

Muiderberg District Heating Project

A transformative opportunity for contractors and engineering specialists to deliver the Netherlands' next generation of sustainable community heating infrastructure

Building a Sustainable Energy Future

The Muiderberg District Heating Project represents a landmark development in renewable heating infrastructure for the Netherlands. Located near the IJmeer lake, this greenfield project will establish a fully sustainable heat supply system serving approximately 1,200 consumers with reliable, affordable heating whilst dramatically reducing the community's carbon footprint.

This is more than infrastructure—it's a comprehensive energy transition demonstrating leadership in renewable heating technologies. Upon completion, the system will achieve a remarkable 96% renewable energy fraction, placing it amongst the most sustainable district heating schemes in the Netherlands and establishing a replicable model for communities throughout Europe.

The project encompasses complete design and construction of a new district heating production plant and distribution network, utilizing innovative renewable thermal energy harvested from the IJmeer lake. With an estimated annual heat demand of 20,420 MWh including distribution losses, the system must deliver reliable, efficient, and resilient operation under varying seasonal conditions whilst supporting national climate goals and broader European Green Deal ambitions.

Project Scope and Opportunity

The tender programme encompasses the full engineering scope required to realize this new production facility, including advanced heat pump technology, buffer storage systems, and all necessary mechanical, electrical, and control systems. Responsibilities are distributed across multiple specialist contractors and authorities to ensure technical quality and seamless integration across the entire system.

Annual Heat Demand

20,420 MWh including distribution losses, serving full community requirements

Consumer Base

Approximately 1,200 connected consumers benefiting from sustainable heating

Renewable Fraction

96% of annual demand supplied from renewable sources through innovative technology

Innovative Technical Solutions

The Muiderberg system employs a sophisticated integration of proven renewable technologies to maximize efficiency and reliability. At its core, a approx. 4 MW water-source heat pump extracts thermal energy from the IJmeer lake, providing the primary heating capacity for the entire network. This is complemented by an approx. 8 MW gas-fired boiler that ensures supply security during extreme winter peak periods, representing just 4% of annual heat demand.

The innovative combination of IJmeer lake water extraction, seasonal aquifer thermal energy storage (ATES), and short-term thermal energy storage through a 1,500 m³ TTES tank creates a highly efficient integrated system. The ATES system enables seasonal storage—capturing excess heat in summer for use during winter months—whilst the TTES tank provides crucial short-term buffering that allows the heat pump to operate at optimal efficiency points.

Multiple design elements optimize system performance: pre-insulated distribution pipes minimize thermal losses; sophisticated SCADA control systems continuously optimize equipment dispatch and operating parameters; and weather-forecast integration enables predictive system management. The system's design properly accounts for real-world thermal performance rather than idealized conditions, ensuring reliable operation across all seasonal scenarios.

Community Impact and Legacy

The Muiderberg project extends far beyond technical achievement to create lasting community value. Consumers will benefit from reliable, affordable heating with long-term price stability compared to individual systems subject to volatile fossil fuel markets. The high renewable energy fraction insulates users from future carbon pricing mechanisms whilst eliminating individual heating system maintenance concerns.

The heating central's dual function as operational infrastructure and public exhibition space fosters community engagement and education about sustainable heating technologies. The glass facade transparency invites public curiosity whilst exhibition spaces provide accessible information about renewable energy principles and the specific technologies deployed in Muiderberg. This educational dimension extends the project's impact beyond direct consumers to inspire broader awareness of sustainable energy solutions throughout the region. As the Dutch energy transition progresses and renewable gas options such as biogas and hydrogen become available, even the residual 4% fossil fuel dependency can be further reduced or eliminated.

Project Benefits

- High supply security and protection from market volatility
- Resident involvement in development and policy
- Positive, transparent, and affordable business case
- Flexible solution in both design and implementation
- CO₂-neutral, sustainable, and safe energy supply

Contract Package A: Heating Central Including SCADA and Water Treatment

The heating central contractor assumes comprehensive responsibility for the complete design, procurement, installation, and commissioning of all systems within the primary production facility. This represents the project's largest and most technically sophisticated contract package, requiring expertise across multiple engineering disciplines.

