Board of Retirement Regular Meeting

Sacramento County Employees' Retirement System

Agenda Item 23

MEETING DATE: **January 19, 2021**

SUBJECT: **Education: SCERS' Real Assets Strategy**

SUBMITTED FOR: ___ **Consent** ____ **Deliberation and Action** _X_ **Receive and File**

RECOMMENDATION

Staff recommends that the Board receive and file the education presentation provided by Staff and Cliffwater, providing an update on SCERS' Real Assets portfolio.

PURPOSE

This item supports the 2020 Annual Investment Plan to provide education to Board members.

SUMMARY

Since SCERS established the Real Assets asset class in 2012, the industry has changed significantly, which has translated to revisions to the structure of SCERS Real Assets portfolio and approaches toward implementation. This memo provides a background and update on SCERS' Real Assets portfolio and an overview of the real assets sector and its evolution and challenges since SCERS established its Real Assets asset class.

SCERS' REAL ASSETS STRATEGY

When the Real Assets asset class was established in 2012 it included real estate, commodities, treasury inflation protected securities (TIPS), and private real assets (energy and infrastructure mostly). Accordingly, the Real Assets class investment objectives was based not on a singular investment strategy or underlying asset but rather by a broad approach to portfolio construction, including a combination of real assets sub-classes. Commodities was meant to provide both inflation protection and diversification, with real estate and real assets providing modest current income and less return volatility. TIPS were meant to offer inflation protection, diversification, and greater return consistency, but was not expected to enhance returns.

In 2017, SCERS's strategic asset allocation was revised to incorporate a functional approach with three primary asset categories – Growth, Diversifying, and Real Return. Real Assets was separated from Real Estate, Commodities, and TIPS, becoming its own separate asset class within the Real Return asset category. Asset classes within the Real Return asset category include:

- Real Estate, both core and non-core
- Real Assets, including energy, infrastructure, and natural resources
- Commodities, which was reallocated to Liquid Return in 2019
- TIPS and inflation-linked bonds

SCERS Real Return Portfolio	Minimum	Target	Maximum
Real Estate	5%	7%	9%
Real Assets	5%	7%	9%
Liquid Real Return	0%	2%	3%
TIPS	0%	0%	3%
Real Return Asset Category		**16%**	

The Real Assets asset class seeks to achieve the following investment objectives:

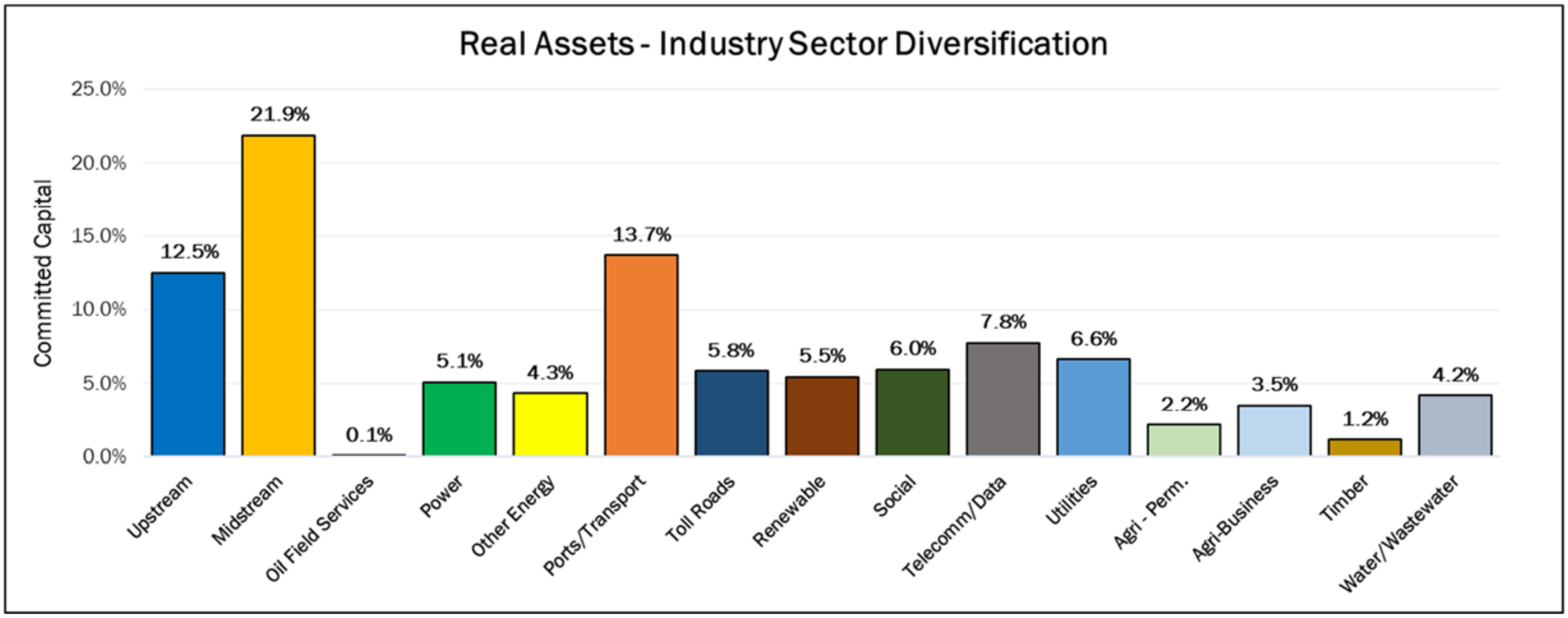
- Attractive returns on a real (net of inflation) basis, with an inflation adjustment
- Diversification for SCERS' total portfolio, including low or negative correlation to equities
- Moderate income and cash flow generation
- Greater consistency in the return distribution and muted downside risk

Located in predominately developed markets worldwide, underlying real asset investments may include a broad array of sub-asset classes and strategies primarily across infrastructure, energy, and agriculture, including:

- Transportation
  - Toll roads; bridges and tunnels; airports and seaports; public parking; marine terminals; freight and logistics; public transportation
- Utilities
  - Power transmission and distribution; water and sewage treatment; distributed energy networks
- Energy
  - Oil and gas exploration and production; oil and gas pipelines and storage; oil and gas royalties; renewable energy; battery storage; energy services
- Telecommunications
  - Cell towers; fiber and fiber-optic networks; data centers; small cell networks
- Social Infrastructure
  - Educational facilities, sports facilities; healthcare and medical facilities; judicial buildings (courthouses, correctional facilities, and police stations); senior and student housing
- Agriculture

- o Permanent and row crop production; crop inputs and biologics; agriculture processing, storage and distribution; food and agribusinesses; controlled environments and vertical crop facilities
- Timber
- Other natural resources
  - o Metals and mining; carbon credits; wetlands mitigation

As of September 30, 2020, SCRES' Real Assets portfolio sector diversification based on committed capital is shown below:

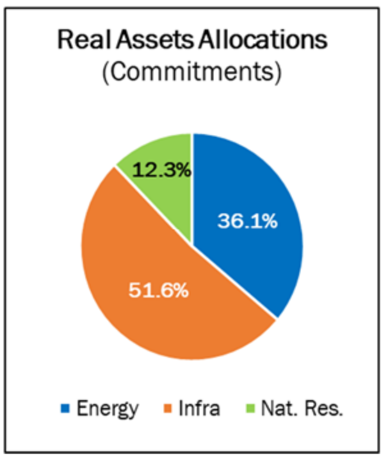


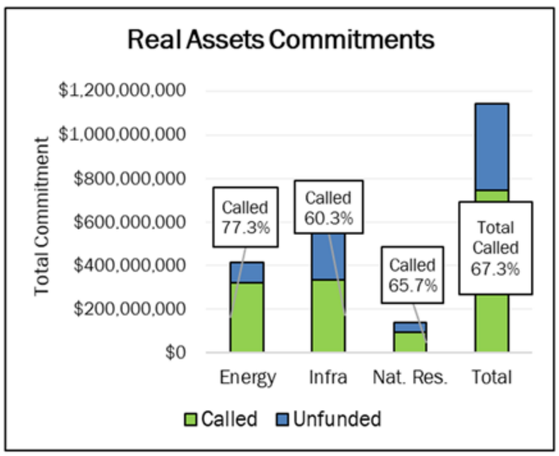
Within SCERS' allocation structure for Real Assets, the allocation will range from 5%-9%, with a target of 7%. As of September 30, 2020, SCERS' actual Real Assets allocation is 5.3% invested versus the 7% targeted. SCERS continues to make progress in building out the Real Assets portfolio, which is projected to reach its 7% invested target in 2023. Per the 2020 Real Assets Investment Plan, a commitment to Real Assets may range from 3-7 fund investments, with a commitment range from $170-$270 million. As of December 31, 2020, SCERS made 4 commitments totaling $140 million, which is below the target of 5 commitments totaling $220 million—somewhat expected given the impact of the Coronavirus pandemic to SCERS' portfolio liquidity and asset class weightings.

