GEODYN SOLUTIONS™

PROPOSAL TO MAXIMIZE CAMBODIA'S HYDROPOWER CAPACITY WITH GREEN TECHNOLOGIES AND DIGITAL INNOVATION

www.geodynsolutions.com

EXECUTIVE VISION

CAMBODIA HAS AN ESTIMATED 6.7–10 GW OF HYDROPOWER POTENTIAL, YET ONLY ABOUT 10% HAS BEEN DEVELOPED. CURRENT INSTALLED HYDRO ACCOUNTS FOR ~40% OF ELECTRICITY SUPPLY, BUT DROUGHTS AND FOSSIL IMPORTS CREATE VOLATILITY. GEODYN SOLUTIONS, WITH ITS PARTNERS, PROPOSES A $16.5B PHASED PROGRAM (WITH CONTINGENCY $19.8B) TO EXPAND CAMBODIA'S HYDROPOWER SUSTAINABLY TO ~7.5–8 GW BY 2045. THIS WILL BE PAIRED WITH FLOATING SOLAR, PUMPED STORAGE, AI SMART GRIDS, BLOCKCHAIN POWER TRADING, AND TOKENIZED CARBON CREDITS, POSITIONING CAMBODIA AS A REGIONAL LEADER IN CLEAN, DIGITAL ENERGY.

PROJECT SCOPE & PHASED DEVELOPMENT

PHASE I (2026–2032):
EXPAND ON TRIBUTARIES + SOLAR-HYDRO HYBRIDS

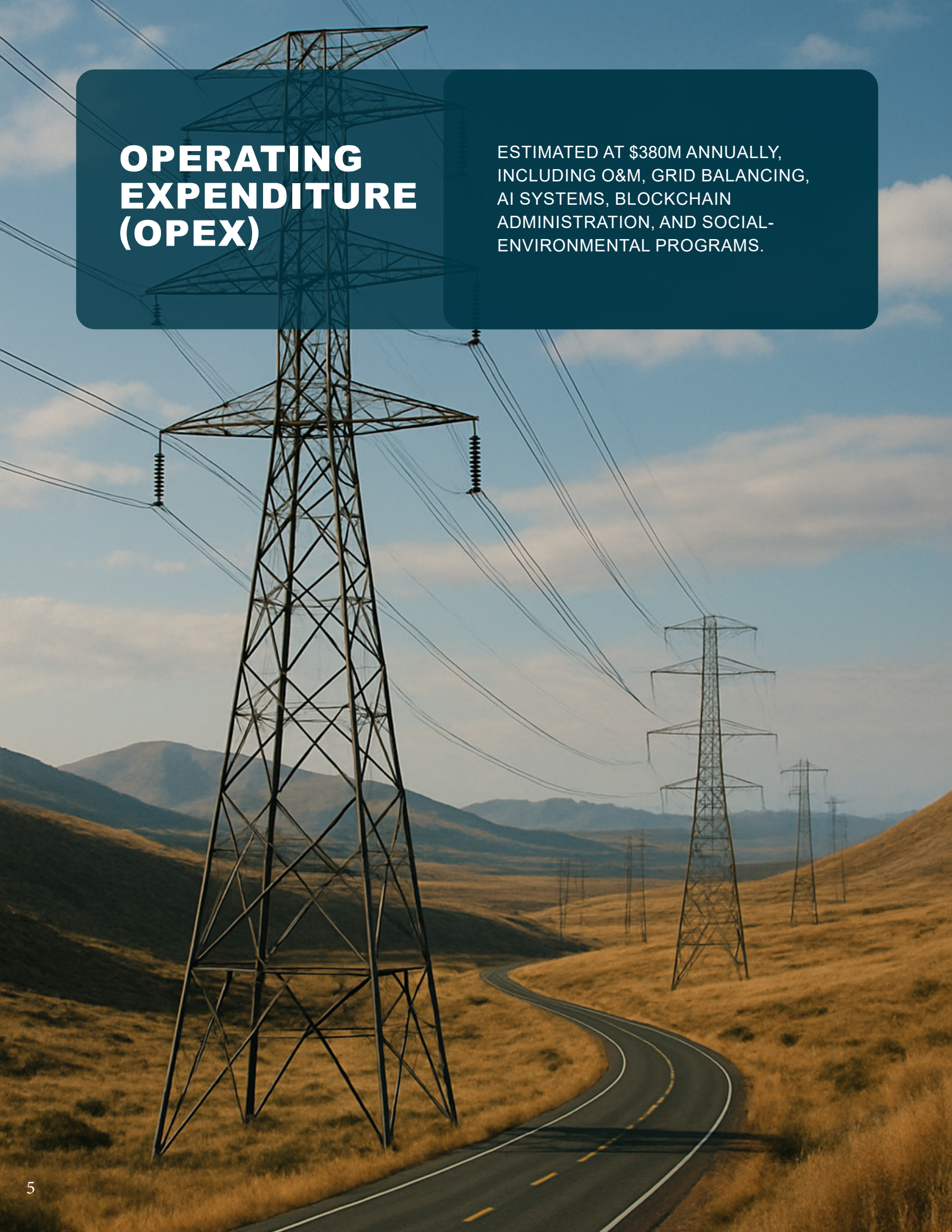
- Focus on tributary projects (Sesan, Srepok, Sekong basins, Cardamom range rivers).
- Deploy floating solar-hydro hybrids on reservoirs to increase output and reduce evaporation.
- Introduce AI-driven water flow prediction to stabilize dry-season production.
- Strengthen the 230–500 kV grid to link hydro and solar into Phnom Penh and industrial zones.

