

OpenUtilities® sisHYD®

Design, Analysis, and Simulation of District Energy Networks

OpenUtilities sisHYD is a comprehensive analytical modeling and network design application that delivers the thermal and hydraulic calculations needed for district energy pipeline networks that provide heating or cooling. OpenUtilities sisHYD can quickly perform complex analyses on district energy networks to identify asset usage costs, present operational status, locate critical points, simulate failure scenarios, and calculate all major thermal and hydraulic parameters of the network.

THERMAL-HYDRAULIC CALCULATIONS

To guarantee uninterrupted service, OpenUtilities sisHYD runs steady-state and dynamic calculations to determine pressure, temperature, supply times, and mass flow distribution in the network. Model scenarios include multiple input stations operating on different supply temperatures and using specific controls. In design mode, the calculation engine proposes new pipe types based on the specific pressure loss and velocity of a pipe.

IMMEDIATE BUSINESS VALUE

District energy owner-operators get immediate business value from OpenUtilities sisHYD. When networks are built out with new connections, the application identifies the least expensive options. With its modeling outputs, fewer iterations are needed to produce a design that meets the needs of new clients.

In addition, OpenUtilities sisHYD's modeling outputs help to meet customer service agreements by ensuring that heat is delivered at just the right temperature and pressure. By carefully calibrating the network, you will use the minimum amount of energy necessary to generate the heat required. You can also model the most efficient pumping schedule, reducing the energy needed for pump operations and saving money. Using dynamic calculations, you can smooth peak heat loads by increasing supply temperatures ahead of expected peaks.

NETWORK, PROFILE, AND TIME SERIES PLOTS

By generating network plots that adhere to a freely configurable labeling and color/weight coding schema, you can visualize the results. The operational mode can easily identify critical areas and system reactions in your network. You can create dynamic profile plots using a user-defined network path. The profile plots include an elevation profile, the vapor pressure, and pressure maintenance lines on the same diagram. The time series plot displays changes of a physical property over time for a specific calculation scenario.

INTEGRATION WITH THE MICROSTATION® USER INTERFACE

You can easily navigate between plots, reports and calculation logs, and the associated data with the MicroStation interface, which features a modeless dialogue system with workflow-driven wizards. The OpenUtilities sisHYD graphic features are used to build and modify the modeled facility graphically.

ENGINEERING UNITS AND ENGINEERING LIBRARIES

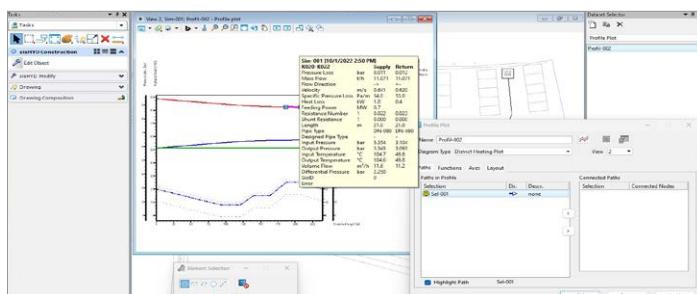
Units displayed in the user interface, including dialog, plots, and reports, are freely configurable and editable. OpenUtilities sisHYD is delivered with a pipe-type catalog within Microsoft Excel spreadsheets. You can extend that library with your own pipe types and reuse the catalog across projects.

FLEXIBLE DATA SOURCES

OpenUtilities sisHYD can use data imported from virtually any GIS or asset management resource. The application can be used as a stand-alone calculator, or it can be integrated into a complete Bentley district energy GIS and facilities management solution.

REPORTING AND PDF OUTPUT

OpenUtilities sisHYD can create reports on the fly to get statistical information and lists of object rules. You can print the information or export it to Microsoft Excel for additional post processing. With PDF outputs, results can be shared with just a few clicks. OpenUtilities sisHYD comes with print preparation capabilities and adds functions to automatically populate labels and legends on print templates.



Generate district energy dynamic profile plots.



SYSTEM REQUIREMENTS

MINIMUM: Windows 10 (64 bit) or higher, Intel® or AMD® processor 3.0 GHz or greater, any industry-standard video card that supports DirectX, 4 GB memory, 25 GB storage
RECOMMENDED: 16 GB memory, up to 40 GB disk space

OpenUtilities sisHYD At-A-Glance

DESIGN CALCULATIONS AND ANALYSIS

- Calculate hydraulic and thermal network parameters
- Design new networks using design aids for placing appropriate pipe diameters
- Generate reports that calculate equipment and construction costs
- District energy-specific controls: mass flow control, differential pressure control, temperature control (in general and specialized as bypass control and admixture control)
- Use manufacturer pump and valve specifications for modeling
- Validate that calculated elements are operating within their assigned limits
- Design pipe inner diameters by limiting the specific pressure loss and velocity
- Pipe inner diameter designs can be done on the entire network, by network segment, by pipe type, or by selected pipes
- Network analysis to find critical points (such as pressure differences and temperatures)

SCALABLE NETWORK MODELING

- Unlimited number of consumers
- Unlimited number of loops
- All network components are modeled as elements (pipes, pumps, valves, supplier, consumer)

ENERGY BALANCE MODELING

- Heat generation
- Heat consumption
- Overall heat loss
- Pumps

DATA MANAGEMENT

- Open database for storing data
- External applications can access the published database schema
- Import data from OpenUtilities sisNET® or other network documentation systems to avoid redundant data models
- Exchange data for use with third-party optimization tools (load distribution, daily resource scheduling, pump optimization, interfacing with computer process control)

SPECIAL FUNCTIONS

- Complete network thermal calculation
 - Thermal dynamic calculation

- Heat losses
- Consideration of different supply service temperatures
- Temperature plots (color-coded network plot, profile plot)
- Bypass between supply and return with and without control valves/pumps
- Supply customers from the return when operating conditions are favorable
- Return temperature may be modeled as a dependency of the supply temperature
- Admixture control support
- Simulate arbitrary pump tasks
- Preconfigured yet customizable units of measure

USABILITY

- User-friendly interface with intuitive controls
 - Tooltip displaying analytical results
 - Objects intelligently linked between map graphics and profile, reports, and logs
- Print preparation features
- Seamless integration with MicroStation
- Trace and search in the map views
- Validate input data
- Wizard-based workflows

REPORTS, MAPS, AND CHARTS

- Generate tabular lists and reports
- Create presentation map plots with labeling to document analysis results
- Configure network map plots to display selected objects and results as labels
- Apply color and weight coding to map plots based on attributes
 - Color-code pressure differences or supply temperatures
 - Thematically apply line weights based upon the internal pipe diameter
- Create profile plots of node and pipe results along user-defined network routes
- Generate time series plots at specific points on the network, showing details for each time step
- Export map graphics as PDFs for archiving and distribution
- Publish network plots at user-defined map scales
- Symbology and annotation collision detection