



27 NEAR-FARM AGRI-TECH · THE PANGASINAN MODEL

₱800,000 a month back in your pocket. *From day one.*

For Philippine provinces, agri-cooperatives, dairy farms, livestock operators and tobacco growers. **One Karnot Agri-Tech Centre. Three revenue streams. Solar-powered, off-grid capable, replicable across all 44 municipalities of Pangasinan and every agri-province nationwide.** Cold storage + tobacco curing + hydroponic fodder, all on one platform.

PANGASINAN AGRI-TECH CENTRE · 1 HECTARE · MODELLED TO A REAL PROVINCIAL PROPOSAL

₱800K

In your pocket every month

Net of the green-loan payment · from day one

2 yr

Cash payback (incl. land)

1.5 yr excluding the ₱7M land cost · 65.5% annual ROI

200+

Smallholder farmers served

30 km radius · 13-15 direct jobs + 50+ indirect

You pay nothing up front. *The bank does — plus the BOI.*

DBP, LandBank and BPI all run **green-loan programmes** with agri-industrial priority — **~6.5–8% p.a., 5–10 year terms, 70–80% LTV.** Add a **provincial co-investment** (land contribution) and a **BOI Pioneer Income Tax Holiday under RA 11285** — provincial agri-tech qualifies. The monthly net profit (₱1.11M from the integrated centre) is larger than the monthly loan payment (~₱320K). **Cash flow goes UP from day one.** Karnot files the loan, the BOI registration, the building permits and the DOE ESCO paperwork as part of project scope.

— WHY THIS OPPORTUNITY, WHY NOW

The Philippines loses 30-40% of post-harvest produce. *The cold chain doesn't reach the farm.*

Of 240 cold storage facilities nationwide, 151 are concentrated in Metro Manila. Rural farming areas have effectively zero cold-chain access. Annual rice losses alone exceed 3.17 million metric tonnes, valued at over USD 1 billion. Add a tobacco province burning 5–8 m³ of firewood per barn per season, a livestock sector strangled by imported feed prices, and a dairy industry running CIP hot water on LPG — and you have the conditions for one integrated solution. The Karnot Agri-Tech Centre delivers cold storage + tobacco curing + hydroponic fodder + dairy CIP, all from one solar-powered platform, replicable in 3–4 months per facility.



Post-harvest losses: ~50% of root crops, 25-40% of fish catch

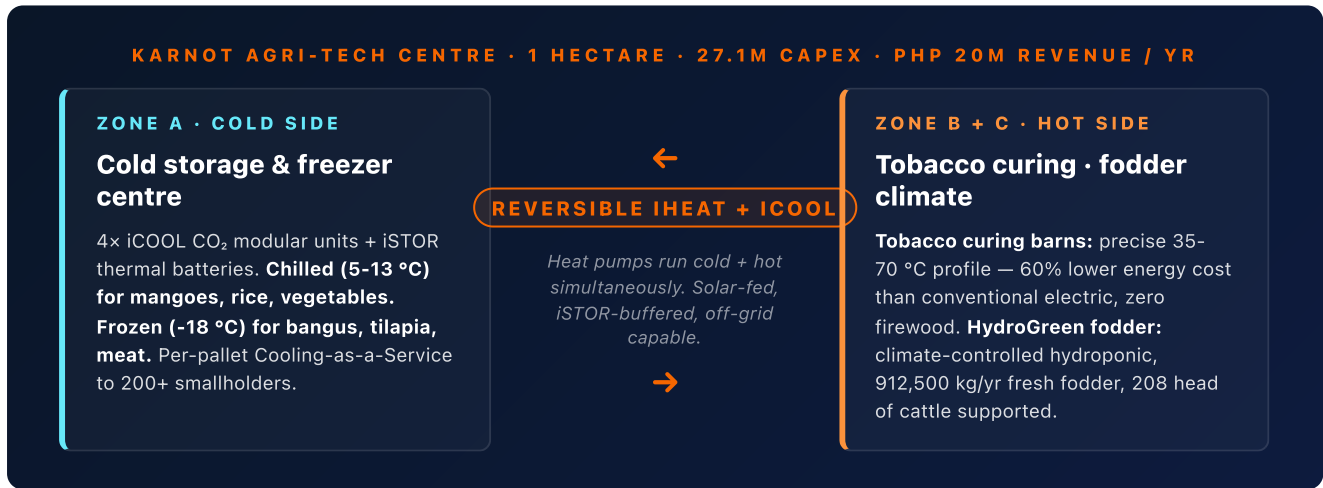
Pangasinan grows rice, mangoes, tobacco, fish, livestock. Produce spoils within hours of harvest because there is no nearby cold storage. Karnot near-farm CO₂ cold rooms with iSTOR thermal batteries bring chilled (5–13 °C) and frozen (-18 °C) storage to within 30km of the farm — 30-40% losses → under 5%.