PHASE II (2032–2045):
STORAGE + DIGITAL MARKET LEADERSHIP

- Build pumped-storage hydropower plants for peak load stability.
- Integrate green hydrogen plants powered by surplus hydro for export and transport decarbonization.
- Deploy blockchain-based smart contracts for transparent PPAs with Vietnam, Thailand, and Laos.
- Launch a national carbon token system, enabling each kWh exported to be paired with digital carbon credits tradeable globally.

CAPITAL EXPENDITURE (CAPEX)

COMPONENT	COST ESTIMATE ($B)
Hydropower expansions (tributaries + cascades)	10.2
Floating solar-hydro hybrids	*1.5*
Pumped-storage hydropower	2.0
AI smart grid + IoT monitoring	1.0
Blockchain PPA + carbon token marketplace	0.6
Green hydrogen pilots	1.2
Subtotal	16.5
Contingency (20%)	3.3
Total Program	$19.8B



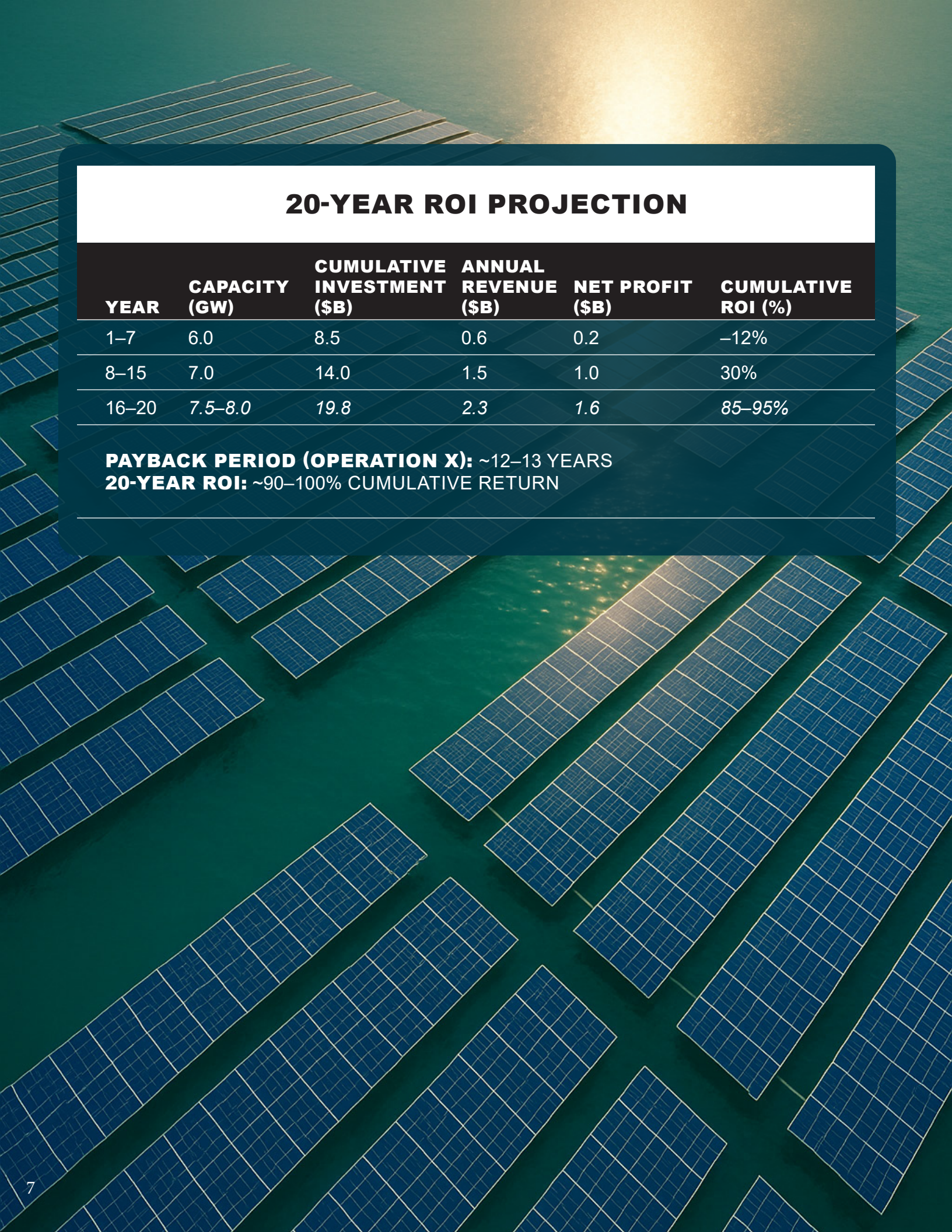
OPERATING EXPENDITURE (OPEX)

ESTIMATED AT $380M ANNUALLY, INCLUDING O&M, GRID BALANCING, AI SYSTEMS, BLOCKCHAIN ADMINISTRATION, AND SOCIAL-ENVIRONMENTAL PROGRAMS.

REVENUE & 20-YEAR ROI

REVENUE STREAMS (BY 2045)

