Resources

- This Smart Electric Power Alliance (SEPA) *Resilient by Design* report examines how 17 utilities are embedding resilience into distribution planning and collaborating with communities. Valuable case studies for utilities looking to implement community-led resilience programs.

KPIs

INPUT INDICATORS
Measure the resources required to deliver

- Existence of community-level resilience initiatives supported or co-financed by the utility

LEADING INDICATORS
Looks forward at future outcomes and events

- Number of communication campaigns or alerts issued annually on heatwaves, grid stress, or drought

LAGGING INDICATORS
Looks back at whether the intended result was achieved

- Documented improvement in client-side adaptive behaviors (e.g., reduced consumption during grid stress)

Action 3

Integrate Adaptation into National Energy Planning and Forecasting

Goal: Ensure climate adaptation is fully embedded into future energy system design and demand projections.

Description: Utilities should use insights gained from adaptation audits, community resilience programs, and grid performance during extreme events to shape national-level energy planning and forecasting. This includes feeding real-world data on vulnerabilities, demand spikes, and resilience measures into the models that guide long-term energy policy, infrastructure investments, and demand scenarios.

Resources

- The Climate resilience section of *Power Systems in Transition* from the International Energy Agency (IEA) offers a conceptual framework and data on how electricity systems must evolve to be resilient. Utilities can use this to feed into national planning, demand forecasting and long-term infrastructure design.
- *Regulatory mechanisms for climate-resilient urban energy systems* (Sustainable Cities and Societiy, 2024) research paper discusses how utilities and regulators can ensure adaptation is embedded in energy system regulatory frameworks and planning processes

KPIs

INPUT INDICATORS
Measure the resources required to deliver

- Contribution of the utility to national or regional climate risk forecasting exercises

LEADING INDICATORS
Looks forward at future outcomes and events

- Evidence of collaboration with regulators on integrating adaptation into long-term energy demand models

LAGGING INDICATORS
Looks back at whether the intended result was achieved

- Inclusion of climate risk metrics in national energy security and reliability indicators

Action 4

Drive Innovation Through Pilots and Standards

Goal: Test, evaluate, and scale adaptation measures in the energy sector.

Description: Support pilot projects on building-grid interaction under extreme conditions and document results for replication. Collaborate with regulators and manufacturers to develop performance standards and testing protocols for resilient systems, ensuring innovation is scalable and credible. Integrating adaptation into mainstream planning processes helps ensure that future energy systems are designed to withstand heatwaves, floods, droughts, and grid stress, rather than treating resilience as a separate or siloed objective. Close collaboration with national governments, regulators, and research institutions is essential to align these inputs with broader energy transition and climate policy goals. In doing so, utilities shift from being reactive service providers to strategic partners shaping climate-ready national energy systems.

- The Electrical Utilities Criteria from the Climate Bonds Initiative sets out science-based standards for utilities, including requirements for adaptation & resilience infrastructure
- Pacific Northwest National Laboratory (PNNL)'s *Climate Adaptation Approaches for Water and Electric Utilities* report is a comprehensive compendium of adaptation strategies for utilities, including many innovation examples and pilots. Helps utilities design, evaluate and scale adaptation measures.

INPUT INDICATORS
Measure the resources required to deliver

- R&D budget dedicated to adaptation-related pilots
- Number of partnerships with regulators, manufacturers, and research bodies
- Existence of internal protocols for pilot evaluation and data sharing

LEADING INDICATORS
Looks forward at future outcomes and events

- Number of adaptation pilot projects initiated annually
- % of pilot projects evaluated and published with performance results
- Development of draft or revised resilience standards submitted to regulators

LAGGING INDICATORS
Looks back at whether the intended result was achieved

- Adoption rate of validated resilience standards by utilities or manufacturers
- Reduction in climate-related system downtime or infrastructure failure rate
- Increase in investment in resilient infrastructure aligned with new standards

PROPERTY & PROJECT DEVELOPERS

Who is this pathway for?

This pathway targets real estate developers, project promoters, asset development managers, and land development companies responsible for conceiving, financing, and delivering new buildings and large-scale refurbishments. It also speaks to investors, design-build consortia, and property funds involved in project initiation and coordination. It provides guidance for integrating adaptation and resilience into project planning, financial modeling, and stakeholder engagement across all phases of property development.

