

Permanent Funds: *Intergenerational Equity Analysis*



Intergenerational Equity

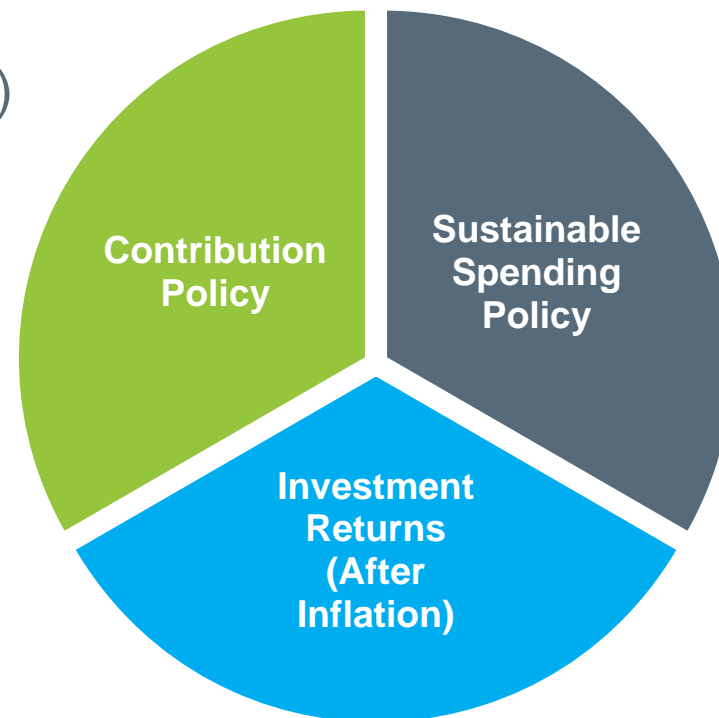
Key Principles:

1. Strives for egalitarian equity between present and future generations in the State of Wyoming.
2. Aims to ensure citizens of tomorrow have the same opportunities and purchasing power as the citizens of today.

Components:

Each play an important role in maintaining Intergenerational Equity.

1. Sustainable Spending Policy
2. Investment Returns (After Inflation)
3. Contribution Policy



Permanent Funds & Intergenerational Equity

Maintaining intergenerational equity or attaining the “Full Objective” is defined as:

1. Preserving economic value after inflation
2. Achieving 1% annual real growth to account for increasing resource demands (e.g. population growth)

Probability of Attaining Full Objective

Funds should strive to reach and maintain a 50% probability of attaining the Full Objective in order to provide equitable opportunities across all generations.

| Probability | Interpretation |
|-------------|---|
| 0% - 49% | Value of benefits available to future generations is eroding relative to generations of today |
| 50% | Value of benefits available to future generations is equal relative to generations of today |
| 51% - 100% | Value of benefits available to future generations is greater relative to generations to today |

Full Objective for Permanent Funds

For the following Funds, attaining the Full Objective would mean growing Fund assets from today’s market value to the following in Year 50:

| | PMTF | CSPLF | Hathaway | Higher Ed |
|---------------------------------|------------|-----------|----------|-----------|
| Current Fund Value (12/31/16) | \$7,234 M | \$3,386 M | \$570 M | \$118 M |
| Full Objective Value in Year 50 | \$11,898 M | \$5,569 M | \$937 M | \$193 M |