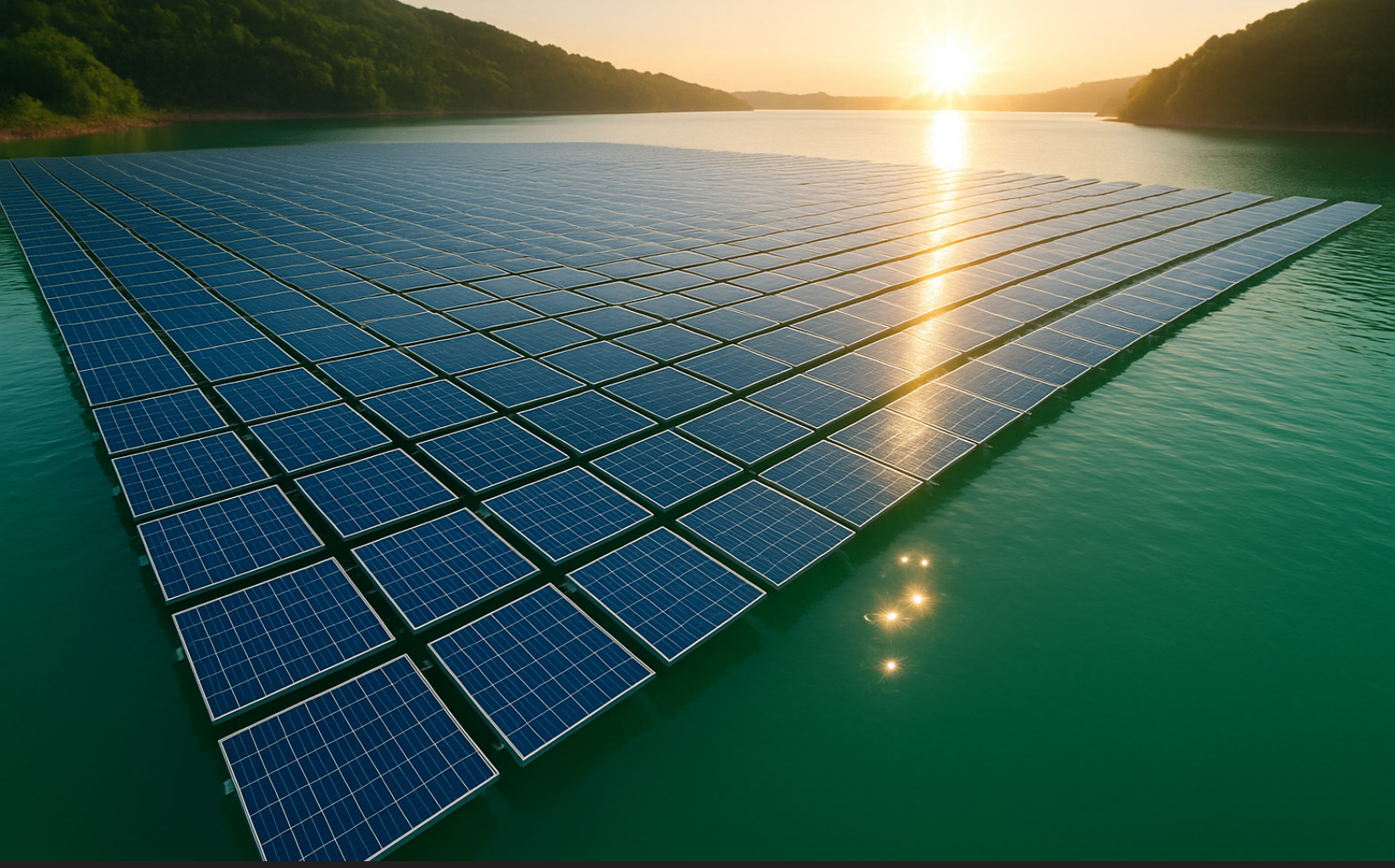
ELECTRICITY SALES & EXPORTS:
~$1.8B/YEAR (DOMESTIC + CROSS-BORDER PPAS WITH THAILAND/VIETNAM).
CARBON CREDITS/TOKENIZATION: ~$250M/YEAR (AT $25–30/TON CO_2 AVOIDED).
GREEN HYDROGEN EXPORTS: ~$150M/YEAR STARTING 2035.
FLOATING SOLAR INTEGRATION SERVICES & MICROGRIDS:
~$100M/YEAR.
TOTAL POTENTIAL ANNUAL REVENUE: ~$2.3B



20-YEAR ROI PROJECTION

YEAR	CAPACITY (GW)	CUMULATIVE INVESTMENT ($B)	ANNUAL REVENUE ($B)	NET PROFIT ($B)	CUMULATIVE ROI (%)
1–7	6.0	8.5	0.6	0.2	–12%
8–15	7.0	14.0	1.5	1.0	30%
16–20	*7.5–8.0*	*19.8*	*2.3*	*1.6*	*85–95%*

