

REFLUX IT

Guadeloupe Water Technology and Procurement Study

Low energy capture desalination circular recovery and EU first sourcing

Decision report • 11 October 2026

Design basis • from a few litres per day to emergency service for 8,000 people

The decision in one sentence

Build a layered water system: local rain storage and measured fog capture first; passive solar stills for household resilience and demonstration; a modular solar seawater RO plant as the dependable 8,000-person backbone; water storage instead of large batteries; and a controlled REFLUX IT programme that recovers pressure, heat, clean side-streams and selected minerals without pretending brine can circulate forever.

Prepared as a supplier-neutral research and procurement brief

European and Guadeloupe production is preferred through transparent whole-life criteria. Chinese systems remain in the comparison lane and can qualify through the same performance, compliance, service and factory-acceptance gates.

Executive decision

Recommended backbone

For the 8,000-person emergency target, procure three independent 60 m³/day-class solar SWRO trains arranged as two duty plus one standby, or an equivalent 120–150 m³/day modular EU system with service redundancy. Size the operating solar field initially around 90 kWp, confirm auxiliary loads by quote, and store at least 360 m³ of finished water in split cyclone-resilient tanks.

Layer	What it does	Preferred route	Decision
1 Avoid demand	Leak detection low-flow fixtures greywater for non-potable uses	Local plumbing and controls	Do now
2 Capture free water	Roof rain fog drizzle limited dew	Guadeloupe tanks plus FogQuest or CloudFisher pilot	Do now as measured pilots
3 Passive production	Solar distillation without grid power	GWS-1 local build plus Carocell benchmark	Household and contingency only
4 Reliable base load	Potable supply independent of rainfall	EU solar SWRO with pressure-energy recovery	Primary municipal backbone
5 Emergency diversity	Portable manual or DC watermaking	Katadyn and Spectra	Strategic stock
6 Resource recovery	Pressure heat water side-streams salts	REFLUX IT loops with monitoring	Integrate selectively

What should not be the backbone

- Fog alone is too site-sensitive and cyclone-exposed until a full dry-season and preferably 12-month field dataset exists.
- Passive dew is elegant but its normal yield is too low for thousands of people.
- Compressor atmospheric water generators are commercially real but use roughly two orders of magnitude more electricity per cubic metre than efficient seawater RO under the compared vendor conditions.
- Cloud seeding cannot make water from a clear sky and does not belong in the committed supply budget for Guadeloupe.

Design basis

Service level	Per person	8,000 people	Use in this study
Drinking only	3 L/day	24 m ³ /day	Minimum beverage volume
Drinking and basic cooking	5 L/day	40 m ³ /day	Short disruption target
Emergency basic service	15 L/day	120 m ³ /day	Primary plant design point
Reduced domestic service	50 L/day	400 m ³ /day	Future expansion not initial scope
Typical higher domestic service	100 L/day	800 m ³ /day	Network-scale planning only

The 15 L/person/day benchmark is an emergency minimum, not a normal long-term standard of living. WHO materials use 15 L/person/day as a minimum quantity to reach quickly after an emergency; actual design must include institutions, losses, firefighting and vulnerable users. [1]

Guadeloupe design envelope

Guadeloupe is not uniformly wet. Normal annual rainfall ranges from about 600 mm in the driest areas to almost 6,200 mm near La Soufrière. Windward Basse-Terre benefits from moist trade winds lifted by the mountains, while Grande-Terre and the smaller low-relief islands face more recurrent drought. This spatial contrast is the reason to combine catchment, storage and seawater treatment rather than assume that high island-wide humidity equals reliable local yield. [2]

Hazard or condition	Design response
Cyclones and extreme gusts	Fog mesh must lower or detach rapidly; still glass must be removable; containers and PV structures require engineered anchoring; tanks should be buried or bermed where feasible.
Salt air and UV	Specify marine-grade 316L in wetted metal paths, UV-stabilised polymers, replaceable fasteners and coatings, and a spares strategy.
Sargassum and coastal organics	Prefer screened offshore or beach-well intake after hydrogeology; otherwise include robust screening, clarification or flotation and UF as site tests dictate.
Dry season and rainfall volatility	Store water rather than electrons, diversify sources and size the RO base load to the dry-season requirement.
Warm humid air	Helpful to condensation AWG output, but not enough to overcome the technology's high electricity intensity at municipal scale.
Power interruptions	Operate PV-direct in daylight, use gravity distribution and reserve grid or wind generation for essential pumps, controls, disinfection and night demand.

