



15B APPLICATION BRIEF

Industrial Heating Hot Water and Cooling

For Philippine hotels, hospitals, food processing, large laundries and industrial kitchens — iHEAT R290 cascade with free-cooling bonus.

0.7 yr

Real payback (verified)

verified install · ₱627K/yr saved · 8 months

COP 4.5

Hot water at 65 °C

₱506K electric boiler → ₱22K iHEAT

+₱143K

Free cooling bonus

83 kW/day evap-side offsets split-AC bill

— WHAT WE INSTALL



FEATURED · INDUSTRIAL WORKHORSE

iHEAT R290 cascade

11.5–100 kW per unit · COP 4.5 · 60–85 °C · cascade to 600 kW

Central hot water for hotels, hospitals, food processing, laundries and industrial kitchens. Replaces LPG / diesel boilers and electric resistance plant. **Every kWh of hot water also produces ~0.75 kWh of cold air** — duct it into your FAHU or cold store and the free cooling pays for itself (₱143K/yr at the verified install).



Larger units · 25–100 kW

25 / 35 / 50 / 65 / 100 kW modules · cascade to 600 kW · R290 · 80 °C

One refrigerant circuit, every scale. 25 kW for a 50-room hotel or hospital wing; 100 kW per module for chains, food-processing CIP, hospital towers.



Karnot install & service

Permits-Managed Service · 3-yr core warranty · 24/7 cloud M&V

We file the **DENR/LGU R290 permit pack**, install, commission, train your team. 24/7 cloud monitoring with automated fault dispatch from Mapandan HQ.



Solar + SG Ready

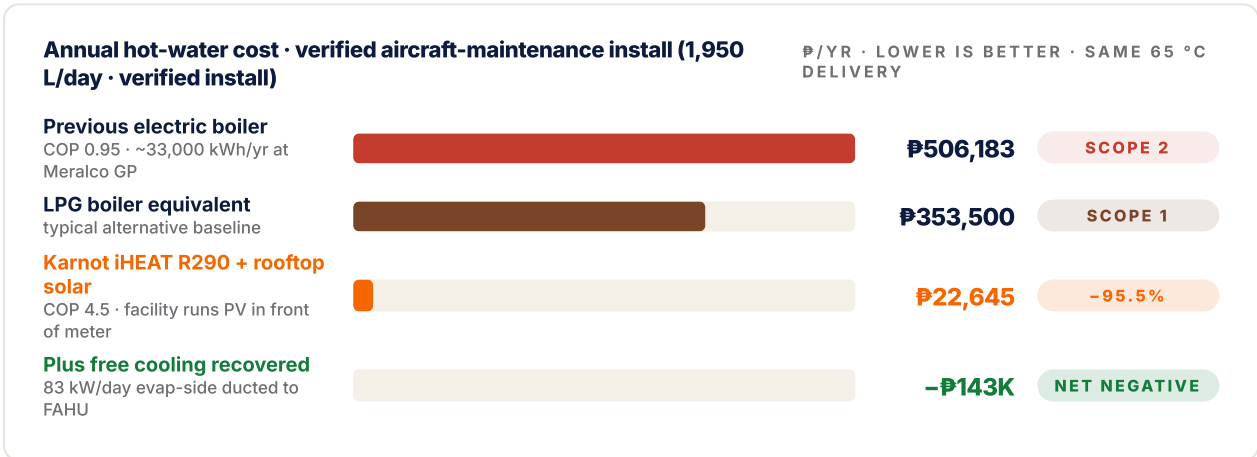
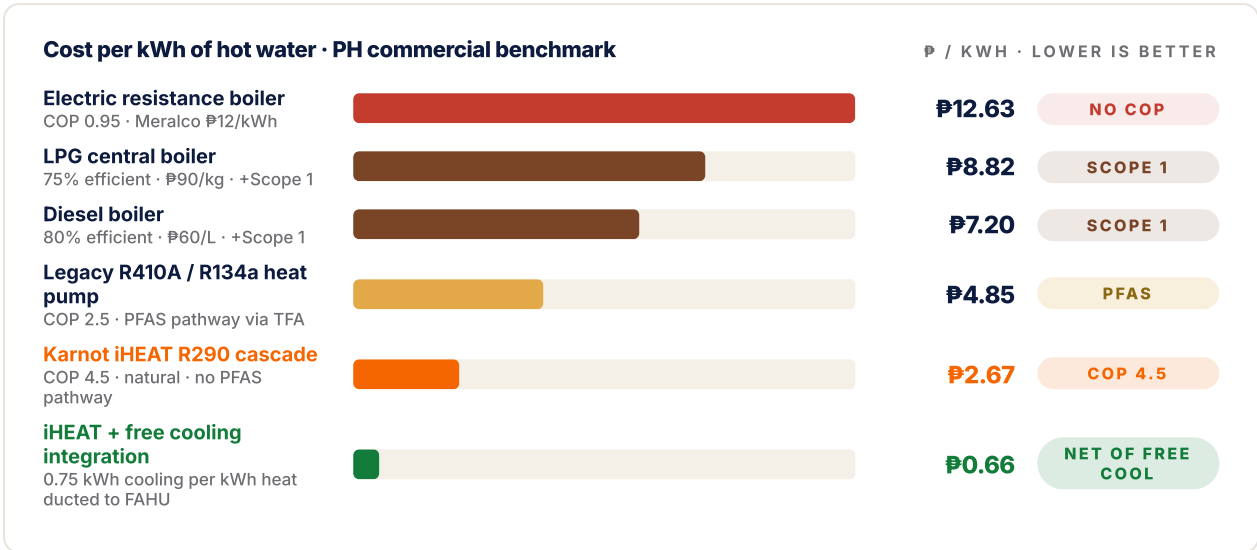
Karnot SG-Ready · iVOLT zero-export · PV-aware scheduling