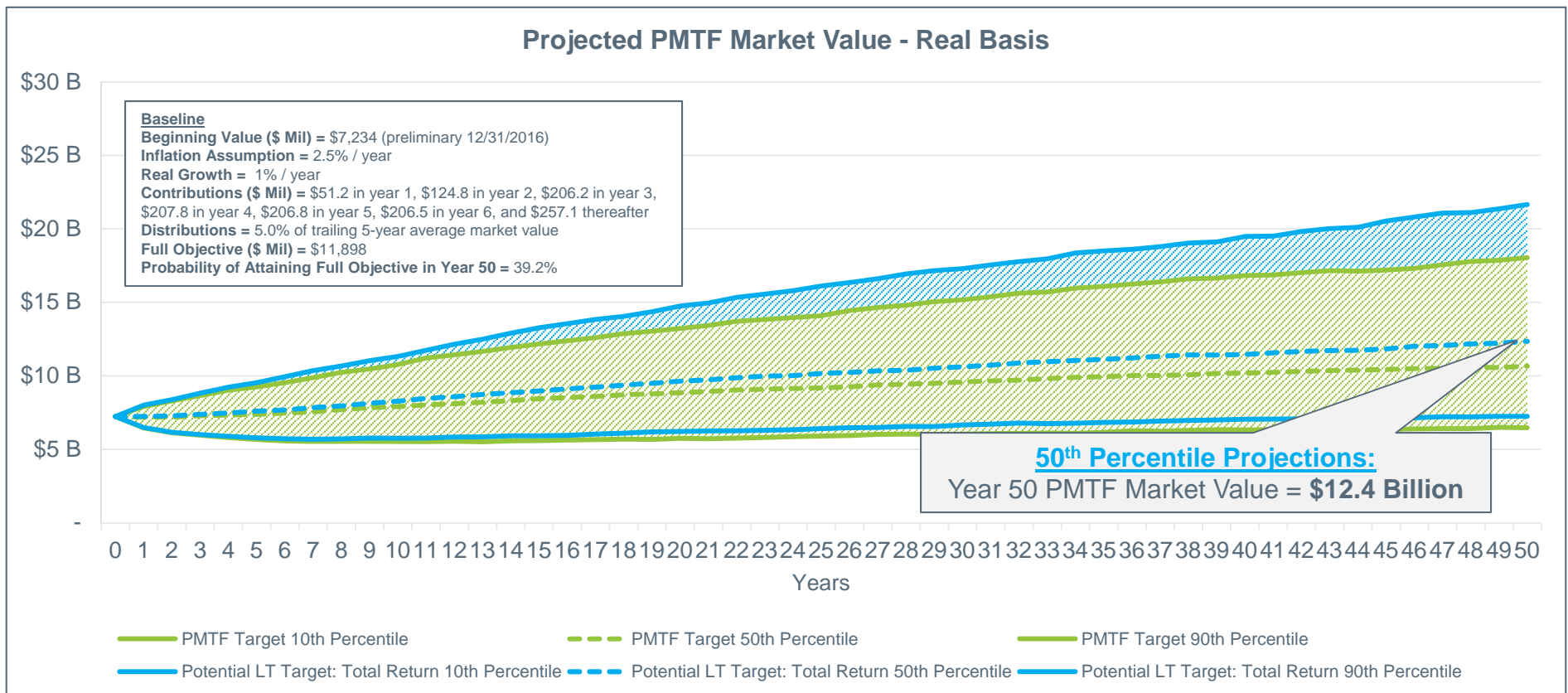
Since the Full Objective is to achieve real growth, all subsequent data shown is in real terms (after inflation).

Intergenerational Equity Analysis: Permanent Mineral Trust Fund

Under the long-term total return potential portfolio, the median probability of achieving the Full Objective (preserving long-term purchasing power) in Year 50 increases from 39.2% to **53.1%**.

The projected market value at Year 50 increases from \$10.7 Billion to **\$12.4 Billion**.

Projected PMTF Market Value - Real Basis



All data is shown in real terms (after 2.50% annual inflation). Model assumes investment earnings always meet or exceed annual spending policy amount. Contribution assumptions were provided by the Consensus Revenue Estimating Group.



Intergenerational Equity Analysis: Permanent Mineral Trust Fund

| | PMTF Target (Current Policy) | Potential LT Target (Change from Current Policy) |
|--|---------------------------------|---|
| Current Framework: 5% of trailing 5-year average market value | | |
| Cumulative 50 Year Distributions (\$B) | \$22.5 | \$24.5 (+2.0) |
| Volatility of Annual Spending Changes (% YoY St. Dev.) | 4.2% | 4.3% (+0.1%) |
| Projected 50 Year Market Value (\$B) | \$10.7 | \$12.4 (+1.7) |
| Probability of Achieving Full Objective | 39.2% | 53.1% (+13.9%) |
| Sensitivity Analysis (+/- vs. Current Framework) | | |
| Impact of Higher Contributions (growing at 1%/year beyond near-term forecasts) | 60.2% (+21.0%) | 72.1% (+19.0%) |
| Impact of Lower Contributions (declining at 1%/year beyond near-term forecasts) | 24.6% (-14.6%) | 38.3% (-14.8%) |
| Impact of 6% Annual Spending Policy Rate | 15.0% (-24.2%) | 26.2% (-26.9%) |
| Impact of 4% Annual Spending Policy Rate | 67.0% (+27.8%) | 78.8% (+25.7%) |

