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KWR Water-Solutions

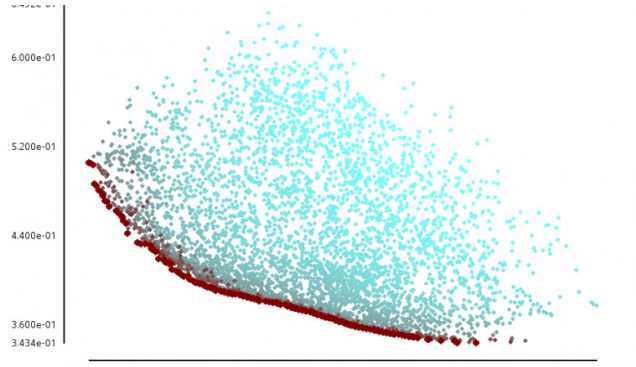
Impact ☐ Product Quality ☑ Sustainability ☑ CO2 Reduction ☑ Operational cost

Advanced modelling and optimizing in drinking water distribution systems.

Technology description

KWR has developed a hydraulic network model called Gondwana. With this model drinking water distribution systems can be optimized.

Gondwana includes accurate and up to date information on all elements that exist in the real world water supply system. This means that there are of hundreds of thousands (or more) elements and demand nodes.



In addition, supply and network controls and demand patterns/scenarios are part of the model. In order for the model to work proparly, all this information should not only exist, but also be readily available (i.e. in a complete structured database) and have the appropriate level of detail.

Once all information is in the system, Gondwana gets to work. A better performing network is created by randomly making changes to the decision variables, while structurally detecting and further incorporating the several resulting performance improvements. In a process known as an 'evolutionary algorithm', the calculations progress step by step to optimal performance.

https://www.kwrwater.nl/en/tools-producten/gondwana/

Use case description

Over the last decades growing attention has been directed at the optimisation of drinking water distribution systems. But the complexity of these systems means that optimal solutions are hard to achieve using traditional methods. Numerical optimisation techniques offer help but have not found their way into water practice because of the lack of suitable tools. That is why KWR developed Gondwana: an optimisation software platform that specifically targets drinking water distribution systems. The platform combines a very flexible and multifaceted approach to the definition of optimisation issues with a user-friendly graphic interface. Gondwana thus unlocks powerful and frequently complex optimisation techniques for use by KWR's hydraulic experts, and consequently also for the entire drinking water sector.

The application of Gondwana has resulted in better designs for network and sensor systems, with material and monetary savings of 10-50%. There is also a better performance with respect to current or original designs or plans.

https://library.kwrwater.nl/publication/56109186/publication/56109186/

Name of technology	Gondwana
Name of end-user	Dutch Water facilities
Main application areas	Drinking water industry
Industry 4.0 domain	Value-Based Service
Technology provider	KWR