

THE REGENERATIVE ESTATE AS A FUTURE-READY ASSET CLASS

TRENDS IN PROPERTY RESILIENCE, FAMILY SECURITY, AND WEALTH
PRESERVATION

Executive Summary

The concept of a regenerative estate—a property designed and operated to produce resilient, self-sufficient supplies of food, water, and energy while restoring ecosystem health—is rapidly moving from a niche lifestyle choice to a definable asset class.

Integrating regenerative systems such as renewable energy, rainwater harvesting, and permaculture gardens materially reduces household vulnerability to extreme weather events such as wildfires, floods, and droughts—as well as to grid outages, supply-chain shocks, and escalating energy and insurance prices. Conversely, conventional estates face increasing exposure to physical climate damage, transition risk (e.g., carbon emissions and energy efficiency regulations), rising adaptation costs, and longer-term market discounting.

A regenerative estate therefore translates into financial value: Lower operating volatility, better total cost of ownership, improved household security, and lower probability of becoming a stranded or impaired asset.

This whitepaper synthesizes recent evidence, frames valuation and risk, and provides an investment and design framework for positioning regenerative estates as a future-ready asset class for families and private investors.

Key insights:

- Physical and transition climate risks are forcing investors to reprice real estate, and some properties face meaningful stranding risk
- Climate events such as wildfires, droughts, and floods are already imposing economic losses due to damages, and will worsen. Properties lacking resilience measures face risk
- Nutritionally poor, resource-intensive diets are driving demand for healthier food (i.e., nutrient-dense, localized, and less chemically-intensive food production)
- On-site renewable energy materially improves resilience, and can deliver measurable economic and utility value during outages. Solar and storage deployment continues to scale
- Wealth markets show an appetite for properties offering agricultural productivity, sustainability, and climate resilience, as well as long-term value preservation—positioning regenerative estates to meet demand from high-net-worth buyers

1. Why treat a regenerative estate as an asset class?

Traditional asset classes are defined by shared risk/return profiles, liquidity characteristics, and investor demand. A regenerative estate bundles a set of durable, correlated characteristics—integrated energy independence, water security, productive land use, biodiversity, and redundancy—that changes the risk profile of a property in ways that are observable, investable, and comparable across holdings.

From a portfolio perspective, regenerative estates:

- Reduce downside volatility (lower exposure to outage-related costs and lost productivity)
- Lower operating cost sensitivity to commodity and utility price shocks
- Mitigate regulatory and market transition risk by meeting or exceeding efficiency and emissions standards
- Create optionality (on-site production, potential revenue streams from surplus energy/food, amenity premium to buyers seeking resilience)

These consistent properties make the regenerative estate amenable to standardized due diligence, valuation adders, and productization (fractional ownership, private family offices, bespoke private real estate investment trusts).

2. Macro drivers that create financial upside for regenerative estates

2.1 Physical climate risks and asset stranding

Regulators, insurers, and markets are increasingly pricing climate-related risks into real-asset valuations. Recent research and commentary from climate risk specialists and financial analysts warn of “assets-at-risk,” where properties are vulnerable to physical and transition shocks; older buildings and low-resilience properties face disproportionate stranding risk as mitigation and adaptation expectations harden.

Implication: Investors holding “non-resilient” estates face higher probability of sudden capital expenditures, rising insurance premiums, and lower liquidity—classic hallmarks of stranded or impaired assets.

2.2 Climate events, damages, and economic losses

Wildfires and droughts are intensifying in tandem due to rising temperatures, prolonged dry periods, and ecosystem degradation. These climate events threaten property function and incur costs to repair damage. Regenerative estates reduce exposure through fire-adapted landscaping, defensible zones, resilient building materials, and integrated water systems such as on-site storage, greywater recycling, and catchment infrastructure.

Flooding remains the most frequent and costly climate hazard worldwide, generating over \$80 billion in annual losses. Intensifying rainfall, sea-level rise, and failing drainage systems are expanding flood risk to inland and historically "safe" areas. Regenerative properties reduce vulnerability through elevated siting, permeable hardscapes, bioswales, and natural buffers like wetlands or rain gardens—protecting structures while also restoring hydrological function.