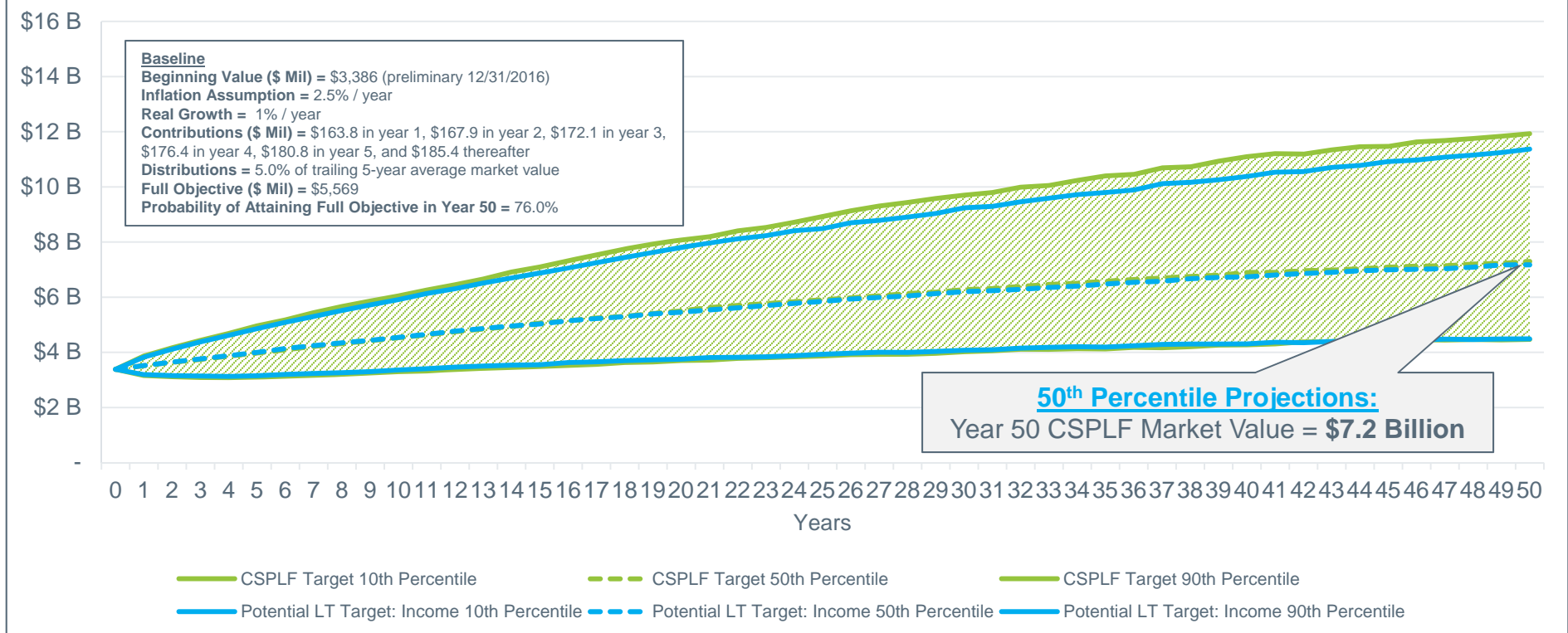
All data is shown in real terms (after 2.50% annual inflation). Model assumes investment earnings always meet or exceed annual spending policy amount. Contribution assumptions were provided by the Consensus Revenue Estimating Group.

Intergenerational Equity Analysis: Common School Permanent Land Fund

Under the income portfolio, the median probability of achieving the Full Objective (preserving long-term purchasing power) in Year 50 decreases modestly from 76.0% to **75.6%**.

The projected market value at Year 50 decreases modestly from \$7.3 Billion to **\$7.2 Billion**.