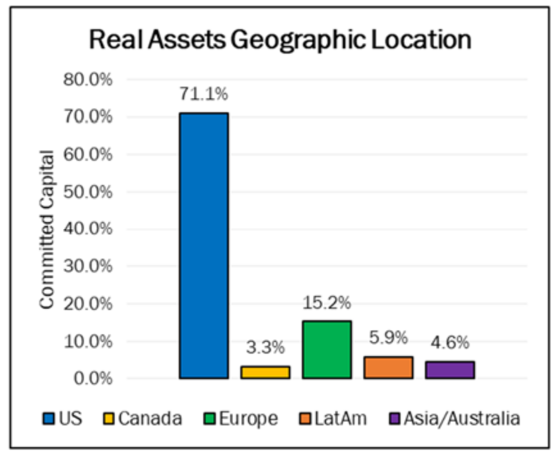
SCERS Real Assets Portfolio Construction				
	Minimum	Target	Maximum	Policy Index Benchmark
Total Real Assets Portfolio	**5%**	**7%**	**9%**	**Custom blend of benchmarks below:**
Infrastructure	30%	**45%**	60%	45% Cambridge Associates Private Infrastructure
Energy	20%	**35%**	50%	35% Cambridge Associates Private Energy
Agriculture, Timber, Other	10%	**20%**	30%	10% NCREIF Farmland + 10% NCREIF Timberland

Staff and consultants are being cautious when it comes to making investments during the pandemic, given the uncertainty surrounding the virus as it relates to the extent of and the duration of its economic impact. Staff had been prioritizing those funds that were already in the due diligence process for a near-term commitment or were existing relationships. Staff and Cliffwater continue to seek out unique and differentiated real assets investment strategies that provide attractive risk adjusted returns, are less sensitive to the broader economy, offer attractive current yield, and/or have the potential to adjust with inflation

As of September 30, 2020, SCERS Real Assets portfolio diversification based on committed capital by investment strategy and geographic region is shown below:







The Real Assets asset class has been structured with significant flexibility to allow sub-asset class allocations to move within ranges, which permits SCERS to move exposures in one segment in favor of attractive risk-adjusted returns in another segment. Also, the asset class has access to a range of investment structures, including closed and open-end commingled funds, as well as customized separate accounts and secondaries.

PORTFOLIO CONSTRUCTION

In balancing the risk-return profile and to achieve the investment objectives of SCERS' Real Assets portfolio, Staff and Cliffwater expect to target approximately 15 long-term manager relationship, with a range of 10-20 managers. Although the number of manager relationships is an ideal target, the number of investment strategies and sector exposures may vary overtime and as such, SCERS' Real Assets exposures are constantly evaluated to maintain an appropriate balance, while achieving its stated investment objective of current income, low correlation, lower volatility, and inflation linked.

In constructing the Real Assets portfolio, Staff has taken a Core-and-Satellite or Hub-and-Spoke approach, where the core or asset class beta exposure represents the Hub or foundational investment. Similar to the approach taken in Real Estate, Staff prefers making foundational investments in open ended core or core plus fund structures, particularly with infrastructure investments. Open ended funds tend to be well diversified by industry sector and geographic regions, where the investment objective is typically to achieve 8%-10% net returns, with the majority of the return coming from current income. Further, because the funds are open ended, it provides SCERS with greater liquidity and allows the ability to add or reduce its exposures over time. Because open ended funds are well diversified, they are expected to generate consistent returns as well as provide current cash distributions ranging from 5%-7% annually.

As SCERS' Real Assets asset class was ramping up, Staff and Cliffwater focused on making commitments to experienced managers in well-known institutional sectors. SCERS' initial commitments were therefore, made in the energy sector, including upstream oil and gas production, midstream energy infrastructure, and power generation. Energy is a large industry sector with a long history of institutional investment and was benefiting from the increasing price of oil and gas, and new approaches to drilling for oil (fracking or horizontal drilling), particularly within the United States, combined with significant demand for the development of energy infrastructure assets. At the time, real assets investing was primarily dominated by oil and gas energy strategies, while infrastructure was a more nascent segment with fewer investment managers and strategies to choose from.

However, as the energy sector began to experience challenges, Staff and Cliffwater felt the upstream energy industry had become too volatile and met fewer of the long-term investment objectives of the Real Assets class and; therefore, implementation has focused less on upstream energy commitments over the past couple of years. Midstream energy, with its long-term contracted income stream and supply-demand imbalance, continued to offer an attractive risk return profile, which supported additional SCERS commitments, including follow-on investments to two midstream energy managers. Yet, as will be discussed, the midstream sector has been equally impacted by the drop in energy prices during the pandemic, as many of its upstream customers have entered bankruptcy, more so than expected. With the energy sector's difficulties, Staff and Cliffwater have been more focused on infrastructure and other real assets opportunities, specifically targeting strategies that have more of the return coming from current cash flow and that exhibit less sensitive to the macro environment and energy prices.

In focusing on infrastructure and the universe of infrastructure funds, there is a limited number of open ended funds that have been through a cycle, though the universe is growing. Searching the Preqin database of over 87,000 funds, there were only 4 core/core plus open end funds targeting North America or Europe before 2012; now there are 14 in total with the majority starting after 2017.

In September of 2015, SCERS made a $125 million foundational investment with IFM Global Infrastructure Fund, an open ended fund, which has generated a net internal rate of return (IRR) of 11.9% since SCERS made its investment. SCERS added a second open ended infrastructure fund in 2020 (Harrison Street Social Infrastructure Fund). Now with SCERS' Real Assets portfolio at 5.3% invested, Staff will be looking to add another open ended core infrastructure fund in 2021 to compliment SCERS' investments in IFM and Harrison Street. Staff and Cliffwater have been evaluating several managers and expect to bring a recommendation to the Board during 2021.

One real assets sector Staff and Cliffwater have spent a considerable effort identifying opportunities is in global agriculture. SCERS made two investments, ACM Permanent Crop II and Paine Schwartz Food Chain V in 2018. Unfortunately the universe of agriculture funds is limited, with many of the managers having limited track records. According to Preqin data, in

2019 there were 12 agriculture funds raised totaling $2.8 billion, with an average fund size of $233 million. Compare that with infrastructure fund raising, where there were 126 funds raised for a total of $111.4 billion and an average fund size of $969 million. Although the agriculture sector is vast and global, it has had difficulty attracting institutional capital. Nevertheless, the pandemic has shown how important the food supply and the supply chain is to our everyday life. Staff has conducted a considerable amount of research in agriculture and continues to support investing in the space, particularly since there are few investors targeting the opportunity. The global themes surrounding agriculture, including diminishing land supply, aging of farm owners, growing middle class in emerging countries, and climate change argue for more institutional investment. Staff and Cliffwater will continue to seek out interesting opportunities in agriculture and recently conducted extensive due diligence on a controlled environment agriculture strategy.

In further building out the real assets portfolio, Staff and Cliffwater continue to seek out investment strategies that can generate alpha/excess returns to the overall portfolio. Staff believes it's these alpha generators where it and Cliffwater can add meaningful value to the overall SCERS portfolio. These types of investments are typically made through closed end fund structures, but can also be made through other structures such as a separate accounts or secondaries. For alpha/spoke investments, Staff believes specialist managers in specific industry sectors and/or geographic regions offer the most attractive returns. Along with Cliffwater, Staff continually looks for differentiated and unique real assets strategies to add to the SCERS portfolio, recent examples of unique strategies is SCERS' investments in Harrison Street Social Infrastructure, an open ended fund targeting education, healthcare, and governmental facilities and NGP Royalty Partners, a closed end fund investing in oil and gas royalties. Both of these strategies provide uncorrelated returns and seek to earn attractive returns, with the majority of the return coming from income.

