

GLOBAL LISTED
INFRASTRUCTURE:

OPPORTUNITIES COME FLOWING DOWN THE PIPELINE

North American pipeline companies are currently uniquely positioned to take advantage of compelling trends that are unfolding in the oil and natural gas industries. Pipeline companies produce visible and stable cash flows, supported by strong regulation and fee-based contracts. However, volatility in commodity prices has led to a significant dislocation between market and fundamental values. This represents an attractive opportunity for investors.

August 2017

World energy demand is expected to grow at an annual rate of 1% over the next 25 years. While renewable energy use will continue to grow, fossil fuels will remain the principal energy source. Natural gas is the fastest growing fossil fuel and coal will continue to lose market share.

The development of North American shale oil and natural gas reserves is supported by rising productivity gains. This represents a significant opportunity for capital expenditure in energy infrastructure as the break-even price of shale oil continues to decline.

Pipeline companies that own large and diversified monopolistic networks offer a unique value proposition to investors:

- > Growth – from future projects
- > Cash flow stability – from fee-based contracts supported by strong regulation
- > Yield – derived from compelling shareholder returns

Key takeaways

- > World energy demand will continue to grow
- > Expansion of the North American shale oil and natural gas industry will be ongoing
- > North American pipeline companies offering stable cash flows and growth opportunities are undervalued

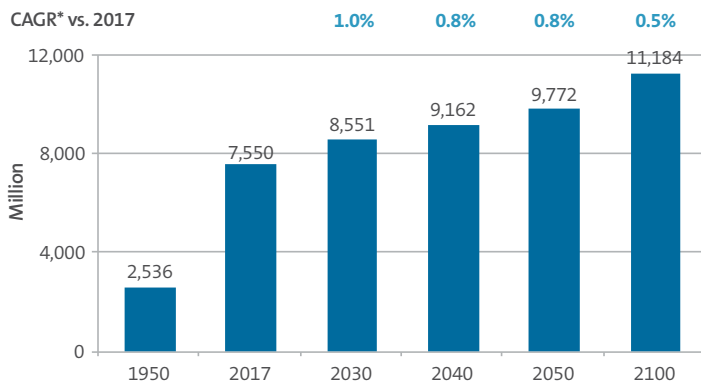


The market keeps expanding

Demand for energy is linked to population size and a country's stage of economic development. Economic growth leads to an increase in living standards and demand for household necessities which drive the increase in energy use.

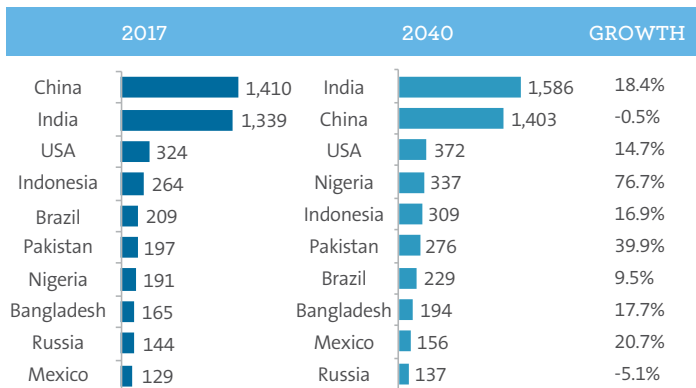
The world population reached 7.6 billion in 2017. China and India remain the two largest countries in the world with a population of 1.4 billion and 1.3 billion, respectively. The world population is expected to grow by approximately 1% per year, adding 1.6 billion people over the next 23 years and reaching 9.2 billion by 2040. Most of this growth is expected to occur in African countries, with strong additions also in India, Pakistan, Indonesia, and the United States.

Figure 1. Evolution of World Population (million)



Source: United Nations Department of Economic and Social Affairs; World Population Prospects. * Compound Average Growth Rate (CAGR)

Figure 2. Population in Top 10 Countries (million)



Source: United Nations Department of Economic and Social Affairs; World Population Prospects.

World GDP is expected to grow at an annual rate of approximately 3%, approaching US\$150 trillion in 2040 and doubling over the next 25 years. Asia Pacific, including China and India, will account for almost half of the increase (US\$37 trillion), followed by North America (US\$15 trillion) and Europe (US\$11 trillion). Notwithstanding its robust population growth, Africa is expected to face a limited increase in GDP per capita and therefore to account for only around 5% of the increase in world GDP, but showing the highest compound annual growth rate (CAGR) of 4%.



Figure 3. Evolution of World GDP (\$US trillion)

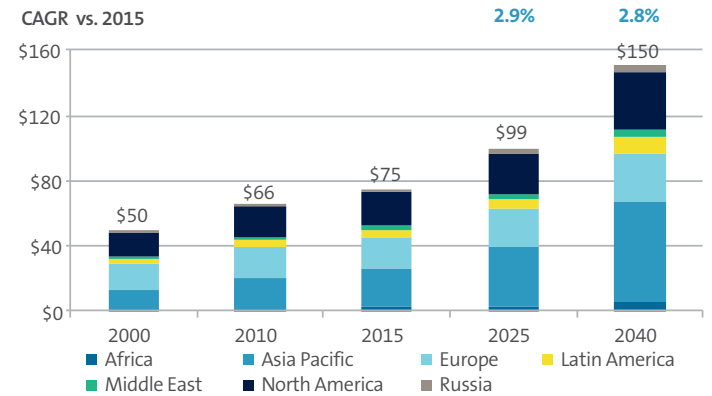
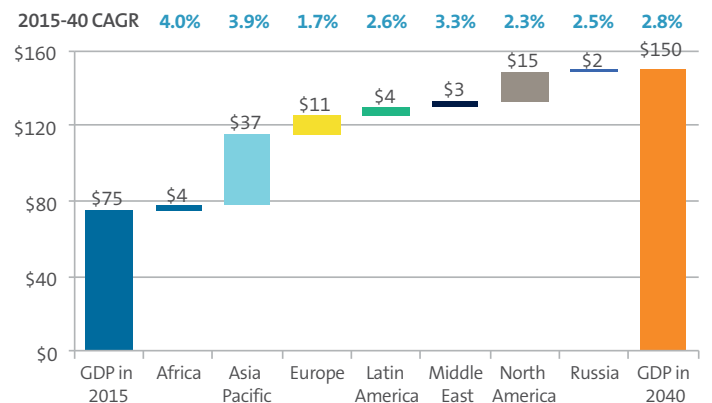


