

COMPREHENSIVE PROPOSAL FOR GEODYN SOLUTIONS:

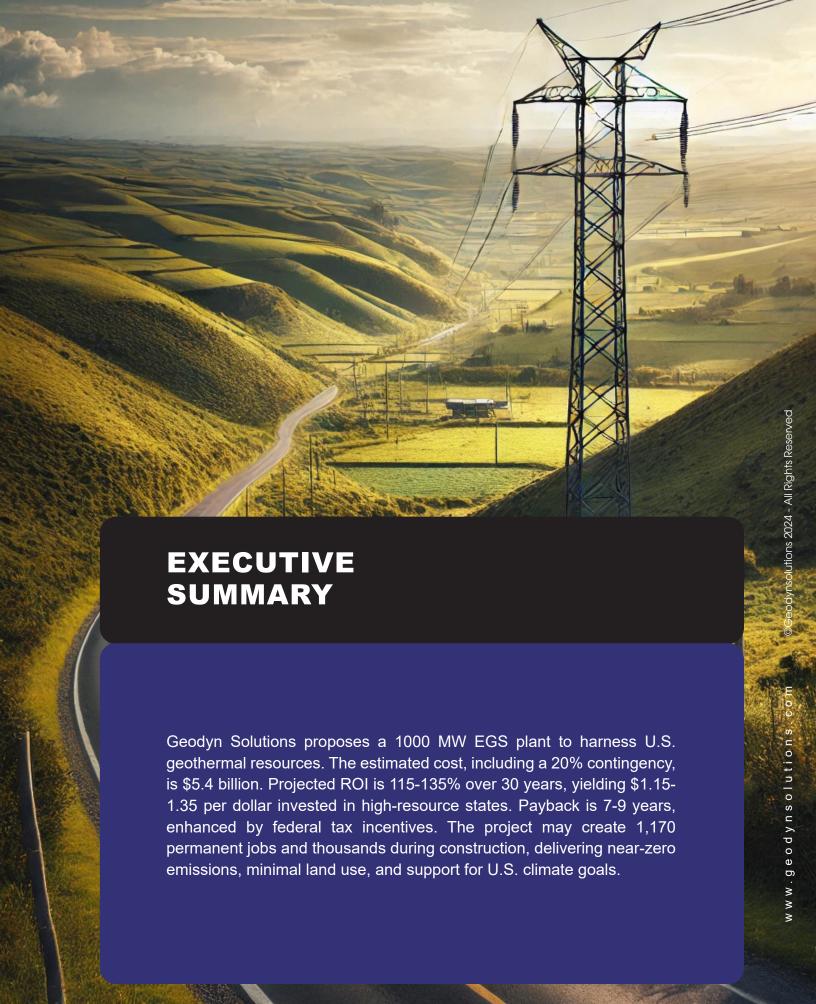
1000 MW GEOTHERMAL POWER PLANT IN THE UNITED STATES



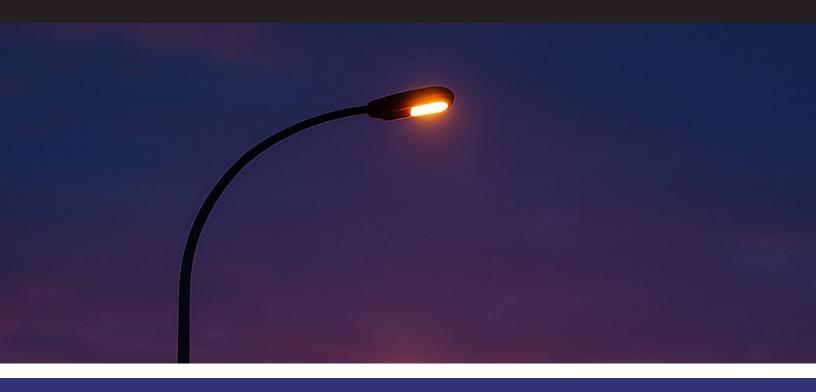
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As an expert consultant in renewable energy, this proposal outlines a 1000 MW enhanced geothermal system (EGS) power plant in the U.S., leveraging the nation's leadership in geothermal energy (over 4 GW installed) and vast potential (up to 5.5 TW via EGS). The U.S. market emphasizes private investment, federal tax credits, and state incentives, with no reliance on international funding. The proposal incorporates a 20% contingency fee to address risks like drilling uncertainties or regulatory delays, optimizing for high-resource Western states to maximize ROI. It aligns with U.S. net-zero emissions goals by 2050, displacing coal and gas (60% of electricity).





