

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

One Karnot Agri-Tech Centre. Three revenue streams. Solar-powered, off-grid capable, replicable across all 44 municipalities of Pangasinan — and every other PH agri-province. Cold storage + tobacco curing + hydroponic fodder, all on one platform.

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WHY EVERY PHILIPPINE AGRICULTURE PROVINCE LOSES MONEY ON THE GROUND

The cold chain doesn't reach the farm. *The tobacco barn burns the forest.*

Three structural problems run side by side in every PH agri-province: post-harvest losses with no cold chain, a tobacco curing tradition burning firewood barn by barn, and a livestock sector strangled by imported feed prices. **All three can be solved from one solar-powered Karnot Agri-Tech Centre.**



30–50% post-harvest losses. No nearby cold storage.

Of **240 cold storage facilities nationwide, 151 are in Metro Manila**. Rural farming areas have effectively zero cold-chain access. PH loses up to **50% of root crops, 30% of vegetables, 25–40% of fish catch**. Annual rice losses alone: 3.17 million tonnes worth over **USD 1 billion**. Produce spoils within hours of harvest because there is nowhere to put it.



Tobacco curing burns 5–8 m³ firewood per barn per season.

Pangasinan is a top PH Virginia tobacco province. Traditional flue curing burns wood, produces **inconsistent leaf quality**, and contributes to deforestation. The National Tobacco Administration (NTA) has flagged curing modernisation as a priority. Imported feed concentrates strangle the livestock sector at the same time. **Same province. Same energy problem. Same solution.**

THE ARCHITECTURE · THREE ZONES, ONE PLATFORM

One 1-hectare site. *Three revenue streams.* *One electricity bill.*

KARNOT AGRI-TECH CENTRE · COSMOS FARM LOW-CARBON INNOVATION CENTRE · MAPANDAN · PANGASINAN

ZONE A · COLD SIDE

Cold storage & freezer centre

4x iCOOL CO₂ modular units with iSTOR thermal batteries. **Chilled (5–13 °C)** for mangoes, rice, vegetables. **Frozen (-18 °C)** for bangus, tilapia, meat. Per-pallet Cooling-as-a-Service for 200+ smallholders within 30 km. Loss reduction: 30–40% → under 5%.



iCOOL CO₂ + iHEAT R290

Reversible. Solar-fed. Off-grid capable. iSTOR-buffered.



ZONE B & C · HOT SIDE

Tobacco curing · HydroGreen fodder · dairy CIP

Tobacco curing barns deliver 35 °C yellowing → 55 °C colour fixing → 70 °C stem drying. 60% lower energy cost. Zero firewood. **HydroGreen fodder centre** grows 912,500 kg/yr fresh fodder for 208 head of cattle. **Dairy CIP hot water** at 60–80 °C from the same machine.

iSTOR PCM · 8–12 HR PASSIVE COOLING WITHOUT POWER

38 kWh PCM, 6 °C discharge, 1,500+ cycles. **Survives PH brownouts. Carries the cold side overnight on solar alone.**

iSAVE · SCADA + COOLING-AS-A-SERVICE BILLING

Per-pallet, per-day billing of 200+ smallholders. Predictive maintenance via MQTT. **Rubidex blockchain M&V.**

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THE FOUR BOXES YOU ACTUALLY NEED

Four products. *One project. One commissioning team.*

Karnot R290 + R744 natural refrigerants. **Oak Ridge National Laboratory validated. EN 378 compliant. SEC PH registered. BOI-SIPP and DOE ESCO in application.** All four boxes ship in 3–4 months and integrate via the same iSAVE platform — one bill of materials, one commissioning visit, one M&V report.



iCOOL CO₂

Transcritical R744 · 40–60% saving · TRL 9

Natural-refrigerant heat pump. **COP 4.2 at -5 °C** (Oak Ridge validated). Dual-zone chilled + frozen. Reversible to 35–70 °C for tobacco.

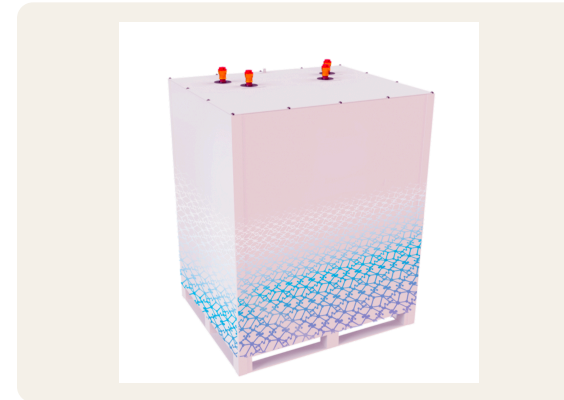
Panasonic two-stage rotary inverter.



iHEAT R290

9.5–100 kW · Reversible

Air-to-water R290 heat pump for **tobacco curing, HydroGreen fodder climate, dairy CIP 60–80 °C**, hot wash. EN 378 outdoor install. COP 4.0+. Drop-in replacement for LPG boilers.



iSTOR PCM

38 kWh · 8–12 hr backup · 1,500+ cycles

PCM thermal battery. **Carries the cold side through a PH brownout overnight on stored cooling alone.** Plus iD-ICE bio-PCM defrost eliminates 7–10 kW load spikes.



iVOLT + HydroGreen

Solar + LiFePO₄ + Vertical pasture

iVOLT zero-export solar PV + battery sizes to the load. **HydroGreen vertical fodder centre grows 912,500 kg/yr** in a 4,000 m² climate-controlled hall. **Cuts cattle finishing time from 100 to 79 days.**