Looking ahead, Staff and Cliffwater expect to spend the majority of their efforts on the spoke/satellite investments as these alpha strategies can deliver attractive returns to the overall real assets portfolio, while at the same time meeting the investment objectives of providing diversification, low correlations, and current income.

REAL ASSETS INDUSTRY REVIEW

Energy:

The pandemic has exacerbated disruption in the energy sector, creating upheaval in the upstream oil and gas exploration and production industry worldwide, and revealing the challenges still to be overcome in transitioning to alternative energy sources. Even the midstream energy sector, which was considered less vulnerable due to its contracted revenues has felt the economic strain. For the last decade, the midstream sector had drawn large amounts of institutional capital believing the sector was a low-risk, long-term infrastructure play. It was thought that midstream infrastructure was mostly insulated from commodity price swings, but the pandemic exposed the true risk. Industry participants have realized and recognize that the midstream space, particularity in gathering and processing assets, which are closer to the drill bit, entails as much risk as drilling. What has been realized is that the midstream contract structures are only as valid as the upstream customers' ability to be an ongoing concern. The pandemic has forced numerous upstream companies into bankruptcy and an inability to honor their midstream contracts.

Recent struggles with rolling blackouts in California have also highlighted the challenge with renewables. If there is no wind or sun for an extended period of time, utilities have a difficult time providing uninterrupted electricity. All of the developed countries in the world are moving away from hydrocarbon driven energy generation to greener alternatives; however, it is less clear exactly how immediate and sustainable a greener power grid will be. In the meantime, natural gas fired electrical plants continue to have a place and role in generating power for the foreseeable future. Still, there has been a flood of capital targeting renewables globally, and in the U.S., industry participants are finding the market becoming over built with investment returns compressing considerably.

Given the uncertainty in the energy space and recognizing there are hidden risks that are yet known, Staff believes energy investments will remain challenged and at a minimum return outcomes will vary noticeably. The variability of returns and the economic sensitivity of the energy sector should question the role and portfolio fit energy investments play in SCERS' Real Assets portfolio long-term, given that some key objectives of the asset class are low correlation to the macro environment, lower return volatility, and current income. One consideration is should energy be allocated to opportunistically rather than through a dedicated target allocation, or be placed in another segment of the portfolio, outside of Real Assets. In either case, a reduced focus on energy within Real Assets would leave a greater emphasis on infrastructure and natural resource investments to meet the investment objectives of Real Assets.

Infrastructure:

As the infrastructure asset class has matured, the definition of what is infrastructure has become more fluid. Over the last 5 years, infrastructure has evolved beyond monopolistic long term contracted assets with high barriers to entry, long lives, and those which provide essential services. While assets such as roads, airports, utilities, and hospitals are still considered infrastructure, infrastructure managers are also defining assets that exhibit characteristics of infrastructure within the domain of infrastructure investment opportunities. These infrastructure-like characteristics include such features as an essential service or facility, barriers to entry, low price elasticity of demand, long-term stable cash flows, and less macroeconomic sensitivity. Viewing infrastructure from a risk-return attribute opens an investor to a universe of sectors where competitive pressures may be less, the economics more favorable, and which may be less sensitive to economic cycles. Or maybe it's a way for managers to justify investment strategies as they reach for returns in an ever crowded marketplace. It is up to Staff and Cliffwater to exercise diligence as the industry morphs and reacts to macro conditions.

In addition to the change in what defines an infrastructure asset, so too has the risk profiles associated with infrastructure investing. In general, the risk profiles of infrastructure strategies historically followed the same categorizations as real estate – core, core plus, value-add, and opportunistic. However, as investors have become more knowledgeable and gained experience investing in the asset class, infrastructure risk has become more transparent. And with the pandemic, risk categorizations have become even more fluid as the pandemic has significantly impacted many sectors once considered core low risk infrastructure assets, such as airports, toll roads, and utilities. What the pandemic has taught investors is infrastructure assets encompass different and unique risks that may not be defined by a label like core or value-add.

The negative economic impacts felt by the pandemic has highlighted the inadequacy of risk labels for infrastructure as lockdowns have tested infrastructure's resilience. Infrastructure assets previously considered to be core in nature such as airports have been impacted seriously by the crisis, and assets that were not considered infrastructure or were thought to be higher risk such as telecommunications, fiber, cell towers, and data centers, which were not even considered infrastructure just 5 years ago, have shown to be resilient, and if not, flourishing during the pandemic.

With the rapid change in the infrastructure sector, more capital entering the space, and changing risk profiles, investing in infrastructure has become more challenging and complex as it relates to portfolio construction and implementation. The altering of what is infrastructure and how risk categorizations have blurred will require SCERS to periodically refine the Real Assets portfolio, particularity within a Core-and-Satellite framework. It is important to maintain foundational investments, where core infrastructure is truly defined as assets with long-term contracted cash flows, require little operational improvement and have minimal obsolesce or technology risk – assets that you should be able to go to sleep and not worry about performing. Identifying core strategies, those that don't keep you up at night, whether defined by asset, attribute, or in execution, is no longer a simple exercise but one requiring deeper inspection.

Compounding portfolio implementation is that many of the infrastructure strategies being offered by generalist managers are targeting the same sectors in the same regions, consequently leading to overlapping of investment portfolios. This overlapping of strategies and assets will make it more problematic in managing sector exposures. In order to manage sector/geographic exposures and risks while also generating attractive returns, Staff and Cliffwater will specifically search for specialist managers targeting sector specific and geographic specific strategies apart from the generalist funds. Unfortunately, the opportunity set for sector strategies is limited, with renewables being an example that has become saturated and digital being targeted by both generalist and specialist managers.

Infrastructure fundraising has had a strong year despite travel restrictions and lockdowns, with the first nine months of 2020 managing to record its second largest Q1-Q3 showing since 2015, raising a total of $91.3 billion of capital to date (versus $111.4 billion for the 2019 calendar year), according to Preqin data. Given the tendency for large fourth quarter closes, Preqin believes 2020 could be another record year for the infrastructure industry. And in spite of negative impacts brought on by the pandemic, investor sentiment towards infrastructure remains strong, with 56% of institutional investors looking to increase their allocation in the coming year (vs. 39% for real estate) according to Preqin surveys.

While fund raising amounts keep increasing, the number of funds closing sustains its downward trend. However, offsetting the downward trend in the number of funds is funds are getting larger, with the average fund size in 2020 equaling $1.2 billion, up from $969 in 2019 and $587 million just 5 years ago, according to Preqin. Without a doubt, the infrastructure sector has grown considerably, with assets under management globally going from $238 billion in 2012 to over $726 billion midway through 2020, a not to insignificant 15% annual growth rate.

Because of the continual growth in fund raising and increasing dry powder, there is intense competition for assets that is leading to what some industry participants believe are exuberant valuations. As such, unease has begun to creep in among investors, with most industry investor surveys highlighting investors' concerns around stretched asset values and an uncertain economic environment, infrastructure performance may experience a period of muted returns going forward. Yet, despite the unease and uncertainty in the marketplace, institutional investors continue to view infrastructure favorably for its cash yield and less correlated returns.

With heightened competition and increasing asset values, Staff and Cliffwater remain cautious in making new real assets commitments and retain a healthy skepticisms of the blurring of what is infrastructure. As the infrastructure sector has changed, the need for discipline is increasingly important, with fund managers willing to take on more risk and stretch industry categorizations as they search for opportunities in a crowded marketplace. In this highly competitive market, Staff and Cliffwater remain focused on selecting differentiated strategies and managers, especially managers that take an operational approach to generating returns. Staff and Cliffwater continue to favor strategies that generate more of the overall return from income and strategies that focus on operational improvements and capital investment, where the outcome is self-made.

Agriculture:

Over the last several years, the U.S agriculture industry, which represents the largest agricultural market, has experienced a number of headwinds, in particular the U.S. and China tariff wars. The trade spat between China and the U.S. has negatively impacted a swath of row and permanent crops, as well as beef and pork products. Also, during the year, U.S. farmers faced record breaking spring rainfall in the Midwest, which delayed or prevented many row crops from being planted, mostly soybeans, corn, and wheat. Then came the pandemic, which slowed agricultural export volumes due to supply chain disruptions caused by quarantine measures, port closures, and vessel delays. Food retailers immediately felt the impact of the supply distributions as countries shutdown restaurants and food establishments forcing consumers to eat at home.