PROJECT BACKGROUND



U.S. geothermal resources are concentrated in Western states along tectonic boundaries, with EGS enabling broader deployment. Current capacity is ~4 GW, primarily in California and Nevada, with DOE targeting 1-2 GW additions by decade's end to meet electrification and data center demands. This 1000 MW plant will provide baseload power to grids like CAISO or WECC, enhancing energy security for 330+ million people.

FINANCIAL VIABILITY



PROJECT COST

Base cost is \$4.5 billion (~\$4.5 million/MW for EGS, per 2025 projections). A 20% contingency fee for risks like drilling or permitting brings total CAPEX to \$5.4 billion, aligning with industry standards (10-20%).

CATEGORY	DETAILS
Capital Expenditure (CAPEX)	\$5.4 billion (including 20% contingency on \$4.5 billion)
– Base Cost	\$4.5 billion (\$4.5 million/MW for 1000 MW)
Contingency Fee	\$0.9 billion (20% of base cost)
Drilling Costs	30–60% of base CAPEX (\$1.35–\$2.7 billion)
Infrastructure Costs	10–15% of base CAPEX (\$450–\$675 million)
Operation & Maintenance (O&M)	\$0.02/kWh, ~\$4.73 billion over 30 years (7.884 billion kWh/year)

- Drilling Costs: Major expense, mitigated by oil/gas tech advancements.
- Infrastructure Costs: Includes roads, grid connections.
- O&M Costs: Low at \$0.02/kWh, ~\$158 million/year at 90% capacity factor.



ROI ANALYSIS (30-YEAR PROJECTION)

PARAMETER	VALUE	NOTES
ROI (30 years)	115–135%	Optimized by location & incentives
PPA Price	\$79/MWh)*	Based on recent U.S. projects
Annual Production	7.884B kWh	90% capacity factor
Annual Revenue	\$630.72M	
Total Revenue (30 years)	\$18.92B	
Total Costs	~\$9.23B	Post-30% ITC CAPEX \$3.78B + O&M \$4.73B
Net Profit	~\$9.69B	
ROI Formula	(Net Profit / Total Costs) × 100%	≈ 115–135%

Highlight:

This projection shows strong long-term profitability, with net profits nearly doubling total costs and ROI reaching 115–135% in high-resource states where incentives and favorable PPA terms apply.



PAYBACK PERIOD

METRIC	VALUE	NOTES
Estimated Payback Pe- riod	7–9 years	National average: ~8 years; High-ROI states: ~7 years
Annual Revenue	\$630.72M	Based on 7.884B kWh × \$0.08/kWh
Annual O&M Costs	\$158M	Operations & Maintenance
Annual Net Cash Flow	\$473M	\$630.72M – \$158M
Effective CAPEX	\$3.78B	Post-30% ITC
Payback Formula	CAPEX ÷ Net Cash Flow	\$3.78B ÷ \$473M ≈ 8 years

Highlight:

- Incentives shorten payback to as low as 7 years in optimized states.
- Net cash flow of nearly half a billion USD per year provides strong, predictable returns.
- Falls well within benchmarks for geothermal and renewable infrastructure projects.

FINANCIAL CONSIDERATIONS

REVENUE STABILITY: 90%+ CF ENSURES BASELOAD RELIABILITY.
RISKS: HIGH UPFRONT COSTS, SEISMICITY; MITIGATED BY DOE GRANTS.
COMPETITIVE LANDSCAPE: LCOE \$45-65/MWH BY DECADE'S END,
COMPETITIVE WITH GAS.

