NEPLAN®

Gas, Water, District Heating and Electrical Systems Analysis Software


Reliable • Efficient • Intuitive

NEPLAN® Software
The state-of-the-art network analysis tool

NEPLAN is a powerful engineering tool for analyzing, planning, optimizing and simulating gas, water, district heating and electrical networks. For over 30 years, NEPLAN AG provides engineers worldwide with the state-of-the-art software solutions. NEPLAN users include large and small utilities as well as engineering and planning companies.

The browser-based software employs a client-server architecture and a unified database in a multi-user environment. NEPLAN includes an extensive user-administration and variant management system, which guarantees an optimized workflow.

Client-server architecture
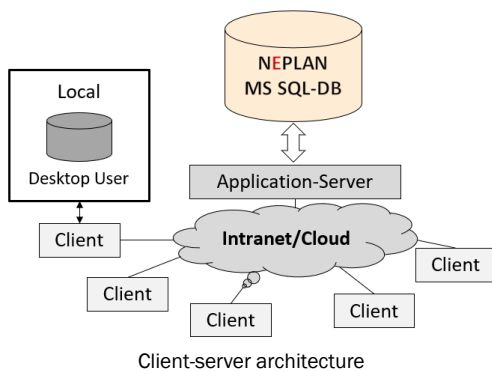
Solutions

NEPLAN can be deployed as a standalone version on a local desktop or as an intranet solution. Moreover, NEPLAN AG is the first company to offer a SaaS, enabling customers to work in the cloud. Cloud users can decide whether to store the network data on the cloud or on their local machine.

- **Desktop**: Installation on a local machine with local project files
- **Intranet**: Installation on a client's server with an SQL-Database
- **Cloud**: Installation on a cloud server

Data Management

- Unified database in a multi-user environment
- Comprehensive users administration tool: allows handling access rights to the master database. Users and user's rights are defined by a central administrator(s)
- Graphical selection and subset management of the complete master database
- Variant management system: handles scenarios, time-dependent network versioning and comparison studies
- Gas, water, district heating and electrical networks in one common database and graphical visualization

Interfaces

- **C#-DLL (API)**: NEPLAN's data and calculation capabilities can be fully integrated in any external application (e.g. GIS, SCADA or smart grid systems).

- **Web Services**: An extensive number of Web Services is available, making all NEPLAN calculation modules directly accessible to external applications.
- **GIS**: NEPLAN's capability to handle data from geographical information systems comes from a long-term experience in this field. Exported network data, such as shapefiles, can be easily imported with NEPLAN's GIS interface.


Shapefile import
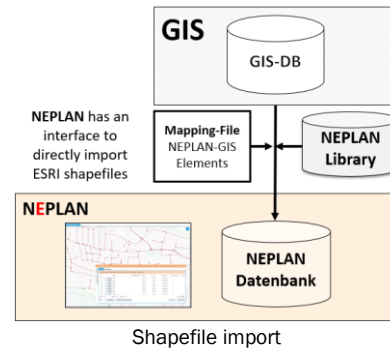
Graphical User Interface

- User-friendly and intuitive GUI with extensive editing, task management and data visualization functionalities
- Comprehensive results handling (graphically and tabularly), for easy network evaluation
- Network coloring based on numerous criteria (e.g. pressure levels, partial networks, zones, calculation results)
- Easy-to-use management and navigation between diagrams and graphic layers
- Highly customizable output reports (the user-defined templates are compatible with MS-Office)
- Results and equipment data are accessible via mobile app
- Compatible with MS-Office
- Support for various languages

Geographical Maps

- Integrated geographical maps via mapping server interface
- Support for a wide range of maps (e.g. street, aerial and satellite)
- Project diagrams defined as geographic (EPSG)
- Support for elevation data server
- KML-export for Google Earth©
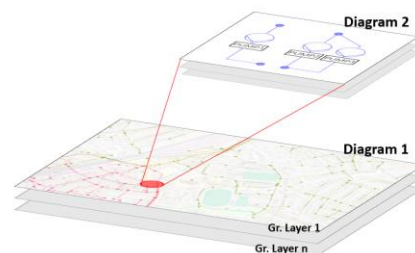
Diagrams and graphic layers

