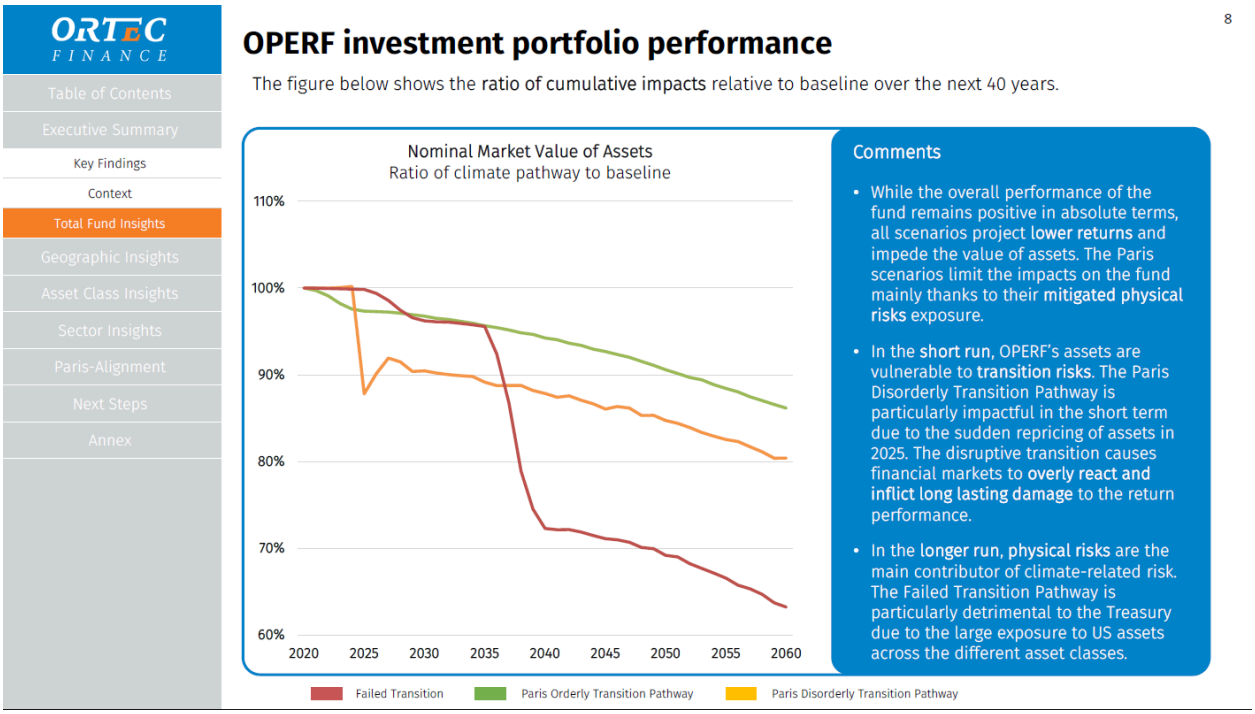
Written Testimony of Rick Pope, Divest Oregon
For 3/19/25 SB 681 hearing

I am a PERS contingent beneficiary, designated by my wife, a retired elementary school teacher. I am also a Divest Oregon volunteer and head its research group. I cannot testify in person on March 19. What follows is the essence of what I have learned that is relevant to the financial need for SB 681, the Pause Act.



2021 Ortec Finance climate damage estimates for OPERF by 2060.[1]

The graph above is a key part of a climate risk assessment for OPERF that the Oregon Treasury commissioned from international financial consultant Ortec Finance in 2021. I obtained it through a lengthy public records process.

The red line is Ortec's estimate of the declining value of OPERF assets in a "failed transition" – a business as usual scenario such as we are in right now. The estimated decline is from a baseline of values OPERF would have received in the absence of climate change. OPERF's estimated asset value decline from the effects of climate change reaches -37% by the year 2060. That is within the working lives of more than 18,000 PERS members now in their 20s, and within the retired lives of 122,000

[1] Ortec Finance, OPERF Climate Risk Assessment p. 8 (2021).

additional PERS members now in their 30s and 40s.[2]

The green and yellow lines show a much less marked baseline value decline. They are Ortec's estimates of the value of OPERF assets in smoother, faster, more climate-friendly energy transitions.