Projected CSPLF Market Value - Real Basis

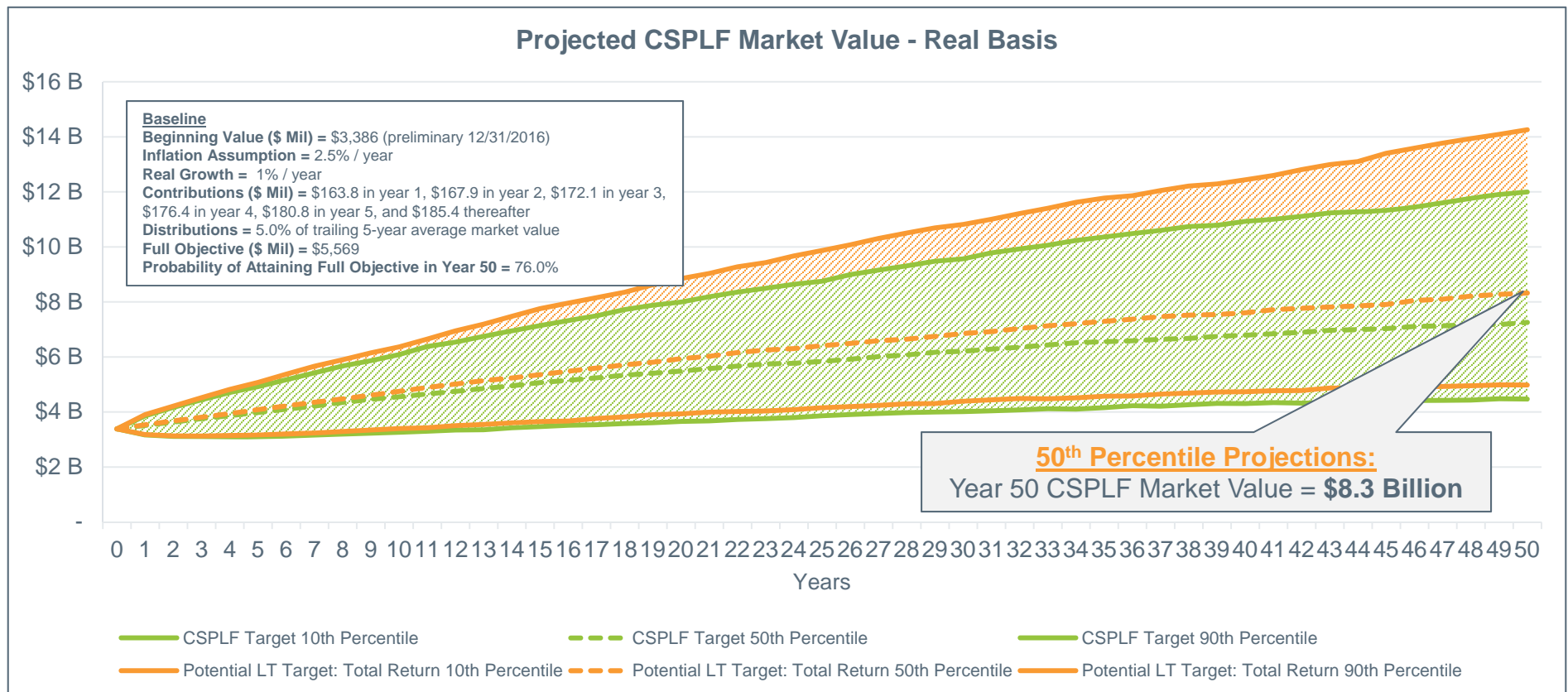


All data is shown in real terms (after 2.50% annual inflation). Model assumes investment earnings always meet or exceed annual spending policy amount. Contribution assumptions were provided by the Consensus Revenue Estimating Group.

Intergenerational Equity Analysis: Common School Permanent Land Fund

Under the long-term total return portfolio, the median probability of achieving the Full Objective (preserving long-term purchasing power) in Year 50 increases from 76.0% to **84.5%**.

The projected market value at Year 50 increases from \$7.3 Billion to **\$8.3 Billion**.



All data is shown in real terms (after 2.50% annual inflation). Model assumes investment earnings always meet or exceed annual spending policy amount. Contribution assumptions were provided by the Consensus Revenue Estimating Group.

