Global Scenarios Comparison Report

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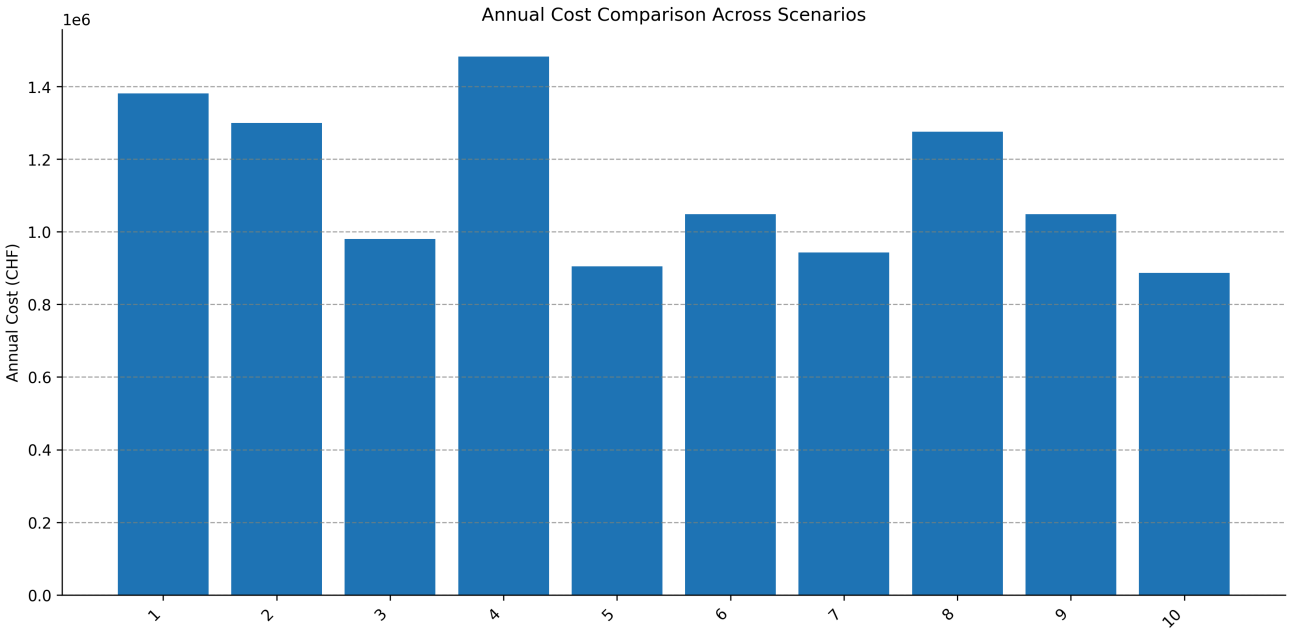
Investment Analysis

Scenario	Initial Inv.	Annual Cost	10y NPV	20y NPV	30y NPV	Annuity
7	CHF 2'750'000	CHF 942'766	CHF −9'918'474	CHF −13'556'583	CHF −15'233'659	CHF 1'353'167
3	CHF 2'550'000	CHF 980'376	CHF −9'821'150	CHF −13'571'752	CHF −15'258'653	CHF 1'355'387
6	CHF 2'300'000	CHF 1'048'043	CHF −9'829'002	CHF −13'616'754	CHF −15'353'770	CHF 1'363'836
5	CHF 3'000'000	CHF 905'287	CHF −10'113'189	CHF −13'807'976	CHF −15'478'398	CHF 1'374'906
9	CHF 3'200'000	CHF 1'048'043	CHF −10'849'783	CHF −14'693'481	CHF −16'578'091	CHF 1'472'589
1	CHF 900'000	CHF 1'380'923	CHF −10'286'888	CHF −14'634'833	CHF −16'770'455	CHF 1'489'676
10	CHF 4'100'000	CHF 887'122	CHF −11'361'773	CHF −15'060'448	CHF −16'896'633	CHF 1'500'885
2	CHF 1'400'000	CHF 1'300'109	CHF −10'637'014	CHF −15'080'109	CHF −17'193'991	CHF 1'527'298
8	CHF 1'800'000	CHF 1'275'673	CHF −11'172'440	CHF −15'548'394	CHF −17'715'738	CHF 1'573'644
4	CHF 2'100'000	CHF 1'482'721	CHF −12'967'033	CHF −18'400'575	CHF −20'754'695	CHF 1'843'586

Annual Cost Comparison



Comparative Analysis of Energy Scenarios

Overall Trends in Cost Effectiveness

The analysis of operational costs and NPV over a 30-year horizon reveals significant disparities among the scenarios. Scenarios with a higher initial investment, such as scenario_10 (4.1M) and scenario_9 (3.2M), display notably lower NPVs (-16.9M and -16.6M, respectively), indicating less cost-effectiveness over time. Conversely, scenario_1, with the lowest initial investment (0.9M) but higher annual costs (1.38M), shows a relatively better NPV (-16.77M).

Trade-offs Between Different Generation Mixes

The mix of generation technologies appears to influence both operational costs and NPVs. Scenarios that incorporate more renewable sources, such as wind and solar (e.g., scenarios_3, _5, and _4), tend to have higher annual costs due to operational and maintenance complexity, leading to worse NPVs. In contrast, scenarios focusing predominantly on nuclear (scenarios_1 and _2) yield lower annual operational costs while maintaining stable outputs, underscoring nuclear's role in providing a reliable energy source.

Scenarios with battery storage (2, 4, 10) experience diverse impacts on annual costs, highlighting the nuanced role of storage technology in enhancing flexibility but also introducing additional costs. Nonetheless, the cumulative effect of investment and maintenance still hinders their NPV outcomes.

Key Success Factors in Better Performing Scenarios

Scenarios such as scenario_7 and scenario_3, which leverage nuclear power heavily while also incorporating renewable resources, demonstrate a balance of lower initial costs and manageable annual expenses, resulting in comparatively better NPVs. The optimal combination of reliable baseload generation (nuclear) and variable resources (solar and wind) alongside efficient storage solutions is essential for improving economic feasibility.

Recommendations for Future Scenario Design

1. **Incorporation of Storage**: Future scenarios should evaluate various types of battery storage, optimizing their deployment to align with peak loads and variable renewable generation without overly inflating costs.
2. **Focus on Cost Management**: A careful balance must be struck between renewables and conventional sources, emphasizing the importance of minimizing operational costs while ensuring generation stability.
3. **Investment in Technology**: Continued investment in advanced nuclear technology and innovative renewable systems can enhance long-term cost-effectiveness.
4. **Consider Economic Incentives**: Examining government policies and market structures could yield strategies for improving project profitability and reducing perceived risks in renewable-heavy scenarios.

By emphasizing these considerations, future energy system designs can optimize economic efficiency while ensuring technical feasibility in diverse operational environments.