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NEPLAN provides fast, accurate and reliable answers to a wide range of engineering problems. Thanks to a close collaboration with academia and industry, NEPLAN is able to offer u equipment models and highly efficient algorithms. The software can manage pipeline networks of any extent and user-defined complexity. Calculation modules can easily be integrated with SCADA and GIS systems.
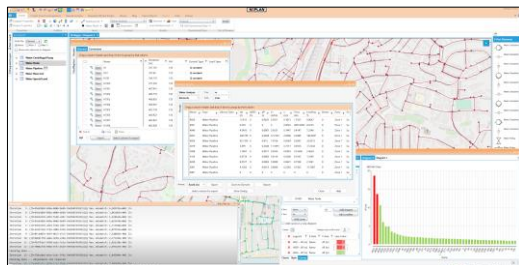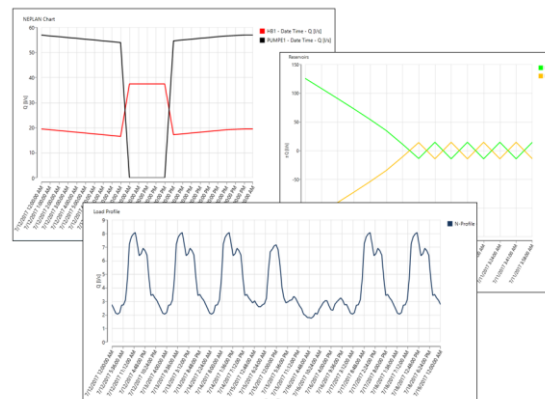
General Features

- Pipeline network representation with nodes and connecting elements, such as pipes, valves, pumps, heat exchangers etc.
- Thermo-hydraulic model for each element
- Advanced pump and valve models, allowing pressure, flow rate and pressure drop regulation at any node or element
- Automatic control of pumps and valves (pressure, flow rate, characteristic curves)
- Modelling of additional pressure losses (e.g. bends, junctions)
- Modelling of temperature dependent loads
- Compressible and incompressible gas calculation
- Libraries can be created for each element type
- Network data can be updated with changed library data and vice versa

Graphical user interface

Pipeline Analysis

- Computes pressures, flow rates and other operational quantities with excellent computational speed and accuracy
- Simultaneous calculation of different pressure zones (high, medium, low) and partial networks
- Calculation with user-defined operational states
- Calculation with synthetic profiles and/or field measurements
- Control of minimum system pressure
- Extensive scenario and operational state management
- Global, regional or simultaneity factors for demand changes
- Ideal for planning and comparative analysis
- Computes the minimum/maximum flow times of the fluid to reach any node in the network starting from a user-defined reference point.

- Evaluation of the mixture of the fluid of every consumer (feeder contribution)

Results visualization

Dynamic / Time Simulation

NEPLAN allows the user to simulate time-dependent processes by assigning synthetic profiles or measurements to consuming and supplying elements. The profiles can be defined on a daily, weekly, seasonal or annual basis. The time characteristics of the storage elements, such as reservoir's inflow and water level, are also taken into account. Additionally, the user can add various result-driven events and hence, simulate more advanced network processes.


Time simulation results

Reliability and Contingency Analysis

Employing the advantages of parallel computing, NEPLAN can rapidly assess the severity of unplanned problems in the network. The user can define any number of component outages and failure scenarios. NEPLAN's Hydraulic Critical Index (HCI), computed during the analysis, provides the user with a very clear indication of how severe a specific outage is.
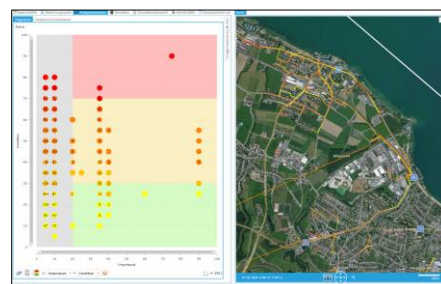
Reliability assessment

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Pipe Type Optimization

This optimization module assists the user in determining the required changes of pipe types in the actual network in order to obtain a target network, where a certain objective function is satisfied. Stochastic optimization methods are used to select the suited pipe types that lead to minimum costs or minimum/maximum flow rates.

