August 2019

Perspectives on U.S. Energy Pricing: Oil, Gas, and Electricity

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Please read disclosure/risk information and Analyst Certification beginning on slide 32.

The Big Picture: Oil and Gas Forecast

- We project back-end-loaded oil price gains in 2019, en route to cyclical highs in 2020, moderating longer-term
- For North American natural gas, we project a trough year in 2020, and slim room for uplift longer-term

RJ&A Oil Price Forecast

2018	Q1 18A	Q2 18A	Q3 18A	Q4 18A	2018A
RJ WTI	$62.89	$67.97	$69.61	$59.32	$64.95
RJ Brent	$66.97	$74.55	$75.26	$68.10	$71.22
2019	**Q1 19A**	**Q2 19A**	**Q3 19E**	**Q4 19E**	**2019E**
RJ WTI	$54.87	$59.89	$65.00	$70.00	$62.50
RJ Brent	$63.27	$68.46	$74.00	$78.00	$71.00
Brent-WTI Spread	$8.39	$8.57	$9.00	$8.00	$8.50
2020	**Q1 20E**	**Q2 20E**	**Q3 20E**	**Q4 20E**	**2020E**
RJ WTI	$85.00	$97.50	$95.00	$92.50	$92.50
RJ Brent	$92.50	$105.00	$102.50	$100.00	$100.00
Brent-WTI Spread	$7.50	$7.50	$7.50	$7.50	$7.50
2021 (+)	**Long-Term Forecast**				**2021E+**
RJ WTI					$75.00
RJ Brent					$80.00
Brent-WTI Spread					$5.00

Source: *Bloomberg, FactSet, Raymond James research*

RJ&A Henry Hub Natural Gas Price Forecast

2018	Q1 18A	Q2 18A	Q3 18A	Q4 18A	2018A
RJ Gas*	$3.03	$2.76	$2.90	$3.61	$3.07
2019	**Q1 19A**	**Q2 19A**	**Q3 19E**	**Q4 19E**	**2019E**
Bloomberg Consensus	$3.06	$2.64	$2.92	$3.16	$2.95
NYMEX Futures	$3.06	$2.64	$2.32	$2.50	$2.65
RJ Gas*	$3.06	$2.64	$2.60	$2.80	$2.75
2020	**Q1 20E**	**Q2 20E**	**Q3 20E**	**Q4 20E**	**2020E**
Bloomberg Consensus	$3.23	$2.97	$2.91	$3.01	$3.05
NYMEX Futures	$2.73	$2.48	$2.54	$2.66	$2.60
RJ Gas*	$2.50	$2.25	$2.15	$2.30	$2.30
2021 (+)	**Long-Term Forecast**				
Bloomberg Consensus					$2.95
NYMEX Futures					$2.75
RJ Gas*					$2.50

Source: Bloomberg, FactSet, Raymond James research ** Bid Week Prices*

Oil Demand: Moderating Growth

- China and other emerging Asia remain top sources of oil demand growth as rising per-capita consumption remains a secular trend
- As the tailwinds of cheap fuel subside, especially with IMO 2020 looming, aggregate OECD demand may resume declines

Oil Demand: Year-Over-Year Changes

Region	2015	2016	2017	2018	2019E	2020E
OECD Americas	1.5%	1.3%	0.7%	1.9%	0.8%	0.6%
OECD Europe	2.3%	1.2%	2.4%	-0.2%	0.1%	0.0%
OECD Pacific (Japan, Korea, Australia)	-0.7%	0.6%	-0.5%	-1.8%	-1.0%	0.0%
CIS (mainly Russia)	-1.4%	-1.6%	0.3%	4.0%	1.9%	0.5%
China	7.0%	3.7%	4.9%	3.6%	1.8%	2.0%
India	10.4%	4.7%	2.9%	4.4%	3.4%	3.0%
Other Asia (Pakistan, Indonesia, Phillipines)	-0.2%	4.6%	3.7%	2.1%	2.4%	1.5%
Non-OECD Americas (South America)	-1.8%	-4.0%	0.1%	-0.7%	-0.4%	0.5%
Middle East	1.2%	0.3%	-0.1%	-0.8%	0.9%	2.5%
Africa	11.2%	-0.1%	0.5%	-0.2%	1.3%	1.0%
Regional Demand (RJ Est.)	**2.1 MMbpd**	**1.3 MMbpd**	**1.6 MMbpd**	**1.2 MMbpd**	**1.0 MMbpd**	**1.0 MMbpd**
Missing Bbls Adj. (RJ Est.)	**(0.25)**	**0.75**	**(0.40)**	**0.45**	**0.00**	**0.00**
Total Demand Growth* (Current)	**1.9 MMbpd**	**2.0 MMbpd**	**1.2 MMbpd**	**1.7 MMbpd**	**1.0 MMbpd**	**1.0 MMbpd**
Total Demand % Growth* (Current)	**2.0%**	**2.1%**	**1.2%**	**1.7%**	**1.0%**	**1.0%**
IEA Estimate (MMbpd)	**2.0 MMbpd**	**1.3 MMbpd**	**1.6 MMbpd**	**1.2 MMbpd**	**1.2 MMbpd**	
IEA Estimate (%)	**2.2%**	**1.4%**	**1.7%**	**1.2%**	**1.2%**	
GDP Data (IMF)	**3.4%**	**3.2%**	**3.8%**	**3.6%**	**3.3%**	**3.6%**

Source: IEA, IMF, Raymond James research

What About Gasoline Demand?