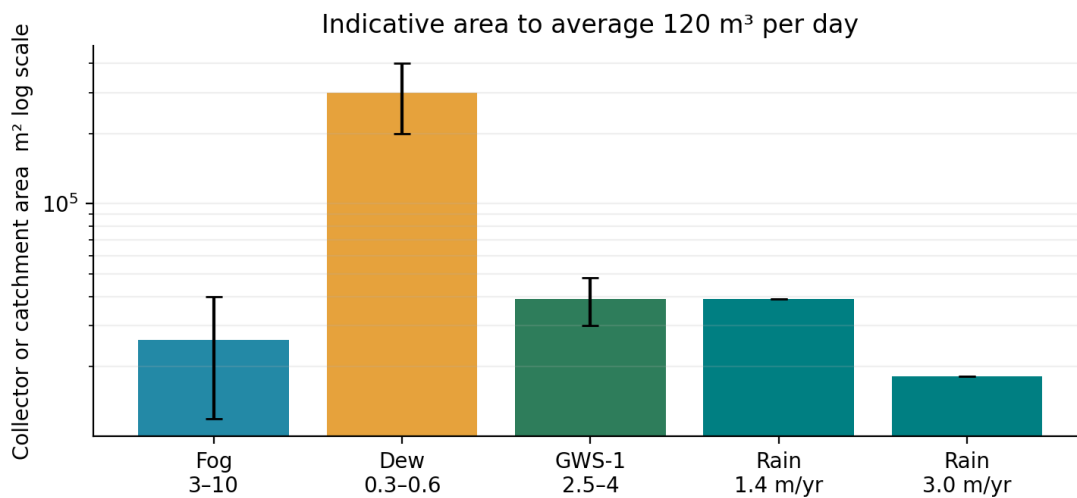
Cyclone operating mode

1. At alert level, lower fog meshes, remove solar-still glazing, isolate tanks and protect vents and overflow points.
2. Before landfall, fill treated-water storage and chemically verify disinfectant residual.
3. After the storm, quarantine all raw capture until turbidity, conductivity and microbiology pass release criteria.
4. Restart the intake and RO in a staged sequence after inspecting screens, membranes, dosing and brine discharge.

Technology ranking and scale

Technology	Typical output basis	Power	Best scale	Guadeloupe verdict
Roof rain	Annual rainfall × area × runoff coefficient	None gravity possible	All	First capture layer storage dominates
Fog mesh	Often 3–10 L/m ² /day annual project average highly local	None	Pilot to village	Promising windward sites measure first
Passive dew	About 0.3–0.6 L/m ² /day in favourable literature	None	Device and garden	Useful supplement not bulk supply
GWS-1 solar still	2.5–4 L/m ² /day design basis	None	Household	Local resilience and training platform
Commercial solar still	Vendor claims vary require local seawater test	None	Household to small cluster	Benchmark GWS-1 against one purchased unit

Technology	Typical output basis	Power	Best scale	Guadeloupe verdict
Manual RO	About 4.5 L/hour for Katadyn Survivor 35	Human power	Liferaft and emergency	Stock for clinics and response teams
Solar DC RO	30–64 L/hour examples	About 110 W class at low end	Household to small village	Strong emergency option
Solar SWRO	1–10,000 m ³ /day vendor range	About 2.5 kWh/m ³ RO core claim	Village to municipal	Best dependable backbone
Condensation AWG	52–5,091 L/day EU models	About 0.22–0.42 kWh/L	Point or emergency	Niche only avoid bulk deployment
Membrane distillation	Project-specific	Low-grade heat plus pumps	Brine side-stream	Pilot for recovery not base load



Area comparison uses 120 m³/day. Rain assumes runoff coefficient 0.8 and annual averages of 1.4 or 3.0 m. Fog, dew and still ranges are indicative; local meteorology and downtime control the actual result.

Scale snapshots

Tier	Demand example	Practical package
Micro	3–75 L/day	One GWS-1 or commercial still; roof capture and 1–5 m ³ tank; manual RO for survival backup.
Small community	0.5–7.5 m ³ /day	Rain storage plus measured fog array; 5 m ³ /day skid SWRO; one spare high-pressure pump and membrane set.
Medium community	15–40 m ³ /day	Two modular solar SWRO trains; 45–120 m ³ treated storage; local rain and fog offset.
8,000-person emergency	120 m ³ /day	Three 60 m ³ /day-class trains two duty plus one standby; about 90 kWp operational PV design basis; 360 m ³ split storage.
Future domestic expansion	400–800 m ³ /day	Network planning multiple larger trains expanded intake and brine study demand reduction first.