The pandemic laid bare the weakness in the agriculture and food supply chain as shelter in place forced consumers to spend more on groceries and less on eating out. This quick turnaround in food consumption caught many farmers and grocery chains by surprise as they struggled to meet demand particularly for fresh fruits and vegetables. As consumers pivoted where they purchased their food, the just-in-time delivery model used by almost every major supermarket chain buckled.

The industry's use of just-in-time delivery relies on third party food suppliers to deliver goods directly to distribution centers where supplies are then moved straight onto the grocers' shelves. Without stock rooms or storage facilities, if there are any problems with deliveries or surges in demand, a grocer has no back up inventory or an ability to adjust their supply leading to empty store shelves.

Along with the shift to eating at home, there has been a surge in online grocery and food delivery. Although this trend to online food purchases had been in place, the pandemic has accelerated the pace of adoption, instead of over years, within the span of three or four months. According to eMarketer Retail Forecasting, food and beverage purchases will be the fastest-growing ecommerce category in 2020, with year-over-year growth of 58.5%, followed by health/personal care/beauty at 32.4%, as consumers shift their purchases of essential goods online. With the growth in online food purchases, the food supply chain will feel additional strain.

Consumer concerns over food safety and how food is produced i.e. organic, non-GMO, sustainable production methods, etc. has been as a major trend throughout the U.S. and other developed markets. Understandably, consumers are influencing how food is processed across the supply chain and to stay ahead, retailers and food distributors are requiring their food suppliers to meet stringent health and safety protocols that is altering practices throughout the supply chain. This trend has led to new agriculture products like plant-based meat substitutes, meal delivery services, and agricultural biotechnologies all requiring a high level of sophistication.

Innovation in the agriculture sector is driving efficiency and has led to higher acreage productivity, lower costs per acre, and more conservation of water and soil resources. The innovations in agriculture and the rapid changes in food production will present exciting investment opportunities.

As previously noted, agriculture capital raising isn’t robust and in fact there are only 15 funds globally in the market looking to raise a total of approximately $5 billion targeting the main agriculture regions of North and South America, Europe, and Australia. According to Macquarie Agriculture Funds Management, total institutional investment in farmland globally ranges between $28 billion-$35 billion. Yet, Macquarie estimates the investable universe of farmland globally at some $1 trillion, which means institutional ownership of agriculture is less than 3.5% of the investable universe. Again, highlighting the dearth of institutional capital focused on agriculture despite food and the food supply chain being a critical need worldwide.

CONCLUSION

As the real assets sector has changed and matured, Staff and consultant are faced with newer challenges in constructing and implementing a portfolio that will achieve the objective of current income, low volatility, lower correlations, and which adjusts with inflation. Some of the challenges noted were risk categorizations, definitions, and overcrowded markets.

With these challenges, during the upcoming Asset Liability Modeling Study, the target allocation for Real Assets and the underling portfolio construction will be evaluated in relation to the opportunity set of strategies necessary to construct a diversified portfolio that meets the asset class’ stated investment objectives. Part of the evaluation will focus on what role energy investments should play, and in particular upstream energy within the Real Assets asset class. As noted, upstream energy has seen extreme movements in returns and upstream returns are driven by expected capital appreciation rather than from income, which doesn’t fit well within the objective of real assets. Under consideration is if energy should be allocated to opportunistically rather than through a dedicated target allocation, or be placed in another segment of the portfolio, outside of Real Assets. Whatever approach is taken for energy, it would necessitate adjusting the overall target allocation to Real Assets, and would leave a greater emphasis on infrastructure, agriculture, and natural resource investments to meet the investment objectives.

As Staff and Cliffwater look forward, the ongoing goal will be to further build out the Real Assets portfolio within a Core-and-Satellite framework. In 2021, Staff will be looking to identify another foundational infrastructure investment to compliment SCERS' existing exposure, and will also look to identify differentiated and unique strategies within closed end investment structures where SCERS can generate attractive returns and enhance portfolio diversification. Likewise, Staff and Cliffwater expect to also identify and evaluate interesting opportunities in the agriculture and natural resources sector.

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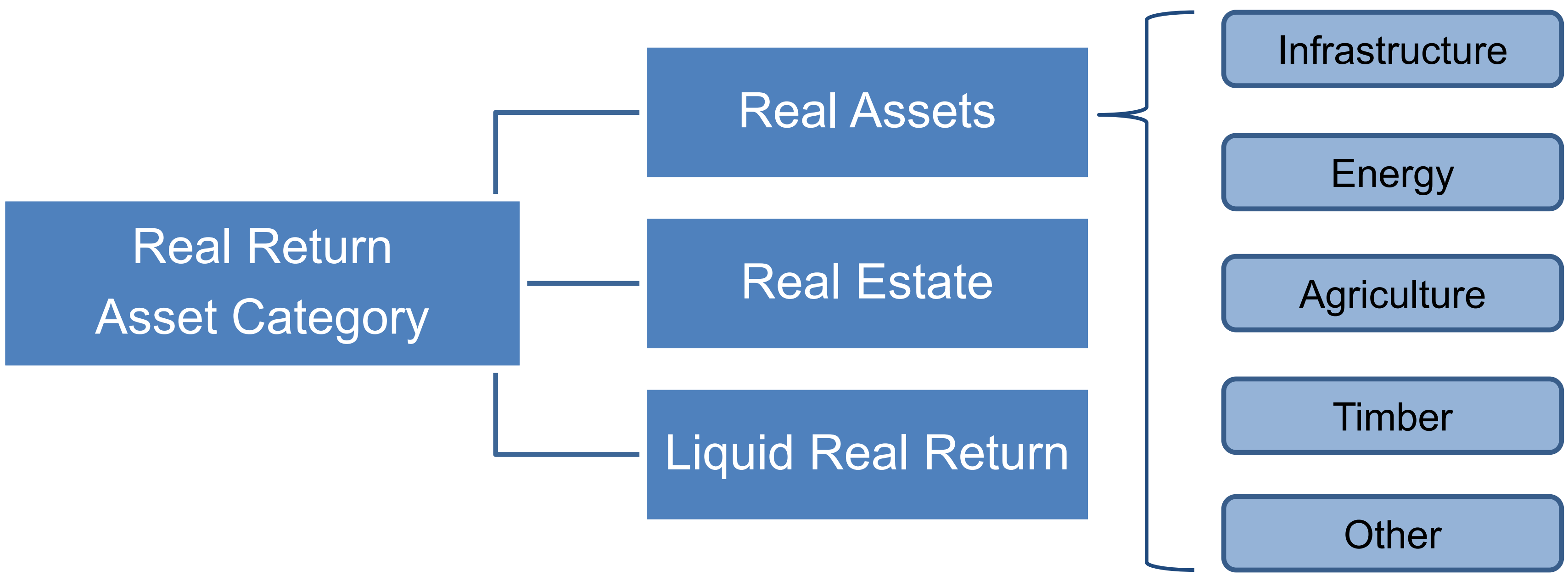
Real Assets – Portfolio Structuring Considerations

January 19, 2021

SCERS Real Assets

The SCERS Real Assets portfolio is a component of the Real Return asset category

- Real Assets includes private (illiquid) funds, excluding Real Estate
    - Primarily composed of Infrastructure and Energy funds, with some Agriculture and Other

