



reducing carbon emissions locally and globally



Cold Storage, Pharma & Regulated Logistics

Layer 2: Chilled Water & Glycol Based Thermal Optimization

(Pharma, Cold Chain & Regulated Logistics)

Applies to closed loop chilled water and water glycol systems only

Why This Matters

Cold chain, pharmaceutical, and regulated logistics facilities operate under **constant regulatory, audit, and uptime scrutiny**. Energy reduction initiatives must be **measurable, auditable, and defensible**, and **cannot introduce operational risk**, temperature instability, or compliance exposure.

In these environments, cooling energy is not discretionary—it is a **required utility service**. The opportunity therefore lies not in changing temperature targets, but in **reducing the electrical energy required to maintain them**.

This makes chilled water and glycol systems a prime candidate for **Layer 2 optimization** within a stacked energy strategy.

The Challenge



- **Layer 1 (Electrical Baseline)**: Reduces upstream electrical waste across all loads
- **Layer 2 (This Use Case)**: Reduces the electricity required to convert power into useful cooling
- **Layer 3 (Operational Stability)**: Ensures savings persist under real operating conditions

This use case addresses thermal conversion efficiency, not electrical delivery and not operational behavior—allowing savings to stack cleanly.



The Emissis Advantage

Emissis deploys **enPact Chiller™**, powered by **Maxwell™ patented heat transfer technology**, into **closed loop chilled water and water glycol systems**.

By enhancing thermal conductivity at the **fluid physics level**, enPact Chiller™ improves heat transfer within evaporators, coils, and heat exchangers—**without mechanical modification, control changes, or process disruption**.

Performance is validated using **IPMVP aligned Measurement & Verification**, ensuring results withstand **internal audit, third party review, and regulatory scrutiny**.

Important boundary: This layer applies only to facilities using chilled water or water glycol cooling loops. It is not applied to DX refrigeration systems.

What Changes (Layer Specific)

At the system level:

- Chillers deliver the same cooling output with less electrical input
- Improved heat transfer reduces compressor lift and runtime
- Thermal performance becomes more stable across operating conditions

All efficiency gains are statistically normalized to isolate true performance improvement from:

- Weather variation
- Load changes
- Operational variance

This preserves clean attribution and prevents overlap with Layer 1 electrical savings.



enPact®



Proven Impact

In regulated pharmaceutical and cold chain environments, enPact Chiller™ deployments have demonstrated:

- **~12–13% improvement in Coefficient of Performance (COP)** at the chiller / plant level
- **IPMVP compatible Energy Efficiency Analysis** using normalized datasets
- **Carbon reductions directly proportional to verified energy savings**

These results reflect **Layer 2 performance only** and are intentionally conservative to support audit and compliance requirements.

Why It Works

Pharmaceutical and regulated logistics facilities predominantly rely on **centralized chilled water or water glycol** systems to deliver:

- Precise temperature control
- Freeze protection
- Operational stability
- Compliance consistency

These **closed loop architectures** are exactly where Maxwell™ delivers value—enhancing thermal conductivity **without altering process design or operating parameters**.

Because this layer improves **how efficiently energy is converted into cooling**, it compounds naturally with upstream electrical optimization and downstream operational stability.



Where It Fits Best

- Pharmaceutical warehouses and distribution centers
- Medical and biopharma logistics hubs
- Temperature controlled logistics facilities with centralized utility plants
- Facilities using **chilled water or water glycol cooling loops**

Not applicable:

- Stand alone DX refrigeration systems
- Small cold rooms or deep freeze units without hydronic loops

