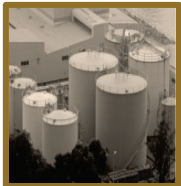


ENERGY LOGISTICS & DISTRIBUTION

Industry In-Sight™

SUMMER / FALL 2021



**ENERGY
EQUIPMENT &
INFRASTRUCTURE
ALLIANCE**

The Voice of the Energy Supply Chain



IN THIS REPORT

Introduction	5
Data Center	8
Data Center: Abbreviations & Acronyms, Definitions, Descriptions and Chart Notes	47
Hot Topics	62
Public and Transaction Comparables by Segment	68
Factoids: Little-known Facts and Stats	86

TABLE OF CONTENTS

INTRODUCTION	5
DATA CENTER	8
▪ OIL	
• Crude Oil and Gasoline Prices	8
• Diesel and Jet Fuel Prices	9
• U.S. Crude Oil and Petroleum Products Supply, Inventory and Consumption	10
• U.S. Refinery Volumes and Wholesale Prices of Petroleum Products	10
• U.S. Crude Oil Refinery Input, Distillation Capacity and Refinery Utilization	11
• U.S. Crude Oil and Petroleum Products Imports and Exports	11
▪ NATURAL GAS	
• Domestic and International Natural Gas Prices	12
• Americas and Western Europe Liquefied Natural Gas Prices	13
• Asia Liquefied Natural Gas Prices and World Liquefied Natural Gas Prices Map	14
• U.S. Import/Export Liquefied Natural Gas Prices and Natural Gas Plant Liquids Prices	15
• U.S. Natural Gas Production and Consumption and U.S. Natural Gas Supply and Inventory	16
• U.S. Natural Gas Consumption by End Use and U.S. Natural Gas Plant Liquids Production	17
• U.S. Liquefied Natural Gas Import and Export Volumes	18
• North America Liquefied Natural Gas Export Terminals – Proposed	18
• North America Liquefied Natural Gas Import/Export Terminals – Approved and Existing	19
▪ PROPANE AND HEATING/FUEL OIL	
• Heating Oil and Intermediate Fuel Oil aka “Bunker Fuel” Prices	20
• Propane Prices	21
• No. 1 Distillate Fuel Oil, Residual Fuel Oil Wholesale, Retail Sales Volume	21
• No. 2 Distillate Fuel Oil Wholesale, Retail Sales Volume	22
• Propane & Propylene and Distillate Fuel Oil Production and Consumption	22
• U.S. Ending Stocks of Propane & Propylene and Distillate Fuel Oil	23
▪ DRILLING ACTIVITY	
• U.S. Well Starts by Depth	24
• Percentage of Crude Oil and Natural Gas Production per Shale Region	24
• Drilled but Uncompleted (DUC) Wells vs. Crude Oil Price	25
• Hydraulic Fracturing Sand Producer Price Index	25
• Crude Oil Production, Rig Count and Production per Rig	26
• Natural Gas Production, Rig Count and Production per Rig	26
• U.S. Drilling Rigs by Type	27
▪ RENEWABLES	
• Wind and Solar Prices	27
• U.S. Total Renewable Energy Consumption	28



TABLE OF CONTENTS

▪	RENEWABLES (Continued)	
•	U.S. Solar, Wind and Hydroelectric Energy Consumption	28
•	U.S. Wood, Waste, Biofuels and Geothermal Energy Consumption	29
•	Corn and Ethanol Prices and Corn Cost per Gallon of Ethanol	29
•	U.S. Solar	
–	Energy Consumption and Net Generation	30
–	Distributed Photovoltaic and Utility-Scale Electricity Generation by Sector	31
–	Cumulative Capacity Installations	32
•	U.S. Wind Power	
–	Capacity Installations	32
–	Utility-Scale Capacity Installations	33
–	Under Construction or in Advanced Development	33
▪	U.S. AGGREGATED ENERGY CONSUMPTION	
•	Energy Consumption by Sector and by Source	34
•	Electricity Prices by Sector	35
▪	LOGISTICS	
•	Storage and Terminals	
–	Commercial Crude Oil, Petroleum and Other Liquids Commercial Inventory	36
–	Natural Gas Underground Storage Capacity	37
–	Crude Oil Refinery, Tank and Underground Storage Capacity and Utilization	37
•	Pipelines	
–	Crude Oil and Natural Gas Pipeline Mileage	38
–	Crude Oil and Petroleum Products Pipeline Movements Between PADDs	38
–	Natural Gas Cumulative Interstate Pipeline Systems Capacity	39
–	Crude Oil and Petroleum Products Exports to Mexico	39
•	Truckers	
–	Truck Tonnage Index and Heavy Truck Sales	40
–	Trucking Conditions Index and Freight Transportation Services Index	40
•	Shipping	
–	Crude Oil Refinery Receipts by Transportation Method	41
–	Crude Oil Movements by Tanker and Barge Between PADDs	41
•	Rail	
–	Movements of Crude Oil by Rail	42
–	Rail Carloads of Petroleum and Petroleum Products	42
▪	ECONOMIC / FINANCIAL	
•	Manufacturers' Monthly Shipments and Purchasing Managers' Index	43
•	U.S. New Housing Starts and Total U.S. Construction Spending	43
•	London Interbank Offered Rate (LIBOR) and Bank Prime Loan Interest Rates	44

TABLE OF CONTENTS

- **ECONOMIC / FINANCIAL (Continued)**
 - Commercial and Industrial Loans vs. Banking Standards and U.S. Treasury Yield Curve 45
 - Corporate Spreads to Treasuries by Quality 46

- DATA CENTER: ABBREVIATIONS & ACRONYMS, DEFINITIONS, DESCRIPTIONS AND CHART NOTES**
 - Abbreviations & Acroynms 47
 - Definitions 48
 - Descriptions 50
 - Chart Notes 51

- HOT TOPICS** 62

- PUBLIC AND TRANSACTION COMPARABLES BY SEGMENT**
 - Petroleum Products Equity Comparables and Selected Transactions 68
 - Natural Gas Equity Comparables 69
 - Natural Gas Selected Transactions 70
 - Propane and Heating/Fuel Oil Equity Comparables and Selected Transactions 71
 - Drilling Equity Comparables and Selected Transactions 72
 - Lubricants and Greases Equity Comparables and Selected Transactions 73
 - Solar Equity Comparables and Selected Transactions 74
 - Wind Equity Comparables and Selected Transactions 75
 - Oil and Gas Field Services Equity Comparables 76
 - Equipment and Physical Technology Equity Comparables 77
 - Oil and Gas Field Services, Equipment and Physical Technology Selected Transactions 78
 - Storage and Terminals Equity Comparables 79
 - Storage and Terminals Selected Transactions 80
 - Pipelines Equity Comparables 81
 - Pipeline Selected Transactions 82
 - Truckers Equity Comparables 83
 - Truckers Selected Transactions 84
 - Average Public EBITDA Trading Multiples – All JKC Energy Sectors 85

- FACTOIDS: LITTLE-KNOWN FACTS AND STATS** 86

All charts in this report are updated to the latest information available at the time of publication. Due to differing reporting dates for various data used throughout the report, all charts are not updated to the same ending period.

INTRODUCTION ... About This Report

We are pleased to offer this periodic report which provides a comprehensive compilation of energy information, insights and data. It aggregates critical planning and forecasting information from a myriad of sources into one resource for energy supply chain analysts and decision-makers.

The energy supply chain is an increasingly complex network of upstream, midstream and downstream providers of construction, equipment, materials and services. As shale gas-oil and renewable energy continue to expand in the U.S., additional infrastructure is needed to connect the new sources to the current network of pipelines, storage and transmission stations. Current and new members of the supply chain will need to expand in order to build and service the additional infrastructure.

We define the Energy Logistics & Distribution Industry as any energy production, transportation and storage activities that take place from the well-head to the refinery or gas processing plant through delivery to the end user. Industry members include: producers and distributors of oil and natural gas, natural gas liquids, refined fuels and propane; energy storage and pipeline operators; oil and gas field services; producers and distributors of lubricants, oils, greases and fluids; service contractors, capital equipment manufacturers; materials suppliers; as well as logistics, transportation and maintenance providers.

Segments covered in this Industry In-Sight™ include:

- Crude oil and refined products, natural gas, liquefied natural gas (LNG), natural gas liquids including propane and heating/fuel oil, as well as drilling activity.
- Renewables, including solar, wind, hydropower and ethanol.
- Logistics, including storage and terminals, pipelines, trucking, shipping and rail.
- Economic and financial data pertinent to the Energy Logistics & Distribution Industry.

It is our intention that this publication will provide value in the following areas:

- **Aggregate Information** – The Data Center provides comprehensive statistics on the Energy Logistics & Distribution Industry including, among others: prices (domestic and international), production, consumption, inventory, imports/exports, LNG terminals, drilling activity, solar and wind capacities, energy consumption by sector and source, tank and underground storage capacities and utilization, pipeline mileage and trucking conditions. In all, the report offers more than 70 individual charts covering these topics and more. All charts in this report are updated to the latest information available at the time of publication.
- **Input to Business Decisions** – As a relevant and informative reference for use when contemplating decisions that will have a meaningful impact on your business. Accordingly, we welcome any input, feedback and suggestions to help us include meaningful and timely topical content in future publications. We especially would like to receive suggestions for ideas on Hot Topics in the Energy Logistics & Distribution Industry.
- **Identification of Opportunities** – The breadth of information provided will enable owners and operators of energy logistics businesses to track developments in energy segments outside of their day-to-day focus.
- **Public and Transaction Comparables by Segment** – This section provides the tracking of a cross-section of publicly-traded companies and transactions in various segments of the Energy Logistics & Distribution Industry. The data include operating metrics, such as revenues and EBITDA (earnings before interest, taxes, depreciation and amortization); and valuation analyses such as total enterprise value / latest twelve months revenues and total enterprise value / latest twelve months EBITDA.

Thank you for taking the time to review this Energy Logistics & Distribution Industry In-Sight™. Our goal is to provide the most comprehensive and beneficial information possible. Please forward your feedback and suggestions to any member of the Jordan Knauff & Company or Energy Equipment & Infrastructure Alliance team members listed on the last two pages of this report.

INTRODUCTION

Who is the Energy Equipment & Infrastructure Alliance (EEIA)?

EEIA ... The Voice of the Energy Supply Chain

The energy supply chain is over 120,000 companies in sixty industries, annually contributing more than \$170 billion to the U.S. economy, with hundreds of thousands of workers in communities throughout every state of the union. They provide construction, well services, capital equipment, supplies, logistics, professional services and technology in support of energy operations. They build energy infrastructure including production sites, transmission infrastructure, pipelines, storage facilities, processing plants and export terminals.

The shale energy revolution is transforming prosperity, security and quality of life in America. In a few short years, it has brought rising employment, income and opportunity to workers and businesses of all sizes and in all fifty states, often to communities that until recently have known limited prospects for growth. It has given Americans a cleaner environment, lower energy costs, renewed national competitiveness and energy security.

Creating a supportive public and policymaker environment for this miracle depends on active public engagement by energy supply chain stakeholders -- the non-oil and gas companies where energy-driven jobs and opportunities are greatest.

EEIA is that voice. EEIA mobilizes and leads the North American supply chain in pursuit of government policies that support full development of our energy resources, while protecting public health, safety and the environment. It also works for widespread public support for energy development.

EEIA is active on all fronts: federal and state legislative, regulatory, judicial and public opinion. Its strength is based upon the supply chain's enormous fifty-state contributions to jobs, economic growth and community prosperity. EEIA conducts economic research that measures and reports the facts about the energy supply chain's tremendous contributions to the American economy.

EEIA is an organization of leading supply chain companies, trade associations and labor organizations. It is the voice of the businesses and workers of America's energy miracle.



INTRODUCTION

Who is Jordan Knauff & Company (JKC)?

JKC was founded in 2001 to undertake a distinct mission: to assemble and maintain a staff of top-notch investment banking personnel and offer their knowledge and experience to provide the best available investment banking services to middle-market companies, the entrepreneurs that lead them and the financial entities that transact with them. JKC has been active within the Energy Logistics & Distribution Industry as operators, investors, board members and investment bankers prior to the firm's founding in 2001.

On a combined basis, over the course of their careers our employees have completed over 200 transactions as investors, owners, operators, buyers, sellers and investment bankers of middle-market businesses across a variety of industries. The majority of our firm's broad transaction experience has been with private companies owned by one shareholder, a partnership, a family or private equity investors.

Experience has taught us that the owners and executives of middle-market businesses tend to have very different needs and goals in capital transactions from those that are common to capital events related to larger companies. Our personnel apply their considerable expertise to accomplish important goals: delivery of successful outcomes for our clients. Pursuant to that, we direct and manage all aspects of the capital transaction process, assist our clients with the management of important constituents (employees, customers, vendors and lenders), act as a teammate to other important client advisors (legal counsel, accountant, tax advisor) and collaborate with transaction counsel in the negotiations with the parties on the other side of the transaction.

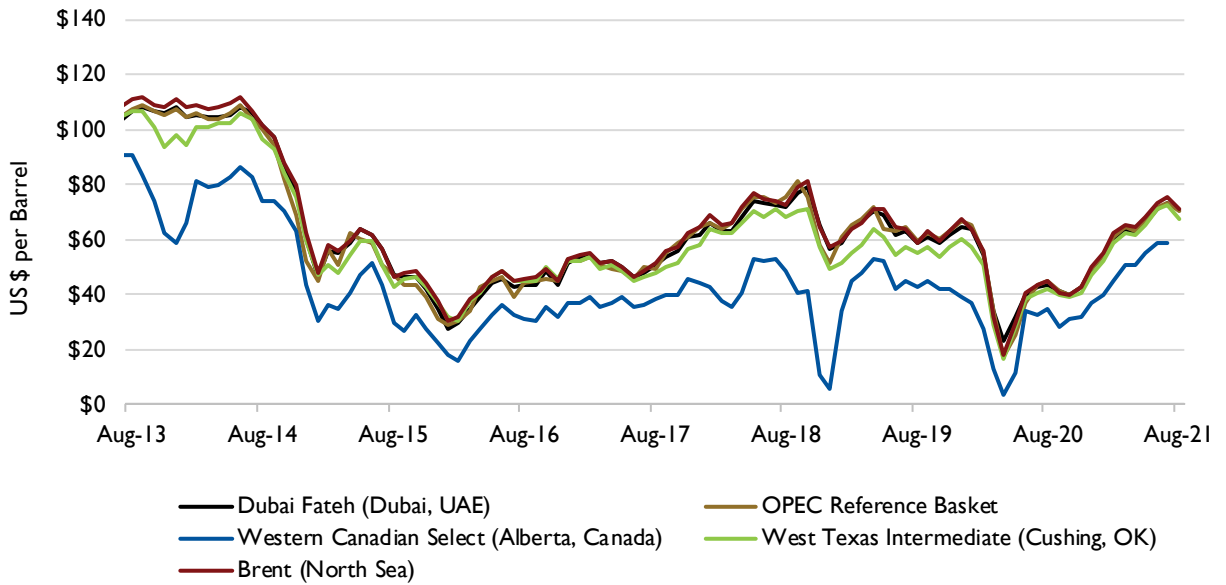
The Services We Provide

- **Sell Companies:** Generate a liquidity event on behalf of the owner(s) through whole, majority, or minority sale of assets, stock or units.
- **Raise Capital:** Representation of companies, management teams and entrepreneurs in the raising of senior debt, mezzanine debt or equity capital. Proceeds may be used for a variety of reasons, including, among others, recapitalizations, funding of growth, funding of acquisitions or liquidity for owners and investors.
- **Acquisition Advisory:** Assistance in sourcing and closing acquisitions -- whether it be a single transaction or a series of acquisitions as part of a consolidation strategy in an Industry Development Project™ (IDP) - a proprietary method for assisting private equity groups, companies or private investors that want to pursue multiple non-auction transactions within a single industry.
- **Strategic Business Services:** A suite of services for middle-market business owners and executives. Comprised of three components – Company Specific Valuation, Capital Road Map® and Strategic Industry Analysis – these services can be packaged together or used on an à la carte basis.

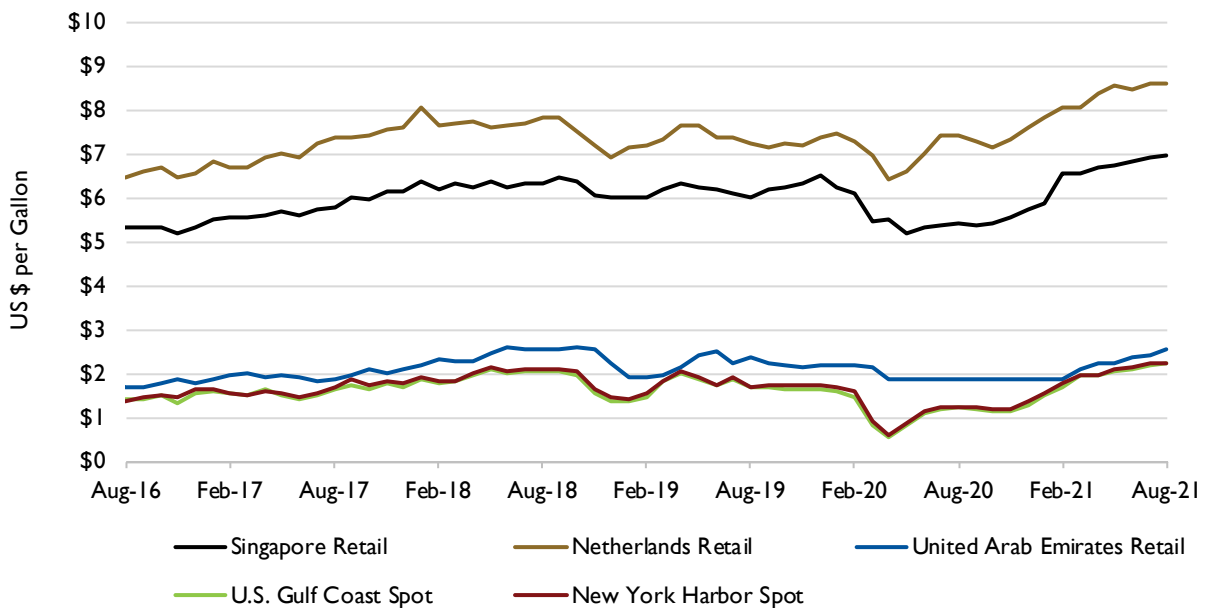
DATA CENTER

OIL

CRUDE OIL PRICES (MONTHLY AVERAGE) (1)



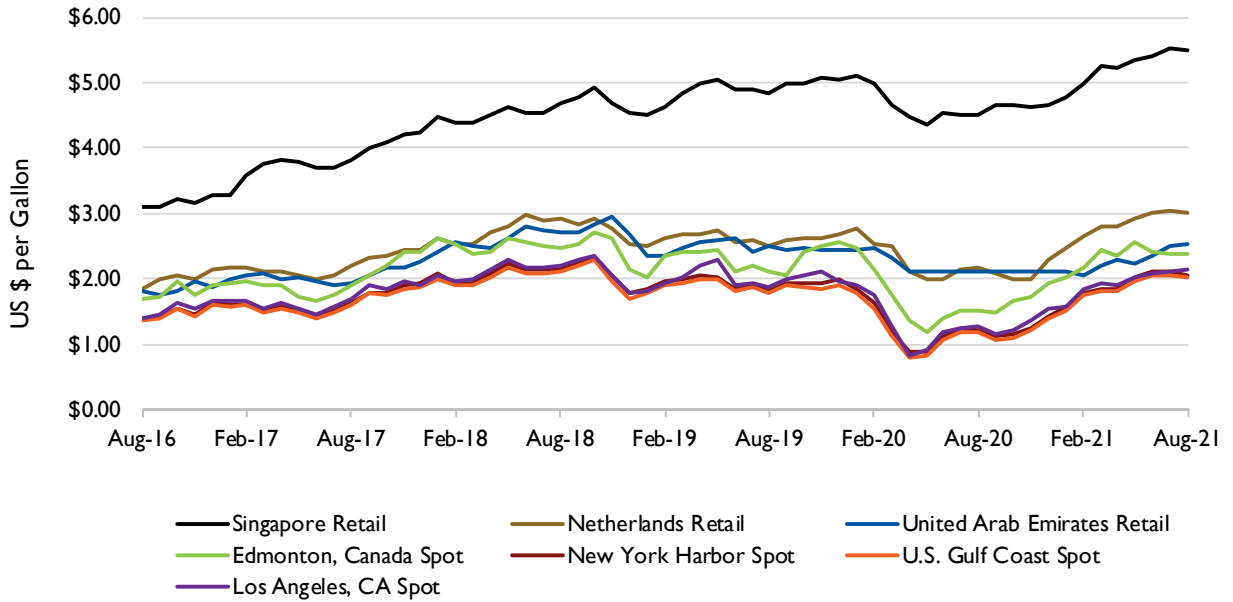
GASOLINE PRICES (MONTHLY AVERAGE) (2)



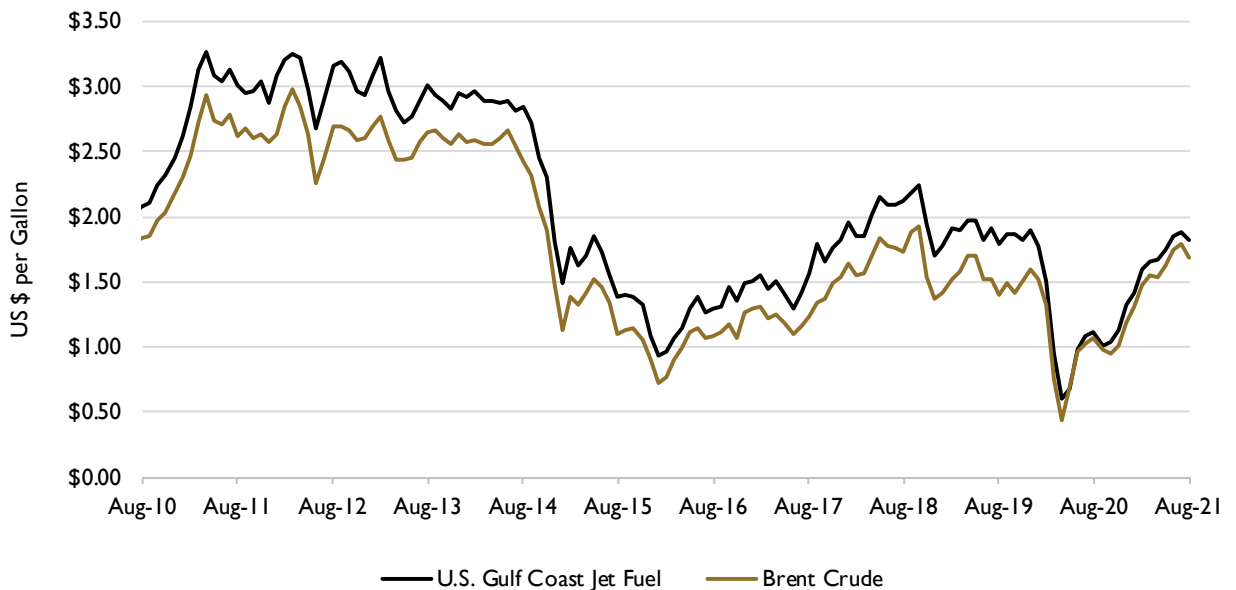
DATA CENTER

OIL

DIESEL PRICES (MONTHLY AVERAGE) (3)



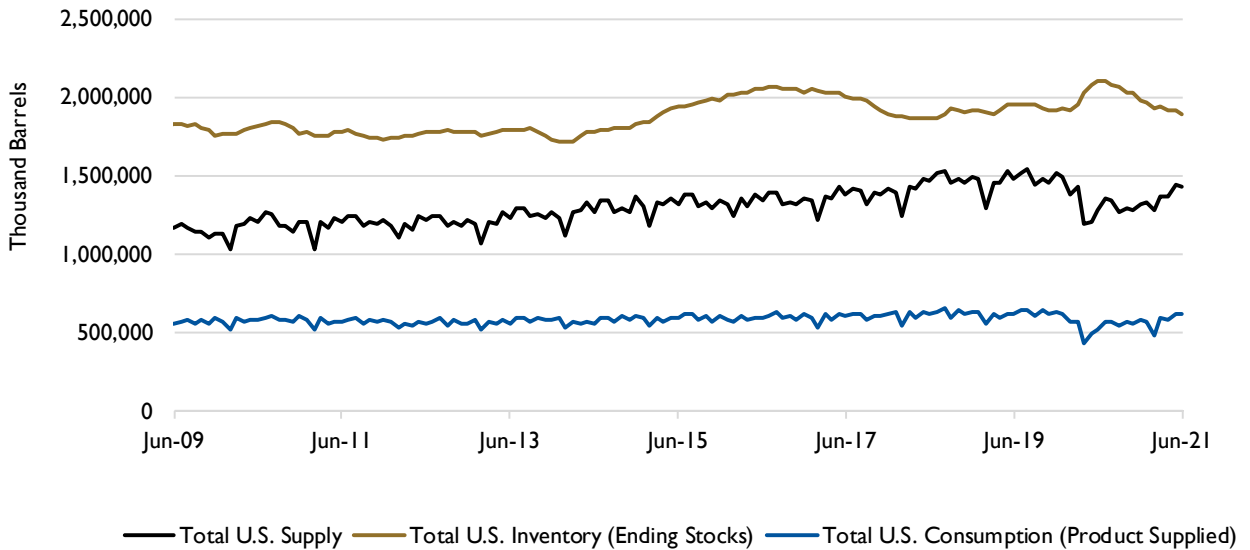
JET FUEL PRICES (MONTHLY AVERAGE) (4)



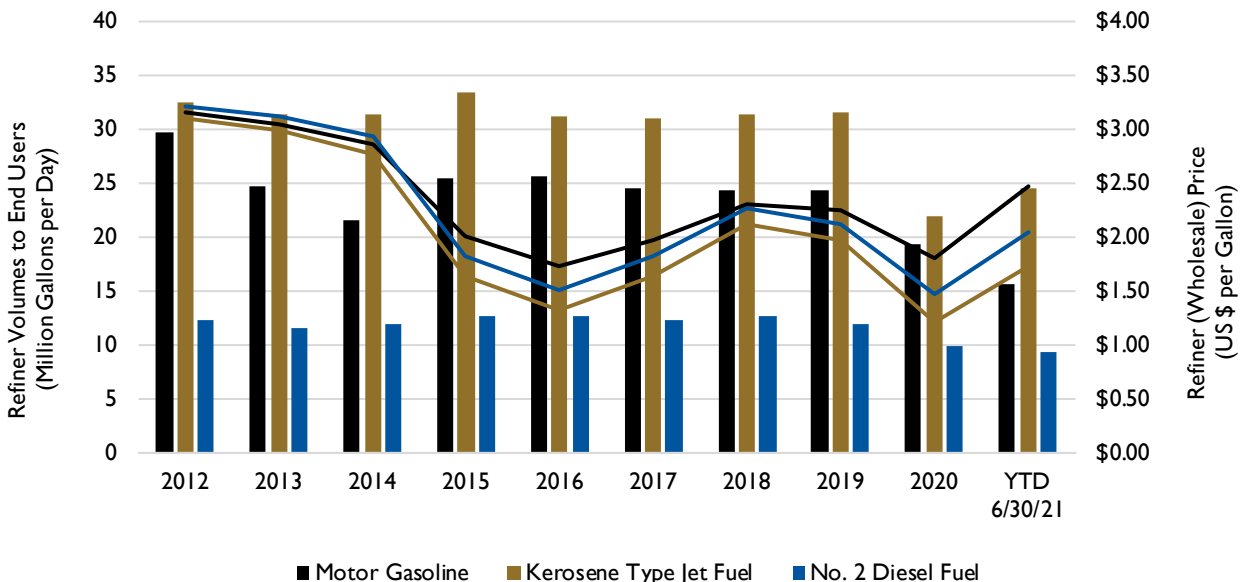
DATA CENTER

OIL

U.S. CRUDE OIL AND PETROLEUM PRODUCTS SUPPLY, INVENTORY AND CONSUMPTION (MONTHLY) ⁽⁵⁾



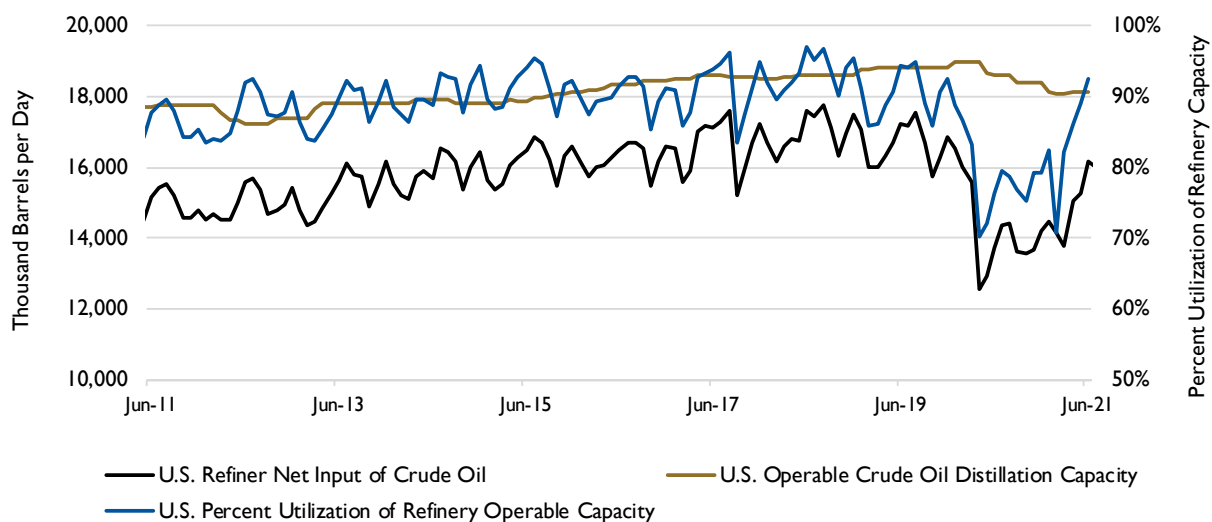
U.S. REFINERY VOLUMES AND WHOLESALE PRICES OF PETROLEUM PRODUCTS (ANNUAL AVERAGE) ⁽⁶⁾



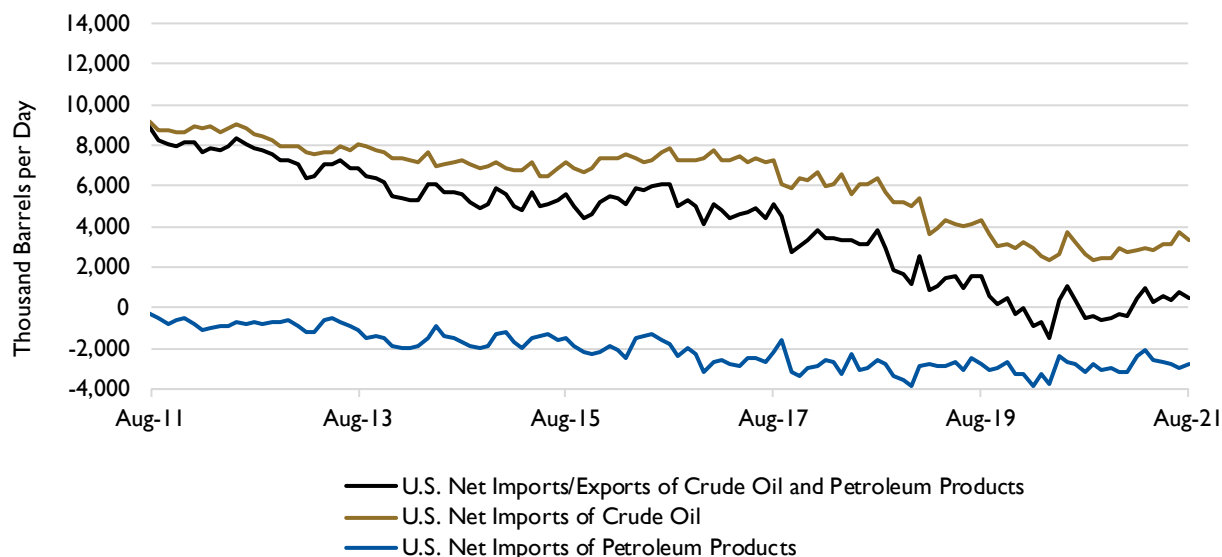
DATA CENTER

OIL

U.S. CRUDE OIL REFINERY INPUT, DISTILLATION CAPACITY AND REFINERY UTILIZATION (MONTHLY AVERAGE) ⁽⁷⁾



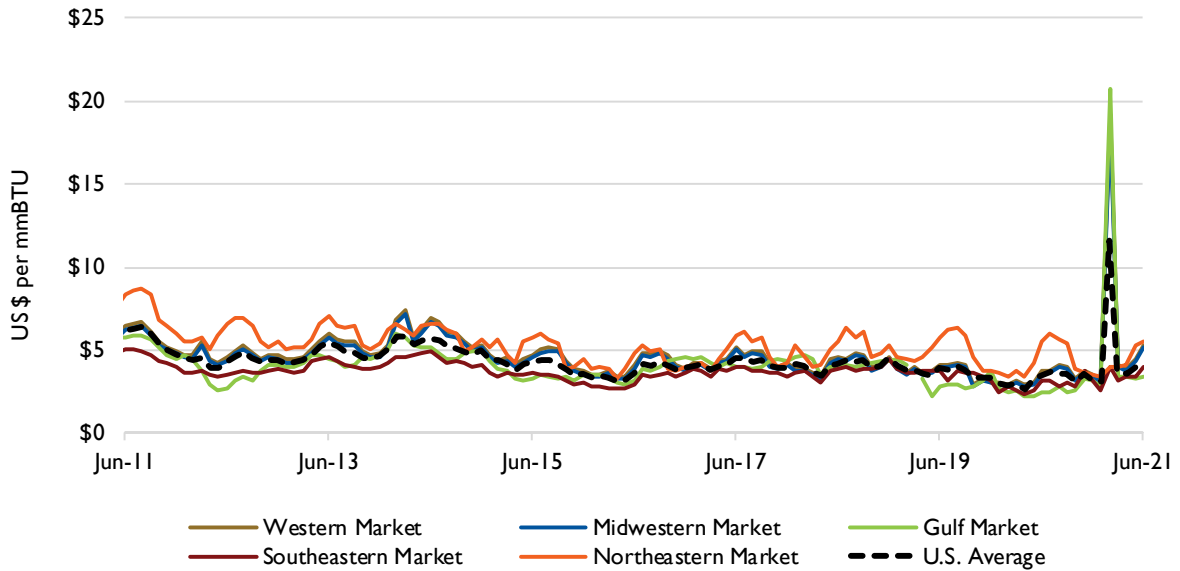
U.S. CRUDE OIL AND PETROLEUM PRODUCTS IMPORTS AND EXPORTS (MONTHLY AVERAGE) ⁽⁸⁾



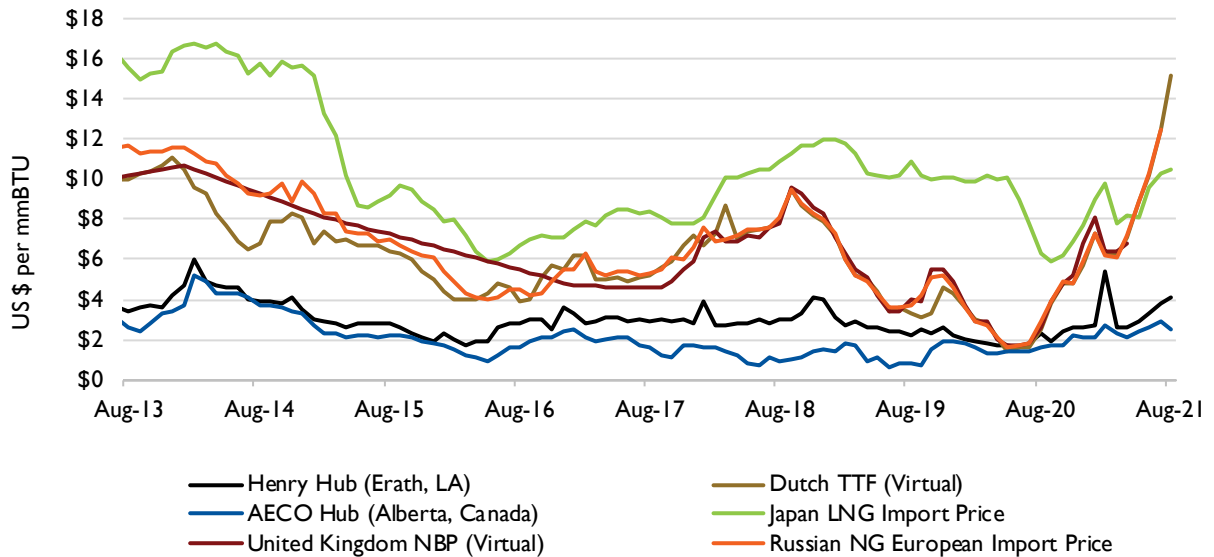
DATA CENTER

NATURAL GAS

DOMESTIC NATURAL GAS CITYGATE PRICES PER REGION (MONTHLY AVERAGE) (9)



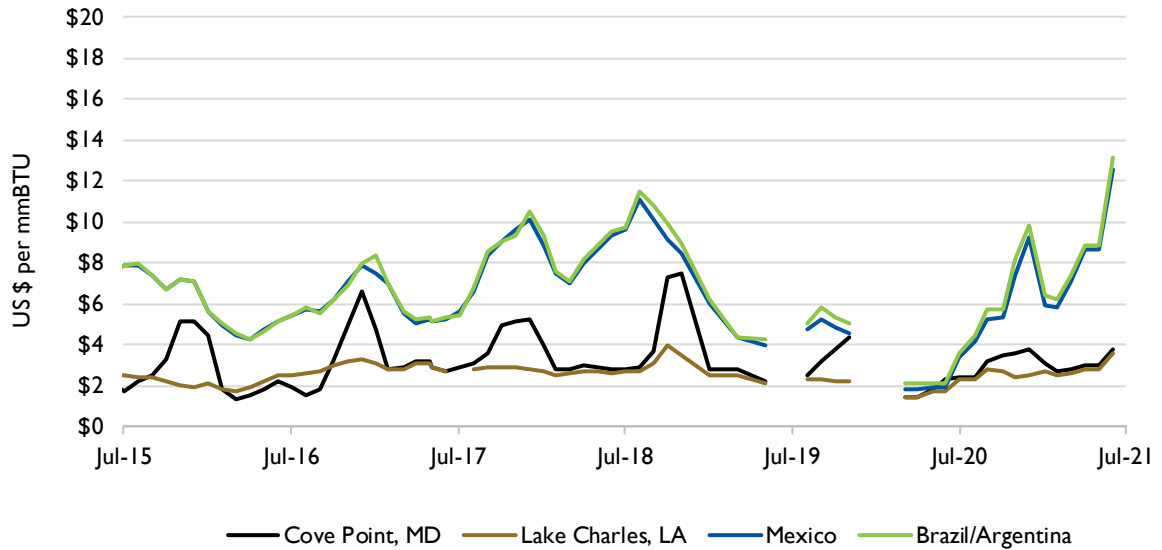
INTERNATIONAL NATURAL GAS PRICES (MONTHLY AVERAGE) (10)



