MEMORANDUM

Date: August 19, 2019

To: Members of the Investment Committee
California Public Employees' Retirement System ("CalPERS")

From: Meketa Investment Group ("Meketa")

Re: Semi-Annual Infrastructure Performance Review
as of June 30, 2019

In our role as the Board Infrastructure Consultant, Meketa conducted a semi-annual performance review of the Infrastructure Portfolio ("the Portfolio") based on data provided in Wilshire's CalPERS Real Assets Performance Analysis Review for the period ended June 30, 2019, and selected CalPERS reports.[1] This memorandum provides the Portfolio performance data and information on key policy parameters, along with summary market commentary.

Portfolio Performance[2]

CalPERS' Infrastructure Portfolio continues to significantly outperform its policy benchmark for the reporting period, and over all other trailing periods shown below, as it did the last semi-annual reporting period.

Net Returns %	Qtr.	6 mos.	1 year	3 year	5 year	10 year
Infrastructure Portfolio	3.4	6.9	11.1	13.8	12.7	17.9
PREA/IPD US Quarterly Property Fund NTR	1.2	2.7	6.5	6.5	5.6	6.2
Over (under) Performance	2.2	4.2	4.5	7.3	7.0	11.7

[1] CalPERS Infrastructure Program Allocation, Characteristics, and Leverage Reports, Quarter Ending March 31, 2019.
[2] Per Wilshire's CalPERS Real Assets Performance Analysis Review for the period ended June 30, 2019, reported with a 1-quarter lag, so effectively as of March 31, 2019.

M E K E T A   I N V E S T M E N T   G R O U P
5796 ARMADA DRIVE SUITE 110   CARLSBAD CA 92008
760 795 3450   fax 760 795 3445   www.meketagroup.com

Key Policy Parameters

The Portfolio is compliant with all key parameters related to diversification and other limits, as demonstrated in the table below.

Key Portfolio Parameter	Policy Range/Limit	NAV 3/31/19 Exposure
Risk Classification	%	%
Core	60-100	82.8
Value Add	0-25	7.1
Opportunistic-All Strategies	0-25	10.1
Opportunistic-Development	0-10	0.0
Geographic Region[3]	%	%
United States	40-100	54.5
International Developed	0-60	45.1
International Developing	0-15	0.4
International Frontier	0-5	0.0
Real Asset Segments-Sectors[4]	%	%
Commercial-Transportation	0-60	11.6
Consumer-Communications	0-40	0.0
Essential-Energy/Water/Waste	0-25	32.0
Specialized-Opportunistic	0-20	27.0
International	0-25	29.4
Manager Exposure[5]	%	%
Largest Partner Relationship	20 max	3.1
Investments with No External Manager	20 max	1.8
Leverage		
Loan to Value	65% max	43.9%
Debt Service Coverage Ratio	1.25x min	2.11x
Public Securities[6]	%	%
Directly Invested[7]	10	0.0

[3] Geographic NAV policy ranges effective as of December 17, 2018.
[4] For informational purposes only. These parameters are measured at the Real Assets Program level.
[5] Calculated as NAV plus total unfunded commitments relative to a Real Assets Program base of $48.7 billion.
[6] Measured at the Real Assets Program level.
[7] Staff reports no direct investments in public securities via separately managed accounts; it is possible that one or more of the commingled fund managers could have de minimus positions in public securities.