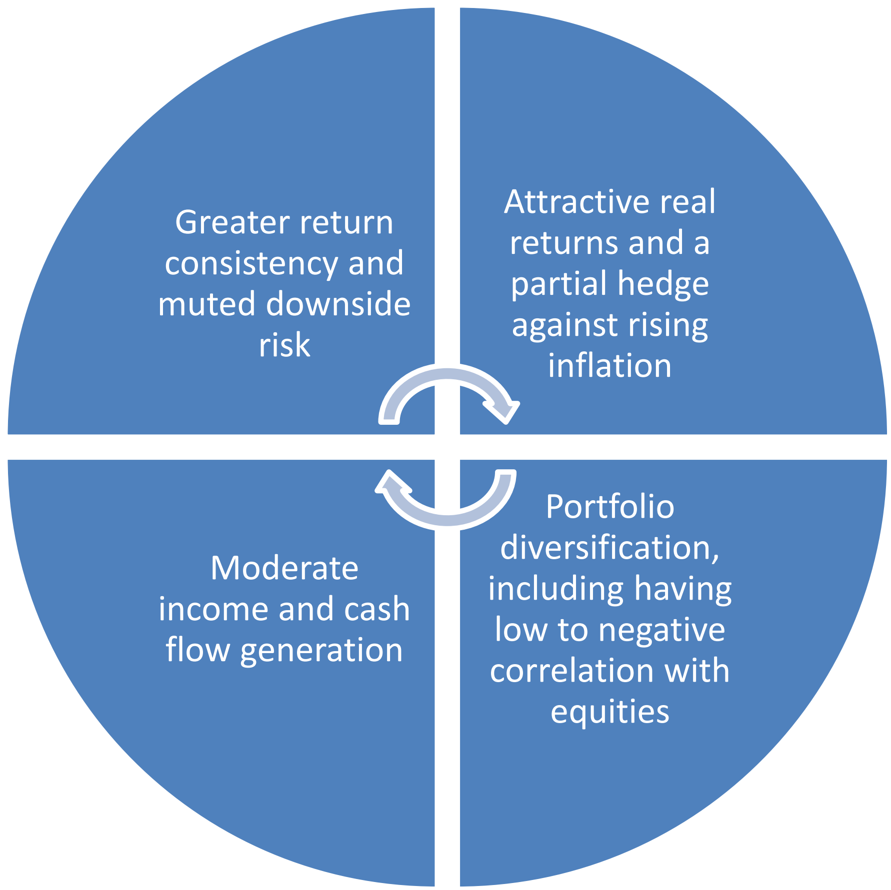


** Liquid Real Return may include inflation linked bonds, floating rate notes, commodities, REITs, and other publicly traded securities*

CLIFFWATER LLC

Real Assets Portfolio Objectives

The SCERS Real Assets portfolio is intended to achieve multiple investment objectives

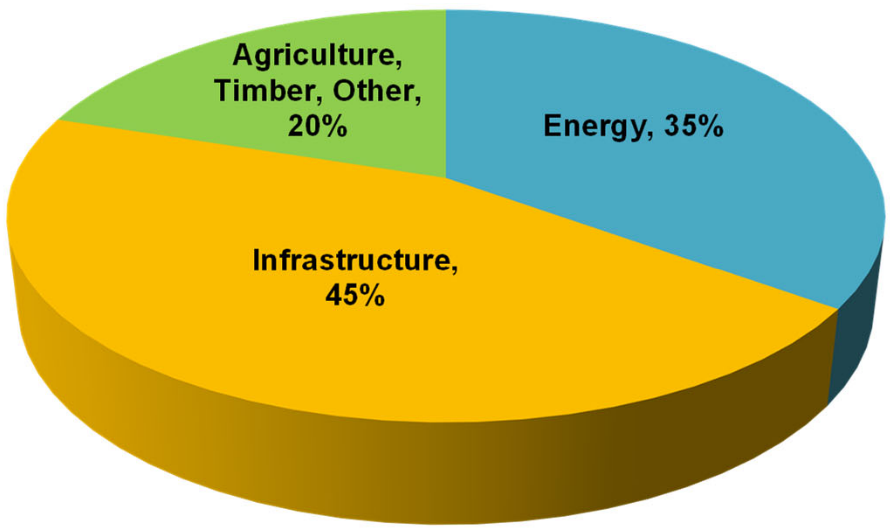


CLIFFWATER LLC

Real Assets Portfolio Composition

SCERS has also developed long-term strategy diversification guidelines for the Real Assets portfolio, as shown below

Long-term Strategy Target Allocations



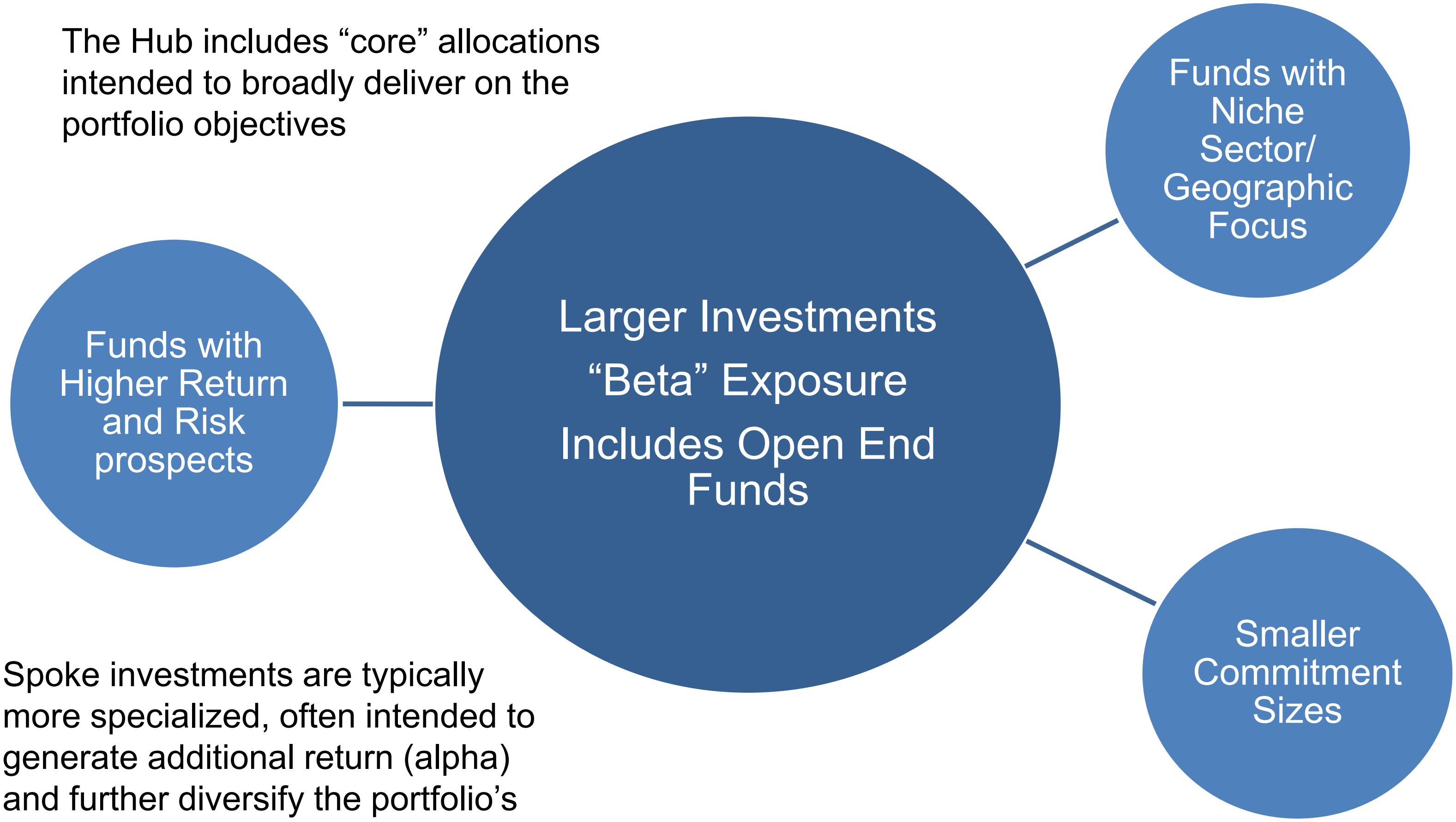
	Target Range
Infrastructure	30% - 60%
Energy	20% - 50%
Agriculture, Timber, Other	10% - 30%

