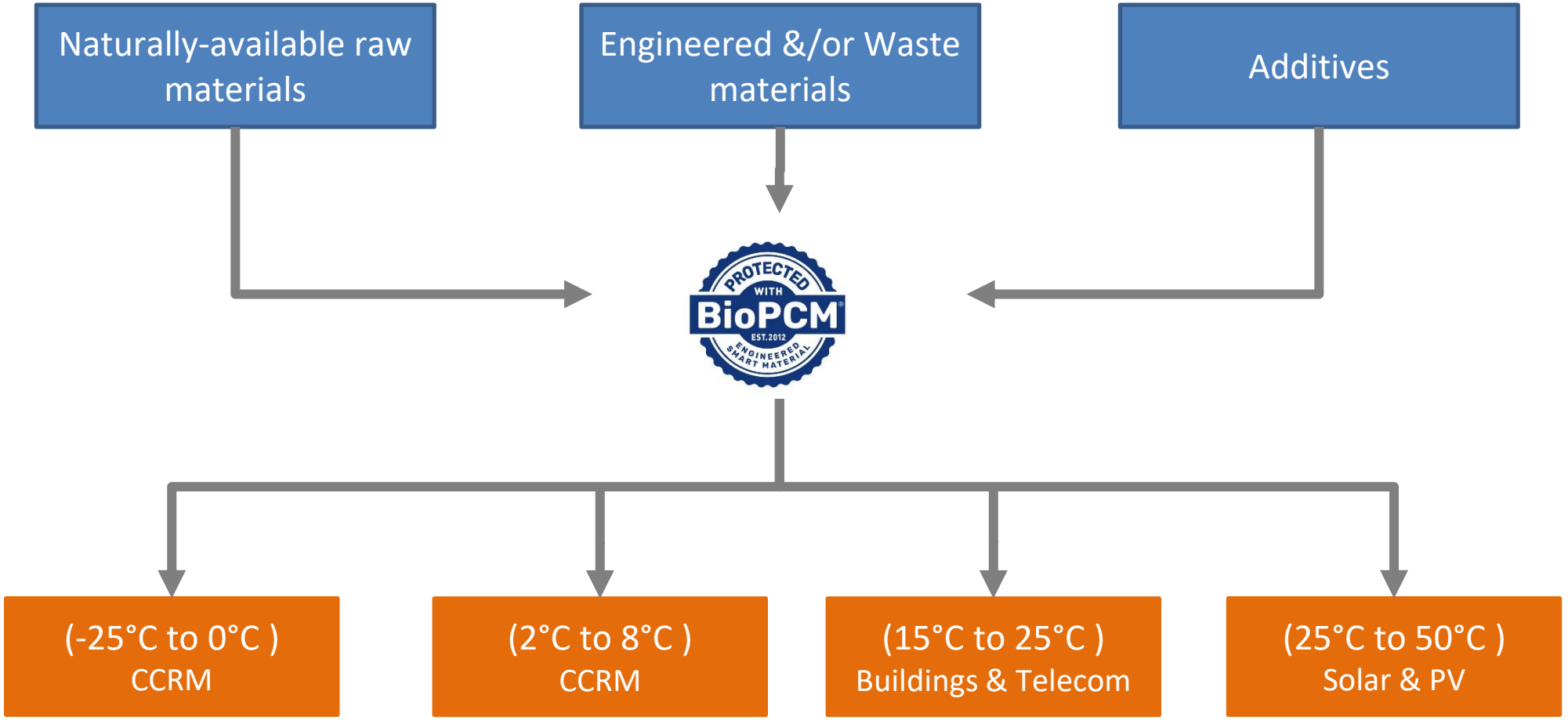
BioPCM® - Engineered smart materials from GWT



CCRM: Cold chain, Refrigeration & Mobility

Advanced materials leader, focused on temperature management and decarbonization

Our Vision: Smart Materials for People & the Planet

Target applications

Energy Efficiency & Storage

Cold Chain, Refrigeration, Mobility

Telecom & Data Centers

Technology platform

PROTECTED WITH BioPCM® EST.2012 ENGINEERED SMART MATERIAL

Case studies – Results of deployment of BioPCM® in cold chain refrigeration and packaging