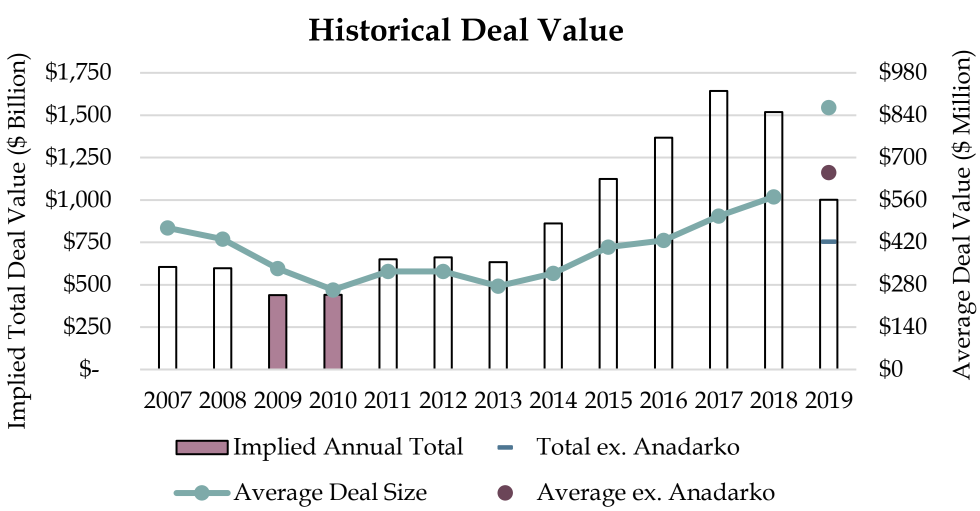
Implementation

The Portfolio's NAV as of March 31, 2019, was $4.78 billion, an increase of $427 million, or 9.8%, compared to the September 30, 2018 NAV of $4.35 billion. The current NAV represents 1.3% of the Total Fund.[8] Until July 2018, a 1% Interim Target was in effect for the Portfolio, as established under the 2013 Asset Liability Management ("ALM") study.[9] As noted in Meketa's 2018 Infrastructure Portfolio Annual Program Review delivered in September 2018, the new Real Asset Program-level Policy Target is 13% (±5%) for the Real Estate, Infrastructure, and Forestland Portfolios collectively. This was generated from the 2018 ALM, effective July 2018, and intentionally eliminates prior portfolio-level targets.

Market Commentary[10]

Market Activity

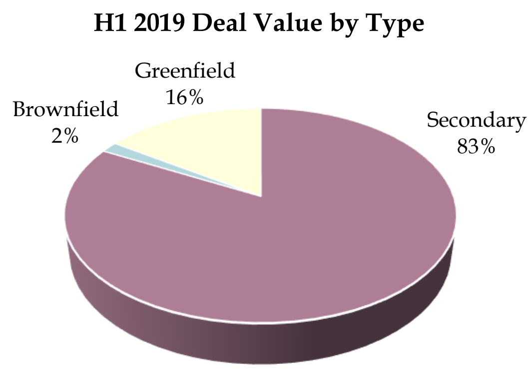
Preqin reports 1,159 completed deals with a transaction date in the first half of 2019, compared to 1,184 for the second half of 2018, for a total of 2,343 over the trailing 12-month period. Last calendar year 2018 represented the first drop off in year-over-year number of deals since 2012, and 2019 is on pace for a further annual decline in number of deals. At the same time, average deal value during the first half of 2019 was $864 million, up over 50% from the record high average in the 2018 calendar year, pushed upward by Occidental's $57 billion acquisition of Anadarko Petroleum — approximately three times the size of the second largest deal during the half. Excluding the Anadarko deal, the first half average was $651 million, a 14% increase from 2018.