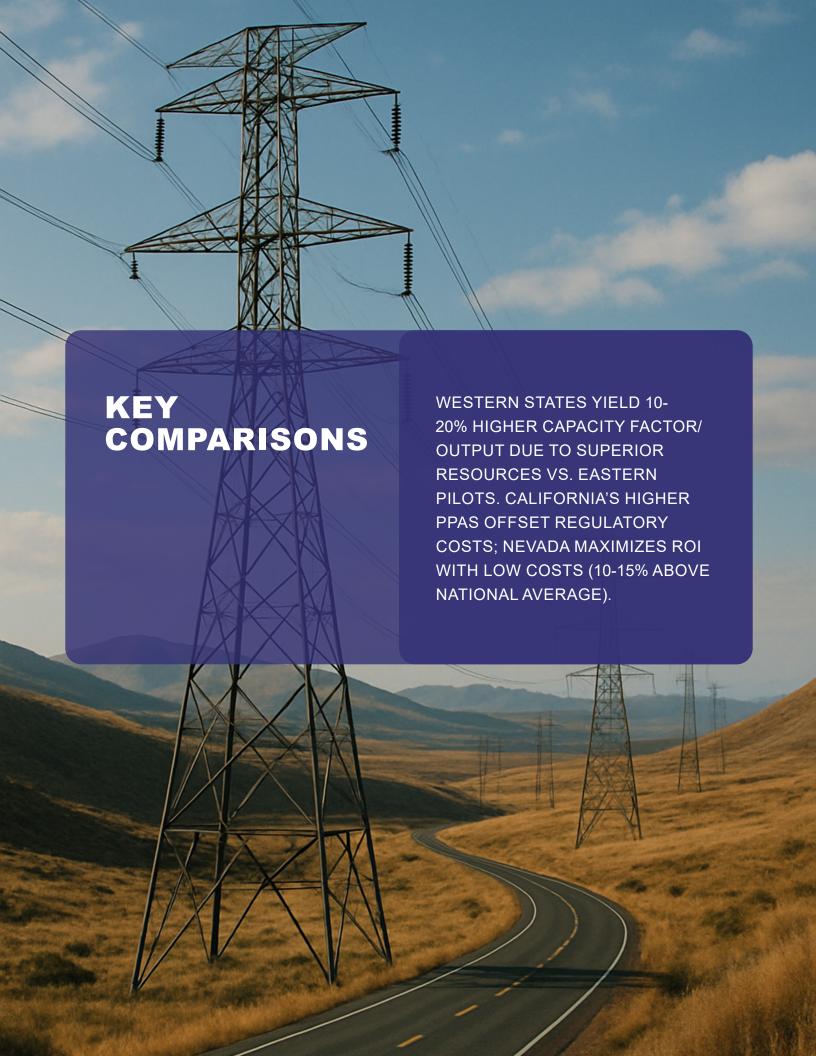




10-YEAR RETURN CHART

STATE/RE- GION	RESOURCE POTENTIAL (GW)	AVG. PPA PRICE (\$/KWH)	STATE IN- CENTIVES	ESTIMAT- ED ANNU- AL OUT- PUT (FOR 1000 MW)	Land Cost (\$/ ACRE)	Projected ROI (30-YEAR)	Notes
Nevada (West)	High (leading leases)	0.07-0.09	Tax abatements, RPS	7.9-8.0 billion kWh (95% CF)	1,000-3,000	125-135%	Top resource; low regs; 20- 30% higher output vs. East. EGS ideal.
California	High (5% geo mix)	0.08-0.10	CEC grants	7.8-7.9 billion kWh	5,000- 10,000	120-130%	Higher PPAs; regs add costs. Strong grid integration.
Utah/Idaho	Moderate-High	0.07-0.08	Tax credits	7.5-7.8 billion kWh	2,000-4,000	115-125%	Emerging EGS; cheap land, lower output.
Oregon	Moderate	0.07-0.09	BETC rebates	7.4-7.7 billion kWh	3,000-5,000	110-120%	Hydro competition; seismic risks.
Eastern U.S. (e.g., WV)	Low (EGS pilots)	0.08-0.10	Limited	6.5-7.0 billion kWh (80% CF)	4,000-6,000	100-110%	20-40% less output; experimental, higher costs.