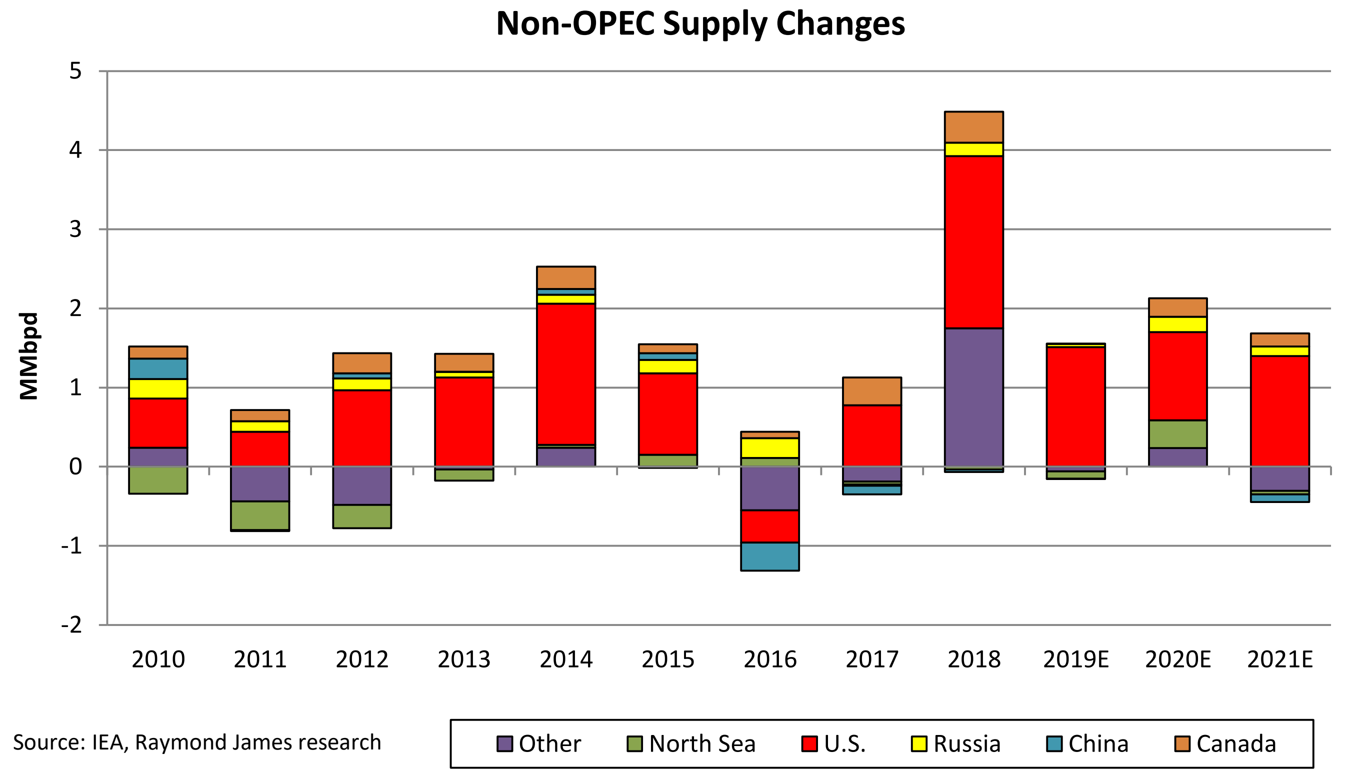
- The U.S. has cheap gasoline by global standards, and despite a high rate of usage, it takes up only about 2% of average income
- Even if our $100 Brent forecast for 2020 were to materialize, the impact on gasoline prices would be milder than many might think – the reason is the hefty role of fuel taxes in what drivers pay at the pump