Investment Analysis and Asset Management

The integrated asset manager gives the user the ability to conduct cross-media strategic and operational asset management, and to perform network risk analysis and efficient investment planning.

Fire-Extinguishing Plan

This NEPLAN module simulates possible fire-fighting conditions for each node and/or hydrant in the entire network. All node pressures for a given extinguishing-water demand are automatically calculated, as are all extinguishing-water demands of nodes with a specified pressure.
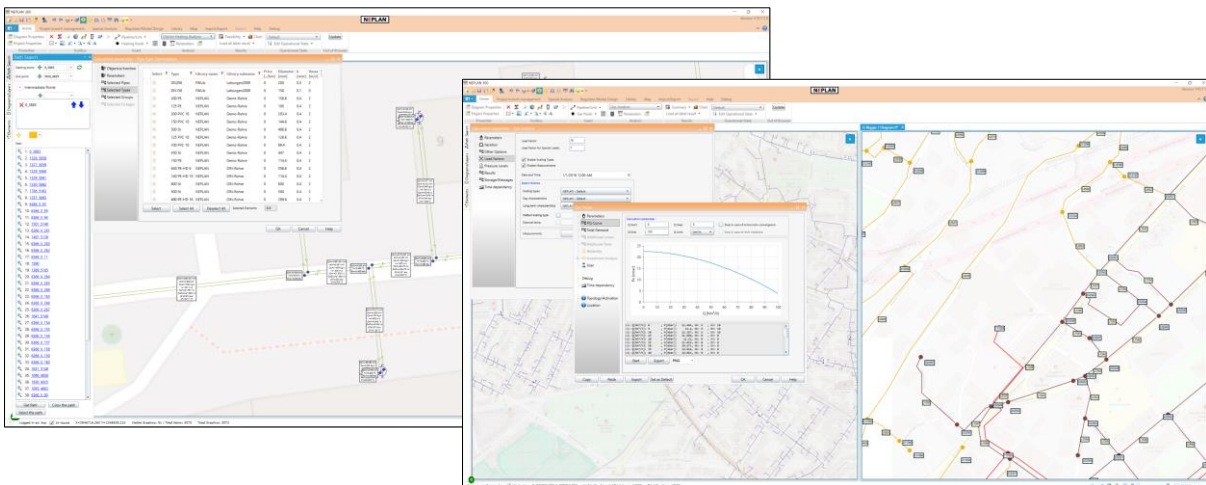
2D-Profiles

With the help of length profiles, various results, such as elevation and pressure changes, along a flow path defined by the user, can be displayed graphically and in a tabular form
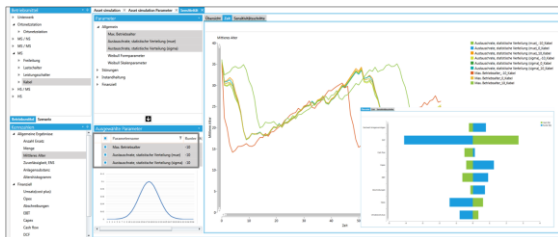
Asset management
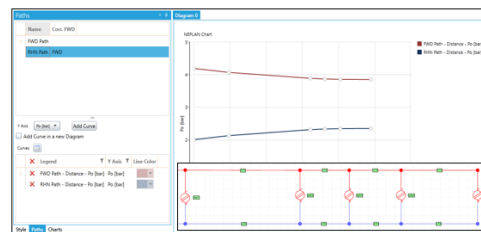
Pressure variation along path

Calculation modules can be bought separately or with a specific package, depending on the network and medium type. The following packages are available:

Gas/Water/District Heating

- Gas advanced
- Water advanced
- Gas + Water
- Gas + Water advanced
- District Heating

Electricity

- Transmission
- Distribution
- Industrial / Generation
- Protection
- Wind-system analysis

For more information and DEMO requests please visit our website at **www.neplan.ch**

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