CLIFFWATER LLC

Portfolio Construction – “Hub and Spoke” Approach

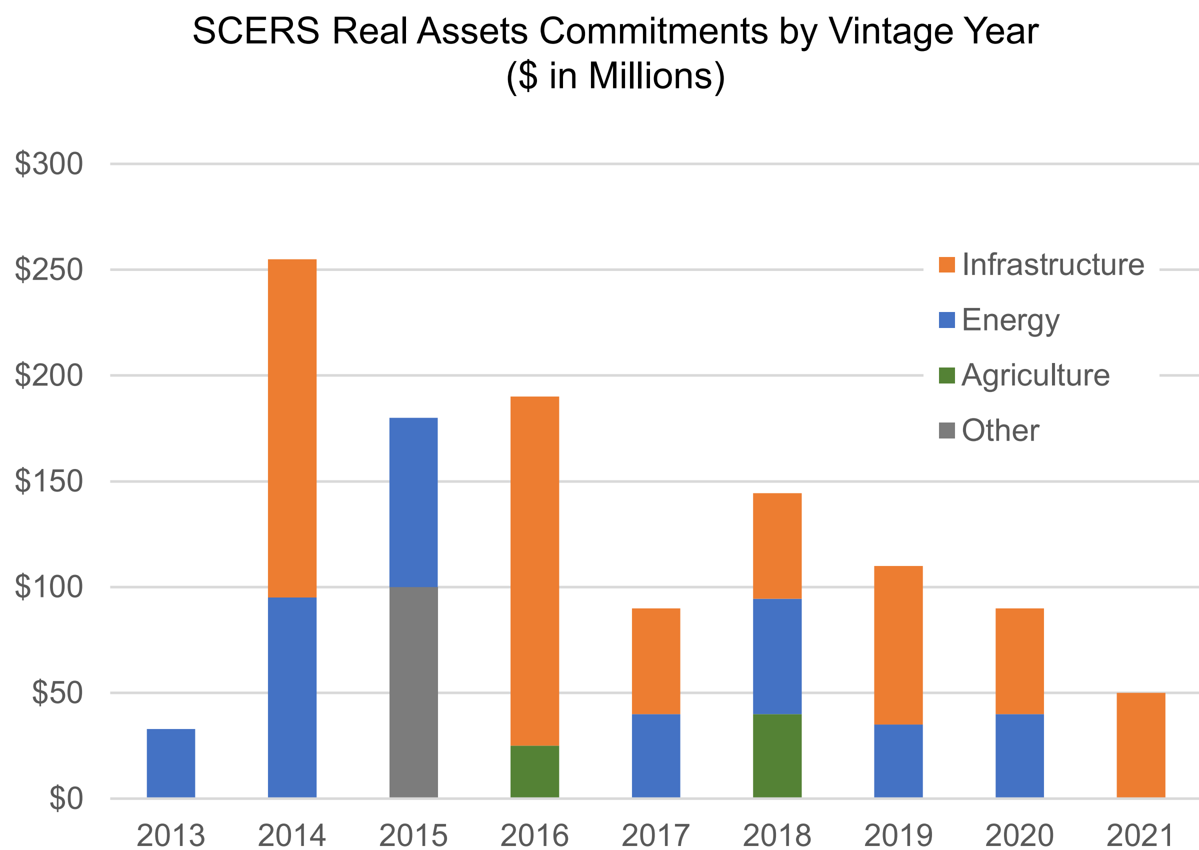
SCERS has taken a hub and spoke approach to constructing the Real Assets portfolio

The Hub includes “core” allocations intended to broadly deliver on the portfolio objectives



Spoke investments are typically more specialized, often intended to generate additional return (alpha) and further diversify the portfolio’s exposure

SCERS' Real Assets Commitment History



SCERS has continued to diversify its Real Assets portfolio exposures over time, though commitment pacing can be uneven

Infrastructure Now Dominating Real Asset Allocations

Infrastructure has seen consistent growth in allocations by institutional investors

- Competition for infrastructure assets has also increased, forcing many infrastructure funds to increase risk through non-traditional investments
- Seeing fewer pure Core strategies; also seeing return compression in low-risk strategies

Infrastructure Risk Categorizations

Core
Target Yield: 6%-8%

- Fully Contracted Cash Flows
- High Barriers to Entry / Monopolistic
- Brownfield or PPPs
- Inflation Sensitive/GDP Insensitive

Core Plus
Target Yield: 5%-8%

- Mix of contracted and market-based cash flows
- Low or Restricted Competition
- Brownfield & Greenfield
- Inflation Sensitive/Partially GDP Insensitive

Value-Add
Target Yield: 0% - 5%

- Shorter Contracts
- Indifferent operating status
- Higher GDP Risk
- Higher Return & Risk

Opportunistic
Target Yield: NA

- Private Equity-Like Investments Within the Traditional Infrastructure Sectors

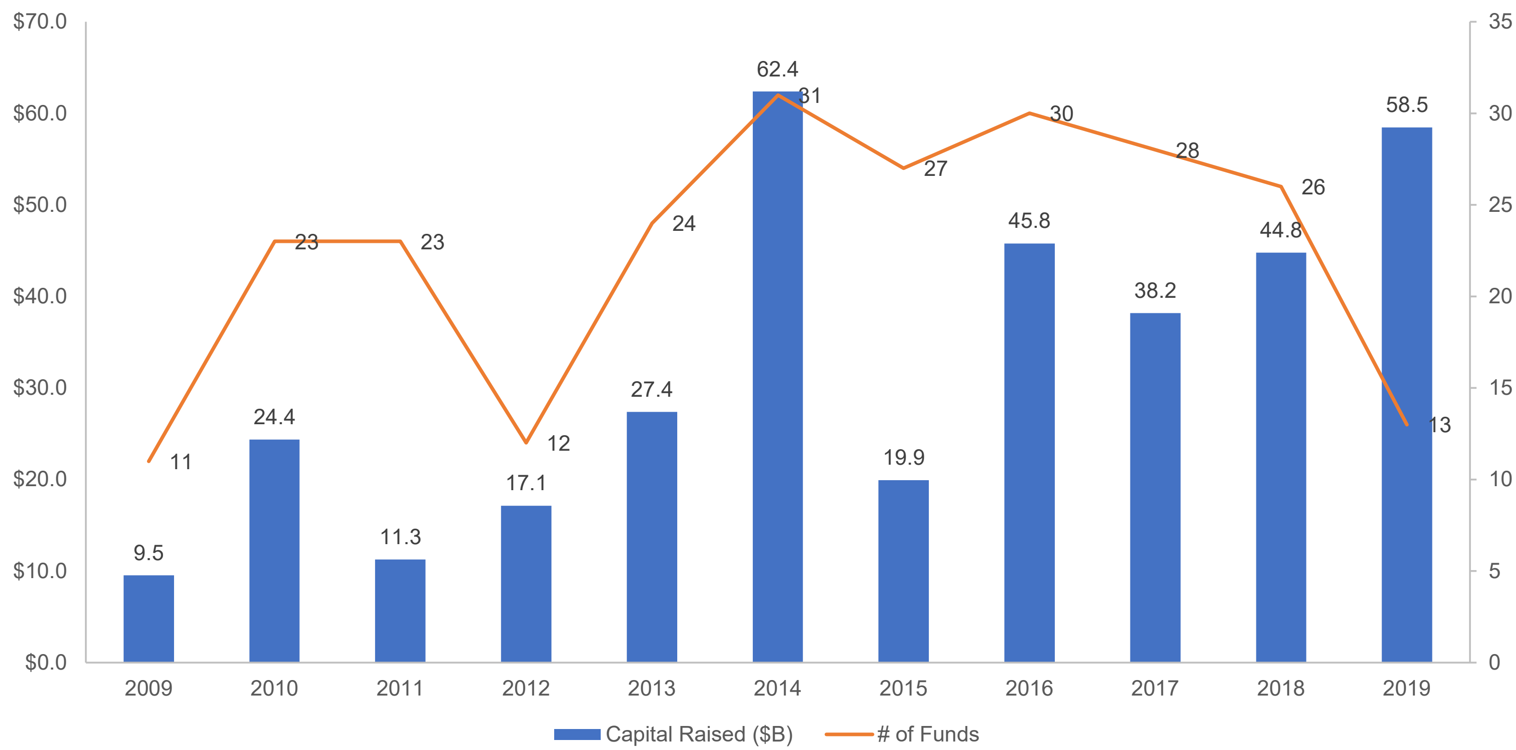
Infrastructure Sectors

Transportation	Energy	Water	Digital Infrastructure	Social
-Roads & Toll Roads	-Oil and Gas Processing, Transportation, & Storage	-Fresh Water Systems	-Data Centers	-Court Houses
-Bridges & Tunnels	-Electricity Transmission	-Waste Water Systems	-Fiber Optic Networks	-Hospitals
-Airports	-Conventional & Renewable Power	-Desalination Plants	-Wireless Towers	-Education Facilities
-Sea Ports			-Cable Networks	-Police Facilities
-Rail & Rolling Stock			-Broadcast Towers	-Correctional Facilities
-Parking			-Satellites	

