Duke NICHOLAS INSTITUTE for ENERGY, ENVIRONMENT & SUSTAINABILITY

THE RESILIENCY COMPANY

Case Study

FORTIFIED Roof Case Study: Midwest State

Piloting a model for affordable housing where future reductions in insurance claims are treated as a potential repayment stream for upfront investments in stronger roofs

INTRODUCTION

This case study explores an emerging resilience finance concept in which future reductions in insurance claims are treated as a potential repayment stream for upfront investments in stronger roofs. While the pilot has not yet been fully implemented, the underlying structure is sufficiently novel to warrant examination as a potential new model for financing property-level risk reduction.

The proposed model centers on a Midwest housing authority captive insurer—a unique element that limits replication to the handful of (roughly 10) US states that have this structure in place. In this state, it takes the form of a quasi-public, member-owned insurance pool that provides coverage to public housing authorities across the state, representing roughly 13,000 affordable housing units. Because the housing authority insurance provider operates as a pooled, mission-oriented risk structure, rather than a traditional private insurer, it may be possible to account for future reductions in claims associated with above-code roof upgrades across the portfolio.

In conventional insurance markets, insurers often lack both the long-term control and accounting structure necessary to directly capture and recycle savings from avoided losses into future resilience investments. In this structure, however, reduced claims across a stable insured portfolio may create measurable financial savings over time that can potentially support repayment of upfront resilience capital.

The proposed pilot is designed to use philanthropic debt to finance the incremental cost of stronger roof systems across participating affordable housing properties. Those low-cost investments would then be evaluated against future reductions in wind, hail, and tornado-

related claims. If the reductions in losses materialize as modeled, the avoided claims would function as a repayment mechanism, creating the possibility of a self-reinforcing resilience finance structure.

This case study is part of Scaling FORTIFIED Roof Adoption, a project showing how states are shifting from reactive disaster spending toward proactive investments in resilient infrastructure.

PILOT: FINANCING STRONGER ROOFS FOR AFFORDABLE HOUSING PORTFOLIOS

Mechanism: Resilience-linked recoverable capital structure

Funding Source: The pilot is funded with up to $5 million in philanthropic capital over 15 years. It is structured as a program-related investment from a national foundation that will finance 1,000 above-code roofs within five years. Modeling of the pilot estimated that claims would be reduced by approximately $5 million over 15 years.

Roof Financing: The pilot is structured around planned roof replacements that are the major driver in claims reductions. When a roof is due for replacement or is damaged and must be replaced, the program covers the incremental cost to move from a code-compliant roof to a stronger roof specification that is expected to reduce future losses. The incremental upgrade amount is approximately $5,000 per roof, allowing for around 1,000 upgraded roofs.

Rationale: The core idea is to provide upfront funding for the above-code roofs. The roofs will, in turn, reduce claims by an amount at or above the amount of upfront funding.

Access to Financing: The pilot operates through a pooled insurance structure rather than through individual housing authority participation. Eligible properties are affordable housing units insured through the housing authority insurance risk pool, allowing claims performance and resilience outcomes to be evaluated across an aggregated portfolio of insured properties rather than on a house-by-house basis.

FINANCING INNOVATION

The innovation lies less in the roof upgrades themselves and more in the financial structure supporting them. Rather than operating through household-level grants, the pilot is designed around a pooled affordable housing insurance portfolio insured through a quasi-public, member-owned risk pool. This structure creates the potential to measure and aggregate claims reductions across a stable insured portfolio over time.

The pilot is designed to use philanthropic capital, delivered through a patient program-related investment loan structure, to finance the incremental cost of upgrading from standard code-compliant roofs to stronger roof specifications expected to materially reduce wind, hail, and tornado losses. Repayment then occurs over a 15-year period through documented reductions in claims across the participating insured portfolio.

This structure attempts to test whether avoided future losses can function as a measurable repayment stream capable of supporting upfront resilience investment. In this model, philanthropy is not simply funding roof upgrades, but underwriting experimentation around a new resilience-finance concept.

By providing patient, mission-oriented capital, philanthropy will absorb the early uncertainty associated with claims modeling, actuarial assumptions, accounting structures, and repayment verification. In doing so, it creates the conditions necessary to determine whether resilience investments can eventually support recoverable capital structures rather than relying exclusively on grants or recurring public appropriations.

The broader significance of the pilot extends well beyond affordable housing roofs. At its core, the structure is testing whether avoided future insurance losses can be treated as a financeable asset. If successful, the model could help establish a new category of resilience finance in which stronger buildings are valued not only for their physical performance, but also for their ability to generate measurable reductions in future losses and insurance costs.

The structure may be especially relevant for quasi-public insurance pools, public housing portfolios, and mission-oriented risk-sharing entities that maintain long-term control over insured assets and are therefore able to capture savings over time. Similar pooled insurance structures exist in a handful of other states, suggesting that the pilot could eventually serve as a proof-of-concept for broader resilience-finance replication if the claims reductions and repayment assumptions are successfully demonstrated.

SUMMARY TABLES

This pilot combines shared insurance pool participation, and a program-related loan investment structure to support stronger roofs in affordable housing portfolios. Rather than financing a full roof replacement, the model is designed to cover the incremental cost of upgrading from a code-compliant roof to a stronger roof specification. The central objective is both to reduce losses across the participating portfolio and document savings into future rounds of upgrades, creating the possibility of a renewable resilience-finance model over time.

Table 1. Financing Mechanism

Program	Source of Funds	Instrument Type	Typical Grant or Benefit	Primary Objective
Pilot for stronger roofs in affordable housing portfolios	Insurance pool funds plus philanthropic seed capital delivered through a below-market program-related loan structure	Portfolio-based upgrade support	$5,000 per roof	Reduce claim losses across an affordable housing portfolio, allowing for repayment of program-related investment

Because this program is still pre-launch, nearly all partners are involved in innovation rather than implementation.

Table 2. Partners

Partner	Contribution
Housing authorities insurance	Insurance pool serving as the platform for the pilot.
Participating public housing authorities	Portfolio owners testing the concept.
Philanthropic investors	Providing catalytic program-related investment rather than grants.
Catastrophe modeling partners	Produced the actuarial analysis demonstrating the potential for claims savings to repay upfront resilience investments.

INSIGHTS

Financial Sustainability: By structuring support as a below-market, program-related investment and seeking to return documented savings from avoided losses or reduced insurance costs back to the philanthropic donor, the model aims to create a more durable financing pathway than a one-time grant. Using debt repayable through reduced claims opens up a new financial innovation not dependent on grant proceeds.

Accessibility: Unlike individual grant programs, this pilot works through an affordable housing portfolio and shared risk pool. That makes it potentially useful for reaching properties and residents who would not otherwise access an individual roof retrofit program.

Government Role: This pilot relies on philanthropic and portfolio-level financial structuring rather than on a direct state grant or tax incentive program. The governmental policy role is therefore less defined in this case study than in states such as North Carolina, Louisiana, or Alabama. It may need further clarification as the pilot develops.

Potential for Replicability: This model may be especially relevant for large affordable housing owners, pooled insurance arrangements, or mission-driven housing portfolios that can measure savings across multiple properties. Its replicability will depend on whether participating entities can document reductions in claims or premiums and reliably use these funds to repay the up-front cost of roofs that are above code. The model could offer a promising template for portfolio-scale resilience finance.

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