Fog capture

Fog collection is passive impaction, not refrigeration. Wind carries liquid droplets into a double layer of correctly selected mesh; droplets coalesce, drain to a gutter and move by gravity. FogQuest states that its process needs no generator and uses 35 percent shade-coefficient UV-protected Raschel mesh in a double layer. Its commonly cited 40 m² collector average is about 200 L/day, but site output varies sharply and their figures should be treated as feasibility values rather than a Guadeloupe guarantee. [3]

Ready route	Origin	Format	How to buy	Important limit
FogQuest	Canada NGO mesh sourced in Chile	1 m ² standard test and 40 m ² large collector methodology	Project engagement and field siting support	Best used for measurement-led community projects
CloudFisher by Aqualonis	Germany	Test unit Mini about 18 m ² Pro about 54 m ²	Direct manufacturer quote with site support	Published wind resistance around 120 km/h is below major Guadeloupe cyclone gusts lower or remove
KnitMesh Technologies	United Kingdom	Engineered knitted-wire fog media	Direct industrial enquiry	Specify potable-contact path corrosion and collection test
Local fabricated SFC	Guadeloupe plus EU components	1 m ² test frame with calibrated gauge	Local metalwork and plumbing contractor	Use the standard geometry to preserve comparability

Fog pilot specification

- Install at least six 1 m² standard fog collectors across windward Basse-Terre elevations, each with an adjacent rain gauge and weather logger.
- Record litres per square metre per day, wind speed and direction, relative humidity, rainfall, conductivity, turbidity, pH and microbiology.
- Run for 12 months where possible and include the complete dry season before any large collector purchase.
- Use quick-release mesh and a documented cyclone lowering drill; do not leave a 120 km/h-rated collector exposed to Category 4 conditions.
- Treat fog water as raw water until the complete catchment, storage and disinfection train is validated.

What fog can realistically supply

At 3–10 L/m²/day, a 54 m² collector would average roughly 162–540 L/day before downtime and treatment losses. Reaching 120 m³/day would require about 12,000–40,000 m² of effective mesh. That is why fog is a valuable offset and remote-site technology, not the unmeasured foundation of the 8,000-person promise.

Rain and dew capture

Rainwater should be the first harvested resource because roofs already exist and local tanks and installers are available. At 1,400 mm/year and an 0.8 runoff coefficient, each square metre yields about 1,120 L/year, or 3.1 L/day averaged across the year. At 3,000 mm/year it yields about 2,400 L/year, or 6.6 L/day. The constraint is dry-season storage and sanitary separation, not annual arithmetic.

Supplier or route	Origin	Available offer	Procurement note
PROCAP	Guadeloupe and Antilles	Rotomoulded PE tanks including ACS potable-water models	Strong local-production preference specify whether the

Supplier or route	Origin	Available offer	Procurement note
			tank is approved for potable storage or only rainwater/non-potable use
Bèl Lapli	Guadeloupe	Turnkey rainwater tanks and treatment	Ask for exact treatment barrier commissioning tests and ARS-compatible use case
Soley K'raïb	Guadeloupe	Tank supply and installation	Confirm current aid eligibility and minimum capacity before relying on subsidy
PAK971	Guadeloupe	ACS tank range reported from 300 to 9,500 L	Useful modular household route obtain written potable-contact documentation
GRAF Carat XL	Germany	10,000 L buried tank through French distribution	EU benchmark freight and cyclone-grade installation extra

Connection rule

Keep harvested rainwater physically separated from the public potable network unless an approved backflow-protected arrangement is designed. Use first-flush diversion, screened inlets, opaque tanks, accessible cleaning, protected vents, filtration and disinfection appropriate to the intended use.

Passive dew

Radiative dew collectors cool a surface below the dew point at night. Literature values around 0.3–0.6 L/m²/day make them suitable for demonstration, plant irrigation and small emergency volumes. At the 120 m³/day target, they imply roughly 200,000–400,000 m² of collector. Sorbent and hydrogel systems can work at lower humidity but require heat for regeneration; most high-performing examples remain research rather than supported turnkey products.

Passive solar desalination

GWS-1 local build

The existing GWS-1 design is a 1 m² single-basin passive solar still intended for Guadeloupe fabrication. It uses a local fired-clay or chamotte shell, a 316L basin and gutter, two removable tempered-glass panes at about 12 degrees and food-grade elastomers. Its design basis is 2.5–4 L/day typical, with 5 L/day as a favourable upper value. It needs no pump, pressure or electricity.

Item	GWS-1 specification	Procurement implication
Footprint	Outer body about 1.12 × 1.12 m basin 1.00 × 1.00 × 0.035 m	Local mould masonry and metalwork are feasible
Glazing	Two panes around 525 × 1,080 mm 4–6 mm tempered	Removable before cyclone hold protected spares
Feed	8–12 L seawater batch	Manual filling possible source-screen and avoid fuel contamination
Output	2.5–4 L/day typical design basis	Pilot against local weather and seawater before scale claims
Product finish	Distillate	Remineralise disinfect and store in ACS-compliant container
Cleaning	Drainable shallow tray	Plan salt removal and acid cleaning procedure recover salt only after quality analysis

For drinking-only supply of 24 m³/day, GWS-1 requires about 6,000–9,600 modules at 4–2.5 L/day. For the 120 m³/day emergency service target, it requires about 30,000–48,000 modules. It is therefore a household resilience product and local manufacturing programme, not the municipal base load.

