

SEPTEMBER  
—  
2018

## A COMPELLING OPPORTUNITY IN REAL ASSETS



Real assets, defined here as natural resources and infrastructure, are an essential part of the global economy. Today, we believe there is a vast opportunity to develop, own and operate tangible real assets—from commodity reserves and production assets to the physical infrastructure that is critical to transporting, storing and converting those commodities to a usable form in the real economy.

The investment opportunity is supported by several long-term macroeconomic trends that may serve as tailwinds to the asset class going forward—global population growth, urbanization and an increasingly wealthy middle class, to name a few. In recent years, investors have turned increasingly toward real assets in an effort to enhance their portfolios by targeting stable long-term returns, protection against inflation and portfolio diversification amid an uncertain global environment.

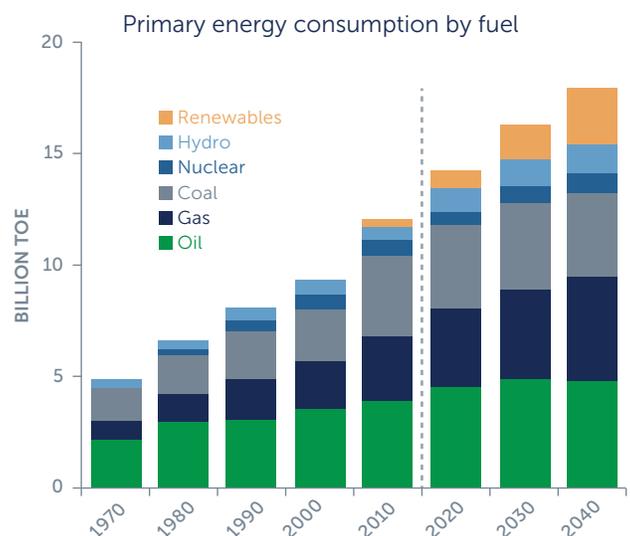
### Setting the Stage: Macro Tailwinds

#### POPULATION GROWTH

The global population is expected to reach 9.7 billion by 2050<sup>1</sup>, with the growth concentrated largely in emerging markets such as Asia (specifically India) and Africa. This projected growth has significant implications for the real assets market. For one, surging populations increase requirements for basic infrastructure to support the movement of people and products, as well as next generation, high-tech infrastructure to deliver digital connectivity. At the same time, a rising global population increases demand for basic services, including electricity and heat, thereby driving demand for commodities like oil and gas, as well as for newly competitive renewable energy solutions.

In fact, against this backdrop of growing global demand, the International Energy Agency (IEA) is forecasting a 62% increase in global power consumption between 2015 and 2040, as measured by tonnes of oil equivalent, with renewables accounting for an increasing percentage of the total (FIGURE 1). In order to support this growth—and specifically to transport oil and gas—the demand for energy midstream assets such as pipelines, import and export terminals and storage facilities, is expected to increase concurrently.

FIGURE 1: GLOBAL POWER GENERATION IS EXPECTED TO INCREASE 62% BY 2040



SOURCE: THE INSTITUTE FOR ENERGY RESEARCH. AS OF MARCH 5, 2018.

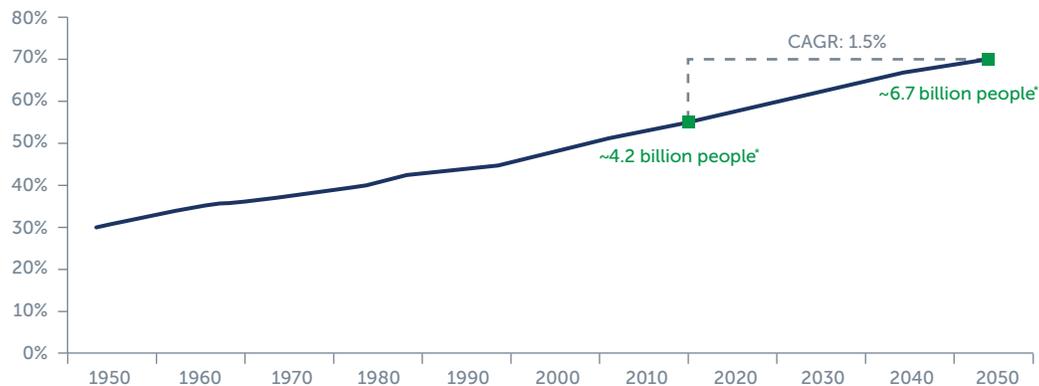
1. Source: United Nations DESA/Population Division. As of July 29, 2015.