01

Detailed Engineering & Design

Complete multi-discipline engineering including mechanical, electrical, civil, structural, and control systems. Integration of a approx. 4 MW heat pump, and approx. 8 MW gas boiler all connected to ATES interface, TEO lake-water system, and TTES tank. SCADA/SRO system design compliant with Dutch standards. Natural refrigerants and low-nox systems

03

Installation & Integration

Complete mechanical and electrical installation including all hydraulic circuits, pumping groups, distribution panels, motor drives, safety systems, and SCADA integration with field equipment and visualization systems.

02

Procurement & Delivery

Full equipment and materials procurement including heat pump units, gas boiler system with chimney, heat exchangers, electrical switchgear, SCADA hardware, water treatment systems, and all auxiliary components required for complete installation.

04

Commissioning & Handover

Functional testing, system optimization, operator training, and delivery of complete documentation package including as-built drawings and O&M manuals. End-to-end verification under varying load conditions.



Contract Package B: WKO/TEO Systems – Aquifer Storage and Lake Extraction

The WKO/TEO contractor delivers the project's innovative renewable energy capture systems, representing some of the most technically specialized work in the entire programme. This package requires deep expertise in geothermal systems, Dutch water regulations, and environmental compliance for surface water thermal extraction.

Engineering & Permitting

Complete WKO/ATES and TEO system design ensuring Dutch regulatory compliance including environmental impact limits and monitoring protocols

Procurement & Installation

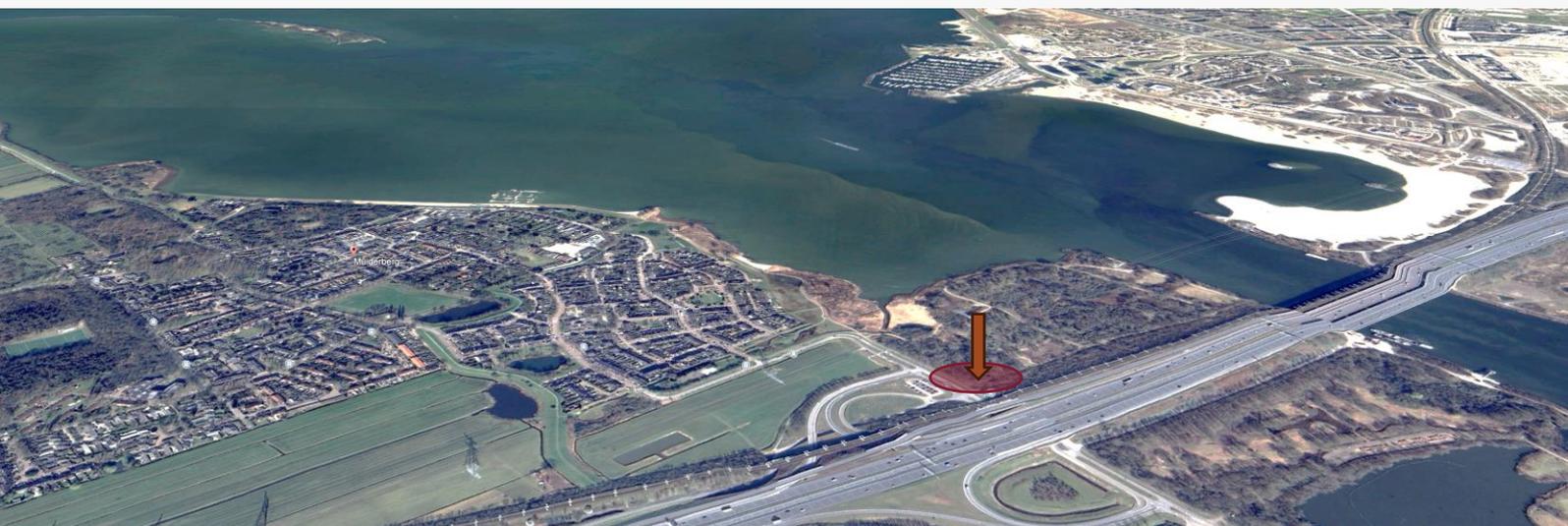
Wellhead equipment, submersible pumps, intake structures, filtration systems, and complete doublet system installation including drilling and certification

