

Overview: In 2022, Maryland adopted [HB 740](#), which required the state Retirement and Pension System’s Board of Trustees (SRPS or the Board) to incorporate a climate risk assessment into its annual pension risk management report. In February 2024, the Board [published its most recent pension risk management](#) report, which included its most detailed climate risk assessment to date. That report, which was produced through consultation with [Meketa Investment Group](#), contained several deficiencies, most of which reflect a [broader failure by economic modelers](#) to accurately estimate economic costs from our current warming trajectory. [Pension funds are highly vulnerable](#) to this challenge, and future reports will require the Board to address this challenge by updating its approach to economic modeling.

The report projected the 20-year impact on projected returns in several different scenarios, including a “3.0 degree” scenario estimating the impact on returns “where the global average temperature anomaly above preindustrial average is constrained to 3.0 Degrees,” and a “policy scenario” estimating the impact of “rises in oil and natural gas prices consistent with the carbon taxation of \$100/tCO₂ where fossil fuel reserve owners do not have increasing profits over the next 10 years.” The report’s conclusion was that the policy scenario “produces the lowest return expectations due to the assumed taxation impact.” These conclusions of benign or even beneficial impact from significant warming are simply implausible. They fly in the face of climate [scientists’ dire warnings](#) about the risks of exceeding the 1.5 C temperature target established by the 2015 Paris Agreement, and overlook [recent research](#) that “provides economic support for [meeting] the warming targets in the Paris Agreement across a variety of specifications.”

The Board’s report is fundamentally flawed for reasons that were summarized in a recent analysis by CarbonTracker called [“Loading the Dice Against Pensions”](#): “some economists have predicted that damages from global warming will be as low as 2% of global economic production for a 3°C rise in global average surface temperature. Such low estimates of economic damages – combined with assumptions that human economic productivity will be an order of magnitude higher than today – contrast strongly with predictions made by scientists of significantly reduced human habitability from climate change.” In essence, the type of model used by SRPS is being heavily critiqued for delivering results that are fundamentally at odds with climate science. The severity of the risks to the portfolio and the planet are simply not being credibly represented.

The Board’s report included the following major flaws:

- [A strong need for analysis of Scope 3 emissions:](#) The report did not use climate metrics that analyzed corporations’ Scope 3 emissions, even though [Scope 3 emissions are typically the largest category of emissions](#). In fairness to the Board, the report acknowledges “While emissions data coverage is robust in the public equity markets, Staff believes this analysis is a starting point rather than a conclusion.” The finalization of the [SEC climate risk disclosure rule](#) and forthcoming rulemaking for California’s [SB 253](#) may help fill some gaps, but the final SEC rule [established a largely voluntary disclosure regime that excluded Scope 3 entirely](#), and Scope 3 data from California will not be available until 2027. The lack of consistent and reliable emissions data is constraining

pension funds' ability to accurately assess their climate risk exposure, and it was [recently reported](#) that CalSTRS is delaying a report on its carbon footprint due to a lack of reliable data.

- Overreliance on backward-looking models: The report states that Meketa used a “macroeconomic model [that] can contextualize past environmental changes (e.g., mean global temperature rise over the pre-industrial baseline) alongside economic and financial factors and projects various climate scenarios going forward over a long timeframe. Their approach is dependent on the continuation of historical trends.” An overreliance on historical data is constraining climate risk analysis in a variety of contexts, and tends to produce conservative estimates of economic damages. As [a report for the Institute and Faculty of Actuaries recently put it](#): “There is no historical precedent for the rate of increase of GHGs, so we cannot be confident about how quickly the planet will warm, although we can estimate where we might end up with this level of GHGs. Similarly, our economy has never been subject to an energy transition of this speed and scale, alongside the increasing physical risk environment we face into. Modelling physical and transition risks based on past data is akin to looking backwards from the deck of the Titanic on the evening of 14 April 1912 and predicting a smooth passage to New York because no icebergs have yet been hit.”
- The need for interrelated variables: According to the report, using Meketa’s model, “possible future values are projected by randomly selecting values consistent with the factor’s past distribution of returns. Additionally, historical relationships among and between factors are also considered in each iteration of projected values.” Temperature is one of the inputs that Meketa’s model considers, but it is an input that affects all other inputs. Energy prices, agricultural prices, and several other inputs are all strongly influenced by the input of temperature. In turn, these inputs are likely to strongly influence each other. This random selection and projection of “historical relationships among and between factors” is insufficient. A model that acknowledges the simultaneous interconnectedness between all variables is needed.
- Insufficient consideration of physical risks: With the exception of a passing mention of physical risks in the section of the report that discusses a questionnaire for managers, the report ignores physical risks, and seems to focus its assessment on transition risks, particularly in ‘high-impact sectors.’ There is limited discussion of the pension fund’s exposure to real estate assets, insurance assets, mortgage-backed securities, catastrophe bonds, or other investments that may be highly exposed to physical risks from climate change.
- The need to incorporate tipping points: Climate scientists have warned that ‘tipping points’-- climate events such as total loss of Arctic sea ice-- could cause warming to become irreversible, and thus less responsive to reductions in greenhouse gas pollution. A paper published earlier this year [projected](#) that one potential tipping point-- the breakdown of the Atlantic Meridional Overturning Current-- could occur by mid-century.

One significant shortcoming of many models, including Meketa's used for the pension risk assessment, is a lack of consideration of tipping points. A large pension system in the United Kingdom has [identified](#) "the inadequacy of climate reference scenarios which do not pay sufficient attention to tail risks, tipping points and discontinuities explored by recent research..." as a major challenge facing pension funds. Or, as a report called "[The Emperor's New Climate Scenarios](#)" put it: "Tipping points must be included if scenarios are to be realistic. They are no longer high-impact, low-likelihood events but are now high impact, high likelihood, and we need to mitigate and plan for them. Ignoring them in scenarios and modelling significantly understates risk."

- 'Investment opportunities' section touts problematic investments: The report's section identifying investment opportunities in cleaner technologies cites a \$200 million investment in Global Infrastructure Partners V, which includes investments in 'LNG' and 'renewable natural gas' among its supposed thematic focus on decarbonization. There [is a growing body of evidence](#) that gas has no emissions benefits compared with coal.