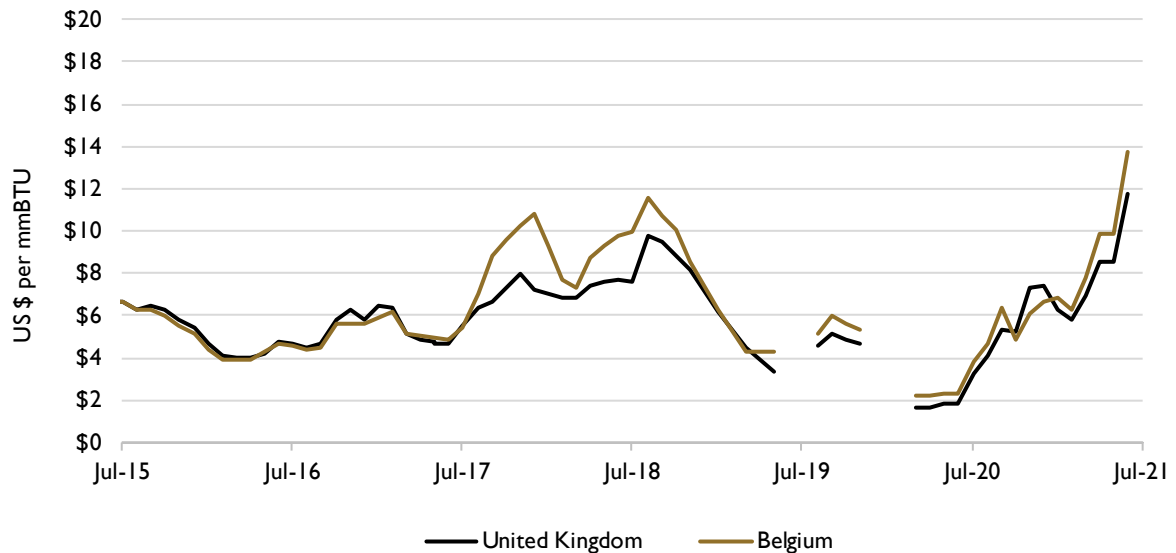
DATA CENTER

NATURAL GAS

AMERICAS LIQUEFIED NATURAL GAS PRICES (MONTHLY AVERAGE) (11)



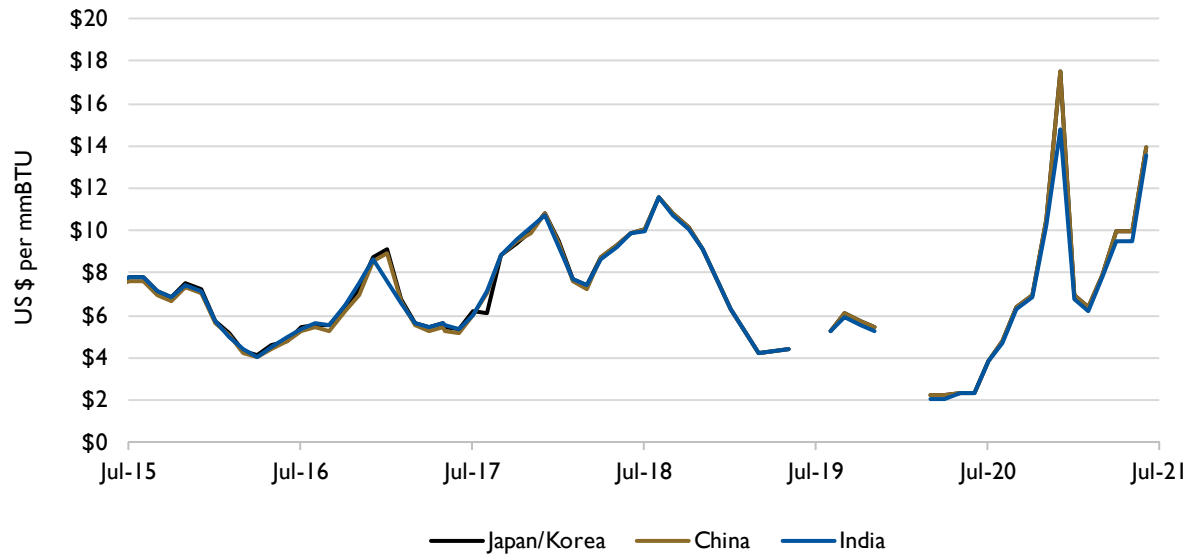
WESTERN EUROPE LIQUEFIED NATURAL GAS PRICES (MONTHLY AVERAGE) (12)



DATA CENTER

NATURAL GAS

ASIA LIQUEFIED NATURAL GAS PRICES (MONTHLY AVERAGE) (13)



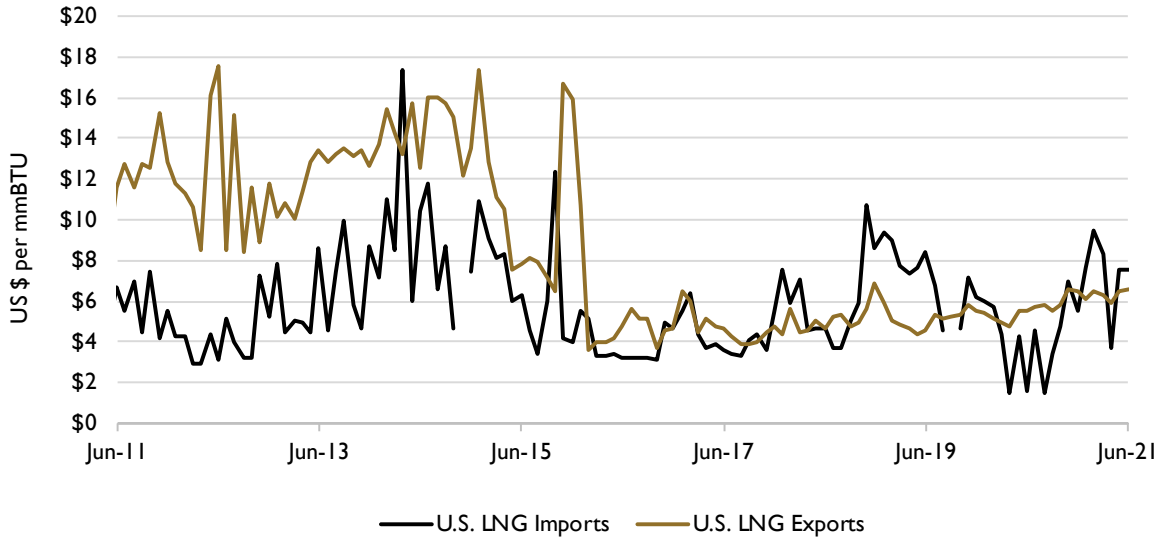
WORLD LIQUEFIED NATURAL GAS PRICES MAP (MONTHLY AVERAGE) (14)



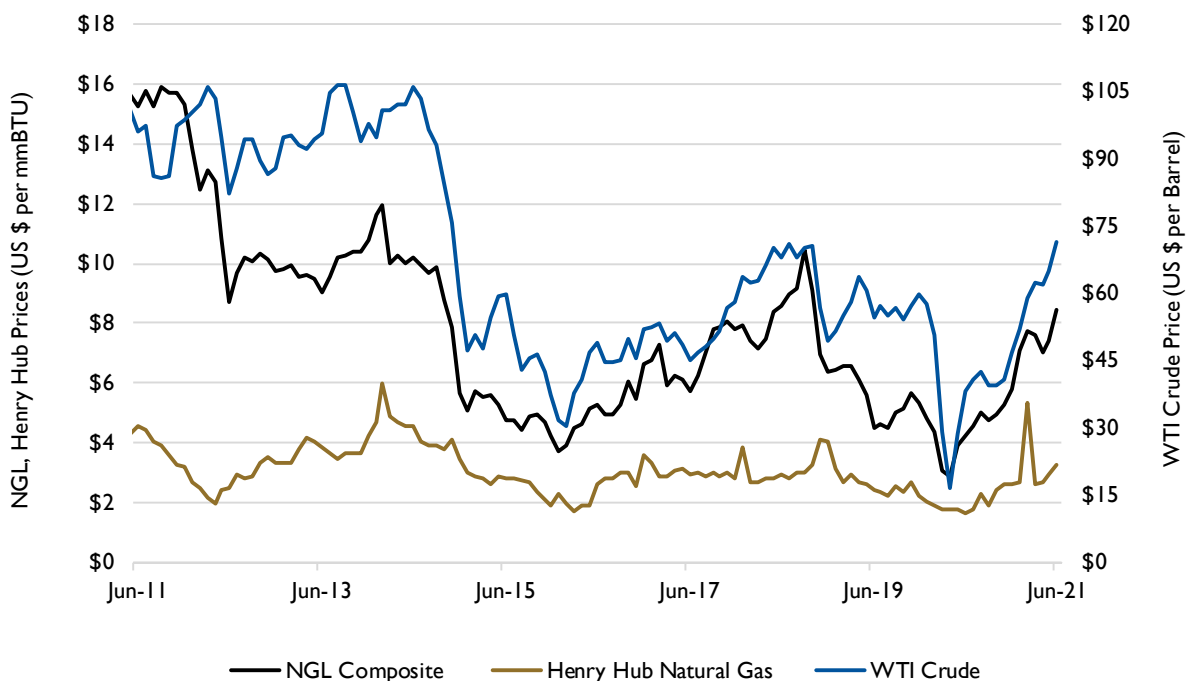
DATA CENTER

NATURAL GAS

U.S. IMPORT / EXPORT LIQUEFIED NATURAL GAS PRICES (MONTHLY AVERAGE) ⁽¹⁵⁾



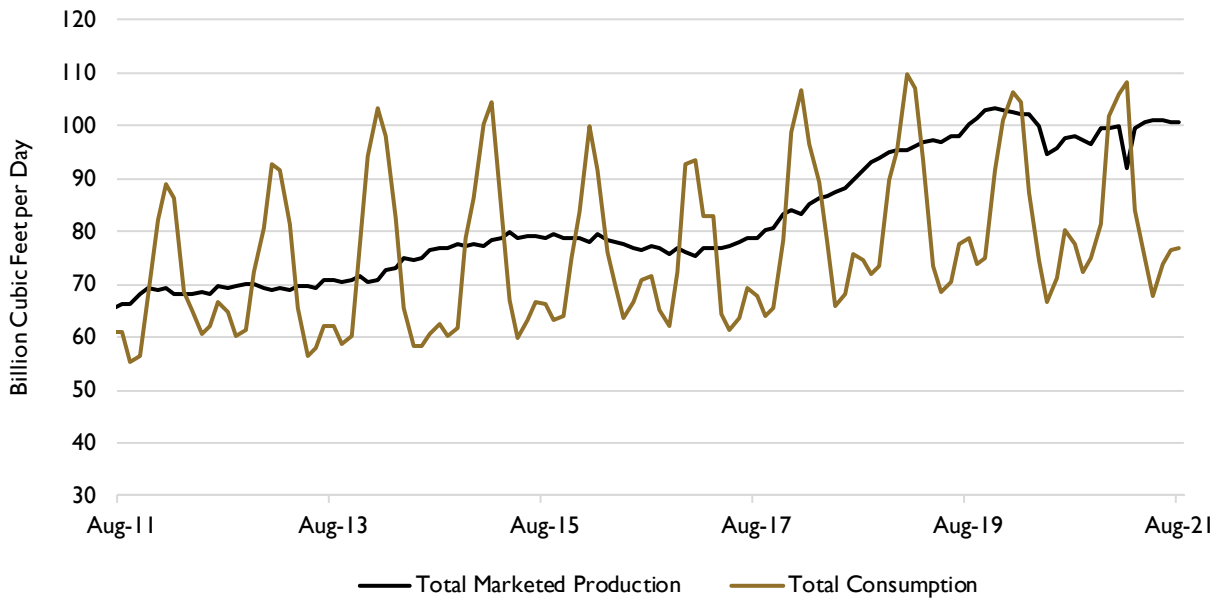
NATURAL GAS PLANT LIQUIDS PRICES (MONTHLY AVERAGE) ⁽¹⁶⁾



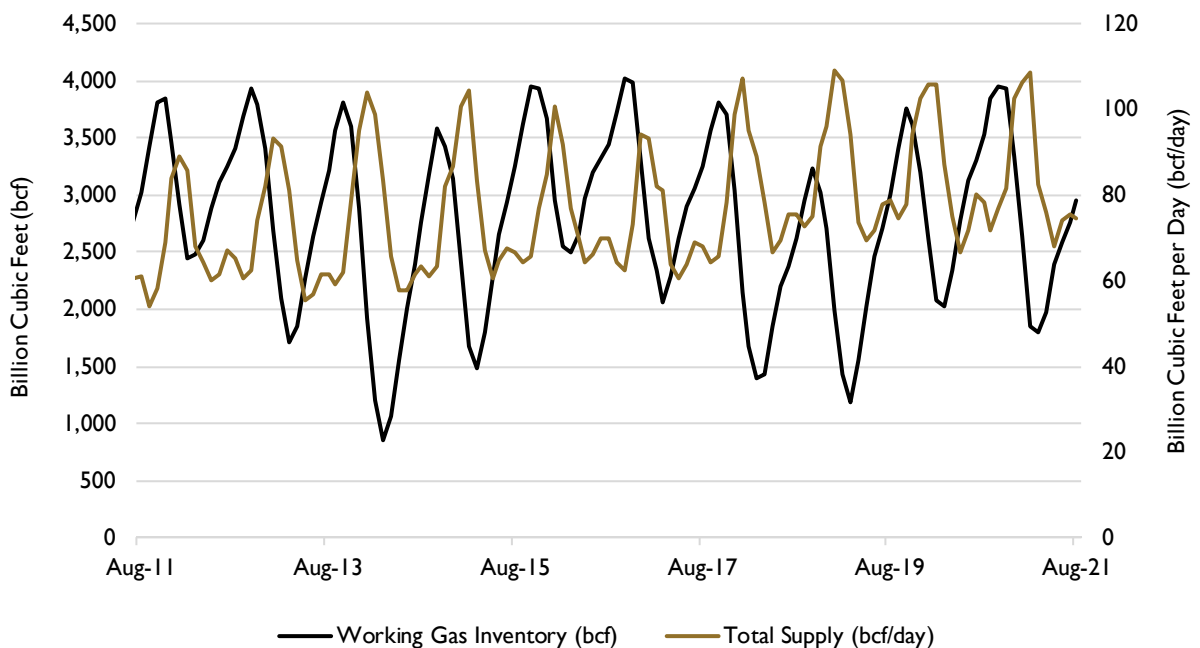
DATA CENTER

NATURAL GAS

U.S. NATURAL GAS PRODUCTION AND CONSUMPTION (MONTHLY) (17)



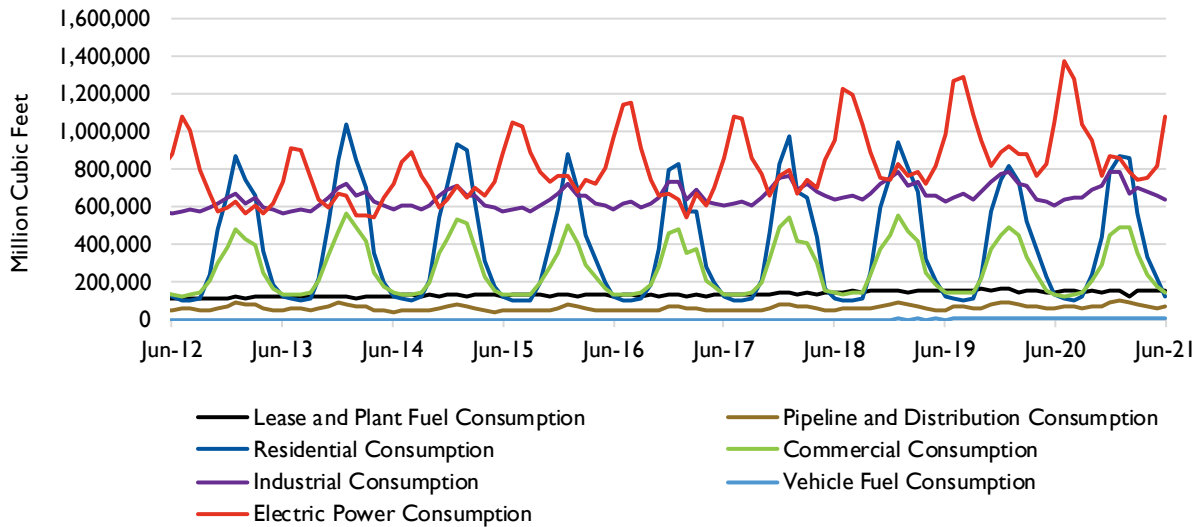
U.S. NATURAL GAS SUPPLY AND INVENTORY (MONTHLY) (18)



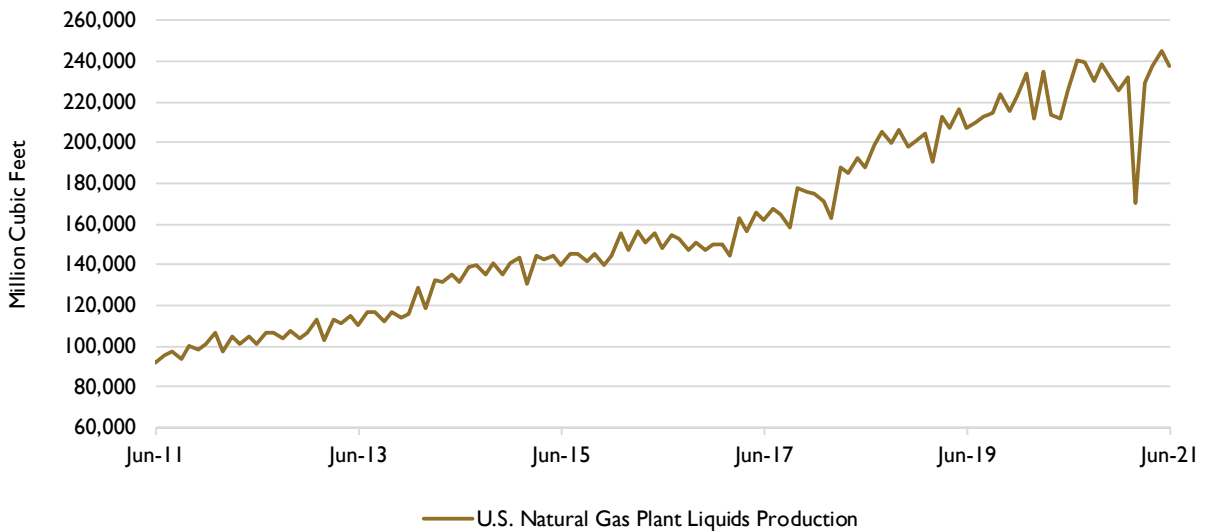
DATA CENTER

NATURAL GAS

U.S. NATURAL GAS CONSUMPTION BY END USE (MONTHLY) (19)



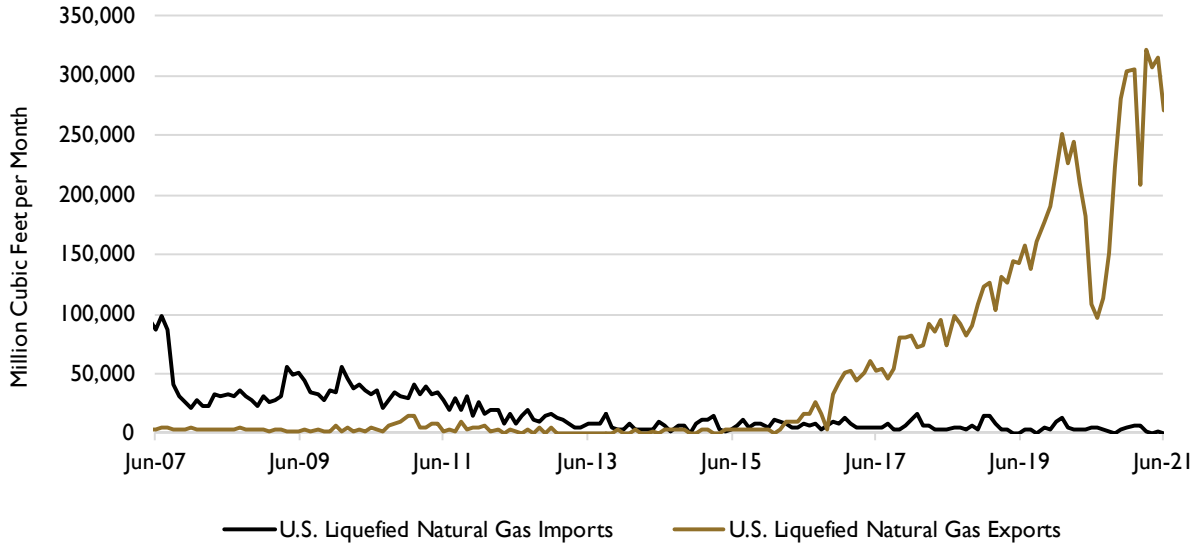
U.S. NATURAL GAS PLANT LIQUIDS PRODUCTION (MONTHLY) (20)



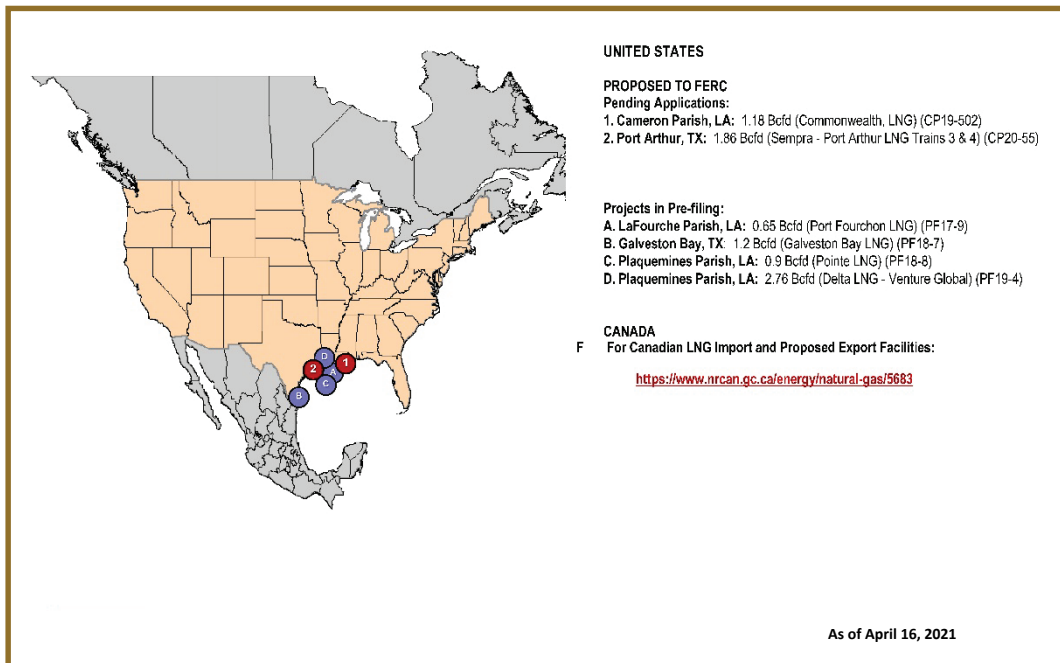
DATA CENTER

NATURAL GAS

U.S. LIQUEFIED NATURAL GAS IMPORT AND EXPORT VOLUMES (MONTHLY) ⁽²¹⁾



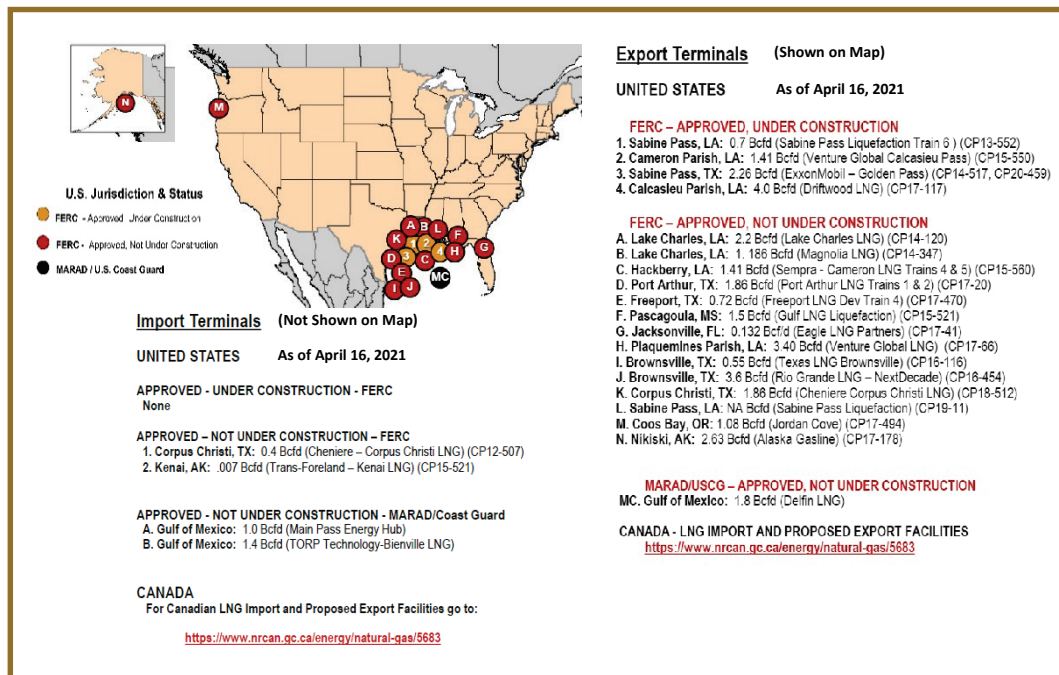
NORTH AMERICAN LNG EXPORT TERMINALS — PROPOSED ⁽²²⁾



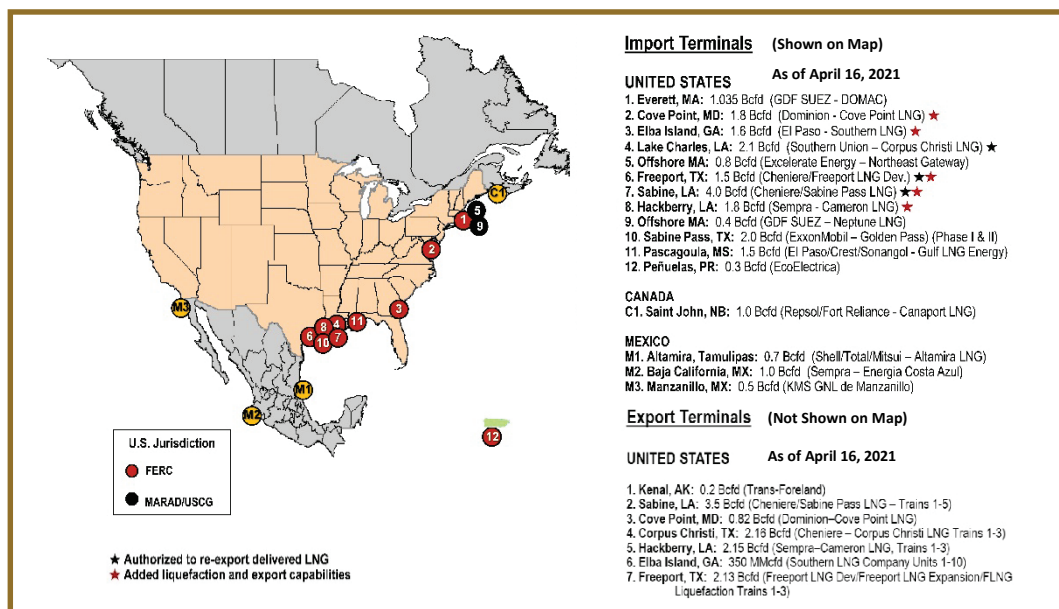
DATA CENTER

NATURAL GAS

NORTH AMERICAN LNG IMPORT/EXPORT TERMINALS — *APPROVED* (23)



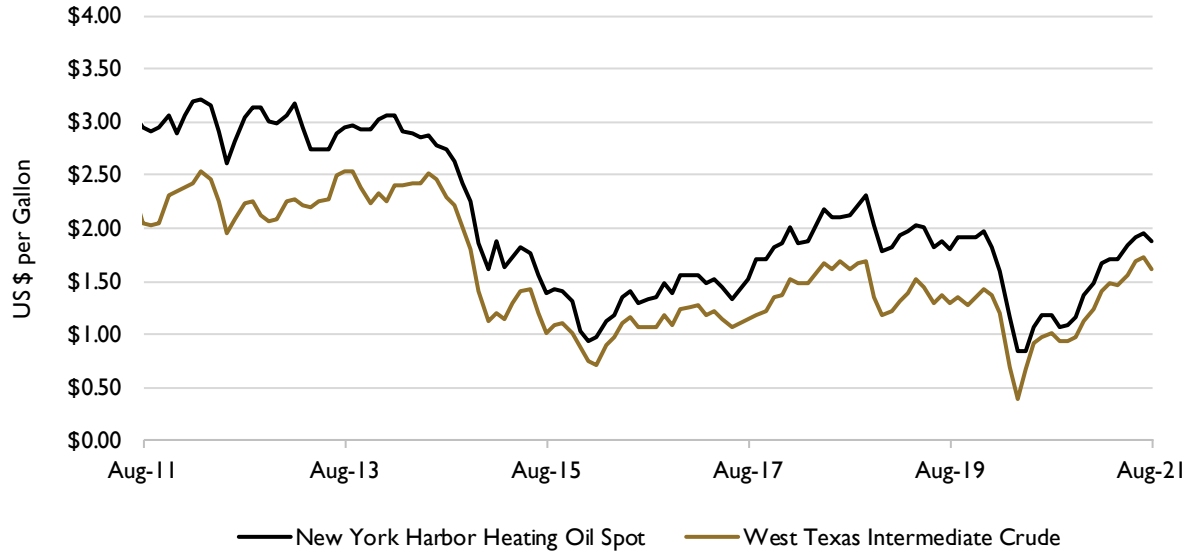
NORTH AMERICAN LNG IMPORT/EXPORT TERMINALS — *EXISTING* (24)



DATA CENTER

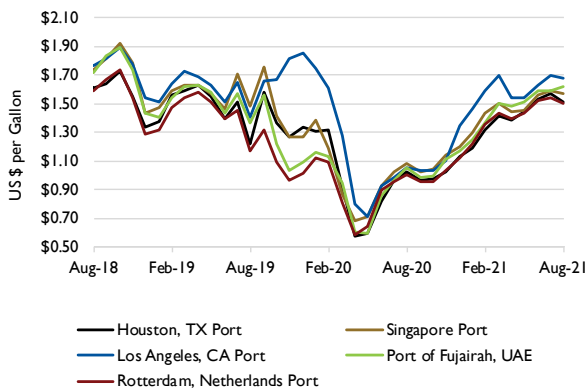
PROPANE AND HEATING/FUEL OIL

HEATING OIL PRICES (MONTHLY AVERAGE) (25)

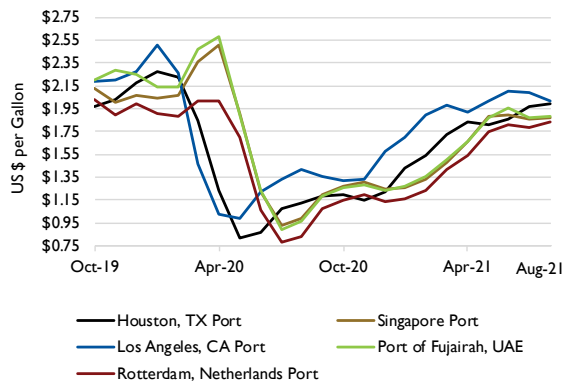


INTERMEDIATE FUEL OIL AKA “BUNKER FUEL” PRICES (MONTHLY AVERAGE) (26)

Intermediate Fuel Oil 380



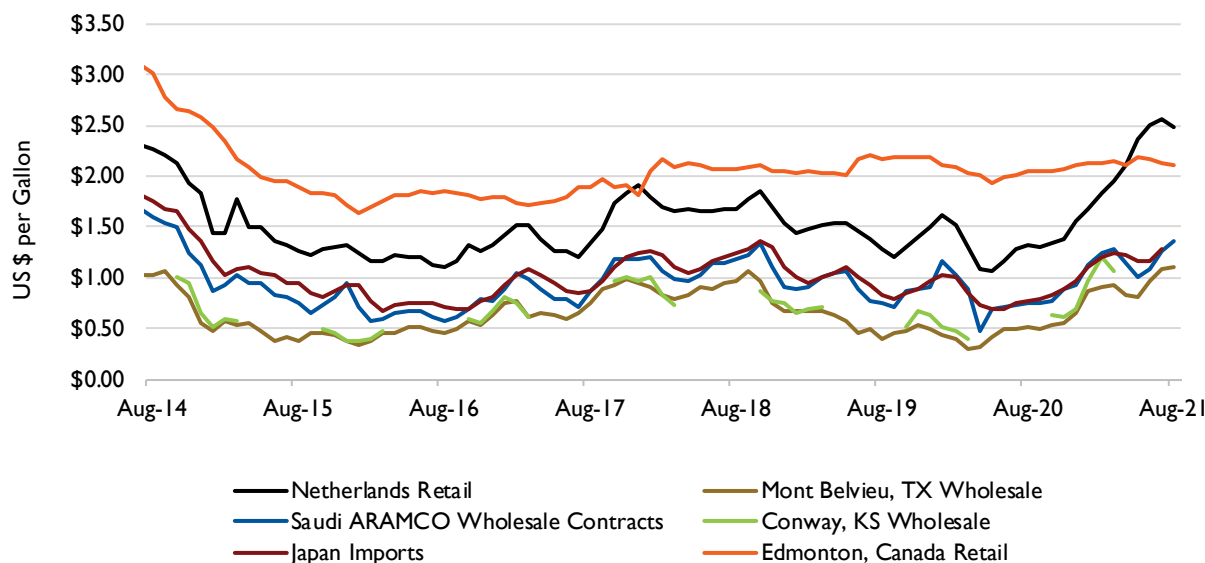
Very Low Sulfur Fuel Oil (VLSFO)



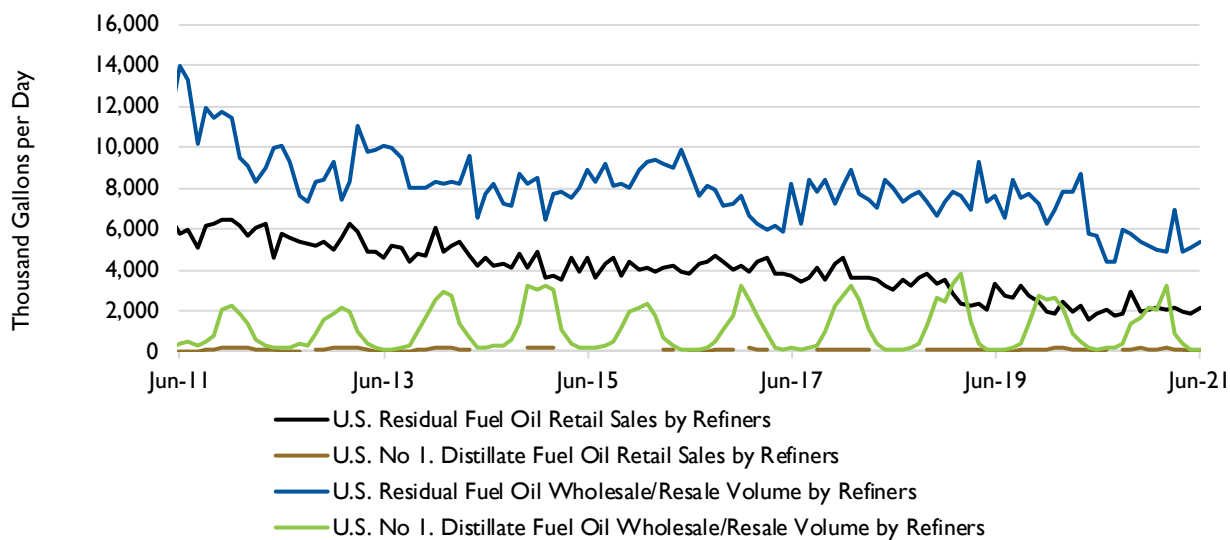
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PROPANE AND HEATING/FUEL OIL

PROPANE PRICES (MONTHLY AVERAGE) (27)



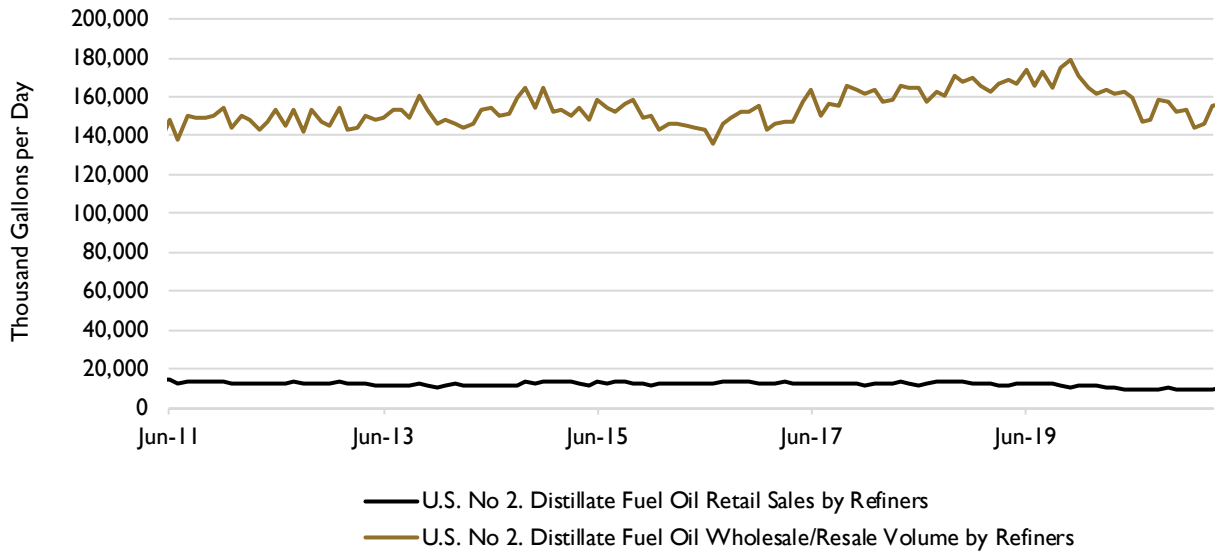
NO. 1 DISTILLATE FUEL OIL, RESIDUAL FUEL OIL WHOLESALE, RETAIL SALES VOLUME BY REFINERS (MONTHLY) (28)