Property and project developers stand at the heart of the buildings and construction value chain, shaping the spaces where people live, work, and thrive. Their projects face increasing exposure to climate hazards from heatwaves and floods to soil subsidence that can damage assets, reduce returns, and compromise safety. Yet adaptation is not only a necessity but a business opportunity: resilient buildings hold higher long-term value, lower insurance costs, and offer superior comfort and reliability for occupants. Integrating climate resilience early in project design mitigates physical and financial risks, enhances market competitiveness, and aligns with emerging regulation and investor expectations. By anticipating future climate conditions and embedding adaptive design and materials, developers can reduce repair costs, safeguard continuity, and attract risk-conscious buyers and tenants. Conversely, ignoring adaptation exposes firms to legal, reputational, and market risks as climate performance becomes a defining standard in real estate investment.

Turn resilience into a core business strategy and market advantage.

Today, most developers address resilience reactively or through compliance with minimal codes. In the short term, they must systematically assess project climate risks and adjust designs accordingly. Medium term, they should integrate adaptation into business models, budgeting, and disclosure. Long term, developers should act as catalysts of systemic resilience: embedding climate-readiness as a standard of quality, value, and innovation in all built assets and portfolios.

PROPERTY & PROJECT DEVELOPERS

Short-Term Actions

Actions	Resources & case studies	KPIs
Engage Early with Insurers, Regulators, and Local Authorities	ULI *Developing Resilience Toolkit: Part One: Risk Assessment and Resilient Design Process*	% of projects incorporating design adjustments resulting from early engagement
Launch Climate-Resilience R&D Pilots	*EU-level Technical Guidance on Adapting Buildings to Climate Change*	Number of pilot projects testing adaptive designs, materials, or technologies
Build Capacity and Embed Resilience in Design and Project Requirements	*Practical Guide to Climate-resilient Buildings & Communities* (UNEP)	% of design briefs or contracts referencing updated regional resilience standards

Medium-Term Actions

Actions	Resources & case studies	KPIs
Integrate Climate Risk into Asset and Project Valuation Models	UNEP FI *TCFD for Real Estate*	% of projects where resilience KPIs are contractually binding or tracked in delivery phase
Commission Rapid Climate Vulnerability Assessments for Portfolios	Climate-Proof Integrated Urban Planning Toolbox, initially developed by UKCIP	Frequency of vulnerability updates per asset or per region
Integrate Adaptation into Design Briefs and Budget Planning from the Outset	*Toolkit for Resilient Public Procurement Strategies to Minimise Risks* (OECD/EC)	% of projects undergoing climate risk review during concept phase

Long-Term Actions

Actions	Resources & case studies	KPIs
Disclose Adaptation Strategies Publicly	*Data, disclosures, and divergence: ESG regulations and compliance in real estate* (Deloitte)	Inclusion of adaptation KPIs and resilience case studies in public reports
Showcase Demonstration Projects and Build Toolkits for Replication	*Sustainable and Affordable Housing* (WGBC)	Number of external presentations, publications, or partnerships to share lessons learned
Invest in Mixed-Income, Resilient Housing	*Mixed-Income Housing Development Planning Strategies and Frameworks in the Global South* (Onatu et al., 2024)	Share of resilient housing projects benefiting from blended finance or public-private funding

Short-term actions

Engage Early with Insurers, Regulators, and Local Authorities

Action 1

Goal: Align development practices with evolving standards and unlock incentives.

Description: Before resilient design and financing strategies can be implemented effectively, developers must engage in proactive coordination with key institutional stakeholders. Establishing structured dialogues with insurers, permitting authorities, and municipal planning bodies allows developers to anticipate new resilience thresholds, evolving regulatory frameworks, and insurance risk requirements. These conversations also create opportunities to identify incentives, co-investment mechanisms, and streamlined permitting pathways for adaptive projects.
From insurers, developers need clarity on premium structures, risk assessment criteria, and requirements for the insurability of adaptive features. From regulators and local authorities, they must receive updated zoning rules, resilience standards, and access to long-term urban adaptation plans. Developers, in turn, must demonstrate a willingness to engage early, adjust project scopes, and contribute actively to collaborative planning discussions.
Engaging early not only reduces approval delays and compliance risks but also positions developers as forward-looking partners, aligning projects with community resilience goals and enhancing long-term asset value.