Figure 4. 2015-40 GDP Additions by Region (\$US trillion)



Source: ExxonMobil's 2017 energy outlook.

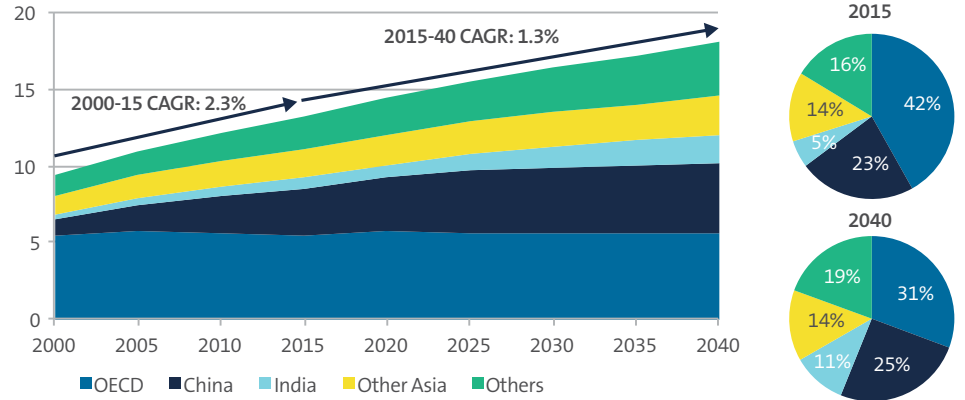
Global demand for energy is still growing

Energy demand is expected to grow over the long term, reflecting trends in population and GDP growth. However gains in energy efficiency will tend to moderate this increase given declining energy intensity (energy use per unit of GDP). World energy consumption is expected to grow at an annual rate of approximately 1% (compared to a 3% rise in GDP), approaching 18 Gtoe (Gigatonnes of oil equivalent – the amount of energy released by burning one billion tonnes of crude oil) by 2040, increasing by almost 40% over the next 25 years. The impact of declining energy intensity is also reflected in the expected lower 2015-40 energy use growth rate of 1.3% relative to the historic 2000-15 rate of 2.3%.

At the regional level, most of the consumption growth is expected in emerging economies. China and India will represent approximately 57% of the increase in energy consumption by 2040, while OECD countries will hardly grow. Thus, the contribution of OECD countries to total world energy consumption is expected to decline from 42% in 2015 to 31% in 2040.

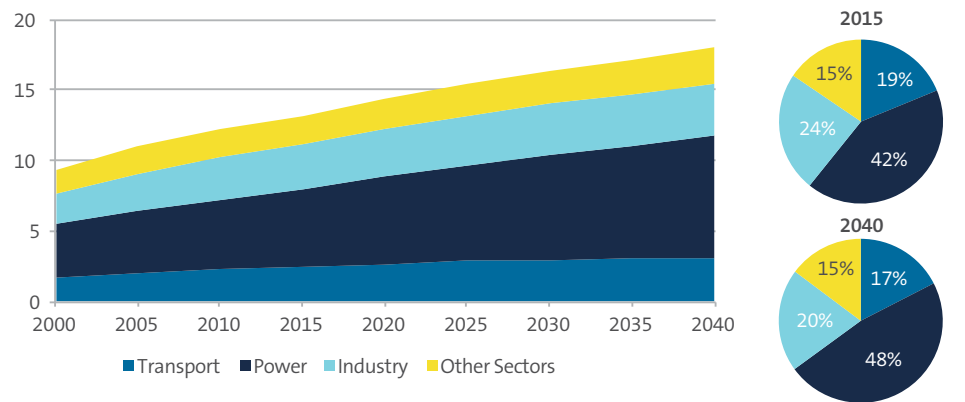
At the sector level, the increase in energy consumption for power generation and industrial use will represent 73% of the overall increase over the next 25 years, as electrification in emerging economies continues. The impact from the transport sector will be minimal.

Figure 5. World Energy Consumption by Region (Gtoe)



Source: BP's 2017 energy outlook.

Figure 6. World Energy Consumption by Sector (Gtoe)



Source: BP's 2017 energy outlook.