Tariff ₱11-13/kWh and frequent brownouts

PH has among the highest electricity tariffs in Southeast Asia. Brownouts make grid-dependent cold storage unreliable. Karnot solar PV + iSTOR PCM thermal batteries deliver 8-12 hours of passive cooling without power — rated for 1,500+ charge cycles. Off-grid capable for the most remote barangay. iCOOL CO₂ refrigeration COP 4.2 at -5 °C (Oak Ridge National Laboratory validated).

— THREE ZONES · ONE PLATFORM · ONE ELECTRICITY BILL



— THE FOUR BOXES · ONE PROJECT

iCOOL CO₂

40-60% saving · TRL 9

Transcritical natural-refrigerant (R744) heat pump. **40-60% energy savings over conventional HFC.** COP 4.2 at -5 °C. **Dual-zone: chilled + frozen.** Reversible to 35–70 °C for tobacco curing.

iHEAT R290

Tobacco + fodder + dairy CIP

Reversible R290 air-to-water heat pump. **Tobacco curing 35-70 °C,** fodder climate control, **dairy CIP hot water 60-80 °C** from one machine. COP 4.0+.

iSTOR PCM

38 kWh · 8-12 hr backup

PCM thermal battery, **6 °C discharge,** 8-12 hours passive cooling without power. **1,500+ charge cycles.** Critical during PH brownouts. **iD-ICE bio-PCM defrost** eliminates 7-10 kW load spikes.

iVOLT + HydroGreen

Solar + vertical pasture

iVOLT solar PV + LiFePO₄ battery, zero-export. **HydroGreen vertical pastures grow 912,500 kg fresh fodder per year** in a 4,000 m² climate-controlled centre. Reduces cattle finishing time from 100 to 79 days.

— WHAT YOU PUT IN · WHAT YOU TAKE OUT

Modelled 1-hectare Pangasinan Agri-Tech Centre. *Real numbers from a live provincial proposal.*

LINE · PANGASINAN AGRI-TECH CENTRE (1 HA)	CAPEX (PHP)	REVENUE / YR	NET / YR
Zone A · Cold Storage & Freezer (4x iCOOL + iSTOR + solar)	~₱8.3M	~₱2.0M	~₱1.3M
Zone B · Tobacco Curing Barns (2x iHEAT reversible + solar)	~₱3.3M	~₱2.25M	~₱1.6M
Zone C · HydroGreen Fodder Centre (4,000 m ² , 208 head)	~₱6.0M	~₱14.6M	~₱9.8M
Training + Assembly + Support facilities	~₱1.5M	~₱1.2M	~₱0.6M
Land (1 hectare @ ₱700/m ²)	₱7.0M	—	—
iSAVE digital platform + IoT + contingency	~₱1.0M	—	—
Total Pangasinan Agri-Tech Centre	₱27.1M	₱20.1M	₱13.3M

Source: Karnot Pangasinan Agri-Tech Centre Investment Proposal, March 2026 · addressed to the Provincial Government of Pangasinan. CAPEX total ₱27,113,176 (~USD 493K). Annual revenue ₱20,066,000 (~USD 365K). Annual net profit ₱13,316,000 (~USD 242K). Payback: ~1.5 years **excluding land**, ~2 years **including land**. Annual ROI: **65.5%**. Operating costs (electricity, grain inputs, 13-staff labour, maintenance, insurance, transport): ₱6.75M/yr. Fodder is the largest revenue stream (912,500 kg @ ₱16/kg). Cold storage runs on a per-pallet Cooling-as-a-Service model (80 pallets ₱120/day × 350 days + freezer 40 pallets). Tobacco curing services 15,000 kg cured leaf @ ₱150/kg curing fee. The same architecture replicates to any PH agri-province — Pangasinan has 44 municipalities.