**URBANIZATION**

As populations grow, and people migrate increasingly into urban areas (FIGURE 2), a new type of demand is surfacing alongside the historically strong demand for basic materials such as base metals and timber. This new urban demand is expected to disrupt conventional electricity distribution models and focus capital investment on telecommunication solutions that can accommodate developments in smart technology and growing data usage. To keep up, in-city infrastructure will have to adjust and modernize, a change that we believe will require significant private capital investment.

The implications of this evolution are far-reaching and likely to impact the full spectrum of real assets, from transportation and telecom to energy midstream and power generation.

**FIGURE 2: THE PERCENTAGE OF POPULATION IN URBAN AREAS IS EXPECTED TO INCREASE STEADILY THROUGH 2050**



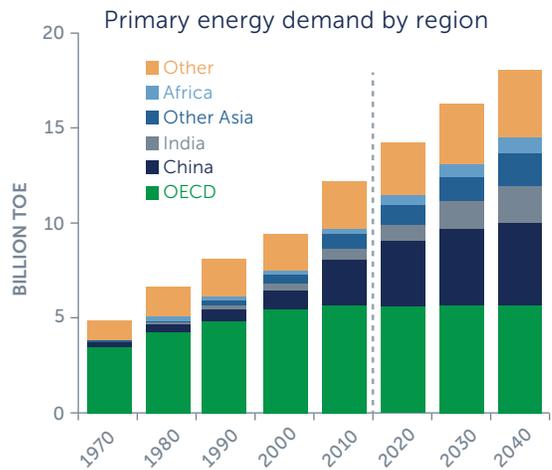
\*ASSUMES A POPULATION OF ROUGHLY 7.6 BILLION IN 2018 (4.2 BILLION IN URBAN AREAS) AND ROUGHLY 9.8 BILLION IN 2050 (6.7 BILLION IN URBAN AREAS). BASED ON CURRENT INFORMATION AND PROJECTIONS FROM THE UNITED NATIONS DESA/POPULATION DIVISION.  
SOURCE: UNITED NATIONS DESA/POPULATION DIVISION; BAI. AS OF 2018.

**THE GROWTH—AND INCREASING WEALTH—OF THE GLOBAL MIDDLE CLASS**

The global middle class is expanding rapidly and is expected to represent a majority of the population by 2020. As a greater percentage of the population spends its discretionary income on larger homes and cars and increased support for existing services, as well as on leisure-related pursuits like travel, e-commerce and cell phone usage, the need for telecommunication and transportation infrastructure to meet this increased demand has also grown (FIGURE 3).

At a higher level, consumption patterns are likely to change over time as technological innovation continues to change the products we use. For example, electric cars are expected to experience increased adoption by a global middle class that is growing in both size and wealth. We expect these changing consumption patterns to facilitate increased data and electricity usage, and generate strong long-term demand for the assets—from roads to batteries to cell towers and other wireless infrastructure—necessary to support this evolution.

**FIGURE 3: AS THE GLOBAL MIDDLE CLASS GROWS, DEMAND FOR ENERGY IS EXPECTED TO INCREASE**



SOURCE: BP ENERGY OUTLOOK. 2018 EDITION.