The continued rise of natural gas

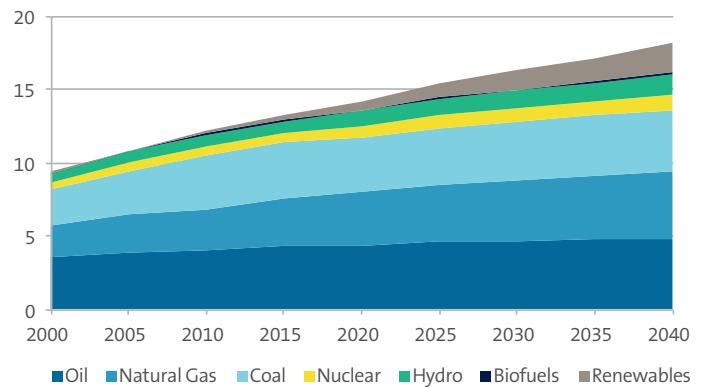
The energy mix has been evolving over recent years. Fossil fuels (oil, natural gas and coal) have been the main source of energy, representing a stable 86% share of the overall energy mix. Oil consumption increased in absolute terms during the 2000-15 period, however its share of the energy mix declined by 5.8% from 38.6% in 2000 to 32.8% in 2015. This decline was offset by an increase in coal, mainly due to increased electricity generation in China. Nuclear power generation has been stable and its share of the energy mix has declined from 6.2% in 2000 to 4.4% in 2015. Renewables, mainly wind, experienced significant growth in the 2000-15 period, increasing their share from 0.5% to 2.7% of global energy use.

The energy mix will continue to evolve in the future. Although fossil fuels remain the main source of energy in the global economy, their share of the global energy mix is expected to decline materially in the future. In absolute terms, oil, natural gas and coal will experience annual growth rates of 0.4%, 1.4% and 0.4%, respectively, during the 2015-40 period.

Natural gas will be the fastest growing fossil fuel with an increasing share of the overall energy mix (from 24.0% in 2015 to 25.0% in 2040), driven by a vast North American shale gas resource base. Meanwhile oil and coal will continue to lose market share falling to 26.7% and 23.5% by 2040, respectively. The declining 2000-15 trend of oil use is expected to continue and coal will be impacted by continued coal-to-gas switching.

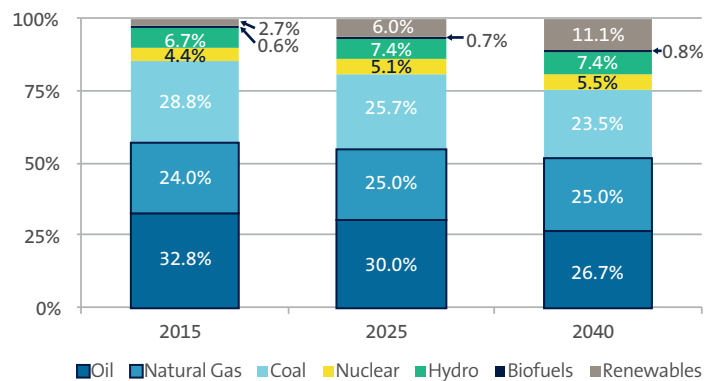
Fossil fuels' share of overall global energy use is expected to fall to 75.2% in 2040 from 85.6% in 2015. Renewables will continue to play an increasingly important role in the power generation mix in the future, with their share of the energy mix rising to 11% in 2040.

Figure 7. Energy Mix (Gtoe)



Source: BP's 2017 energy outlook.

Figure 8. Energy Mix Breakdown (%)



Source: BP's 2017 energy outlook.

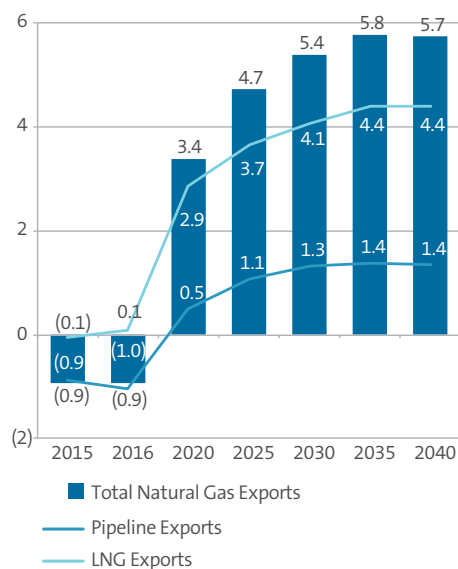
US Shale drive future production growth of oil and natural gas

Oil and gas development activity has been evolving significantly since producers outside of OPEC started to use fracking technology to exploit the vast resource potential in North America. Activity has been influenced both by price levels and the productivity of newly developed wells. US drilling and completion costs decreased materially during the recent commodity downturn, falling by 30%-40% on average compared to 2012 levels, at the height of the previous cycle.

Improvements in drilling technologies (e.g. longer lateral lengths, proppant use, multi-well pads, and an increased number of stages) have led to strong improvements in well productivity and reduced drilling, completion and overall production costs; these are likely to continue.

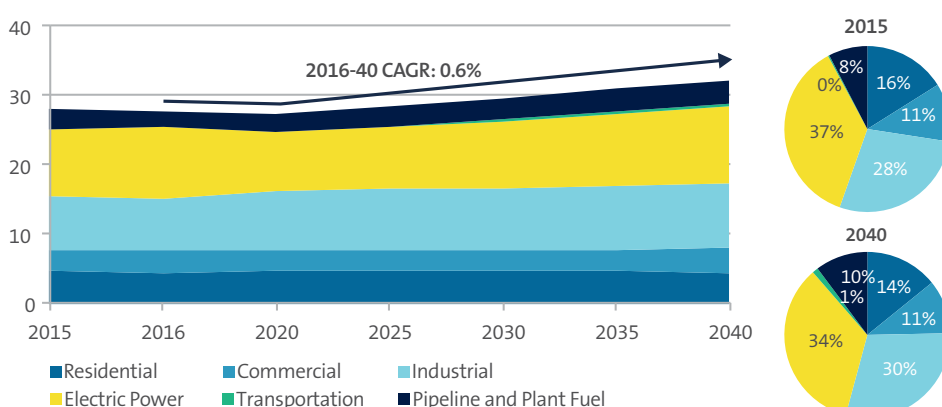
Technological developments in natural gas are expected to boost production from shale gas and associated gas from shale oil projects. Demand from industrial and electric power markets are expected to drive consumption of US natural gas at an annual growth rate of 0.6% over the next 25 years. However, production is expected to grow much faster (at an annual rate of 1.5%) resulting in an annual surplus of almost 6tcf (trillion cubic feet of natural gas) by 2040, as the US is expected to produce 38tcf and consume 32tcf annually. This amount will be exported through pipelines (e.g. 1.4tcf to Mexico in 2040) and liquefied natural gas (LNG) export terminals (4.4tcf in 2040). Most LNG is currently traded globally under oil price-linked contracts, but LNG produced in the US has the key advantage that domestic prices are less sensitive to global oil prices, which may change pricing dynamics in the future.