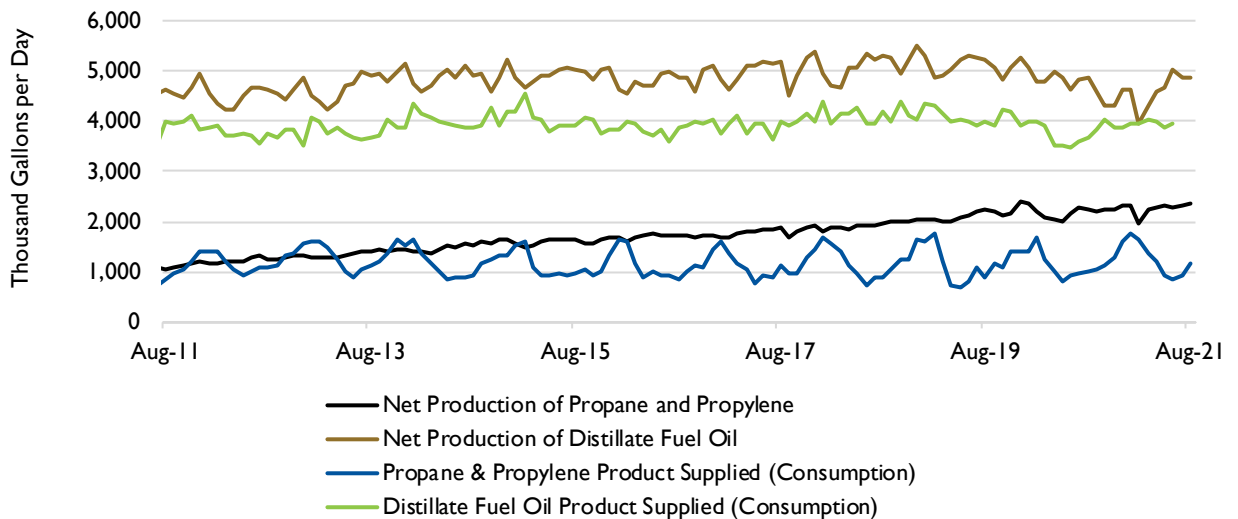
DATA CENTER

PROPANE AND HEATING/FUEL OIL

NO. 2 DISTILLATE FUEL OIL WHOLESALE, RETAIL SALES VOLUME BY REFINERS (MONTHLY) ⁽²⁹⁾



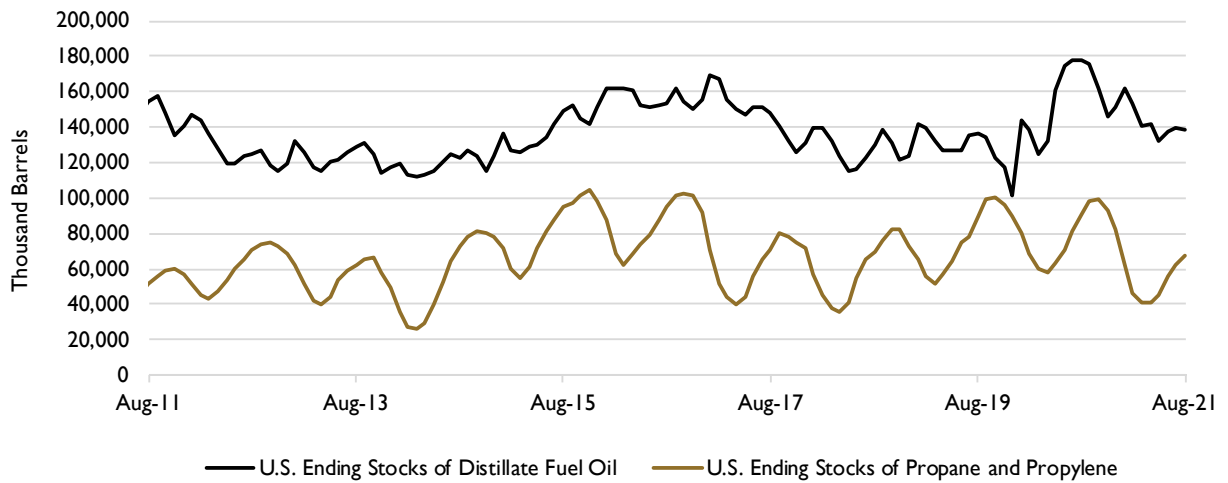
PROPANE & PROPYLENE AND DISTILLATE FUEL OIL PRODUCTION AND CONSUMPTION (MONTHLY) ⁽³⁰⁾



DATA CENTER

PROPANE AND HEATING/FUEL OIL

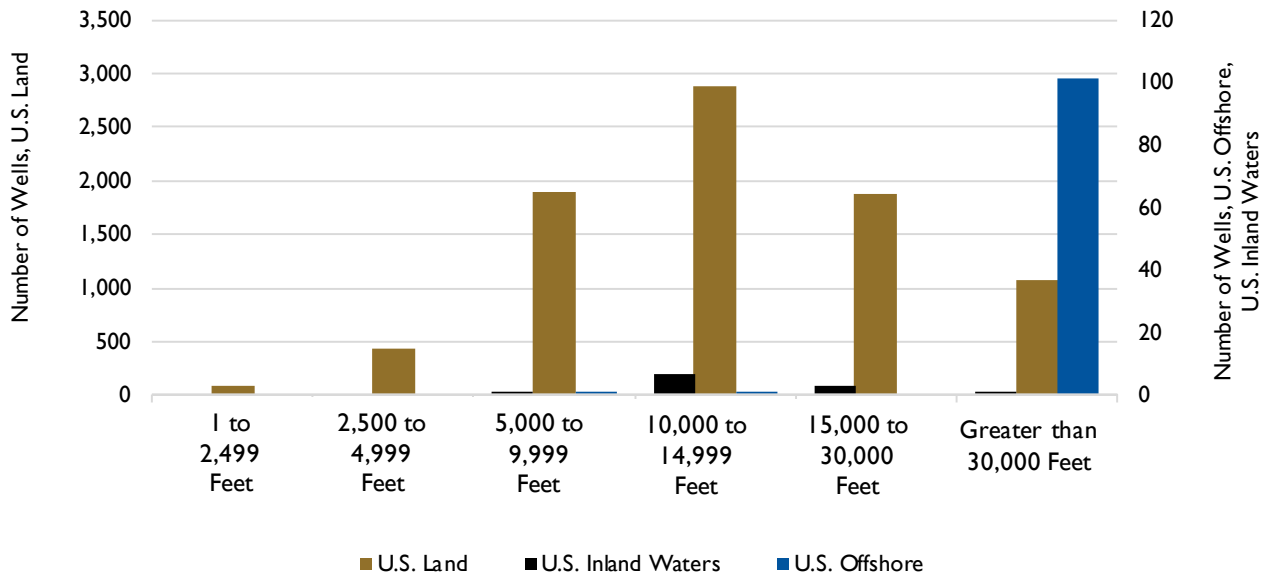
U.S. ENDING STOCKS OF PROPANE & PROPYLENE AND DISTILLATE FUEL OIL (MONTHLY AVERAGE) ⁽³¹⁾



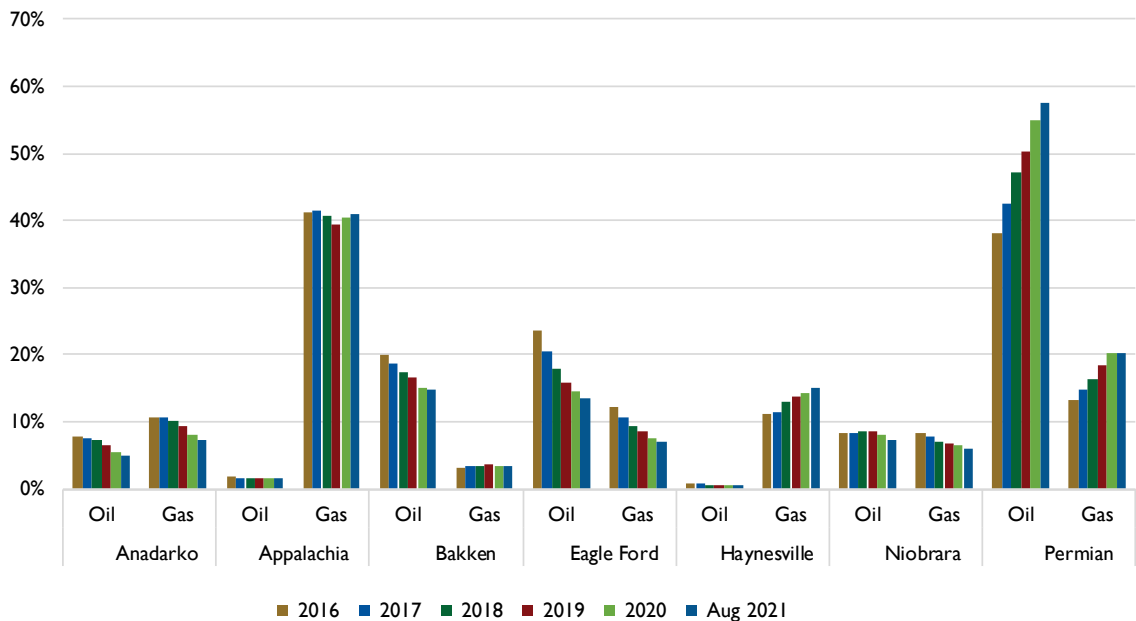
DATA CENTER

DRILLING ACTIVITY

U.S. WELL STARTS BY DEPTH (YEAR TO DATE AUGUST 31, 2021) (32)



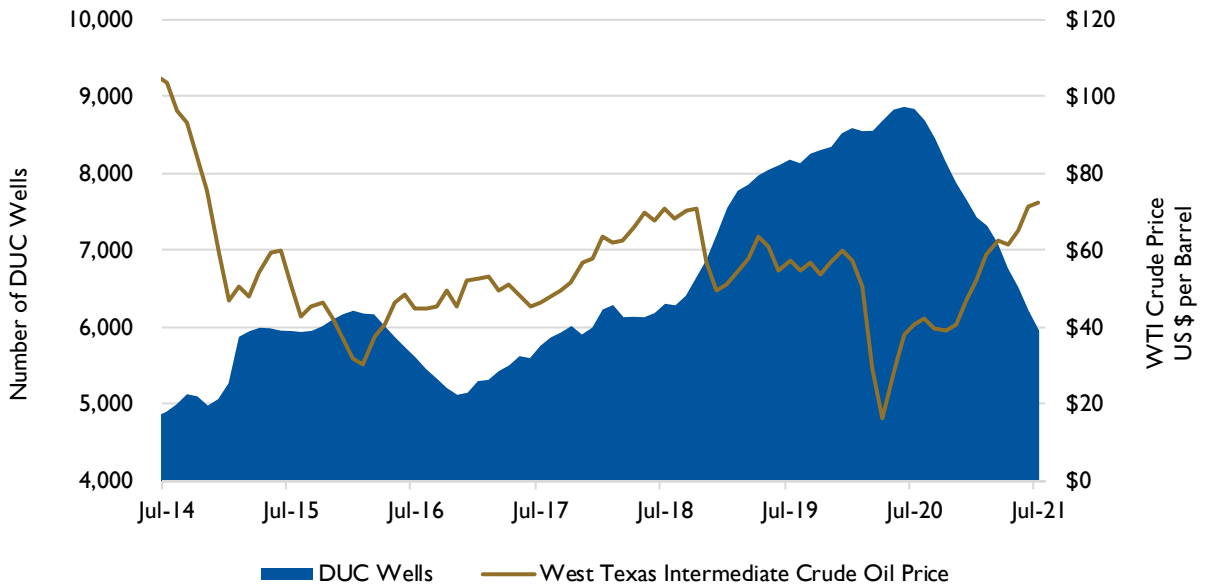
PERCENTAGE OF CRUDE OIL AND NATURAL GAS PRODUCTION PER SHALE REGION (ANNUAL) (33)



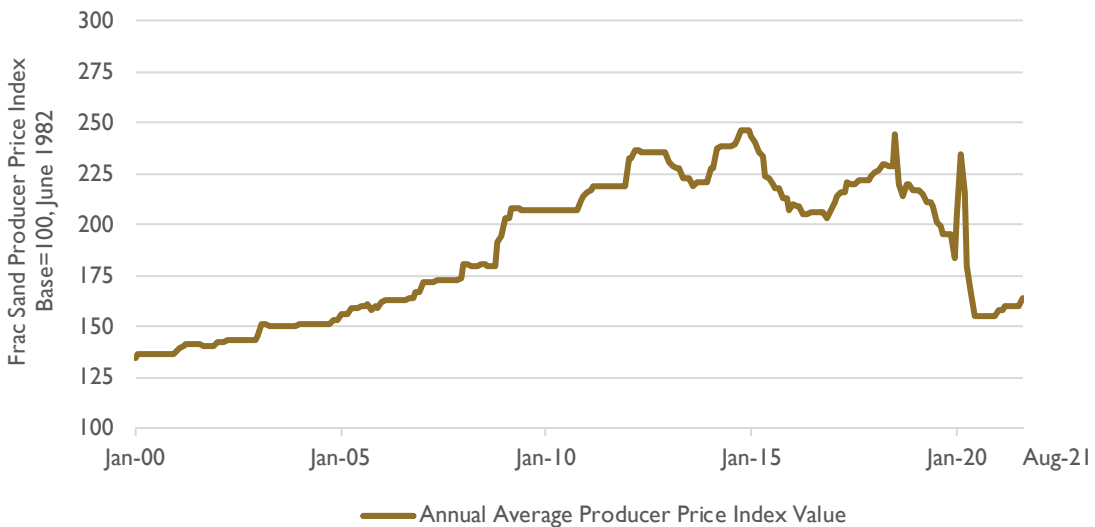
DATA CENTER

DRILLING ACTIVITY

DRILLED BUT UNCOMPLETED (DUC) WELLS VS. CRUDE OIL PRICE (MONTHLY) ⁽³⁴⁾



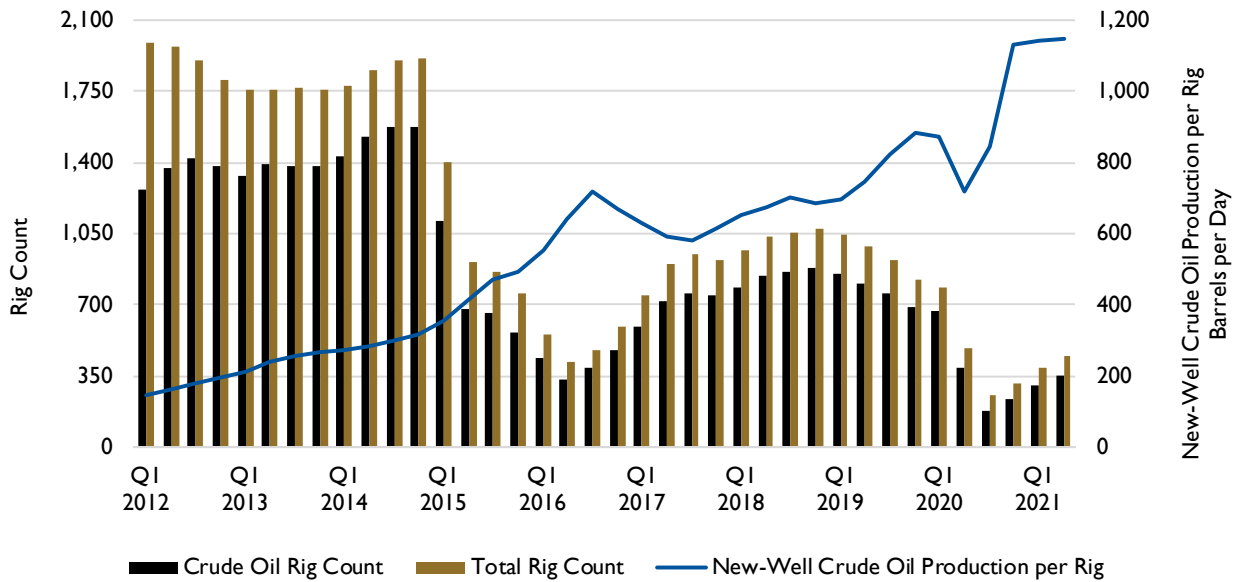
HYDRAULIC FRACTURING SAND PRODUCER PRICE INDEX (MONTHLY) ⁽³⁵⁾



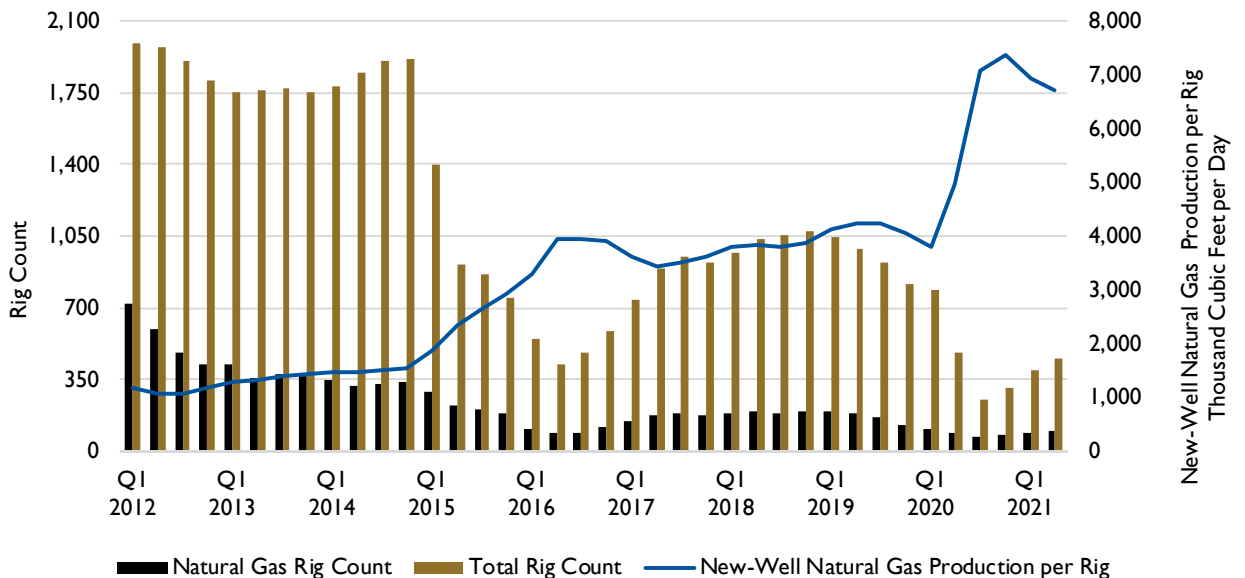
DATA CENTER

DRILLING ACTIVITY

CRUDE OIL PRODUCTION, RIG COUNT AND PRODUCTION PER RIG (QUARTERLY) (36)

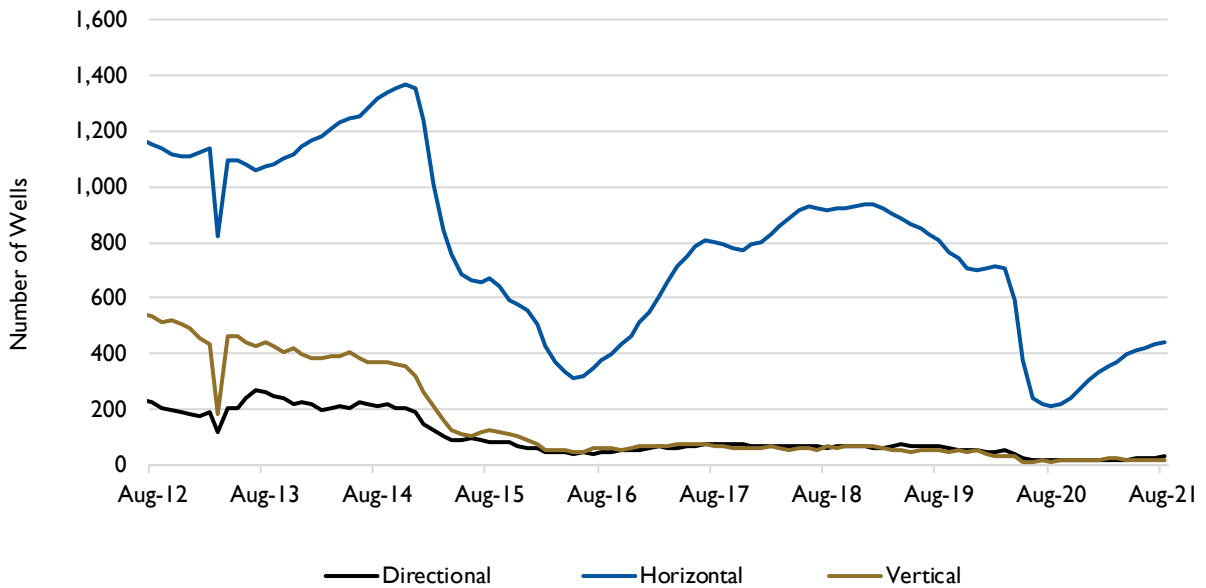


NATURAL GAS PRODUCTION, RIG COUNT AND PRODUCTION PER RIG (QUARTERLY) (37)



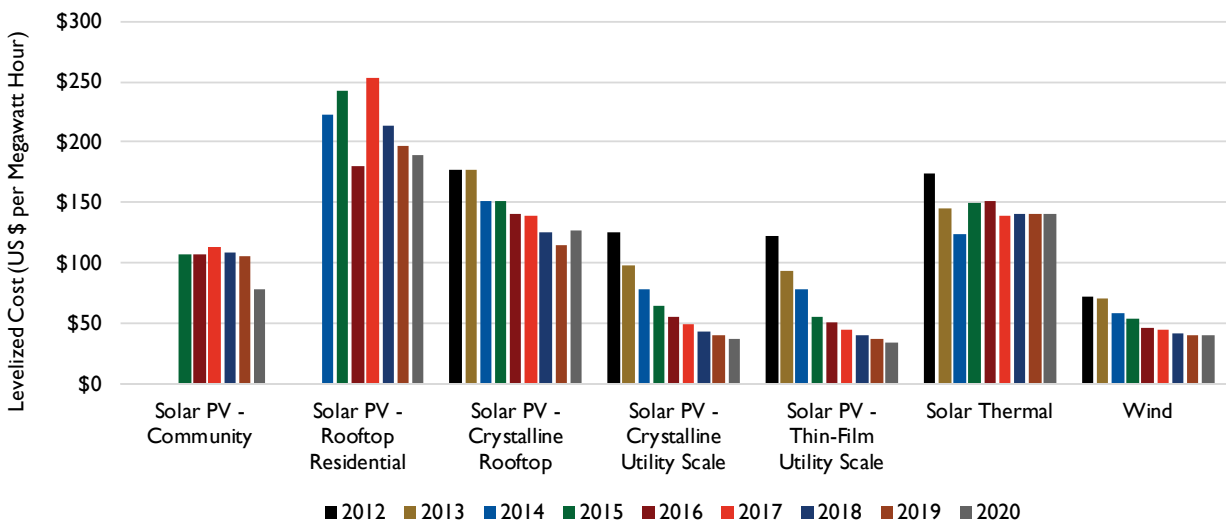
DATA CENTER DRILLING ACTIVITY

U.S. DRILLING RIGS BY TYPE (MONTHLY) (38)



RENEWABLES

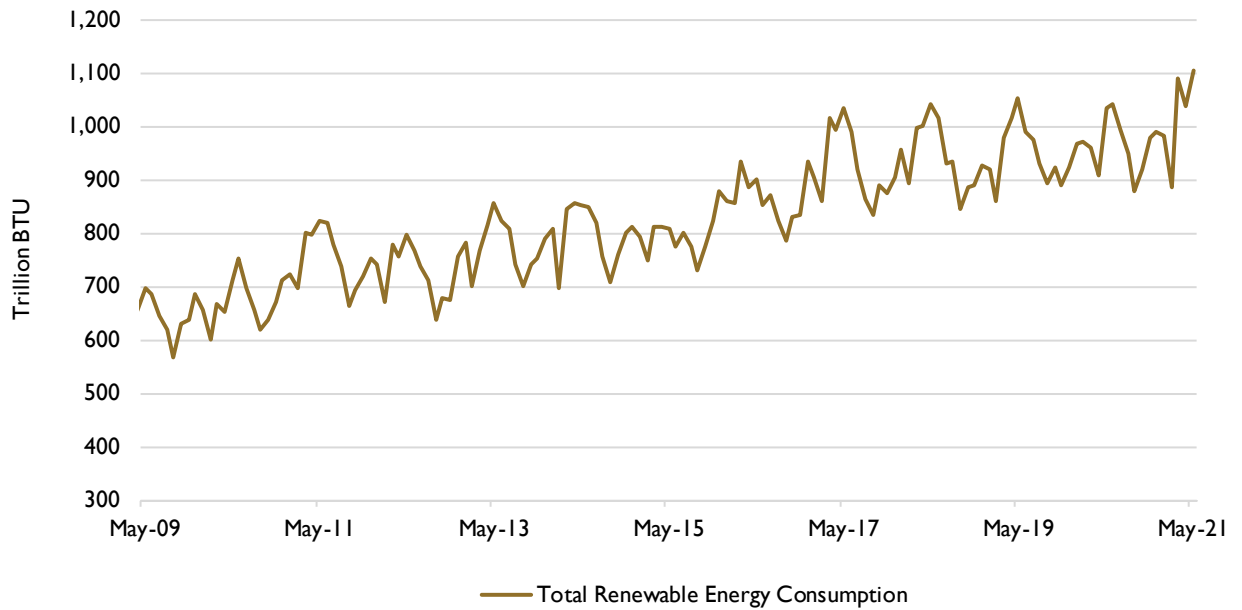
WIND AND SOLAR PRICES (ANNUAL AVERAGE) (39)



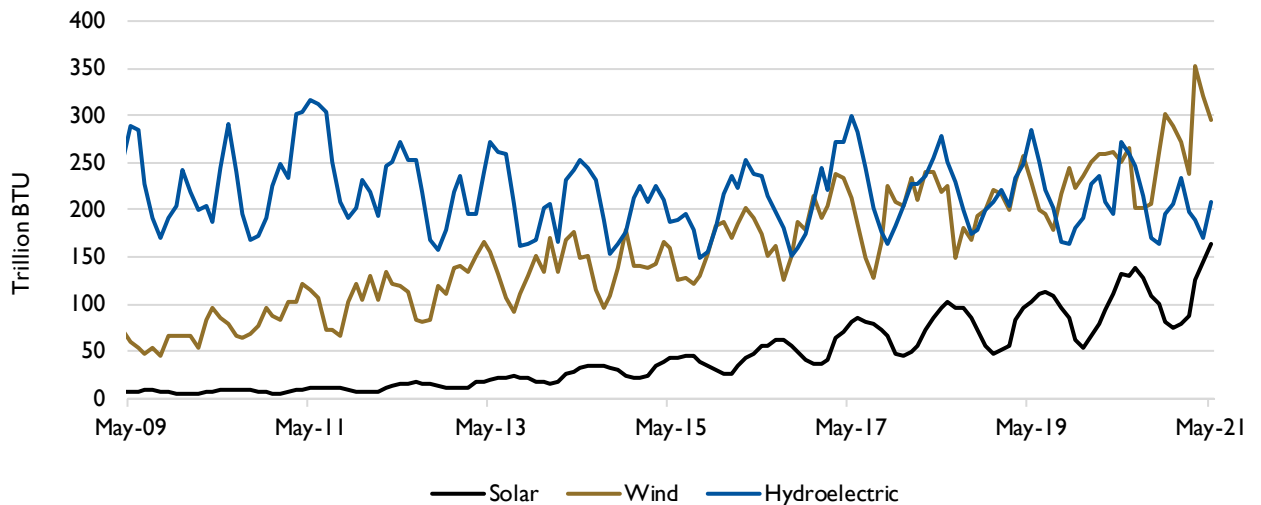
DATA CENTER

RENEWABLES

U.S. TOTAL RENEWABLE ENERGY CONSUMPTION (MONTHLY) (40)



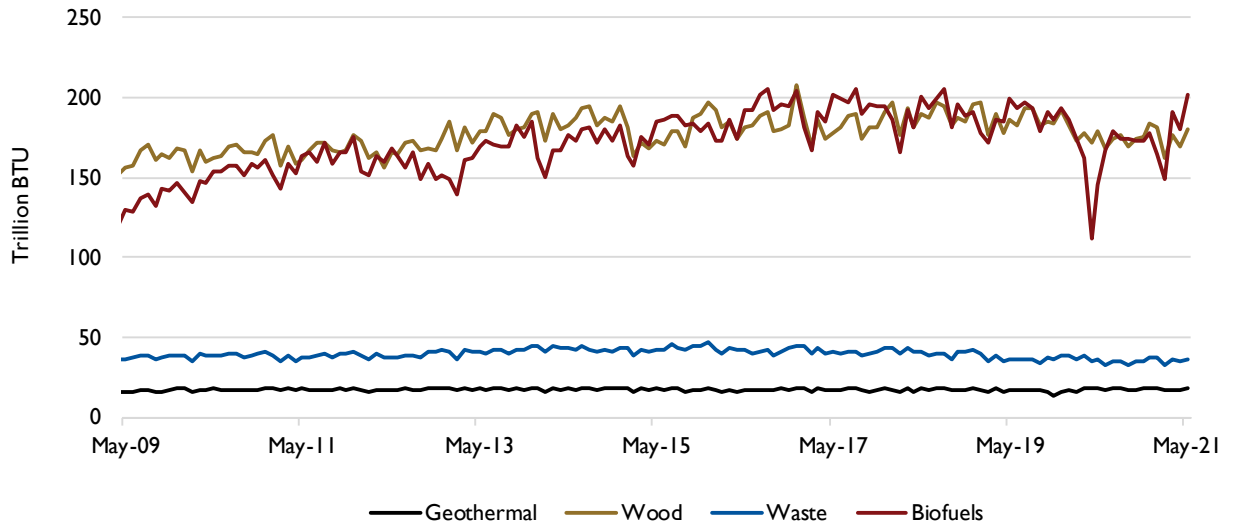
U.S. SOLAR, WIND AND HYDROELECTRIC ENERGY CONSUMPTION (MONTHLY) (41)



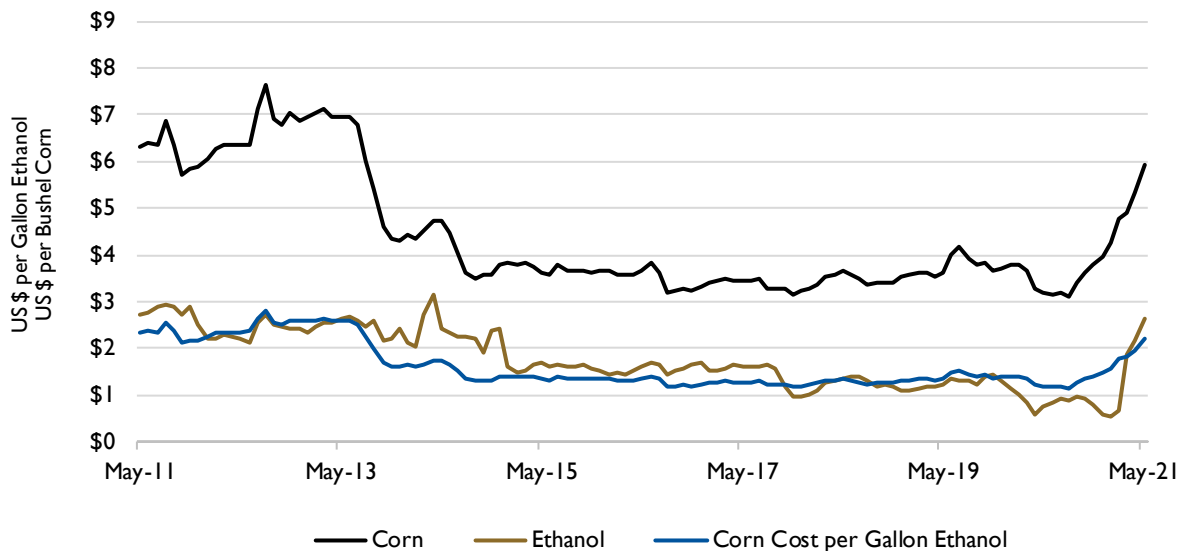
DATA CENTER

RENEWABLES

U.S. WOOD, WASTE, BIOFUELS AND GEOTHERMAL ENERGY CONSUMPTION (MONTHLY) (42)

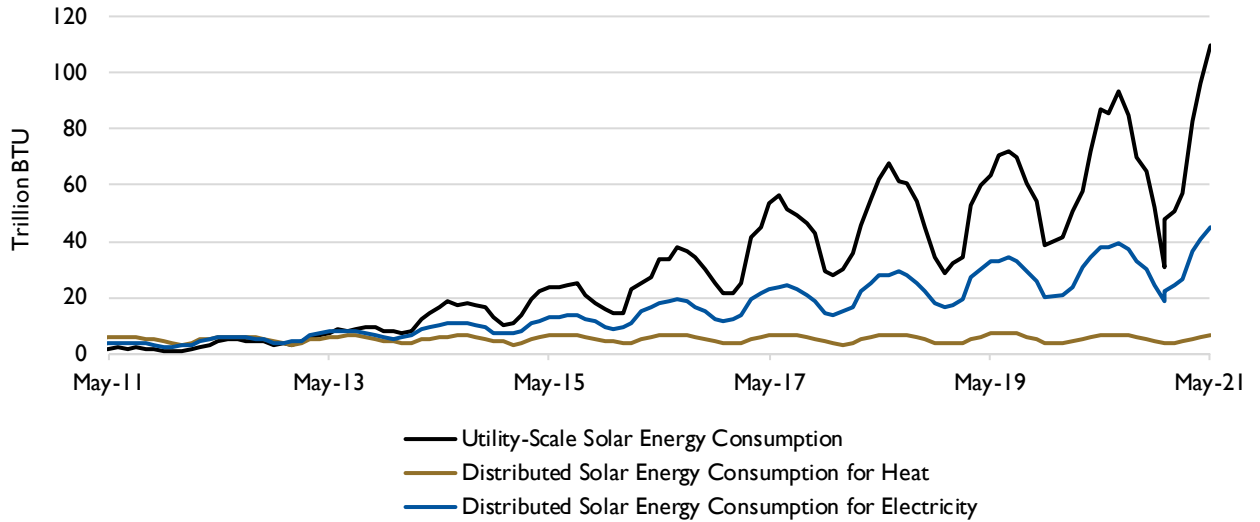


CORN AND ETHANOL PRICES AND CORN COST PER GALLON OF ETHANOL (QUARTERLY) (43)

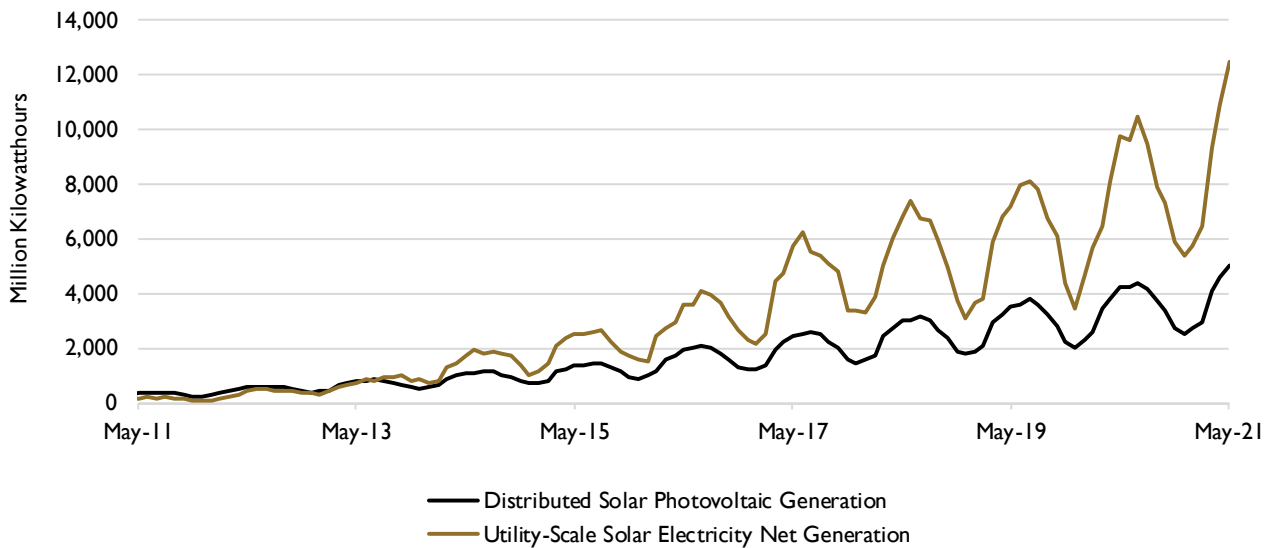


DATA CENTER RENEWABLES

U.S. SOLAR ENERGY CONSUMPTION (MONTHLY) (44)



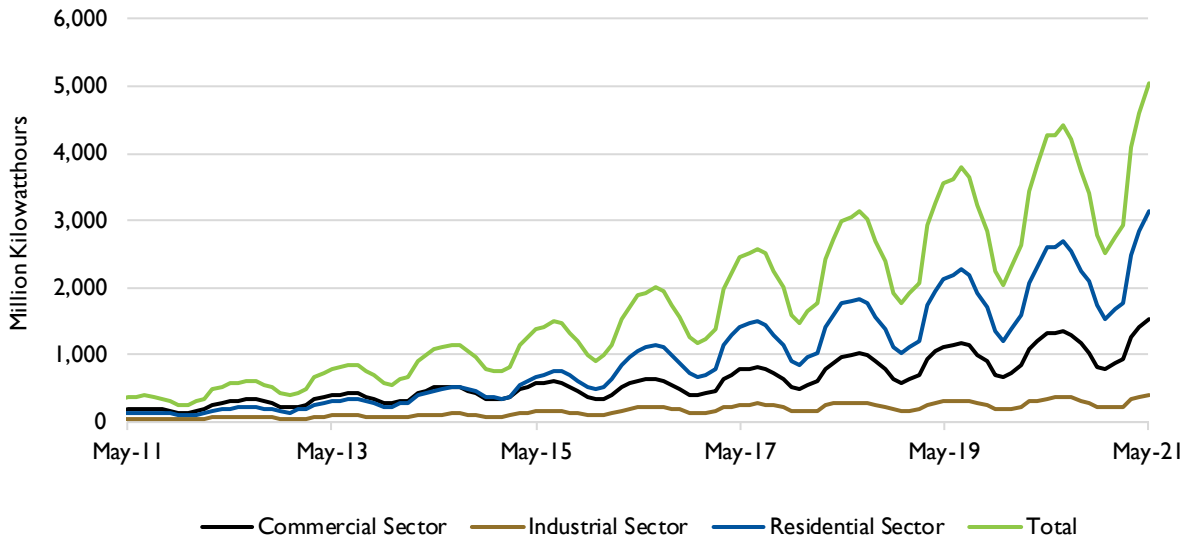
U.S. SOLAR ENERGY NET GENERATION (MONTHLY) (45)