## Current Opportunity: Short-Term Disruption

### THE ENERGY VALUE CHAIN

While many investors understand the potential benefits of a long-term investment in real assets, fewer understand where the tangible investment opportunities exist today. At Barings, we see particular value in real assets sectors that, while supported by long-term macro tailwinds, are undergoing notable changes due to technological advancement and disruption. Perhaps the clearest example of innovative technology leading to investment opportunities can be seen across the energy value chain, where we see potential opportunities across the upstream, midstream and power generation segments:



### ENERGY UPSTREAM

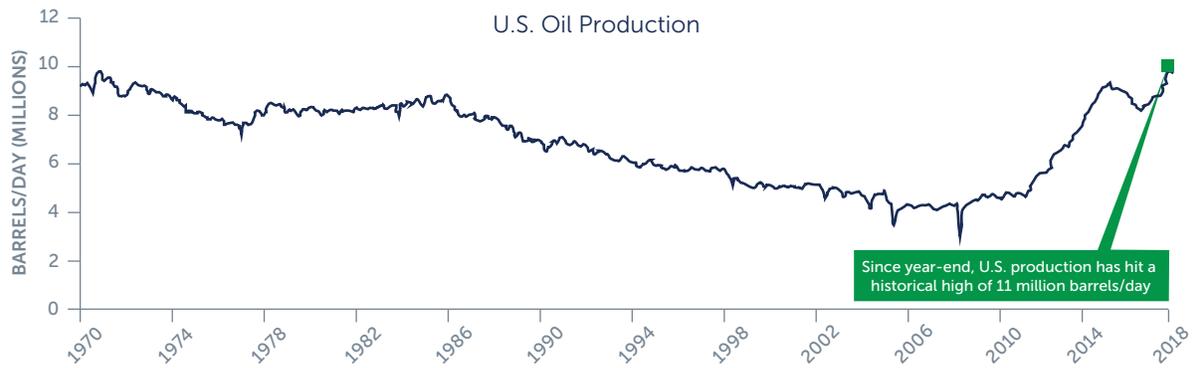
In upstream oil and gas, technological advancements such as horizontal drilling and hydraulic fracturing have enabled efficient and economical access to previously undeveloped reserves. Specifically, new seismic mapping technology has improved the process of identifying hydrocarbons, significantly reducing exploration risk. When advanced geological techniques are combined with improved drilling technologies that allow operators to target specific deposits or broad, lateral shale plays, it allows oil and gas to be produced more efficiently than ever before. This is an important point as this technology has contributed to significant production growth in the U.S.

A good indicator of this change is the increase in U.S. oil production over the last 45 years (FIGURE 4). In the 1970s and 1980s, the U.S. produced roughly 8 million barrels of oil per day, all through conventional production (vertical wells, low-tech drilling and completion methods). Production dipped in the early 2000s and then picked up in recent years, reaching roughly 10 million barrels per day at the beginning of 2018 and exceeding 11 million barrels as of July 2018.<sup>1</sup> Today, the U.S. is on track to become the world's largest oil producer by 2023.<sup>2</sup>

1. Source: U.S. Energy Information Administration. As of July 2018.

2. Source: International Energy Agency. As of May 2018.

FIGURE 4: U.S. OIL PRODUCTION HAS INCREASED SIGNIFICANTLY OVER THE LAST DECADE



SOURCE: EIA. AS OF JANUARY 1, 2018.

This U.S. production renaissance has created a number of short-term opportunities across the energy value chain.

One particular opportunity we see is in smaller, unconventional shale oil or natural gas fields where operators are refocusing their portfolios on larger shale resources. As public companies have come under pressure from shareholders to operate within strict free cash-flow parameters, many companies have begun selling non-core oil and gas assets to de-lever and improve their liquidity position. This has in turn created opportunities for smaller private equity investors to buy these “orphaned” assets—whether producing or in development—at attractive prices.