Figure 9. US Natural Gas Exports (tcf)



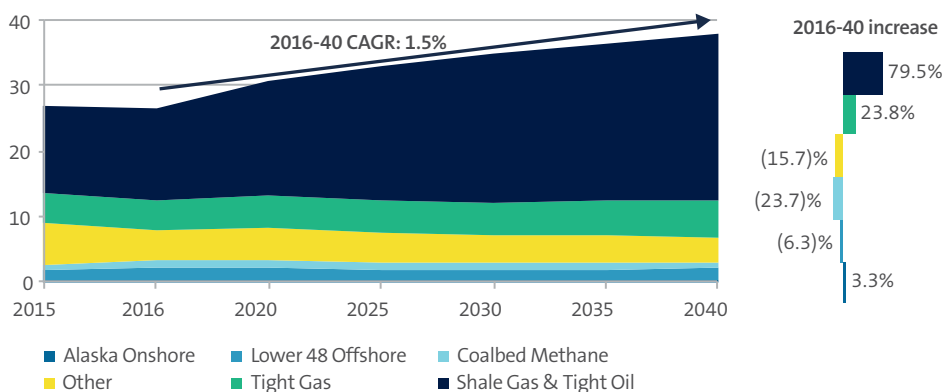
Source: IEA Annual Energy Outlook 2017.

Figure 10. US Natural Gas Consumption (tcf)



Source: IEA Annual Energy Outlook 2017.

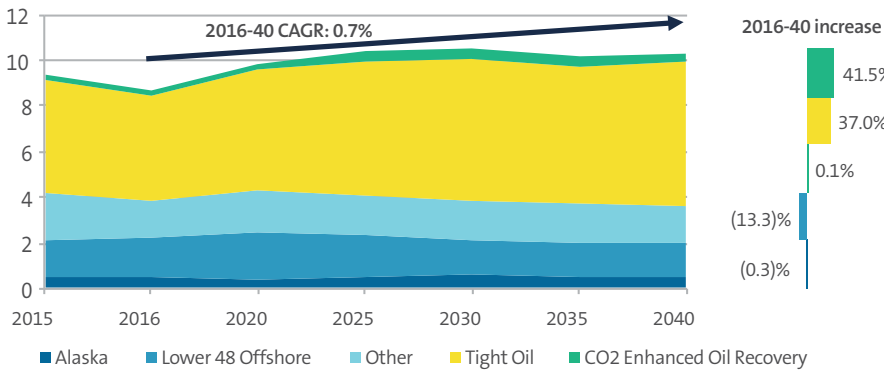
Figure 11. US Natural Gas Production (tcf)



Source: IEA Annual Energy Outlook 2017.

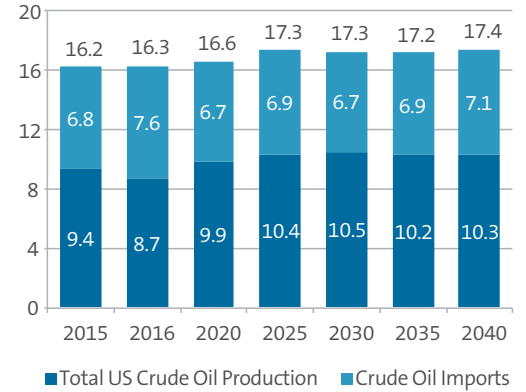
The development of US shale oil reserves (e.g. Permian, Eagle Ford, Bakken, etc.) represents the key driver of future oil production growth, with an estimated overall increase of 37% during 2016-40. US offshore production will increase to 2mbpd (millions of barrels per day) until 2020, before slowly declining when it is expected that new discoveries will no longer fully offset the declines in existing fields. Ongoing improvement in productivity is the main unknown that will impact future production growth.

Figure 12. US Crude Oil Production (mbpd)



Source: IEA Annual Energy Outlook 2017.

Figure 13. US Total Crude Oil Supply (mbpd)



Source: IEA Annual Energy Outlook 2017.