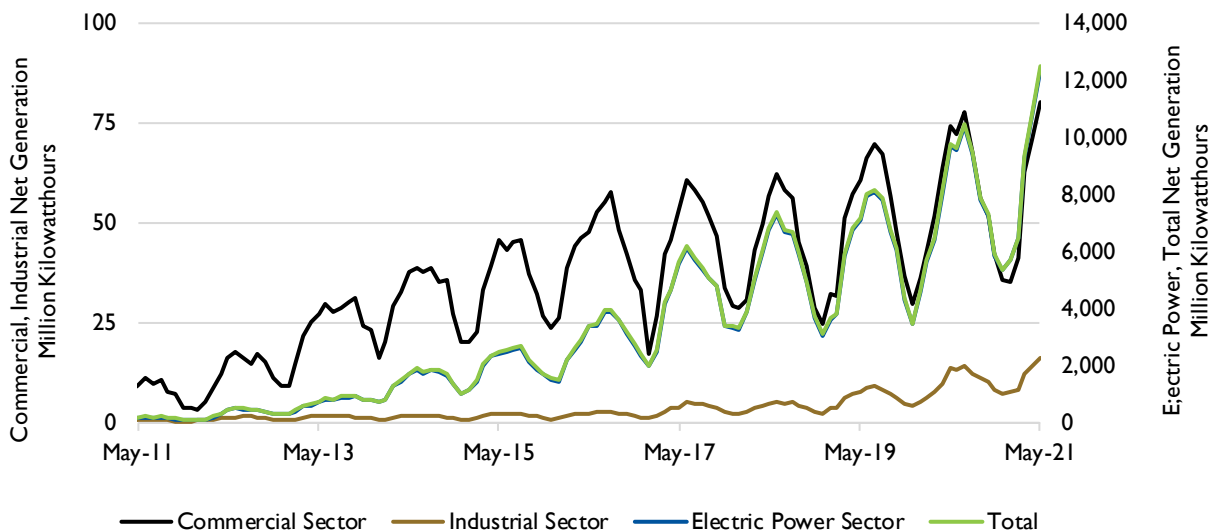
DATA CENTER

RENEWABLES

DISTRIBUTED SOLAR PHOTOVOLTAIC GENERATION BY SECTOR (MONTHLY) (46)

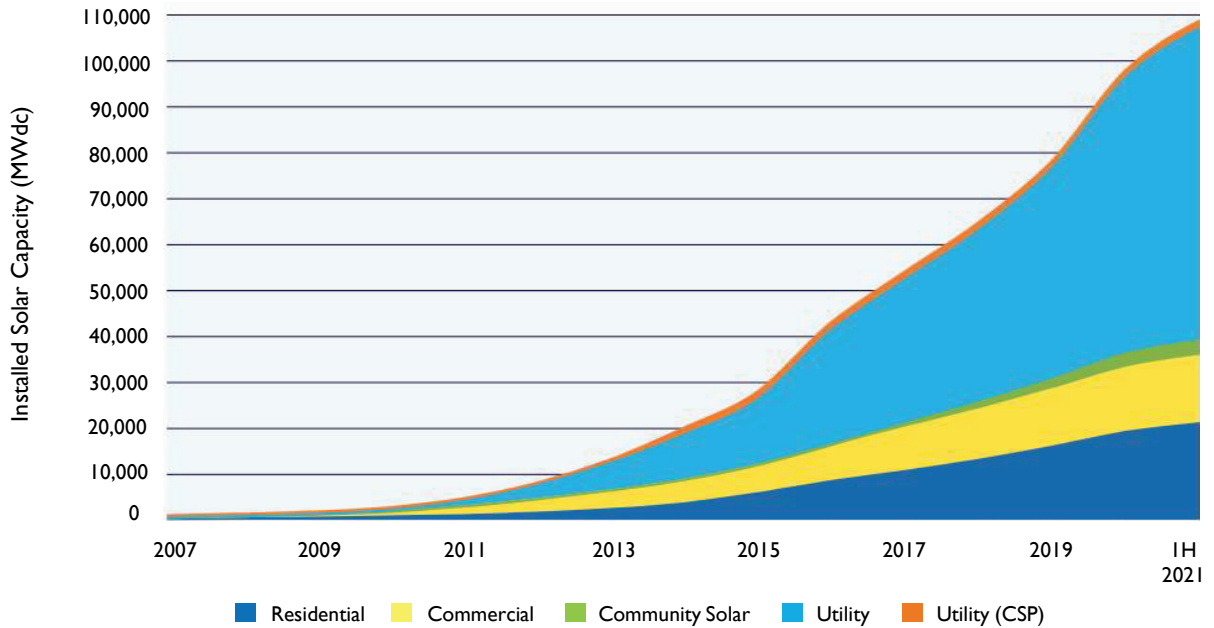


UTILITY-SCALE SOLAR ELECTRICITY NET GENERATION BY SECTOR (MONTHLY) (47)

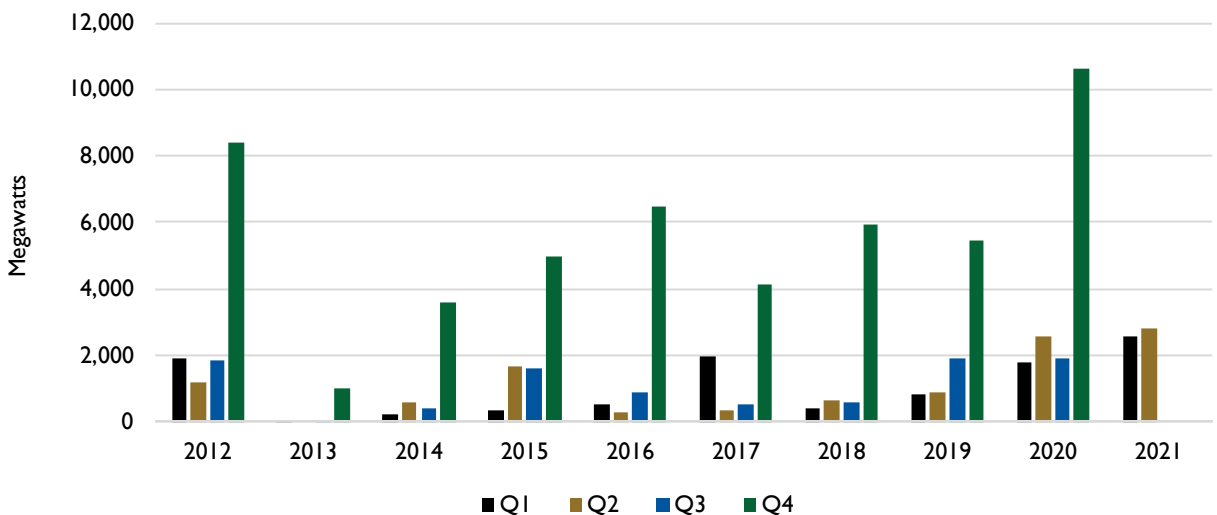


DATA CENTER RENEWABLES

U.S. CUMULATIVE SOLAR INSTALLATIONS (QUARTERLY) (48)

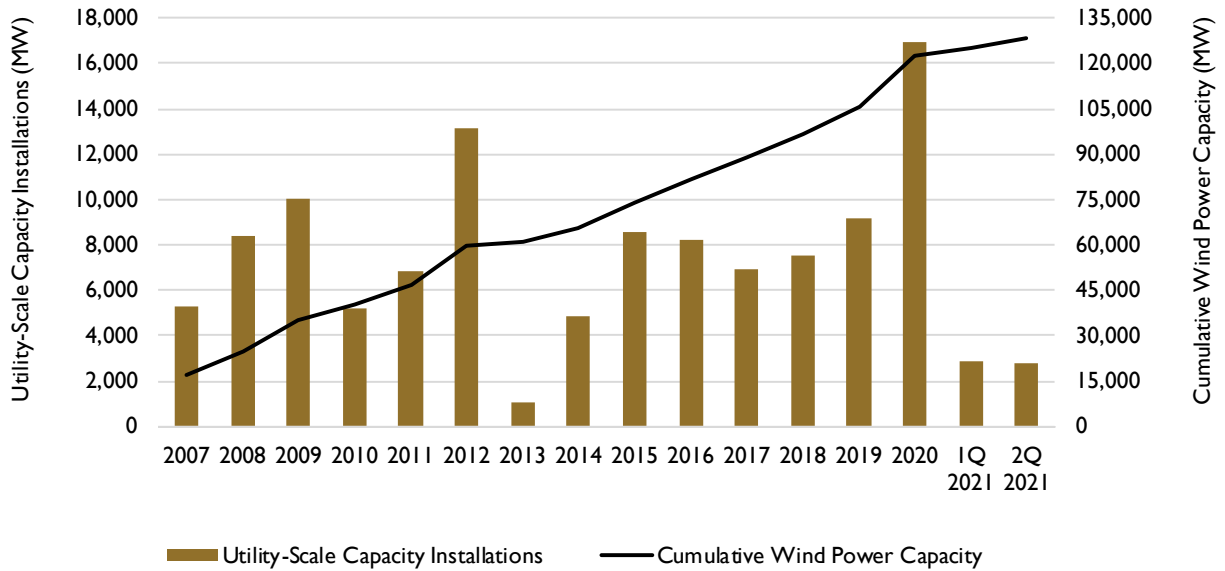


U.S. WIND POWER CAPACITY INSTALLATIONS (QUARTERLY) (49)

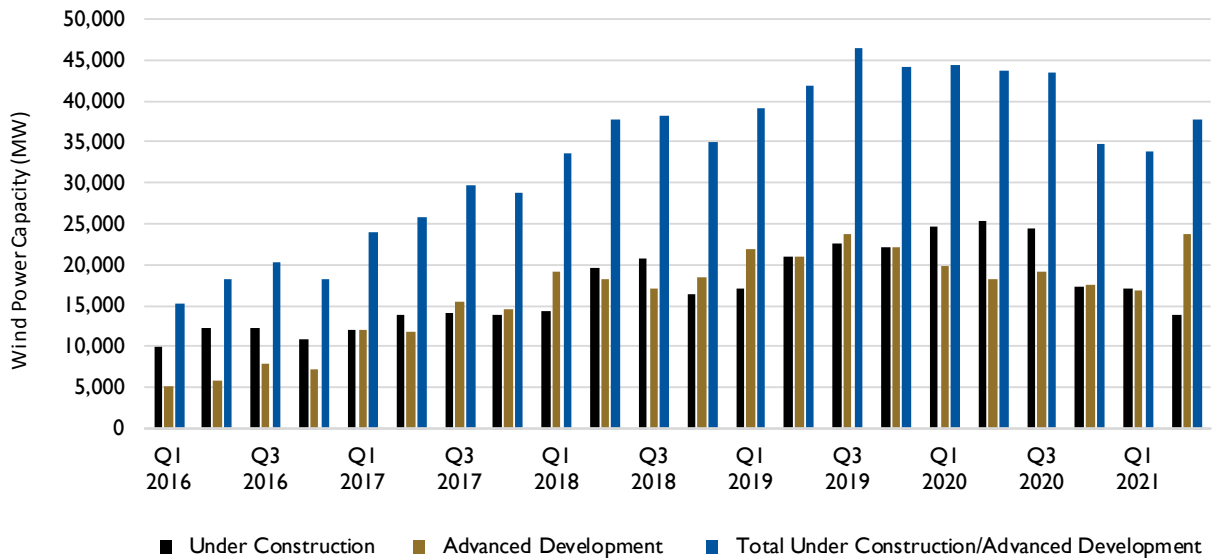


DATA CENTER RENEWABLES

UTILITY-SCALE WIND POWER CAPACITY INSTALLATIONS (ANNUAL) (50)



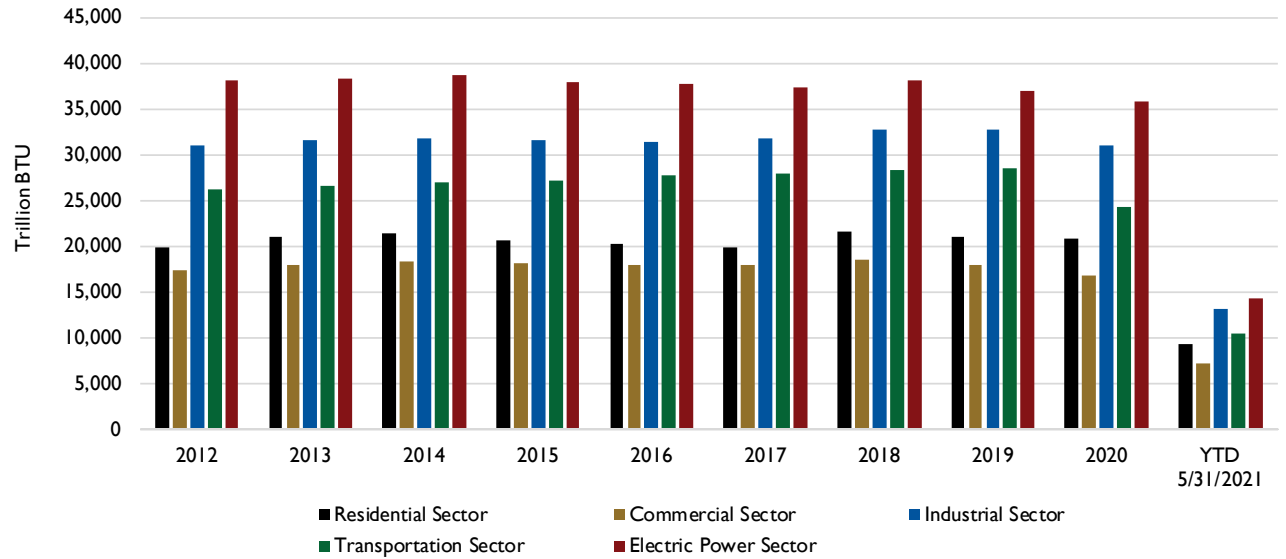
WIND POWER UNDER CONSTRUCTION OR IN ADVANCED DEVELOPMENT (QUARTERLY) (51)



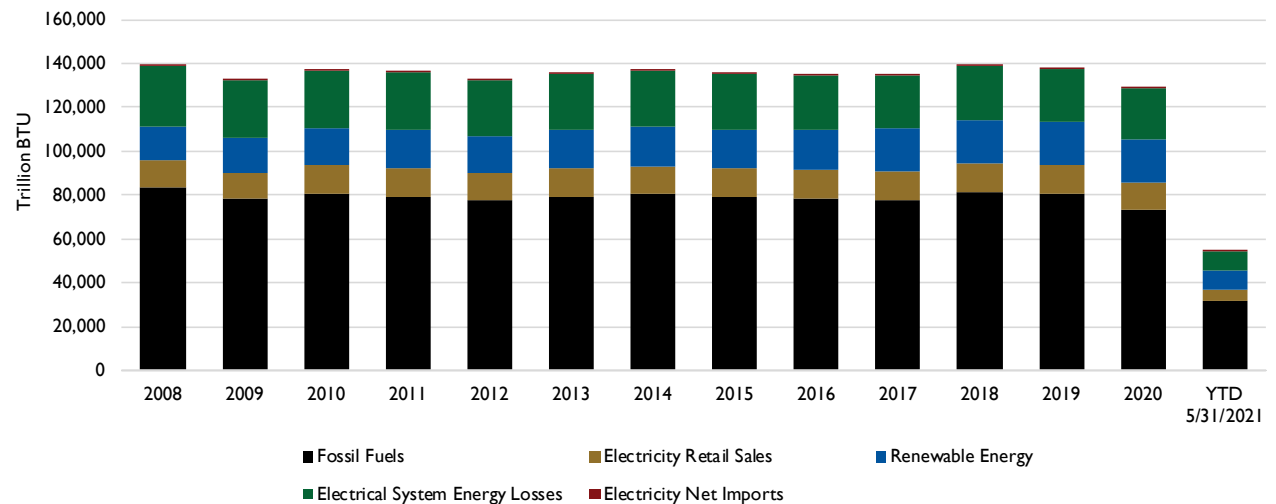
DATA CENTER

U.S. AGGREGATED ENERGY CONSUMPTION

ENERGY CONSUMPTION BY SECTOR (ANNUAL) ⁽⁵²⁾



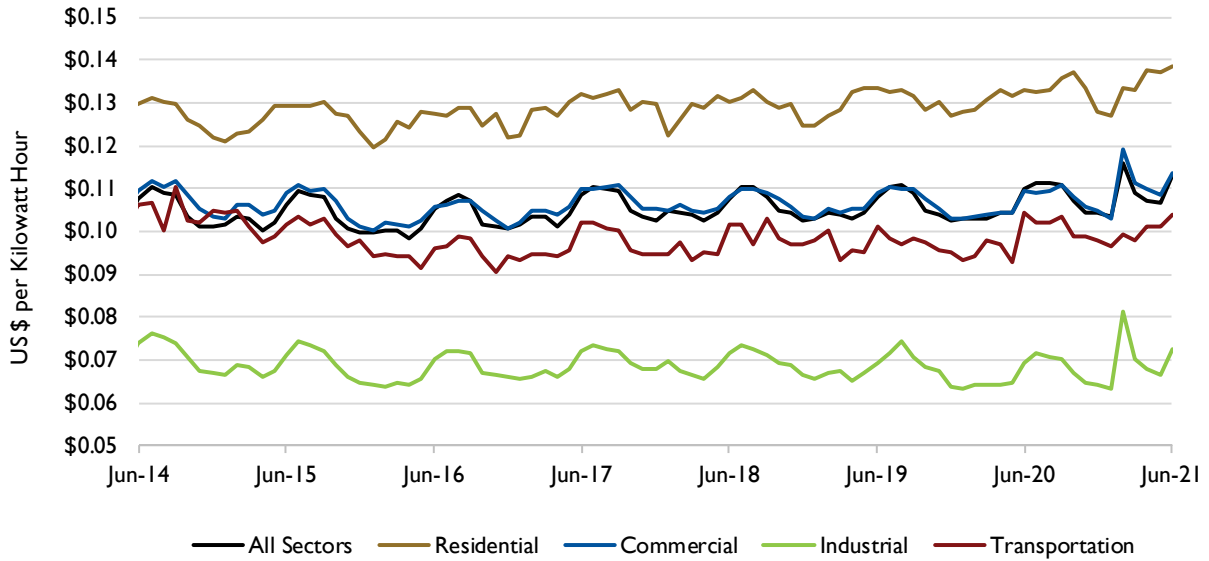
ENERGY CONSUMPTION BY SOURCE (ANNUAL) ⁽⁵³⁾



DATA CENTER

U.S. AGGREGATED ENERGY CONSUMPTION

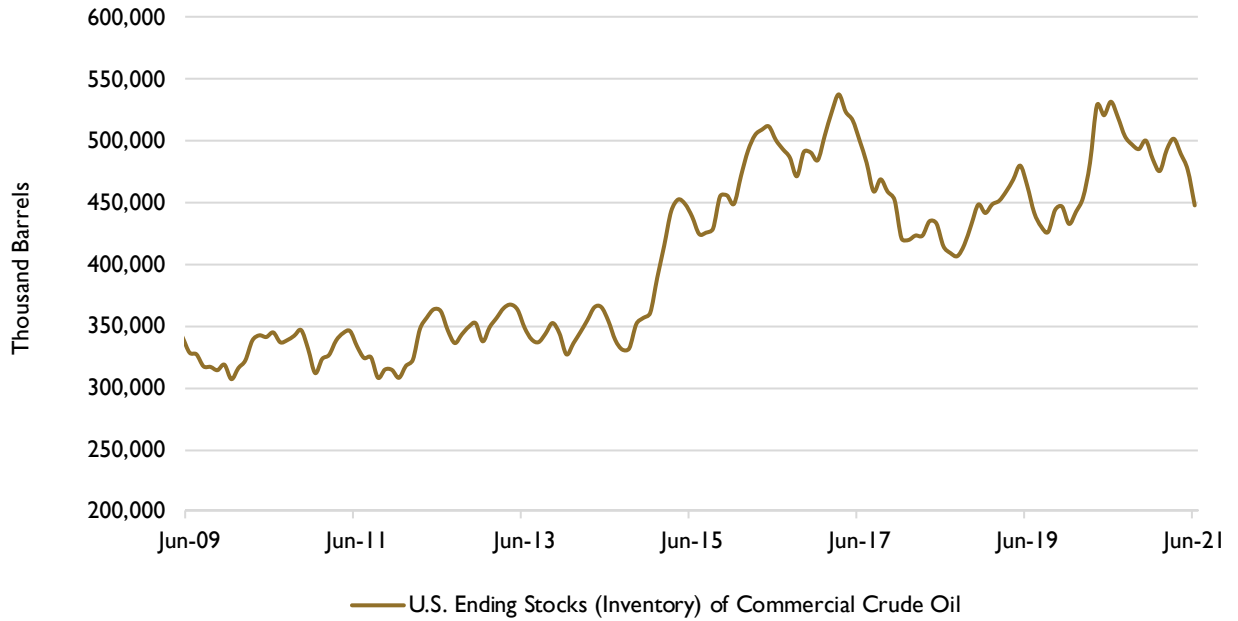
ELECTRICITY PRICES BY SECTOR (MONTHLY AVERAGE) (54)



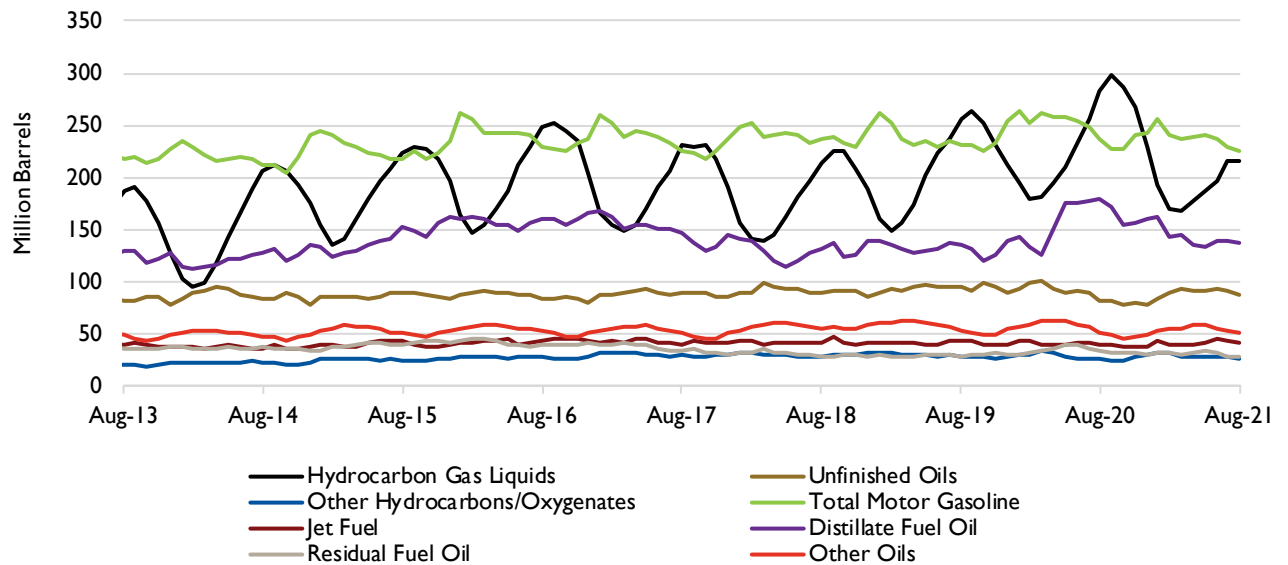
DATA CENTER

LOGISTICS - STORAGE AND TERMINALS

COMMERCIAL CRUDE OIL INVENTORY (MONTHLY) ⁽⁵⁵⁾



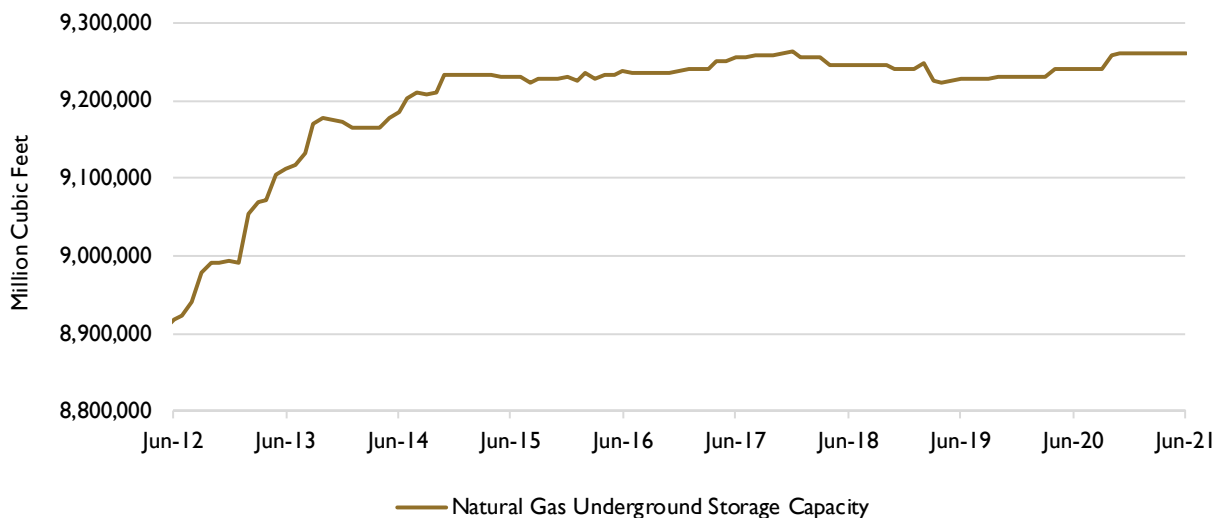
PETROLEUM AND OTHER LIQUIDS COMMERCIAL INVENTORY (MONTHLY) ⁽⁵⁶⁾



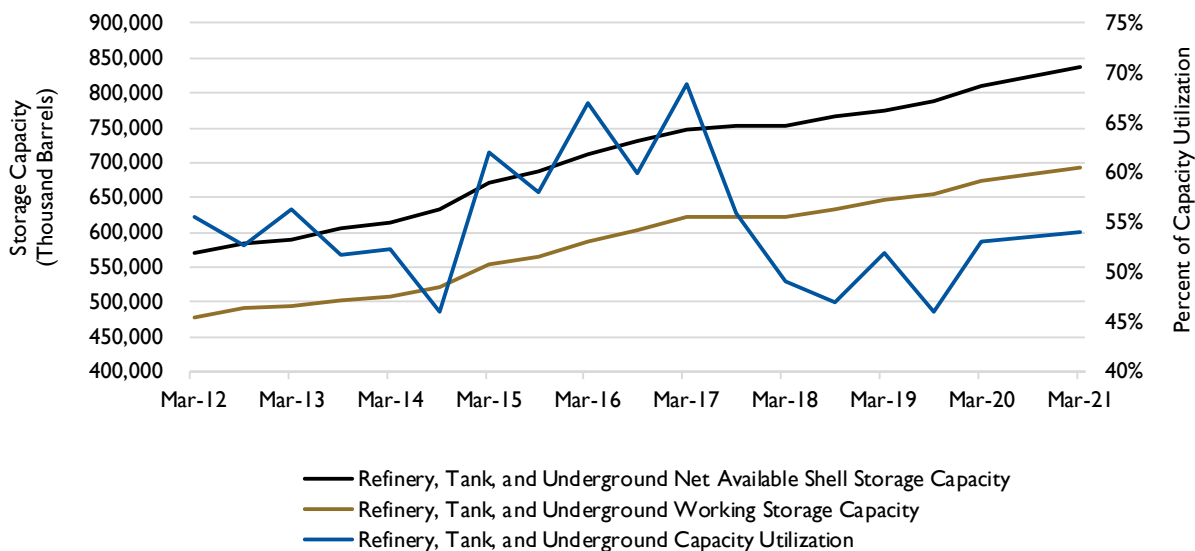
DATA CENTER

LOGISTICS - STORAGE AND TERMINALS

NATURAL GAS UNDERGROUND STORAGE CAPACITY (MONTHLY) (57)



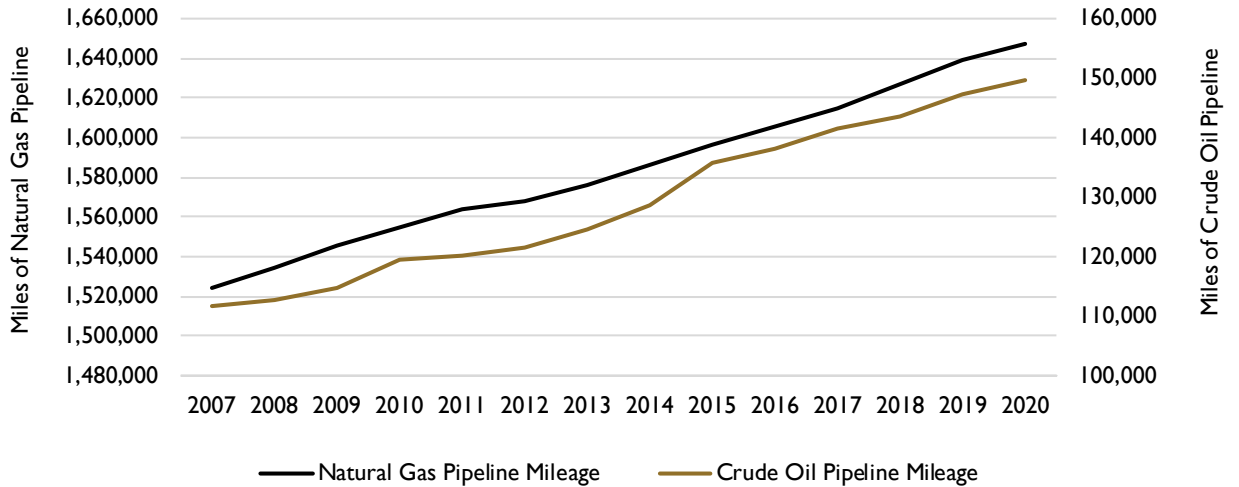
COMMERCIAL CRUDE OIL REFINERY, TANK AND UNDERGROUND STORAGE CAPACITY AND UTILIZATION (ANNUAL) (58)



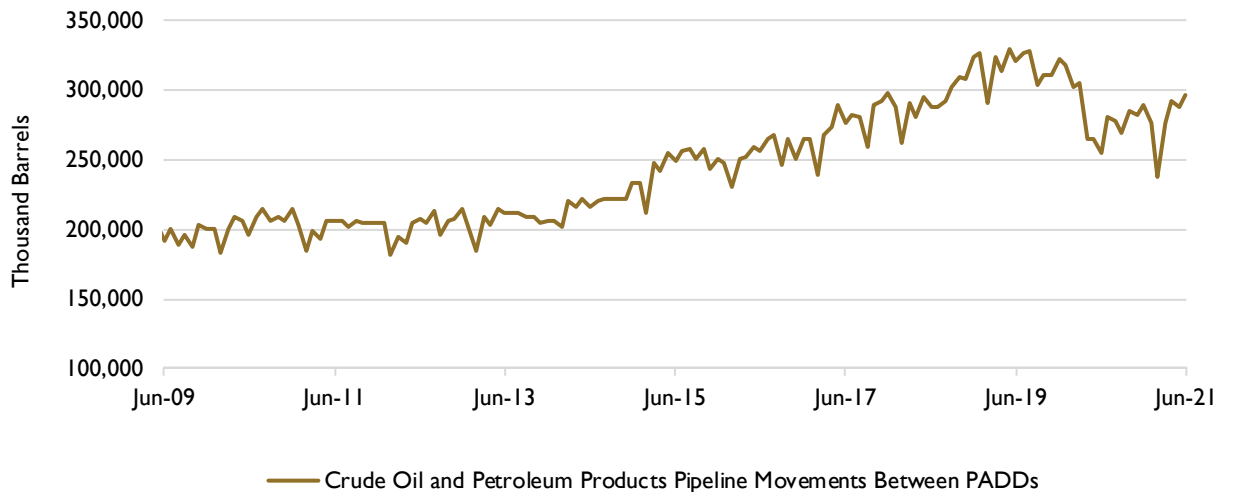
DATA CENTER

LOGISTICS - PIPELINES

CRUDE OIL AND NATURAL GAS PIPELINE MILEAGE (ANNUAL) (59)



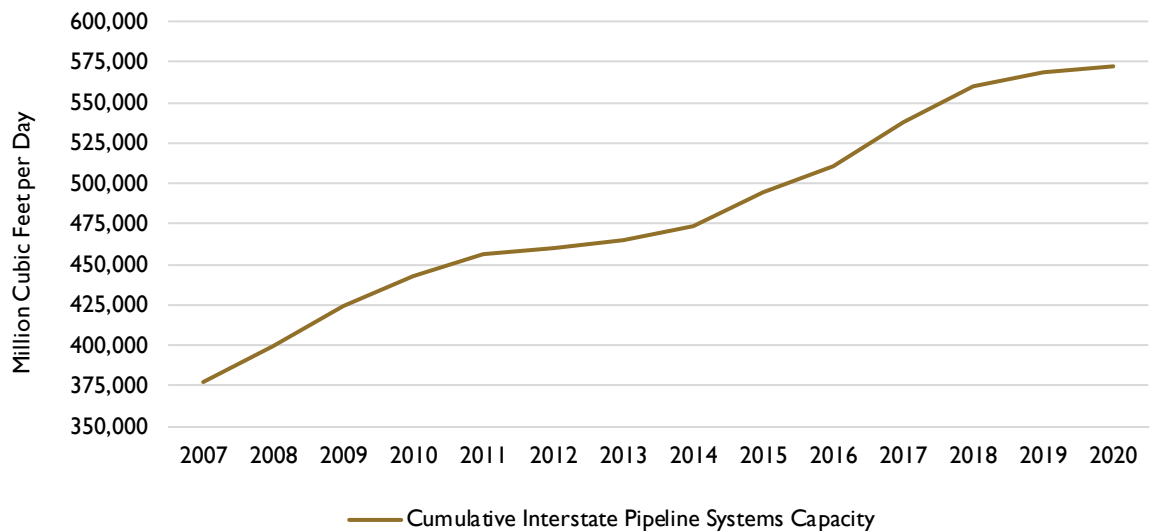
CRUDE OIL AND PETROLEUM PRODUCTS PIPELINE MOVEMENTS BETWEEN PETROLEUM ADMINISTRATION FOR DEFENSE DISTRICTS (PADDs) (MONTHLY) (60)



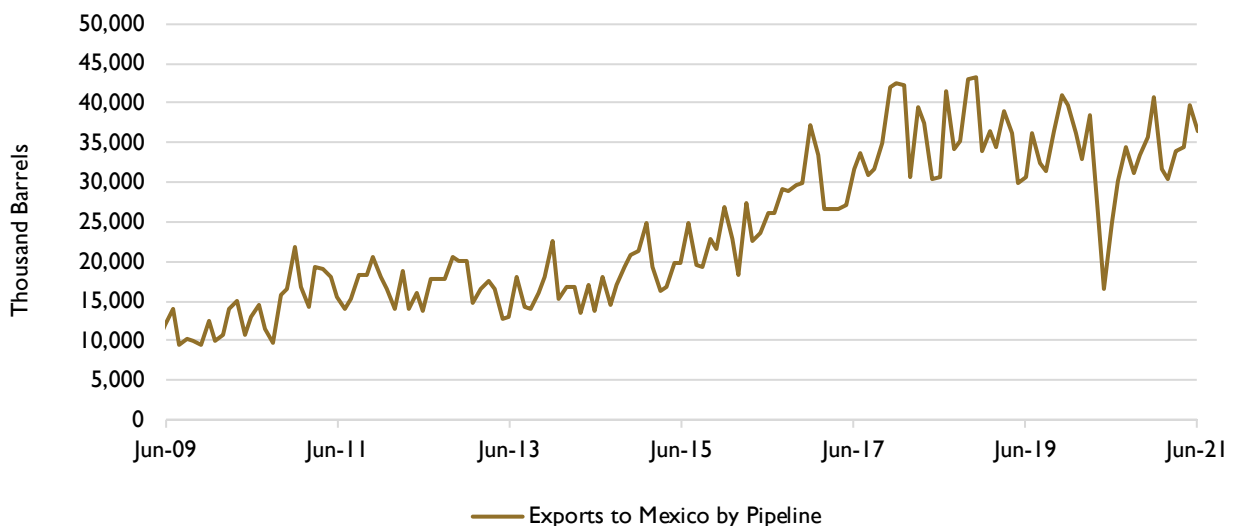
DATA CENTER

LOGISTICS - PIPELINES

NATURAL GAS CUMULATIVE INTERSTATE PIPELINE SYSTEMS CAPACITY (ANNUAL) ⁽⁶¹⁾



CRUDE OIL AND PETROLEUM PRODUCTS EXPORTS TO MEXICO (MONTHLY) ⁽⁶²⁾

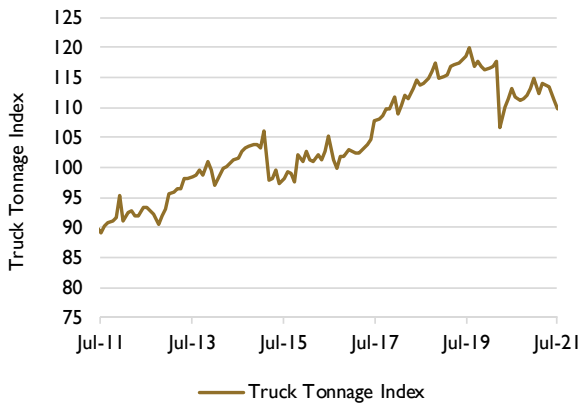


DATA CENTER

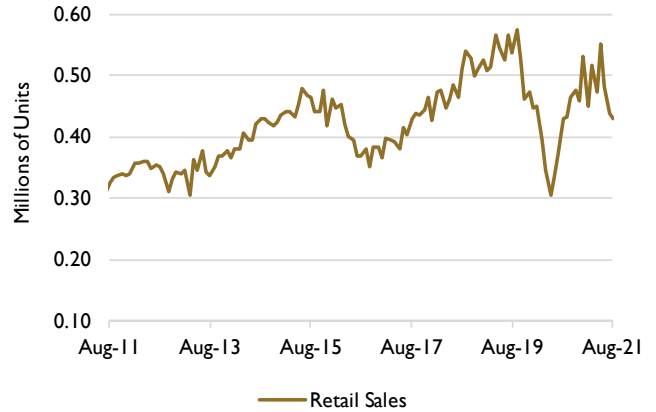
LOGISTICS - TRUCKERS

TRUCK TONNAGE INDEX (MONTHLY) (63)