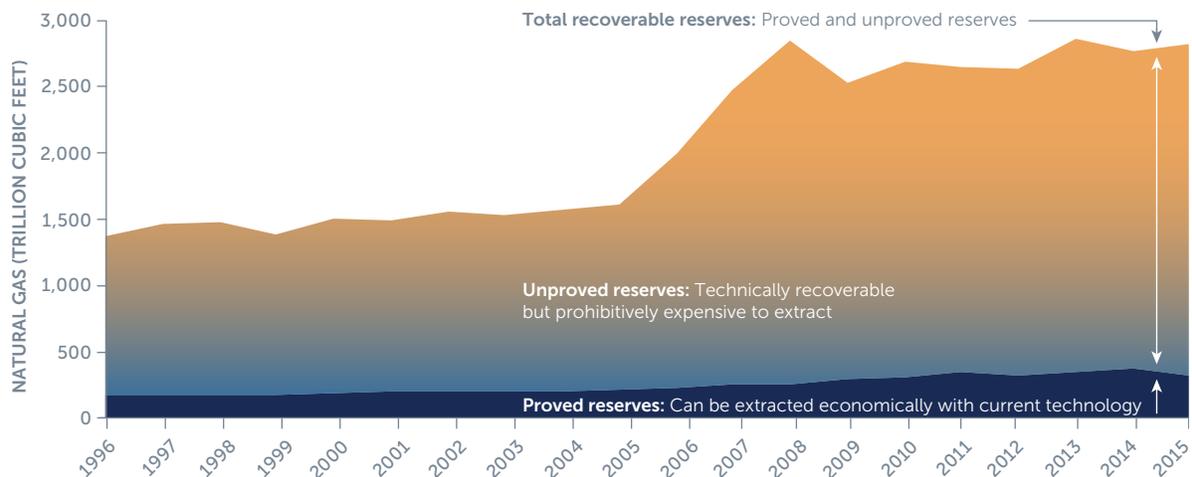
Along similar lines, we also see value in applying new technology to older or less productive reserves. Advancements in drilling and completion techniques—both on-shore and off-

shore—have allowed reserves to be redeveloped and accessed more economically, enhancing productivity and value over time. In our view, this will only be amplified as technology continues to improve the process of identifying economic reserves—today, roughly 10% of total hydrocarbons are being uncovered, but as technology improves that percentage is expected to grow significantly (FIGURE 5). It is also worth noting that while most of the private investment has been in the U.S., upstream opportunities also exist across Continental Europe and, on a smaller scale, in emerging markets.

Finally, as new technology drives production growth, the associated decline rates for unconventional shale oil and natural gas fields are very steep. As a result, the reinvestment required to sustain production is forecasted to be significant over the medium to long term.

FIGURE 5: TODAY, ROUGHLY 10% OF TOTAL HYDROCARBONS ARE BEING RECOVERED, BUT THAT PERCENTAGE IS EXPECTED TO IMPROVE

*Natural Gas: Total Recoverable and Proved Reserves (1996–2015)*



SOURCES: EIA, INSIDE ENERGY; BARINGS. AS OF JANUARY 1, 2015.

**ENERGY MIDSTREAM**

The increase in U.S. oil production has created tremendous demand for energy midstream assets, which has translated into opportunities to invest private capital in infrastructure such as gathering, pipeline, processing and storage assets. To accommodate the massive increase in technology-driven U.S. oil and gas production, and to move that production from geographically-dispersed basins, significant investment is required, not only in gathering and processing assets but also in short and long-haul pipelines to reach domestic demand centers. The macro backdrop also has global implications as increasing demand for electricity and fuel around the world will ultimately require additional assets that can transport resources from their source to a diversified array of international demand centers.

This expansion is already underway, as the U.S. transitions from an oil and gas

importer to an exporter. As a result of this shift, much of the U.S. midstream infrastructure system is being converted in order to support an export business that did not previously exist, creating what we view as an attractive investment opportunity. Today we see value in the reconfiguration of existing midstream infrastructure—the conversion of natural gas terminals for export capabilities—as well as in the construction of new export terminals, pipelines and storage facilities around coastal ports.

