

Hydromx Project

Pilot Project for the Greeno Centre

For any questions, queries or comments please contact Arthur Stokhuyzen, Climate Change Officer (a.stokhuyzen@spelthorne.gov.uk)

Introduction

- Presentation Index
 - S2: Introduction
 - S3: What is Hydromx & How does it work
 - S4: Key benefits of Hydromx
 - S5: System Compatibilities & Impacts
 - S6: Safety & Warranties
 - S7: Case Studies
 - S8: Case Study Data & Links (for full reports please contact a.stokhuyzen@spelthorne.gov.uk)
 - S9: Why the Greeno Day Care Centre
 - S10: Greeno: Quoted Financial Information
 - S11: Monitoring & Review Framework
- Project Aim:
 - Run a pilot at the Greeno Day Care Centre testing the Hydromx product
- Current Situation
 - Council gas emissions represent 27% of all Scope 1&2 emissions and £122,000 annual revenue cost
 - Greeno Day Care Centre uses 209,554kWH/year and £16,579

What is Hydromx & How Does it work

- Hydromx is an advanced thermal fluid that replaces the water or glycol mixture in a closed-loop heating system. Its unique nano-particle composition enhances the rate of heat transfer, essentially increasing the surface area of the liquid in the heating system allowing it to reach desired temperatures more quickly and operate more efficiently.
- More technically: Hydromx is a heat transfer nano-fluid engineered to replace water or water/glycol mixtures in closed-loop heating systems. It contains suspended nano-sized metallic particles (typically iron oxide) that significantly increase the thermal conductivity of the fluid compared to water alone.
- Water has a relatively low thermal conductivity ($\sim 0.6 \text{ W/m}\cdot\text{K}$), meaning it is slow to absorb and transfer heat. In contrast, the nanoparticles in Hydromx create a thermal bridge within the fluid, enhancing its ability to rapidly absorb and conduct heat from the boiler to the heat emitters (e.g., radiators). This is based on the principles of nanofluid thermodynamics, where energy is transferred not just by molecular vibration (as in water), but also by the movement and conduction properties of the suspended particles.
- This is science backed and has seen a history of use in vehicle and industrial processes before entering the building market.

Key Benefits

- **Energy savings:** Independent case studies and commercial trials show consistent **20–50%** reduction in gas consumption.
- **Carbon reduction:** Direct emissions reductions without needing to replace the boiler.
- **Cost-effective:** Lower capital costs than new equipment; payback within 1–3 years
- **Low disruption:** Compatible with existing systems; installation can be completed in a single day
- **Extended system life:** By reducing boiler run-time and protecting against corrosion, Hydromx may help prolong system longevity.

System Compatibilities & Impacts

- **Closed-loop heating systems only:** Hydromx is suitable for sealed systems that recirculate fluid (as in most council buildings). It is **not suitable for open-loop or domestic hot water systems**.
- It is **non-corrosive and non-toxic**, and has been shown to reduce scaling and internal corrosion risk. NSF accredited for its life cycle environmental analysis.
- The fluid includes **anti-freeze properties** (rated to -30°C), offering added protection in winter.
- It is **compatible with most common materials** in commercial heating systems, including steel, copper, and brass. Compatible with the Greeno Day care centre heating

Safety & Warranties

- Hydromx is **non-flammable, non-hazardous**, and safe for use in public buildings including schools, care facilities, and hospitals. NSF accredited for its life cycle environmental analysis.
- The product carries a **20-year performance warranty**, assuming proper installation and system flushing are completed.
- Hydromx can be safely **removed and replaced** if needed — the system can be flushed and returned to standard water/glycol mix with no long-term damage.
- No recorded issues of Hydromx damaging/impacting the operation of a buildings heating system.

Case Studies

- Globally:
 - New York City Council (Empire State Building)
 - New York University
 - Dubai Ice Rink
- UK:
 - Diocese of Chelmsford
 - CREW
 - Welsh Housing Association
 - UK GBC Approved
 - Birmingham Children's Hospital



Data from Case Studies

Site	Installation	Energy Savings	ROI	Issues
Birmingham Children's Hospital	2022	33%	0.8	None
Diocese of Chelmsford (36 Schools)	2021	Between 47% & 37.5%	Between 1.42 & 2.18	None
Welsh Housing Association (19 Properties)	2016	Average of: 37.9%	Average of: 4.3	None
Care Home	2019	28%	1.8	None
Empire State Building	2013	40%	n/a	n/a

- [Heat transfer fluid reducing energy consumption of HVAC systems | UKGBC](#)
- [Essex schools lead energy saving charge – HMX](#)
- [2204-Hydromx-Case-Study-Residential-Care-Home.pdf](#)
- [Hydromx Leads the Way for NYC Carbon Neutral Effort](#)
- (for more & full reports please contact a.stokhuyzen@spelthorne.gov.uk)

Why the Greeno Day Care Centre?

- Suitable building: closed-loop system, consistent heating demand
- Opportunity to test impact in a real-world setting
- Low cost, low disruption intervention with measurable outcomes
- Aligned with climate and financial efficiency objectives

Quoted Financial Information

Site	Cons (kWh)	Systems	Boiler size (tot kWh)	Assesed System Volume (L)	Estimated HDMX Vol (L)	Hydromx Budget Cost	Installation Cost	Total Cost	Energy Savings (kWh)	Cost Savings	ROI	tCO2 Saved
Greeno Centre, TW17 9DH	209,544	3x Valliant 35kWh, 1x 30 Kitchen based system	135	920	460	£6,900.00	£2,240.00	£9,140.00	62833.20	£5,027	1.81	11.43

Monitoring & Review

- To ensure this pilot is successful the Climate Change Team is setting up a robust monitoring and review framework to ensure we have good and reliable data to inform future decisions.
- Key Project KPIs:
 - Setup a measurement timeline that incorporates a minimum reporting period of 9 months between at least September & April.
 - Monitor the carbon emissions reduction, in relation to Scope 1 CO2 emissions. Measured through the Energy Manager portal provided by LASER which gives us consistent and high-quality consumption data.
 - Track ROI. Also measured through the Energy Manager portal provided by LASER which gives us consistent and high-quality consumption cost data.
 - User satisfaction and system performance before and after installation. Measured through staff surveys and consistent engagement with the management team at the Greeno Centre.

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