Implication: Properties that lack integrated resilience to wildfire, drought, and flooding face escalating operating costs and greater risk of value impairment. Regenerative estates mitigate these exposures through adaptive design, maintaining function, reducing volatility, and protecting long-term property value.

2.3 Dietary imbalances and decreased nutrient–density

Research reveals global fruit and vegetable intake is 60% and 40% below the recommended two and three servings per day respectively, while legume and nut intake is 68% to 74% below the recommended one to two servings per day. Over a quarter of all deaths among adults are attributed to poor diets.

Nutritional quality is in decline due to high–yield, low nutrient crop varieties and the shift from natural to chemical farming. And over two billion people suffer from micronutrient insufficiency, especially iodine, iron, folate, vitamin A, and zinc.

Regenerative food solutions such as permaculture gardening, food forests, and passive solar greenhouses increase nutrient availability. And regenerative water solutions such as rainwater harvesting and irrigation systems increase yields by improving soil fertility without the use of harsh chemicals. Estates featuring these solutions enable increased access to—and consumption of—organic fruits, vegetables, legumes, nuts, and whole grains.

Implication: Regenerative estates prioritize nutrient–dense, diversified, and chemical–free food production—often including pasture–raised, chemical–free meats and integrated livestock systems—thereby meeting the growing demand for healthier diets, personal well–being, and longevity.

2.4 Energy transition, outages, and distributed generation

The energy transition is not only about decarbonization but also decentralization. Rapid deployment of solar, batteries, and microgrids has created viable paths to islandable resiliency for properties. Large additions of solar capacity and growing interest in microgrids and distributed energy resources (DERs) demonstrate both the tech maturity and market scale. During grid disruptions, on-site generation plus storage offers quantifiable value (avoided outage cost, continuity of operations).

Implication: Estates with integrated solar, storage, and intelligent load management will be substantially less exposed to outage-related losses and long-term energy price inflation. As power demand increases (e.g., AI, data centers, and edge computing) microgrids may offer arbitrage opportunities.

2.5 Buyer demand and wealth preservation motives

High-net-worth and private buyers increasingly value privacy, security, and place-based resilience. Luxury and prime residential markets continue to show buyer preferences for properties that promise stability, long-term quality, and differentiated amenities—a market that regenerative estates can address.

Implication: Demand-side premiums may be captured by regenerative estates, improving liquidity and preserving intergenerational value.

3. What is a regenerative estate? Core systems and metrics

A regenerative estate intentionally integrates the following systems so they are synergistic, redundant, and net-positive over time:

Food: Food forests, market gardens, passive solar greenhouses, livestock with rotational grazing, and food storage systems. Metrics: Annual edible yield per acre, caloric self-sufficiency percentage, months of stored food.

Water: Rainwater capture, cistern storage, managed aquifer recharge, greywater reuse, efficient irrigation, as well as a wildfire- and drought-tolerant landscape. Metrics: Days of potable water autonomy, irrigation self-sufficiency, liters captured per millimeter of rainfall.

Energy: Solar PV, battery storage, heat pumps, backup gensets with biofuel options, EV infrastructure, microgrid controls. Metrics: Fraction of annual energy generated on-site, hours of islanding capability, resilience, and value-of-loss avoided per outage hour.

Ecosystem services and soil health: Carbon sequestration, biodiversity corridors, and pollinator habitat. Metrics: Soil organic carbon per hectare, [biodiversity index](#).

Governance and security: Redundant communications, access control, emergency plans, and family governance structures for intergenerational transfer. Metrics: Communication backup systems, assessment of emergency response readiness, governance meeting frequency and participation rate.

These systems are designed for redundancy (e.g., multiple water sources), modularity (e.g., scalable microgrids), and regeneration (e.g., improving soil, water table, and biodiversity over time).

4. Financial case: Returns, avoided costs, and risk reduction

4.1 Quantifying resilience value

There are three channels by which a regenerative estate creates financial value:

Avoided losses—e.g., income and living costs that would have been lost during outages, crop failures, or water restrictions. Research into the value of residential solar and storage shows measurable resilience value that, when modelled at county level, can be monetized as avoided value-of-lost-load during outages.

Lower operating exposure—energy and irrigation cost hedging via on-site production reduces sensitivity to commodity shocks (electricity, diesel, fertilizer, feed).