This graph from Treasury's own consultant shows that OPERF investment and engagement to promote a clean-energy transition—the sooner, the smoother, the better—are prudent actions to provide secure future retirements for Oregon's public servants.

SB681 is one such prudent action. But don't take my word for it–check out the footnotes.

OPERF's fiduciary duty of impartiality requires it to protect future retirements of younger PERS members equally with those of today. The OIC and Treasury have a fiduciary duty under Oregon law[3] to protect younger and older beneficiaries impartially. OPERF fiduciaries cannot favor those in or near retirement in a manner that jeopardizes future OPERF values needed to sustain future retirements for today's young teachers, firefighters, police officers, and public servants of all kinds.

New private investments in fossil fuel infrastructure, designed to pay benefits to Baby Boomers over the next 10-12 years, do so by heaping pension risk on Generation X, Millennials, Generation Z and upcoming Generation Alpha PERS beneficiaries. These investments lock in decades of self-inflicted climate-damaging greenhouse gas emissions, and thereby jeopardize the future value of OPERF's entire portfolio. OPERF needs to make it harder, not easier, to raise capital for these portfolio-damaging investments. This duty is required by OPERF trustees' fiduciary duties of prudence and impartiality. It is also consistent with Oregon's long standing climate policy.[4]

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[2] PERS actuary Milliman reports 18,212 PERS members now in their 20s, 49,930 members now in their 30s, 71,983 members now in their 40s, and 72,977 PERS members now in their 50s. While the bulk of members retire in their 60s, more than 6,000 active and inactive members continue working into their 70s. Milliman, Oregon PERS Actuarial Valuation pp. 87, 93, 94 (2024); Social Security Administration, Actuarial Life Table (2021).

[3] ORS 293.726(4)(a) – Standard of judgment and care in investments.

[4] 2007 House Bill 3543 found after extensive study that global warming poses "a serious threat to the economic well-being . . . of Oregon (p.1 Section 1(3)); and that "There is a need to . . . begin reducing greenhouse gas emissions in order to prevent disruption of Oregon's economy (p. 2 Section 1 (7). The bill established the Oregon Global Warming Commission (p.3 Section 4). 2020. Executive Order No. 20-04 pp. 1, 3 followed suit, as did the Oregon Global Warming Commission report to legislature p. 9 (2023), and the Oregon Environmental Quality Commission Climate Protection Program 2024 Rulemaking p. 14 (11/21/24).

Climate change is a risk unlike any other. Global warming to 3+°C, the path we are on,[5] has never been seen in human history.[6] According to Nobel Laureate and Yale University climate economist Professor Nordhaus:

> "CO_2 concentrations in the atmosphere were 280 parts per million (ppm) in 1750 and reached more than 413 ppm in 2018. Models project that unless forceful steps are taken to reduce fossil fuel use, concentrations of CO_2 will reach 700–900 ppm by 2100. <u>According to climate models, this will lead to a warming averaged over the globe in the range of 3°–5°C by 2100, with significant further warming after that.</u> If global warming continues unchecked, future temperatures will soon surpass the historical maximum of the last half million years" (emphasis added).[7]

US average temperature increases will be 40% higher than world average increases. Because greenhouse gas emissions heat the globe unevenly, for every 1°C rise in global average temperature, the US average temperature will rise by about 1.4°C.[8]

Climate change increasingly permeates all economic activity. <u>It is the mother</u> of huge macroeconomic financial risks. It is producing a new world for physical, economic and investment climates.