MEASURES GROSS TONNAGE OF FREIGHT

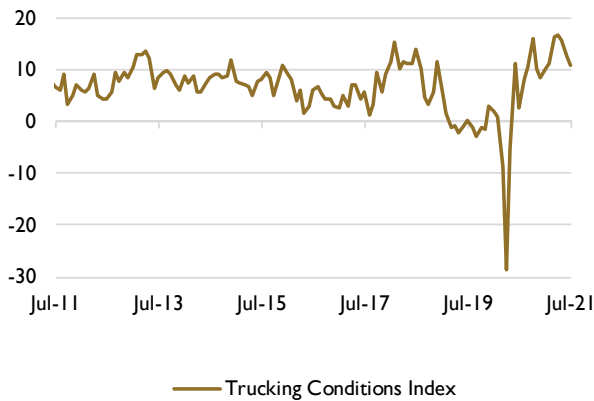


HEAVY TRUCK SALES (MONTHLY) (64)



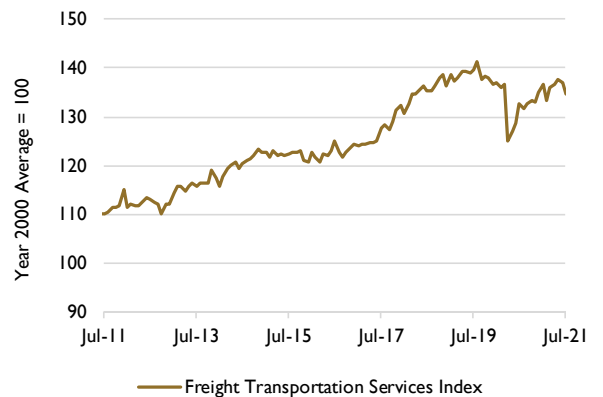
TRUCKING CONDITIONS INDEX (MONTHLY) (65)

INCLUDES FREIGHT VOLUMES, RATES, FLEET CAPACITY, BANKRUPTCIES, FUEL PRICE AND FINANCING



FREIGHT TRANSPORTATION SERVICES INDEX (MONTHLY) (66)

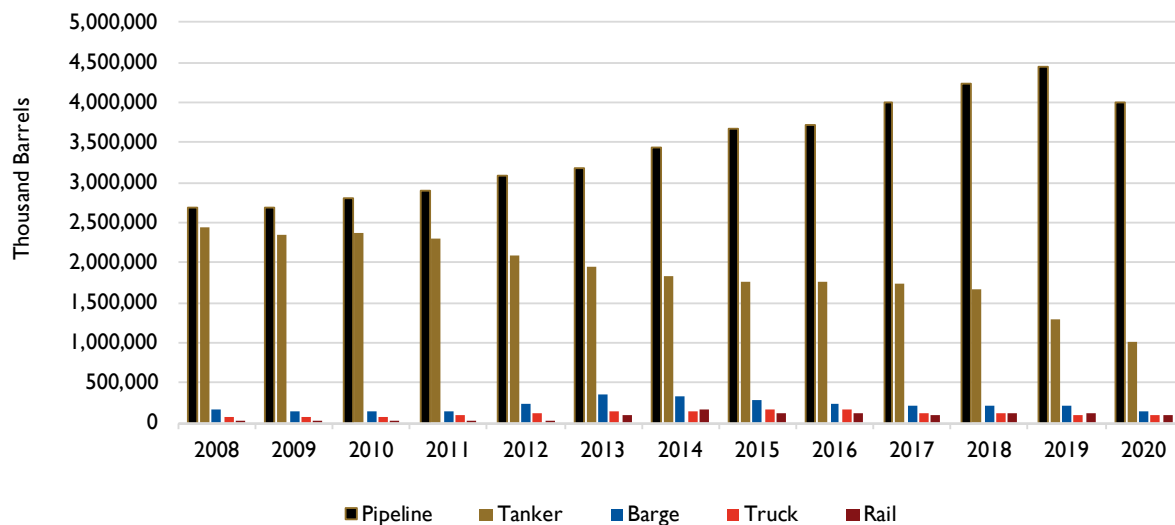
INCLUDES TRUCKING, RAIL, WATERWAYS, PIPELINES AND AIR FREIGHT



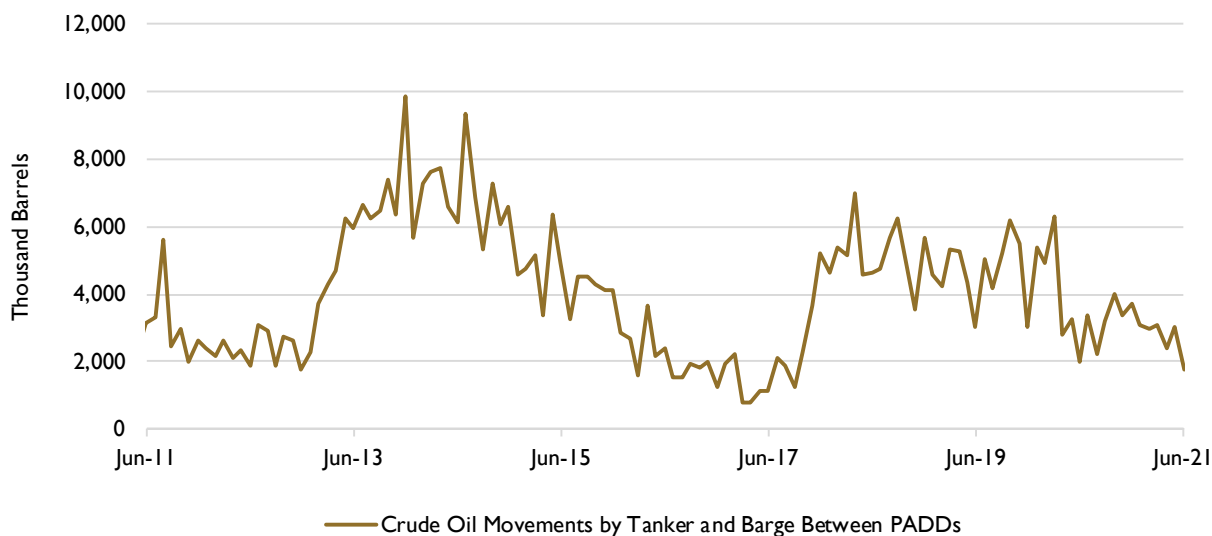
DATA CENTER

LOGISTICS - SHIPPING

CRUDE OIL REFINERY RECEIPTS BY TRANSPORTATION METHOD (ANNUAL) ⁽⁶⁷⁾



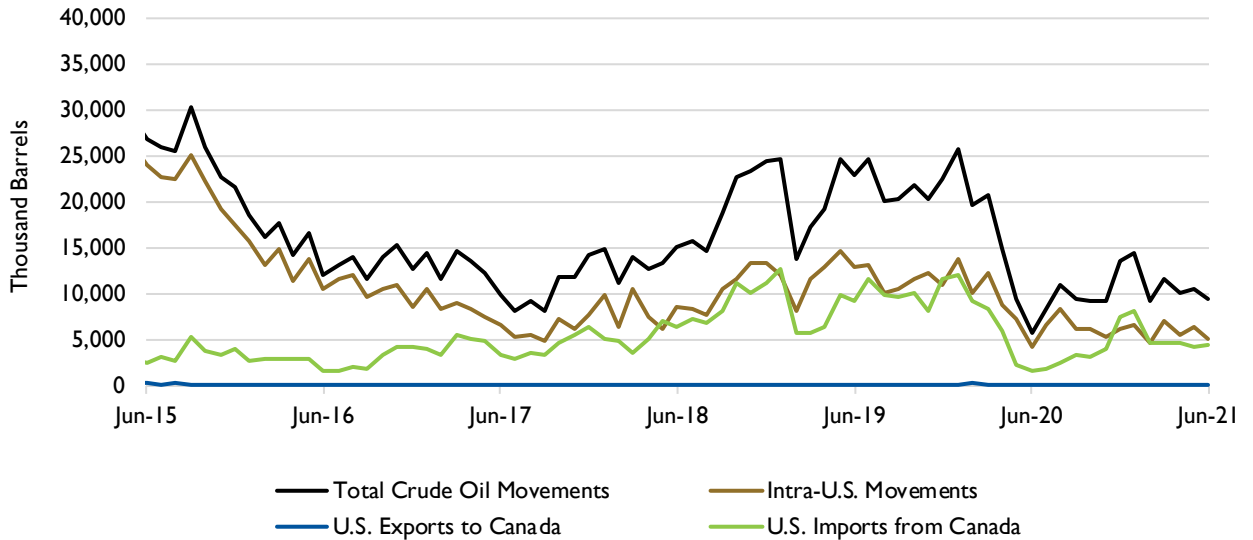
CRUDE OIL MOVEMENTS BY TANKER AND BARGE BETWEEN PETROLEUM ADMINISTRATION FOR DEFENSE DISTRICTS (PADDs) (MONTHLY) ⁽⁶⁸⁾



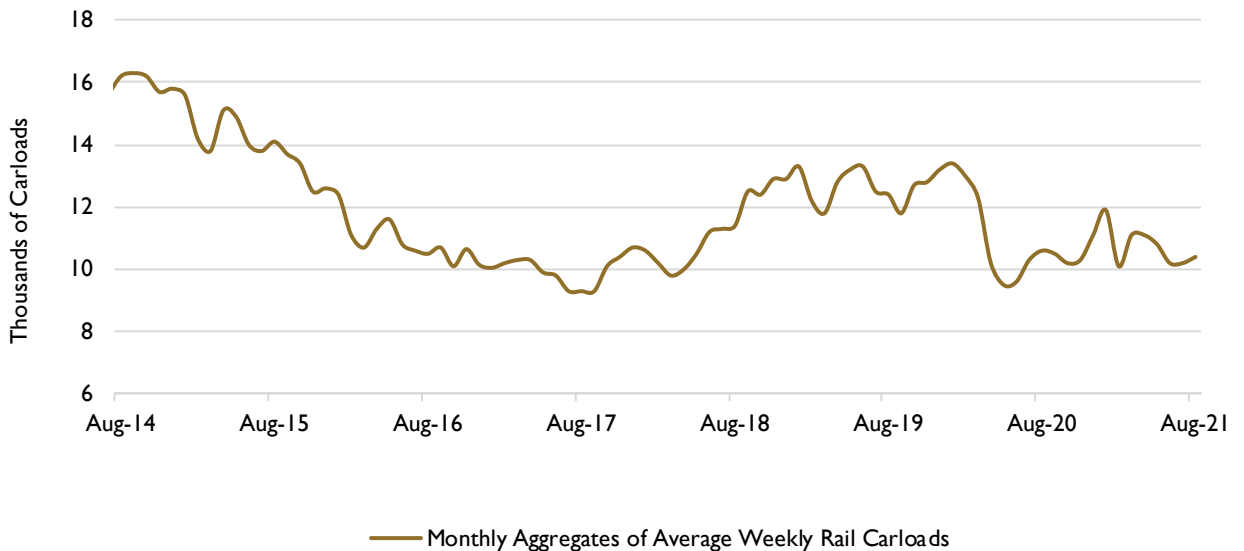
DATA CENTER

LOGISTICS - RAIL

MOVEMENTS OF CRUDE OIL BY RAIL (MONTHLY) (69)



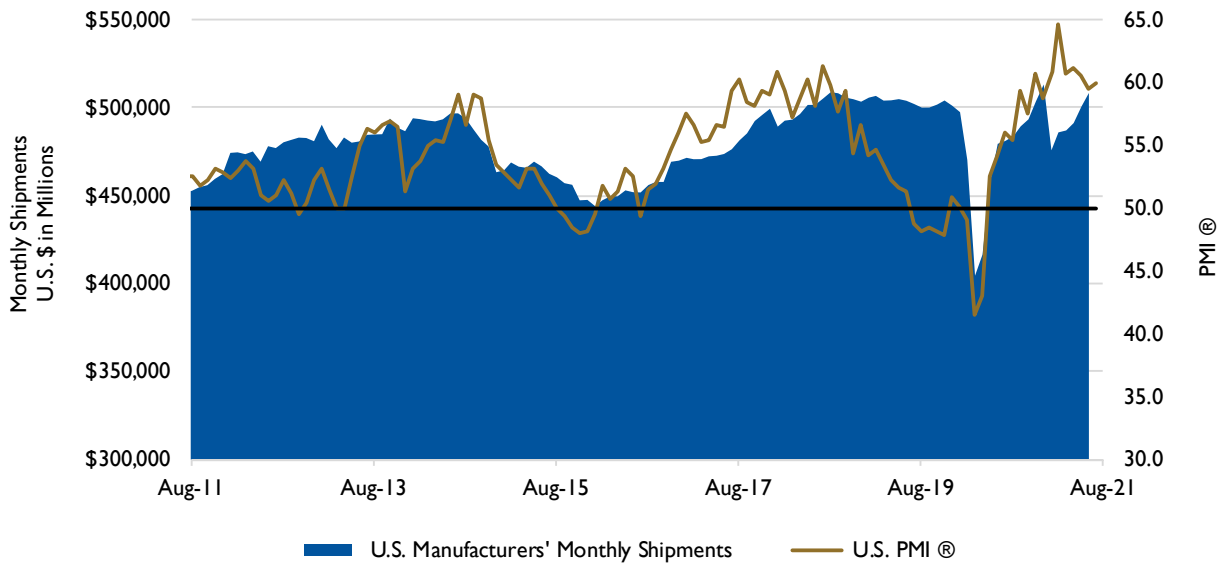
AVERAGE WEEKLY RAIL CARLOADS OF PETROLEUM AND PETROLEUM PRODUCTS (MONTHLY AGGREGATE) (70)



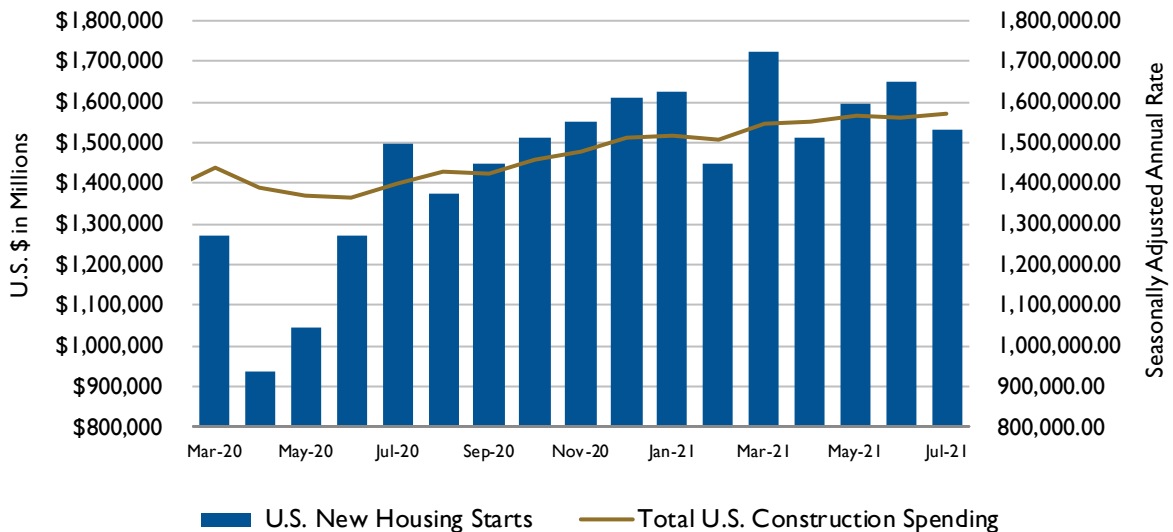
DATA CENTER

ECONOMIC / FINANCIAL

U.S. MANUFACTURERS' MONTHLY SHIPMENTS AND U.S. PURCHASING MANAGERS' INDEX (PMI®) (MONTHLY) (71)



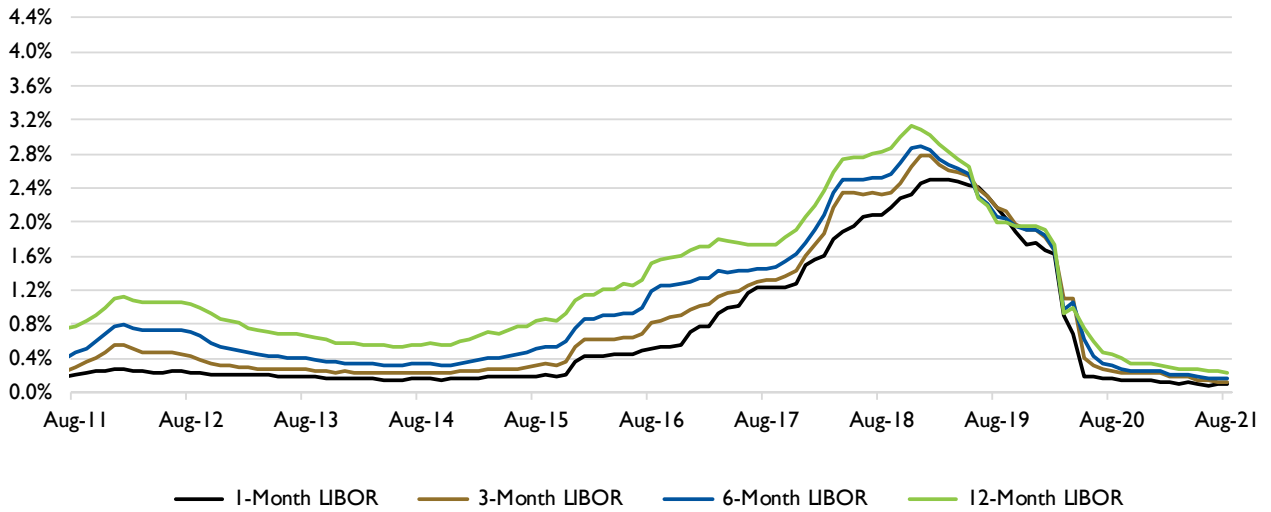
U.S. NEW HOUSING STARTS AND TOTAL U.S. CONSTRUCTION SPENDING (MONTHLY) (72)



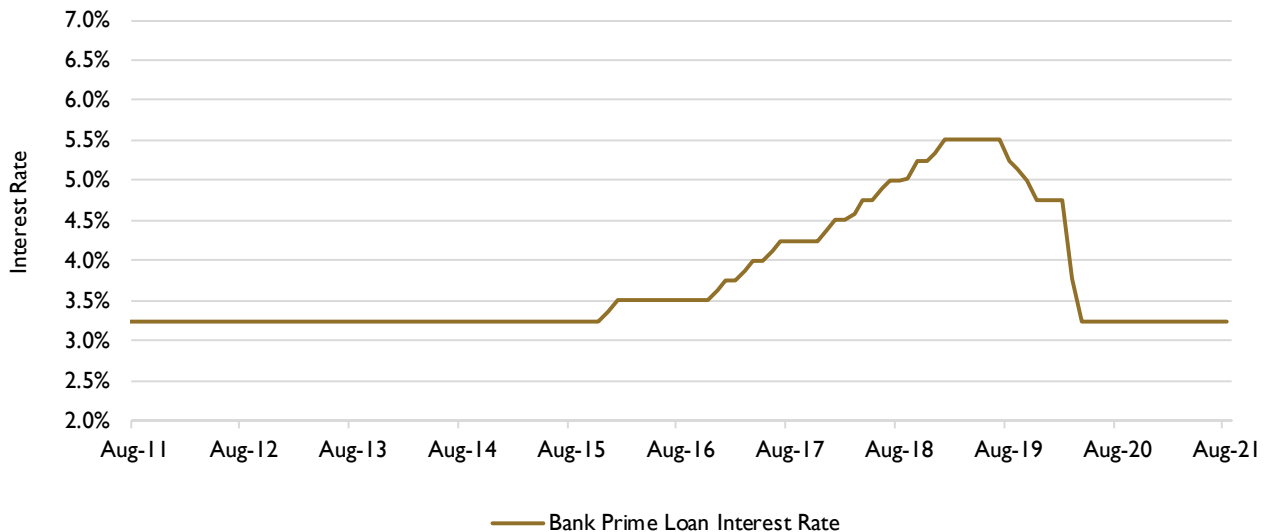
DATA CENTER

ECONOMIC / FINANCIAL

LONDON INTERBANK OFFERED RATE (LIBOR) (MONTHLY AVERAGE) BASED ON U.S. DOLLAR ⁽⁷³⁾



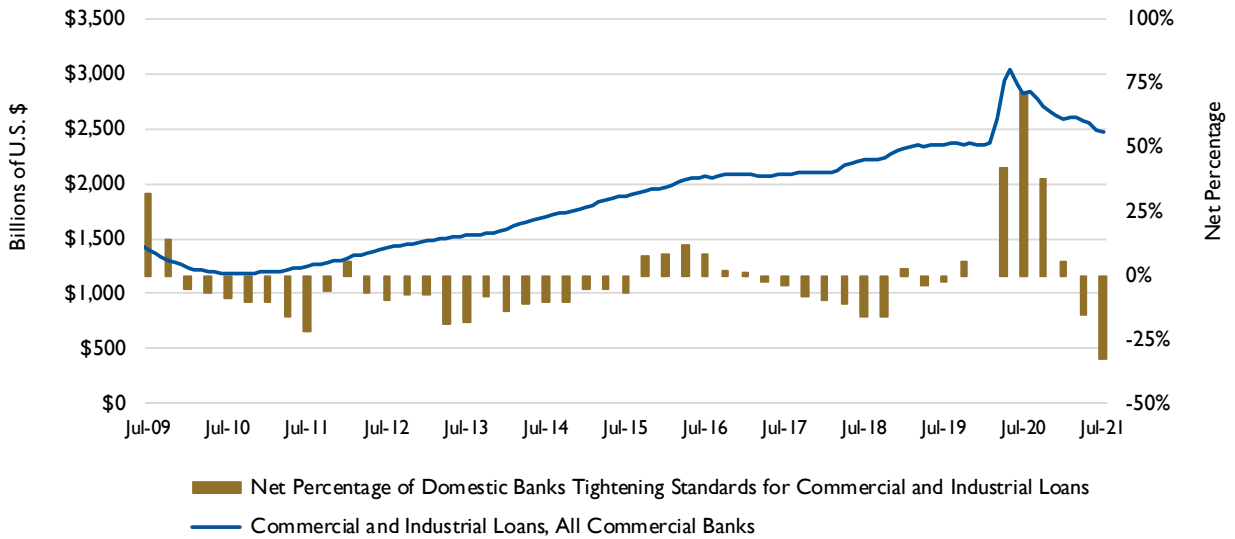
BANK PRIME LOAN INTEREST RATES (MONTHLY AVERAGE) ⁽⁷⁴⁾



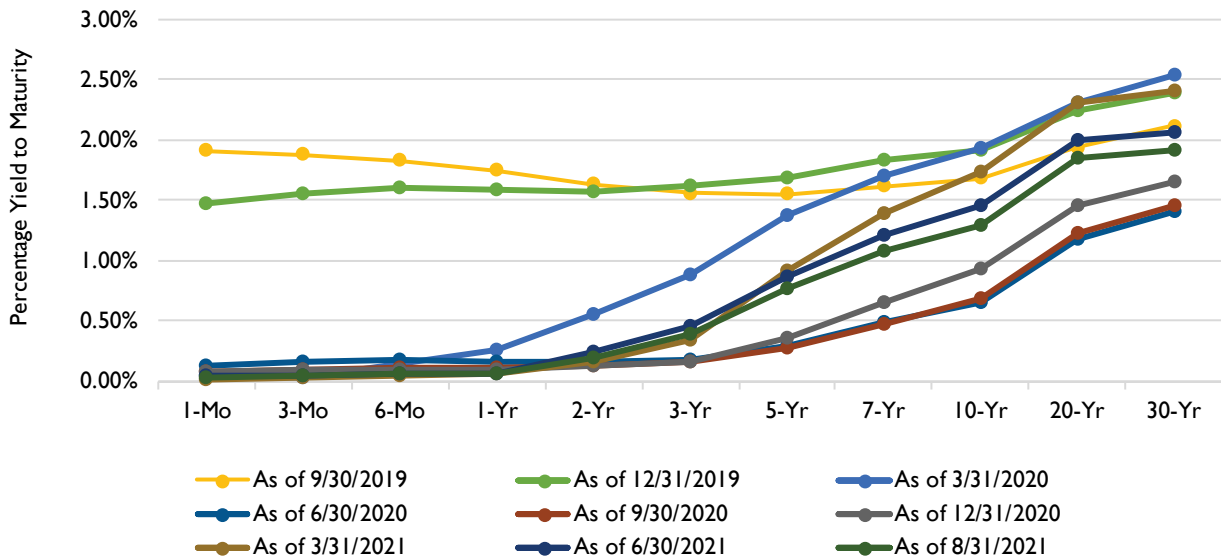
DATA CENTER

ECONOMIC / FINANCIAL

COMMERCIAL AND INDUSTRIAL LOANS VS. BANKING STANDARDS (QUARTERLY, MONTHLY) ⁽⁷⁵⁾



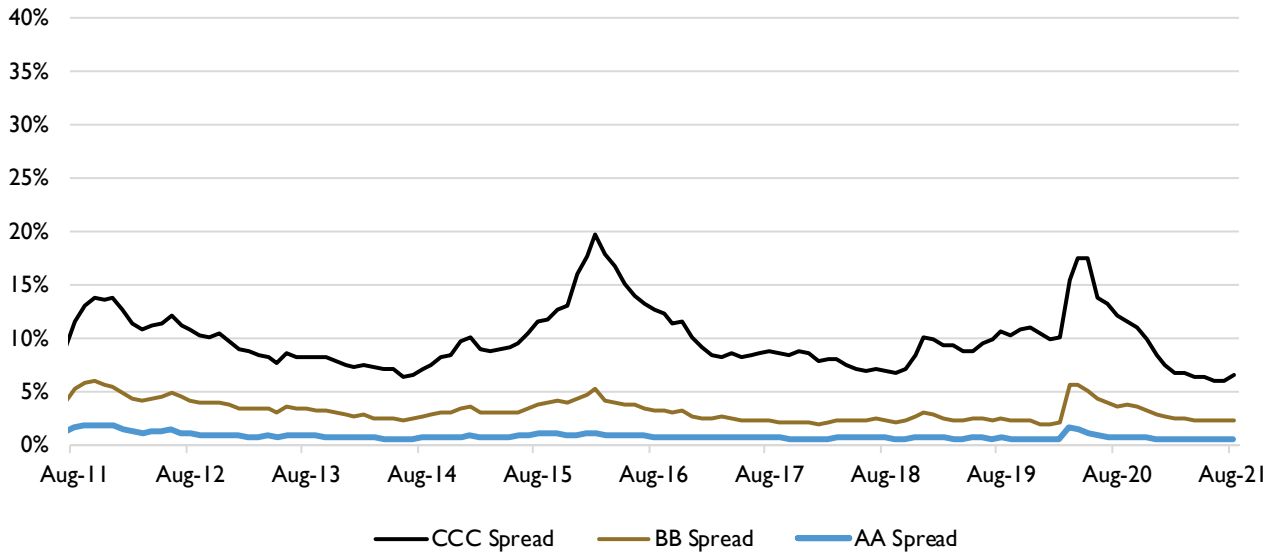
U.S. TREASURY YIELD CURVE (MONTHLY, ANNUAL) ⁽⁷⁶⁾



DATA CENTER

ECONOMIC / FINANCIAL

CORPORATE SPREADS TO TREASURIES BY QUALITY (MONTHLY AVERAGE) ⁽⁷⁷⁾



DATA CENTER: ABBREVIATIONS & ACRONYMS, DEFINITIONS, DESCRIPTIONS AND CHART NOTES

ABBREVIATIONS & ACRONYMS

AECO – Alberta Energy Company
ARAMCO – Saudi Arabian Oil Company, formerly the Arabian-American Oil Company
BCF – Billion cubic feet
BTU – British thermal unit
CIF – Costs, insurance and freight
CMT – Constant maturity treasury
DUC – Drilled but uncompleted wells
EBITDA – Earnings before interest, taxes, depreciation and amortization
IFO – Intermediate fuel oil
ITC – Investment Tax Credit
LCOE – Levelized cost of energy
LIBOR – London Interbank Offered Rate
LNG – Liquefied natural gas
LPG – Liquefied petroleum gas
mmBTU – Millions of British Thermal Units
MTBE – Methyl tertiary butyl ether
MW – Megawatt
NBP – National Balancing Point
NGPL – Natural gas plant liquids
NYMEX – New York Mercantile Exchange
OAS – Option-adjusted spread
OPEC – The Organization of Petroleum Exporting Countries
PADD – Petroleum Administration for Defense District
PG&E – Pacific Gas & Electric
PMI ® – U.S. Purchasing Managers Index ®
PV – Photovoltaic
SoCal – Southern California
SPR – Strategic Petroleum Reserve
TETCO-M3 – Texas Eastern Transmission Corporation Pipeline Zone M3
TTF – Title Transfer Facility
UAE – United Arab Emirates
WTI – West Texas Intermediate crude oil

DATA CENTER: ABBREVIATIONS & ACRONYMS, DEFINITIONS, DESCRIPTIONS AND CHART NOTES

DEFINITIONS

Biofuels – liquid fuels and blending components produced from biomass feedstocks, used primarily for transportation.

British Thermal Unit (BTU) – A traditional unit of heat; it is defined as the amount of heat required to raise the temperature of one pound of water by one degree Fahrenheit.

Ending Stocks – A proxy for inventory, defined as the total volume of a given commodity held in storage (leases, refineries, processing plants, pipelines, terminals, tank farms) at the end of the last day of a given month.

Distillate Fuel Oil – A general classification for a variety of petroleum fractions produced in petroleum distillation operations. Included within this classification are No. 1, No. 2 and No. 4 diesel fuels (used in on-highway and off-highway diesel engines), as well as No. 1, No. 2 and No. 4 fuel oils (used primarily for space heating and electric power generation).

Distributed Solar Energy – Refers to solar energy generated by small-scale photovoltaic generation plants. Small-scale is defined as a plant with capacity below one megawatt.

Index – A figure in a system or scale representing the average value of specified prices, shares, or other items as compared with some reference figure.

Intermediate Fuel Oil – Also known as IFO and Bunker Fuel, fuel utilized by ships and barges to facilitate international exchange of various commodities across an array of industries.

Investment Tax Credit – A federal policy tax incentive that supports the deployment of solar energy in the United States.

LIBOR – The London Interbank Offered Rate is the average interest rate at which leading banks borrow funds of a sizeable amount from other banks in the London market.

Liquefied Natural Gas – Natural gas that has been cooled to a liquid state, at about -260°Fahrenheit, for shipping and storage.

Liquefied Petroleum Gas – A group of hydrocarbon gases, primarily propane, normal butane and isobutene, derived from crude oil refining or natural gas processing.

Natural Gas Liquids – A group of hydrocarbons including ethane, propane, normal butane, isobutene and natural gasoline. Generally include natural gas plant liquids and all liquefied refinery gases except olefins.

Natural Gas Plant Liquids – Ethane, propane, butane, isobutane, pentane and pentane plus.

Petroleum Administration for Defense District (PADD) – A geographic aggregation of the 50 States and the District of Columbia into five Districts. PADD 1 is the East Coast region, PADD 2 is the Midwest region, PADD 3 is the Gulf Coast region and PADD 5 is the West Coast region.

Petroleum Products – Obtained from the processing of crude oil (including lease condensate), natural gas and other hydrocarbon compounds. Petroleum products include unfinished oils, liquefied petroleum gases, pentanes plus, aviation gasoline, motor gasoline, naphtha-type jet fuel, kerosene-type jet fuel, kerosene, distillate fuel oil, residual fuel oil, petrochemical feedstocks, special naphthas, lubricants, waxes, petroleum coke, asphalt, road oil, still gas and miscellaneous products.

DATA CENTER: ABBREVIATIONS & ACRONYMS, DEFINITIONS, DESCRIPTIONS AND CHART NOTES

DEFINITIONS

Product Supplied – A widely utilized proxy for consumption of petroleum products, measuring the disappearance of said products from primary sources. Primary sources include, among others, refineries, processing plants, blending plants, pipelines and bulk terminals.

Propylene – Petrochemical feedstock that is recovered from refinery or petrochemical processes. It is an olefinic hydrocarbon that is gaseous at standard temperature and pressure.

Residual Fuel Oil – The general classification for heavy oils that remain after lighter oils are distilled away in the process of petroleum refining.

Spot vs. Wholesale Price – “Spot” prices are defined by the U.S. Energy Information Administration as, “the price for a one-time open market transaction for immediate delivery of a specific quantity of a product at a specific location where the commodity is purchased ‘on the spot’ at current market rates.”

In this report, certain charts contain both “spot” and “wholesale” prices for given commodities alongside each other within the same chart. In these instances, the wholesale prices shown are, in fact, wholesale market “spot” prices. Thus, the terms are interchangeable in charts where both terms are present in describing respective price series.

Strategic Petroleum Reserve (SPR) – An emergency fuel storage of crude oil maintained by the United States Department of Energy for use during periods of major supply interruption.

Virtual Trading Point – Commodity trading center created to service a specific geographic region but does not have a physical location.

DATA CENTER: ABBREVIATIONS & ACRONYMS, DEFINITIONS, DESCRIPTIONS AND CHART NOTES

DESCRIPTIONS

General Conversion Information

- International pricing data for various commodities were converted by JKC from the units utilized by the original data source (in the form of currency value per unit of energy content or volume) to appropriate domestic units (in the form of U.S. dollars per common domestic unit of energy content or volume) in order to allow for convenient, informative comparison of international and domestic commodity price series through displaying them on a singular chart in consistent units. Appropriate domestic units for a given commodity are determined by whatever units are most commonly utilized in the United States to denote prices of that commodity, per the U.S. Energy Information Administration.
- International currency units were converted to U.S. dollars using historical exchange rates published by x-rates.com.
- Energy content and volume conversion factors differ by commodity. International energy content or volume units were converted using the various sources listed below:
 - Google.com In-Browser Unit Converter
 - Alberta Energy Co. Hub Natural Gas – gigajoules to mMBTU
 - Dutch TTF Hub Natural Gas – megawatt hours to mMBTU
 - Houston; Los Angeles; Rotterdam; Singapore; Port of Fujairah, UAE IFO 380, IFO 180 Bunker Fuel – liters/kilogram to gallons per metric ton
 - Iowa State University Liquid Fuel Measurements and Conversions
 - Netherlands Retail LPG – liters to metric tons, metric tons to barrels
 - Saudi ARAMCO Propane – metric tons to barrels
 - Japan Propane Imports – metric tons to barrels
 - Holland Retail Gasoline – liters to gallons
 - Singapore Retail Gasoline – liters to gallons
 - UAE Gasoline – liters to gallons
 - Edmonton Diesel Fuel – liters to gallons
 - Singapore Retail Diesel – liters to gallons
 - Holland Retail Diesel – liters to gallons
 - UAE Diesel – liters to gallons
 - Official Nebraska Government Website
 - Netherlands Retail LPG – barrels to gallons
 - Saudi ARAMCO Propane – barrels to gallons
 - Japan Propane Imports – barrels to gallons
 - Lanka IOC Oil Company
 - Houston; Los Angeles; Rotterdam; Singapore; Port of Fujairah, UAE IFO 380, IFO 180 Bunker Fuel – density, in liters per kilogram

DATA CENTER: ABBREVIATIONS & ACRONYMS, DEFINITIONS, DESCRIPTIONS AND CHART NOTES

CHART NOTES

All charts in this report are updated to the latest information available at the time of publication. Due to differing reporting dates for various data used throughout the report, all charts are not updated to the same ending period.

(1) Crude Oil Prices

- Sources: U.S. Energy Information Administration (Brent, West Texas Intermediate), IndexMundi via WorldBank (Dubai Fateh), Alberta.ca Economic Dashboard (Western Canadian Select), OPEC.org and Quandl.com (OPEC Reference Basket).
- The Organization of Petroleum Exporting Countries (OPEC) reference basket is a composite of the following blends of crude oil: Saharan Blend (Algeria), Girassol (Angola), Oriente (Ecuador), Zafiro (Equatorial Guinea), Rabi Light (Gabon), Iran Heavy (Islamic Republic of Iran), Basra Light (Iraq), Kuwait Export (Kuwait), Es Sider (Libya), Bonny Light (Nigeria), Qatar Marine (Qatar), Arab Light (Saudi Arabia), Murban (United Arab Emirates), Merey (Venezuela).
- All prices are spot or wholesale.

(2) Gasoline Prices

- Sources: U.S. Energy Information Administration (New York Harbor, U.S. Gulf Coast), Trading Economics (Singapore, Netherlands Retail), United Arab Emirates Ministry of Energy (UAE Retail).
- New York Harbor Spot, U.S. Gulf Coast Spot, Netherlands Retail and Singapore Retail all represent the price history of conventional gasoline in their respective locations. United Arab Emirates Retail represents an aggregate of unleaded 95, unleaded 98 and unleaded 91 prices in the United Arab Emirates.

(3) Diesel Prices

- Sources: U.S. Energy Information Administration (U.S. Gulf Coast, New York Harbor, Los Angeles, CA), Ec.europa.eu European Commission (Netherlands Retail), Knoema.com (Singapore Retail), United Arab Emirates (UAE Retail).
- New York Harbor, U.S. Gulf Coast and Los Angeles, CA prices represent ultra-low sulfur No. 2 diesel.
- Edmonton, Canada price represents low-sulfur diesel.
- Singapore Retail, United Arab Emirates Retail and Netherlands Retail prices represent conventional gasoil found at the pump. Gasoil is an alternative term for diesel commonly used throughout Europe.
- Netherlands Retail prices exclude taxes, Singapore Retail prices include taxes.

(4) Jet Fuel Prices

- Source: U.S. Energy Information Administration.
- All prices are spot or wholesale prices.

(5) U.S. Crude Oil and Petroleum Products Supply, Inventory and Consumption

- Source: U.S. Energy Information Administration.
- Crude Oil and Petroleum Products consist of natural gas plant liquids (ethane, propane, butane, isobutane, pentane), other liquids (hydrogen, oxygenates and renewable fuels like fuel ethanol, motor and aviation gasoline blending components, unfinished oils) and finished petroleum products (motor gasoline, aviation gasoline, kerosene-type jet fuel, kerosene, distillate fuel oil, residual fuel oil, petrochemical feedstocks, naphthas, lubricants, waxes, petroleum cokes, asphalt and road oil, still gas, miscellaneous products).
- Supply is comprised of field production, renewable fuels and oxygenate plant net production, refinery and blender net production, imports and net Petroleum Administration for Defense District (PADD) receipts. Net PADD receipts represent the net volume of product movement into and out of each PADD by tanker, barge and pipeline.
- Ending Stocks is a proxy for inventory and is defined as primary stocks held in storage as of midnight on the last day of the month. Primary stocks include products held in storage at, or in, leases, refineries, natural gas processing plants, pipelines, tank farms and bulk terminals with the capacity to store at least 50,000 barrels or that can receive product by tanker, barge or pipeline. Ending Stocks include volumes in the Strategic Petroleum Reserve (SPR) maintained by the Federal Government for use during periods of major supply interruption.
- Product Supplied is a proxy for consumption as it measures the disappearance of said product from primary sources, including refineries, processing plants, blending plants, pipelines and bulk terminals.