	Retail Gasoline Prices, 1Q19			Extrapolation to 2020		
	$ / gal	Avg. usage (gal)	% of avg. income	$ / gal	Increase	% of avg. income
Mexico	$4.17	96	3.9%	$5.05	21%	4.7%
South Africa	$3.65	56	3.3%	$4.53	24%	4.1%
Canada	$3.92	330	2.8%	$4.80	22%	3.5%
Brazil	$4.24	55	2.6%	$5.12	21%	3.1%
Malaysia	$1.94	145	2.4%	$2.82	45%	3.5%
Saudi Arabia	$2.04	265	2.4%	$2.92	43%	3.4%
Pakistan	$2.50	12	2.3%	$3.38	35%	3.1%
U.S.	$2.92	432	1.9%	$3.80	30%	2.5%
Russia	$2.69	85	1.9%	$3.57	33%	2.6%
Thailand	$4.39	35	1.9%	$5.27	20%	2.3%
Nigeria	$1.54	25	1.9%	$2.42	57%	2.9%
Philippines	$3.98	16	1.8%	$4.86	22%	2.2%
Argentina	$3.75	45	1.6%	$4.63	23%	2.0%
Egypt	$1.70	27	1.5%	$2.58	52%	2.2%
Australia	$3.87	194	1.4%	$4.75	23%	1.7%
Japan	$4.87	107	1.3%	$5.75	18%	1.5%
Colombia	$2.92	17	1.3%	$3.80	30%	1.7%
Iran	$0.52	81	1.3%	$1.40	169%	3.4%
Kuwait	$1.31	265	1.2%	$2.19	67%	2.0%
India	$4.15	6	1.2%	$5.03	21%	1.4%
Poland	$4.77	38	1.2%	$5.65	18%	1.4%
U.K.	$6.08	68	1.0%	$6.96	14%	1.1%
Germany	$5.79	78	1.0%	$6.67	15%	1.1%
South Korea	$4.63	64	0.9%	$5.51	19%	1.1%
Indonesia	$2.71	14	0.9%	$3.59	33%	1.2%
Italy	$6.65	43	0.9%	$7.53	13%	1.0%
France	$6.30	37	0.6%	$7.18	14%	0.6%
Turkey	$4.51	10	0.5%	$5.39	20%	0.6%
China	$4.18	12	0.5%	$5.06	21%	0.6%
Norway	$7.20	48	0.4%	$8.08	12%	0.5%

Source: Bloomberg, Raymond James research

Non-OPEC Supply Growth Slowing

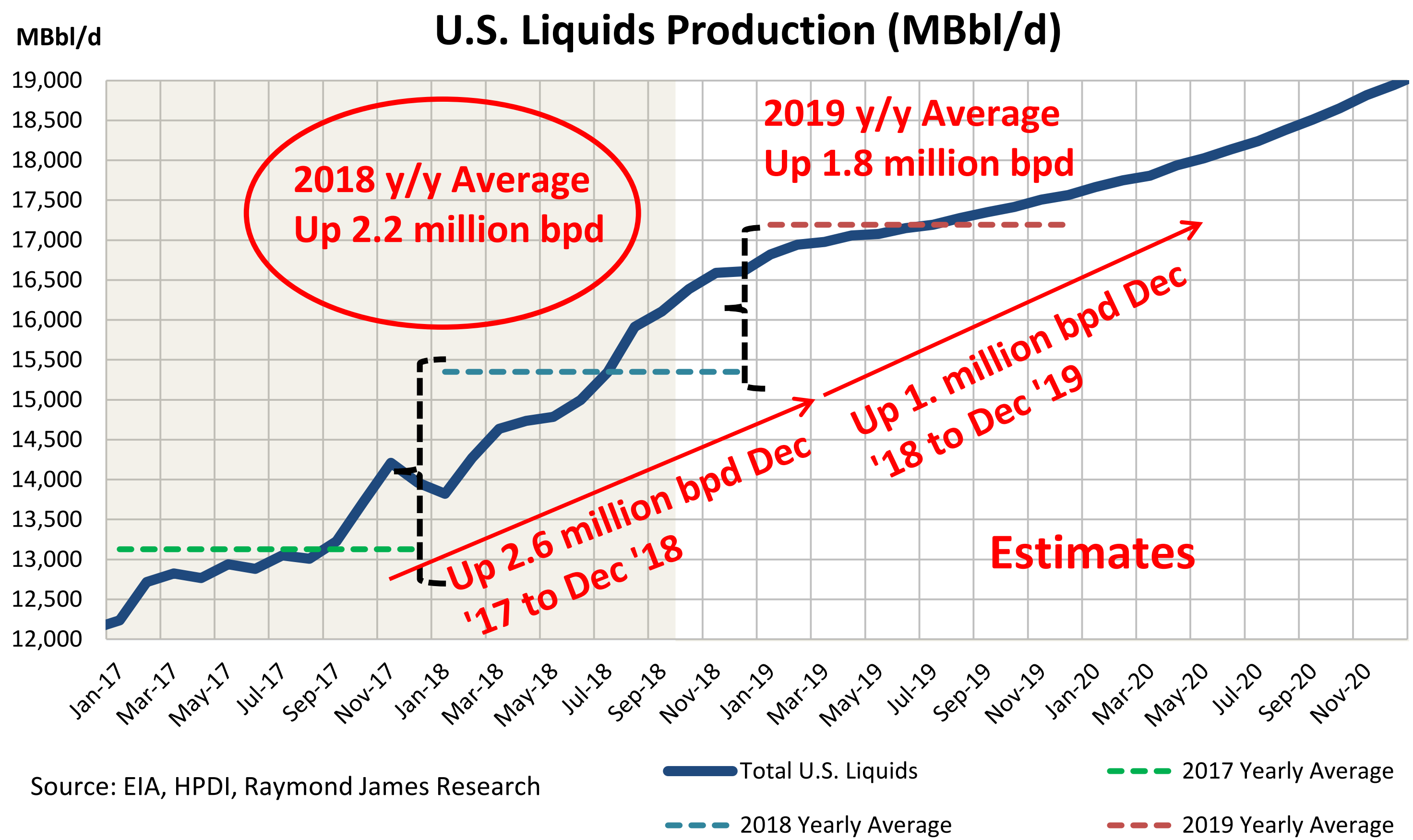
- After non-OPEC supply growth accelerated in 2018 – led by record y/y production growth in the U.S. – 2019 is exhibiting a much smaller increase, and 2020 is likely to be similar