Resources

- ULI's Developing Resilience Toolkit Part One: Risk Assessment and Resilient Design Process provides guidance on understanding the exposure of a portfolio to physical climate hazards and outlines principles on incorporating resilience thinking into asset design and operations.
- The *EU-level Technical Guidance on Adapting Buildings to Climate Change* and its companion *Best Practice Guide* together provide developers and practitioners with a comprehensive overview of evolving regulations, standards, and assessment approaches for building resilience. These documents offer both regulatory context and practical examples to inform project planning and anticipate future insurance and policy expectations.
- *A Practical Guide to Climate-resilient Buildings & Communities* (United Nations Environment Programme, 2021) povides a practical checklist of interventions and stakeholder-engagement needs. Handy for early meetings with local authorities and coordinating parties.

KPIs

INPUT INDICATORS
Measure the resources required to deliver

- Number of early-stage consultations held with insurers, regulators, and local authorities before project design is finalized

LEADING INDICATORS
Looks forward at future outcomes and events

- % of projects incorporating design adjustments resulting from early engagement

LAGGING INDICATORS
Looks back at whether the intended result was achieved

- Reduction in permitting delays or insurance premium surcharges for completed projects

Launch Climate-Resilience R&D Pilots

Action 2

Goal: Test, validate, and de-risk adaptive design strategies, materials, and technologies before mainstream adoption.

Description: Developers should dedicate space and resources within upcoming projects to serve as testbeds for resilience innovations. These pilots can explore solutions such as modular retrofits, permeable paving, flood-proof designs, or water retention systems. By monitoring and documenting outcomes, developers generate reliable performance data that reduces uncertainty, reassures investors and insurers, and sets benchmarks for regulators and peers.

Resources

- The *EU-level Technical Guidance on Adapting Buildings to Climate Change* provides methodologies for vulnerability and risk assessments, outlining what effective adaptive design looks like. Its accompanying *Best Practice Guide* complements this with real-world examples and case studies to illustrate implementation.
- In *An adaptive framework for assessing climate resilience* in Buildings (2024), researchers present a methodology applied in different climates for assessing resilience; useful for monitoring & validation of R&D pilots.

KPIs

INPUT INDICATORS
Measure the resources required to deliver

- Share of annual R&D budget or project portfolio allocated to resilience pilots

LEADING INDICATORS
Looks forward at future outcomes and events

- Number of pilot projects testing adaptive designs, materials, or technologies

LAGGING INDICATORS
Looks back at whether the intended result was achieved

- Uptake of validated resilient technologies or design strategies in mainstream projects

Action 3

Build Capacity and Embed Resilience in Design and Project Requirements

Goal: Ensure resilience is systematically integrated into project design while staying ahead of evolving codes and regulations.

Description: Developers should invest in training their design, procurement, and construction teams to strengthen expertise in climate-responsive techniques, adaptive materials, and lifecycle costing. In parallel, they must **build legal and policy intelligence** systems to anticipate changes in regional codes such as new rules on drought adaptation, soil movement, or fire buffers. Legal and compliance teams should monitor regulatory trends, while design leads translate these insights into updated templates and operational guidelines.
At the same time, developers should **make resilience a non-negotiable part of client briefs and project requirements**, ensuring that adaptation is considered from the very start of the design phase. This alignment drives demand for resilient design choices, reduces risks of non-compliance or delays, and builds trust with funders, insurers, and communities.

Resources

- ULI's Developing Resilience Toolkit Part Two is intended for use by real estate development, design, and sustainability teams, property and asset management teams, investment committees, or other stakeholders seeking information on what strategies are available to reduce risk from specific or multiple hazards and their implications
- The *EU-level Technical Guidance on Adapting Buildings to Climate Change* provides a comprehensive framework for integrating resilience into building design and procurement, with references to standardization systems such as the Eurocodes. Its companion document, the *Best Practice Guide*, complements the technical guidance by showcasing practical examples, design strategies, and lessons learned to support implementation at project and policy levels.
- *A Practical Guide to Climate-resilient Buildings & Communities* (United Nations Environment Programme, 2021) simplifies adaptation-measures into checklists and is accessible to non-specialist members of the design/construction team; good for training.