Intergenerational Equity Analysis: Common School Permanent Land Fund

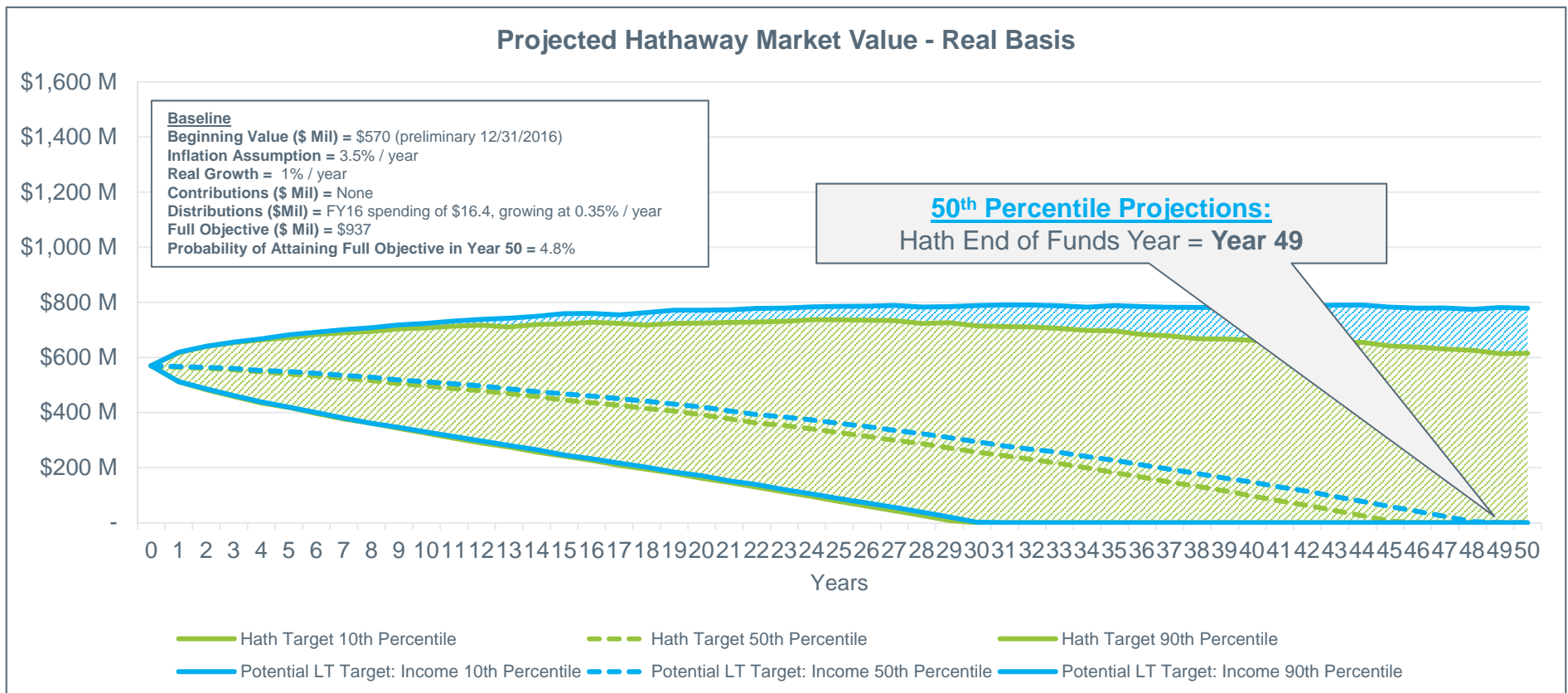
| | CSPLF Target (Current Policy) | Potential LT Target: Income (Change from Current Policy) | Potential LT Target: Total Return (Change from Current Policy) |
|--|----------------------------------|---|---|
| Current Framework: 5% of trailing 5-year average market value | | | |
| Cumulative 50 Year Distributions (\$B) | \$13.9 | \$13.7 (-0.2) | \$15.0 (+1.1) |
| Volatility of Annual Spending Changes (% YoY St. Dev.) | 8.7% | 8.6% (-0.1%) | 8.8% (+0.1%) |
| Projected 50 Year Market Value (\$B) | \$7.3 | \$7.2 (-0.1) | \$8.3 (+1.0) |
| Probability of Achieving Full Objective | 76.0% | 75.6% (-0.4%) | 84.5% (+8.5%) |
| Sensitivity Analysis (+/- vs. Current Framework) | | | |
| Impact of Higher Contributions (growing at 1%/year beyond near-term forecasts) | 91.5% (+15.5%) | 92.0% (+16.4%) | 95.1% (+10.6%) |
| Impact of Lower Contributions (declining at 1%/year beyond near-term forecasts) | 57.3% (-18.7%) | 56.0% (-19.6%) | 69.4% (-15.1%) |
| Impact of 6% Annual Spending Policy Rate | 51.6% (-24.4%) | 49.8% (-25.8%) | 63.7% (-20.8%) |
| Impact of 4% Annual Spending Policy Rate | 90.9% (+14.9%) | 91.4% (+15.8%) | 94.9% (+10.4%) |

All data is shown in real terms (after 2.50% annual inflation). Model assumes investment earnings always meet or exceed annual spending policy amount. Contribution assumptions were provided by the Consensus Revenue Estimating Group.