- The infrastructure asset class has a finite set of sectors that meet the stated (or perceived) criteria for infrastructure investments
  - Each sector has a range of risk and return characteristics that are largely commensurate with the level of contracted cash flows
- Public Private Partnerships (PPPs) are an investment structure utilized across all infrastructure sectors
  - Represents the lowest risk and often lowest return due to its highly contracted cash flows
  - Other investment structures may not include any contracted cash flow but may have other defensible characteristics (e.g. barriers to entry) that provide meaningful protection

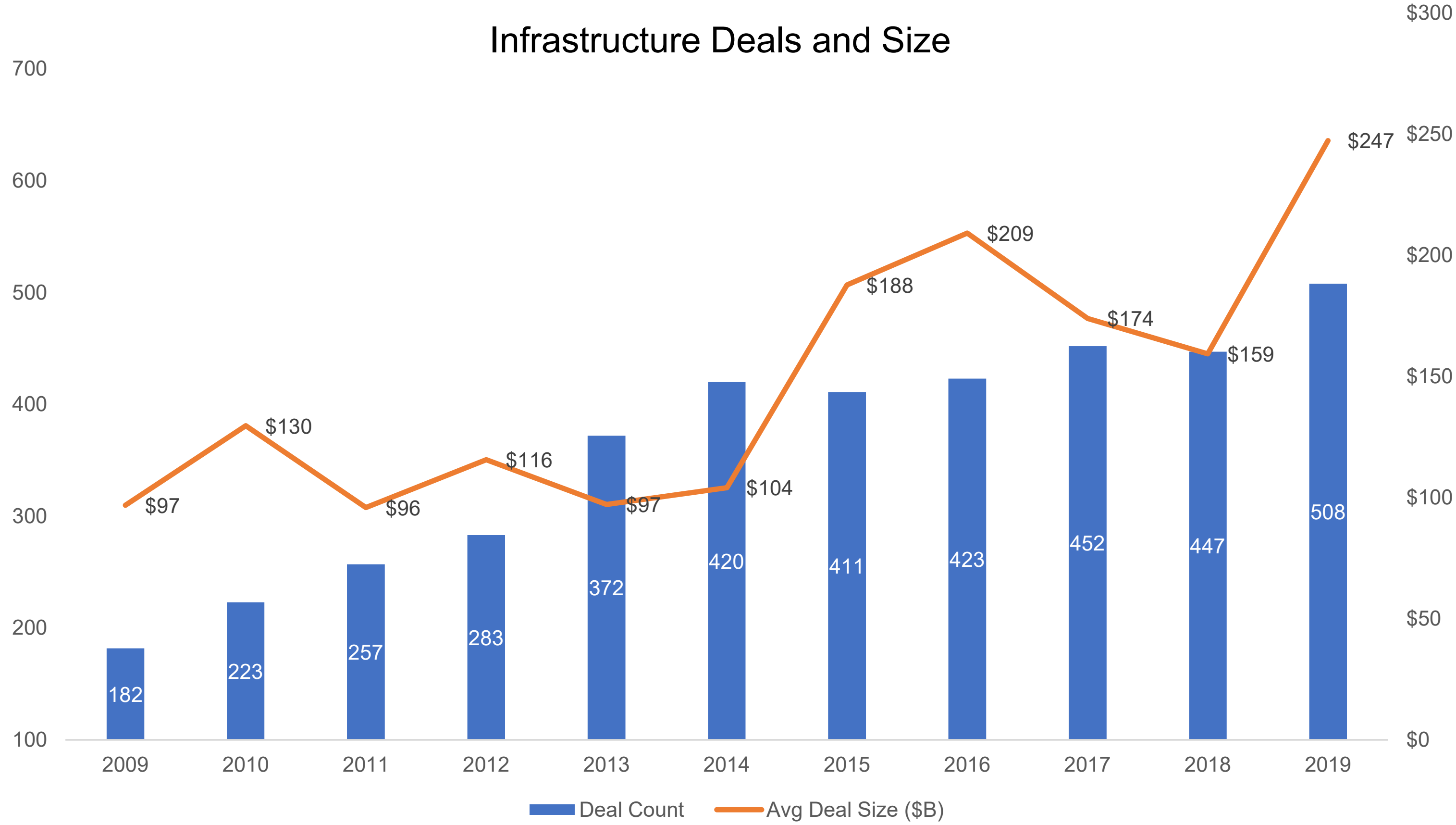
CLIFFWATER LLC

Infrastructure Fundraising



- Infrastructure fund sizes are increasing, with more capital going to a smaller number of funds
  - Two funds raised recently that were larger than $20 billion
  - Four other “mid-market” funds have grown from ~$1 – 2 billion to more than $10 billion
  - Approximately $90 billion of uninvested capital (“dry powder”) from infrastructure funds currently
- Core funds have favored offering open-end vehicles; current universe is limited at less than 10

Infrastructure Fund Investment Activity



Commensurate with increasing fund sizes and dry powder, the number of infrastructure deals has grown, with average transaction sizes growing even faster

Energy Value Chain

Highlighting major segments of the energy value chain, with general characteristics of each

– *Included Renewables as a segment, though is really a component of Downstream power production*

Upstream
Exploration, acquisition and production of oil and natural gas reserves

- High commodity price sensitivity
- Capital appreciation focus with little income generation
- Volatile performance

Midstream
Processing, transportation & storage of oil and natural gas

- More infrastructure-like
- Contracted cash flows, can have links to commodity prices
- Midstream assets found in Energy and Infrastructure funds

Downstream
Refining and distribution of oil and natural gas, as well as power generation

- Expected returns low unless taking greenfield (development) risk or executing a value-add strategy
- Downstream assets can also be found in Energy and Infrastructure funds

Renewables
Development and operation of renewable energy sources

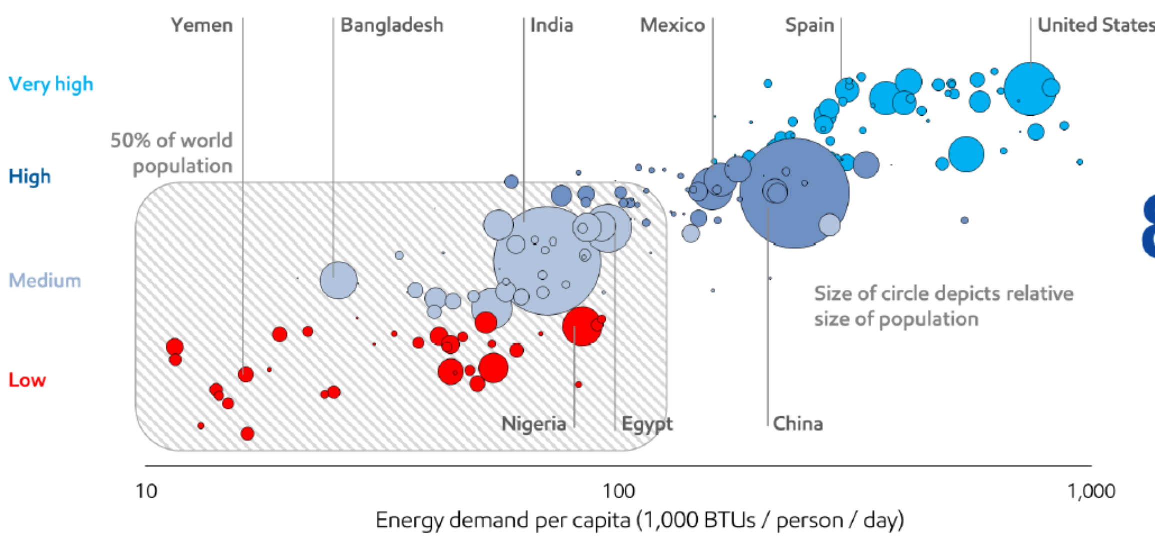
- Significant demand for renewable assets
- Government subsidies still important to the underlying economics
- Varying degrees of technology risk

Energy Remains Essential as the Landscape Evolves

Access to affordable and reliable energy is essential for human stability and development

– However, the sources of that energy production and distribution continue to evolve