Source: IEA, Raymond James research

U.S. Liquids Near 19 MMbpd by YE20

- The Permian Basin is playing the dominant role in U.S. oil production growth, but room for upside in the Bakken, Eagle Ford, and SCOOP/STACK should not be overlooked



Source: EIA, HPDI, Raymond James Research

Trajectory of Global Inventories

- The market pays disproportionate attention to weekly U.S. data, even though it accounts for only ~20% of global inventories
- Our global oil model shows a substantial inventory draw in 2019, followed by a modest one in 2020, and the data looks even more bullish on a days of consumption basis
- For IMO 2020, our assumption is that the regulations will effectively erase ~1.0 million bpd of global supply

Oil Supply-Demand: Year-Over-Year Changes (MMbpd)					
Source	**2016A**	**2017A**	**2018A**	**2019E**	**2020E**
Previous Year Build/Draw	**1.6**	**0.0**	**-0.7**	**0.2**	**-1.1**
U.S. Supply Growth	-0.4	0.8	2.2	1.6	1.1
Other Non-OPEC, Ex-U.S.	-0.5	0.0	0.2	-0.1	1.0
OPEC Supply Growth	1.3	-0.3	0.2	-1.7	0.7
Saudi Arabia	*0.3*	*-0.5*	*0.4*	*-0.5*	*0.6*
Other OPEC	*1.0*	*0.1*	*-0.2*	*-1.2*	*0.1*
Total Supply Change	**0.4**	**0.5**	**2.6**	**-0.3**	**1.9**
IMO 2020 "Supply" Impact	**0.0**	**0.0**	**0.0**	**-0.1**	**-0.9**
Total Demand Change	**2.0**	**1.2**	**1.7**	**1.0**	**1.0**
Inventory Build Estimate	**0.0**	**-0.7**	**0.2**	**-1.1**	**-0.2**

Source: IEA, Raymond James research

Oil Market Wildcards

- Above and beyond high-visibility supply and demand drivers, there are some potential wildcards as well

Bullish

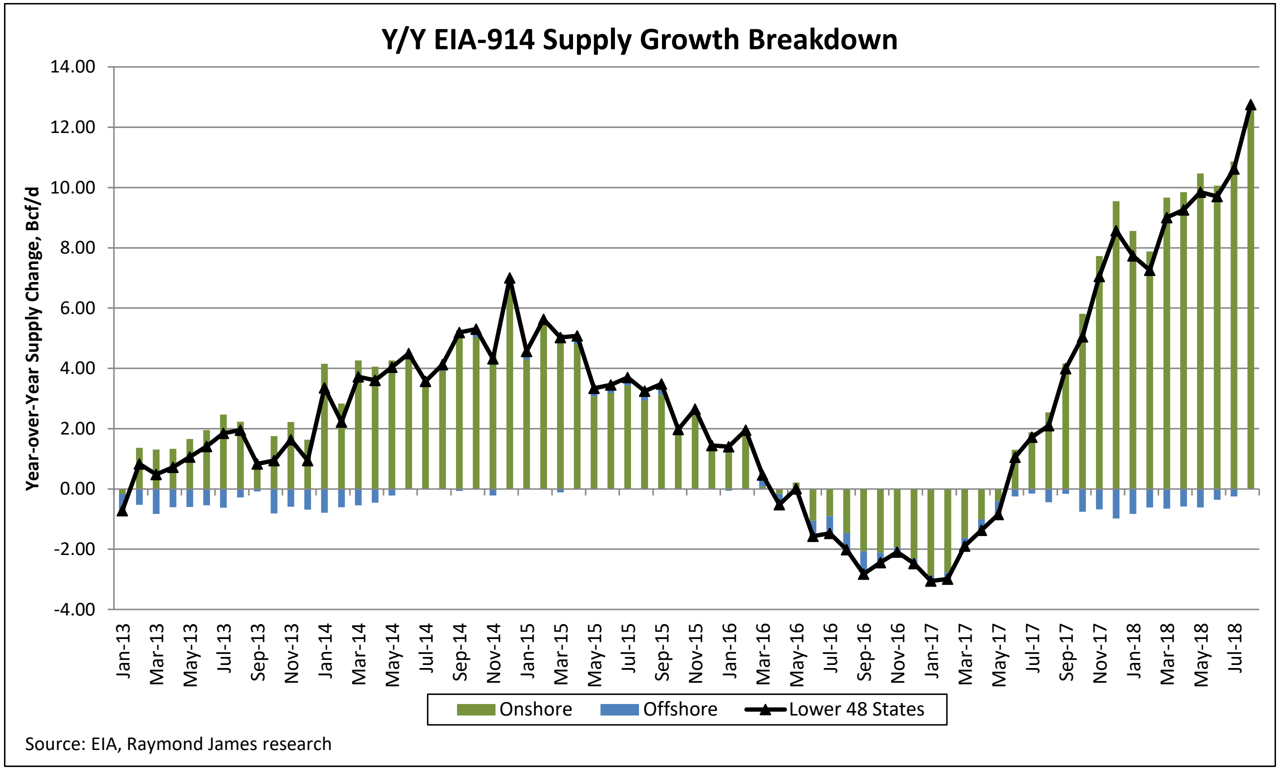
- **Strait of Hormuz shutdown:** In the event of U.S.-led or Saudi-led military action against Iran, retaliation would almost certainly include an attempt to blockade the world's most critical waterway for tankers

