INVO 2020 Vision

2020 Focus:

✓ Reduce cost, complexity, and risk
✓ Fewer, but more strategic partnerships with external managers.

Mission

Manage the CalPERS investment portfolio in a cost-effective, transparent and risk-aware manner in order to generate returns to pay benefits.

Vision

- The Investment Beliefs and CalPERS Core Values are the guiding principles underlying our investment decisions.
- We operate with a focus on repeatable, predictable, and scalable portfolios and practices.
- We seek alignment of interests with our primary stakeholders, our business partners, and ourselves.
- We use clearly articulated performance, risk, and cost metrics to evaluate our value-add to the funds.
- Our investment and business activities are supported by a solid platform of effective risk management and controls.
Investment Belief 8: Costs Matter and need to be effectively managed

From

INVO 2010
- Manually aggregated, fragmented expense management reporting
- Limited awareness of total cost
- Insufficient focus on fees
- Fragmented cost management process incenting use of external resources
- Difficulty Benchmarking against relevant peers

To

INVO 2017
- Automated, timely, meaningful expense management reporting
- Improved knowledge of total cost
- Focus on fee reduction and value-add
- Better-aligned fee structures drive improved performance
- Greater flexibility to manage internal vs. external resources in the best interest of the fund
- Development of meaningful cost benchmark statistics
### INVO Cost Effectiveness Trends 2011-2016

Management fees have decreased $404 million or 45%, while AUM has increased over the period from $197 billion to $295 billion. Consultant fees have decreased $37 million or 73%. Excluding profit sharing, the Investment Office has decreased overall costs by $402 million or 39%.

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>External Mgmt Fees – Base (Public)</strong></td>
<td>103</td>
<td>96</td>
<td>82</td>
<td>83</td>
<td>88</td>
<td>100</td>
</tr>
<tr>
<td>**External Mgmt Fees – Base (Private)**¹</td>
<td>801</td>
<td>751</td>
<td>739</td>
<td>715</td>
<td>662</td>
<td>400</td>
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<tr>
<td><strong>Total External Mgmt Fees – Base</strong></td>
<td><strong>$904</strong></td>
<td><strong>$847</strong></td>
<td><strong>$821</strong></td>
<td><strong>$798</strong></td>
<td><strong>$750</strong></td>
<td><strong>$500</strong></td>
</tr>
<tr>
<td><strong>Consultants</strong></td>
<td>51</td>
<td>38</td>
<td>27</td>
<td>21</td>
<td>18</td>
<td>14</td>
</tr>
<tr>
<td><strong>Personnel Services/OE&amp;E⁴</strong></td>
<td>37</td>
<td>44</td>
<td>44</td>
<td>61</td>
<td>63</td>
<td>65</td>
</tr>
<tr>
<td><strong>Portfolio Mgmt Services</strong></td>
<td>18</td>
<td>21</td>
<td>22</td>
<td>28³</td>
<td>31</td>
<td>35</td>
</tr>
<tr>
<td><strong>Operating</strong></td>
<td>30</td>
<td>24</td>
<td>35</td>
<td>24</td>
<td>26</td>
<td>24</td>
</tr>
<tr>
<td><strong>Total Portfolio Management Expense</strong></td>
<td><strong>$136</strong></td>
<td><strong>$127</strong></td>
<td><strong>$128</strong></td>
<td><strong>$134</strong></td>
<td><strong>$138</strong></td>
<td><strong>$138</strong></td>
</tr>
<tr>
<td><strong>INVO Total Portfolio Management Fees &amp; Expenses</strong></td>
<td><strong>$1040</strong></td>
<td><strong>$974</strong></td>
<td><strong>$949</strong></td>
<td><strong>$932</strong></td>
<td><strong>$888</strong></td>
<td><strong>$638</strong></td>
</tr>
<tr>
<td><strong>External Mgmt - Profit Sharing (Public)</strong></td>
<td>57</td>
<td>54</td>
<td>70</td>
<td>81</td>
<td>73</td>
<td>54</td>
</tr>
<tr>
<td><strong>External Mgmt - Profit Sharing Paid (Private)</strong></td>
<td>227</td>
<td>111</td>
<td>326</td>
<td>105</td>
<td>71</td>
<td>93</td>
</tr>
<tr>
<td><strong>External Mgmt - Profit Sharing Accrued (Private)²</strong></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>632</td>
<td>452</td>
<td>198</td>
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<tr>
<td><strong>Private Equity Profit Sharing</strong></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total Profit Sharing</strong></td>
<td><strong>$284</strong></td>
<td><strong>$165</strong></td>
<td><strong>$396</strong></td>
<td><strong>$818</strong></td>
<td><strong>$596</strong></td>
<td><strong>$835</strong></td>
</tr>
<tr>
<td><strong>INVO Total Portfolio Mgmt. Expense + Profit Sharing</strong></td>
<td><strong>$1324</strong></td>
<td><strong>$1139</strong></td>
<td><strong>$1345</strong></td>
<td><strong>$1750</strong></td>
<td><strong>$1484</strong></td>
<td><strong>$1473</strong></td>
</tr>
</tbody>
</table>