Many studies show a strong correlation between increased temperatures and reduced economic growth. According to the most recent Congressionally mandated, extensively reviewed climate research study:

> <u>As climate change advances, economic risks are projected to grow over time.</u> Over the next few decades, climate change is projected to cause ecosystem disruptions, water stress, and agricultural losses. Over the coming century, the country faces relocation costs and damage to property and infrastructure due to

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[5] The UN Intergovernmental Panel on Climate Change (IPCC) forecasts a 2.8° C to 3.2°C temperature rise. IPCC, Climate Change 2023 Summary for Policymakers A.4.3 and A.4.4 p. 11. The US Global Change Research Program forecasts warming of about 2.6°C (ranging from 2°–3.7°C) by 2100. US Global Change Research Program, Fifth National Climate Assessment 2 Climate Trends.pdf key message 2-3, p. 2-29. MSCI's 2024 Net-Zero Tracker (producing graphic above) places the world's listed companies on a path to heat the planet by 3°C (5.4°F) this century. MSCI 2024 Net Zero Tracker p. 4. MSCI is an acronym for Morgan Stanley Capital International. It is an investment research firm that provides stock indexes, portfolio risk and performance analytics, and governance tools to institutional investors and hedge funds. MSCI is known for its widely used benchmark indexes of stock performance in various sectors and geographies.

[6] Ripple et al., The 2023 state of the climate report: Entering uncharted territory (Bioscience 2023).

[7] Nordhaus, Climate Change: The Ultimate Challenge for Economics pp.1996-97 (2018).

[8] US Global Change Research Program, Fifth National Climate Assessment 2 Climate Trends.pdf key message 2-3, p. 2-21. This is an extensively reviewed study mandated periodically by Congress since 1990. About USGCRP | GlobalChange.gov.

coastal flooding, major adverse impacts on ecosystem services, substantial and unequal health costs, large negative impacts on economic production, and a restructured investment landscape" (emphasis added).[9]

Unabated greenhouse gas emissions causing climate change present enormous system-level risks to OPERF investment values. Healthy economic climates obviously require a healthy physical climate. But many human and natural systems are highly vulnerable to climate-sensitive physical systems.[10]

With the physical climate deteriorating, a substantial risk arising for OPERF is the systematic risk of a climate-damaged chronic bear market.[11] Another is the systemic risk of market collapse from interlinked complex systems overwhelmed by increasing climate physical damage.[12] OPERF cannot stock-pick out of a chronic climate bear market. It cannot stock-pick out of a climate-triggered systemic financial collapse.[13] While some investments would do better than others, all investment values would suffer.

Economists, actuaries and financial overseers say both of these system-level risks are plausible. As with all system-level risks, the precise times and impacts of climate change are uncertain. "This uncertainty means that in managing climate risk we must err on the side of caution if we are to maintain the relative stability and proper functioning of our market economies."[14]

GDP as usual is at severe risk. Investment values depend on the GDP that supports them. As modeling sophistication and knowledge of climate impacts grows, a clear trend shows increasing damage estimates to GDP from unabated 3+°C global warming:

- In 22021, as it did in 2015, the New York University School of Law surveyed 738 economists who published climate-related research in the field's highest- ranked academic journals. More than 75% thought it likely that climate change will have a long-term, negative impact on the growth rate of the global economy. Only 5% thought it unlikely.[15]

[9] US Global Change Research Program, Fifth National Climate Assessment 19 Economics.pdf key message 19.1, p.19-6 (2023).
[10] Nordhaus, Climate Change: The Ultimate Challenge for Economics p. 1999 (2018).
[11] Institute and Faculty of Actuaries & Ortec Finance, Climate scenario analysis for pension schemes pp. 7, 10 (2020).
[12] US Financial Stability Oversight Council, Annual Report p. 49 (2024); Choudhury, Climate Change as Systemic Risk p. 64 (Berkeley Business Law Journal 2021).
[13] Oxford University Press, *A Dictionary of Economics* (5th ed. 2017); Institute and Faculty of Actuaries & Ortec Finance, Climate scenario analysis for pension schemes pp. 7, 10 (2020); Steele, Confronting the 'Climate Lehman Moment': The Case for Macroprudential Climate Regulation p. 135 (2020).
[14] US Commodity Futures Trading Commission, Managing Climate Risk in the U.S. Financial System p. xx (2020).
[15] NYU Institute for Policy Integrity, Gauging Economic Consensus on Climate Change p. 15 (2021).