Bearish

- **Peace in Libya:** If the ongoing civil strife in Libya were to subside, ending the periodic disruptions at export terminals, exports could be boosted by as much as 0.5-0.6 MMbpd
- **Regime change in Venezuela:** If a more business-friendly administration were to come to power, regaining the confidence of international investors, the steep production declines of recent years would likely end or even reverse

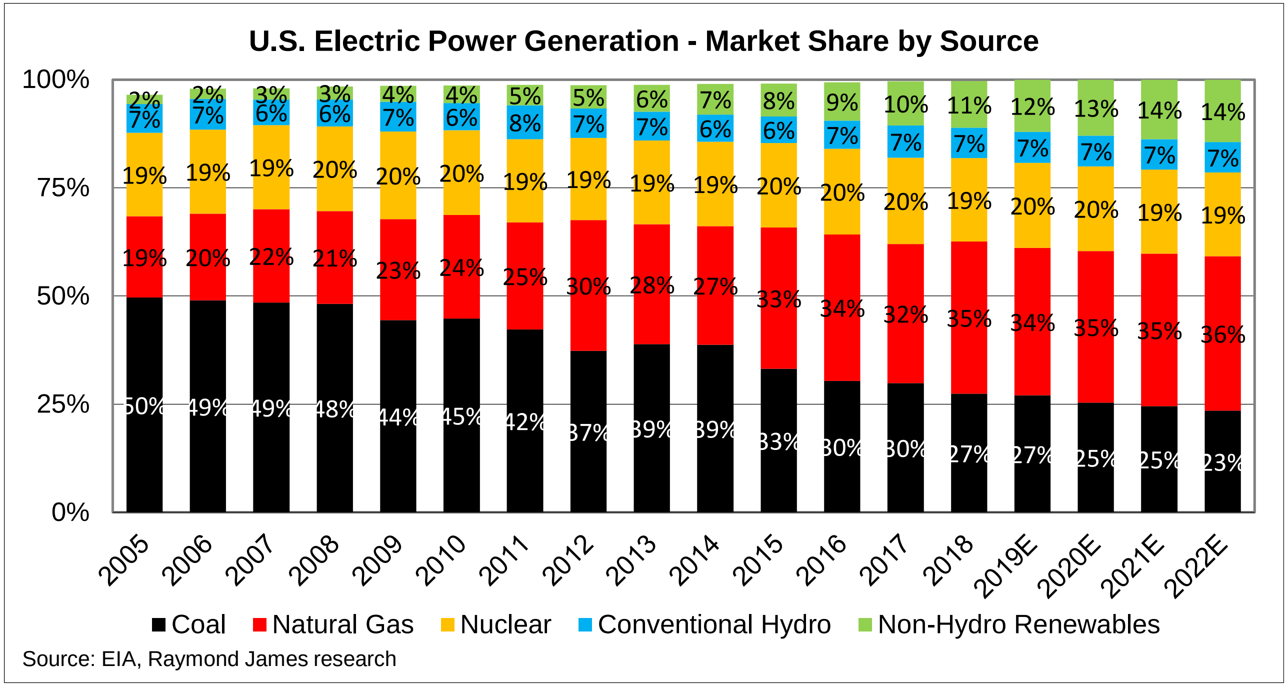
U.S. Natural Gas in a Trading Range

- We see prices staying generally range-bound, $2.50/Mcf to $3.00/Mcf, over the medium-term, with short-term moves mainly driven by coal-to-gas switching and weather
- Associated gas from liquids-rich basins plays a major role in how supply evolves; demand-side drivers include LNG exports, pipeline exports to Mexico, chemicals/fertilizer, and gas-fired power newbuilds



Slow Share Gain in U.S. Electricity Mix

- During the period 2008-2018, natural gas captured more than half of the market share lost by coal in the domestic electricity mix – with the rest going to wind and solar
- Over the next decade, however, we project that wind/solar will capture, on average, two-thirds of the incremental share