¹ External Mgmt. base fees paid are net of applicable fee offsets in Private Equity (PE). Does not include any fees paid directly by portfolio companies to General Partners (GPs). Does not include PE Partnership Expenses (approx. $75 million) or Mgmt Fees paid by the underlying Funds in the Fund of Fund (approx. $46 million).

² Includes Real Assets, Activist and any remaining ARS funds.

³ Includes $399 million one-time RE accrual “catch-up”.

⁴ Investment Office Salaries and Operating Expenses and Equipment.

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**Invo Cost Effectiveness Trends 2011-2016**

Management fees have decreased $404 million or 45%, while AUM has increased over the period from $197 billion to $295 billion. Consultant fees have decreased $37 million or 73%. Excluding profit sharing, the Investment Office has decreased overall costs by $402 million or 39%.
INVO Cost Trends: FY 2011-2016 Basis Points (BPS)

One-time accrual “catch-up” for Real Estate profit sharing was recorded in 2014-15 due to an accounting policy change; This line allocates those accruals to the associated year.
INVO Total Cost Structure: FY 2015-16

As of June 30, 2016: $1.4 billion total fees, costs & profit sharing

1 Costs include legal, appraisal, audit, custody, and tax advisory services
2 Costs include technology, data, analytics and trading/portfolio management systems
3 Investment Office Salaries and Operating Expenses and Equipment
4 External Mgmt. base fees paid are net of applicable fee offsets in Private Equity (PE). Does not include any fees paid directly by portfolio companies to General Partners (GPs). Does not include PE Partnership Expenses such as legal, tax, consulting and other expenses (approx. $75 million) or Mgmt Fees paid by the underlying Funds in the Fund of Fund (approx. $46 million)
FY 2015-16 External Management Costs

Private assets are primarily externally managed and represent 86% of external management costs

Total External Mgmt Fees\(^1\) and Profit Sharing\(^2\) by program (%)

- **Private Equity**: $697
- **Global Equity**: $153
- **Global Fixed Income**: $14
- **Real Assets**: $457
- **ARS/MAC**: $14

**ASSET CLASS** | **5-YEAR RETURNS\(^3\)** | **10-YEAR RETURNS\(^3\)**
--- | --- | ---
Private Equity | 9.7% | 10.2%
Global Fixed Income | 5.9% | 7.2%
Global Equity | 6.1% | 4.6%
ARS | 5.1% | 4.6%
Real Assets | 11.1% | -0.09%

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\(^1\) External Mgmt. base fees paid includes impact of any fee offsets in Private Equity (PE). Does not include any fees paid directly by portfolio companies to General Partners (GPs). Does not include PE Partnership Expenses (approx. $75 million) or Mgmt Fees paid by the underlying Funds in the Fund of Fund (approx. $46 million)

\(^2\) Figures include paid and accrued Profit Sharing for Real Assets (RA).

\(^3\) Per 6/30/2016 CIO Report
FY 2015-16 Profit Sharing Real Assets and Private Equity

Real Assets Profit Sharing is accrued and paid. Private Equity Profit Sharing is netted from distributions.

