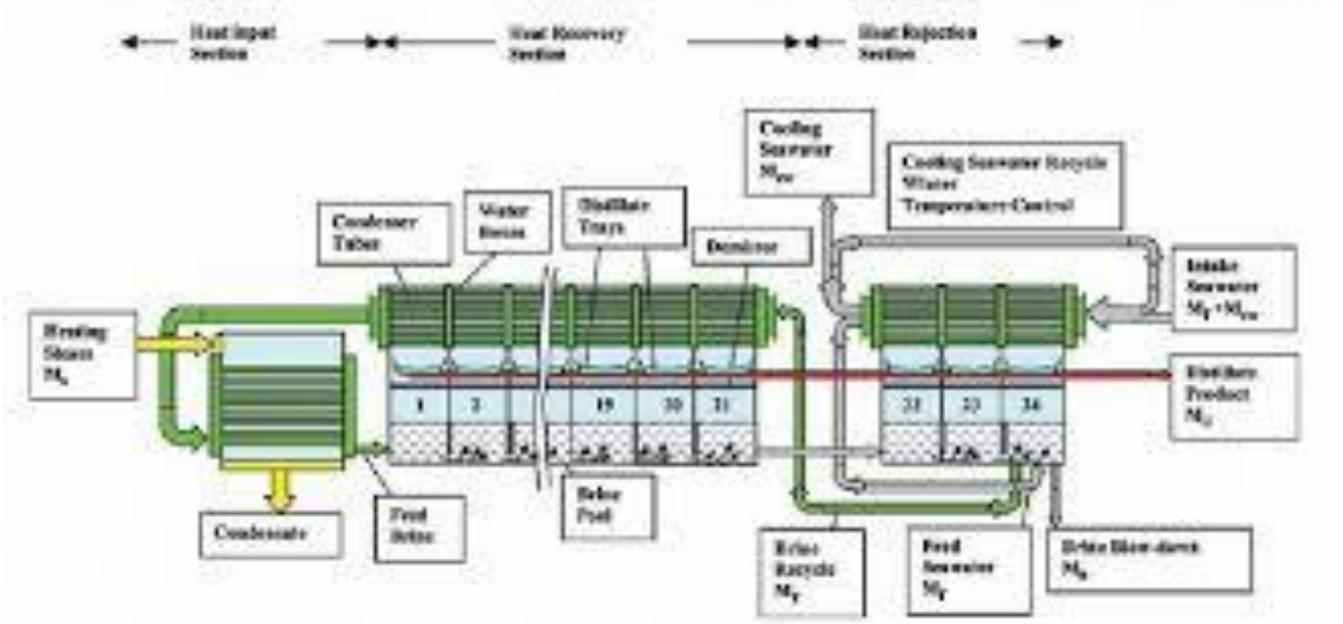


WESTERN REGION ENERGY + WATER SECURITY MASTER PLAN

(Hybrid CCGT + Renewable + Desalination + Grid Stabilization Model)

1 Reference Model: Jebel Ali Framework





4

Core Lessons from Dubai:

- Co-located power + desalination

- Waste heat recovery (MSF)
 - Progressive expansion over decades
 - Hybridization (MSF → SWRO transition)
 - Centralized grid integration
 - Government-backed long-term capital deployment
-

2 Western Region Adaptation Strategy (U.S.)

Target Regions:

- California Coast
 - Arizona (imported desalinated water via pipeline)
 - Nevada
 - New Mexico
 - West Texas (if extended inland via transmission + pipeline corridor)
-

3 Engineering Configuration

A. Energy Generation Core

1. Combined Cycle Gas Turbine (CCGT)

- 2–4 GW initial phase
- Use domestic natural gas
- Waste heat recovery steam generators (HRSG)
- Black-start capable

2. Solar + Wind Hybrid Field

- 3–6 GW solar thermal + PV
- Wind corridor integration (West Texas, SoCal, Nevada)
- Grid-scale battery storage (4–8 hr duration)

3. Optional Future:

- Small Modular Nuclear Reactors (SMR)
- Hydrogen blending into turbines

B. Water Production Design

Phase 1 – Hybrid MSF + RO

- 1.5–2.0 million m³/day target capacity
- Coastal seawater intake (Pacific or Gulf of California via Mexico partnership)

Technologies:

Process	Purpose	Benefit
Multi-Stage Flash (MSF)	Uses turbine waste heat	Stable baseload water
Seawater Reverse Osmosis (SWRO)	Lower energy per m ³	Lower carbon footprint
Brine concentration + mineral recovery	Revenue stream	Lithium / magnesium recovery