- Economists Professors Burke[16] and Kotz,[17] In the prestigious journal *Nature,* separately estimated unabated global warming will produce GDP or income reductions of 25-40% from a climate-change-free baseline.
- The Network for Greening the Financial System (NGFS), a consortium of 120 central banks, estimates a 15%+ GDP reduction by 2050,[18] and a 30% reduction by 2100.[19] The Oregon Investment Council's investment consultant Meketa endorses NGFS scenarios and risk assessments.[20]
- Treasury's consultant Ortec Finance estimates unabated climate change will cause a 16% US GDP reduction from baseline by 2060, and a 63% reduction by 2100.[21]
- A 2024 GDP study by economists Professors Bilal and Kanzig, at Harvard and Northwestern universities, found unabated climate change implies precipitous declines in output, capital and consumption that exceed 50% by 2100. They found this damage comparable to fighting a war domestically and permanently.[22]
- Professor Bilal, in a later interview with Harvard Magazine, said the degree of spending loss from 3°C warming would be "comparable to living in the 1929 Great Depression, *forever*."[23]

Investment values as usual are also at severe risk. Using a well documented climate-specific model,[24] as shown in the graph on page 1, Treasury's consultant Ortec Finance estimated a 28% baseline reduction in OPERF values from unabated climate change by 2040, and a 37% reduction by 2060.[25]

A ground-breaking 2024 EDHEC-Risk Climate Impact Institute research paper used the latest features in a climate and econometric Integrated Assessment Model to examine various probable states of the economy and the probable effects of climate change on investment values in those economic states. Professor Rebonato et al. estimated a 20%

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[16] Burke et al., Large potential reduction in economic damages under UN mitigation targets pp. 1, 4 (*Nature* 2018).
[17] Kotz et al., The economic commitment of climate change 553 and Figure 1; Extended Data Table 3 (*Nature* 2024).
[18] NGFS long-term scenarios for central banks and supervisors p. 26 (2024).
[19] Damage functions, NGFS scenarios, and the economic commitment of climate change p. 4 (2024).
[20] Meketa says the NGFS damage scenarios "provide well specified data, both in terms of outputs as well as documented linkages throughout." NGFS assessments of aspects of physical and transition risk, Meketa says, "provide high-level data suitable for reviewing portfolio risk exposures in a top-down manner." Meketa Investment Group, Climate Scenario Frameworks p. 3 (2023)
[21] Ortec Finance, OPERF Climate Risk Assessment pp. 3, 65 (2021).
[22] Bilal & Kanzig, The Macroeconomic Impact of Climate Change: Global vs. Local Temperature pp. 4-5 (2024).
[23] Harvard Magazine, What is the Economic Impact of Climate Change on Global GDP? (2024).
[24] GIC & Ortec, The Role of Climate Change Scenarios in Investment Portfolios pp. 7-9 (2021); GIC & Ortec, Integrating Climate Scenario Analysis into Investment Management p.23 (2023).
[25] Ortec Finance, OPERF Climate Risk Assessment p. 8 (2021).

to 40% baseline reduction in asset values from unabated 3°C climate change. The EDHEC team estimated a 40% to 60% reduction should climate tipping points occur.[26]

All damage estimates contain uncertainty. All risk contains uncertainty. The Ortec and EDHEC damage estimates are high-quality indicators of climate risk to OPERF.

The 2008-09 Great Recession provides a small foretaste of what can be expected to happen in a 20-40% loss of OPERF investment values. After the 2008 financial crisis, real GDP fell 4.3 percent, home values fell 30%, and the S&P 500 index fell 57%. The US Federal Reserve characterized the recovery from the Great Recession as "slow and grudging."[27] It took 6 years, until 2013, for the value of OPERF to recover to its pre-recession level.[28] As a result OPERF's value from 2007 to 2022 has only a 2.26% compounded annual growth rate.