KPIs

INPUT INDICATORS
Measure the resources required to deliver

- Existence of internal training or guidance materials on regional resilience codes and legal trends

LEADING INDICATORS
Looks forward at future outcomes and events

- % of design briefs or contracts referencing updated regional resilience standards

LAGGING INDICATORS
Looks back at whether the intended result was achieved

- Decrease in rework or redesigns caused by changing regulatory requirements

Medium-term actions

Integrate Climate Risk into Asset and Project Valuation Models

Action 1

Goal: Make resilience and risk part of the financial logic of development and acquisition.

Description: Use tools like CRREM, life-cycle costing, and TCFD-aligned frameworks to assess the long-term value of assets considering acute (e.g., floods) and chronic (e.g., heat stress) climate risks. This step helps avoid stranded assets and aligns investments with evolving ESG standards.

Resources

- UNEP FI's *Changing Course* report (TCFD for Real Estate) provides sector-specific guidance and scenarios to integrate physical andtransition risk into governance, metrics and targets, and investment decisions.
- UNEP FI's *Climate Risks in the Real Estate Sector* (2023 brief) is a concise overview of material physical and transition risks owners should manage, with implications for valuation.
- *Real Estate Climate Value at Risk* (RECVR) (Deloitte and Longevity Partners methodology) provides a valuation-driven methodology for real estate assets which incorporates climate & sustainability risk into cash-flows and value at risk. Useful for developers when embedding resilience into financial logic.
- *Climate risk and the opportunity for real estate* (McKinsey & Company report) highlights how physical and transition risks affect asset and portfolio valuation and what actions real estate players must take. A good high-level guide for developers.
- *MSCI Real Assets Climate Analysis: Real Estate Climate VaR Methodology*. A forward-looking valuation tool for real estate assets covering physical & transition risks, with a long time horizon to 2100. Helps developers understand how resilience ties into long-term asset value.

KPIs

INPUT INDICATORS
Measure the resources required to deliver

- % of project briefs that explicitly include resilience performance goals (e.g., overheating thresholds, flood tolerance)

LEADING INDICATORS
Looks forward at future outcomes and events

- % of projects where resilience KPIs are contractually binding or tracked in delivery phase

LAGGING INDICATORS
Looks back at whether the intended result was achieved

- Improvement in asset performance under stress events (temperature, moisture, flooding)

Commission Rapid Climate Vulnerability Assesments for Portfolios

Action 2

Goal: Prioritize at-risk buildings for retrofitting or divestment.

Description: Engage consultants or internal analysts to map exposure across existing portfolios, using local hazard data (e.g., drought-prone soils, urban heat islands). It creates a baseline for strategic upgrades and de-risking.

- *Vulnerability assessment for climate adaptation* (IPCC technical paper). Core methodology on vulnerability assessment useful for commissioning rapid assessments and ensuring they're built on solid structure.
- Bat-ADAPT (available on the R4RE platform), developed by OID, is a decision-making and mapping tool for climate risks in France and Europe, based on IPCC scenarios. It also features recommendations and assistance for planning and implementing adaptation actions.
- ISO 14090:2019 Adaptation to climate change (principles & requirements). Framework to embed adaptation into governance, risk, and decision-making; useful to structure portfolio-level programs.
- The *EU Technical Guidance on Adapting Buildings to Climate Change* provides a framework for assessing climate hazards, identifying vulnerabilities, and rating building resilience, with detailed annexes and references to existing standards. Accompanying it is a *Best Practice Guide*, which offers practical case studies and replicable solutions to support owners and practitioners in adapting buildings effectively.
- The Climate-Proof Integrated Urban Planning Toolbox, initially developed by UKCIP and refined by Local Partnerships is a step-by-step process to build asset and portfolio adaptation plans and for translating risk screens into actions.
- UNEP FI's *Changing Course* report (TCFD for Real Estate) provides sector-specific guidance and scenarios to integrate physical andtransition risk into governance, metrics and targets, and investment decisions.
- ULI and Heitman's *Climate Risk & Real Estate Investment* report shows how leading investors price climate risk, adjust underwriting and hold-sell, and upgrade assets; useful for IC memos and strategy notes.
- *Climate Risk & Vulnerability Assessment in Informal Settlements* (Land, 2024). While focused on informal settlements in the Global South, this paper published in Land, offers important lessons on hazard exposure and vulnerability assessment in contexts with limited data. Developers active in emerging markets should draw from this.