Already assembled solar still

Supplier	Origin	Offer	Evidence gate
F Cubed Carocell	Australia with international projects	Modular direct solar desalination panels	Current vendor material claims roughly 25 L/day for a panel in one project context while older brochures cited about 10–15 L/day for 2–3 m ² models. Buy one benchmark only after a guaranteed Guadeloupe seawater curve and potable-path documentation.
Desolenator	Netherlands and international	Current offer is large solar thermal multi-effect and mechanical-vapour-compression infrastructure	Treat as custom large-project enquiry not a current household still kit.

Water quality warning

Solar distillation removes salts but some volatile contaminants can carry over. Do not feed seawater contaminated with fuel, solvents or severe algal decay without source control and testing. Distillate also needs stabilisation or remineralisation before distribution to reduce corrosivity and improve taste. [4]

Low energy reverse osmosis

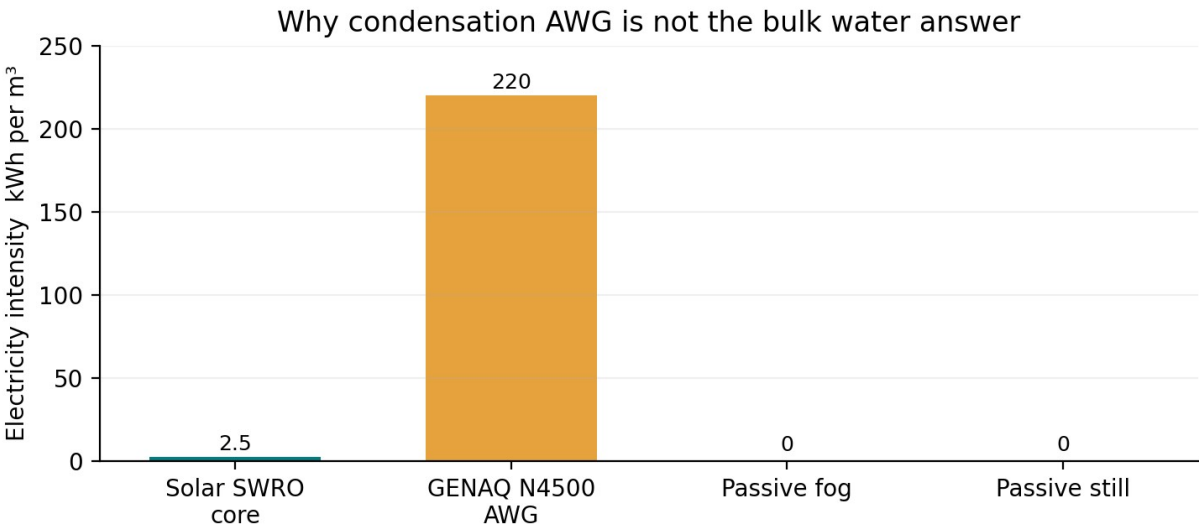
Seawater reverse osmosis is the most mature dependable route from tens of litres to thousands of cubic metres per day. The low-energy step is not a magic membrane: it is pressure-energy recovery, efficient pumps, sound intake pretreatment and operating the plant near its design point. Water storage can replace most electrical battery storage by running hard in daylight and delivering by gravity around the clock.

Small and portable systems

Supplier and model	Origin	Nominal output	Power and role	Buy route
Katadyn Survivor 06	Switzerland	Emergency survival unit 1–6 people	Manual	Katadyn marine and safety dealer network
Katadyn Survivor 35	Switzerland	About 4.5 L/hour vendor daily figure 132 L	Manual clinics and liferafts	Katadyn marine and safety dealer network
Spectra Aquifer 200	United States	About 30 L/hour	12 or 24 V DC about 110 W energy-recovery pump	Spectra authorised distributor
Spectra Aquifer 360	United States	About 57 L/hour	12 or 24 V DC solar or wind compatible	Spectra authorised distributor
Spectra LB400	United States	About 64 L/hour up to 12 hours/day	DC with Clark energy recovery	Spectra authorised distributor
Rainman portable	Australia with EU dealers	Model-dependent roughly 100–240 L/hour in larger AC packages	Transportable backup generally higher energy than Clark-type recovery	European marine dealer network

Medium and large solar SWRO

Supplier	Origin	Commercial range	Why shortlist	Qualification point
OSMOSUN	France	About 1–10,000 m ³ /day SWRO modular combinations higher	Battery-free solar operation EU service path published 2.5 kWh/m ³ core at 35 g/L	Reconcile guaranteed daily output PV area auxiliaries intake and brine scope in one performance schedule
Elemental Water Makers	Netherlands	About 5–100 m ³ /day standard project bands	Solar RO with energy recovery current indicative complete-project bands published	Quote Guadeloupe freight civil work pretreatment and long-term service
Solar Water Solutions	Finland	About 1–1,000 m ³ /day cited range	Renewable-compatible desalination packages	Demand references in tropical seawater and cyclone installation design
Boreal Light Winture	Germany	About 1–30 m ³ /hour product family	Large solar water systems with project delivery	Confirm seawater configuration whole-plant SEC and Caribbean spares
GivePower	United States nonprofit	Solar water farm projects about 15,000–75,000 L/day	Potential humanitarian partner	Partnership route rather than ordinary equipment purchase