THE BILL OF MATERIALS · MODELLED TO A REAL PROVINCIAL PROPOSAL

**₱27.1M kit. ₱20.1M annual revenue. ₱13.3M
annual net profit.**

LINE · 1-HECTARE PANGASINAN AGRI-TECH CENTRE	CAPEX (PHP)	REVENUE / YR	NET / YR
Zone A · Cold Storage & Freezer (4× iCOOL + iSTOR + solar)	~₱8.3M	~₱2.0M	~₱1.3M
Zone B · Tobacco Curing Barns (2× iHEAT + 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 + IoT + commissioning + contingency	~₱1.0M	—	—
Total Karnot 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. Operating costs ₱6.75M/yr (electricity, grain inputs, 13-staff labour, maintenance, insurance, transport). Annual ROI **65.5%**. Payback ~1.5 yr excluding land, ~2 yr including land. The same architecture replicates to every other PH agri-province.

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THE CASH FLOW · BANK-FINANCED, BOI-INCENTIVISED

From day one. *Net of the loan. Net of operating cost.*

MONTH 1

₱ 800K

₱1.11M monthly net profit **minus** the green-loan payment (~₱320K). Net cash in pocket. Every month. From the day the centre opens.

YEAR 1

₱ 9.6M

In your pocket while the loan is being repaid. **Kit pays for itself in cash terms before month 25** (including the ₱7M land cost).

YEAR 5

₱ 48M

Loan paid off. From now on you keep **every peso** of the ₱13.3M annual profit. ROI: 65.5% a year.

YEAR 15

₱ 181M

Total cash retained over the 15-year asset life of **a single centre**. Multiply by every agri-province in the Philippines.

HOW YOU PAY FOR THE KIT · YOU DON'T, THE BANK DOES

Three banks. *One BOI Income Tax Holiday.* *Karnot files everything.*

DBP

Sustainable Energy Finance Programme (SEFP)

Agri-industrial priority sector — covers cold chain + heat pump + solar PV. 70–80% loan-to-value. 5–10 year terms. State development bank, used to large provincial deals.

~6.5–8% p.a.

LandBank

Sustainable Energy Investment Loan (SEILP)

Path of least resistance for agri-cooperatives, dairy farms and provincial LGUs that already bank with LandBank. Agri-friendly underwriting. 7–15 yr terms available.

~7% p.a.

BPI

Sustainable Development Finance (SDF)

Fastest decisions for established SMEs and provincial commercial operators. ESG-aligned loan book. Comfortable with Karnot R290 + R744 technology and EN 378 compliance.

~1–1.5% below SME

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.

Province contributes land. *Karnot delivers the technology 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 (Income Tax Holiday, duty-free equipment imports)**. Karnot invests full capital. Province benefits from **employment, food security and technology transfer** — no provincial CAPEX exposure.

C

Public-Private Partnership

Formal PPP structure. **Provincial infrastructure support** (road access, water, grid connection). Karnot provides technology and operations. **Joint steering committee** ensures alignment with provincial development priorities.

D

Demonstration Agreement

Province designates the project as an **official Agricultural Technology Demonstration Site**. Karnot invests and operates. Province provides **policy support, farmer mobilisation, linkages to DA, DOST, NTA** national programmes.

THE REPLICATION MODEL · THE MATHS IS NOT SUBTLE

One centre. **3–4 month build. 30 km service radius.**

44

Municipalities in Pangasinan alone

Each centre serves a **30-km radius**. Each centre hires **13–15 direct jobs** + 50+ indirect in supply chain, transport, agricultural services. Priority hiring from local barangays. **Focus on women and youth employment.**

200+

Smallholders served per centre

Farmers, fisherfolk, livestock operators, dairy farms, agri-cooperatives. Per-pallet Cooling-as-a-Service via iSAVE. **Post-harvest losses go from 30–40% to under 5%**. Farmers sell at optimal market prices, not distress prices.

17

PH regions with the same problem

Every PH agri-province has the same three problems: post-harvest losses, tobacco firewood, imported feed strangling livestock. **The Karnot Agri-Tech Centre solves all three from one platform.** 3–4 month build per centre.

Single centre: ~₱13.3M net profit / yr. *Multiply by 5–20 centres per province, multiply again by every agri-province in the Philippines.*

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WHAT HAPPENS NEXT

Four steps from this deck *to a working Agri-Tech Centre on your land.*

- 1 Site visit + provincial agriculture office meeting**
 Karnot team visits the proposed site (1 hectare typical), meets the Provincial Agriculture Office, walks the constraints — power, water, road access.
- 2 Presentation to Governor + Provincial Board**
 We present the technology, economic impact and partnership models (A – D) to the Governor and Provincial Board. We close on the MoU.
- 3 BOI registration + building permits + green loan**
 Karnot files BOI Income Tax Holiday application, files building permits (Karnot Permits-Managed Service: MEDIUM tier ₱180K), files the DBP / LandBank / BPI green-loan paperwork. Provincial co-signing where needed.
- 4 Construction start · 3–4 month build**
 Cold Storage + Fodder Centre opens first (Phase 1, Q1 2027). Tobacco Curing Facility opens aligned with the tobacco season (Phase 2, Q2 2027). Both income streams running by end of year one.

BRING IT TO YOUR PROVINCE

Send us your *land size, agri mix, current cold-chain access and target municipality.*

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