DATA CENTER: ABBREVIATIONS & ACRONYMS, DEFINITIONS, DESCRIPTIONS AND CHART NOTES

(6) U.S. Refinery Volumes and Wholesale Prices of Petroleum Products

- Source: U.S. Energy Information Administration Petroleum Marketing Monthly.

(7) U.S. Crude Oil Refinery Input, Distillation Capacity and Refinery Utilization

- Source: U.S. Energy Information Administration Petroleum Supply Weekly.
- Net Input is defined as gross inputs less gross production. Crude Oil Refinery Net Input values are monthly aggregates of weekly net input averages, measured in thousands of barrels per day. The resulting values are represented as monthly average refinery inputs, measured in thousands of barrels per day.
- Refinery Capacity refers to the maximum amount of crude oil designed to flow into the distillation (or crude) unit of the refinery. Operable Capacity is equal to the sum of operating and idle capacity. Idle Capacity is capacity that is not in operation, not under active repair, and can be placed in operation within 30 days.

(8) U.S. Crude Oil and Petroleum Products Imports and Exports

- Source: U.S. Energy Information Administration Petroleum Supply Monthly.
- U.S. Net Imports of Petroleum Products data fall below zero at which point the U.S. becomes a net exporter.

(9) Domestic Natural Gas Citygate Prices per Region

- Source: U.S. Energy Information Administration.
- The prices shown are “Citygate” prices. A Citygate is defined as “a point or measuring station at which a distributing gas utility receives gas from a natural gas pipeline company or transmission system.” The Citygate price represents the benchmark price for a given region, accounting for all costs of acquisition, storage, and transportation of gas as well as other charges associated with local distribution companies obtaining the gas for sale to end-users.
- The Western market contains Oregon, Washington, California, Nevada, Arizona, New Mexico, Utah, Wyoming, Colorado, Montana, and Idaho.
- The Midwestern market contains North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, Minnesota, Iowa, Missouri, Arkansas, Wisconsin, Michigan, Illinois, and Indiana.
- The Gulf market contains Texas and Louisiana; the Southeastern market contains Florida, Mississippi, Alabama, Georgia, Tennessee, North Carolina, and South Carolina.
- The Northeastern market contains Kentucky, Virginia, West Virginia, Ohio, Pennsylvania, New York, Vermont, New Hampshire, Maine, Massachusetts, Rhode Island, Connecticut, Delaware, New Jersey, and Maryland.

(10) International Natural Gas Prices

- Sources: U.S. Energy Information Administration (Henry Hub), NGX Clearinghouse (AECO Hub), BP Statistical Review of World Energy 2017 (United Kingdom NBP), World Bank via Index Mundi (Russian NG European Import Price), Knoema via World Bank (Japan LNG Import), my.Elexys.be Market Information (Dutch TTF).
- Henry Hub serves as the primary global pricing benchmark.
- Alberta Energy Company (AECO) Hub serves North America.
- United Kingdom National Balancing Point (NBP) serves the British Isles.
- Dutch Title Transfer Facility (TTF) serves continental Europe.
- Virtual Trading Point (Virtual) does not have a physical location and was created to serve a specific region.
- Japan LNG Import Price represents aggregate import prices of liquefied natural gas in Japan and is a price benchmark serving the Asia-Pacific region. The price includes costs, insurance and freight (CIF).
- All price benchmarks above represent gaseous state natural gas transported by pipeline, with the exception of Japan LNG Import Price, which represents liquid state natural gas transported by ship.
- All prices are spot or wholesale.

(11), (12), (13) and (14) Liquefied Natural Gas Prices

- Sources: Federal Energy Regulatory Commission (U.S., Mexico, Belgium, India), World Bank via Bluegold Research (Brazil/Argentina, Japan/Korea, China, United Kingdom).
- All prices are “landed” prices. Landed price is the price received at the regasification terminal and is based on a netback calculation that removes the costs of pipeline transportation, regasification, waterborne shipping and liquefaction, so as to best represent the effective price to the producer or seller at a specific location or defined point.

DATA CENTER: ABBREVIATIONS & ACRONYMS, DEFINITIONS, DESCRIPTIONS AND CHART NOTES

(15) U.S. Import / Export Liquefied Natural Gas Prices

- Source: U.S. Energy Information Administration.
- All prices are spot or wholesale.

(16) Natural Gas Plant Liquids Prices

- Source: U.S. Energy Information Administration.
- Natural gas liquids spot prices at Mont Belvieu, TX.
- Natural Gas Plant Liquids (NGPL) Composite price includes ethane, propane, butane, isobutane and natural gasoline. Daily closing spot prices for each component are averaged into a monthly series, then weighted according to the portion of a representative natural gas plant liquids barrel that they occupy. The NGPL Composite price excludes natural gas liquids produced at crude oil refineries.

(17) U.S. Natural Gas Production and Consumption

- Source: U.S. Energy Information Administration.
- Marketed Production is equal to gross withdrawals of natural gas from production reservoirs, less gas used for reservoir repressuring, nonhydrocarbon gases removed in treating and processing operations, and quantities vented and flared (gas that is disposed of by release into the atmosphere).

(18) U.S. Natural Gas Supply and Inventory

- Source: U.S. Energy Information Administration.
- Working Gas is defined as the total amount of natural gas in storage less the amount of base gas. Base gas is the amount of gas intended as permanent inventory.

(19) U.S. Natural Gas Consumption by End Use

- Source: U.S. Energy Information Administration.

(20) U.S. Natural Gas Plant Liquids Production

- Source: U.S. Energy Information Administration.
- Natural Gas Plant Liquids Production refers to the sum of all production of ethane, propane, butane, isobutane, pentane and pentane plus.

(21) U.S. Liquefied Natural Gas Import and Export Volumes

- Source: U.S. Energy Information Administration.

(22), (23) and (24) North American LNG Import / Export Terminals – Proposed, Approved and Existing

- Source: Federal Energy Regulatory Commission.

(25) Heating Oil Prices

- Source: U.S. Energy Information Administration.
- Spot prices of No 2. heating oil at New York Harbor, alongside the spot prices of West Texas Intermediate crude oil for comparison purposes.

(26) Intermediate Fuel Oil aka “Bunker Fuel” Prices

- Source: Ship & Bunker.
- Intermediate Fuel Oil, also known as IFO and Bunker Fuel, is fuel utilized by ships and barges to facilitate international exchange of various commodities across an array of industries, including energy. It is classified in the maritime field by its viscosity, measured in centistokes. IFO 380 has a maximum viscosity of 380 centistokes and is comprised of 98% residual fuel oil and 2% distillate fuel oil. Under new regulations from the International Maritime Organization, ships must burn fuel with a sulfur content of not more than 0.5 percent or install costly emissions-cleaning scrubbers. Very Low Sulfur Fuel Oil (VLSFO) contains a maximum sulfur content of 0.5 percent.

DATA CENTER: ABBREVIATIONS & ACRONYMS, DEFINITIONS, DESCRIPTIONS AND CHART NOTES

(27) Propane Prices

- Sources: U.S. Energy Information Administration (Conway, KS and Mont Belvieu, TX spot prices), Government of Canada National Energy Board (Edmonton, Canada trading hub prices), Ec.europa.eu European Commission (Netherlands Retail prices), LPG Australia and news articles (Saudi ARAMCO contract prices), Knoema.com and Petroleum Association of Japan (Japan Imports prices).
- Conway, KS and Mont Belvieu, TX retail prices are propane prices, while Saudi ARAMCO Contracts and Japan Imports are liquefied petroleum gas (LPG) prices. Netherlands Retail and Edmonton, Canada retail prices are auto propane and exclude taxes.
- Propane and LPG prices are represented on the same chart due to the fact that propane is dealt in international marketplaces as LPG, and is referred to as LPG in many European and Asian countries. LPG is comprised of a mixture of propane and butane.
- Conway, KS wholesale prices are typically available only for the winter months (October through March), during which propane demand is driven by cold weather, therefore, the data series displayed is intermittent.

(28) No. 1 Distillate Fuel Oil, Residual Fuel Oil Wholesale, Retail Sales Volume by Refiners

- Source: U.S. Energy Information Administration.
- No. 1 Distillate Fuel Oil consists of No. 1 diesel fuel and No. 1 fuel oil. The former is used in high-speed diesel engines, including those used by metropolitan buses and smaller automobiles. No. 1 fuel oil is utilized primarily as fuel for portable outdoor stoves and heaters.
- Residual Fuel Oil is the general classification for heavy oils that remain after lighter oils are distilled away in the process of petroleum refining. Residual Fuel Oil includes No. 5 and No. 6 fuel oils. The former is used in steam-powered vessels, and the latter is used for electric power generation, space heating, vessel bunkering and industrial processes.
- All wholesale and retail sales volumes refer to those sold by refiners only.

(29) No. 2 Distillate Fuel Oil Wholesale, Retail Sales Volume by Refiners

- Source: U.S. Energy Information Administration.
- No. 2 Distillate Fuel Oil consists of No. 2 diesel fuel and No. 2 fuel oil (heating oil). No. 2 diesel fuel is utilized in on-and-off highway diesel engines, including those used by railroad locomotives, trucks, automobiles and agricultural machinery. No. 2 fuel oil (heating oil) is used for space heating and moderate capacity industrial/commercial burner units.
- All wholesale and retail sales volumes refer to those sold by refiners only.

(30) Propane & Propylene and Distillate Fuel Oil Production and Consumption

- Source: U.S. Energy Information Administration.
- Distillate Fuel Oil is a general classification for a variety of petroleum fractions produced in petroleum distillation operations. Included within this classification are No. 1, No. 2 and No. 4 diesel fuels (used in on-highway and off-highway diesel engines), as well as No. 1, No. 2 and No. 4 fuel oils (used primarily for space heating and electric power generation).
- Propylene is an important petrochemical feedstock that is recovered from refinery or petrochemical processes. It is an olefinic hydrocarbon that is gaseous at standard temperature and pressure.
- Product Supplied is a proxy for consumption as it measures the disappearance of said product from primary sources, including refineries, processing plants, blending plants, pipelines and bulk terminals.

(31) U.S. Ending Stocks of Propane & Propylene and Distillate Fuel Oil

- Source: U.S. Energy Information Administration.
- Distillate Fuel Oil is a general classification for a variety of petroleum fractions produced in petroleum distillation operations. Included within this classification are No. 1, No. 2 and No. 4 diesel fuels (used in on-highway and off-highway diesel engines), as well as No. 1, No. 2 and No. 4 fuel oils (used primarily for space heating and electric power generation).
- Propylene is an important petrochemical feedstock that is recovered from refinery or petrochemical processes. It is an olefinic hydrocarbon that is gaseous at standard temperature and pressure.
- Ending Stocks are defined as the total volume of a propane and propylene/distillate fuel oil held in storage as of the last day of the period. Ending Stocks are monthly averages of Ending Stocks reported at the end of each week during that month, not the amount of Ending Stocks reported at the end of the month. The resulting values are represented as monthly average inventory levels.

DATA CENTER: ABBREVIATIONS & ACRONYMS, DEFINITIONS, DESCRIPTIONS AND CHART NOTES

(32) U.S. Well Starts by Depth

- Source: Platts RigData.
- Total number of well starts by depth on U.S. Land, U.S. Inland Waters and U.S. Offshore, respectively.

(33) Percentage of Crude Oil and Natural Gas Production per Shale Region

- Source: U.S. Energy Information Administration Drilling Productivity Report.
- Percentage of total U.S. crude oil and natural gas production from each of the shale regions.

(34) Drilled but Uncompleted Wells vs. Crude Oil Price

- Source: U.S. Energy Information Administration Drilling Productivity Report.
- Drilled but Uncompleted (DUC) Wells are oil and gas wells that have been drilled but haven't gone through the process of completion (the process of installing well casing, tubing and other equipment that prepares a well for production). The number of DUC wells has significant implications on the domestic supply response to crude oil price changes. If crude oil prices decrease, it is theoretically likely that the amount of DUC wells will increase, and vice versa in an increasing crude oil price scenario. Therefore, the West Texas Intermediate Crude price is tracked for comparative purposes.

(35) Hydraulic Fracturing Sand Producer Price Index

- Source: U.S. Bureau of Labor Statistics.
- Hydraulic Fracturing Sand is sand utilized as a proppant in the process of hydraulic fracturing to help facilitate the extraction of oil and gas from subsurface rock formations.
- The Producer Price Index for Hydraulic Fracturing Sand measures the weighted average period-to-period change in the selling prices received by domestic producers of hydraulic fracturing sand.
- Hydraulic Fracturing Sand Producer Price Index Base = 100 at June 1982.
- Not seasonally adjusted.

(36) and (37) Crude Oil and Natural Gas Production, Rig Count and Production per Rig

- Sources: U.S. Energy Information Administration Drilling Productivity Report (new-well crude oil and natural gas production per rig), Baker Hughes Inc. (rig count).
- New-Well Crude Oil or Natural Gas Production per Rig in each quarter represents the average of each month's value. New-well production per rig is estimated by dividing several trailing months of data on total production from new wells in each region by that region's monthly rig count, lagged by two months. New-well production per rig is intended to indicate an average rig's contribution to total crude oil production from new wells.
- The determination between a crude oil rig and a natural gas rig is made by the operating company at the time of issuance of the rig permit by the relevant state's permitting authority. The classification of a given rig as an oil or gas rig is based solely upon the operator's judgment after drilling an appraisal well and determining its specific hydrocarbon content. For example, if a well's production comes 50% from gas, 20% from Natural Gas Liquids and 30% from oil, it could either be listed as a gas rig, because gas comprises the largest share of hydrocarbons, or an oil rig because oil drives the well's economics. This determination is at the judgment of the operator.

DATA CENTER: ABBREVIATIONS & ACRONYMS, DEFINITIONS, DESCRIPTIONS AND CHART NOTES

(38) U.S. Drilling Rigs by Type

- Source: Baker Hughes North America Rotary Rig Count.
- A vertical well is a well that penetrates the earth vertically below the surface-mounted drilling platform, or the surface location of the well.
- A directional well is classified as one in which the surface location of the well is not vertically above the target reservoir. Thus, the well deviates horizontally from its surface location in order to reach the target reservoir, at a specific azimuth and incline. Azimuth measures the cardinal direction of the well's path relative to the surface location, and incline measures degrees of deviation from vertical.
- Per Baker Hughes methodology, a horizontal well is a type of directional well that deviates from vertical by greater than 80 degrees, or one in which the lower part of the wellbore is parallel to the "pay zone." The pay zone is the section of a reservoir that contains hydrocarbons that can be produced economically.

(39) Wind and Solar Prices

- Source: Lazard's Levelized Cost of Energy Analysis 2012-2020.
- The Levelized Cost of Energy (LCOE) is the net present value of the per-megawatt hour cost of building and operating a generating plant over an assumed financial life and duty cycle. It is utilized as a means of comparing the cost-competitiveness of various energy-generating technologies of unequal life spans, project sizes, capital profiles and capacities.
- The respective levelized costs of each generation technology for each year are a simple average of the high and low values of the cost range associated with that generating technology during that year.
- Solar PV refers to solar photovoltaic.
- Solar PV – Community refers to a solar power plant whose electricity is shared by more than one household.
- Solar PV – Rooftop Residential refers to a Solar PV system that has its solar panels mounted on the rooftop of a residential structure.
- Solar PV – Crystalline Rooftop refers to crystalline solar panels mounted on rooftops. Crystalline panels are a type of solar panel that achieves the photoelectric effect, the chemical process that converts solar (light) energy to electricity, through use of crystalline silicone solar cells.
- Solar PV – Crystalline Utility-Scale refers to a solar power plant that uses crystalline panels to generate power that is fed into the grid, supplying a utility with energy.
- Solar PV – Thin Film Utility-Scale refers to a solar power plant that uses thin-film solar panels to generate power that is fed into the grid, supplying a utility with energy. Thin-film panels differ from crystalline panels in that the photoemissive materials, those which produce an electric current when contacted by sufficient solar energy, are not cut from crystals.
- Solar Thermal refers to solar technology that generates thermal energy to heat water or other fluids, rather than generating electricity.

(40) U.S. Total Renewable Energy Consumption

- Source: U.S. Energy Information Administration Monthly Energy Review.
- Total Renewable Energy Consumption is comprised of hydroelectric, geothermal, solar, wind, wood, waste and biofuels.
- Waste refers to biomass waste and is organic non-fossil material of biological origin that is a byproduct or a discarded product. Biomass waste includes municipal solid waste from biogenic sources, landfill gas, sludge waste, agricultural crop byproducts, straw and other biomass solids, liquids and gases.
- Biofuels are liquid fuels and blending components produced from biomass feedstocks, used primarily for transportation. Biomass is organic, non-fossil material comprised of decayed biological matter.

(41) U.S. Solar, Wind and Hydroelectric Energy Consumption

- Source: U.S. Energy Information Administration Monthly Energy Review.

(42) U.S. Wood, Waste, Biofuels and Geothermal Energy Consumption

- Source: U.S. Energy Information Administration Monthly Energy Review.
- Biofuels are liquid fuels and blending components produced from biomass feedstocks, used primarily for transportation. Biomass is organic, non-fossil material comprised of decayed biological matter.

(43) Corn and Ethanol Prices and Corn Cost per Gallon of Ethanol

- Source: U.S. Department of Agriculture Economic Research Service (corn and ethanol price).

DATA CENTER: ABBREVIATIONS & ACRONYMS, DEFINITIONS, DESCRIPTIONS AND CHART NOTES

(44) U.S. Solar Energy Consumption

- Source: U.S. Energy Information Administration Monthly Energy Review.
- Utility-scale solar energy refers to solar energy generated by plants with a capacity of at least one megawatt that is transmitted via the transmission grid to a high volume of consumers. Thus, Utility-Scale Solar Energy Consumption represents consumption of solar energy generated at plants with capacity of at least one megawatt.
- Distributed solar energy refers to solar energy generated by small-scale generating plants with capacity below one megawatt that is distributed over a specific locality with a small volume of consumers relative to utility-scale energy consumers. Thus, Distributed Solar Energy Consumption represents consumption of solar energy generated at small-scale generating plants.

(45) U.S. Solar Energy Net Generation

- Source: U.S. Energy Information Administration Monthly Energy Review.
- Distributed Solar Photovoltaic Generation refers to energy generated by small-scale photovoltaic generation plants. Small-scale is defined as a plant with capacity below one megawatt. Photovoltaic generation refers to solar energy generated by photovoltaic solar panels.
- Utility-Scale Solar Electricity Net Generation refers to generation of solar energy by plants with capacity equal to or above one megawatt. Net generation is defined as the amount of gross generation less electrical energy consumed by the generating plant for service or auxiliaries.

(46) Distributed Solar Photovoltaic Generation by Sector

- Source: U.S. Energy Information Administration Monthly Energy Review.
- Distributed Solar Photovoltaic Generation refers to energy generated by small-scale photovoltaic generation plants. Small-scale is defined as a plant with capacity below one megawatt. Photovoltaic generation refers to solar energy generated by photovoltaic solar panels.

(47) Utility-Scale Solar Electricity Net Generation by Sector

- Source: U.S. Energy Information Administration Monthly Energy Review.
- Utility-Scale Solar Electricity Net Generation refers to generation of solar energy by plants with capacity equal to or above one megawatt. Net generation is defined as the amount of gross generation less electrical energy consumed by the generating plant for service or auxiliaries.
- Gaps in the data represent periods for which there was no data reported, or the data value was trivially small and thus deemed unnecessary to report.

(48) U.S. Solar Capacity Installations

- Source: Solar Energy Industries Association Q1 2017 Solar Market Insight Report.
- The Investment Tax Credit (ITC) is a federal policy tax incentive that supports the deployment of solar energy in the United States. The ITC allows those who install a solar system to claim up to 30% of the price paid to install the system as a tax credit when filing Federal taxes, thereby significantly discounting the cost associated with transitioning to solar energy.

(49) U.S. Wind Power Capacity Installations

- Source: American Wind Energy Association U.S. Wind Energy Quarterly Market Report.
- Wind Power Generation Capacity Installations refers to non-utility-scale wind power capacity additions. Utility-scale is defined as installations of wind turbines larger than 100 kilowatts.

(50) Utility-Scale Wind Power Capacity Installations

- Source: American Wind Energy Association U.S. Wind Energy Quarterly Market Report.
- Utility-Scale Wind Capacity includes installations of wind turbines larger than 100 kilowatts. Capacity installations may not always equate to an equal increase in cumulative wind power capacity due to decommissioned, uprated and repowered wind turbines.

DATA CENTER: ABBREVIATIONS & ACRONYMS, DEFINITIONS, DESCRIPTIONS AND CHART NOTES

(51) Wind Power Under Construction or in Advanced Development

- Source: American Wind Energy Association (AWEA) U.S. Wind Energy Quarterly Market Report.
- AWEA defines projects as being “in advanced development” if it has not yet begun construction, but has either signed a power purchase agreement, announced a firm turbine order, or been announced to proceed under utility ownership.

(52) U.S. Aggregated Energy Consumption by Sector

- Source: U.S. Energy Information Administration.
- Energy consumed by the electric power sector is primary energy only. Primary energy is energy in its original form, before any transformation to secondary or tertiary forms of energy. For example, coal can be converted to synthetic gas and then to electricity. Under these circumstances, coal is primary energy, synthetic gas is secondary energy and electricity is tertiary energy.

(53) U.S. Aggregated Energy Consumption by Source

- Source: U.S. Energy Information Administration.
- Total consumption of each category of energy is as accurate as possible. However, some data is unavailable or unreported and, thus, some total consumption values may be understated.
- Fossil Fuels includes coal, petroleum-based products, natural gas and natural gas-based products.
- Renewable Energy includes conventional hydroelectric, solar, biomass, nuclear, geothermal and wind.
- Biomass is a renewable energy source derived from organic matter such as wood, crop waste, or garbage, with wood being the largest contributor.
- Fossil Fuels and Renewable Energy consumption represent consumption of primary energy, which is energy in its original form, before transformation to secondary or tertiary forms of energy. Thus, to arrive at total energy consumption, Electricity Retail Sales (representing consumption of secondary and tertiary forms of energy) is added alongside consumption of Fossil Fuels and Renewable Energy.
- Electrical System Energy Losses are a deduction from total energy consumption, and are incorrectly represented as positively contributing to total energy consumption. Thus, total energy consumption figures in each year are overstated by the amount of electrical system energy losses.

(54) Electricity Prices by Sector

- Source: U.S. Energy Information Administration.

(55) Commercial Crude Oil Inventory

- Source: U.S. Energy Information Administration.
- U.S. Ending Stocks of Commercial Crude Oil represents stocks (inventory) of crude oil held in storage for commercial use. This figure excludes both lease stock and volumes in the Strategic Petroleum Reserve (SPR). Lease stock is crude oil stored in tanks at sites where producers are drilling on leased land. They're excluded from total commercial crude oil inventory because they aren't yet available for commercial use. The SPR is petroleum maintained by the Federal Government for use during periods of major supply interruption.
- Ending stocks (inventory) are primary stocks of crude oil held in storage as of midnight on the last day of the month. Primary stocks include crude oil held in storage at, or in, leases, refineries, natural gas processing plants, pipelines, tank farms and bulk terminals with the capacity to store a minimum of 50,000 barrels of petroleum products or that can receive petroleum products by tanker, barge or pipeline.

(56) Petroleum and Other Liquids Commercial Inventory

- Source: U.S. Energy Information Administration.
- Hydrocarbon Gas Liquids (HGLs) are molecules of carbon and hydrogen in various combinations. HGLs include alkanes, or paraffins (ethane, propane, butane, isobutene, natural gasoline) and alkenes, or olefins (ethylene, propylene, butylene, isobutylene).
- Unfinished Oils are all oils that require further processing and are produced by partial refining of crude oil. Unfinished Oils include naphthas and lighter oils, kerosene and light gas oils, heavy gas oils and residuum.
- Other Hydrocarbons/Oxygenates are substances that increase the amount of oxygen in various gasoline blends when added to them. This category includes fuel ethanol, methanol and methyl tertiary butyl ether (MTBE).
- Total Motor Gasoline includes finished motor gasoline and motor gasoline blending components.

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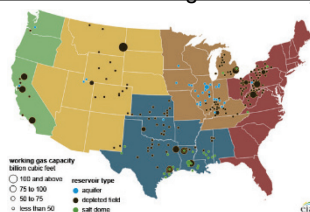
(56) Petroleum and Other Liquids Commercial Inventory (continued)

- Distillate Fuel Oil is a general classification for a variety of petroleum fractions produced in petroleum distillation operations. Included within this classification are No. 1, No. 2 and No. 4 diesel fuels (used in on-highway and off-highway diesel engines), as well as No. 1, No. 2 and No. 4 fuel oils (used primarily for space heating and electric power generation).
- Residual Fuel Oil is the general classification for heavy oils that remain after lighter oils are distilled away in the process of petroleum refining. Residual Fuel Oil includes No. 5 and No. 6 fuel oils. The former is used in steam-powered vessels, and the latter is used for electric power generation, space heating, vessel bunkering and industrial processes.
- Other Oils include aviation gasoline blending components, finished aviation gasoline, kerosene, petrochemical feedstocks, special naphthas, lubricants, waxes, petroleum coke, asphalt and road oil, still gas and miscellaneous products.

(57) Natural Gas Underground Storage Capacity

- Source: U.S. Energy Information Administration.
- Underground Storage Capacity refers to total natural gas storage capacity in underground storage facilities called “salt domes,” which are caverns hollowed out in subsurface salt formations. Salt domes are the primary means of natural gas storage in the United States.

U.S. Underground Natural Gas Storage Facilities by Type (July 2015)



(58) Commercial Crude Oil Refinery, Tank and Underground Storage Capacity and Utilization

- Source: U.S. Energy Information Administration.
- Commercial Crude Oil Storage Capacity refers to working storage capacity. Working capacity is the volume difference between a crude oil storage tank’s maximum safe fill capacity and the volume below which pump suction is ineffective, called tank bottoms.
- Crude Oil Shell Storage Capacity is the design capacity of a petroleum storage tank. It includes tank bottoms, working storage capacity and contingency space. Contingency space is defined as available storage space above the defined maximum operating inventory level that remains empty during normal operations. Shell Storage Capacity is always greater than or equal to working storage capacity.
- Crude Oil Storage Capacity data is released only twice per year for the months of March and September. Thus, the data series excludes inventory levels for all months other than March and September of each year.

(59) Crude Oil and Natural Gas Pipeline Mileage

- Source: Pipeline and Hazardous Materials Safety Administration.
- The chart includes information from only Federal Energy Regulatory Commission-regulated pipeline companies.
- Crude Oil Pipeline Mileage represents total mileage of pipelines dedicated to the transport of crude oil and those dedicated to the transport of petroleum products. Pipeline Mileage for crude oil includes trunk lines only.
- Pipeline Mileage for natural gas includes both trunk and gathering lines.
- Trunk lines are synonymous with transmission lines, which are large, cross-country pipelines that move oil or gas from producing areas to refineries. Gathering lines are pipelines that transport oil or gas from the area in which it was produced to a storage facility which acts as an intermediate stop before transportation by truck, railcar, or trunk line.

(60) Crude Oil and Petroleum Products Pipeline Movements Between Petroleum Administration for Defense Districts (PADDs)

- Source: Federal Reserve Bank of St. Louis, with data provided by the U.S. Energy Information Administration.
- Crude Oil and Petroleum Products Pipeline Movements Between PADDs represents the total volume of crude oil and petroleum products transported between each PADD. The data does not include movements within each PADD.

DATA CENTER: ABBREVIATIONS & ACRONYMS, DEFINITIONS, DESCRIPTIONS AND CHART NOTES

(61) Natural Gas Cumulative Interstate Pipeline Systems Capacity

- Source: U.S. Energy Information Administration.
- Cumulative Interstate Capacity refers to capacity of natural gas pipelines crossing between states. Thus, capacity of intrastate pipelines is not included and the data should not be interpreted as representing total capacity of natural gas pipelines.

(62) Crude Oil and Petroleum Products Exports to Mexico

- Source: U.S. Energy Information Administration.
- Petroleum Products include pentanes plus, liquefied petroleum gases, unfinished oils, finished motor gasoline, motor gasoline blending components, oxygenates, fuel ethanol, distillate fuel oil, kerosene, kerosene-type jet fuel, special naphthas, residual fuel oil, waxes, petroleum coke, asphalt and road oil, lubricants and miscellaneous products.

(63) Truck Tonnage Index

- Source: U.S. Department of Transportation, Bureau of Transportation Statistics.
- The Truck Tonnage Index measures the gross tonnage of freight that is transported by motor carriers for a given month. The Index serves as an indicator of shipping activity in the United States.
- Created by the U.S. Department of Transportation, Bureau of Transportation Statistics via information published in the American Trucking Association (ATA) Monthly Truck Tonnage Report.
- In January 2018, ATA revised the seasonally adjusted index back five years as part of its annual revision. In addition, ATA re-indexed the seasonally adjusted and not seasonally adjusted tonnage indexes to 2015 = 100 back to 1973.

(64) Heavy Truck Sales

- Source: Federal Reserve Bank of St. Louis.
- Heavy Trucks are trucks with more than 14,000 pounds gross vehicle weight.

(65) Trucking Conditions Index

- Source: FTR Transportation Intelligence.
- The Trucking Conditions Index summarizes the status of the trucking industry through tracking changes in six major conditions including freight volumes, freight rates, fleet capacity, fleet bankruptcies, fuel price and financing.
- An index value greater than zero represents a positive environment in the truck market, and an index value below zero represents a negative environment. An index value above 10 is a sign that volumes, prices and margin are in a solidly favorable range.

(66) Freight Transportation Services Index

- Source: Federal Reserve Bank of St. Louis.
- The Freight Transportation Services Index measures the output of the for-hire freight transportation industry and consists of data from for-hire trucking, rail, inland waterways, pipelines and air freight.

(67) Crude Oil Refinery Receipts by Transportation Method

- Source: U.S. Energy Information Administration.
- Refinery Receipts by Pipeline, Tanker, Barge, Truck and Rail refer to total volumes of crude oil of domestic and international origin that are in transit to, or received by, domestic refineries. Volumes of crude oil in transit via pipeline are excluded from receipts. Foreign crude oil is included in receipts only after entry through customs.
- Refinery inputs track volumes of crude oil that are entered into refining processes (e.g., distillation units, cokers, etc.).
- The volume difference between refinery receipts and refinery inputs is that which is in transit but not yet received by refineries plus that which has been received and is held in bonded storage, awaiting entry into refining processes.

(68) Crude Oil Movements by Tanker and Barge Movements Between Petroleum Administration for Defense Districts (PADDs)

- Source: U.S. Energy Information Administration.
- The data series shown on the chart is an aggregate of all crude oil movements between Petroleum Administration for Defense Districts (PADDs). This includes crude oil movement from PADD 1 to PADD 2 and PADD 3; PADD 2 to PADD 1 and PADD 3; and PADD 3 to PADD 1, PADD 2 and PADD 5.
- PADD 1 is the East Coast region, PADD 2 is the Midwest region, PADD 3 is the Gulf Coast region and PADD 5 is the West Coast region.

DATA CENTER: ABBREVIATIONS & ACRONYMS, DEFINITIONS, DESCRIPTIONS AND CHART NOTES

(69) Movements of Crude Oil by Rail

- Source: U.S. Energy Information Administration.

(70) Average Weekly Rail Carloads of Petroleum and Petroleum Products

- Source: Association of American Railroads.
- Monthly aggregates of the average weekly number of rail carloads transporting petroleum and petroleum products in the United States.
- Excludes the U.S. operations of Canadian railroads.

(71) U.S. Manufacturers' Monthly Shipments and U.S. Purchasing Managers' Index (PMI®)

- Sources: For Manufacturers' Monthly Shipments - U.S. Census Bureau Manufacturers' Shipments, Inventories and Orders Survey; and for U.S. Purchasing Managers' Index (PMI®) – Institute for Supply Management Manufacturing Report on Business®.
- A PMI® above 50 represents expansion within the manufacturing sector compared with the prior month.

(72) U.S. New Housing Starts and Total U.S. Construction Spending

- Source: U.S. Census Bureau.

(73) London Interbank Offered Rate (LIBOR), Based on U.S. Dollar

- Source: ICE Benchmark Administration Limited via the Federal Reserve Bank of St. Louis.
- The London Interbank Offered Rate is the average interest rate at which leading banks borrow funds of a sizeable amount from other banks in the London market. LIBOR is the most widely used benchmark or reference rate for short term interest rates. The chart values are monthly percent averages of daily figures and are not seasonally adjusted.

(74) Bank Prime Loan Interest Rates

- Source: Federal Reserve Bank of St. Louis.
- The Bank Prime Loan Interest Rate is that posted by a majority of top 25 (by assets in domestic offices) insured, U.S.-chartered commercial banks. Prime is one of several base rates used by banks to price short-term business loans.
- The chart values are monthly percent averages of daily figures and are not seasonally adjusted.

(75) Commercial and Industrial Loans vs. Banking Standards

- Source: Federal Reserve Bank of St. Louis.
- Net Percentage of Domestic Banks Tightening Standards for Commercial and Industrial Loans to large and middle-market firms. Quarterly, not seasonally adjusted.
- Commercial and Industrial Loans, All Commercial Banks. Monthly, seasonally adjusted.

(76) U.S. Treasury Yield Curve

- Source: U.S. Treasury.
- U.S. Treasury Yield Curve rates are commonly referred to as Constant Maturity Treasury (CMT) rates. Yields are interpolated by the U.S. Treasury from the daily yield curve.
- The curve, which relates the yield on a security to its time to maturity, is based on the closing market bid yields on actively traded U.S. Treasury securities in the over-the-counter market.

(77) Corporate Spreads to Treasuries by Quality

- Source: Federal Reserve Bank of St. Louis.
- Corporate Spreads to Treasuries represent the spread, or difference, between the yield curve of an index of corporate bonds of a given rating category and the spot rate U.S. Treasury curve. The spot rate U.S. Treasury curve is a yield curve that uses U.S. Treasury spot rates rather than yields, and represents the rate for a zero-coupon U.S. Treasury bond.
- The corporate bond yield indexes are Bank of America Merrill Lynch Option-Adjusted Spread (OAS) Indexes for all bonds with a given investment rating of AA, BB or CCC or below that are publically issued in the U.S. domestic market. Each respective OAS index is calculated using each constituent bond's OAS, weighted by market capitalization. A bond's OAS is the bond's yield spread relative to the risk-free rate of return, typically the U.S. Treasury securities yield, adjusted to account for an embedded option.

HOT TOPICS

A NATURAL GAS INFRASTRUCTURE BUILDING BOOM IS COMING

The Energy Equipment & Infrastructure Alliance (EEIA) keeps close watch on policy trends and new technologies that drive demand for electricity, because they determine the outlook for natural gas production and pipeline infrastructure, which currently provide 40% of U.S. electricity generation.

Every dynamic we see suggests that wind, solar and other renewables, while growing rapidly, will fall far short of covering increasing electricity demand. Natural gas is the key path to make up the difference over the next few decades.

The federal government's own energy statistics agree. In its latest Annual Energy Outlook, the U.S. Energy Information Administration (EIA) forecasts that so long as natural gas remains plentiful, its use for power generation will rise by 51% by 2035 and 85% by 2050, based on current policies and trends – without considering major emerging new sources of demand.

Consider “green” hydrogen – produced by applying renewable electrical current to water – and how replacing only 10% of the natural gas used for power generation with green hydrogen would consume 42% of all the renewable electricity generated in 2020. Whether green hydrogen is used for power generation or other industrial energy needs, its call on renewable energy resources will be significant.

Add new power consumption driven by President Biden's recent executive order that half of all cars sold by 2030 must be electric. If only one-third of cars and light trucks were electric, 265 billion kilowatt hours (kWh) of added electricity will be needed annually to charge them. Electrifying just 25% of commercial building space – another Administration goal - would pull another 435 billion kWh from the grid. Comparatively, that's over 17% of total electricity generation in all of 2020.

Another obscure but emerging major electricity demand driver is bitcoin mining. Recently, Cambridge University in England calculated that computer networks used for bitcoin mining consume 120 billion kWh annually – equal to the annual electricity consumption of Argentina. Two-thirds of this now happens in the cheap-coal regions of eastern China. A new Chinese government crackdown is driving crypto miners and their vast computer networks out of China, largely to the U.S., the next most abundant source of cheap electricity.

HOT TOPICS

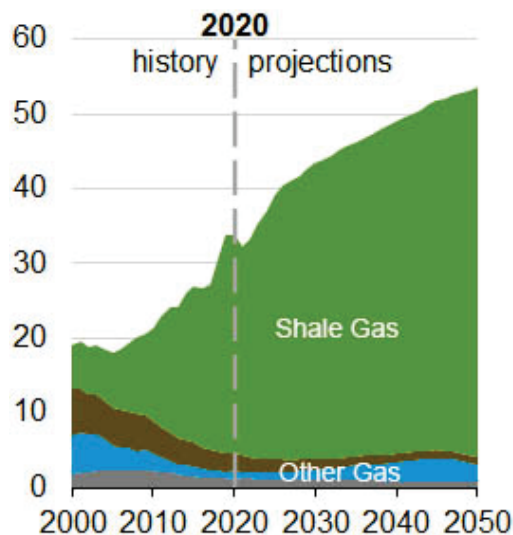
A NATURAL GAS INFRASTRUCTURE BUILDING BOOM IS COMING (CONTINUED)

All that potential is on top of growth in electricity demand driven by general economic growth, forecast by EIA at about 1% per year through 2050.

When you combine rising U.S. demand with ongoing steady declines of coal and nuclear generation, reduced hydro output from prolonged drought, a solar panel supply crunch resulting from the new U.S. ban on importing panels or their raw materials from the forced labor regions of China, all signs point to natural gas as the fuel that fills the gap and keeps the lights on.

Beyond natural gas for electricity generation, per EIA, total natural gas production including for residential, commercial, industrial and exports will grow from about 92 billion cubic feet (bcf)/day in 2020 to 146 bcf/day in 2050. That's an added 54 bcf/day that will need to move through a pipeline network that is already operating near capacity. It all adds up to a compelling picture of more natural gas production and more new pipelines needed to deliver it.

**High Oil and Gas Supply Case
(Trillion Cubic Feet of Natural Gas)**



Source: U. S. Energy Information Administration, Annual Energy Outlook 2021.

HOT TOPICS

A NATURAL GAS INFRASTRUCTURE BUILDING BOOM IS COMING (CONTINUED)

We've heard industry veterans say that "the pipeline business has always been a boom-bust industry." Based on the inevitability of big increases in natural gas demand, added to by carbon capture, utilization and storage (CCUS) and the thousands of miles of new CO2 pipelines needed, all things point to a major midstream construction boom taking shape on the horizon.