Comparison uses OSMOSUN's published 2.5 kWh/m³ RO-core figure at 35 g/L and GENAQ Nimbus N4500's 0.22 kWh/L, equivalent to 220 kWh/m³. Fog and passive stills use no operating electricity but require large collection area. Vendor conditions differ; this chart is a screening comparison, not a tender guarantee. [5] [6]

Recommended 8,000-person configuration

- 1. Commission raw-seawater analysis over seasons, including algae, hydrocarbons, turbidity, temperature, boron and sargassum-related risk.
- 2. Tender three independent 60 m³/day-class trains with two duty plus one standby, or an equivalent N+1 arrangement delivering 120 m³/day under the guaranteed worst design condition.
- 3. Use pressure exchangers or equivalent high-efficiency recovery and require measured whole-plant specific energy, including intake, pretreatment, dosing, post-treatment and controls.
- 4. Use about 90 kWp as the first-pass PV sizing basis for 120 m³/day from OSMOSUN's 0.75 kWp per daily m³ rule, then add the supplier's documented allowance for losses and auxiliaries. [5]
- 5. Store 360 m³ finished water as a three-day emergency reserve, split into isolated tanks such as six 60 m³ cells or twelve 30 m³ cells.
- 6. Finish with remineralisation, pH stabilisation, disinfection, online conductivity and turbidity, secure sampling points and an operator laboratory plan.

Illustrative brine balance

At an assumed 40 percent recovery, 120 m³/day of product needs about 300 m³/day feed and leaves about 180 m³/day concentrate. Starting from 35 g/L seawater, the concentrate is roughly 58 g/L before detailed ion and temperature effects. Pressure-energy recovery reduces electricity; it does not recover this water or remove the salt.

Desert water technologies

Desert water technology is a family, not one product. The relevant question is which source is already present: liquid fog, night-sky cooling potential, humidity that can be condensed, saline groundwater, seawater or low-grade heat. Guadeloupe has abundant seawater and pockets of orographic fog, so it should borrow the best desert techniques without copying the wrong energy economics.

Method	Maturity	Energy input	Guadeloupe use
Fog mesh	Commercial and community proven	Wind and gravity	Mountain pilot and remote supply
Radiative dew	Field-demonstrated at small scale	Night-sky cooling	Supplementary education agriculture
Compressor AWG	Commercial	High electricity	Point-of-use emergency or bottled-water displacement only
Desiccant or hydrogel AWG	Fast-moving research and early products	Solar or waste heat regeneration plus fans	Monitor do not count in current supply
Solar still	Mature simple principle	Sunlight	Household resilience and local manufacture
PV-driven SWRO	Commercial and scalable	Solar electricity with pressure recovery	Primary bulk-water choice
Membrane distillation	Commercial niches and pilots	Low-grade heat plus pumping	Brine concentration and waste-heat recovery pilot

Atmospheric water generators

Supplier	Origin	Example	Output and energy	Decision
GENAQ	Spain	Nimbus N500	506 L/day 0.24 kWh/L	EU-first emergency pilot
GENAQ	Spain	Nimbus N4500	4,445 L/day 0.22 kWh/L	Not bulk due to energy
GENAQ	Spain	Cumulus C5000	5,091 L/day 0.26 kWh/L	Mobile emergency niche
Watergen	Israel	GEN-M Pro and GEN-L	Up to about 1,000 and 6,000 L/day vendor ratings	Non-EU comparison verify climate curve
Heaven Springs or FND	China	Industrial AWG	Vendor family around 500 –5,000 L/day	China benchmark lane full FAT and potable compliance
SOURCE Hydropanel	United States	Self-contained solar panel	A few litres/day class	Remote point use not municipal

At 0.22 kWh/L, producing 120 m³/day requires about 26,400 kWh/day. The RO-core comparison at 2.5 kWh/m³ is about 300 kWh/day, before common intake and finishing loads. Even allowing for different boundaries, AWG is not a rational bulk substitute when seawater is beside the site.

REFLUX IT recovery architecture

REFLUX IT should mean measured recirculation with a defined contaminant boundary. Every loop must state what is recovered, what accumulates and where the final reject goes. The objective is fewer imported kilowatt-hours, fewer litres of new feed, longer component life and useful co-products without compromising drinking-water safety.