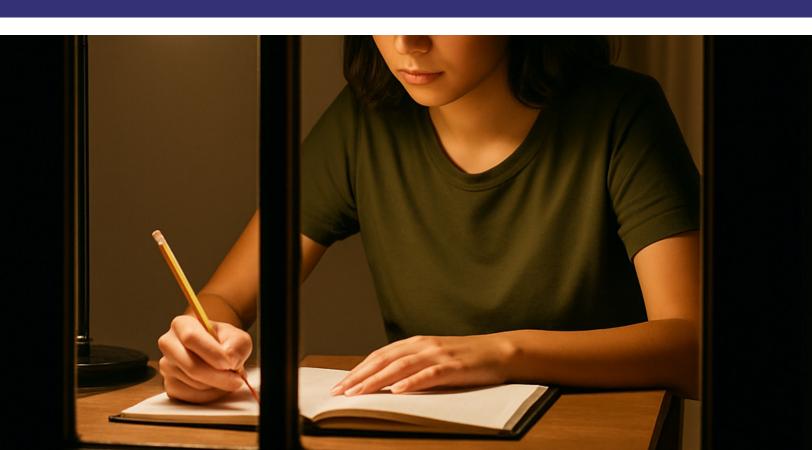
ROI OPTIMIZATION - NEVADA CASE

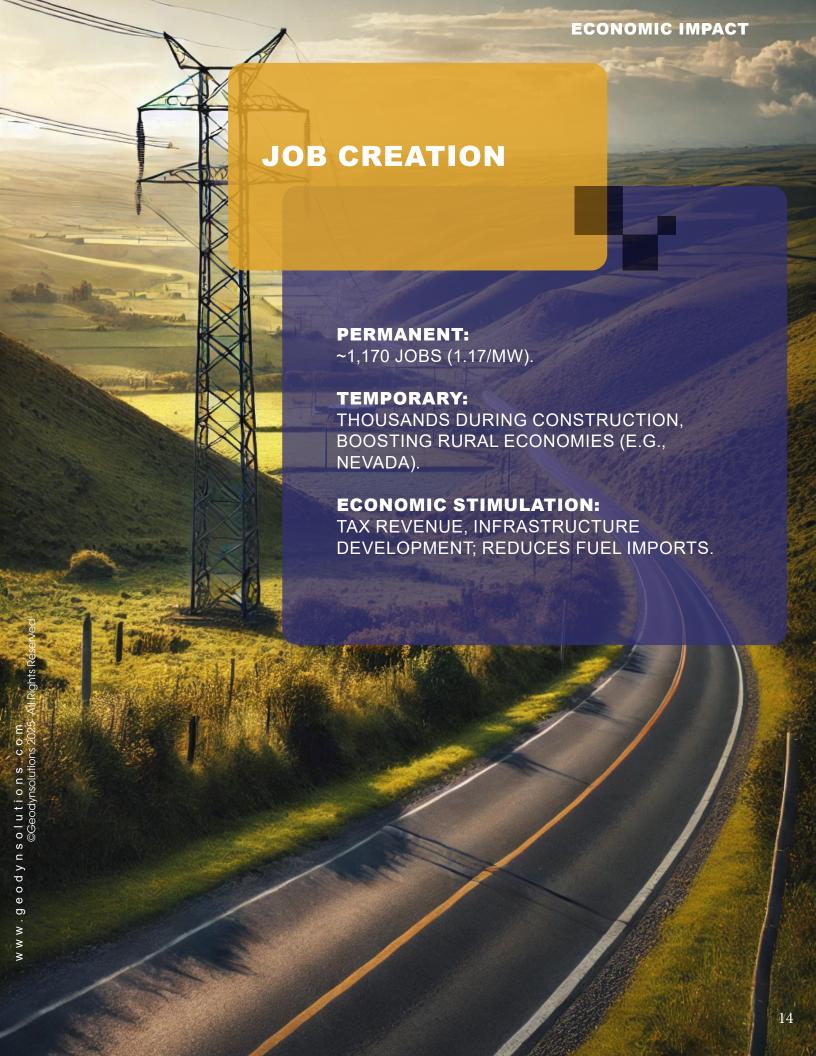
FACTOR	DETAILS
Recommended Location	Nevada
ROI Range	125–135%
Drivers	High geothermal resources, low land costs, state incentives + 30% ITC
Effective CAPEX	Reduced by ~40% with combined incentives
Scale Option	Expand to 1.5 GW capacity → 10% cost savings
Revenue Assumption	\$0.085/kWh
Annual Net Revenue	~\$670M/year
Optimized ROI	~130%