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HOT TOPICS

CURRENT TURMOIL IN OUR SUPPLY CHAIN

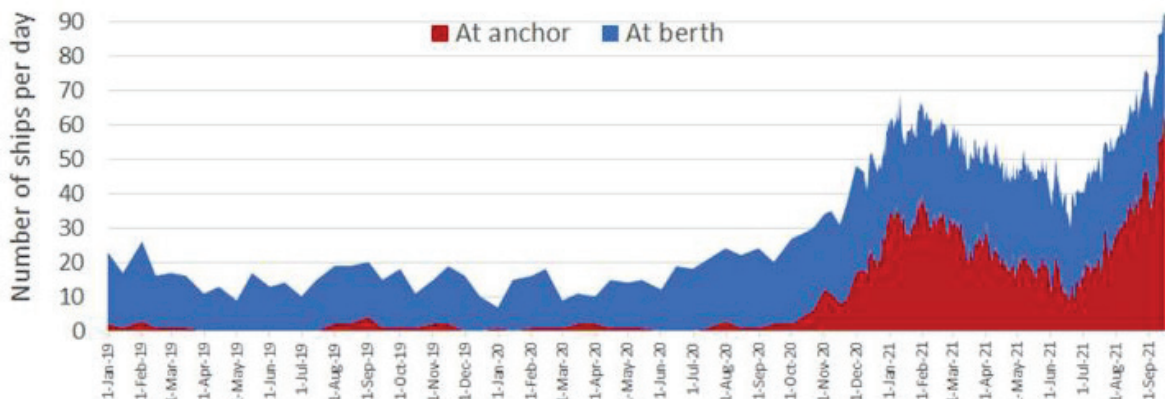
The modern supply chain can deliver materials from around the world to companies and customers in days or even hours. Over the years, supply chains have become longer and more complex, while the severity and frequency of disruption is increasing. In recent years, we have seen regional natural disasters, such as the 2011 earthquake and tsunami in Japan, cause global ripples in the supply chain highlighting the weaknesses present in our interconnected global networks.

Natural disasters and extreme weather conditions are not the only threats to supply chains. The supply chain disruptions caused by the COVID-19 pandemic are still flowing through businesses and households, resulting in shortages of key manufacturing components, order backlogs, delivery delays and a spike in transportation costs and consumer prices.

Restarting the global manufacturing machine after continuing pandemic lockdowns has turned out to be difficult. A shortage of shipping containers emerged, shipping rates for certain routes skyrocketed, congestion developed at international ports that then spread to railroads and inland rail terminals, compounding the trucking and chassis shortage that already existed.

COVID-19 highlighted the fragility of the supply chain model in times of stress. Virus outbreaks the summer at big export hubs in China idled ships for weeks as they waited for terminals to reopen. After the ships sailed, they got stuck again at congested western U.S. ports that could not handle the increased cargo volume. Congestion has been growing at the neighboring ports of Los Angeles and Long Beach, which account for more than a third of all U.S. seaborne imports.⁽¹⁾ Newly arriving ships are adding to a record-breaking backlog, that on September 19th reached 73 ships, waiting in San Pedro Bay to unload cargo, nearly double the number a month ago.⁽²⁾

Container Ships at Anchor in San Pedro Bay and at Berth in Ports of Los Angeles and Long Beach⁽³⁾



HOT TOPICS

CURRENT TURMOIL IN OUR SUPPLY CHAIN (CONTINUED)

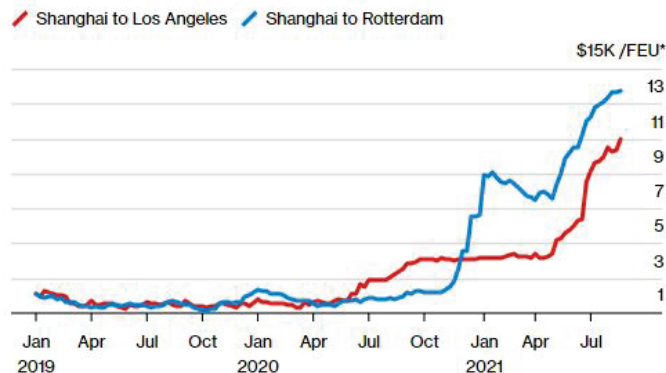
The Southern California gateway is creating a narrow funnel -- ocean volumes pour in from Asia and can only flow out at a certain rate due to terminal limitations, as well as limitations of warehouses, trucking and rail beyond the terminal. The Port of Long Beach has broken monthly cargo records in 12 of the last 13 months. Through July, the port processed 5.5 million twenty-foot long containers (TEUs), a 32% increase over the same period last year. The Port of Los Angeles has processed 6.3 million TEUs in 2021.⁽⁴⁾

The surge is being driven by Americans shifting their spending away from services, such as restaurants and vacations, to home improvements, office equipment and other consumer goods. Port leaders state that importers are also stocking up on additional inventory after the shortcomings of just-in-time supply chains were exposed in the early weeks of the pandemic.

Hundreds of thousands of containers are stuck aboard container ships waiting for a berth or stacked up at terminals waiting to be moved by truck or rail to inland terminals. The congestion has contributed to a worldwide shortage of shipping containers and to spiraling costs for ocean freight. The logjam prompted the Biden administration to appoint a ports envoy last month to address how to improve cargo movement following complaints from U.S. businesses.

Shipping consolidation over the past five years is also contributing to the delay in movement of cargo across the oceans. The top six container operators control more than 70% of all container capacity, according to maritime data provider Alphaliner.⁽⁵⁾ The cost of sending a container from Asia to Europe is about 10 times higher now than in May 2020, while the cost from Shanghai to Los Angeles has grown more than sixfold, according to the Drewry World Container Index. Between 60% to 70% of shipping deals on the Asia-America route are done through spot or short-term contracts.⁽⁶⁾

Spot Rates for Shipping Containers⁽⁶⁾



Source: Drewry World Container Index
 *Note: FEU refers to a 40-foot container



HOT TOPICS

CURRENT TURMOIL IN OUR SUPPLY CHAIN (CONTINUED)

Additional delays in the delivery of key inputs could lead to a decline in manufacturing. This is already happening in several industries, particularly the auto industry, where a semiconductor shortage is forcing a slowdown in production. Toyota Motor plans worldwide production cuts of 40% in September; Ford plans to idle a plant near Kansas City, Missouri, that makes the F-150 pickup truck; and General Motors stopped most of its truck production in North America last month.⁽⁷⁾

Over the last several quarters, critical components for solar energy equipment, including polysilicon, steel, aluminum, semiconductor chips, copper and other metals, have become increasingly supply-constrained. Increasing demand for solar energy, combined with pandemic-related realities (such as increased shipping costs, microchip availability, and a residential home renovation boom) have led to increased commodity prices and delivery delays. Supply chain problems have forced Timken Company to reduce its sales and earnings projections for the second half of 2021. Last year renewable energy (wind and solar) generated 12% of the company's total sales, making it Timken's largest end market.⁽⁸⁾

Many companies are feeling the effects of the disruptions. The third quarter edition of Deloitte's CFO Signals report stated that 44% of CFOs indicated supply disruptions have increased costs by 5% or more this year, while 32% said sales have fallen due to delays or shortages.⁽⁹⁾

In Europe, companies in the U.K. are struggling with record low levels of stock and retail selling prices are rising at the fastest pace since November 2017.⁽⁶⁾ Germany's recovery is also under threat. A key measure of business confidence in Europe's largest economy fell by more than economists had predicted with the drop blamed in part on shortages for metals, plastic products and semiconductors, among other goods.

It is hard to see supply chain bottlenecks being resolved any time soon, with some major exporters, including Indonesia and Vietnam, still struggling to contain the delta outbreak. Global supply chain disruption is not expected to end anytime soon. As long as demand continues through the holiday shopping season, COVID-19 outbreaks continue to shut shipping ports around the world, and extreme weather hits individual links in the chain, expect the disruption to persist.

Sources:

- 1) The Wall Street Journal, U.S. Ports See Shipping Logjams Likely Extending Far Into 2022, September 5, 2021.
- 2) The Wall Street Journal, Why Container Ships Can't Sail Around the California Ports Bottleneck, September 21, 2021.
- 3) Freight Waves, Record Shattered: 65 Container Ships Stuck Waiting off California, September 16, 2021.
- 4) Supply Chain Dive, LA, Long Beach Port Congestion Could Disrupt \$90B in Trade: Russell, September 9, 2021.
- 5) The Wall Street Journal, Shipping Options Dry Up as Businesses Try to Rebuild from Pandemic, September 12, 2021.
- 6) Bloomberg, The World Economy's Supply Chain Problem Keeps Getting Worse, August 25, 2021.
- 7) Forbes, No End in Sight for the COVID-led Global Supply Chain Disruption, September 3, 2021.
- 8) The Repository, Supply Chain Problems Factor into Timken Decision to Reduce 2021 Projections, September 17, 2021.
- 9) Bloomberg, CFOs Say Supply-Chain Upheaval is Hitting Sales, Raising Costs, September 16, 2021.

PUBLIC AND TRANSACTION COMPARABLES BY SEGMENT

PETROLEUM PRODUCTS EQUITY COMPARABLES (1)

Petroleum Products (United States & Canada)

Company	LTM ⁽²⁾			Stock Price 06/30/21	% of 52-Week High	Market Cap	Total Enterprise Value ⁽³⁾	TEV / LTM		Net Debt ⁽⁴⁾ EBITDA
	Revenues	EBITDA	Margin					Revenues	EBITDA	
Calumet Specialty Products Partners, L.P.	\$2,529	(\$107)	(4.2)%	\$6.87	91.6%	\$541	\$2,003	0.8x	NM	NM
Chevron Corporation	116,033	21,866	18.8	104.74	92.6	201,945	241,322	2.1x	11.0x	1.6x
CVR Energy, Inc.	5,370	(17)	(0.3)	17.96	66.5	1,806	2,780	0.5x	NM	NM
EnLink Midstream, LLC	4,788	983	20.5	6.39	94.9	3,131	9,384	2.0x	9.5x	4.6x
Gibson Energy Inc.	4,818	278	5.8	19.17	88.0	2,808	4,056	0.8x	14.6x	4.5x
Exxon Mobil Corporation	215,879	24,449	11.3	63.08	97.2	267,052	333,986	1.5x	13.7x	2.3x
HollyFrontier Corporation	13,802	804	5.8	32.90	77.6	5,280	8,212	0.6x	10.2x	2.7x
Keyera Corp.	2,804	561	20.0	26.89	93.2	5,942	8,614	3.1x	15.3x	4.9x
Marathon Petroleum Corporation	87,972	4,313	4.9	60.42	93.2	39,433	80,658	0.9x	18.7x	2.9x
Parkland Corporation	13,123	894	6.8	32.33	88.8	4,868	8,303	0.6x	9.3x	3.7x
Phillips 66	81,037	(767)	(0.9)	85.82	91.0	37,578	55,249	0.7x	NM	NM
NuStar Energy L.P.	1,538	706	45.9	18.05	87.1	1,977	6,759	4.4x	9.6x	4.9x
Valero Energy Corporation	75,780	1,156	1.5	78.08	91.9	31,916	45,252	0.6x	39.1x	9.6x
Median			5.8%		91.6%			0.8x	12.3x	4.1x
Mean			10.5%		88.7%			1.4x	15.1x	4.2x

SELECTED TRANSACTIONS

Announced / Closed Date	Target(s)	Acquirer	Total Enterprise Value (TEV)	TEV / Revenues	TEV / EBITDA
4/24/2019	Anadarko Petroleum Corporation (NYSE:APC)	Occidental Petroleum Corporation (NYSE:OXY)	\$57,809.2	4.4x	7.6x
10/22/2018	EnLink Midstream Partners, LP (NYSE:ENLK)	EnLink Midstream, LLC (NYSE:ENLC)	\$12,923.5	1.7x	12.2x
8/27/2018	Blue Ridge Mountain Resources, Inc. (OTCPK:BRMR)	Eclipse Resources Corporation (NYSE:ECR)	\$348.0	3.6x	12.8x
8/1/2018	Energy Transfer Operating, LP	Energy Transfer, LP (NYSE:ET)	\$69,430.8	2.1x	10.9x
5/17/2018	Enbridge Energy Partners, LP (NYSE:EEP)	Enbridge Inc. (TSX:ENB)	\$15,925.8	6.6x	10.1x
4/30/2018	Andeavor (NYSE:ANDV)	Marathon Petroleum Corporation (NYSE:MPC)	\$35,103.0	0.9x	12.7x
11/8/2017	Alon USA Partners, LP	Delek US Holdings, Inc. (NYSE:DK)	\$1,050.4	0.5x	5.9x
4/5/2017	Houghton International Inc.	Quaker Chemical Corporation (NYSE:KWR)	\$1,415.4	-	11.8x
2/2/2017	ONEOK Partners, LP	ONEOK, Inc. (NYSE:OKE)	\$23,722.4	2.7x	12.9x

(1) Matching public companies to middle-market companies is an imperfect comparable analysis due to the variables of size, equipment, markets, etc. Nonetheless JKC's research has yielded this list as the closest available.

(2) LTM is defined as last twelve months.

(3) Total Enterprise Value is defined as market capitalization plus total debt less cash and cash equivalents.

(4) Net Debt is defined as total debt less cash and cash equivalents.

PUBLIC AND TRANSACTION COMPARABLES BY SEGMENT

NATURAL GAS

EQUITY COMPARABLES (1)

Natural Gas (United States & Canada)

Company	LTM ⁽²⁾			Stock Price 06/30/21	% of 52-Week High	Market Cap	Total Enterprise Value ⁽³⁾	TEV / LTM		Net Debt ⁽⁴⁾ EBITDA
	Revenues	EBITDA	Margin					Revenues	EBITDA	
Alliant Energy Corporation	\$3,455	\$1,380	39.9%	\$55.76	94.3%	\$13,948	\$21,249	6.2x	15.4x	5.3x
AltaGas Ltd.	6,258	1,090	17.4	21.00	98.6	5,874	13,867	2.2x	12.7x	5.9x
Atmos Energy Corporation	3,314	1,369	41.3	96.11	89.8	12,570	18,889	5.7x	13.8x	4.9x
Avista Corporation	1,364	466	34.1	42.67	86.8	2,958	5,335	3.9x	11.5x	5.3x
Baytex Energy Corp.	877	293	33.4	1.93	95.2	1,088	2,486	2.8x	8.5x	4.4x
Calumet Specialty Products Partners, L.P.	2,529	(107)	(4.2)	6.87	91.6	541	2,003	0.8x	NM	NM
Genovus Energy Inc.	21,647	3,318	15.3	9.57	92.2	19,312	33,068	1.5x	10.0x	3.8x
Chesapeake Utilities Corporation	541	201	37.2	120.33	96.3	2,110	2,793	5.2x	13.9x	3.4x
Corning Natural Gas Holding Corporation	34	9	26.8	23.81	99.4	73	149	4.3x	16.2x	7.6x
Crestwood Equity Partners LP	3,136	475	15.1	29.98	88.3	1,884	5,544	1.8x	11.7x	5.6x
Dominion Energy, Inc.	14,036	6,282	44.8	73.57	84.6	59,336	100,313	7.1x	16.0x	6.3x
EnLink Midstream, LLC	4,788	983	20.5	6.39	94.9	3,131	9,384	2.0x	9.5x	4.6x
Enbridge Inc.	34,064	9,934	29.2	40.06	98.9	81,147	144,387	4.2x	14.5x	5.5x
Enterprise Products Partners L.P.	32,572	7,851	24.1	24.13	93.9	52,728	82,630	2.5x	10.5x	3.6x
Epsilon Energy Ltd.	27	13	46.8	5.00	97.8	119	101	3.7x	7.9x	(1.5)x
Eversource Energy	9,526	3,177	33.4	80.24	83.0	27,560	46,066	4.8x	14.5x	6.0x
Genesis Energy, L.P.	1,921	326	17.0	11.61	90.8	1,423	5,799	3.0x	17.8x	10.2x
National Fuel Gas Company	1,675	920	54.9	52.25	94.6	4,764	7,310	4.4x	7.9x	2.7x
New Jersey Resources Corporation	2,024	442	21.8	39.57	89.1	3,812	6,166	3.0x	14.0x	5.7x
Northwest Natural Holding Company	818	295	36.1	52.52	92.5	1,610	2,866	3.5x	9.7x	4.3x
MDU Resources Group, Inc.	5,624	870	15.5	31.34	89.5	6,305	8,671	1.5x	10.0x	2.8x
OGE Energy Corp.	3,396	903	26.6	33.65	94.9	6,736	11,509	3.4x	12.7x	5.4x
ONE Gas, Inc.	1,670	506	30.3	74.12	90.0	3,947	7,771	4.7x	15.4x	7.7x
ONEOK, Inc.	11,328	2,966	26.2	55.64	97.2	24,790	38,700	3.4x	13.0x	4.7x
RGC Resources, Inc.	72	22	31.2	25.21	92.0	207	336	4.7x	15.0x	5.8x
South Jersey Industries, Inc.	1,733	504	29.1	25.93	88.7	2,660	6,020	3.5x	11.9x	6.4x
Southwest Gas Holdings, Inc.	3,413	762	22.3	66.19	88.3	3,839	7,026	2.1x	9.2x	4.0x
Summit Midstream Partners, LP	387	172	44.5	30.38	99.1	205	1,766	4.6x	10.3x	7.5x
Targa Resources Corp.	11,737	2,124	18.1	44.45	90.3	10,164	21,263	1.8x	10.0x	3.2x
TC Energy Corporation	10,537	7,033	66.7	49.51	92.7	48,456	91,885	8.7x	13.1x	5.7x
Median			29.1%		92.4%			3.5x	12.7x	5.3x
Mean			29.8%		92.5%			3.7x	12.3x	5.1x

(1) Matching public companies to middle-market companies is an imperfect comparable analysis due to the variables of size, equipment, markets, etc. Nonetheless JKC's research has yielded this list as the closest available.

(2) LTM is defined as last twelve months.

(3) Total Enterprise Value is defined as market capitalization plus total debt less cash and cash equivalents.

(4) Net Debt is defined as total debt less cash and cash equivalents.

PUBLIC AND TRANSACTION COMPARABLES BY SEGMENT

NATURAL GAS

SELECTED TRANSACTIONS (1)

Announced / Closed Date	Target(s)	Acquirer	Total Enterprise Value (TEV)	TEV / Revenues	TEV / EBITDA
2/17/2021	Enable Midstream Partners, LP (NYSE:ENBL)	Energy Transfer LP (NYSE:ET)	\$7,329.7	3.1x	9.5x
1/13/2021	Corning Natural Gas Holding Corporation (OTCPK:CNIG)	Argo Infrastructure Partners LP	\$172.0	4.6x	17.2x
7/27/2020	CNX Midstream Partners LP (NYSE:CNXM)	CNX Resources Corporation (NYSE:CNX)	\$764.2	5.1x	6.6x
2/27/2020	EQM Midstream Partners, LP	Equitrans Midstream Corporation (NYSE:ETRN)	\$4,395.8	7.6x	8.1x
10/21/2019	AltaGas Canada Inc. (TSX:ACI)	Alberta Teachers' Retirement Fund Board; Public Sector Pension Investment	\$1,278.2	5.2x	15.2x
9/16/2019	SemGroup Corporation	Energy Transfer LP (NYSE:ET)	\$5,007.4	1.9x	11.2x
8/27/2019	Tallgrass Energy, LP (NYSE:TGE)	The Blackstone Group Inc. (NYSE:BX)	\$9,337.3	9.9x	9.9x
5/8/2019	Andeavor Logistics LP	MPLX LP (NYSE:MPLX)	\$14,804.7	5.6x	10.6x
4/24/2019	Anadarko Petroleum Corporation (NYSE:APC)	Occidental Petroleum Corporation (NYSE:OXY)	\$57,809.2	4.4x	7.6x
11/8/2018	Western Gas Partners, LP (NYSE:WES)	Western Gas Equity Partners, LP (NYSE:WGP)	\$13,427.9	6.5x	12.0x
10/22/2018	EnLink Midstream Partners, LP (NYSE:ENLK)	EnLink Midstream, LLC (NYSE:ENLC)	\$12,923.5	1.7x	12.2x
10/9/2018	Antero Midstream Partners LP (NYSE:AM)	Antero Midstream GP LP (NYSE:AMGP)	\$7,359.7	7.7x	11.5x
9/28/2018	American Midstream Partners, LP (NYSE:AMID)	ArcLight Capital Partners, LLC	\$1,595.1	2.0x	14.2x
8/27/2018	Blue Ridge Mountain Resources, Inc. (OTCPK:BRMR)	Eclipse Resources Corporation (NYSE:ECR)	\$348.0	3.6x	12.8x
8/1/2018	Energy Transfer Operating, LP	Energy Transfer, LP (NYSE:ET)	\$69,430.8	2.1x	10.9x
5/17/2018	Williams Partners LP (NYSE:WPZ)	The Williams Companies, Inc. (NYSE:WMB)	\$57,052.1	7.0x	14.1x
4/25/2018	Rice Midstream Partners LP (NYSE:RMP)	EQM Midstream Partners, LP (NYSE:EQM)	\$2,443.1	7.7x	9.9x
11/1/2017	Southcross Energy Partners, LP (NYSE:SXE)	American Midstream Partners, LP (NYSE:AMID)	\$624.1	1.0x	14.8x
7/19/2017	Avista Corporation (NYSE:AVA)	Hydro One Limited (TSX:H)	\$5,332.4	3.7x	11.3x

(1) Total Enterprise Value is defined as market capitalization plus total debt less cash and cash equivalents.

PUBLIC AND TRANSACTION COMPARABLES BY SEGMENT

PROPANE AND HEATING/FUEL OIL EQUITY COMPARABLES ⁽¹⁾

Propane and Heating/Fuel Oil (United States & Canada)

Company	LTM ⁽²⁾			Stock Price 06/30/21	% of 52-Week High	Market Cap	Total Enterprise Value ⁽³⁾	TEV / LTM		Net Debt ⁽⁴⁾ EBITDA
	Revenues	EBITDA	Margin					Revenues	EBITDA	
Ferrellgas Partners, L.P.	\$1,700	\$289	17.0%	\$23.40	98.3%	\$114	\$2,061	1.2x	7.1x	7.0x
NGL Energy Partners LP	5,871	418	7.1	2.38	47.7	308	4,692	0.8x	11.2x	8.4x
Spire Inc.	2,197	617	28.1	72.27	92.7	3,735	7,330	3.3x	11.9x	5.7x
Star Group, LP.	1,444	155	10.7	11.20	93.1	450	693	0.5x	4.5x	1.4x
Suburban Propane Partners, L.P.	1,247	302	24.2	15.34	84.4	959	2,249	1.8x	7.4x	4.2x
UGI Corporation	7,133	2,195	30.8	46.31	96.1	9,668	15,577	2.2x	7.1x	2.5x
Median			20.6%		92.9%			1.5x	7.3x	4.9x
Mean			19.6%		85.4%			1.6x	8.2x	4.9x

SELECTED TRANSACTIONS

Announced / Closed Date	Target(s)	Acquirer	Total Enterprise Value (TEV)	TEV / Revenues	TEV / EBITDA
7/14/2021	Kamps Propane, Inc.	Superior Plus Corp. (TSX:SPB)	\$240.0	-	8.9x
4/22/2021	Assets of Freeman Gas, Inc.	Superior Plus Corp. (TSX:SPB)	\$170.0	-	-
2/11/2021	Assets of Highlands Propane Inc.	Superior Plus Corp. (TSX:SPB)	\$10.9	-	-
2/11/2021	Miller Propane Inc.	Superior Plus Corp. (TSX:SPB)	\$5.9	-	-
1/26/2021	All of the Assets of Holden Oil, Inc.	Superior Plus Corp. (TSX:SPB)	\$17.8	-	-
11/11/2020	Assets of Petroleum Heat and Power Co., Inc.	Superior Plus Corp. (TSX:SPB)	\$6.1	-	-
10/15/2020	Central Coast Propane, Inc.	Superior Plus Corp. (TSX:SPB)	\$12.9	-	-
9/11/2020	Simmons Energy Solutions Inc.	MFA Oil Company	-	-	-
8/25/2020	Rymes Propane & Oils, Inc.	Superior Plus Corp. (TSX:SPB)	\$159.0	-	-
7/28/2020	Champagne's Energy, Inc.	Superior Plus Corp. (TSX:SPB)	\$27.3	-	-
2/6/2020	All American Propane, Inc.	ThompsonGas LLC	-	-	-
1/9/2020	Evelyn Jeanne, Inc., d/b/a Western Propane Service	Superior Plus Corp. (TSX:SPB)	-	-	-
11/13/2019	Propane Distribution Assets in New Brunswick and Quebec	Superior Plus Corp. (TSX:SPB)	\$3.7	-	-
11/13/2019	Propane Distribution Assets in North Carolina	Superior Plus Corp. (TSX:SPB)	\$1.2	-	-

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PUBLIC AND TRANSACTION COMPARABLES BY SEGMENT

DRILLING

EQUITY COMPARABLES ⁽¹⁾

Drilling (United States & Canada)

Company	LTM ⁽²⁾			Stock Price 06/30/21	% of 52-Week High	Market Cap	Total Enterprise Value ⁽³⁾	TEV / LTM		Net Debt ⁽⁴⁾
	Revenues	EBITDA	Margin					Revenues	EBITDA	
AKITA Drilling Ltd.	\$69	\$6	8.9%	\$1.11	92.0%	\$45	\$108	1.6x	17.7x	9.2x
Baker Hughes Company	20,469	2,420	11.8	22.87	86.1	17,698	24,599	1.2x	10.2x	1.0x
CES Energy Solutions Corp.	721	44	6.2	1.56	94.1	396	654	0.9x	14.8x	5.5x
Ensign Energy Services Inc.	637	130	20.4	1.81	89.6	294	1,382	2.2x	10.6x	8.2x
Halliburton Company	13,370	1,551	11.6	23.12	92.5	20,570	28,743	2.1x	18.5x	5.1x
Helmerich & Payne, Inc.	1,083	17	1.6	32.63	90.0	3,521	3,456	3.2x	NM	(3.5)x
Independence Contract Drilling, Inc.	59	(8)	(13.0)	4.29	53.8	28	170	2.9x	NM	NM
NOV Inc.	5,377	(99)	(1.8)	15.32	85.0	5,985	6,994	1.3x	NM	NM
Precision Drilling Corporation	649	115	17.7	41.70	95.8	555	1,501	2.3x	13.1x	8.0x
Secure Energy Services Inc.	1,695	73	4.3	3.40	81.8	545	897	0.5x	12.3x	6.7x
Valaris Limited	1,182	(73)	(6.2)	28.88	96.4	2,166	1,912	1.6x	NM	NM
Median			6.2%		90.0%			1.6x	13.1x	6.1x
Mean			5.6%		87.0%			1.8x	13.9x	5.0x

SELECTED TRANSACTIONS

Announced / Closed Date	Target(s)	Acquirer	Total Enterprise Value (TEV)	TEV / Revenues	TEV / EBITDA
5/4/2020	Quintana Energy Services Inc.	KLX Energy Services Holdings, Inc. (NasdaqGS:KLXE)	\$49.6	0.1x	2.1x
10/8/2018	Rowan Companies plc (NYSE:RDC)	EnSCO plc (NYSE:ESV) / Valaris plc (NYSE:VAL)	\$3,139.1	3.8x	43.9x
10/1/2018	Sidewinder Drilling LLC	Independence Contract Drilling Inc. (NYSE:ICD)	\$291.8	2.6x	45.1x
8/27/2018	Blue Ridge Mountain Resources, Inc. (OTCPK:BRMR)	Eclipse Resources Corporation (NYSE:ECR)	\$347.9	3.6x	12.8x
8/13/2018	Trinidad Drilling Ltd. (TSX:TDG)	Ensign Energy Services Inc. (TSX:ESI)	\$714.0	1.5x	5.1x
6/5/2018	Xtreme Drilling Corp.	AKITA Drilling Ltd. (TSX:AKT.A)	\$155.0	2.8x	162.4x
2/15/2018	Layne Christensen Company (NasdaqGS:LAYN)	Granite Construction Incorporated (NYSE:GVA)	\$491.9	1.0x	16.5x
5/30/2017	Atwood Oceanics, Inc. (NYSE:ATW)	EnSCO plc (NYSE:ESV)	\$1,759.6	2.2x	4.7x
5/19/2017	Savanna Energy Services Corp.	Total Energy Services Inc. (TSX:TOT)	\$458.2	1.4x	16.6x

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PUBLIC AND TRANSACTION COMPARABLES BY SEGMENT

LUBRICANTS AND GREASES

EQUITY COMPARABLES (1)

Lubricants and Greases (United States & Canada)

Company	LTM ⁽²⁾			Stock Price 06/30/21	% of 52-Week High	Market Cap	Total Enterprise Value ⁽³⁾	TEV / LTM		Net Debt ⁽⁴⁾ EBITDA
	Revenues	EBITDA	Margin					Revenues	EBITDA	
Albemarle Corporation	\$3,229	\$826	25.6%	\$168.46	89.4%	\$19,663	\$21,451	6.6x	26.0x	1.7x
Ashland Global Holdings Inc.	2,395	478	20.0	87.50	91.2	5,312	6,740	2.8x	14.1x	3.3x
Clean Harbors, Inc.	3,310	567	17.1	93.14	96.5	5,082	6,239	1.9x	11.0x	1.9x
CSW Industrials, Inc.	490	115	23.6	118.46	82.4	1,858	2,156	4.4x	18.7x	2.4x
FMC Corporation	4,674	1,205	25.8	108.20	87.5	13,944	17,318	3.7x	14.4x	2.7x
Ingevity Corporation	1,336	456	34.1	81.36	90.9	3,257	4,360	3.3x	9.6x	2.4x
Kraton Corporation	1,711	266	15.5	32.29	70.4	1,038	2,038	1.2x	7.7x	3.6x
NewMarket Corporation	2,198	444	20.2	321.98	74.4	3,519	4,052	1.8x	9.1x	1.2x
Ocean Bio-Chem, Inc.	61	14	23.5	12.20	54.1	116	109	1.8x	7.6x	(0.3)x
Quaker Chemical Corporation	1,618	273	16.9	237.19	78.5	4,239	5,021	3.1x	18.4x	2.9x
Stepan Company	2,092	268	12.8	120.27	86.3	2,708	2,880	1.4x	10.7x	0.7x
Synalloy Corporation	268	15	5.6	9.99	86.3	92	189	0.7x	12.5x	6.1x
Trecora Resources	229	17	7.3	8.32	90.7	207	215	0.9x	12.8x	1.2x
Valvoline Inc.	2,798	696	24.9	32.46	93.7	5,878	7,690	2.7x	11.0x	2.6x
Median			20.1%		86.9%			2.3x	11.8x	2.4x
Mean			19.5%		83.7%			2.6x	13.1x	2.3x

SELECTED TRANSACTIONS

Announced / Closed Date	Target(s)	Acquirer	Total Enterprise Value (TEV)	TEV / Revenues	TEV / EBITDA
12/7/2020	Gabriel Performance Products, LLC	Huntsman Corporation (NYSE:HUN)	\$250.0	2.4x	11.0x
7/12/2019	Milacron Holdings Corp. (NYSE:MCRN)	Hillenbrand, Inc. (NYSE:HI)	\$2,051.1	1.7x	12.9x
4/23/2019	Synalloy Corporation (NasdaqGM:SYNL)	Privet Fund Management, LLC	\$308.8	1.0x	10.9x
9/13/2018	MPM Holdings Inc. (OTCPK:MPMQ)	KCC Corporation (KOSE:A002380); SJL Partners; Wonik QnC Corporation (KOSDAQ:A074600)	\$2,664.9	1.0x	7.4x
8/15/2018	KMG Chemicals, Inc.	Cabot Microelectronics Corporation (NasdaqGS:CCMP)	\$1,606.5	3.5x	13.5x
4/5/2017	Houghton International Inc.	Quaker Chemical Corporation (NYSE:KWR)	\$1,415.4	1.8x	11.8x

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PUBLIC AND TRANSACTION COMPARABLES BY SEGMENT

SOLAR

EQUITY COMPARABLES ⁽¹⁾

Solar (United States & Canada)

Company	LTM ⁽²⁾			Stock Price 06/30/21	% of 52-Week High	Market Cap	Total Enterprise Value ⁽³⁾	TEV / LTM		Net Debt ⁽⁴⁾ EBITDA
	Revenues	EBITDA	Margin					Revenues	EBITDA	
Boralex Inc.	\$538	\$341	63.4%	\$30.47	66.6%	\$3,127	\$6,342	11.8x	18.6x	8.8x
Capital Power Corporation	1,387	805	58.0	33.05	96.9	3,803	7,244	5.2x	9.0x	3.1x
NextEra Energy Partners, LP	951	640	67.3	76.36	86.5	5,795	15,175	16.0x	23.7x	6.9x
NRG Energy, Inc.	18,170	3,152	17.3	40.30	91.4	9,864	19,258	1.1x	6.1x	2.8x
Sunrun Inc.	1,266	(263)	(20.8)	55.78	55.3	11,375	17,792	14.1x	NM	NM
Median			58.0%		86.5%			11.8x	13.8x	5.0x
Mean			37.1%		79.3%			9.6x	14.3x	5.4x

SELECTED TRANSACTIONS

Announced / Closed Date	Target(s)	Acquirer	Total Enterprise Value (TEV)	TEV / Revenues	TEV / EBITDA
6/16/2021	Solarpack Corporacion Tecnologica, S.A. (BME:SPK)	EQT Infrastructure V; EQT Partners AB	\$1,543.1	9.5x	20.7x
1/13/2020	TerraForm Power, Inc. (NasdaqGS:TERP)	Brookfield Renewable Partners LP. (TSX:BEP.UN)	\$10,880.5	9.5x	13.0x
11/4/2019	Pattern Energy Group Inc. (NasdaqGS:PEGI)	Canada Pension Plan Investment Board	\$6,293.7	11.5x	16.1x
2/5/2018	8point3 Energy Partners LP (NasdaqGS:CAFD)	Capital Dynamics, Inc.	\$1,671.3	23.8x	17.0x
5/4/2017	Up to 20 Megawatts of Solar Energy Power Generation Assets	Kontrol Energy Corp. (CNSX:KNR)	\$22.6	-	4.1x
3/7/2017	TerraForm Global, Inc. (NasdaqGS:GLBL)	Orion US Holdings I LP	\$1,651.8	6.6x	17.2x
1/20/2016	Capstone Infrastructure Corporation	Irving Infrastructure Corp.	\$1,435.1	-	12.7x
12/3/2014	Hawaiian Electric Industries, Inc. (NYSE:HE)	NextEra Energy, Inc. (NYSE:NEE)	\$4,398.8	1.3x	8.5x

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PUBLIC AND TRANSACTION COMPARABLES BY SEGMENT

WIND

EQUITY COMPARABLES (1)

Wind (United States & Canada)

Company	LTM ⁽²⁾			Stock Price 06/30/21	% of 52-Week High	Market Cap	Total Enterprise Value ⁽³⁾	TEV / LTM		Net Debt ⁽⁴⁾ EBITDA
	Revenues	EBITDA	Margin					Revenues	EBITDA	
Algonquin Power & Utilities Corp.	\$2,031	\$716	35.3%	\$14.91	81.5%	\$9,206	\$16,816	8.3x	23.5x	9.1x
Avangrid, Inc.	6,582	1,879	28.5	51.43	91.5	19,913	30,695	4.7x	16.3x	3.3x
Boralex Inc.	538	341	63.4	30.47	66.6	3,127	6,342	11.8x	18.6x	8.8x
Brookfield Renewable Partners L.P.	3,878	2,320	59.8	38.66	75.6	18,301	50,618	13.1x	21.8x	8.1x
Innervex Renewable Energy Inc.	558	393	70.4	17.39	66.3	3,037	6,966	12.5x	17.7x	9.7x
NextEra Energy Partners, LP	951	640	67.3	76.36	86.5	5,795	15,175	16.0x	23.7x	6.9x
Northland Power Inc.	1,602	1,066	66.5	34.13	82.2	7,689	14,055	8.8x	13.2x	4.7x
TransAlta Renewables Inc.	354	199	56.0	16.81	85.1	4,487	4,914	13.9x	24.7x	2.5x
Median			61.6%		81.8%			12.1x	20.2x	7.5x
Mean			55.9%		79.4%			11.1x	20.0x	6.6x

SELECTED TRANSACTIONS

Announced / Closed Date	Target(s)	Acquirer	Total Enterprise Value (TEV)	TEV / Revenues	TEV / EBITDA
1/13/2020	TerraForm Power, Inc. (NasdaqGS:TERP)	Brookfield Renewable Partners L.P. (TSX:BEP.UN)	\$10,880.5	9.5x	13.0x
11/4/2019	Pattern Energy Group Inc. (NasdaqGS:PEGI)	Canada Pension Plan Investment Board	\$6,293.7	11.5x	16.1x
10/21/2019	AltaGas Canada Inc. (TSX:ACI)	Alberta Teachers' Retirement Fund Board; Public Sector Pension Investment	\$1,278.2	5.2x	15.2x
10/30/2017	Alterra Power Corp. (TSX:AXY)	Innervex Renewable Energy Inc. (TSX:INE)	\$745.0	10.6x	31.0x
7/27/2017	Boralex Inc. (TSX:BLX)	Caisse de dépôt et placement du Québec	\$3,436.5	12.5x	20.3x
6/19/2017	Pattern Energy Group Inc. (NasdaqGS:PEGI)	Public Sector Pension Investment Board	\$4,313.7	12.2x	18.6x
3/7/2017	TerraForm Global, Inc. (NasdaqGS:GLBL)	Orion US Holdings I LP	\$1,651.8	6.6x	17.2x
1/20/2016	Capstone Infrastructure Corporation	Irving Infrastructure Corp.	\$1,435.1	-	12.7x

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PUBLIC AND TRANSACTION COMPARABLES BY SEGMENT

OIL AND GAS FIELD SERVICES

EQUITY COMPARABLES (1)

Oil and Gas Field Services (United States & Canada)