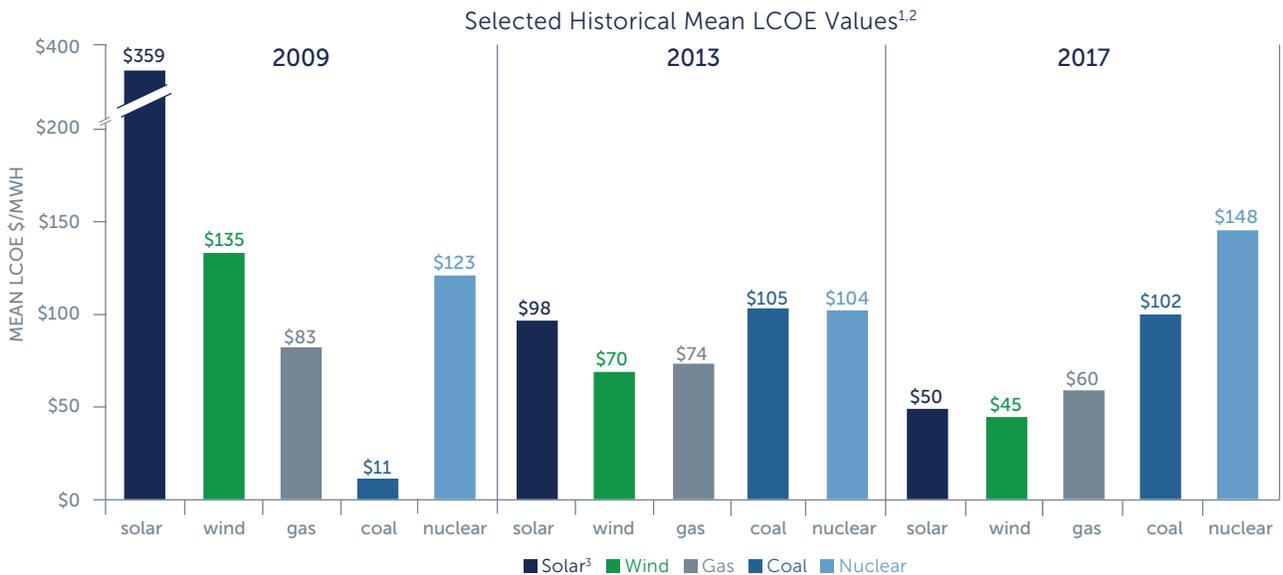
**POWER GENERATION**

Power generation is another segment within the energy value chain that is undergoing a notable shift as a result of long-term structural trends and shorter-term technological innovation. Over the next 45 years, global demand for electricity is expected to require \$35–\$45 trillion in generation investment alone, particularly in emerging markets. In addition to the

economic benefits of increased power accessibility, greater availability of cheap natural gas and improvements in technology around renewable energy continue to reduce the cost of power. These developments have effectively disrupted the entire power delivery ecosystem and made the choice between renewable and conventional generation sources an economic decision, rather than one driven predominantly by social pressures.

As a result, aging, coal-fired generation plants are increasingly being replaced by cleaner power inputs and renewable units. Accelerating the transition, renewables are moving toward grid parity with conventional power generation facilities, as measured by the levelized cost of electricity (LCOE) on a U.S. dollar per mega-watt-hour (USD/MWh) basis (FIGURE 6).

**FIGURE 6: RENEWABLE UNITS MOVING TOWARD GRID PARITY WITH CONVENTIONAL POWER GENERATION FACILITIES**



SOURCE: LAZARD LCOE ANALYSIS, INCLUDING VERSIONS 3.0, 7.0 AND 11.0; BARINGS. AS OF NOVEMBER 2017.  
 NOTE: REFLECTS AVERAGE OF UNSUBSIDIZED HIGH AND LOW LEVELIZED COST OF ELECTRICITY (LCOE) RANGE FOR GIVEN VERSION OF LCOE STUDY  
 1. PRIMARILY RELATES TO NORTH AMERICAN ALTERNATIVE ENERGY LANDSCAPE, BUT REFLECTS BROADER/GLOBAL COST DECLINES.  
 2. REFLECTS TOTAL DECREASE IN MEAN LCOE SINCE THE LATER OF LAZARD'S LCOE--VERSION 3.0 OR THE FIRST YEAR LAZARD HAS TRACKED THE RELEVANT TECHNOLOGY.  
 3. REFLECTS MEAN OF FIXED-TILT (HIGH END) AND SINGLE-AXIS TRACKING (LOW END) CRYSTALLINE PV INSTALLATIONS.