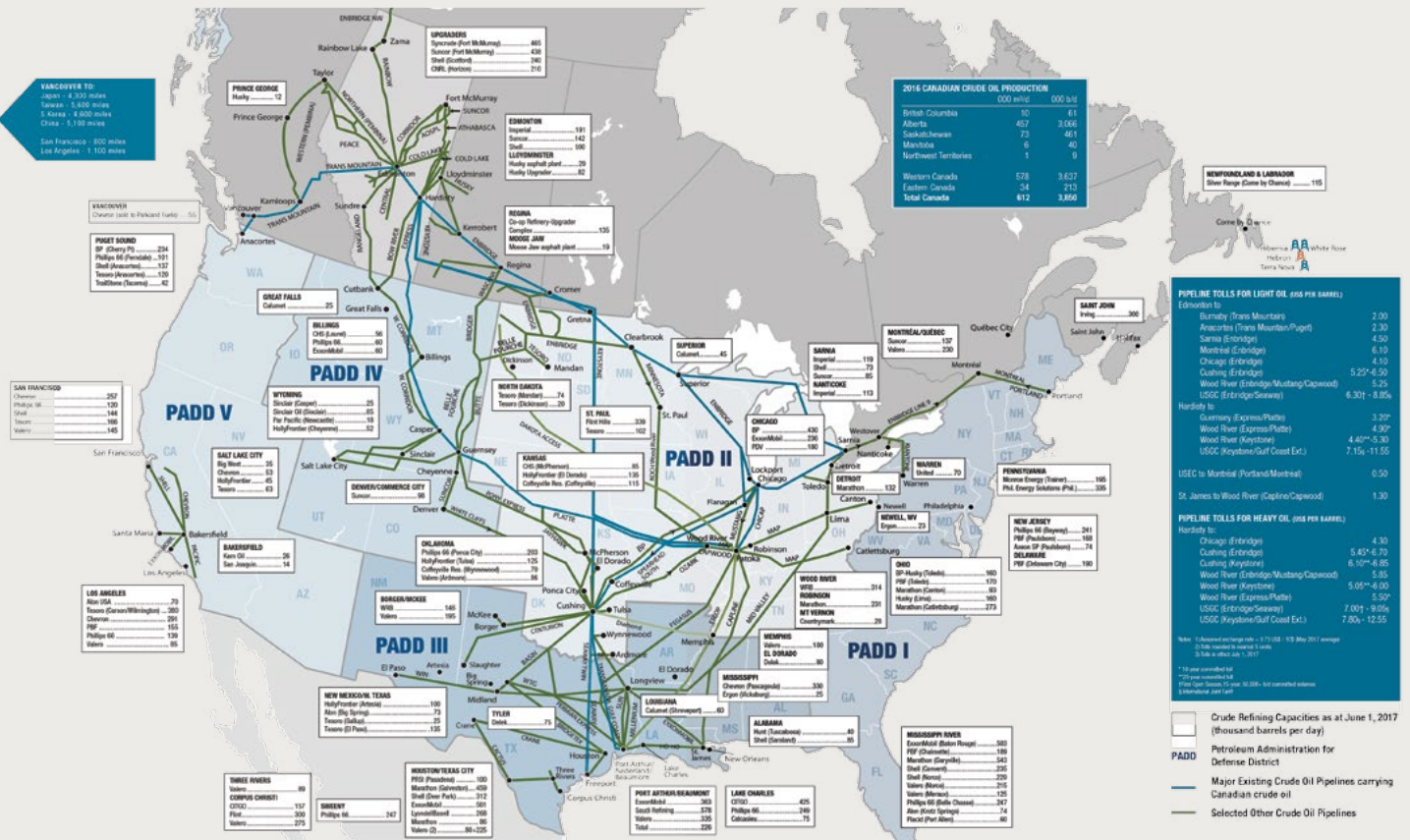
Investment opportunity in oil and natural gas storage and transportation

Monopolistic companies that own large and diversified networks offering attractive yields and growth opportunities from future projects represent compelling investment opportunities. Investors should aim to avoid businesses that are highly sensitive to volatility in volumes and/or commodity prices. They should look to identify companies that demonstrate:

- > Growth – from future projects
- > Cash flow stability – from fee-based contracts supported by strong regulation
- > Yield – derived from compelling shareholder returns

Such an investment framework enables investors to capture long-term value in the energy infrastructure sector while avoiding short-term volatility in the commodity environment. North American energy infrastructure companies are today uniquely positioned to take advantage of the compelling long-term trends that are currently unfolding in the oil and natural gas supply industries.

Figure 14. North American Crude Oil Infrastructure System



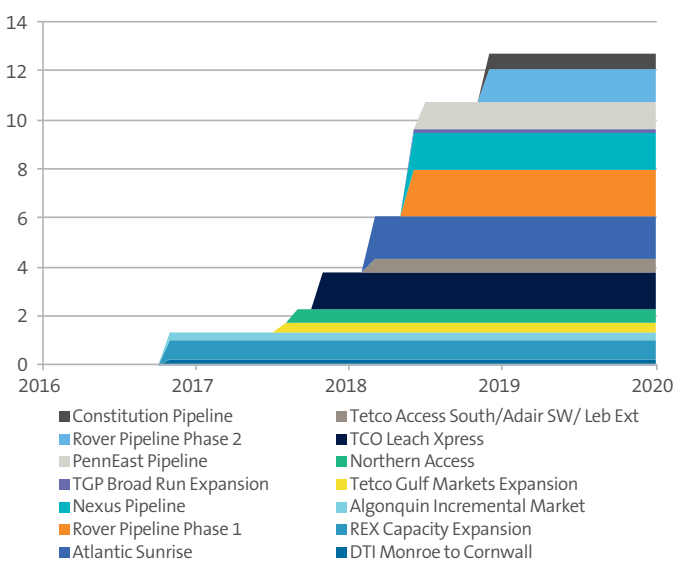
Source: Canadian Association of Petroleum Producers (CAPP).



In order to satisfy the long-term needs of oil and natural gas consumers and to connect the shale projects to the demand centres, additional infrastructure (i.e. pipeline and LNG export terminals) is required. In order to connect the prolific Marcellus and Utica natural gas projects to the Gulf of Mexico coast, significant construction of pipelines will take place in the Northeast over the next couple of years.