U.S. LNG Exports Are Scaling

North American Liquefaction Plants (Green Denotes in Operation or Construction)					
Project	Location	Est. Capacity (Bcf/d) Max. Target	Status	Targeted Startup	Owner/Applicant
Kenai LNG	Alaska	0.2	Last shipment was in 2015		Andeavor
Sabine Pass LNG	Louisiana	3.0	In operation (trains 1-5); construction (6)		Cheniere Energy Partners
Cove Point LNG	Maryland	0.8	In operation		Dominion
Corpus Christi LNG	Texas	1.5	In operation (trains 1-2); construction (3)		Cheniere Energy
Elba Island LNG	Georgia	0.4	In operation		Kinder Morgan, EIG Global Energy
Cameron LNG	Louisiana	1.7	In operation (train 1); construction (2-3)		Sempra, Total, Mitsui, Mitsubishi, NYK
Freeport LNG	Texas	2.1	Under construction	2H 2019	Michael Smith, Global Infr. Partners, Osaka Gas
Calcasieu Pass LNG	Louisiana	1.4	Under construction	2022	Venture Global LNG, Stonepeak Infr. Partners
Plaquemines LNG	Louisiana	2.7	DOE-approved	2023	Venture Global LNG
Driftwood LNG	Louisiana	3.6	DOE-approved	2023	Tellurian
Port Arthur LNG	Texas	1.5	DOE-approved	2023	Sempra
Goldboro LNG	NS, Canada	1.4	NEB-approved	2023	Pieridae Energy
Annova LNG	Texas	0.8	DOE-approved	2024	Exelon, Black & Veatch, Kiewit Energy Group
LNG Canada	BC, Canada	3.6	Under construction	2024	Shell, Petronas, PetroChina, Mitsubishi, Kogas
Golden Pass LNG	Texas	2.1	Under construction	2024	Qatar Petroleum, ExxonMobil
Kwispaa LNG	BC, Canada	3.3	NEB-approved	2024	Steelhead LNG
Delta LNG	Louisiana	2.7	Pre- export permit	2024	Venture Global LNG
Lake Charles LNG	Louisiana	2.0	DOE-approved (incl. non-FTA)	2025	Energy Transfer, Shell
Woodfibre LNG	BC, Canada	0.3	NEB-approved; conditional FID in place	TBD	Pacific Oil & Gas
Bear Head LNG	NS, Canada	1.6	DOE-approved (incl. non-FTA) and NEB	TBD	Liquefied Natural Gas Ltd.
Magnolia LNG	Louisiana	1.1	DOE-approved (incl. non-FTA)	TBD	Liquefied Natural Gas Ltd.
Rio Grande LNG	Texas	3.7	DOE-approved	TBD	NextDecade
Delfin LNG	Louisiana	2.9	DOE-approved	TBD	Fairwood LNG
Texas LNG	Texas	0.5	DOE-approved	TBD	Third Point, Samsung
Gulf LNG	Mississippi	1.4	DOE-approved	TBD	Kinder Morgan, Thunderbird, Arc, Lightfoot
Cedar LNG	BC, Canada	0.9	NEB-approved	TBD	Haisla Nation
Alaska LNG	Alaska	2.7	DOE-approved (incl. non-FTA)	TBD	Alaska Gasline Development Corp.
Jordan Cove LNG	Oregon	0.8	DOE-approved (incl. non-FTA)	TBD	Pembina Pipeline
Kitimat LNG	BC, Canada	1.4	NEB-approved	TBD	Chevron, Woodside Petroleum
Orca LNG	BC, Canada	3.3	NEB-approved	TBD	Orca LNG
NewTimes Energy	BC, Canada	1.6	NEB-approved	TBD	NewTimes Energy
Point Comfort LNG	Texas	1.2	Pre- export permit	TBD	LE Group Holding
Commonwealth LNG	Louisiana	0.2	DOE-approved	TBD	Waller Marine
Total		**58.4**			

Source: DOE, company reports, Raymond James research. Assumes 1 mtpa = 0.1371 Bcf/d unless specific Bcf/d figure is given by company.