INPUT INDICATORS
Measure the resources required to deliver

- Budget and staff time allocated to vulnerability assessments
- % of portfolio covered by rapid vulnerability assessments
- Number of partnerships with climate data providers or consultants

LEADING INDICATORS
Looks forward at future outcomes and events

- Frequency of vulnerability updates per asset or per region
- Number of priority assets identified for intervention or retrofit

LAGGING INDICATORS
Looks back at whether the intended result was achieved

- % of identified priority assets with completed adaptation plans
- Reduction in financial exposure or insurance risk premiums on adapted assets
- Integration of climate risk metrics into internal investment decision frameworks

Integrate Adaptation into Design Briefs and Budget Planning from the Outset

Goal: Ensure that climate resilience is embedded in both the design intent and financial structure of new developments, securing long-term performance and value.

Description: To future-proof their projects, property developers and investors must treat adaptation not as an add-on, but as a core design and investment priority. This means embedding adaptation objectives directly into design briefs (specifying features such as passive cooling strategies, flood-resilient foundations, fire-smart landscaping, and moisture control systems) tailored to local hazard profiles. At the same time, these commitments must be backed by dedicated budget lines, supported by tools like life-cycle costing and ROI projections based on avoided damage costs. By aligning design and finance early in the process, developers can protect asset value, enhance occupant well-being, and avoid the risks of sidelining resilience during cost-cutting phases. This approach builds both climate readiness and market credibility into the foundations of each project.

Resources

- *Adaptation of buildings to climate change: an overview* (in Frontiers in Built Environment, 2024) surveys adaptive design strategies (passive cooling, moisture control, etc). Developers can use this to define design briefs and budgets incorporating adaptation features.
- *An adaptive framework for assessing climate resilience in buildings* () provides a practical framework for assessing design resilience. Helps translate design briefs into measurable requirements and budget planning.
- *Toolkit for Resilient Public Procurement Strategies to Minimise Risks* (OECD/EC). A procurement-toolkit oriented to public-sector/resilient infrastructure, but developers can draw on the check-lists and strategies to embed resilience requirements (flood, heat, fire, materials) into tender documents, partner procurement terms, ground-lease conditions, etc.

KPIs

INPUT INDICATORS
Measure the resources required to deliver

- % of new project briefs explicitly referencing climate adaptation
- Share of project budgets allocated to resilience or adaptive design measures
- Availability of design templates incorporating hazard-specific measures

LEADING INDICATORS
Looks forward at future outcomes and events

- Number of development teams trained on integrating resilience into project design
- Frequency of collaboration with adaptation experts (architects, engineers, ecologists) during pre-design phases
- % of projects undergoing climate risk review during concept phase

LAGGING INDICATORS
Looks back at whether the intended result was achieved

- Average reduction in operating disruptions due to extreme weather
- Change in asset value or occupancy rates for projects incorporating adaptation measures
- ROI of resilience investments compared to avoided damage and repair costs

Long-term actions

Disclose Adaptation Strategies Publicly

Action 1

Goal: Align with investor, tenant, and regulatory expectations.

Description: Publicly disclose resilience strategies in ESG reports and sustainability frameworks. Highlight adaptation as a driver of value creation, risk reduction, and reputation. Proactive disclosure positions developers ahead of regulatory and market shifts.

Resources

- *Data, disclosures, and divergence: ESG regulations and compliance in real estate* (Deloitte) covers how real-estate players globally face increasing pressure to disclose adaptation/resilience activities and how disclosure frameworks are evolving; valuable guidance for positioning your adaptation strategy publicly.
- *How real estate and construction are improving climate disclosures* (EY) emphasises that while many firms focus on carbon mitigation, disclosure of climate-related physical risks (which is your adaptation domain) remains weak, indicating the opportunity for developers to lead.
- Disclosure standards of the EU taxonomy, CSRD, can be used as examples of “how to disclose”. See for instance this OID guide (in French)
- Adaptation: building climate-resilient real estate (Deepki blog overview) focuses on how real-estate companies can integrate adaptation into governance, risk-management and importantly into public disclosures (e.g., via ESG frameworks, taxonomy alignment).