Market premiums and liquidity—buyer preference for secure, private, and resilient properties can manifest as higher sale prices and faster transactions in stressful markets; wealth market reports indicate continued appetite for prime, differentiated properties.

4.2 Stranding and adaptation costs for non-regenerative estates

Properties that fail to adapt will face:

- Rising retrofit costs to meet new efficiency standards or insurance criteria (historic warnings by financial and regulatory leaders note significant upgrade requirements across the building stock)
- Increased insurance premiums, deductibles, or uninsurability in high-risk zones
- Market discounting and longer time-to-liquidity as buyers price in climate/performance risk

A practical rule: Where adaptation capital expenditure (CapEx) and ongoing higher premiums exceed the post-retrofit value uplift, the asset becomes impaired.

5. Valuation approach and investment metrics

To treat regenerative estates as an asset class, valuation must go beyond bricks-and-mortar replacement cost and include resilience-adjusted cash flows and optionality.

Suggested model elements:

- Resilience-adjusted net present value (RANPV): Standard discounted cash flow augmented by avoided outage costs, lower expected insurance/utility inflation, and optional revenue streams (surplus energy sales, boutique agriproducts)
- Probability-of-stranding (PoS) discount: Scenario-driven probability that the property experiences partial/total impairment within an investment horizon (e.g., 10 to 30 years), multiplied by expected impairment cost. Supported by climate scenario mapping and regulatory timelines
- CapEx amortization pathways: Treat integrated systems (microgrids, cisterns, permaculture infrastructure) as strategic CapEx with multi-decadal “useful lives” and depreciate accordingly
- Resilience score / ESG overlay: A standardized scoring system combining water, energy, food, biodiversity, and governance metrics to enable cross-property comparisons

By integrating these adjustments, owners and advisors can estimate the premium a regenerative estate should command and the discount a non-resilient property should bear.

6. Implementation blueprint: Design, capital, and operation

A repeatable pipeline for developing regenerative estates:

Site risk audit—map extreme weather event risk, utility reliability, service and market access, and regulatory timelines (e.g., efficiency standards)

Systems design—holistic plan linking food, water, and energy production. Prioritize passive solutions (passive solar greenhouses, earthworks)

Phased capital plan—identify near-term wins (rainwater capture) and longer-term investments (solar and storage). Use staged finance (tax equity, energy performance contracts, green loans)

Operational protocols—establish family governance, maintenance schedules, inventory, seed banks, and contingency plans

Measurement and reporting—keep a ledger of diet and yields, energy production, water autonomy, soil organic carbon—to support valuation and future resale

Financing: Blends of private capital, sustainable mortgages, energy service agreements, and resilience bonds can lower upfront capital requirements while sharing performance risk.

7. Policy, insurance, and market tailwinds

Policymakers and insurers are tightening expectations on building performance and risk disclosure. Central bankers and regulators have publicly warned of stranded real-estate risk and urged transparency and CapEx acceleration. Meanwhile, energy markets continue to add large volumes of solar capacity and distributed generation, making on-site energy systems an increasingly mainstream resilience tool.

Insurance markets are evolving pricing, exclusions, and underwriting based on resiliency features; estates demonstrating mitigations (defensible landscaping, hardening, water storage) can negotiate improved coverages.

8. Risks and counterarguments

- **Technology adoption cycles and CapEx:** Upfront cost can be high; careful phasing and metric-driven return on investment (ROI) assessments are essential
- **Market depth and liquidity:** Regenerative estates are specialized and may trade to a niche buyer pool; however, demand among UHNW buyers for resilience and legacy assets can offset illiquidity risk
- **Maintenance and governance burden:** Productive landscapes and microgrids require competent management—governance structures and operating partnerships are required to prevent value erosion
- **Regulatory uncertainty:** While many signals point to tighter standards, regional timelines vary; scenario analysis is required

9. Recommendations for families, advisors, and investors

For families and private owners:

- Prioritize low-regret, high-impact measures: Rainwater harvesting and storage
- Establish family governance and a maintenance endowment to avoid “mission drift” across generations

For wealth advisors and family offices:

- Treat resilience as an asset-level risk factor in portfolio stress tests. Price a probability-of-stranding (PoS) into valuations and stress scenarios
- Consider pooled vehicles that develop or retrofit regenerative estates to professional operational standards

For developers and capital allocators

- Productize regenerative estates with standardized measurement (yield, autonomy days, resilience score) and packaged financing (green mortgages, resilience bonds)
- Invest in operational partners—regenerative estates are as much about long-term operations as they are about initial capital

10. Conclusion

A regenerative estate is more than an upgraded country home—it is a portfolio instrument that materially alters a property's risk/return profile.