As of June 30, 2016 (in $millions)

- **36%** (36% of $279 million) Real Assets Profit Sharing Paid & Accrued
- **64%** (64% of $490 million) Private Equity Profit Sharing Distributed

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1All data and values are aligned with page 85 (Real Assets) and pages 100-104 (Private Equity) of the 2015-16 Comprehensive Annual Financial Report (CAFR). Includes both paid and accrued profit sharing for Real Assets.
CalPERS is Cost Advantaged vs. Peers

Independent Benchmarking cost analysis indicates CalPERS is low cost compared to its peers

- CEM Benchmark cost is the cost peers would incur if they had CalPERS actual asset mix
- CalPERS actual base cost of 32.5 bps is less than benchmark cost of 42.1 bps due to:
  - Internal management of public assets
  - Index-oriented management for 2/3 of equity portfolio
  - Lower private asset fees

<table>
<thead>
<tr>
<th>CEM Cost Analysis</th>
<th>BPS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2015</td>
</tr>
<tr>
<td>CalPERS Actual Cost</td>
<td>32.5</td>
</tr>
<tr>
<td>CalPERS CEM Benchmark Cost</td>
<td>42.1</td>
</tr>
<tr>
<td>CalPERS Cost Advantage</td>
<td>(9.6)</td>
</tr>
</tbody>
</table>

CEM Methodology vs. Investment Office Actuals

- CEM Benchmark Survey collects calendar year performance and assets from CalPERS and its global peers, and uses a standard methodology to compare the peer funds.
- CalPERS reports costs with CEM on a fiscal year basis (2015 CEM report uses 2014-15 fiscal year-end Investment expenses).
- CEM total cost data methodology for peer comparison excludes profit sharing/carry for many private assets, including real estate, infrastructure, natural resources and private equity.
- Profit sharing is included for the public market asset classes and hedge funds.
- CEM figures include an allocation of CalPERS Enterprise support costs (e.g. FINO, ITSB) in our Investment costs.

1 Actual and benchmark cost bps figures per CalPERS CEM CY 2015 & 2014 Report and reflects custom peer group of 14 large global sponsors. CEM methodology excludes profit sharing fees for private asset classes.
CEM Peer Benchmarking: INVO Net Value-Add\(^1\) Trend

CEM reports are on a one year lag. 2015 report uses 2014-15 fiscal year-end Investment expenses.

2015 5-year net value-add\(^2\)

(Your 5-year: net value added 4 bps, cost savings 7 bps)

2015 3-year net value-add\(^2\)

(Your 3-year: net value added 48 bps, cost savings 6 bps)

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\(^1\) Data per CalPERS CEM Reports. 5-year chart is from most recent 2015 CEM report which shows CalPERS peers in 2015.

\(^2\) Net Value-Add = Net total fund return – Policy Return
CalPERS is Cost Advantaged vs. Peers

Internal Management of Public Assets and Index-Oriented management of equities drive cost advantage

CalPERS Internal Management vs. Peers

- % of Total Assets Internally Managed
  - CalPERS: 69%
  - CalPERS Peers: 59%
  - U.S. Funds: 8%

CalPERS Public Market Assets Managed Internally

<table>
<thead>
<tr>
<th></th>
<th>Global Equity</th>
<th>Global Fixed Income</th>
<th>Liquidity</th>
<th>Inflation Assets</th>
<th>Total</th>
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<tbody>
<tr>
<td>Total Public Assets</td>
<td>144</td>
<td>57</td>
<td>13</td>
<td>29</td>
<td>243</td>
</tr>
<tr>
<td>($ billions)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Managed Internally</td>
<td>79%</td>
<td>92%</td>
<td>100%</td>
<td>100%</td>
<td>86%</td>
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<tr>
<td>BPS</td>
<td>2.2</td>
<td>3.8</td>
<td>0.8</td>
<td>0.5</td>
<td>2.3</td>
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1 Data per CalPERS CEM CY 2015 Report
2 Per 12/31/2015 CIO Quarterly Performance Report presented at February 2016 Investment Committee
3 Estimate of total FY 2015-16 INVO expenses including an allocation of all direct program and shared service expenses
**INVO FY 2015-2016 Basis Points by Program Area**