This fundamental shift in power generation and delivery is driving investment opportunities globally. For instance, renewable power projects—traditional hydroelectric facilities as well as solar and wind generation—have become highly efficient from both a production and capital cost standpoint. We also see value in peaking facilities, or facilities run during periods of high (peak) demand. These facilities comprise simple-cycle gas turbines that can support intermittent load on the grid, as well as smaller-scale engines—typically gas-fired or diesel-fired—that can fire up quickly to provide backup power. While renewables represent a large and growing opportunity set, we also see select value in the conventional power space, specifically around existing facilities that require capital to retool toward cleaner energy inputs.

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*Real assets can offer investors many potential benefits, including stable long-term return potential, a hedge against unexpected inflation and low or modest correlations to equity and fixed income investments.*

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#### **ACCESSING THE OPPORTUNITY**

We believe the most effective way to capitalize on the opportunity across real assets is through private markets. Investors that are willing to sacrifice short-term liquidity are in a position to align their capital with the longer-term, structural tailwinds that underpin the growing demand for real assets. Additionally, there are interesting technological disruption and public-sector dynamics that make the current market environment attractive for investors who are considering allocating capital to the sectors.

Our preferred method of accessing the opportunity in real assets, and specifically across the energy value chain, is through partnering with best-in-class sponsors by investing directly into their primary funds and alongside those same sponsors in select equity co-investments, or investments in companies, assets or projects. In recent years, demand for co-investment has grown, given the potential for attractive returns, fee savings and, in some cases, increased manager transparency. This in turn has resulted in increased competition for access to highly coveted deal flow. This heightened competition is particularly evident in the traditional private equity market (buyouts, growth and venture capital). In the real assets space, underwriting co-investments requires specific expertise and an ability to understand complex assets, structures and situations. As a result, there tends to be less competition for real assets co-investments than in the traditional private equity market. We believe reduced competition creates a compelling pipeline of co-investment opportunities.

We also see opportunities in the real assets segment of the secondary market. The secondary market for private equity has grown substantially since the early 2000s. As the market has matured, more buyers have entered and the amount of dry powder seeking secondaries has increased substantially. Similar to co-investments, underwriting real assets secondaries requires specific expertise and experience with complex assets and structures. As a result, based on our observations, there are far fewer participants seeking secondaries in the real assets space than in the traditional private equity market. Based on our belief that this is a less efficient area of the secondary market, we believe the real assets secondaries market presents a number of potentially attractive opportunities.

**CONCLUSION**

Real assets can offer investors many potential benefits, including stable long-term return potential, a hedge against unexpected inflation and low or modest correlations to equity and fixed income investments. Correlations between real assets sectors also tend to be low, meaning investors may be able to further diversify their portfolios by investing across multiple real assets sectors.

In today’s environment, investors are balancing the need for higher levels of return from their private market allocations with the risks associated with investing into a decade-long global expansion. As an investor across various segments of the private markets, we grapple with the same decisions on where to seek the best risk-adjusted returns in the current environment. At this stage, we prefer investments that are supported by long-term, structural tailwinds while offering investors an opportunity to capitalize on cyclical dynamics. Real assets sit squarely at the intersection of compelling secular and cyclical dynamics and continue to be one of our best ideas for allocating private capital in the current market environment.

**A WORD ABOUT RISK**

While we see many benefits to investing in private equity, and specifically in real assets sectors, investing in private equity involves risks. Securities may be illiquid and therefore may need to be sold or redeemed at less than the amount originally invested. Depending on the nature of the specific investment, investors may also be exposed to specific country, sector and/or manager-level risks and may lose part or all of their original investment as a result.

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*As of March 31, 2018*

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