This will add 11bcf/d (billion cubic feet per day) of takeaway capacity (total capacity of the crude oil or natural gas pipeline) and improve basis differentials (the difference between the spot price and future price of a commodity) and producer netbacks (the difference between the revenues earned from the commodity and the total costs associated in delivering the commodity to market).

Figure 15. US Northeast Pipelines Over 2017 and 2018 (bcf/d)

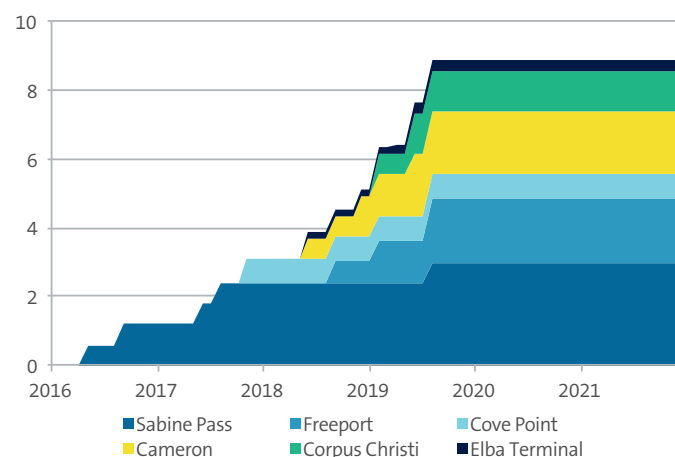


Source: FERC and Wall Street research.

This pipeline build-out will improve interconnectivity significantly, allowing the transportation of molecules to the southern US border for export to Mexico and the Gulf Coast. This will provide feedstock, or the raw material, to the LNG export facilities that are currently under construction. Currently six terminals have reached the final investment decision (FID) stage, which will provide an expected export capacity of 9bcf/d by the end of the current decade.

This pipeline construction activity also facilitates an increase in exports of US natural gas to Mexico to meet its increased demand for fuel for electrical power generation. Furthermore, the new US administration is proving to be fossil fuel “friendly”, providing easier access to permits, however intervention by state governments and political opposition continues.

Figure 16. US LNG Export Capacity (bcf/d)



TERMINALS WITH FID	EXPORT CAPACITY	
	MTPA	BCF/D
SABINE PASS	22.5	3.0
FREEPORT	13.9	1.9
COVE POINT	5.3	0.7
CAMERON	13.5	1.8
CORPUS CHRISTI	9.0	1.2
ELBA TERMINAL	2.5	0.3
TOTAL CAPACITY	66.7	8.9

Source: FERC and Wall Street research.



Divergence in market valuations and fundamentals

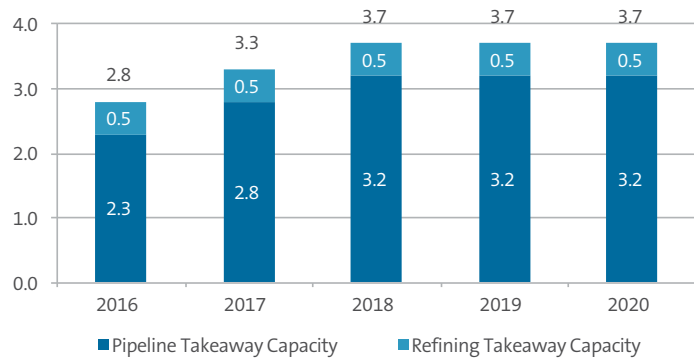
A significant opportunity lies ahead to satisfy additional demand. However the capital investment required to facilitate the next stage of energy infrastructure growth is expected to be less than that made during the previous cycle. This is due to several factors including the expected growth rate of demand and the amount of expandable capacity installed today compared to that at the beginning of the “shale boom”.

The next capital expenditure cycle will build on the extensive networks already installed and operated across the continent. Increasing connectivity is essential for producers to get their products to market. Meanwhile larger networks will better accommodate the increased volumes without the same historic level of capital being required to deliver growth.

Pipeline operators are going to benefit from higher utilisation rates on existing assets and lower-risk growth projects to connect marginal volumes to the existing systems, i.e. brownfield expansion. Importantly, this is likely to lead to higher cash flows being generated by pipeline companies. This comes as capacity installed during the previous investment cycle becomes fully operational, utilisation rates increase and expenditure levels fall. This operating environment may also lead to higher free cash-flow yields and lower overall leverage ratios, all of which are supportive for the long term sustainability of the industry.

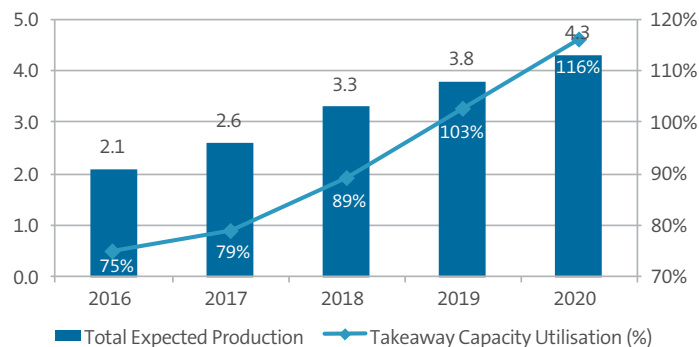
Oil production growth resumed in 2016 following the rebound in commodity prices; those basins that enjoy low break-even costs are likely to be used more intensively during the next couple of years. The Permian basin in West Texas could see its takeaway capacity exhausted by 2019 depending upon commitments to underpin the expansion of brownfield projects. Moreover, by the end of the decade, there could also be a need for green field expansion projects to avoid significant basis widening, i.e. the spot price increasing faster than the future price.