NC Power Prices Are Near the Low End of the U.S. Spectrum

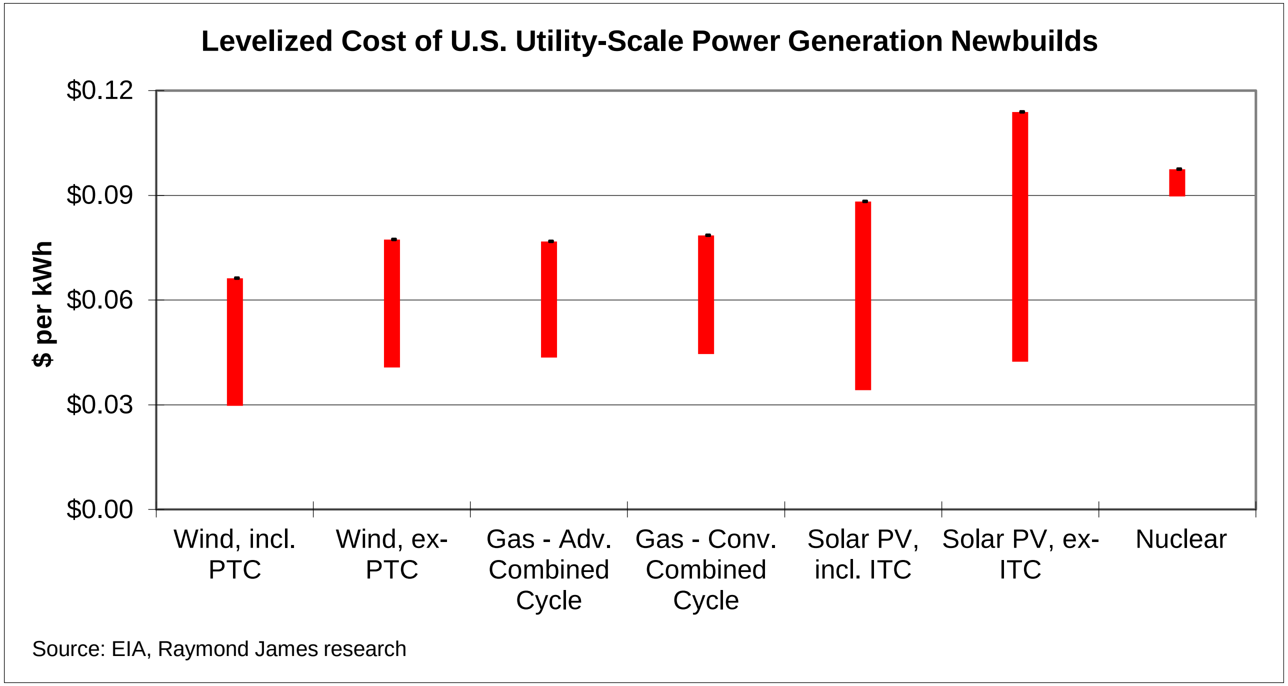
- For a combination of reasons, including relatively low T&D costs, electricity prices paid by North Carolina's residents and businesses typically rank among the ten lowest in the U.S.
- However, it is worth underscoring that retail power prices are trending higher across the country: on average, annual increases of 1-2% (roughly in line with inflation) have taken place throughout the past decade – despite the backdrop of flat to down wholesale pricing

	Avg. Power Price, Dec. 2018 (Cents / kWh)	
	Commercial	Industrial
Alabama	$11.2	$5.9
Alaska	$19.7	$16.5
Arizona	$9.7	$6.0
Arkansas	$7.3	$5.1
California	$15.3	$11.9
Colorado	$9.6	$7.0
Connecticut	$17.7	$14.1
Delaware	$10.0	$7.8
District of Columbia	$12.7	$8.7
Florida	$9.7	$7.8
Georgia	$8.7	$5.2
Hawaii	$32.4	$28.5
Idaho	$7.4	$5.7
Illinois	$8.6	$6.7
Indiana	$10.3	$7.2
Iowa	$8.7	$5.4
Kansas	$9.8	$7.4
Kentucky	$9.7	$5.6
Louisiana	$8.8	$5.4
Maine	$12.5	$9.2
Maryland	$10.8	$8.4
Massachusetts	$16.8	$14.7
Michigan	$11.0	$7.2
Minnesota	$9.9	$7.6
Mississippi	$10.8	$6.3
Missouri	$8.2	$6.2
Montana	$10.1	$5.8
Nebraska	$8.5	$7.0
Nevada	$7.6	$4.8
New Hampshire	$15.9	$13.7
New Jersey	$12.0	$10.1
New Mexico	$9.8	$5.5
New York	$13.1	$5.6
North Carolina	$8.6	$6.1
North Dakota	$8.7	$8.2
Ohio	$9.7	$6.6
Oklahoma	$7.5	$5.0
Oregon	$8.9	$6.0
Pennsylvania	$8.9	$6.7
Rhode Island	$17.4	$17.1
South Carolina	$10.1	$6.2
South Dakota	$9.4	$7.4
Tennessee	$10.6	$6.0
Texas	$7.7	$5.1
Utah	$7.3	$5.5
Vermont	$15.4	$10.8
Virginia	$8.3	$6.8
Washington	$8.7	$4.7
West Virginia	$8.8	$6.0
Wisconsin	$10.5	$7.3
Wyoming	$9.2	$6.5

