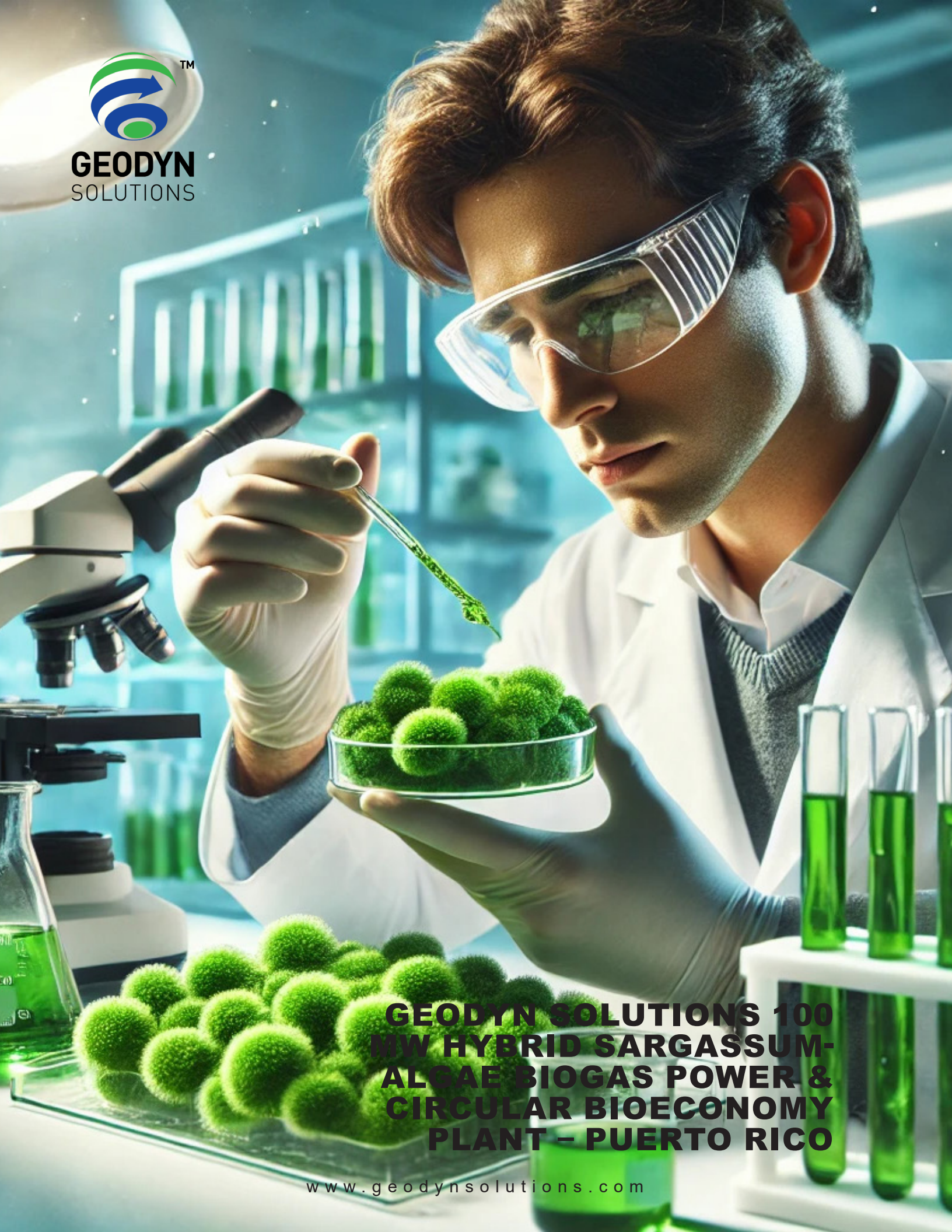
GEODYN SOLUTIONS™



GEODYN SOLUTIONS 100 MW HYBRID SARGASSUM-ALGAE BIOGAS POWER & CIRCULAR BIOECONOMY PLANT – PUERTO RICO

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EXECUTIVE SUMMARY

Geodyn Solutions proposes a 100 MW hybrid biogas power plant in Puerto Rico, combining seasonal Sargassum seaweed harvesting with cultivated algae systems to produce renewable baseload electricity, organic fertilizer, and high-value algae-based food and feed products. This hybrid approach leverages Puerto Rico's natural abundance of Sargassum during peak seasons while maintaining year-round energy production and product output through controlled algae cultivation.

The project supports Puerto Rico's transition to clean energy while addressing Sargassum overgrowth, improving coastal ecosystems, and generating strong multi-stream revenue with a 12-year ROI approaching 300%.