Industrial hot water is 24/7 — perfect for solar pre-investment. iVOLT + iSTOR charges the tank on midday solar; cascade rides through the evening peak.

Another 30–50% off the electric bill.

— LESS CARBON. LESS PESOS. EVERY KWH OF HEAT.

The economics moved. *Two charts say why.*



PFAS-class HFC refrigerants are the asbestos. Not LPG — the real liability is the legacy heat pump on the roof. karnot.com/compliance

ECHA UNIVERSAL PFAS RESTRICTION
5-country REACH proposal (DE, DK, NL, NO, SE) explicitly names HFC-125, HFC-134a, HFC-143a, HFO-1234yf in scope. **RAC adopted opinion 3 Mar 2026, SEAC draft opinion 11 Mar 2026.** Commission decision next.

TFA BREAKDOWN PATHWAY
When R410A / R134a / R1234yf leak, they break down to **trifluoroacetic acid (TFA)** — HFO-1234yf at 100%, HFC-134a at up to 20% per ECHA. TFA is OECD-classified PFAS, water-soluble, accumulates in drinking water + breast milk. EFSA reference values under review 2026.

WHY R290 / R744 ARE EXEMPT
R290 (propane) breaks down to CO₂ + water. R744 (CO₂) IS the breakdown product. **No fluorine, no TFA pathway, no PFAS classification.** Not in scope of F-gas Regulation. Not in scope of the ECHA PFAS proposal. Never will be.

— WHAT YOU SAVE

Real install — Philippine aircraft-maintenance facility.




VERIFIED AIRCRAFT-MAINTENANCE INSTALL · 1,950 L/DAY	PREVIOUS (ELECTRIC BOILER)	KARNOT iHEAT R290 CASCADE	ANNUAL SAVING
Hot water annual cost	₱506,183	₱22,645 (COP 4.5 + rooftop solar)	₱483,538/yr
Free cooling recovered (evap-side)	— (no recovery)	83 kW/day ducted to FAHU	+₱143,452/yr
Refrigerant / combustion footprint	Scope 2 grid electric · ~204 tCO ₂ e/yr	R290 · GWP 3 · no PFAS pathway	-77% Scope 2 · zero PFAS exposure
CAPEX · Simple payback · total saved	(legacy already paid)	~₱420K installed	0.7 yr · ₱627K/yr

Real install · Philippine aircraft-maintenance facility · 1,950 L/day at 28 → 65 °C. Previous: electric boiler feeding technician showers, wash bays and sanitation. Replacement: iHEAT R290 cascade 50 kW, 1,500 L stratified tank, evaporator ducted to hangar office air handler. COP 4.5 annualised. Meralco GP ₱12/kWh blended (facility runs rooftop solar in front of meter → ₱22K figure). Free cooling = 83 kW/day × 8 hr × ₱12/kWh × 240 days, credited at ₱143K. NPV ₱5.7M at 8%, lifetime saving ₱9.4M / 15-year life. Excludes avoided refrigerant top-up cost on the legacy split-AC fleet.

“Industrial hot water in the Philippines is the easiest payback in the country — if you know how to count. The headline saving is the electric-resistance bill collapsing by 95%. The real saving is the free cooling on the evaporator side, which most engineers miss because they were trained on European systems where cold air is unwanted. In the Philippines, that cold air is worth as much as the hot water. One machine, two outputs, 8-month payback.”

Stuart Cox · Founder & CEO · Karnot Energy Solutions Inc.
Real install · Philippine aircraft-maintenance facility · verified by site M&V · May 2026

— WHAT YOU GET WITH EVERY INSTALL

 <p>BOI paperwork</p> <p>Karnot files your RA 11285 registration as part of standard project scope. Final incentive package subject to BOI approval.</p>	 <p>3-year warranty</p> <p>On each heat-pump core. Service contract and refrigerant compliance included for the warranty period.</p>	 <p>Monthly M&V report</p> <p>IPMVP Option B sub-meters on both the hot-water output AND the free-cooling output. Cost-per-litre-DHW and cooling-kWh-recovered reported monthly. Tracks Scope 2 reduction for SEC PFRS S2 disclosure.</p>
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Want the ROI run on your hot & cold loads?

Send us your boiler & chiller capacity and 12 months of LPG + Meralco bills. We send back a sized iHEAT cascade, free-cooling integration spec, projected hot+cold saving, NPV, IRR and payback — no commitment.

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[karnot.com / applications / hot-water](http://karnot.com/applications/hot-water)