Source: EIA, Raymond James research

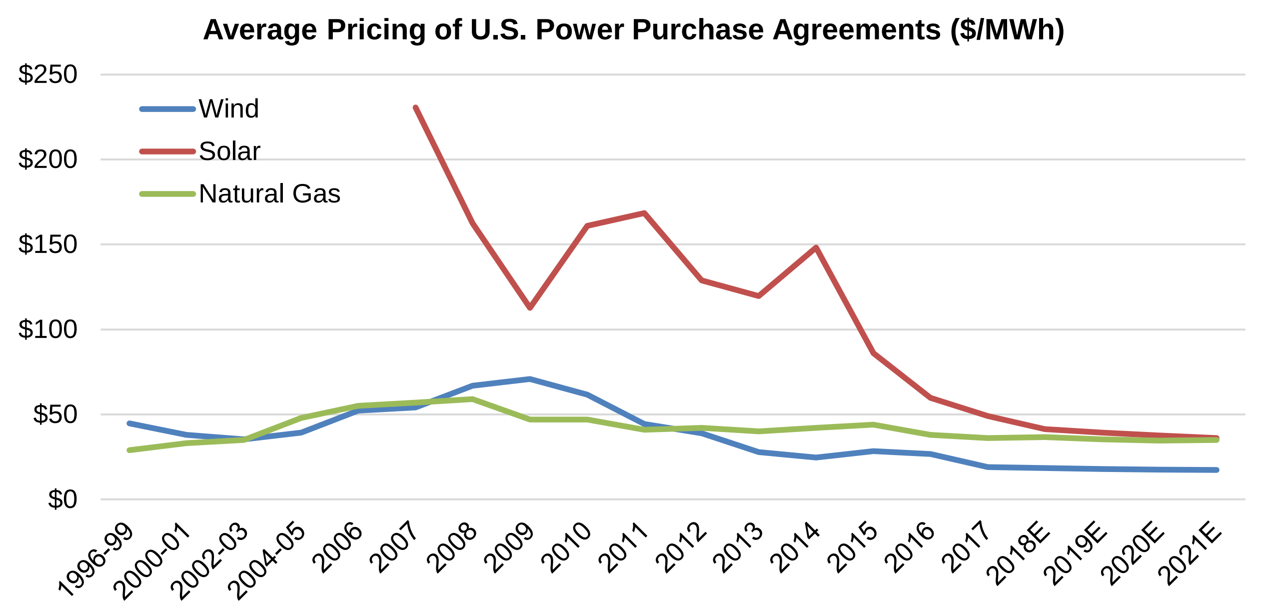
The Lowest-Cost Power Sources Are…

- Power plant economics always need to be considered on a case-by-case basis, due to significant variability based on geography and other factors, but on the whole, onshore wind projects and natural gas-fired power plants are currently the lowest-cost options for newbuilds



…Subject to Change Over Time

- While solar's levelized cost structure remains slightly higher than either wind or natural gas, it has been declining more rapidly, and in some parts of the country utility-scale solar already represents a cost-competitive option
- Concurrently, large-scale battery deployments are becoming more commonplace, though it will probably be 2022-2023 before storage becomes truly mainstream



Source: DOE, LBNL, Raymond James research

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Market Perform (MP3) Expected to perform generally in line with the S&P 500 over the next 12 months.

Underperform (MU4) Expected to underperform the S&P 500 or its sector over the next six to 12 months and should be sold.

Suspended (S) The rating and price target have been suspended temporarily. This action may be due to market events that made coverage impracticable, or to comply with applicable regulations or firm policies in certain circumstances, including when Raymond James may be providing investment banking services to the company. The previous rating and price target are no longer in effect for this security and should not be relied upon.

Raymond James Ltd. (Canada) definitions

Strong Buy (SB1) The stock is expected to appreciate and produce a total return of at least 15% and outperform the S&P/TSX Composite Index over the next six months.

Outperform (MO2) The stock is expected to appreciate and outperform the S&P/TSX Composite Index over the next twelve months.

Market Perform (MP3) The stock is expected to perform generally in line with the S&P/TSX Composite Index over the next twelve months and is potentially a source of funds for more highly rated securities.

Underperform (MU4) The stock is expected to underperform the S&P/TSX Composite Index or its sector over the next six to twelve months and should be sold.

Raymond James Europe (Raymond James Euro Equities SAS & Raymond James Financial International Limited) rating definitions

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Outperform (2) Expected to appreciate and outperform the Stoxx 600 over the next 12 months.

Market Perform (3) Expected to perform generally in line with the Stoxx 600 over the next 12 months.

Underperform (4) Expected to underperform the Stoxx 600 or its sector over the next 6 to 12 months.

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High Risk/Income (H/INC) Medium to higher risk equities of companies that are structured with a focus on providing a meaningful dividend but may face less predictable earnings (or losses), more leveraged balance sheets, rapidly changing market dynamics, financial and competitive issues, higher price volatility (beta), and potential risk of principal. Securities of companies in this category may have a less predictable income stream from dividends or distributions of capital.

High Risk/Growth (H/GRW) Medium to higher risk equities of companies in fast growing and competitive industries, with less predictable earnings (or losses), more leveraged balance sheets, rapidly changing market dynamics, financial or legal issues, higher price volatility (beta), and potential risk of principal.

High Risk/Speculation (H/SPEC) High risk equities of companies with a short or unprofitable operating history, limited or less predictable revenues, very high risk associated with success, significant financial or legal issues, or a substantial risk/loss of principal.

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