Loop	Capture	Return path	Control boundary	Priority
Pressure reflux	Hydraulic pressure in RO brine	Isobaric pressure exchanger or Clark-type pump to incoming feed	No mixing claim beyond device specification monitor SEC and leakage	Immediate
Heat reflux	RO motor heat AWG condenser heat solar PVT heat	Feed preheat where useful hot water membrane- distillation side-stream	Avoid heating RO feed beyond membrane design legionella controls on warm water	Pilot
Clean-water reflux	Final rinse safe backwash supernatant HVAC condensate	Earlier treatment stage or non-potable tank	Never return chemicals or pathogens without hazard review	Immediate after validation
Rain fog dew merge	Multiple low-energy raw sources	Common equalisation then source-appropriate treatment	Online conductivity and turbidity isolate suspect source	Immediate
Brine water reflux	Residual water in concentrate	Second-pass RO or membrane distillation	Scaling and osmotic pressure increase each cycle fixed maximum concentration	Pilot only
Mineral reflux	Salt-rich concentrate	Crystallisation or sale/use after analysis	Heavy metals antiscalant and market quality no food claim without certification	Research
Storage reflux	Daytime solar surplus as treated water	Elevated or pressure- managed tanks feed night demand	Maintain disinfectant residual and turnover	Immediate
Material reflux	Local clay shell repairable steel replaceable mesh	Repair and reuse programmes	Potable-contact parts remain compliant	Immediate

The non-negotiable limit

A closed brine loop is not perpetual water reuse. Salt, boron, antiscalant and trace contaminants accumulate while osmotic pressure rises. The system needs a licensed terminal pathway: a designed marine diffuser, a validated salt or mineral product, evaporation or a true zero-liquid-discharge train. Energy recovery alone is not water recovery.

Practical process train

Stage	Equipment	Recovered output
Capture	Rain roofs fog mesh seawater intake	Gravity-fed raw water where terrain permits
Pretreatment	Screens settling or flotation media or UF dosing	Backwash supernatant only if validated for return
Primary separation	SWRO with isobaric ERD	Brine pressure returned to feed

Stage	Equipment	Recovered output
Product finish	Calcite or controlled remineralisation disinfection	Stable potable water
Storage	Split buried or anchored tanks	Energy stored as water gravity delivery
Concentrate side-stream	Optional MD or crystallisation pilot	Additional water salt or mineral sample data

EU first supplier strategy

An EU-first result can be achieved without an origin-only exclusion. Score whole-life performance that matters in Guadeloupe: potable compliance, independently witnessed output, energy at the stated seawater condition, cyclone design, repair time, local training, spare parts held in the EU or Caribbean, warranty response and transparent end-of-life handling. If public money is involved, have the contracting authority confirm the applicable French and EU procurement route. The European Commission notes that lifecycle-cost methods and tenderer data requirements should be disclosed in the procurement documents. [7]

Evaluation criterion	Weight	Evidence required
Potable water and materials compliance	25	EU drinking-water basis ACS or equivalent potable-contact dossier lab plan
Guaranteed output under Guadeloupe conditions	20	35–40 g/L warm seawater site solar profile turndown and availability
Whole-plant energy and REFLUX recovery	15	kWh/m ³ including auxiliaries ERD efficiency measured acceptance test
Cyclone and corrosion resilience	15	Structural calculations anchoring marine coatings safe shutdown procedure
Service spares and training	10	Response time EU or Caribbean stock French manuals operator course
Lifecycle cost	10	20-year NPV assumptions disclosed chemicals membranes energy disposal
Circularity and local value	5	Repairability local fabrication share take-back and material recovery

Current buy and quote matrix

Need	EU or local lead	Non-EU comparison	Procurement action
Rain storage	PROCAP Bèl Lapli Soley K'raib PAK971 GRAF	Chinese tanks only if freight and ACS-equivalent dossier justify	Buy locally after civil and potable-use check
Fog pilot	CloudFisher Germany KnitMesh UK local SFC fabrication	FogQuest Canada and Chile mesh	Buy six standard collectors not a production field yet
Passive solar still	GWS-1 Guadeloupe build	Carocell Australia benchmark	Build twelve GWS-1 and buy one comparator
Manual emergency RO	Katadyn Switzerland	Other marine units only after service	Buy for clinics shelters and response

Need	EU or local lead	Non-EU comparison	Procurement action
		and parts check	teams
Small solar DC RO	No stronger EU low-power household comparator identified	Spectra USA	Buy one field unit and retain full spares
120 m ³ /day solar SWRO	OSMOSUN France lead Elemental Netherlands Solar Water Solutions Finland B and P Italy	FHNED Wangyang Hexing China	Two-stage tender with witnessed FAT and lifecycle scoring
AWG emergency	GENAQ Spain	Watergen Israel FND or Heaven Springs China	Pilot only if a specific resilient use case exists
Brine recovery pilot	RN Solutions Netherlands memsys Germany Salinity Solutions UK for suitable feed	Chinese MD or crystalliser only after references and lab test	Treat as R&D side-stream not a prerequisite for water supply

