assets, the role for this



#### The Diversity of Real Assets: Portfolio Construction for Institutional Investors

Is the combination of real assets in an institutional portfolio meeting the investor's investment

## Real Asset Blogs

[How The Coronavirus Pandemic Highlights The Diversity In Real Assets \(4/30/2020\)](#)

[Spot Gold and Gold Miners Are NOT Two Sides of the Same Coin \(5/21/2020\)](#)

[Market Volatility Has Declined – Is There a Case for Investing in Gold? \(6/8/2020\)](#)

[Customize Benchmarks to Fit Investors' Investment Objectives, Not the Other Way Around \(7/10/2020\)](#)

[Opportunities in Sustainable Farming Practices \(8/3/2020\)](#)

[Investing in Agriculture – Wedging the Yield Gap \(9/16/2020\)](#)



Thank You!



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