The convergence of intensifying climate risks and asset stranding, climate events, damages and economic losses, dietary imbalances and decreasing nutrient-density, energy transition, outages and distributed generation, as well as buyer demand give regenerative estates a defensible place in the modern asset landscape. Owners who proactively invest in regenerative food, water, and energy systems reduce exposure to the negative effects of these macro drivers.

Conversely, non-regenerative estates face increasing economic exposure and potential impairment. For families seeking intergenerational wealth preservation, and for investors hunting for uncorrelated, durability-focused real assets, regenerative estates represent a future-ready asset class worth serious allocation and operational attention.

INVESTOR MEMO

THE REGENERATIVE ESTATE AS A FUTURE-READY ASSET CLASS

Thesis

Regenerative estates—properties integrating self-sufficient food, water, and energy systems—are emerging as a resilient and real asset class. Unlike conventional estates, which face rising stranded asset, uninsurability, climate, utility, regulatory, and overall financial exposure, regenerative estates hedge downside risk while offering intergenerational value preservation and differentiated buyer demand.

Why it matters

- Climate exposure: Global regulators and insurers warn of trillions in *stranded real estate assets* without resilience measures. Wildfires, floods, and other climate events cost billions globally, including in property damages
- Decline in diet and food quality: Insufficient fruit, vegetable, legume, and nut intake. Prevalence of high-yield, low nutrient crop varieties, and a shift from natural to chemical farming
- Energy volatility: Power outages and power-quality disturbances cost the economy over billions annually; solar and battery systems improve resilience and reduce outage-risk
- Wealth market demand: UHNW buyers increasingly seek privacy, resilience, and security—positioning regenerative estates as premium assets

Approximate resilience-adjusted net present value (RANPV): Example calculation

Baseline vs. regenerative estate: 20-year comparison

Metric	Baseline Property	Regenerative Estate	Notes
Initial Investment / Property Value	\$12,000,000	\$12,945,000*	\$12M base property + \$945k regenerative improvements
Annual Operating Savings / Revenue	\$0	\$200,000	From <u>solar generation, water recycling, efficient irrigation, optional agricultural income</u>
Average Outage / Drought Losses	<u>\$50,000/year escalating 3.5%</u>	<u>\$5,000/year</u>	90% reduction due to regenerative systems
Utility Cost Escalation	<u>+3.5% real annually</u>	<u>Mitigated</u>	Solar, storage, and efficiency reduce exposure
Insurance Cost Escalation	<u>+6% real annually</u>	<u>~10–15% reduction (~\$30k/year)</u>	Improved risk profile lowers ongoing insurance costs

Metric	Baseline Property	Regenerative Estate	Notes
Stranding Risk Adjustment	<u>-\$200,000</u> <u>NPV</u>	<u>\$0</u>	Asset considered compliant with future climate, regulatory, and utility conditions
Projected Property Appreciation	3% real annual	<u>3% + 1%</u> <u>regenerative</u> <u>premium</u>	Regenerative improvements assumed to drive 7.5% uplift at sale
NPV of Operating Savings & Avoided Losses	-	~\$1,015,000	20-year discounted savings minus upfront costs, adjusted for avoided stranding risk
Appreciation Premium (NPV)	-	~\$2,640,000	Based on 1% real annual premium over 20 years
Total NPV Uplift vs. Baseline	-	~\$3,655,000	Combined operational savings + appreciation
IRR (annualized)	-	1.5–2% (operating savings only); ~22–23% (including sale)	Incremental return relative to regenerative investment and projected sale