Budget anchors not quotations

Item	Published screening figure	How to use it
FogQuest standard test collector	US \$75–200 each to build	Legacy public budget basis confirm current mesh labour freight and expert siting
FogQuest 40 m ² large collector	US \$1,000–1,500 each about 10-year life stated	Legacy public budget basis excludes cyclone adaptation tanks and treatment
Elemental 5,000–11,000 L/day project	About €40,000–€70,000 indicative	2026 online screening range confirm complete Guadeloupe scope
Elemental 20,000–40,000 L/day project	About €100,000–€120,000 indicative	Use only to sanity-check bids not an award price
Elemental 50,000–100,000 L/day project	About €190,000–€450,000 indicative	Wide site-dependent band 120 m ³ /day plus N+1 and storage will be higher
GRAF Carat XL 10,000 L tank	French listing around €6,002 TTC	Tank only benchmark Guadeloupe freight excavation anchoring pipework and treatment extra

China comparison lane

China has deep capability in membranes, pressure vessels, pumps, desalination integration, solar equipment and atmospheric water generation. Including it strengthens the competition. The fair approach is the same pass-fail gate for every origin, with extra document and service checks where the supplier lacks an established EU support chain.

Chinese supplier	Visible offer	Why compare	Mandatory gate before award
FHNED Jiangsu Fenghai	5 15 25 50 100 and 144 m ³ /day SWRO listings including new-energy container models	Direct size match around the project target	Third-party FAT full bill of materials CE dossier potable-contact declarations 35 g/L performance EU spares and commissioning partner
Zhuhai Wangyang	Container SWRO examples around 65 144 500 and 720 t/day optional ERD	Broad maritime track record claim	Guaranteed whole-plant SEC boron and chloride reference calls cyber and controls documentation
Hexing	Factory-integrated container SWRO with solar and storage compatibility	Potential fast deployment	Clarify whether PV batteries intake post-treatment and brine outfall are included

Chinese supplier	Visible offer	Why compare	Mandatory gate before award
Snowate	iERD pressure exchanger and water-treatment components	Component-level cost and technology benchmark	Independent efficiency curve seawater materials endurance test leakage and warranty
FND or Heaven Springs	Atmospheric water generators up to several thousand L/day	Useful AWG price-performance comparison	Output curve at Guadeloupe temperature and RH kWh/L noise refrigerant sanitation and EU potable compliance

Factory acceptance test essentials

- Witness 72 continuous hours at agreed feed salinity, temperature and fouling index; do not accept a freshwater recirculation demonstration.
- Record product flow, salt rejection, boron where applicable, recovery, pressure, chemical use, noise and whole-plant kWh/m³.
- Verify every major component serial number against the approved bill of materials and retain PLC source backup and passwords.
- Take accredited laboratory samples and define rejection and liquidated-damages thresholds in the contract.
- Ship commissioning spares, two years of critical consumables, French maintenance instructions and operator training with the plant.
- Hold final payment until site acceptance under Guadeloupe feed and solar conditions.

Cloud seeding reality check

Short answer

The material normally meant is silver iodide AgI not silver chloride. Glaciogenic seeding targets suitable supercooled clouds; hygroscopic seeding generally uses salts in warm clouds. Rockets are only delivery systems. Seeding cannot create clouds or moisture.

WMO distinguishes hygroscopic methods that modify liquid drops from glaciogenic methods that target ice crystals. Evidence is strongest for wintertime orographic clouds with constrained dynamics; attribution in complex clouds is difficult, and cloud-scale proof for hail cannons and ionisation remains lacking. [8]

Question	Evidence-led answer for Guadeloupe
Can it create rain from blue sky	No. It can only attempt to modify suitable existing clouds.
Is silver used	Usually AgI for glaciogenic seeding; hygroscopic warm-cloud methods generally use salts.
Are rockets used	Yes in some programmes, but they bring explosives, aviation and environmental controls.
Is it dependable enough for the 8,000-person budget	No. Tropical variability and attribution difficulty make it research only.
Should equipment be purchased now	No. First commission a study with Météo-France, universities and competent French authorities, with defined success and monitoring.

France's ANELFA network uses ground silver-iodide generators for hail suppression. That does not demonstrate reliable potable supply in Guadeloupe, and seeding would not bypass treatment, storage or compliance.

Treatment and assurance

Source	Main hazards	Minimum treatment concept
Rain	Bird and animal contamination roof debris metals first flush	First flush screened opaque tank filtration validated disinfection periodic cleaning
Fog and dew	Airborne dust microorganisms mesh and gutter contamination	Source protection filtration validated disinfection routine chemistry and microbiology
Solar distillate	Volatile carryover very low mineral content storage contamination	Source exclusion activated carbon if justified remineralisation disinfection
RO permeate	Low alkalinity boron under some conditions post-treatment contamination	Remineralisation and pH control disinfection conductivity and lab verification
AWG water	Airborne contaminants wet surfaces biofilm	Air filtration sanitation programme mineral finish disinfection and microbiology