Intergenerational Equity Analysis: Hathaway Scholarship Endowment Fund

Under the income portfolio, the median probability of achieving the Full Objective (preserving long-term purchasing power) in Year 50 increases from 4.8% to **6.8%**.

Under both scenarios, the market value is projected to fall to \$0 before Year 50, but the projected end of funds year increases to Year 46 to **Year 49**.

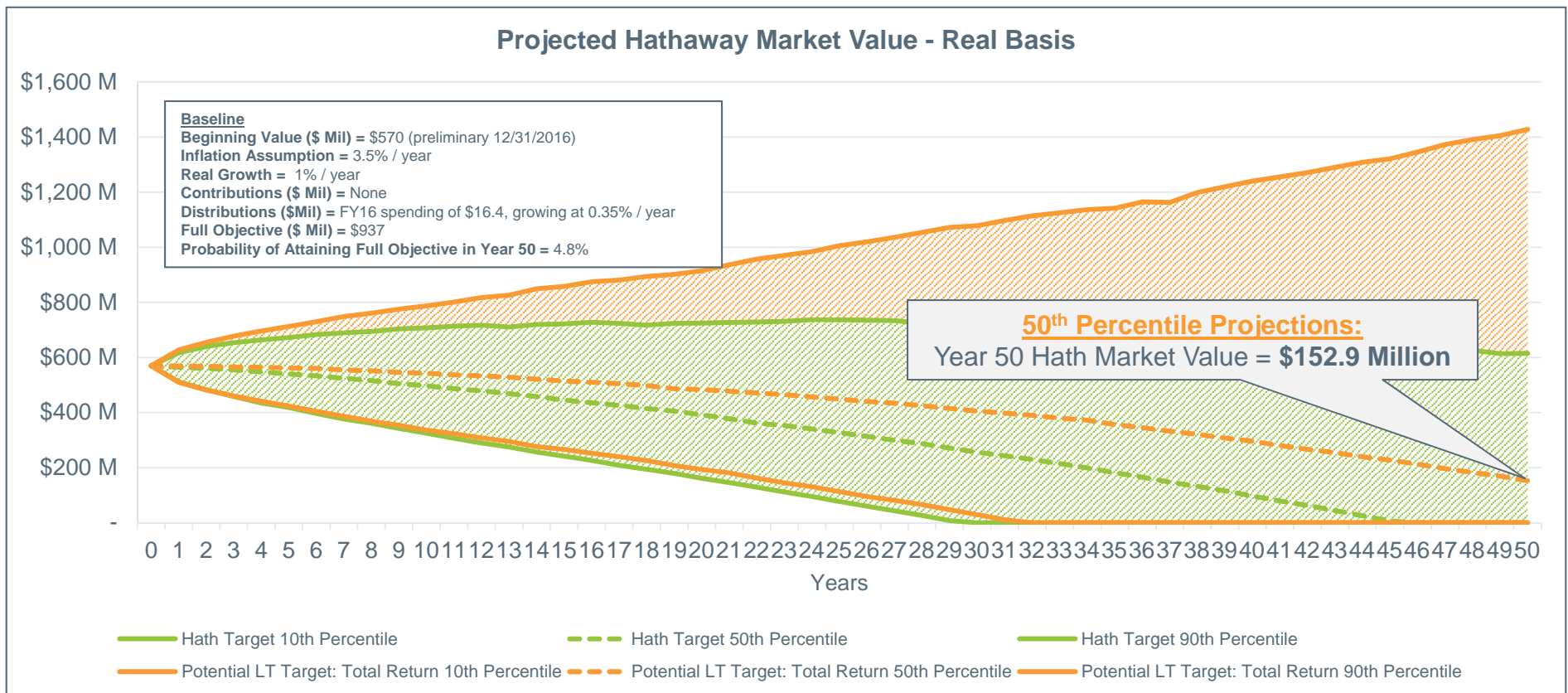


All data is shown in real terms, after 3.50% annual inflation (2.50% standard assumption + 1.00% additional inflation of higher education prices). Model assumes investment earnings always meet or exceed annual spending policy amount. Contribution assumptions were provided by the Consensus Revenue Estimating Group.