*Regenerative systems up-front cost breakdown

Component	Estimated 2025 Installed Cost	Example Allocation	Description
Solar PV array (120 kW)	\$2.00–\$2.40 /W → \$240,000–\$290,000	<u>\$270,000</u>	<u>Supplies ~70% of estate's annual electricity; 25-year lifespan</u>
Battery energy storage (400 kWh usable)	\$550–\$650 /kWh → \$220,000–\$260,000	<u>\$240,000</u>	<u>Provides 6–8 hours of backup; enables peak-shaving and resilience</u>
Rainwater harvesting system (100,000 gal capacity)	\$2.25 / gal → \$225,000	<u>\$225,000</u>	<u>Includes filtration, pumps, and cistern; supports irrigation and water security.</u>
Efficient irrigation and greywater reuse	\$100,000–\$150,000	<u>\$125,000</u>	<u>Reduces freshwater consumption by 40–60%</u>
Smart controls, integration, and monitoring	~10% of system cost	<u>\$85,000</u>	<u>Energy management system, sensors, automation, analytics</u>
Total up-front capital investment	—	≈ \$945,000	~7.9% of property value

Regenerative estate cash flow overview

Year 0: -\$945,000 (regenerative system investment)

Years 1–20: +\$200,000 annual operating savings (mitigates losses and escalation)

Year 20: +\$2,640,000 (projected appreciation premium at sale). ~\$3,655,000 (Combined operational savings and appreciation) total NPV uplift vs. baseline.

Regenerative estate cash flow overview

- **1.5–2% IRR:** From operating savings and avoided losses alone.
- **~22–23% IRR:** Including projected property appreciation due to regenerative improvements.

Assumptions

- Discount rate used: 6% real (net of inflation)
- All annual values reflect current dollar equivalents (i.e. real dollars)

Sample resilience scorecard

Dimension	Metric	Score (1–5)
Food	% of annual caloric yield produced	4 (70%)
Water	Days of potable water autonomy	5 (365+)
Energy	Hours of islanding capability	5 (72+)
Biodiversity	Soil carbon increase (tC/ha/year)	4 (+1.5)
Governance	Emergency protocols and stewardship	4 (formal)

Composite Resilience Score: 22/25 (future-ready asset)

Investor takeaway

- **Downside hedge:** Lower volatility, reduced stranding risk
- **Upside premium:** Growing UHNW demand, intergenerational security
- **Portfolio role:** Diversifier and long-duration wealth preservation asset

Recommendation: Allocate 5 to 10% of real asset holdings into regenerative estates as a resilience hedge and intergenerational store of value.

Appendix: Selected data sources and evidence (key citations)

- Asia Growth Partners (AGP). (2017, July 05). Costs, Savings, and ROI for Smart Building Implementation.
<https://asiagrowthpartners.com/guide/costs-savings-and-roi-for-smart-building-implementation/g666>
- Baik, S. et al. (2024). The resilience value of residential solar + storage systems in the continental U.S.. Environmental Research: Energy. 1(4), 2753-3751/ad93da.
https://www.researchgate.net/publication/385918100_The_resilience_value_of_residential_solar_storage_systems_in_the_continental_US
- Bhardwaj, R.L. et al. (2024). An Alarming Decline in the Nutritional Quality of Foods: The Biggest Challenge for Future Generations' Health. Foods. 14;13(6), 877. <https://pmc.ncbi.nlm.nih.gov/articles/PMC10969708/>
- CBRE Investment Management. The Economic Case for Sustainability.
<https://www.cbreim.com/sustainability/the-economic-case-for-sustainability>
- Center on Global Energy Policy at Columbia | SIPA. (2023, June 01). The Reliability and Resiliency of Electric Services in the U.S. in Light of Recent Reliability Assessments and Alerts.
<https://www.energypolicy.columbia.edu/publications/the-reliability-and-resiliency-of-electric-services-in-the-u-s-in-light-of-recent-reliability-assessments-and-alerts/>
- Commission for Environmental Cooperation (CEC). (2008, September 08). Renewable Energy as a Hedge Against Fuel Price Fluctuation.
<https://www.cec.org/publications/renewable-energy-as-a-hedge-against-fuel-price-fluctuation/>
- Contrino, L. (2025, June 05). How Climate Change Is Influencing Property Demand and Valuation in the UK. Feast Magazine. <https://www.feast-magazine.co.uk/property/how-climate-change-is-influencing-property-demand-and-valuation-in-the-uk-58311>