The finished water system should be designed to the applicable French requirements implementing the EU Drinking Water Directive, with ARS Guadeloupe engagement before potable use. WHO's desalination guidance is a useful design reference, but it does not replace French authorization, surveillance and potable-contact requirements. [4] [9]

Twelve month delivery plan

Period	Work	Decision gate
0–30 days	Confirm sites and demand engage ARS and water authority issue raw-water sampling plan buy manual emergency units	Approved design basis and sampling chain
Month 1–3	Install six fog test collectors twelve GWS-1 stills one commercial still comparator rain tank upgrades	Verified instruments and baseline lab results
Month 2–4	Issue EU-first performance tender plus China comparison lot or alternates	Three compliant bids with comparable scope
Month 4–6	Witness factory tests complete intake and brine studies finalise tank and PV civil design	FAT pass and permits pathway
Month 6–10	Construct intake foundations PV 360 m ³ storage install and commission RO	Site acceptance at guaranteed output and water quality
Month 10–12	Optimise REFLUX loops cyclone drill audit spares review fog and still dataset	Operational readiness and scale or stop decisions

Pilot success criteria

Pilot	Scale trigger	Stop or redesign trigger
Fog	Dry-season median and 90 percent availability support target cost microbiology controllable	Cyclone handling impractical yield too intermittent contamination burden high
GWS-1	At least 2.5 L/m ² /day campaign average with acceptable cleaning and no leaks	Frequent glass or seal failure carryover contamination labour cost excessive
Solar SWRO	Guaranteed 120 m ³ /day service with N+1 compliant water measured whole-plant energy	Pretreatment instability missing spares brine pathway not permitted
AWG	Only if point-use mission values independence more than energy cost	Any proposal to substitute AWG for the 120 m ³ /day seawater plant
Brine recovery	Net extra water or saleable product with safe chemistry and positive lifecycle case	Scaling chemical accumulation no legal offtake or disposal route

Immediate procurement package

1. Six standard 1 m² fog collectors with matched weather and rainfall logging.
2. Twelve locally built GWS-1 solar stills and one complete commercial solar-still benchmark.
3. Local ACS-compliant rain and finished-water tanks for pilots, with first-flush and disinfection components.
4. Manual RO kits for critical response and one small DC energy-recovery watermaker for operational training.
5. A two-stage tender for a 120 m³/day guaranteed solar SWRO service with N+1 trains, PV, intake, pretreatment, remineralisation, disinfection, split 360 m³ storage, brine management, training and two-year critical spares.
6. An optional priced REFLUX IT side-stream package covering pressure recovery as mandatory and heat or brine recovery as separately testable pilots.

Bottom line

Spend the first money on measurements, local storage and emergency diversity. Spend the large money on a guaranteed modular solar SWRO service, not on an unverified atmospheric-water or cloud-seeding promise. Keep European manufacturing and Guadeloupe value creation at the centre through whole-life scoring, while letting capable Chinese vendors prove themselves against exactly the same acceptance test.

Sources and vendor links

Accessed 11 October 2026. Vendor capacities, efficiencies and prices are claims for screening until written into a guaranteed contract and verified at factory and site acceptance.

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- [5] **OSMOSUN** [OSMOSUN solar seawater desalination](#) Commercial range battery-free operation energy and PV sizing claims.
- [6] **GENAQ** [Atmospheric water generator solutions](#) Current nominal output and energy figures.
- [7] **European Commission** [Life-cycle costing in green public procurement](#) Transparent lifecycle method and tender data principles.
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- [9] **European Union** [Directive EU 2020 2184 on the quality of water intended for human consumption](#) EU drinking-water framework.
- [10] **Aqualonis** [CloudFisher products](#) Commercial fog collector family.
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- [12] **Katadyn** [Survivor desalination products](#) Manual emergency watermakers.
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- [14] **F Cubed** [Carocell solar desalination](#) Passive solar desalination products and project claims.
- [15] **Elemental Water Makers** [Solar desalination systems](#) EU commercial solar RO supplier.
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- [17] **Boreal Light** [Winture solar water systems](#) Large solar water-treatment systems.
- [18] **RN Solutions** [Membrane distillation](#) Low-grade-heat membrane-distillation option.
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- [20] **Salinity Solutions** [Batch reverse osmosis](#) High-recovery batch RO for suitable brackish and wastewater feeds.
- [21] **Jiangsu Fenghai New Energy Desalinated Development** [SWRO product list](#) Chinese 5–144 m³/day listed systems and larger ranges.
- [22] **Zhuhai Wangyang Water Treatment** [Containerized seawater desalination](#) Chinese container SWRO examples.
- [23] **Snowate** [Desalination energy recovery devices](#) Chinese pressure-exchanger comparison.
- [24] **Heaven Springs** [Atmospheric water generation](#) Chinese AWG comparison.
- [25] **PROCAP** [Procap water tanks](#) Antilles tank manufacturing and potable models.
- [26] **Bèl Lapli** [Aqua rainwater systems](#) Guadeloupe rainwater installation route.