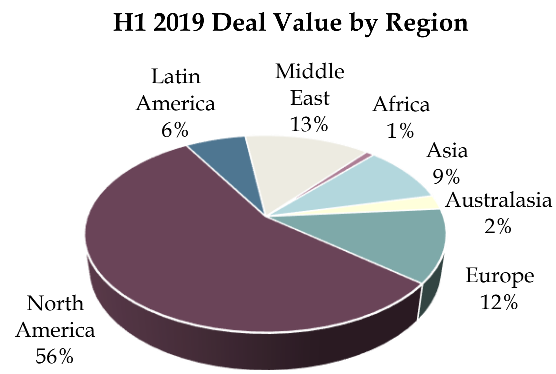


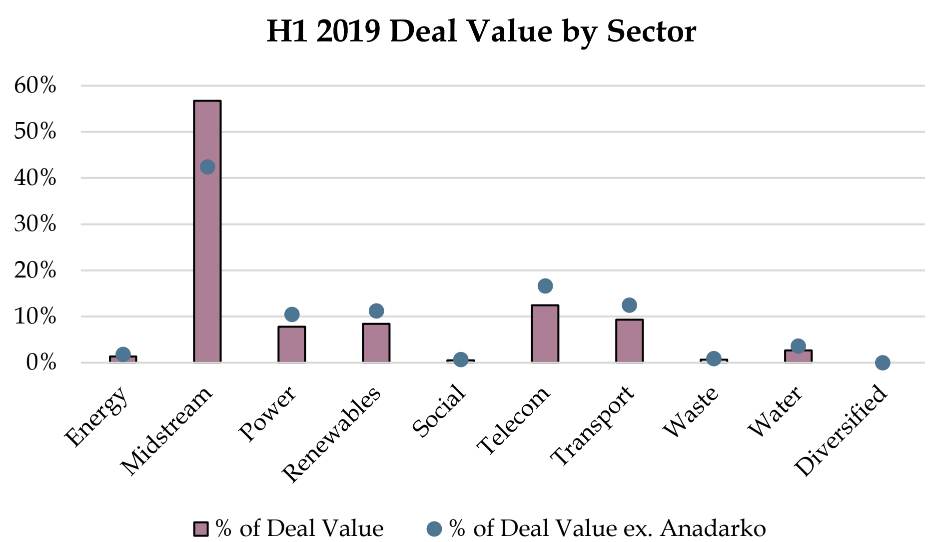
---

[8] The Total Fund market value was $370.3 billion as of December 31, 2018, per Staff.
[9] Also per Staff 2017 Annual Program Review.
[10] Commentary based on analysis of aggregated and deal-level data from Preqin, and other Preqin data, unless otherwise cited. Prior year data may have changed from figures shown in prior reports.

Total deal size in H1 2019 (including equity and debt) is only available for 264 transactions, or about 23% of total number of deals, representing $228 billion in deal value. Distribution by risk category,[11] geography, and sector for the deals for which size is available is shown below.







[11] According to Preqin: Secondary stage is a fully operational asset or structure that requires no investment for development; Brownfield is an existing, typically operating asset needing improvements, repairs, or expansion; and a Greenfield asset does not currently exist. These categories can roughly be mapped to Core, Value Add, and Opportunistic, respectively, ignoring other risk attributes such as geography and sector.

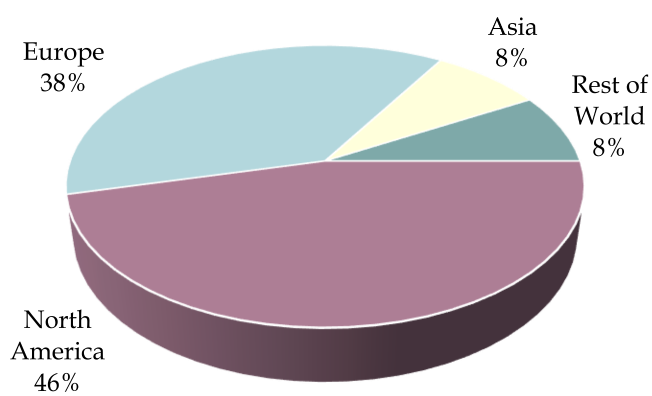
Among the North American deals closing in H1 2019, 24 were identifiable as involving California assets, including: seven separate solar power transactions (including one battery & solar facilities portfolio), six power plants, four midstream/downstream assets, three water distribution/treatment assets, two energy storage portfolios, one biomass gasification plant, and one parking lot. Several are highlighted below.

- Multiple solar projects: Buyers included Duke Energy, Excelsior Energy Capital, Goldman Sachs, and Kirkbi A/S.
- Six natural gas-fired peaking facilities: Avenue Capital Group (through its subsidiary Middle River Power) purchased from Carlyle Group.
- Long Beach Container Terminal: Macquarie Infrastructure Partners purchased from Orient Overseas (International).
- Carlsbad Desalination Plant: Aberdeen Asset Management purchased from Stonepeak Infrastructure Partners and Poseidon Resources.