- Debebe, Y. et al. (2025). *Integrating rainwater harvesting and organic soil amendment to enhance crop yield and soil nutrients in agroforestry*. Environ Dev Sustain. <https://link.springer.com/article/10.1007/s10668-024-05764-2>
- Gilmore, A. (2022, September 01). Losses from fossil fuel stranded assets 'could reach \$30.6tn'. Net Zero Investor. <https://www.netzeroinvestor.net/news-and-views/losses-from-fossil-fuel-stranded-assets-could-reach-30.6tn>
- Global Nutrition Report. What we eat matters: Health and environmental impacts of diets worldwide. <https://globalnutritionreport.org/reports/2021-global-nutrition-report/health-and-environmental-impacts-of-diets-worldwide/>
- González, D.A. et al. (2025). BioRegen Index: Pampas As a Case Study. 5th World. <https://5thworld.com/blog/bioregen-index-pampas-as-a-case-study/>
- FCIQ. (2025, February 15). Climate Change Is Transforming Home Insurance – Here's What Homeowners Need to Know. <https://www.fciqu.ca/insurance-and-risk-management/residential-property-insurance/climate-change-is-transforming-home-insurance-heres-what-homeowners-need-to-know/>
- FCIQ. (2025, October 04). Smart Property Insurance: How Risk Reduction Cuts Your Premium Costs. <https://www.fciqu.ca/insurance-and-risk-management/sustainable-insurance-solutions/smart-property-insurance-how-risk-reduction-cuts-your-premium-costs/>
- Financial Model Excel. (2025, September 29). How Can Greenhouse Farming Maximize Profitability with These 5 Top Strategies?. <https://financialmodelexcels.com/blogs/profitability/greenhouse-farming-produce>
- Highjoule (HJ). C&I Energy Storage Systems. <https://www.hijoule.com/products/>

- Institute for Climate Economics (I4CE). (2024, June 28). From Stranded Assets to Assets-at-Risk: Reframing the narrative for European private financial institutions. <https://www.i4ce.org/en/publication/stranded-assets-assets-risk-reframing-narrative-european-private-financial-institutions-climate/>
- Insurance Bureau of Canada (IBC). (2025, January 13). 2024 shatters record for costliest year for severe weather-related losses in Canadian history at \$8.5 billion. <https://www.ibc.ca/news-insights/news/2024-shatters-record-for-costliest-year-for-severe-weather-related-losses-in-canadian-history-at-8-5-billion>
- Intercontinental Exchange. (2025, September 08). ICE Mortgage Monitor: Property Insurance Costs Grow 11.3% over the Last Twelve Months. <https://markets.financialcontent.com/stocks/article/bizwire-2025-9-8-ice-mortgage-monitor-property-insurance-costs-grow-113-over-the-last-twelve-months>
- Joint Economic Committee. (2023, October 16). *Climate-exacerbated wildfires cost the U.S. between \$394 to \$893 billion each year in economic costs and damages.* <https://www.jec.senate.gov/public/index.cfm/democrats/2023/10/climate-exacerbated-wildfires-cost-the-u-s-between-394-to-893-billion-each-year-in-economic-costs-and-damages>
- Knight Frank. (2024, March 05). *Liam Bailey, Knight Frank's Global Head of Research and Editor of The Wealth Report, distils the findings from this year's edition.* <https://www.knightfrank.com/research/article/2024-03-05-key-findings>
- McKinsey & Company. (2022, February 04). *Climate risk and the opportunity for real estate.* <https://www.mckinsey.com/industries/real-estate/our-insights/climate-risk-and-the-opportunity-for-real-estate>
- McKinsey & Company. (2022, June 23). *Proposed climate rule signals new era for real estate.* <https://www.mckinsey.com/industries/real-estate/our-insights/proposed-climate-rule-signals-new-era-for-real-estate>