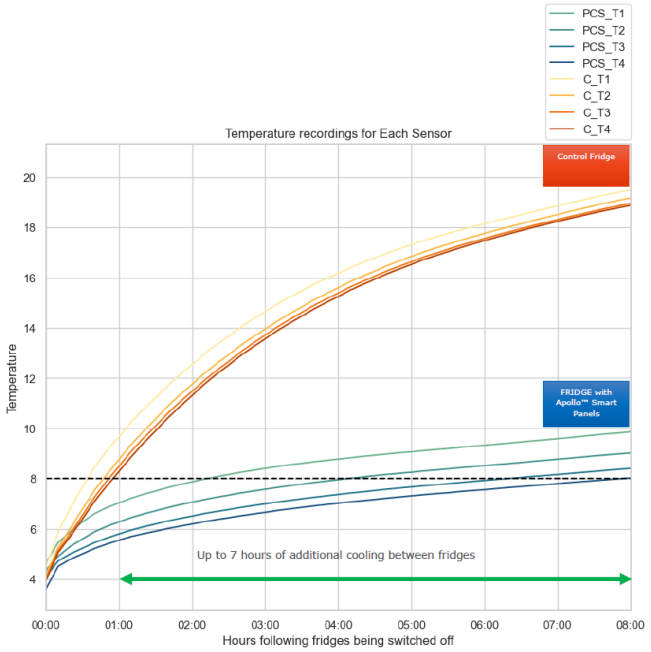
BioPCM® in fridges maintains safety, reduces kWh consumed and avoids waste

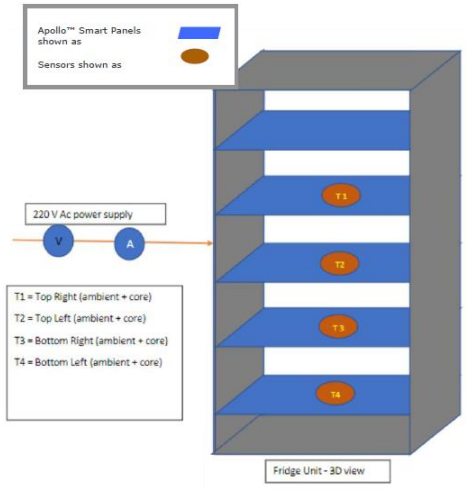
CHALLENGE

Power outages and mechanical failures of compressors, HVACs, trucks and fridges

01

SOLUTION





BioPCM® in cold storage transport has been deployed by the top 3PLs in the world

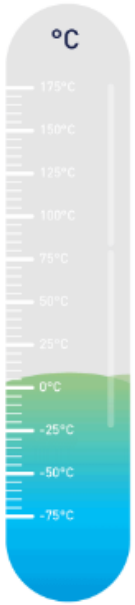
CHALLENGE

Smaller, lighter shipments that can last prolonged periods

02

Leading 3PLs in the cold storage industry

SOLUTION



- Longer duration protection from BioPCM® eliminates product waste.
- Longer duration = longer driving range for vehicles.

Extended protection from BioPCM® reduces product waste

Parcel Solution Thermal Testing Results: 4L Solution				
ISTA 7D Ambient Profile	Conditioning Temperature	Duration Between 15-25°C (hrs)		Additional Protection Provided by BioPCM® (hrs)
		Current customer solution	DualTemp 18/23 BioPCM®	
Summer	15°C	137	200	63
	20°C	70	96	26
Winter	25°C	94	148	54
	20°C	68	70	2

Deployed in Asia, BioPCM® enables load shifting, reduce kWh consumed and address ESG goals

CHALLENGE

Ambitious ESG commitments with few easy-to-deploy options

03

SOLUTION

Pilot partner in cold storage warehouse

Goals	Results
Shut off >2 hours	5.5 hours of shut off achieved; 9.5% of load shift savings achieved
Reduce energy consumption	4.5% HVAC savings achieved
Reduce temperature fluctuation	After BioPCM was installed, temperature stabilized (no fluctuations)

Case study #5: Deployment of BioPCM® in a cold storage warehouse

- Goal:
  - Extend HVAC shut off >2 hours
  - Decrease overcooling (reduce energy consumption)
  - Reduce temperature fluctuation

- Products used: BioPCM in bottles

Goals	Results
Shut off >2 hours	5.5 hours of shut off achieved; 9.5% of load shift savings achieved
Reduce energy consumption	4.5% HVAC savings achieved
Reduce temperature fluctuation	After BioPCM was installed, temperature stabilized (no fluctuations)