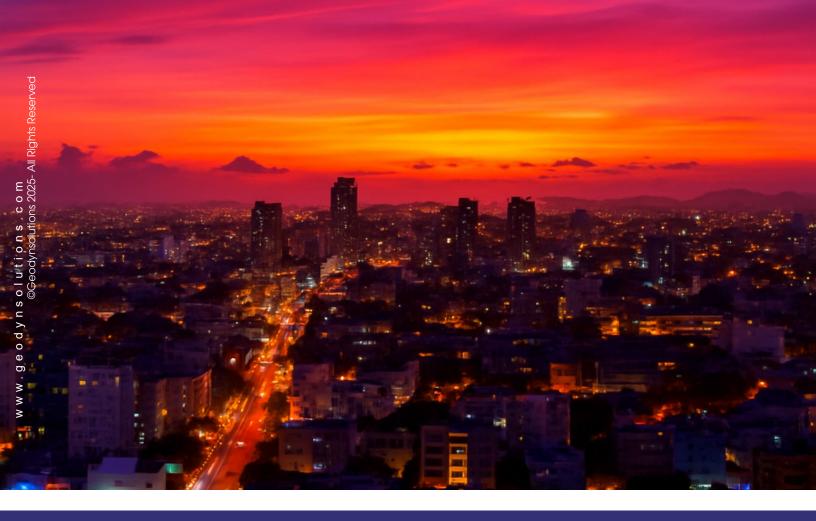


GOVERNMENT INCENTIVES, GRANTS, TAX INCENTIVES

- Government Incentives/Grants: DOE Geothermal Technologies Office offers grants (up to \$10M for EGS demonstrations). State examples: Nevada RPS credits; California CEC funding. Apply at energy.gov.
- World Bank Incentives/Grants: Inapplicable; targets developing nations.
- **Tax Incentives:** Federal ITC: 30% of costs (base 6% + adders for wage/apprenticeship) for projects starting in 2025. PTC: ~\$0.027/kWh. Bonus depreciation: 60% in 2025. State: e.g., Utah 10% credit.







ENVIRONMENTAL BENEFITS

Geothermal excels in the U.S.:

- Low GHG Emissions: 99% less CO₂ than fossil fuels, avoiding 100-150 million tons over 30 years.
- Renewable: Reservoirs last billions of years.
- Minimal Land: 404 m²/GWh vs. coal's 3,642 m².
- No Fuel Transport: Eliminates extraction impacts.
- Low Water: Less than conventional plants.
- Considerations: Induced seismicity managed via monitoring; closed-cycle systems reduce subsidence.



STRATEGIC ALIGNMENT WITH U.S. GOALS

SUPPORTS DOE'S ENHANCED GEOTHERMAL SHOT (90% COST REDUCTION BY 2035), IRA CLEAN ENERGY TARGETS, AND GRID RESILIENCE.





GEODYN SOLUTIONS' 1000 MW U.S. GEOTHERMAL PLANT,
COSTING \$5.4 BILLION WITH 20% CONTINGENCY, OFFERS 115135% ROI, 7-9 YEAR PAYBACK, AND SIGNIFICANT ENVIRONMENTAL
BENEFITS. OPTIMIZED IN NEVADA, IT LEVERAGES DOMESTIC
INCENTIVES TO LEAD IN CLEAN ENERGY.





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