Intergenerational Equity Analysis: Hathaway Scholarship Endowment Fund

Under the long-term total return portfolio, the median probability of achieving the Full Objective (preserving long-term purchasing power) in Year 50 increases from 4.8% to **26.4%**.

The projected market value at Year 50 increases from \$0 to **\$152.9 Million**.



All data is shown in real terms, after 3.50% annual inflation (2.50% standard assumption + 1.00% additional inflation of higher education prices). Model assumes investment earnings always meet or exceed annual spending policy amount. Contribution assumptions were provided by the Consensus Revenue Estimating Group.

Intergenerational Equity Analysis: Hathaway Scholarship Endowment Fund

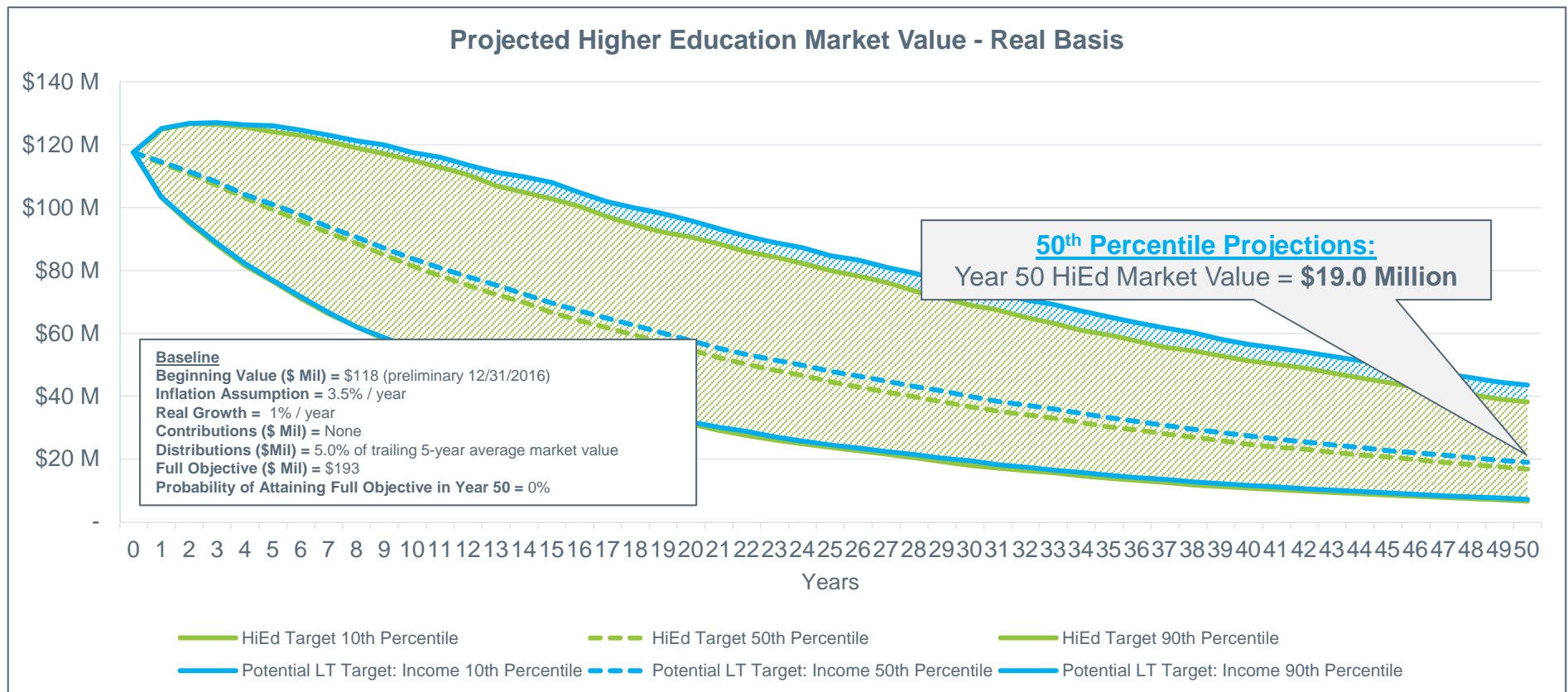
| | Hathaway Target (Current Policy) | Potential LT Target: Income (Change from Current Policy) | Potential LT Target: Total Return (Change from Current Policy) |
|---|-------------------------------------|---|---|
| Current Framework: FY16 spending of \$16.4, growing at 0.35% / year (+/- vs. Current Framework) | | | |
| Cumulative 50 Year Distributions (\$M) | \$820.1 | \$878.3 (+58.2) | \$897.9 (+77.8) |
| Volatility of Annual Spending Changes (% YoY St. Dev.) | 10.9% | 10.3% (-0.6%) | 8.8% (-2.1%) |
| Projected 50 Year Market Value (\$M) | \$0.0 | \$0.0 (No Change) | \$152.9 (+152.9) |
| Projected End of Funds Year | Year 46 | Year 49 (+3 Years) | N/A |
| Probability of Achieving Full Objective | 4.8% | 6.8% (+2.0%) | 18.0% (+13.2%) |
| Sensitivity Analysis (+/- vs. Current Framework) | | | |
| Probability of Preserving Purchasing Power (0% real growth) | 10.9% (+6.1%) | 8.4% (+1.6%) | 29.6% (+11.6%) |
| Impact of Contributions of \$11.5M per year (currently \$0 per year) | 41.9% (+37.1%) | 49.1% (+42.3%) | 64.4% (+46.4%) |
| Impact of 1% Annual Distribution Growth (in real terms) | 2.7% (-2.1%) | 3.9% (-2.9%) | 12.2% (-5.8%) |
| Impact of 0% Annual Distribution Growth (in real terms) | 6.5% (+1.7%) | 9.5% (+2.7%) | 22.1% (+4.1%) |

