



reducing carbon emissions locally and globally



# District Cooling Systems

*(Utility • Municipal • Private Operators)*

# Why This Matters

District cooling systems are already among the most efficient cooling architectures in the world. For utilities, municipalities, infrastructure owners, and private operators, even single digit efficiency gains translate into material reductions in energy consumption, operating cost, and carbon emissions at portfolio scale.

Because these systems are capital intensive, mission critical, and highly optimized, incremental improvements must be proven, auditable, and system safe to justify adoption. Performance gains must be attributable, independently verifiable, and achieved without introducing operational or control risk.



## The Emissis Advantage

Emissis deploys **enPact Chiller™**, powered by **Maxwell™ patented heat transfer nanofluid technology**, into **closed loop chilled water systems within district cooling plants**.

Maxwell™ enhances thermal conductivity and convective heat transfer at the fluid level, **improving the effectiveness of heat exchange across chillers, heat exchangers, and hydronic distribution loops** – without modifying plant controls, chiller hardware, pumps, or network architecture.

Performance is validated using formal Energy Efficiency Analysis (EEA) and IPMVP aligned measurement and verification methodology, ensuring that outcomes are defensible and attributable.

**Important boundary:** This use case applies exclusively to closed loop district chilled water systems. Maxwell™ is not applied to open cooling towers, condenser water loops, or DX refrigeration systems.



# What Changes

By improving heat transfer within the circulating fluid itself, enPact Chiller™ delivers the same cooling output with lower electrical input.

Specifically:

- Improved heat transfer reduces compressor lift
- Chillers operate more efficiently across varying load conditions
- System performance stabilizes under part load and peak demand
- Thermal efficiency gains propagate across the plant, not just individual assets

All improvements occur within the thermal conversion layer, independent of control strategy changes or operator behavior.

# Proven Impact

Measured and validated results from live district cooling deployments demonstrate:

- ~13–15% improvement in Chiller Coefficient of Performance (COP)
- ~9% improvement in overall System COP (SCOP)
- Performance validated through a full Energy Efficiency Analysis (EEA)
- Results normalized and verified using IPMVP aligned methodology

Energy savings directly translate into reduced electricity consumption, lower operating cost, and measurable carbon reduction at the system and portfolio level.



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## Why It Works

District cooling plants operate large volume, centralized hydronic loops, making them an ideal environment for Maxwell™.

Because thermal efficiency improvements occur at the fluid physics level, gains compound across:

- Chillers
- Pumps
- Heat exchangers
- Distribution networks

This produces system wide benefits that scale across entire plants and multi plant portfolios, rather than isolated component improvements.

Independent validation by a leading global district cooling operator confirms both technical performance and portfolio level applicability, elevating this use case from pilot scale validation to infrastructure ready deployment.

## Where It Fits Best

- Utility owned district cooling operators
- Municipal and government backed cooling networks
- Private district cooling providers
- Infrastructure funds and sovereign linked operators
- Large centralized chilled water plants serving campuses, districts, or cities