Commissioning & Verification

Seasonal mode switching tests, thermal response tests, environmental compliance verification, and submission of monitoring data to Dutch authorities

The ATES (Aquifer Thermal Energy Storage) system employs a doublet configuration with warm and cold wells enabling seasonal thermal storage. This captures excess heat during summer months for use during winter, significantly improving overall system efficiency and renewable energy utilization. Design and installation must comply with Dutch WKO standards, Waterwet (Water Act) requirements, and vergunningverlening voor WKO-systemen permitting frameworks.

The TEO (Thermal Energy from Surface Water) system extracts thermal energy from the IJmeer lake, requiring sophisticated intake and return infrastructure with appropriate screening and environmental mitigation. Ecological impact limits for temperature differential in surface water must be carefully managed, with monitoring protocols established for long-term operation.



Contract Package C: TTES Tank – Short-Term Thermal Storage

The 1,500 m³ TTES (Thermal Energy Storage System) tank provides crucial short-term buffering capacity that enables optimal heat pump operation and system responsiveness. This substantial 12-metre tank integrates structurally into the purpose-built heating central, requiring careful coordination with building design and foundation works.

The contractor's scope encompasses complete detailed design including thermal stratification optimization, insulation specification, and safety systems. Structural integration must comply with Dutch building standards (Bouwbesluit) for stability and safety whilst ensuring efficient thermal performance through appropriate internal and external connections.

Technical Specifications

- Tank volume: 1,500 m³
- Height: 12 metres
- Thermal stratification design for optimal efficiency
- Full insulation and protective cladding
- Integrated safety and monitoring systems

Scope Elements

- Structural design and foundation integration
- Complete procurement and assembly
- Performance verification and SCADA integration
- Safety testing and documentation

Commissioning activities verify stratification performance, charging and discharging efficiency, thermal losses, and integration with SCADA control systems. The contractor must demonstrate that the tank performs as designed across the full range of operating conditions, providing the buffering capacity essential for system optimization.



Technical Requirements and Standards

All contractors must demonstrate comprehensive understanding of and compliance with Dutch technical standards, environmental regulations, and industry best practices. The project's complexity requires seamless coordination between multiple specialist contractors whilst maintaining rigorous quality standards throughout design, installation, and commissioning phases.



Dutch Regulatory Framework

Compliance with Waterwet, WKO permitting, Bouwbesluit, and Hoogheemraadschap requirements including environmental permits and monitoring obligations



Quality & Safety Standards

All systems designed and installed to relevant Dutch and European standards with comprehensive safety testing, documentation, and certification



System Integration

Seamless coordination between all contractors ensuring interface compatibility, comprehensive testing, and unified SCADA/control system operation

Particular attention must be paid to water quality requirements across all systems. Lake-water extraction must include appropriate filtration and screening to protect equipment and comply with environmental standards. ATEs wells require protection systems and water quality monitoring aligned with Dutch WKO guidelines. The district heating primary circuit requires filtration, chemical dosing, and degassing appropriate to Dutch water chemistry.

SCADA and control systems must incorporate robust cybersecurity measures, alarm management protocols, and remote access capabilities whilst ensuring reliable operation across all seasonal conditions. Weather-forecast integration and optimization algorithms regarding fluctuation electrical prices should maximize renewable energy utilization and system efficiency.

Expression of Interest and Next Steps

The Muiderberg District Heating Project offers contractors and engineering specialists an exceptional opportunity to demonstrate expertise in sustainable energy infrastructure whilst contributing to the Netherlands' energy transition. This project's scale, technical sophistication, and community impact make it a flagship development in renewable heating technology.

For further information regarding tender documentation, technical specifications, site visits, or expression of interest procedures, please contact the project team. We look forward to partnering with industry leaders to deliver this transformative sustainable heating infrastructure for the Muiderberg community.