### Investment Office Costs by Program Area

**FY 2015-16 Costs ($ in millions)**

<table>
<thead>
<tr>
<th>Costs</th>
<th>Global Equity</th>
<th>Global Fixed Income</th>
<th>Private Equity</th>
<th>Real Estate</th>
<th>Infra/Forest</th>
<th>MAC/ARS</th>
<th>Total Front Office</th>
<th>INVO Operations</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>Average Assets</td>
<td>157,815</td>
<td>79,167</td>
<td>27,757</td>
<td>27,374</td>
<td>4,463</td>
<td>1,967</td>
<td>298,542</td>
<td>298,542</td>
<td>$</td>
</tr>
<tr>
<td>Percent of NAV</td>
<td>53%</td>
<td>27%</td>
<td>9%</td>
<td>9%</td>
<td>1%</td>
<td>1%</td>
<td>100%</td>
<td>100%</td>
<td>Basis Points</td>
</tr>
<tr>
<td>Management Fees</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Basis Points Management Fees</td>
<td>6</td>
<td>1</td>
<td>75</td>
<td>57</td>
<td>51</td>
<td>73</td>
<td>17</td>
<td>-</td>
<td>500</td>
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<tr>
<td>Internal Investment Personnel</td>
<td>9</td>
<td>12</td>
<td>9</td>
<td>8</td>
<td>1</td>
<td>0.1</td>
<td>40</td>
<td>22</td>
<td>62</td>
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<tr>
<td>Other Portfolio Management Expenses</td>
<td>15</td>
<td>10</td>
<td>14</td>
<td>14</td>
<td>1</td>
<td>1</td>
<td>56</td>
<td>20</td>
<td>75</td>
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<tr>
<td>Basis Points Internal Investment &amp; Portfolio Management Expense</td>
<td>2</td>
<td>3</td>
<td>8</td>
<td>8</td>
<td>6</td>
<td>7</td>
<td>3</td>
<td>1</td>
<td>114</td>
</tr>
<tr>
<td>Total (Excluding Profit Sharing)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Basis Points</td>
</tr>
<tr>
<td>Basis Points Total Portfolio Management Fees &amp; Expenses</td>
<td>7</td>
<td>4</td>
<td>83</td>
<td>65</td>
<td>57</td>
<td>80</td>
<td>20</td>
<td>1</td>
<td>14</td>
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<tr>
<td>Profit Sharing</td>
<td>63</td>
<td>3</td>
<td>490</td>
<td>244</td>
<td>35</td>
<td>(0.7)</td>
<td>835</td>
<td>-</td>
<td>835</td>
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<tr>
<td>Basis Points Profit Sharing</td>
<td>4</td>
<td>0.4</td>
<td>177</td>
<td>89</td>
<td>79</td>
<td>(4)</td>
<td>28</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Total (Including Profit Sharing)</td>
<td>177</td>
<td>36</td>
<td>720</td>
<td>422</td>
<td>61</td>
<td>15</td>
<td>1,431</td>
<td>42</td>
<td>1,473</td>
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<tr>
<td>Total Program Basis Points Including Profit Sharing</td>
<td>11</td>
<td>5</td>
<td>259</td>
<td>154</td>
<td>136</td>
<td>76</td>
<td>48</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

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1. Average Assets as of 6/30/2015 & 6/30/2016
2. Percentage of NAV is based on Average Assets
3. Ties to CAFR total and includes Hamilton Lane fees. Does not include PE Partnership Expenses & Management Fees paid by the underlying Funds in the Fund of Fund
4. Basis points are based on CalPERS’ Average Assets
Cost Effectiveness Initiative Savings Activities & Outlook

Cost Savings Activities
Comprised of on-going run rate savings due to elimination or reduction of expenses paid historically as well as savings resulting from improved economics on new commitments, and one-time savings are singular elimination/reduction of expenses paid on project/service.

Key Drivers of Cost Savings
- Internal Management of Public Assets
- Renegotiation of External Management Fees
- Reduction of Consulting and other related Operating Costs

INVO Roadmap Cost Effectiveness Initiative Implemented

- 11-12: $262 million
- 12-13: $242 million
- 13-14: $68 million
- 14-15: $217 million
- 15-16: $67 million
- 16-17: $66 million

Significant improvement in financial data, systems and controls. Identified consulting fee savings and renegotiated terms on existing key external manager relationships.

Cost Effectiveness is no longer a separate initiative, it is embedded in all decisions for new/existing deals and services within the Investment Office.

Identified additional external manager relationships to re-negotiate terms for lower fees.

1Thru Q2 data