Company	LTM ⁽²⁾			Stock Price 06/30/21	% of 52-Week High	Market Cap	Total Enterprise Value ⁽³⁾	TEV / LTM		Net Debt ⁽⁴⁾ EBITDA
	Revenues	EBITDA	Margin					Revenues	EBITDA	
Archrock, Inc.	\$796	\$352	44.2%	\$8.91	82.5%	\$1,373	\$3,012	3.8x	8.6x	4.6x
Baker Hughes Company	20,469	2,420	11.8	22.87	86.1	17,698	24,599	1.2x	10.2x	1.0x
Blueknight Energy Partners, L.P.	114	53	46.5	3.78	88.7	157	(111)	(1.0)x	(2.1)x	2.2x
Cathedral Energy Services Ltd.	25	(7)	(27.4)	0.40	98.0	25	41	1.6x	NM	NM
CES Energy Solutions Corp.	721	44	6.2	1.56	94.1	396	654	0.9x	14.8x	5.5x
Cypress Environmental Partners, L.P.	145	4	2.6	2.42	55.7	30	90	0.6x	24.1x	14.1x
Dawson Geophysical Company	30	(16)	(55.8)	2.61	58.4	61	26	0.9x	NM	NM
ENGlobal Corporation	51	(7)	(13.7)	3.03	32.2	106	101	2.0x	NM	NM
Enservco Corporation	12	(6)	(44.6)	1.64	39.0	19	35	2.8x	NM	NM
Ensign Energy Services Inc.	637	130	20.4	1.81	89.6	294	1,382	2.2x	10.6x	8.2x
Enterprise Group, Inc.	12	5	36.8	0.21	77.9	10	20	1.6x	4.4x	1.9x
Essential Energy Services Ltd.	78	3	4.0	0.34	98.8	48	52	0.7x	16.9x	(0.0)x
High Arctic Energy Services Inc	56	4	6.7	1.29	97.6	63	53	1.0x	14.2x	(2.8)x
Innospec Inc.	1,270	159	12.5	90.61	84.1	2,230	2,150	1.7x	13.6x	(0.4)x
Matrix Service Company	694	(2)	(0.3)	10.50	64.3	279	231	0.3x	NM	NM
Mullen Group Ltd.	962	169	17.6	10.78	96.5	1,042	1,432	1.5x	8.5x	3.4x
Newpark Resources, Inc.	510	(2)	(0.3)	3.46	84.8	315	377	0.7x	NM	NM
North American Construction Group Ltd.	435	120	27.5	15.18	87.7	428	760	1.7x	6.4x	2.8x
Parkland Corporation	13,123	894	6.8	32.33	88.8	4,868	8,303	0.6x	9.3x	3.7x
Precision Drilling Corporation	649	115	17.7	41.70	95.8	555	1,501	2.3x	13.1x	8.0x
Profire Energy, Inc.	21	(1)	(6.9)	1.13	64.9	54	42	2.0x	NM	NM
ProPetro Holding Corp.	666	85	12.8	9.16	65.5	937	882	1.3x	10.3x	(0.8)x
Secure Energy Services Inc.	1,695	73	4.3	3.40	81.8	545	897	0.5x	12.3x	6.7x
Select Energy Services, Inc.	539	(5)	(0.9)	6.04	79.7	531	546	1.0x	NM	NM
Shawcor Ltd.	951	54	5.6	4.77	76.5	336	587	0.6x	11.0x	4.2x
Smart Sand, Inc.	106	(13)	(12.0)	3.33	80.0	144	193	1.8x	NM	NM
STEP Energy Services Ltd.	305	7	2.2	1.44	99.4	98	272	0.9x	41.3x	25.4x
USA Compression Partners, LP	634	387	61.1	16.48	98.4	1,599	4,054	6.4x	10.5x	5.0x
Median			5.9%		84.5%			1.3x	10.6x	3.7x
Mean			6.6%		80.3%			1.5x	12.5x	4.9x

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PUBLIC AND TRANSACTION COMPARABLES BY SEGMENT

EQUIPMENT AND PHYSICAL TECHNOLOGY

EQUITY COMPARABLES (1)

Equipment and Physical Technology (United States & Canada)

Company	LTM ⁽²⁾			Stock Price 06/30/21	% of 52-Week High	Market Cap	Total Enterprise Value ⁽³⁾	TEV / LTM		Net Debt ⁽⁴⁾ EBITDA
	Revenues	EBITDA	Margin					Revenues	EBITDA	
AKITA Drilling Ltd.	\$69	\$6	8.9%	\$1.11	92.0%	\$45	\$108	1.6x	17.7x	9.2x
CSI Compressco LP	279	84	30.3	1.84	78.3	88	747	2.7x	8.9x	7.9x
Enerflex Ltd.	784	116	14.8	6.77	86.1	607	858	1.1x	7.4x	2.1x
Exterran Corporation	604	128	21.2	4.76	78.6	158	721	1.2x	5.6x	4.4x
Forum Energy Technologies, Inc.	469	(108)	(23.1)	23.48	82.4	131	341	0.7x	NM	NM
Geospace Technologies Corporation	97	3	3.6	8.09	65.2	109	75	0.8x	21.5x	(8.2)x
Gulf Island Fabrication, Inc.	229	(21)	(9.2)	4.52	85.3	70	41	0.2x	NM	NM
Halliburton Company	13,370	1,551	11.6	23.12	92.5	20,570	28,743	2.1x	18.5x	5.1x
Hanwei Energy Services Corp.	8	(0)	(3.1)	0.02	71.4	4	8	1.0x	NM	NM
Helix Energy Solutions Group, Inc.	679	132	19.4	5.71	84.5	861	1,135	1.7x	8.6x	1.7x
ION Geophysical Corporation	77	(10)	(12.4)	2.09	39.1	60	214	2.8x	NM	NM
Key Energy Services, Inc.	238	(15)	(6.5)	4.51	25.8	62	118	0.5x	NM	NM
McCoy Global Inc.	25	(1)	(3.4)	0.73	100.0	20	20	0.8x	NM	NM
MIND Technology, Inc.	22	(11)	(49.9)	1.94	59.0	27	49	2.2x	NM	NM
Nabors Industries Ltd.	1,832	447	24.4	114.24	85.5	925	3,924	2.1x	8.8x	5.4x
NOV Inc.	5,377	(99)	(1.8)	15.32	85.0	5,985	6,994	1.3x	NM	NM
Natural Gas Services Group, Inc.	69	20	28.7	10.28	84.1	140	110	1.6x	5.5x	(1.3)x
PHX Energy Services Corp.	191	21	11.2	3.62	95.9	182	194	1.0x	9.1x	0.6x
RPC, Inc.	637	8	1.2	4.95	66.6	1,054	997	1.6x	125.5x	(12.0)x
Schlumberger Limited	21,647	4,109	19.0	32.01	86.8	44,761	58,863	2.7x	14.3x	3.2x
Solaris Oilfield Infrastructure, Inc.	110	17	15.8	9.74	64.6	310	362	3.3x	20.9x	(2.2)x
Superior Drilling Products, Inc.	9	(1)	(13.2)	0.92	63.9	24	29	3.2x	NM	NM
TechnipFMC plc	13,149	1,208	9.2	9.05	69.4	4,079	5,532	0.4x	4.6x	1.4x
TerraVest Industries Inc.	238	40	16.7	15.67	97.1	282	360	1.5x	9.1x	2.5x
TETRA Technologies, Inc.	329	(26)	(7.9)	4.34	96.7	549	710	2.2x	NM	NM
Weatherford International plc	3,384	421	12.4	18.20	90.9	1,276	2,972	0.9x	7.1x	3.8x
Median			9.0%		84.3%			1.5x	9.0x	2.3x
Mean			4.5%		77.9%			1.6x	18.3x	1.5x

- (1) Matching public companies to middle-market companies is an imperfect comparable analysis due to the variables of size, equipment, markets, etc. Nonetheless JKC's research has yielded this list as the closest available.
- (2) LTM is defined as last twelve months.
- (3) Total Enterprise Value is defined as market capitalization plus total debt less cash and cash equivalents.
- (4) Net Debt is defined as total debt less cash and cash equivalents.

PUBLIC AND TRANSACTION COMPARABLES BY SEGMENT

OIL AND GAS FIELD SERVICES AND EQUIPMENT AND PHYSICAL TECHNOLOGY

SELECTED TRANSACTIONS ⁽¹⁾

Announced / Closed Date	Target(s)	Acquirer	Total Enterprise Value (TEV)	TEV / Revenues	TEV / EBITDA
8/4/2021	Alamo Pressure Pumping, LLC	NexTier Completion Solutions, Inc.	\$238.0	-	3.4x
3/9/2021	Tervita Corporation (TSX:TEV)	Secure Energy Services Inc. (TSX:SES)	\$1,022.9	0.9x	6.7x
12/21/2020	RigNet, Inc. (NasdaqGS:RNET)	Viasat, Inc. (NasdaqGS:VSAT)	\$235.7	1.0x	8.6x
12/7/2020	SEACOR Holdings Inc. (NYSE:CKH)	American Industrial Partners	\$845.5	1.5x	11.1x
9/1/2020	OneStim Business	Liberty Oilfield Services Inc. (NYSE:LBRT)	\$427.8	0.1x	1.5x
9/1/2020	Calfrac Well Services Ltd. (TSX:CFW)	THRC Holdings, LP	\$675.7	0.8x	34.9x
5/3/2020	Quintana Energy Services Inc. (NYSE:QES)	KLX Energy Services Holdings, Inc. (NasdaqGS:KLXE)	\$49.6	0.1x	2.1x
2/23/2020	Strad Inc. (TSX:SDY)	Management	\$116.6	1.1x	3.5x
11/20/2019	W&W Energy Services, Inc.	Petrofac Limited (LSE:PFC)	\$24.8	-	-
6/17/2019	C&J Energy Services, Inc. (NYSE:CJ)	Keane Group, Inc. (NYSE:FRAC)	\$699.2	0.3x	2.9x
3/20/2019	Red Bone Services LLC/Tecton Energy Services Ltd.	KLX Energy Services Holdings, Inc. (NasdaqGS:KLXE)	\$82.5	-	4.8x
1/20/2019	ZCL Composites Inc. (TSX:ZCL)	Shawcor Ltd. (TSX:SCL)	\$233.7	1.7x	12.5x
10/29/2018	Adler Hot Oil Service, LLC.	Enservco Corporation (AMEX:ENSV)	\$12.5	0.7x	4.3x
6/5/2018	Xtreme Drilling Corp.	AKITA Drilling Ltd. (TSX:AKT.A)	\$155.0	2.8x	162.4x
5/1/2018	KLX Inc. (NasdaqGS:KLXI)	Aviall Inc.	\$4,482.9	-	15.7x
4/16/2018	Aveda Transportation and Energy Services Inc. (TSXV:AVE)	Daseke Companies, Inc.	\$2,139.8	0.7x	4.8x
1/16/2018	USA Compression Partners, LP (NYSE:USAC)	Energy Transfer Partners, LP (NYSE:ETP); Energy Transfer Equity, LP (NYSE:ETE)	\$2,033.4	7.3x	14.3x
1/2/2018	Archrock Partners, LP	Archrock, Inc. (NYSE:AROC)	\$2,405.5	4.3x	10.5x
12/11/2017	Pure Technologies Ltd.	Xylem Inc. (NYSE:XYL)	\$395.2	4.0x	26.5x
5/19/2017	Savanna Energy Services Corp.	Total Energy Services Inc. (TSX:TOT)	\$458.2	1.8x	16.6x
5/15/2017	Ceiba Energy Services Inc.	Secure Energy Services Inc. (TSX:SES)	\$27.2	4.5x	29.2x
4/24/2017	Flowchem Ltd.	KMG Chemicals, Inc. (NYSE:KMG)	\$495.0	N/A	11.5x

(1) Total Enterprise Value is defined as market capitalization plus total debt less cash and cash equivalents.

PUBLIC AND TRANSACTION COMPARABLES BY SEGMENT

STORAGE AND TERMINALS

EQUITY COMPARABLES ⁽¹⁾

Storage and Terminals (United States & Canada)

Company	LTM ⁽²⁾			Stock Price 06/30/21	% of 52-Week High	Market Cap	Total Enterprise Value ⁽³⁾	TEV / LTM		Net Debt ⁽⁴⁾ EBITDA
	Revenues	EBITDA	Margin					Revenues	EBITDA	
Alliant Energy Corporation	\$3,455	\$1,380	39.9%	\$55.76	94.3%	\$13,948	\$21,249	6.2x	15.4x	5.3x
AltaGas Ltd.	6,258	1,090	17.4	21.00	98.6	5,874	13,867	2.2x	12.7x	5.9x
Blueknight Energy Partners, LP.	114	53	46.5	3.78	88.7	157	(111)	(1.0)x	(2.1)x	2.2x
Chart Industries, Inc.	1,196	207	17.3	146.32	87.4	5,319	5,797	4.8x	28.1x	2.6x
EnLink Midstream, LLC	4,788	983	20.5	6.39	94.9	3,131	9,384	2.0x	9.5x	4.6x
Equitrans Midstream Corporation	1,445	1,161	80.3	8.51	73.0	3,681	11,825	8.2x	10.2x	5.9x
Gibson Energy Inc.	4,818	278	5.8	19.17	88.0	2,808	4,056	0.8x	14.6x	4.5x
Green Plains Partners LP	83	53	64.2	12.80	93.2	297	402	4.9x	7.6x	1.8x
Magellan Midstream Partners, LP.	2,525	1,149	45.5	48.91	90.8	10,921	16,108	6.4x	14.0x	4.3x
MPLX LP	8,935	4,886	54.7	29.61	94.3	30,484	52,850	5.9x	10.8x	4.0x
NuStar Energy LP.	1,538	706	45.9	18.05	87.1	1,977	6,759	4.4x	9.6x	4.9x
Median			45.5%		90.8%			4.8x	10.8x	4.5x
Mean			39.8%		90.0%			4.1x	11.9x	4.2x

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(2) LTM is defined as last twelve months.

(3) Total Enterprise Value is defined as market capitalization plus total debt less cash and cash equivalents.

(4) Net Debt is defined as total debt less cash and cash equivalents.

PUBLIC AND TRANSACTION COMPARABLES BY SEGMENT

STORAGE AND TERMINALS

SELECTED TRANSACTIONS (1)

Announced / Closed Date	Target(s)	Acquirer	Total Enterprise Value (TEV)	TEV / Revenues	TEV / EBITDA
8/5/2021	BP Midstream Partners LP (NYSE:BPMP)	BP Midstream Partners Holdings LLC	\$1,826.9	14.5x	9.3x
6/1/2021	Stagecoach Gas Services LLC	Kinder Morgan, Inc. (NYSE:KMI)	\$1,225.0	-	10.0x
2/17/2021	Enable Midstream Partners, LP (NYSE:ENBL)	Energy Transfer LP (NYSE:ET)	\$7,329.7	3.1x	9.5x
2/10/2021	Inter Pipeline Ltd. (TSX:IPL)	Brookfield Infrastructure Partners L.P. (NYSE:BIP)	\$13,857.6	6.5x	17.2x
8/24/2020	Cheniere Energy Partners, LP (AMEX:CQP)	Brookfield Infrastructure Partners LP (NYSE:BIP) and Blackstone Infrastructure Partners, LP	\$17,027.5	5.1x	11.3x
7/27/2020	CNX Midstream Partners LP (NYSE:CNXM)	CNX Resources Corporation (NYSE:CNX)	\$764.2	5.1x	6.6x
2/27/2020	EQM Midstream Partners, LP	Equitrans Midstream Corporation (NYSE:ETRN)	\$4,395.8	7.6x	8.1x
9/16/2019	SemGroup Corporation (NYSE:SEMG)	Energy Transfer LP (NYSE:ET)	\$4,991.7	2.1x	13.5x
8/27/2019	Tallgrass Energy, LP (NYSE:TGE)	The Blackstone Group Inc. (NYSE:BX)	\$9,337.3	8.9x	11.2x
8/21/2019	Kinder Morgan Canada Limited (TSX:KML)	Pembina Pipeline Corporation (TSX:PPL)	\$2,294.7	4.4x	16.3x
5/10/2019	Buckeye Partners, LP (NYSE:BPL)	IFM Global Infrastructure Fund	\$10,500.3	2.7x	18.6x
11/8/2018	Western Gas Partners, LP (NYSE:WES)	Western Gas Equity Partners, LP (NYSE:WGP)	\$13,427.9	6.5x	12.0x
10/22/2018	EnLink Midstream Partners, LP (NYSE:ENLK)	EnLink Midstream, LLC (NYSE:ENLC)	\$12,923.5	1.7x	12.2x
10/18/2018	Valero Energy Partners LP	Valero Energy Corporation (NYSE:VLO)	\$4,069.8	7.6x	10.5x
9/19/2018	Dominion Energy Midstream Partners, LP (NYSE:DM)	Dominion Energy, Inc. (NYSE:D)	\$10,405.4	13.6x	19.7x
8/1/2018	Energy Transfer Partners, LP (NYSE:ETP)	Energy Transfer Equity, LP (NYSE:ETE)	\$69,412.3	2.1x	10.8x
7/30/2018	Four Corners Area Assets	Harvest Midstream Company	\$1,125.0	-	13.2x
7/10/2018	Transmontaigne Partners LP (NYSE:TLP)	TLP Acquisition Holdings LLC	\$1,254.3	6.1x	11.5x
6/29/2018	Boardwalk Pipeline Partners, LP	Boardwalk GP LP	\$6,792.1	5.3x	8.3x
5/17/2018	Enbridge Energy Partners, LP (NYSE:EEP)	Enbridge Inc. (TSX:ENB)	\$15,925.8	6.6x	10.1x
4/30/2018	Andeavor (NYSE:ANDV)	Marathon Petroleum Corporation (NYSE:MPC)	\$35,101.9	0.9x	12.7x

(1) Total Enterprise Value is defined as market capitalization plus total debt less cash and cash equivalents.

PUBLIC AND TRANSACTION COMPARABLES BY SEGMENT

PIPELINES

EQUITY COMPARABLES (1)

Oil and Gas Pipelines (United States & Canada)

Company	LTM ⁽²⁾			Stock Price 06/30/21	% of 52-Week High	Market Cap	Total Enterprise Value ⁽³⁾	TEV / LTM		Net Debt ⁽⁴⁾ EBITDA
	Revenues	EBITDA	Margin					Revenues	EBITDA	
Antero Midstream Corporation	\$965	\$747	77.4%	\$10.39	97.2%	\$4,960	\$8,063	8.4x	10.8x	4.1x
ATCO Ltd.	3,222	1,254	38.9	35.48	95.2	4,068	14,073	4.4x	11.2x	5.8x
Blueknight Energy Partners, LP.	114	53	46.5	3.78	88.7	157	(111)	(1.0)x	(2.1)x	2.2x
Crestwood Equity Partners LP	3,136	475	15.1	29.98	88.3	1,884	5,544	1.8x	11.7x	5.6x
Enable Midstream Partners, LP	3,057	969	31.7	9.11	91.9	3,971	8,525	2.8x	8.8x	4.3x
Enbridge Inc.	34,064	9,934	29.2	40.06	98.9	81,147	144,387	4.2x	14.5x	5.5x
Energy Transfer LP	52,085	12,580	24.2	10.63	92.0	28,750	90,589	1.7x	7.2x	3.7x
Enterprise Products Partners L.P.	32,572	7,851	24.1	24.13	93.9	52,728	82,630	2.5x	10.5x	3.6x
Equitrans Midstream Corporation	1,445	1,161	80.3	8.51	73.0	3,681	11,825	8.2x	10.2x	5.9x
Evolve Transition Infrastructure LP	50	14	27.9	0.87	49.2	47	506	10.0x	36.1x	31.0x
Genesis Energy, L.P.	1,921	326	17.0	11.61	90.8	1,423	5,799	3.0x	17.8x	10.2x
Gibson Energy Inc.	4,818	278	5.8	19.17	88.0	2,808	4,056	0.8x	14.6x	4.5x
Inter Pipeline Ltd.	2,145	799	37.2	16.26	97.3	6,981	12,612	5.9x	15.8x	7.1x
Kinder Morgan, Inc.	14,395	6,565	45.6	18.23	94.5	41,283	74,157	5.2x	11.3x	4.8x
ONEOK, Inc.	11,328	2,966	26.2	55.64	97.2	24,790	38,700	3.4x	13.0x	4.7x
Plains All American Pipeline, L.P.	30,109	1,876	6.2	11.36	91.8	8,203	20,663	0.7x	11.0x	5.4x
Summit Midstream Partners, LP	387	172	44.5	30.38	99.1	205	1,766	4.6x	10.3x	7.5x
Targa Resources Corp.	11,737	2,124	18.1	44.45	90.3	10,164	21,263	1.8x	10.0x	3.2x
The Williams Companies, Inc.	8,920	4,443	49.8	26.55	93.7	32,252	57,166	6.4x	12.9x	5.0x
TC Energy Corporation	10,537	7,033	66.7	49.51	92.7	48,456	91,885	8.7x	13.1x	5.7x
Western Midstream Partners, LP	2,721	1,701	62.5	21.42	90.4	8,848	16,336	6.0x	9.6x	4.2x
Median			31.7%		92.0%			4.2x	11.2x	5.0x
Mean			36.9%		90.2%			4.3x	12.3x	6.4x

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PUBLIC AND TRANSACTION COMPARABLES BY SEGMENT

PIPELINES

SELECTED TRANSACTIONS ⁽¹⁾

Announced / Closed Date	Target(s)	Acquirer	Total Enterprise Value (TEV)	TEV / Revenues	TEV / EBITDA
8/5/2021	BP Midstream Partners LP (NYSE:BPMP)	BP Midstream Partners Holdings LLC	\$1,826.9	14.5x	9.3x
6/1/2021	Stagecoach Gas Services LLC	Kinder Morgan, Inc. (NYSE:KMI)	\$1,225.0	-	10.0x
2/17/2021	Enable Midstream Partners, LP (NYSE:ENBL)	Energy Transfer LP (NYSE:ET)	\$7,329.7	3.1x	9.5x
2/10/2021	Inter Pipeline Ltd. (TSX:IPL)	Brookfield Infrastructure Partners L.P. (NYSE:BIP)	\$13,857.6	6.5x	17.2x
10/5/2020	TC PipeLines, LP (NYSE:TCP)	TC Energy Corporation (TSX:TRP)	\$2,213.6	7.4x	9.0x
7/27/2020	CNX Midstream Partners LP (NYSE:CNXM)	CNX Resources Corporation (NYSE:CNX)	\$764.2	5.1x	6.6x
2/27/2020	EQM Midstream Partners, LP	Equitrans Midstream Corporation (NYSE:ETRN)	\$4,395.8	7.6x	8.1x
9/16/2019	SemGroup Corporation (NYSE:SEMG)	Energy Transfer LP (NYSE:ET)	\$4,991.7	2.1x	13.5x
8/27/2019	Tallgrass Energy, LP (NYSE:TGE)	The Blackstone Group Inc. (NYSE:BX)	\$9,337.3	8.9x	11.2x
8/21/2019	Kinder Morgan Canada Limited (TSX:KML)	Pembina Pipeline Corporation (TSX:PPL)	\$2,294.7	4.4x	16.3x
5/10/2019	Buckeye Partners, LP (NYSE:BPL)	IFM Global Infrastructure Fund	\$10,500.3	2.7x	18.6x
11/8/2018	Western Gas Partners, LP (NYSE:WES)	Western Gas Equity Partners, LP (NYSE:WGP)	\$13,427.9	6.5x	12.0x
10/18/2018	Valero Energy Partners LP	Valero Energy Corporation (NYSE:VLO)	\$4,069.8	7.6x	10.5x
10/9/2018	Antero Midstream Partners LP (NYSE:AM)	Antero Midstream GP LP (NYSE:AMGP)	\$7,359.7	7.7x	11.5x
9/28/2018	American Midstream Partners, LP (NYSE:AMID)	ArcLight Capital Partners, LLC	\$1,595.1	2.0x	14.2x
7/10/2018	Transmontaigne Partners LP (NYSE:TLP)	TLP Acquisition Holdings LLC	\$1,254.3	6.1x	11.5x
5/17/2018	Williams Partners LP	The Williams Companies, Inc. (NYSE:WMB)	\$57,090.5	7.0x	14.1x
5/17/2018	Enbridge Energy Partners, LP (NYSE:EEP)	Enbridge Inc. (TSX:ENB)	\$15,925.8	6.6x	10.1x
5/10/2018	Amberjack Pipeline Company LLC	Shell Midstream Partners, LP (NYSE:SHLX)	\$1,928.7	8.2x	9.4x
3/26/2018	Tallgrass Energy Partners, LP (NYSE:TEP)	Tallgrass Equity, LLC	\$4,176.5	6.4x	6.9x
8/15/2017	Western Refining Logistics, LP (NYSE:WNRL)	Andeavor Logistics LP (NYSE:ANDX)	\$1,843.8	0.8x	14.4x
12/20/2016	Howard Midstream Partners, LP	Alberta Investment Management Corporation	\$1,394.7	4.3x	14.4x

(1) Total Enterprise Value is defined as market capitalization plus total debt less cash and cash equivalents.

PUBLIC AND TRANSACTION COMPARABLES BY SEGMENT

TRUCKERS

EQUITY COMPARABLES (1)

Truckers (United States & Canada)

Company	LTM ⁽²⁾			Stock Price 06/30/21	% of 52-Week High	Market Cap	Total Enterprise Value ⁽³⁾	TEV / LTM		Net Debt ⁽⁴⁾ EBITDA
	Revenues	EBITDA	Margin					Revenues	EBITDA	
Adams Resources & Energy, Inc.	\$1,329	\$41	3.1%	\$27.69	73.4%	\$118	\$83	0.1x	2.0x	(1.4)x
ArcBest Corporation	3,390	282	8.3	58.19	61.9	1,477	1,500	0.4x	5.3x	(0.2)x
Covenant Logistics Group, Inc.	913	95	10.4	20.68	86.3	346	470	0.5x	4.9x	0.9x
Daseke, Inc.	1,449	178	12.3	6.48	72.0	422	1,094	0.8x	6.2x	3.4x
Heartland Express, Inc.	625	182	29.2	17.13	75.3	1,369	1,221	2.0x	6.7x	(0.9)x
Hess Corporation	5,810	3,008	51.8	87.32	95.9	26,764	34,946	6.0x	11.6x	2.2x
J.B. Hunt Transport Services, Inc.	10,737	1,376	12.8	162.95	88.7	17,219	18,104	1.7x	13.2x	0.6x
Knight-Swift Transportation Holdings Inc.	5,027	1,229	24.4	45.46	89.2	7,524	8,267	1.6x	6.7x	0.6x
Landstar System, Inc.	5,243	441	8.4	158.02	86.5	6,069	5,977	1.1x	13.6x	(0.2)x
Marten Transport, Ltd.	899	198	22.0	16.49	81.9	1,365	1,277	1.4x	6.5x	(0.4)x
Old Dominion Freight Line, Inc.	4,577	1,418	31.0	253.80	91.9	29,432	28,870	6.3x	20.4x	(0.4)x
P.A.M. Transportation Services, Inc.	575	117	20.4	26.38	79.6	302	552	1.0x	4.7x	1.8x
Patriot Transportation Holding, Inc.	82	8	10.3	11.31	86.0	38	32	0.4x	3.7x	(1.0)x
Parkland Corporation	13,123	894	6.8	32.33	88.8	4,868	8,303	0.6x	9.3x	3.7x
Ryder System, Inc.	8,967	2,507	28.0	74.33	82.9	4,004	10,545	1.2x	4.2x	2.5x
Saia, Inc.	2,013	374	18.6	209.49	84.0	5,472	5,599	2.8x	15.0x	0.3x
Schneider National, Inc.	4,990	685	13.7	21.77	77.4	3,866	3,652	0.7x	5.3x	(0.3)x
TFI International Inc.	5,044	708	14.0	91.34	96.9	8,522	9,736	1.9x	13.8x	2.8x
Titanium Transportation Group Inc.	246	15	6.2	2.83	80.9	124	190	0.8x	12.4x	4.7x
Universal Logistics Holdings, Inc.	1,589	180	11.3	23.30	83.4	627	1,135	0.7x	6.3x	2.8x
USA Truck, Inc.	629	67	10.7	16.07	73.4	135	308	0.5x	4.6x	2.4x
Werner Enterprises, Inc.	2,477	509	20.5	44.52	89.5	3,024	3,126	1.3x	6.1x	0.2x
Yellow Corporation	4,859	173	3.6	6.51	63.8	333	1,603	0.3x	9.3x	8.0x
Median			12.8%		83.4%			1.0x	6.5x	0.6x
Mean			16.4%		82.2%			1.5x	8.3x	1.4x

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(4) Net Debt is defined as total debt less cash and cash equivalents.

PUBLIC AND TRANSACTION COMPARABLES BY SEGMENT

TRUCKERS

SELECTED TRANSACTIONS ⁽¹⁾

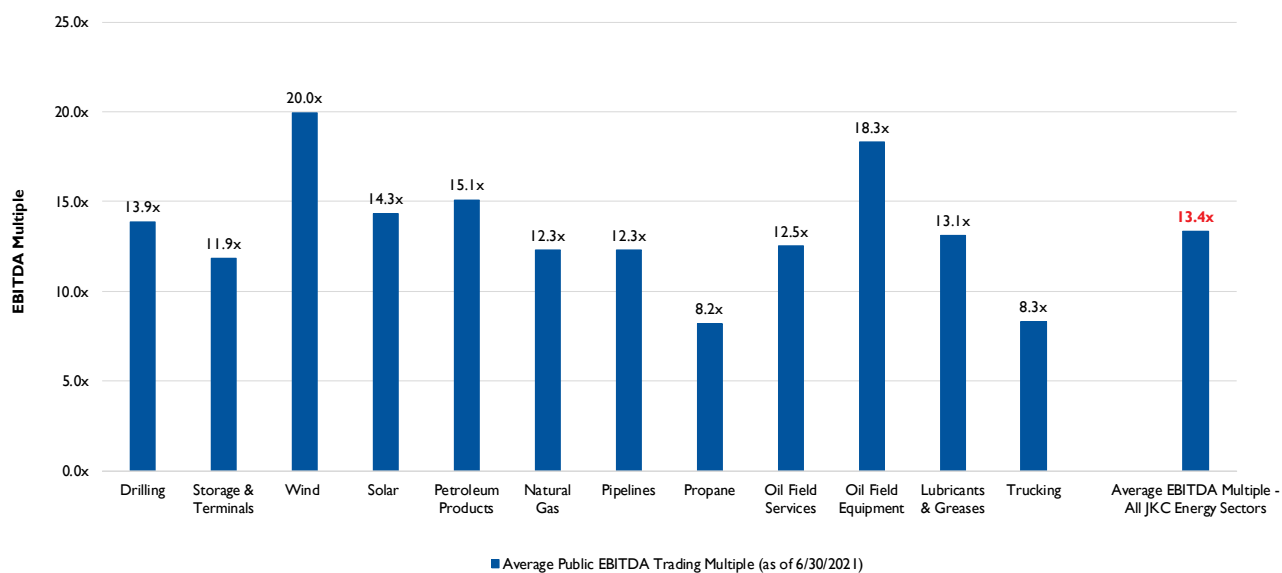
Announced / Closed Date	Target(s)	Acquirer	Total Enterprise Value (TEV)	TEV / Revenues	TEV / EBITDA
2/19/2020	Performance Team LLC	A.P. Møller - Mærsk A/S (CPSE:MAERSK B)	\$545.0	1.0x	6.1x
11/5/2018	CaseStack, Inc.	Hub Group, Inc. (NasdaqGS:HUBG)	\$255.0	1.1x	11.6x
8/31/2018	Mode Transportation, LLC	York Capital Management	\$238.5	-	10.0x
12/7/2017	Keen Transport, Inc.	Wallenius Wilhelmsen ASA (OB:WALWIL)	\$64.0	0.8x	6.4x
7/19/2016	Span-Alaska Transportation, Inc.	Matson Logistics, Inc.	\$197.6	-	9.4x
5/2/2016	Trimac Transportation Ltd.	Trimac Corporation	\$215.9	-	5.9x
9/9/2015	Con-way Inc.	XPO Logistics, Inc. (NYSE:XPO)	\$3,057.0	-	6.2x
8/17/2015	Liberty International Inc.	Janel Corporation (OTCPK:JANL)	\$2.3	-	26.6x
7/28/2015	Stagecoach Cartage and Distribution, LLC	Roadrunner Transportation Systems, Inc. (NYSE:RRTS)	\$40.0	-	5.7x
5/25/2015	Hodges Trucking Company, LLC	Rodan Transport (U.S.A.) Ltd.	\$42.0	-	3.0x
5/6/2015	Quality Distribution Inc.	Apax Partners LLP	\$823.3	-	12.0x
5/4/2015	Bridge Terminal Transport Inc.	XPO Logistics, Inc. (NYSE:XPO)	\$100.0	-	8.1x
4/21/2015	Command Transportation, LLC	Echo Global Logistics, Inc. (NasdaqGS:ECHO)	\$391.0	-	10.6x
1/20/2015	Wheels Group Inc.	Radiant Global Logistics Ltd.	\$80.1	-	13.5x

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PUBLIC AND TRANSACTION COMPARABLES BY SEGMENT

AVERAGE PUBLIC EBITDA TRADING MULTIPLES

ALL JKC ENERGY SECTORS (AS OF 6/30/2021)



FACTOIDS: LITTLE-KNOWN FACTS AND STATS

PETROLEUM PRODUCTS (1)

- Despite volatility in global oil markets, U.S. crude oil exports reached a record high in 2020.
- U.S. crude oil exports have increased significantly since 2015 and have averaged around 3.00 million b/d every year since 2019.
- The four-week rolling average of U.S. crude oil export volumes has not fallen below 2.00 million b/d during the past three years, despite the COVID-19 pandemic.

NATURAL GAS (2)

- U.S. exports of liquefied natural gas (LNG) continued to grow in the first six months of 2021, averaging 9.6 billion cubic feet per day (Bcf/d). This average marks an increase of 42%, or 2.8 Bcf/d, compared with the same period in 2020.
- LNG exports exceeded pipeline exports for the first time on a monthly basis in November 2020.
- In 2020, natural gas exports accounted for 23% of total U.S. energy exports in energy equivalent terms.

PROPANE AND HEATING/FUEL OIL (3)

- Propane was initially discovered by Edmund Ronalds in 1864 while he was conducting research on Pennsylvania crude oil. But the commercial use of propane wasn't fully realized until nearly 50 years later when Walter O. Snelling, a chemist, secured a patent.
- Three years later, Snelling sold the patent for propane to Frank Phillips, who was the founder of Phillips Petroleum, for \$50,000. In today's money, that's \$1.3 million.
- About 90% of the propane used in the United States is produced domestically.

(1) U.S. Energy Information Administration.

(2) U.S. Energy Information Administration.

(3) PitStop Propane and Fuels and James O2.

FACTOIDS: LITTLE-KNOWN FACTS AND STATS

LUBRICANTS AND GREASES (1)

- A team of researchers is working to turn plastic waste into lubricants, including hydraulic fluids and greases. The research is part of a government program funding sustainable innovations.
- The team includes personnel from Argonne National Laboratory, Chevron Philips Chemical Co., Chemstations Inc., American Packaging Corp., the City of Ames Resource Recovery Facility, Hy-Vee, Iowa State University and Texas A&M University.
- The team's next goal is to research the cost and technology needed to upcycle plastic waste and find out more about how these products may perform.

SOLAR (2)

- The U.S. solar market surpassed 100 gigawatts (GW) of installed electric generating capacity, doubling the size of the industry over the last 3.5 years.
- The U.S. solar industry installed 5 GW of new capacity in Q1 2021, a new first quarter record and a 46% increase over Q1 2020. The utility-scale sector accounted for a majority of these installations.
- Texas led all states with 1.52 GW of new solar capacity in Q1, more than it added in all of 2019 and three times more than any other state. Indiana, Virginia, Michigan, and Iowa were among the top ten solar states for the first quarter.

WIND (3)

- U.S. onshore wind generating capacity increased 74% from 2013 to 2019 to a total of 104 GW, including 9.6 GW built in 2019.
- The average U.S. construction cost for onshore wind generators fell from \$1,895 per kilowatt (kW) in 2013 to \$1,391/kW in 2019.
- However, wind capacity and construction costs vary significantly by region. Wind Belt states, such as New Mexico, Kansas, and Colorado, were among the least expensive in the United States for constructing wind generating capacity from 2013 to 2019.

(1) Lubricants Greases Magazine.

(2) Solar Energy Industries Association.

(3) U.S. Energy Information Administration.

FACTOIDS: LITTLE-KNOWN FACTS AND STATS

OIL AND GAS FIELD SERVICES (1)

- Historically, one of the most closely followed measures of the level of demand for the oil and gas field services industry is the active rotary rig count.
- Baker Hughes began publishing the North American active rig count on a weekly basis since 1944 and initiated the monthly international rig count in 1975.
- Having multiple wells per pad in a shale play has a greater effect on performance in a given area. Therefore, tracking well counts in the last decade has improved predictive power than indications provided solely by rig counts.

EQUIPMENT AND PHYSICAL TECHNOLOGY (2)

- The newest head-mounted displays (HMD) use augmented reality to superimpose digital images on the viewer's field of vision. Without fumbling with a mobile device, an industrial worker wearing an HMD could perform maintenance on a piece of equipment while looking at a virtual checklist of activities, or even receive remote assistance from a colleague.
- The industries most likely to use head-mounted displays are manufacturing, energy and utilities, and logistics. These industries benefit most from hands-free content access to help with complex workflows.

STORAGE AND TERMINALS (3)

- By using tank terminals as 'forward stocking' locations, products owners can save a considerable amount of supply chains costs.
- As our national economies become more intertwined, gross trade continues to grow. Because tank terminals are key in facilitating gross trade and correcting product imbalances, an increase in gross trade presents new business opportunities for tank terminals.

(1) Mercer Capital.
(2) BizTech.
(3) Insights Global.

FACTOIDS: LITTLE-KNOWN FACTS AND STATS

PIPELINES (1)

- Total worldwide capital spending on pipeline installations is projected to increase about 10% this year after plunging nearly 30% in 2020, with North America, Asia, Eastern Europe and the former Soviet states accounting for about three-quarters of all capital expenditures for new pipeline construction during the 2021-2025 period.
- Growing demand for LNG and related natural gas infrastructure is a key driver of current and planned pipeline construction worldwide. Gas infrastructure accounts for 66% of projected new pipeline installations through 2025.

TRUCKERS (2)

- Federal regulations permit truck drivers to drive for 11 hours per day, or 70 hours in any 8 day period. This totals over 4,000 hours per year of driving.
- Trucking is a male dominated industry with women representing only 6.7% of U.S. truck drivers.
- 29% of truck drivers are between the ages of 45-55, while only 5% are between 20-24 years old.

(1) Pipeline & Gas Journal.

(2) Zmodal.

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ABOUT JORDAN KNAUFF & COMPANY

Jordan Knauff & Company was founded in 2001 to undertake a distinct mission: to assemble and maintain a staff of top-notch investment banking personnel and offer their knowledge and experience to provide the best available investment banking services to middle-market companies, the entrepreneurs who lead them and the financial entities that transact with them. On a combined basis, over the course of their careers our employees have completed over 200 transactions as investors, owners, operators, buyers, sellers and investment bankers of middle-market businesses across a variety of industries. The majority of our firm's broad transaction experience has been with private companies owned by one shareholder, a partnership, a family or private equity investors.



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EEIA is a Washington, D.C.-based trade association representing the North American natural gas and petroleum production, transportation and processing infrastructure supply chain. That supply chain is comprised of 60 industries that provide construction, equipment, materials, services and supplies to energy infrastructure and operations. EEIA advocates for sound legislative and regulatory policies at the federal and state levels. Its members include companies, trade associations and labor organizations operating in the energy sector. EEIA advocates for industries both directly with policymakers, and through mobilization of business leaders and workers to act and speak for the value and benefits of full and responsible development of energy resources in their communities and with their political leaders.



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