PROJECT SUMMARY

PARAMETER	DETAIL
Location	Puerto Rico (coastal/industrial zone)
Project Type	Hybrid Sargassum-Algae Biogas Power & Circular Bioeconomy
Installed Capacity	100 MW continuous baseload
Core Technologies	Anaerobic Digestion + Combined Heat & Power (CHP)
Feedstock Sources	Sargassum (seasonal) + Cultivated Algae (year-round)
Additional Products	Organic Fertilizer, Algae Protein for Food/Feed
Deployment Timeline	18–24 months
Electricity Sale Rate	$0.19 per kWh

LAND REQUIREMENT

- Open Pond Cultivation Area: 7,000–14,000 acres (28–56 km²)
- Land selected for flat topography, non-arable use, and proximity to CO_2 and water sources
- Modular design allows staged development across available parcels

CAPITAL EXPENDITURE *(CAPEX)* – OPEN POND SYSTEM

Component	Cost Estimate (USD)
Open Pond Cultivation Infrastructure	$100 million
Anaerobic Digestion Systems	$120 million
Combined Heat and Power (CHP) Units	$80 million
CO□ Capture and Integration	$20 million
Fertilizer Processing Facilities	$25 million
Algae Biomass Drying & Processing Facility	$35 million
Site Preparation, Civil Works, Water Systems	$30 million
Grid Connection and Transmission	$30 million
Contingency (25%)	$110 million
Total CAPEX *Aligned with global benchmarks for bioenergy and algae infrastructure investment costs.*	**$550 million**

OPERATING EXPENDITURE (OPEX)

Category	Annual Cost (USD)
Labor & Administration	$12 million
Algae Pond Operations	$15 million
Maintenance and Spare Parts	$10 million
Fertilizer & Biomass Processing	$5 million
Water Systems and CO□ Handling	$3 million
Environmental Compliance & Monitoring	$2 million
Insurance, Licenses, Taxes	$3 million
Total Annual OPEX	**$50 million/year**

ANNUAL OUTPUT & REVENUE STREAMS

ELECTRICITY SALES

- ANNUAL OUTPUT: 100 MW × 85% CAPACITY × 8,760 HOURS = 744.6 GWH
- REVENUE: 744.6M KWH × $0.19 = $141.47 MILLION/YEAR

ORGANIC FERTILIZER SALES

- DIGESTATE OUTPUT: ~200,000 TONS/YEAR
- REVENUE: $100/TON = $20 MILLION/YEAR

ALGAE PROTEIN (FOOD/FEED) SALES

- DRY BIOMASS OUTPUT: ~10,000 TONS/YEAR
- REVENUE: $2,500/TON = $25 MILLION/YEAR

TOTAL ANNUAL REVENUE:

$141.47M (ELECTRICITY) + $20M (FERTILIZER) + $25M (ALGAE) = $186.47 MILLION/YEAR

12-YEAR RETURN ON INVESTMENT (ROI)

Metric	Value
Total Revenue (12 Years)	$2.237 billion
Total OPEX (12 Years)	$600 million
Total Net Profit	$1.637 billion
Total CAPEX	$550 million
12-Year ROI	**~297.6%**
Payback Period	**~4.03 years**

CARBON SEQUESTRATION & ENVIRONMENTAL BENEFITS

Benefit Area	Detail
CO_2 Capture via Algae	~1.8 tons CO_2 absorbed per ton of algae
Total CO_2 Captured	~300,000 tons/year
Net Emissions Profile	Near-zero or carbon-negative
Waste Reuse	Integrates wastewater & CO_2 flue gas
Water Efficiency	Closed-loop systems reuse 90%+ water
Land Use	Utilizes low-value/non-arable land
Byproducts	Organic soil amendment, reduced fertilizer imports