All data is shown in real terms (after 3.50% annual inflation (2.50% standard assumption + 1.00% additional inflation of higher education prices). Model assumes investment earnings always meet or exceed annual spending policy amount. Contribution assumptions were provided by the Consensus Revenue Estimating Group.

Intergenerational Equity Analysis: *Excellence in Higher Education Endowment Fund*

Under the income portfolio, the median probability of achieving the Full Objective (preserving long-term purchasing power) in Year 50 remains at **0.0%**.

The projected market value at Year 50 increases from \$16.8 Million to **\$19.0 Million**.



All data is shown in real terms, after 3.50% annual inflation (2.50% standard assumption + 1.00% additional inflation of higher education prices). Model assumes investment earnings always meet or exceed annual spending policy amount. Contribution assumptions were provided by the Consensus Revenue Estimating Group.

Intergenerational Equity Analysis: Excellence in Higher Education Endowment Fund

| | Higher Education Target (Current Policy) | Potential LT Target (Change from Current Policy) |
|--|---|---|
| Current Framework: 5% of trailing 5-year average market value (+/- vs. Current Policy) | | |
| Cumulative 50 Year Distributions (\$M) | \$145.6 | \$151.2 (+5.6) |
| Volatility of Annual Spending Changes (% YoY St. Dev.) | 4.0% | 4.1% (+0.1%) |
| Projected 50 Year Market Value (\$M) | \$16.8 | \$19.0 (+2.2) |
| Probability of Achieving Full Objective | 0.0% | 0.0% (No Change) |
| Sensitivity Analysis (+/- vs. Current Framework) | | |
| Probability of Preserving Purchasing Power (0% real growth) | 0.1% (+0.1%) | 0.1% (+0.1%) |
| Impact of Contributions of \$6.4M per year (currently \$0 per year) | 43.7% (+43.7%) | 50.1% (+50.1%) |
| Impact of 6% Annual Spending Policy Rate | 0.0% (No Change) | 0.0% (No Change) |
| Impact of 4% Annual Spending Policy Rate | 0.1% (+0.1%) | 0.1% (+0.1%) |

All data is shown in real terms (after 3.50% annual inflation (2.50% standard assumption + 1.00% additional inflation of higher education prices). Model assumes investment earnings always meet or exceed annual spending policy amount. Contribution assumptions were provided by the Consensus Revenue Estimating Group.