PAYBACK PERIOD (OPERATION X): ~12–13 YEARS
20-YEAR ROI: ~90–100% CUMULATIVE RETURN



JOB CREATION & ECONOMIC BENEFITS

CONSTRUCTION: ~30,000 JOBS (CIVIL, ELECTRO-MECHANICAL, SOLAR, LOGISTICS).
PERMANENT OPERATIONS: ~6,500 SKILLED JOBS (AI, BLOCKCHAIN, HYDRO OPERATIONS, HYDROGEN).
INDIRECT EMPLOYMENT: ~15,000 IN SUPPLY CHAINS, SERVICES, AGRICULTURE, AND TOURISM.
ECONOMIC BOOST: HYDROPOWER EXPANSION AND CARBON MARKETS COULD ADD 3–4% GDP ANNUALLY BY 2045.

GREEN TECHNOLOGIES INTEGRATION

FLOATING SOLAR-HYDRO HYBRIDS – INCREASE ANNUAL ENERGY YIELD & REDUCE RESERVOIR EVAPORATION.

AI-POWERED HYDROLOGY – REAL-TIME OPTIMIZATION OF FLOW, DROUGHT/FLOOD PREDICTION.

SMART GRIDS & IOT SENSORS – AUTOMATED GRID BALANCING, PREDICTIVE MAINTENANCE, BIODIVERSITY MONITORING.

BLOCKCHAIN SMART CONTRACTS – CROSS-BORDER ELECTRICITY TRADING WITH FULL TRANSPARENCY.

TOKENIZED CARBON CREDITS – GLOBAL MARKETPLACE FOR CO_2 OFFSET TRADES.

GREEN HYDROGEN PLANTS – EXPORT-READY, DECARBONIZING CAMBODIA'S TRANSPORT & INDUSTRY.

EMBEDDED GREEN TECHNOLOGIES

MICROGRIDS – FOR RURAL ELECTRIFICATION, IMPROVING ENERGY ACCESS.

PUMPED STORAGE – STORING MONSOON ENERGY FOR DRY-SEASON SUPPLY.

AI ENVIRONMENTAL MONITORING – PROTECT FISHERIES, INDIGENOUS COMMUNITIES, AND WATERSHED HEALTH.

ENVIRONMENTAL & SOCIAL BENEFITS

CO_2 REDUCTION: ~12M TONS ANNUALLY BY OFFSETTING COAL IMPORTS.
ENERGY EQUITY: COMMUNITY ENERGY TOKENS TO ENSURE RURAL HOUSEHOLDS ACCESS AFFORDABLE RENEWABLE POWER.
SUSTAINABILITY: AI & IOT USED TO PROTECT FISHERIES, FORESTS, AND INDIGENOUS LIVELIHOODS.
CLIMATE RESILIENCE: DIVERSIFICATION WITH SOLAR + HYDRO REDUCES DROUGHT VULNERABILITY.

STRATEGIC BENEFITS

- Cambodia secures energy independence and export capability.
- Geodyn Solutions establishes leadership in AI + blockchain-integrated hydropower.
- Attracts green bonds, World Bank, and ASEAN climate funds.
- Positions Cambodia as a green energy hub in ASEAN by 2045.

THIS PROGRAM SETS A ROADMAP FOR CAMBODIA TO DEVELOP UP TO 8 GW OF SUSTAINABLE HYDROPOWER CAPACITY BY 2045, ANCHORED BY $19.8B IN PHASED INVESTMENT. BY COMBINING HYDROPOWER, FLOATING SOLAR, AI, BLOCKCHAIN, AND TOKENIZED CARBON CREDITS, CAMBODIA CAN ACHIEVE ENERGY SECURITY, FINANCIAL RETURNS (~100% ROI IN 20 YEARS), AND GLOBAL RECOGNITION AS A DIGITAL GREEN-ENERGY LEADER.

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