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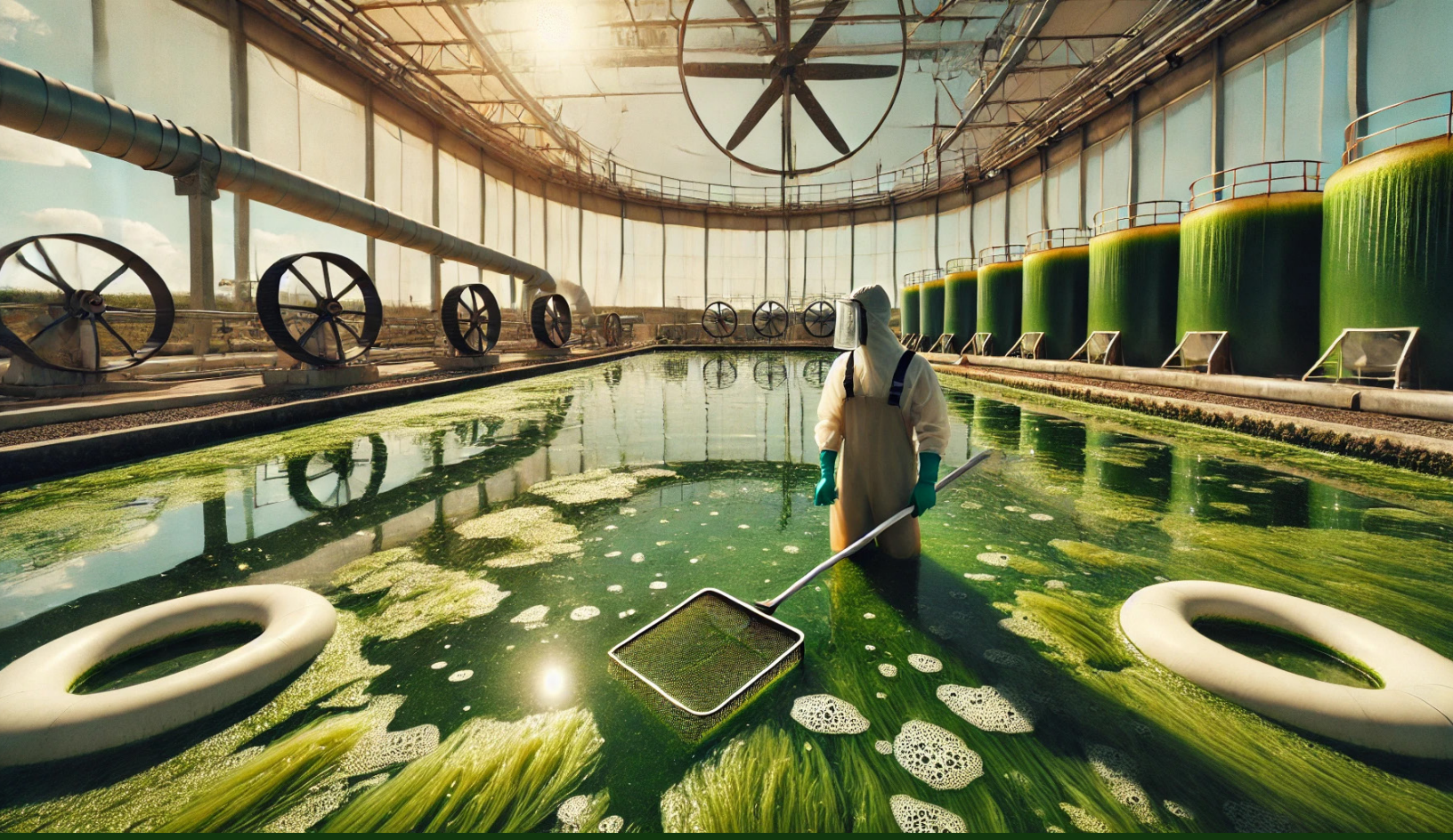

JOB CREATION IMPACT

Category	Estimated Jobs Created
Construction & Engineering	600–800 temporary
Long-Term Operations	180 direct staff
Algae & Product Processing	180 (tech, logistics, QA)
Indirect Support & Supply Chain	200–300
Total Job Impact	1,000+ jobs
Total Job Impact	**~1,100+ jobs**

STRATEGIC BENEFITS FOR PUERTO RICO

- **Energy Security:** Locally produced renewable baseload power
- **Economic Resilience:** Diversified revenue across energy, food, fertilizer
- **Environmental Leadership:** A flagship carbon-sequestering infrastructure
- **Global Leadership:** One of the world's largest algae-based bioeconomy models
- **Scalable:** Modular, replicable, and adaptable to future hydrogen integration

IMPLEMENTATION & BUSINESS MODEL

- **Lead Developer/Operator:** Geodyn Solutions
- **Financing Model:** PPA-based + ESG investor consortium
- **Contingent Fee Structure:** 25% success-based compensation model
- **Public-Private Partnerships:** With PREPA, municipalities, academia
- **Eligible Incentives:** DOE grants, USDA biomass, carbon credits, green bonds

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Geodyn Solutions' 100 MW algae biogas power plant delivers a powerful, climate-smart solution tailored for Puerto Rico. With strong financials — nearly $1.64B in net profit over 12 years, a payback under 5 years, and triple-impact returns from energy, food, and agriculture — this project sets the standard for regenerative, profitable clean infrastructure.

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