U.N. HUMAN DEVELOPMENT INDEX (HDI)



860 million

people live without electricity

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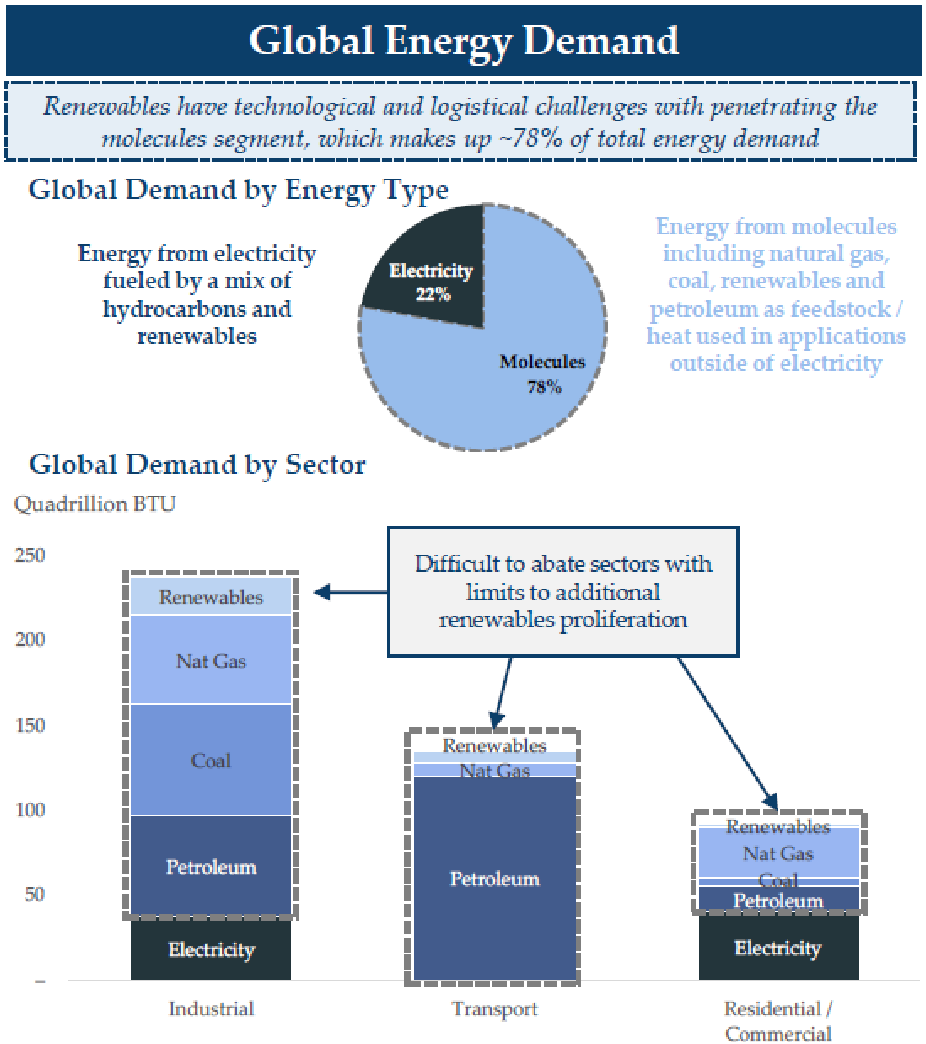
Energy Uses

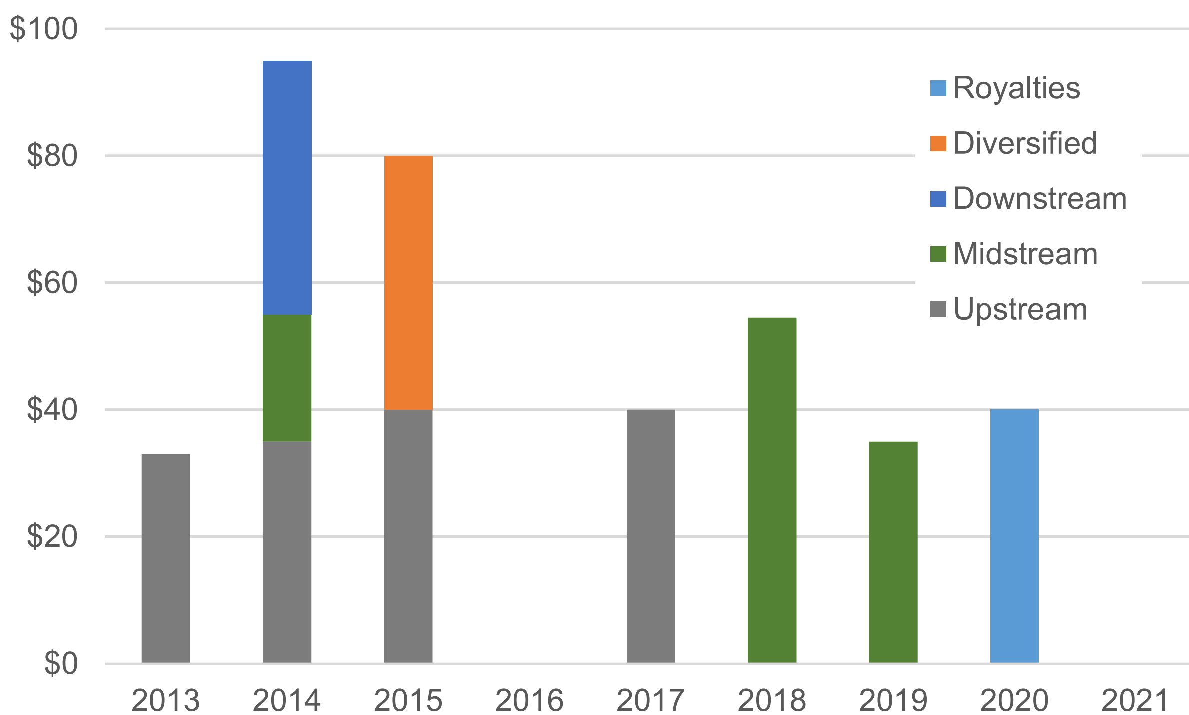


Expect hydrocarbons will continue to play a meaningful role in global energy production for years to come

However, the energy transition away from hydrocarbons will continue as supply declines, technology improves, and social pressure increases

SCERS' Energy Commitments

SCERS Energy Commitments by Vintage Year
($ in Millions)



SCERS has limited its exposure to oil & gas exploration and production (upstream energy)

– Energy focus has increasingly been on midstream and other sectors

Sector Specific Real Assets Funds

Other Real Assets sector funds include agriculture, timberland, water, and wastewater

- Institutional investors have invested in the agriculture sector for more than 20 years, yet total allocations remain small
  - Weather, pricing, and international trade issues have impacted performance
  - Over the past 5 – 10 years, farmland funds have begun to apply innovative techniques to increase yield through sustainable practices
- Timberland has also been included in institutional portfolios for decades
  - The sector had initial strong performance as large integrated paper companies divested timberland holdings to investors who initially saw successful exits
  - Timberland has since lagged expectations as housing-related demand has generally slowed, with no large substitute markets for timber
- The water and wastewater sector has long been a target of global diversified funds which invested in large regulated assets, primarily in the U.K.
  - The U.S. market is highly fragmented and offers good investment opportunities for operators with experience

Sector Specific Real Assets Funds

Newer specialized Real Assets strategies include commodity royalty funds and other leasing strategies

- Commodity royalty funds represent a relatively new institutional asset class
  - Can provide a lower return, lower risk alternative to higher risk investment strategies in the oil and gas and mining sectors
- Hard asset leasing strategies are also relatively new but are offering investment opportunities with strong cash flow profiles
  - Cash flows are often contracted and backed by high credit quality counter-parties
  - These leasing strategies have been focused primarily on aircraft, rail, and shipping assets

Real Assets Portfolio Considerations

- Continuing to evaluate portfolio allocations and structure given evolving market and macro dynamics
- Considering additional large allocations, including to open end funds, for lower risk strategies
- Evaluating the role of energy investments in the Real Assets portfolio and desired target sectors for continued investment
- Maintaining alignment of portfolio risk positioning with portfolio objectives
- Selection and portfolio construction remain critical to successful implementation, particularly given increasing competition and exposure overlap in several Real Assets sectors

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