4 Why This Works in the Western U.S.

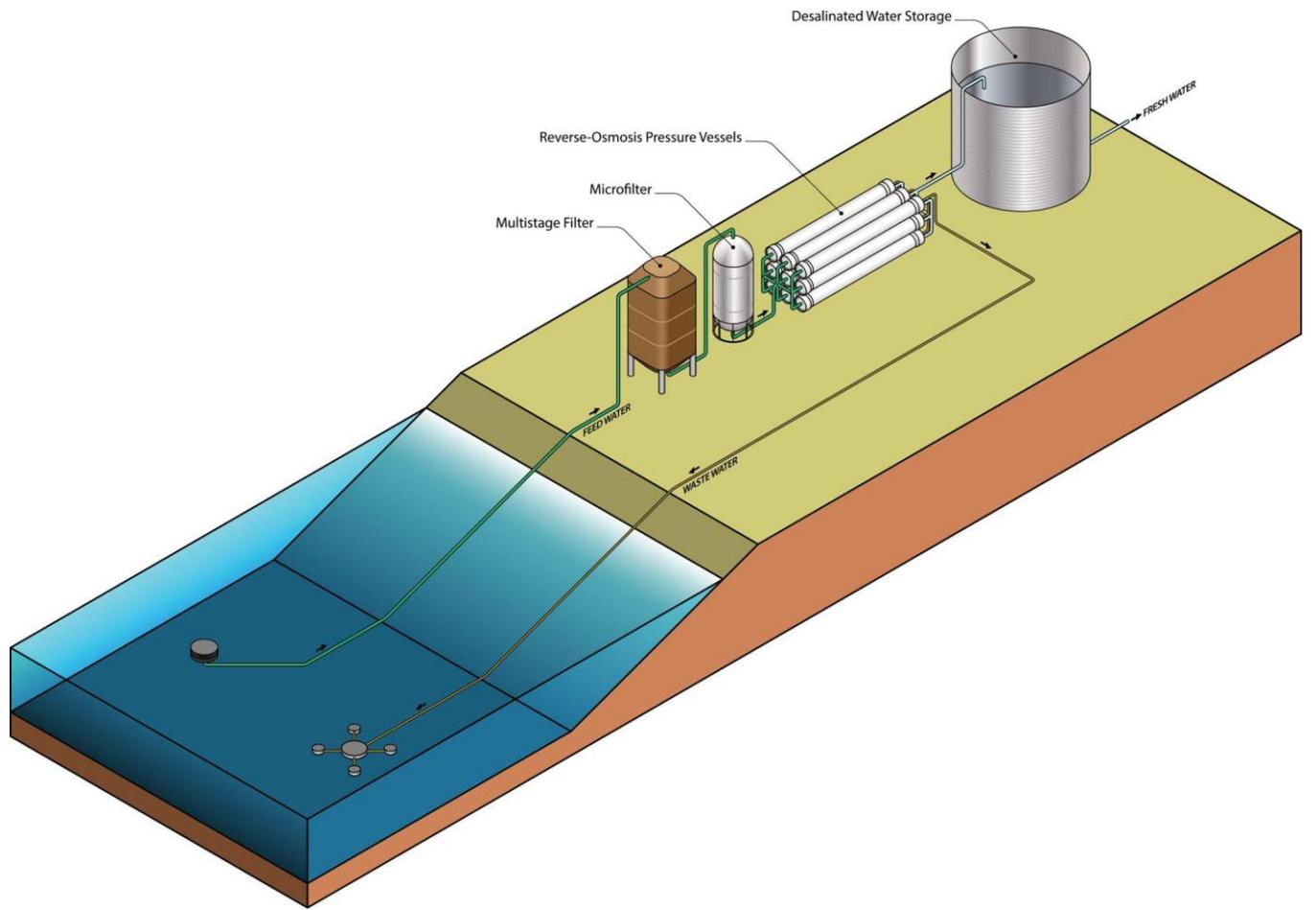
Western Problem:

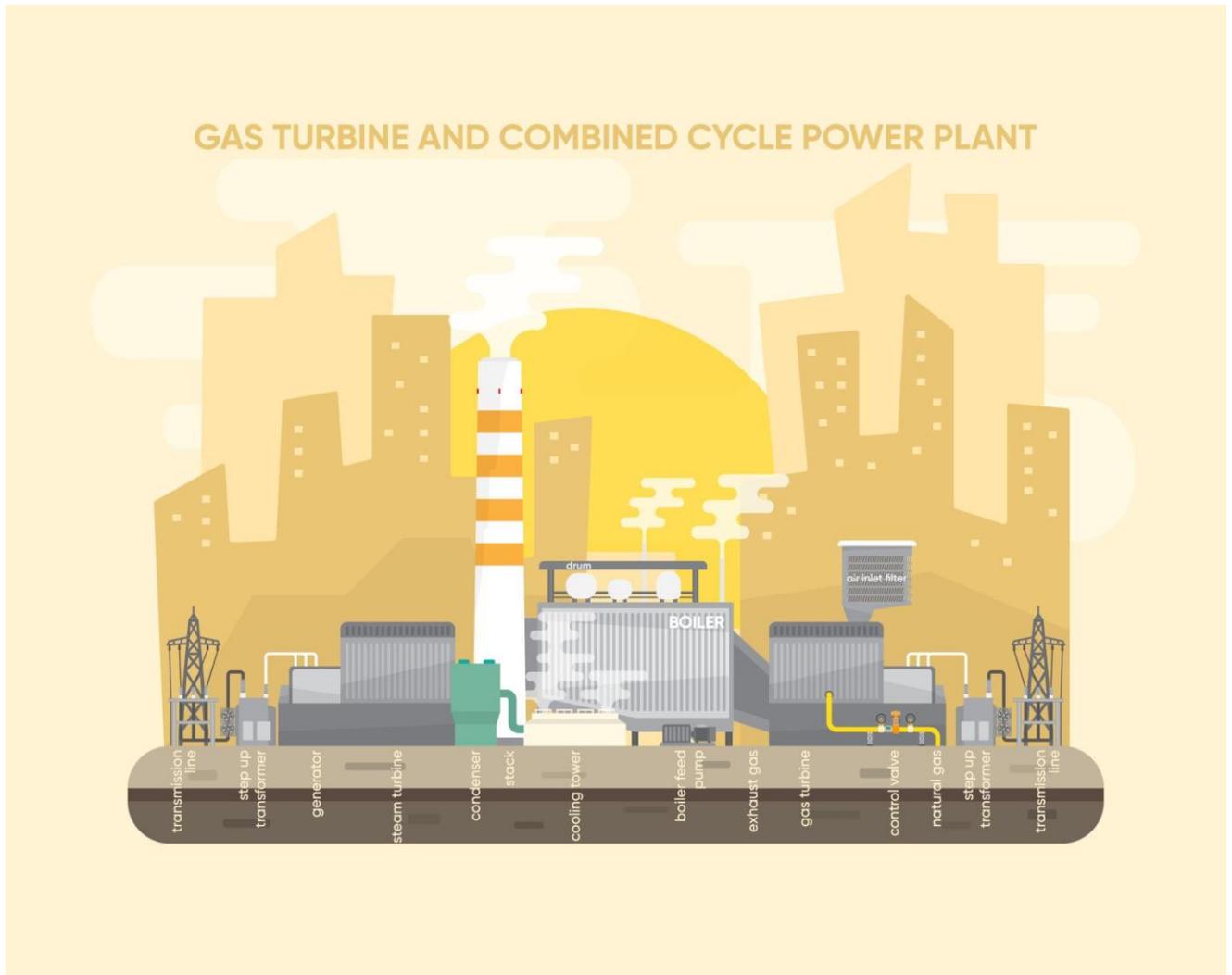
- Colorado River depletion
- Lake Mead / Lake Powell crisis
- Aquifer collapse (Arizona & West Texas)
- Grid instability (California summer peaks)

Integrated Solution:

- Desalination reduces river dependence
 - Co-generation lowers cost per kWh + per m³
 - Solar reduces fuel dependency
 - Energy stabilizes water production
-

5 Infrastructure Layout Concept





4

Zoning Concept:

1. Coastal energy-water complex
2. Inland transmission corridor
3. Parallel high-pressure water pipeline
4. Elevated storage reservoirs
5. Inland distribution hubs

6 Phased Buildout Plan

Phase 0 – Feasibility (Year 1)

- Environmental impact study
- Federal + State coordination
- Coastal permitting
- Tribal and regional water compacts

Phase 1 – 2 GW + 800,000 m³/day (Years 2–5)

- Initial desalination
- Serve coastal metros

Phase 2 – Expand to 4–6 GW + 2M m³/day (Years 5–10)

- Export water inland
- Renewable expansion

Phase 3 – Full Renewable Offset (Years 10–20)

- 60–80% renewable powered desalination
- Hydrogen co-production
- Carbon capture on gas turbines

7 Capital Model (Rough Order of Magnitude)

Component	Estimated Cost
4 GW CCGT	\$4–6 Billion
2M m ³ /day Desalination	\$6–9 Billion
Solar + Wind	\$8–12 Billion
Pipelines + Transmission	\$5–10 Billion
Total Program	\$25–35 Billion

Comparable to Dubai’s cumulative expansion but scaled for U.S. labor + compliance.

8 Environmental & Carbon Strategy

- Transition MSF → high-efficiency RO
 - Renewable integration
 - Waste heat optimization
 - Brine mineral extraction
 - Carbon capture retrofits
 - Seawater intake fish protection systems
-

9 Water Delivery Concept

- Pumped inland to:
 - California Central Valley
 - Phoenix Metro
 - Las Vegas
 - West Texas growth corridor
 - Augment aquifers
 - Agricultural contracts
 - Industrial cooling supply
-

10 Policy & Governance Model

- Public-Private Partnership (PPP)
 - Federal Infrastructure Act funding
 - State water authority bonds
 - Utility rate-backed financing
 - Strategic energy independence positioning
-

1 1 Strategic Advantages Over Jebel Ali

Dubai Model	Western Upgrade
Gas heavy	Hybrid renewable
MSF dominant	RO dominant
Water only	Water + Mineral recovery
Local supply	Multi-state export
Carbon intensive	Carbon transition model