Figure 17. Permian Takeaway Capacity (mbpd)



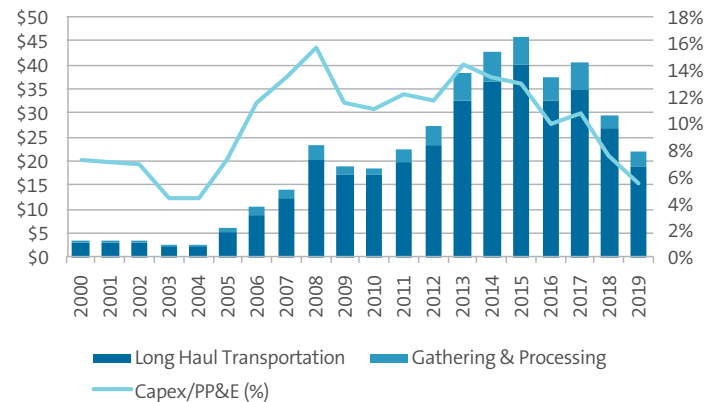
Source: Wall Street research.

Figure 18. Permian Production (mbpd)



Source: Wall Street research.

Figure 19. Capital Investment (\$billion)



Source: Bloomberg as of 30-Jun-2017. Estimates (2017-19) based on consensus. Transportation includes: ENB, EPD, ETE, IPL, KMI, PAGP, TRP, VSN and WMB. Gathering & Processing includes: ENLC, GEI, KEY, MMP, OKE, PPL, SEMG and TRGP.

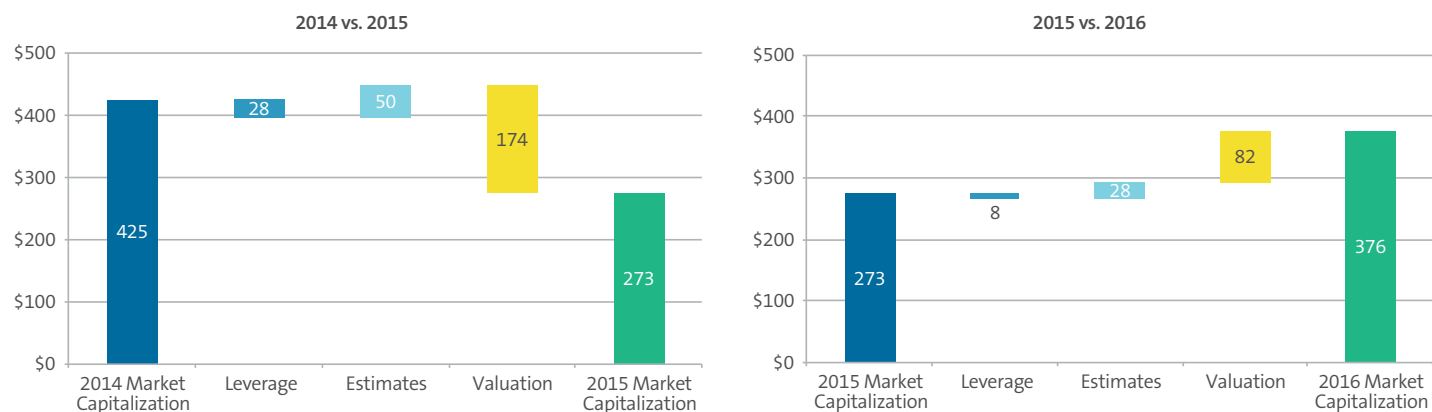
Increasing connectivity is essential for producers to get their products to market.



The attractiveness of an investment opportunity depends on the price paid for the asset. This is no different for infrastructure investing, including North American energy infrastructure companies that own and operate pipelines. The significant decline and the subsequent rebound of energy markets led to weakness in all related equity sub-sectors, including midstream infrastructure assets (this refers to those that are involved in the transportation and marketing of the crude or refined products). This is despite these assets being characterised by more stable cash flows, underpinned by long-term contracts.

Lower oil prices placed increasing pressure on producers, resulting in a significant number of companies filing for bankruptcy protection during the downturn. Investors began raising questions about midstream contract structures and the treatment of these contracts in bankruptcy proceedings. This raised the possible effect of contract renegotiations and withdrawals on cash flows that would negatively impact these companies. Despite the stability and resilience of their cash flows, counterparty risk emerged as an ongoing concern for pipeline companies and has resulted in a considerable de-rating of the sector from a valuation perspective.

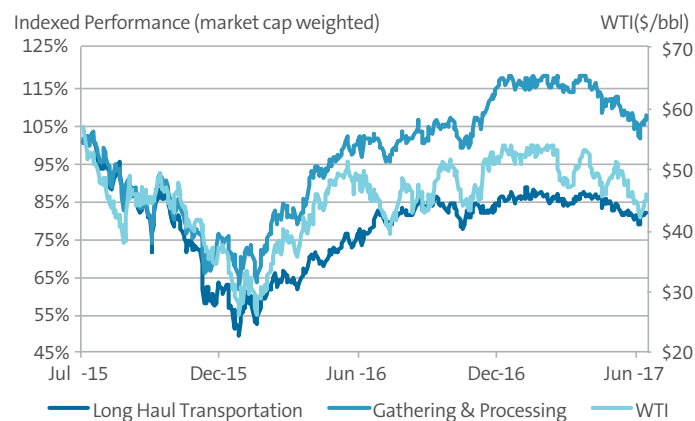
Figure 20. US Energy Infrastructure - Evolution of Market Capitalisation (\$billion)



Source: Bloomberg as of 31-Dec-2016. Companies included in the analysis: ENB, ENLK, KMI, SE, OKE, IPL, PPL, PAGP, KEY, TRP, GEI, WMB, VSN, TRGP, SEMG, EPD, ETP, MMP and SEP.