Dry Powder and Fundraising

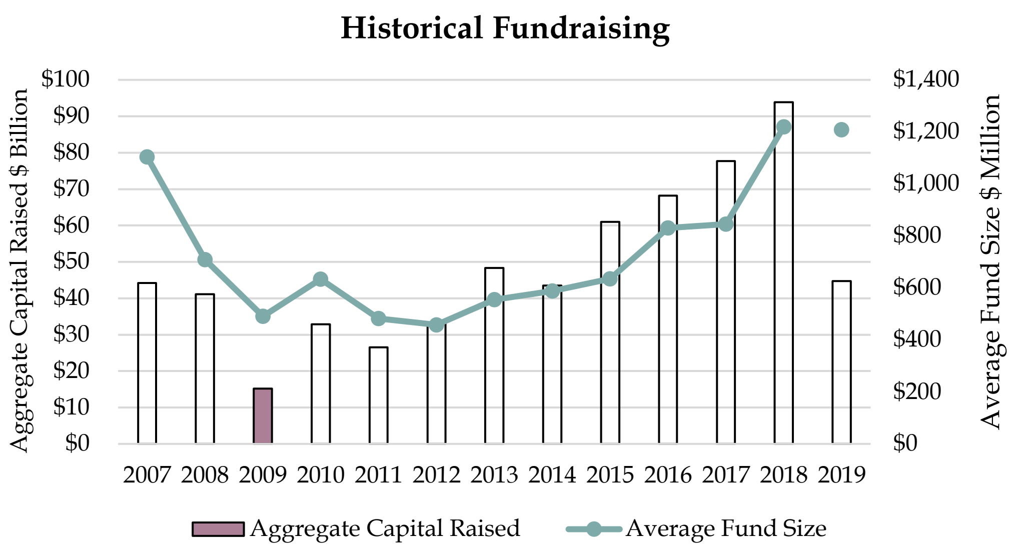
As of June 2019, unlisted infrastructure funds[12] had $228 billion in dry powder, the highest level on record and an increase of $44 billion from December 2018. Together, funds focused on North America and Europe, CalPERS' primary target geographies, accounted for 84% of the total dry powder, as seen in the chart below.

Dry Powder by Geography



[12] Includes funds and fund of funds.

Infrastructure managers are on pace to match the record fundraising levels reached during 2018 with $45 billion raised during the first half of 2019, as seen in the chart below. In total, 38 funds held a final close during the first half — equating to an average fund size of approximately $1.2 billion, roughly in line with the previous year's average. Brookfield Asset Management and Global Infrastructure Partners are each raising their fourth closed-end fund with both seeking $17 billion to $20 billion, and possibly more. Also notable is the $14 billion Blackstone Infrastructure Partners reportedly raised for its new open-ended fund. Beyond those mega-funds, a number of other funds in market are targeting $5 billion to $6 billion in commitments, including Antin Infrastructure Partners IV, ArcLight Energy Partners Fund VII, Energy Capital Partners IV, and EIG Energy Fund XVII.



Market Outlook

As we have previously reported, institutional demand for infrastructure still shows no signs of waning and managers continue to come to market with a wide variety of offerings with respect to strategy, sector, geography, and risk-return profile. We continue to see an increase in co-investment, club, and separate account options as investors seek lower fees and greater governance which managers trade for ready, dependable capital outside of fundraising cycles. We continue to view the core space as highly competitive, while the value-added segment offers a wider range of sourcing and transaction avenues. CalPERS' bench of existing managers, new commitments, and relationships under development keep the Infrastructure Portfolio well-positioned in the marketplace.

Conclusion

We believe the Portfolio's performance for the reporting period and all other trailing periods has been impressive relative to the benchmark. The Portfolio's development and its current position is appropriate and consistent with applicable policies and guidances:

- *Risk*—Exposures are roughly within the middle or lower-middle of the classification policy ranges, with the exception of development stage, which has no investments;
- *Geography*—U.S. exposures are at the lower end of the categorical range, International Developed in the upper-middle of the range, and other international exposures at the bottom of their range at effectively zero;
- *Segment*—Investments represent multiple segments, noting that data are informational, as range targets are applicable at the Real Assets Program level;
- *Manager*—Exposures are well below the maximums allowed;
- *Leverage*—Metrics are comfortably compliant; and
- *Public Securities*—The Portfolio has no direct exposures.

As we have previously observed, the market environment continues to be challenging for core buyers on pricing, but CalPERS has an excellent vantage point on the deal flow, which remains robust. CalPERS continues to exercise its reputation, resources, and strategic relationships with select managers and other investors to participate in the market with acumen and discipline.

Please do not hesitate to contact us if you have questions or require additional information.

Sincerely,

Stephen P. McCourt, CFA
Managing Principal/Co-CEO

Lisa Bacon, CAIA
Principal

SPM/EFB/jls