OPERF was actuarially overfunded in 4 of 8 years before the Great Recession, and was only 4%-8% underfunded in the other 4 years. OPERF became 20% actuarially underfunded in 2008. OPERF has not been fully funded since, and remained 23% underfunded as of December 31, 2023.[29]

The outlook for damage from climate change is decidedly more permanent than from the 2008-09 financial crisis. Public employers and taxpayers would face significant risks of service cuts or tax increases to cover investment shortfalls, even while public budgets would be stressed from responding to increasing climate-caused destruction and health impacts. With no federal protections available as there are for private pensions, in severe but plausible cases it is easy to imagine that political pressures could mount to stop employer contributions, cut retirement benefits, or even pay vested beneficiaries their funded share and eliminate PERS altogether.[30]

Economists overwhelmingly agree that acting now to keep climate change well below the 3°C path we are on will cost far less, and affect asset values far less, than the long-term damage from 3°C global warming. They include:

- The US Financial Stability Oversight Council[31]
- The multi-national Network for Greening the Financial System[32]

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[26] Rebonato et al., How does climate risk affect equity valuations? pp. 6, 32 & Table 1, 39 & Table 5 (EDHEC 2024).
[27] US Federal Reserve, The Great Recession | Federal Reserve History (2013).
[28] Oregon PERS, PERS by the Numbers p. 25 (2024).
[29] Oregon PERS, PERS by the Numbers p. 26 (2024).
[30] ORS 238.600(2) – System established.
[31] US Financial Stability Oversight Council, Report on Climate-Related Financial Risk p. 19 (2021).
[32] NGFS long-term scenarios for central banks and supervisors pp. 28, 31 (2024).

- The overwhelming majority of 738 NYU climate-economist survey respondents[33]
- The Bank of England[34]
- Professor Burke and colleagues at Stanford University and the National Bureau of Economic Research[35]
- Professor Dietz at the London School of Economics[36]
- Professor Kotz and colleagues at Potsdam University[37]
- Professor Rebonato and colleagues at EDHEC[38]
- Oregon Treasury consultant Ortec Finance[39]
- Professors Bilal and Kanzig at Harvard and Northwestern universities. They found that global warming was so destructive of GDP that it is cost-effective for the US to unilaterally decarbonize for its own benefit, regardless of what the rest of the world does.[40]

Protective solutions require action by OPERF fiduciaries. Public pension funds have strong financial interests in stopping new locked-in fossil fuel investments that will increase climate damage to their investment values for decades.

SB 681, the Pause Act, is a prudent measure to reduce funding for new fossil fuel power plants, pipelines and LNG terminals that will lock in climate-damaging, investment-damaging greenhouse gas emissions for decades. It is consistent with fiduciary duty, with climate science, with economic analyses of the impact of climate change–and with the warning and encouragement of Nobel Laureate economist Professor Nordhaus:

> "[G]lobal warming is a major threat to humans and the natural world. I have used the metaphor that climate change is like a vast casino. By this, I mean that economic growth is producing unintended but dangerous changes in the climate and earth systems. These changes will lead to unforeseeable consequences. We are rolling the climatic dice, the outcome will produce surprises, and some of them are likely to be perilous. The message is that we need not roll the climatic dice—that there is time to turn around and walk back out of the casino."[41]

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[33] NYU Institute for Policy Integrity, Gauging Economic Consensus on Climate Change pp. i-iii (2021).
[34] Bank of England Prudential Regulation Authority, SS3/19: Enhancing banks' and insurers' approaches to managing the financial risks from climate change p. 3 (2019).
[35] Burke et al., Large potential reduction in economic damages under UN mitigation targets p. 4 (2018).
[36] Dietz et al., Climate value at risk of global financial assets p. 4 (2016).
[37] Kotz et al., The economic commitment of climate change | Nature 553 and Figure 1; Extended Data Table 3 (2024).
[38] Rebonato et al., How does climate risk affect equity valuations? P.12, 38 (2024).
[39] Ortec Finance, OPERF Climate Risk Assessment p. 8 (2021).
[40] Bilal & Kanzig, The Macroeconomic Impact of Climate Change: Global vs. Local Temperature* p. 44 (2024).
[41] Nordhaus, Climate Change: The Ultimate Challenge for Economics p. 1996 (2018).