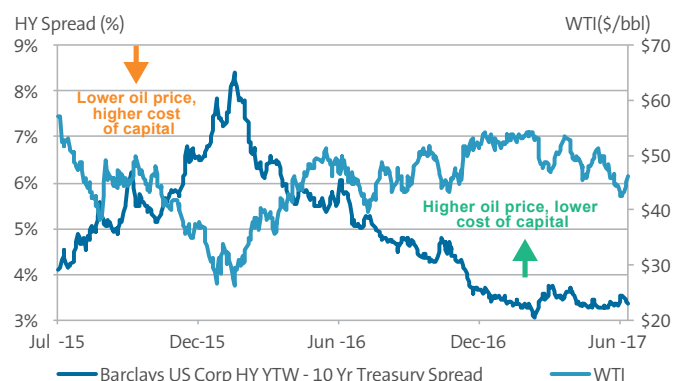
Market valuations in the sector bottomed in February 2016, but have subsequently rebounded since. However, within the broader energy infrastructure space, the share prices of companies that are more exposed to the commodity cycle (e.g. those engaged in the gathering and processing stages of production) have materially outperformed companies with a more stable and fee-based, long-haul transportation business model. This is due to their higher exposure to commodity prices and a more volatile cost of capital.

Figure 21. Trading Performance



Source: Bloomberg as of 30-Jun-2017. Transportation includes: ENB, EPD, ETE, IPL, KMI, PAGP, TRP, VSN and WMB. Gathering & Processing includes: ENLC, GEI, KEY, MMP, OKE, PPL, SEMG and TRGP.

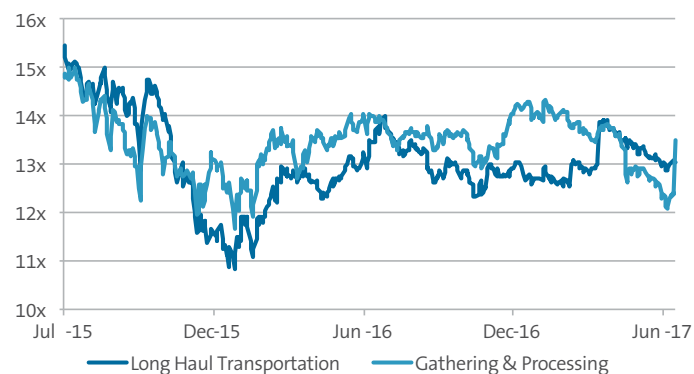
Figure 22. Commodity Volatility vs. Cost of Capital



Source: Bloomberg as of 30-Jun-2017. Transportation includes: ENB, EPD, ETE, IPL, KMI, PAGP, TRP, VSN and WMB. Gathering & Processing includes: ENLC, GEI, KEY, MMP, OKE, PPL, SEMG and TRGP.

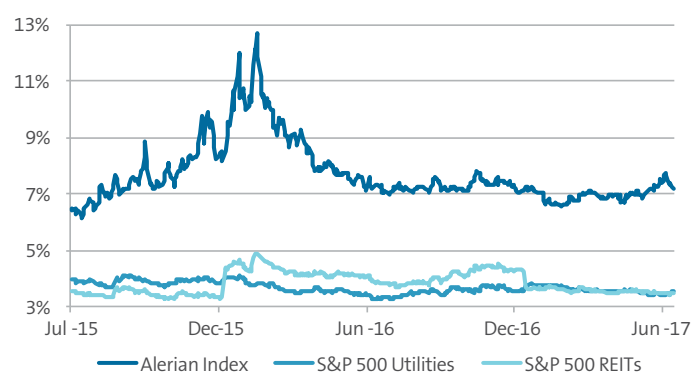
The volatility in commodity prices has therefore prompted a significant dislocation between value and fundamentals in midstream infrastructure companies. This has resulted in an attractive opportunity, still available today, to acquire high quality companies engaged in long-haul energy transportation. These trade at a market discount relative to the more cyclical businesses engaged in gathering and processing. Intuitively and historically, the higher quality long haul pipeline companies have traded at a premium due to their lower correlation to commodity prices and their higher quality regulated or long-term contracted cash flows. Furthermore, the dividend yield of the sector is favourable relative to historic levels and when compared to other yield-oriented sectors such as listed real estate and utilities.

Figure 23. NTM EV/EBITDA



Source: Bloomberg as of 30-Jun-2017. Transportation includes: ENB, EPD, ETE, IPL, KMI, PAGP, TRP, VSN and WMB. Gathering & Processing includes: ENLC, GEI, KEY, MMP, OKE, PPL, SEMG and TRGP.

Figure 24. Dividend Yield



Source: Bloomberg as of 30-Jun-2017. Transportation includes: ENB, EPD, ETE, IPL, KMI, PAGP, TRP, VSN and WMB. Gathering & Processing includes: ENLC, GEI, KEY, MMP, OKE, PPL, SEMG and TRGP.

This relative price differential is likely to reverse and hence the current dislocation represents a compelling value opportunity for investors with exposure to assets in this sector.

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