— THE CASH FLOW · PLAIN AND DULL

<p>MONTH 1</p> <p>₱800K</p> <p>₱1.11M net profit minus the green-loan payment (~₱320K). Net cash in pocket. Every month. From day one.</p>	<p>YEAR 1</p> <p>₱9.6M</p> <p>In your pocket while the loan is being repaid. Kit pays for itself in cash terms before month 25 (incl. land).</p>	<p>YEAR 5</p> <p>₱48M</p> <p>Loan paid off. From now on you keep every peso of the ₱13.3M annual profit.</p>	<p>YEAR 15</p> <p>₱181M</p> <p>Total cash retained over the 15-year asset life. Each PH agri-province can host 5–20 of these.</p>
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— HOW YOU PAY FOR IT · YOU DON'T, THE BANK DOES

Three banks + BOI + provincial co-investment. *Karnot files all the paperwork.*

Philippine green-loan programmes *built for agri-tech CAPEX*

DBP · SEFP

Sustainable Energy Finance Programme

Agri-industrial priority · covers cold chain + heat pump + solar. 70–80% LTV · 5–10 yr · ~6.5–8% p.a.

LANDBANK · SEILP

Sustainable Energy Investment Loan

Path of least resistance for agri-cooperatives, dairy farms and provincial LGUs that already bank with LandBank · ~7% p.a.

BPI · SDF

Sustainable Development Finance

Fastest decisions for established SMEs and provincial commercial operators · ~1–1.5% below standard SME rate

These are **loans**, not grants. Plus **BOI Pioneer Income Tax Holiday** and **duty-free equipment import under RA 11285** — provincial agri-tech qualifies. Karnot files **the loan, the BOI registration, the building permits, the DOE ESCO accreditation and the iSAVE Cooling-as-a-Service billing platform** as part of project scope.

— FOUR WAYS TO PARTNER · ONE PROVINCIAL REPLICATION MODEL

PARTNERSHIP OPTIONS · FROM THE PANGASINAN PROVINCIAL PROPOSAL

The province contributes land. *Karnot delivers the technology, the operation and the bank loan.*

A · Provincial Co-Investment. Province contributes land or land subsidy; Karnot provides all technology, equipment and operational expertise; revenue shared proportionally; provincial government gets priority access for farmer cooperatives and LGU-nominated beneficiaries. **B · BOI / PEZA Registration Support.** Province facilitates BOI registration (ITH, duty-free imports); Karnot invests full capital; province benefits from employment, food security and technology transfer. **C · Public-Private Partnership.** Formal PPP structure with provincial infrastructure support (road access, water, grid connection) and Karnot providing technology and operations; joint steering committee. **D · Demonstration Agreement.** Province designates the project as an official Agricultural Technology Demonstration Site; Karnot invests and operates; province provides policy support, farmer mobilisation and linkages to DA, DOST, NTA national programmes. **The replication model: Pangasinan has 44 municipalities. Each Agri-Tech Centre serves a 30-km radius, deploys in 3-4 months, hires 13-15 direct jobs.**

“ Every PH agri-province has the same three problems: post-harvest losses that no cold chain reaches, a tobacco curing tradition burning firewood, and a livestock sector strangled by imported feed. The Karnot Agri-Tech Centre solves all three from one solar-powered platform — iCOOL CO₂ on the cold side, iHEAT reversible on the hot side, HydroGreen fodder on the climate-controlled side, iSAVE billing the smallholders by the pallet. ₱27M CAPEX, ₱20M annual revenue, 65% ROI, 2-year payback. The Pangasinan proposal is the prototype. The 43 other municipalities in Pangasinan, plus every other agri-province in the Philippines, are the replication queue. The maths is not subtle. ”

Stuart Cox · Founder & CEO · Karnot Energy Solutions Inc.