- Microgrid Knowledge. (2025, February 26). Bloomberg NEF: Microgrids, Sustainable Energy Thrive in 2024.
<https://www.microgridknowledge.com/microgrids/news/55270854/bloombergnef-microgrids-sustainable-energy-thrive-in-2024>
- Muñoz, S. M. et al. (2024). Urban Stormwater Management Using Nature-Based Solutions: A Review and Conceptual Model of Floodable Parks. Land. 13(11), 1858. <https://www.mdpi.com/2073-445X/13/11/1858>
- Office of Scientific and Technical Information. (2020, April 01). Advancing Electric System Resilience with Distributed Energy Resources: A Review of State Policies. U.S. Department of Energy.
<https://www.osti.gov/biblio/2394650>
- Office of Scientific and Technical Information. (2004, June 08). Amplifying Real Estate Value through Energy & Water Management: From ESCO to 'Energy Services Partner'. U.S. Department of Energy.
<https://www.osti.gov/biblio/886597>
- Official Data Foundation. Fuels and utilities price inflation since 1975.
<https://www.officialdata.org/Fuels-and-utilities/price-inflation/1975-to-2024>
- Oliver, J. & Mooney, A. (2024, October 01). Mark Carney warns net zero will mean 'significant' stranded property assets. Financial Times.
<https://www.ft.com/content/d0925242-858c-4a97-a98b-db846a470d27>
- Organics Farming, The Canadian Way. (2025, January 30). Smart Rainwater Harvesting Transforms Alberta Farms (With Real Results).
<https://organicagcentre.ca/water-management-and-conservation/smart-rainwater-harvesting-transforms-alberta-farms-with-real-results/>
- Organisation for Economic Co-operation and Development (OECD). Climate risks and disasters. <https://www.oecd.org/en/topics/climate-risks-and-disasters.html>
- Poudel, S. & Dubey, A. (2019). Critical Load Restoration using Distributed Energy Resources for Resilient Power Distribution System. IEEE Transactions on Power Systems. 34(1), 52- 63.
<https://ieeexplore.ieee.org/document/8421054>

- Ramakrishnan, U. (2002). *Prevalence of Micronutrient Malnutrition Worldwide*. Nutrition Reviews. 60(5), 46–52.
https://academic.oup.com/nutritionreviews/article-abstract/60/suppl_5/S46/1896146
- Solar Energies. *Solar Panels Quebec Cost Guide 2025 + Calculator*.
<https://solarenergies.ca/solar-panels-quebec-guide/>
- Solar Guide. *Solar Panels Cost in Canada (2025)*.
<https://solarguide.ca/solar-panel-cost/>
- Strong, S. *Study: Home Wildfire Resistance Starts with Defensible Space and Proper Materials*. Architect Magazine.
https://www.architectmagazine.com/technology/study-home-wildfire-resistance-starts-with-defensible-space-and-proper-materials_s
- Sun, T. et al. (2025). *Solar and battery can reduce energy costs and provide affordable outage backup for US households*. Nature Energy. 10, 1025–1040. <https://www.nature.com/articles/s41560-025-01821-w>
- Swiss RE. (2022, March 30). *Extreme flood events once again drive high losses in 2021, yet 75% of flood risks remain uninsured, Swiss Re Institute reveals*. <https://www.swissre.com/en/china/news-insights/press-release/nr-20220330-sigma1-2022-china.html>
- U.S. Department of Energy. *Benefits of Residential Solar Electricity*.
<https://www.energy.gov/energysaver/benefits-residential-solar-electricity>
- U.S. Department of Energy. (2023, December 22). *Estimate the Value of Resilience with the Customer Damage Function Calculator*.
<https://www.energy.gov/femp/articles/estimate-value-resilience-customer-damage-function-calculator>
- United States Environmental Agency (EPA). (2024, September). *Climate Change Indicators: Coastal Flooding*. <https://www.epa.gov/climate-indicators/climate-change-indicators-coastal-flooding>
- U.S. Energy Information Administration (EIA). (2025, February 24). *Solar, battery storage to lead new U.S. generating capacity additions in 2025*.
<https://www.eia.gov/todayinenergy/detail.php?id=64586#>

- Vrensen, H. et al. (2020). *Managing Climate Change-Related Risks in Global Real Estate*. The Counselors of Real Estate. 44(23). <https://cre.org/real-estate-issues/managing-climate-change-related-risks-in-global-real-estate/>
- Williamson, R.F. (2024). *Permaculture Management of Arable Soil Increases Soil Microbial Abundance, Nutrients, and Carbon Stocks Compared to Conventional Agriculture*. *Agronomy*. 14(7), 1446. <https://www.mdpi.com/2073-4395/14/7/1446>
- World Economic Forum. (2022, January 12). *The conversation about green real estate is moving on as corporates prioritize sustainability*. <https://www.weforum.org/stories/2022/01/green-real-estate-sustainability-corporate-priority/>