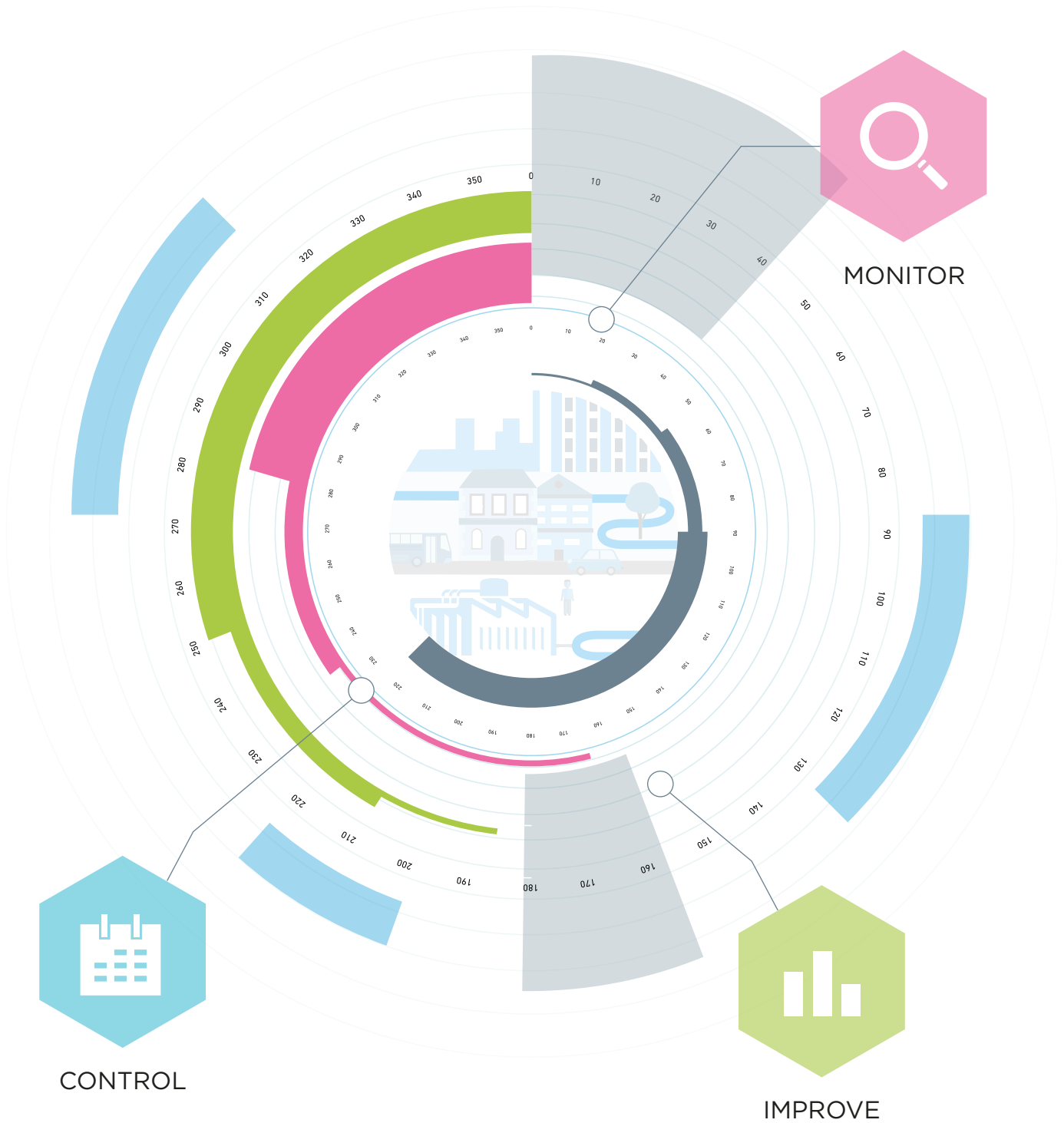


The Servo

A single control center
for the SEDIF Water Service



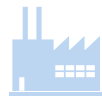


SEDIF, largest water service in France

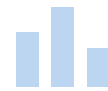
The coverage area of the Syndicat des Eaux d'Ile-de-France (SEDIF) (water authority for the Greater Paris region) encompasses 150 municipalities around Paris. With 4.5 million residents and 590,000 subscribers, it is the largest water service in France and one of the largest in the world.

SEDIF has entrusted management of the public water service to Veolia Eau d'Ile-de-France, which oversees all operations and maintenance according to rules defined and monitored by SEDIF.

The delegated provider's performance is assessed continuously based on 170 indicators. At the heart of a complex, highly urbanized environment - the region around the capital - where critical activities often of national interest are concentrated, the performance of the water service requires constant monitoring and rapid response, from the global scale of the coverage area to its smallest link.



3
main drinking water
production plants



350,000
annual water
quality analyses



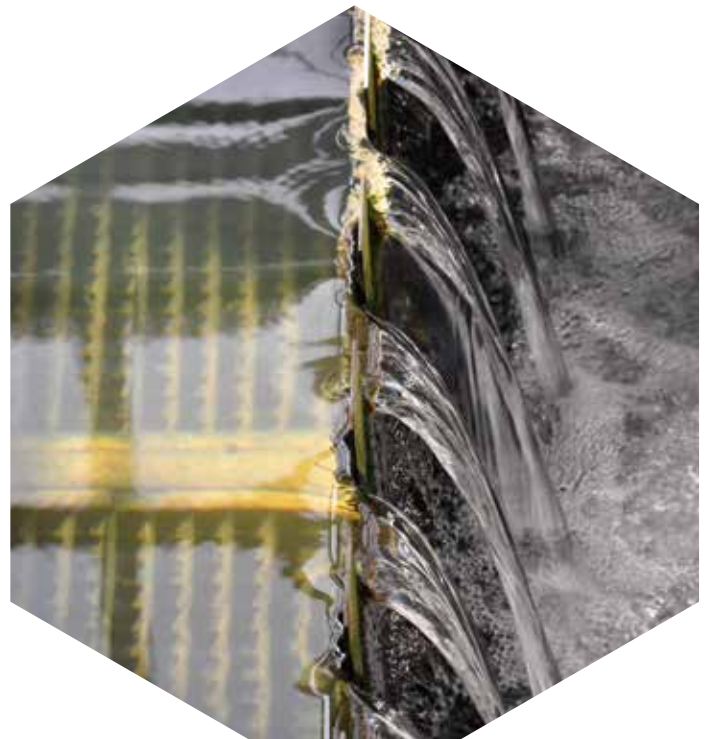
250 million
cubic meters of drinking water
distributed each year



8,642 km
of pipes



67
reservoirs



Monitoring the performance of the water service, from resource to tap

The ServO is the centralized control center for the entire water service, from resource to tap. Designed by Veolia Eau d'Ile-de-France for SEDIF, this major innovation consolidates and coordinates operating data in order to oversee and optimize management of the service, respond effectively to any event impacting water production, distribution or quality, and manage crises.

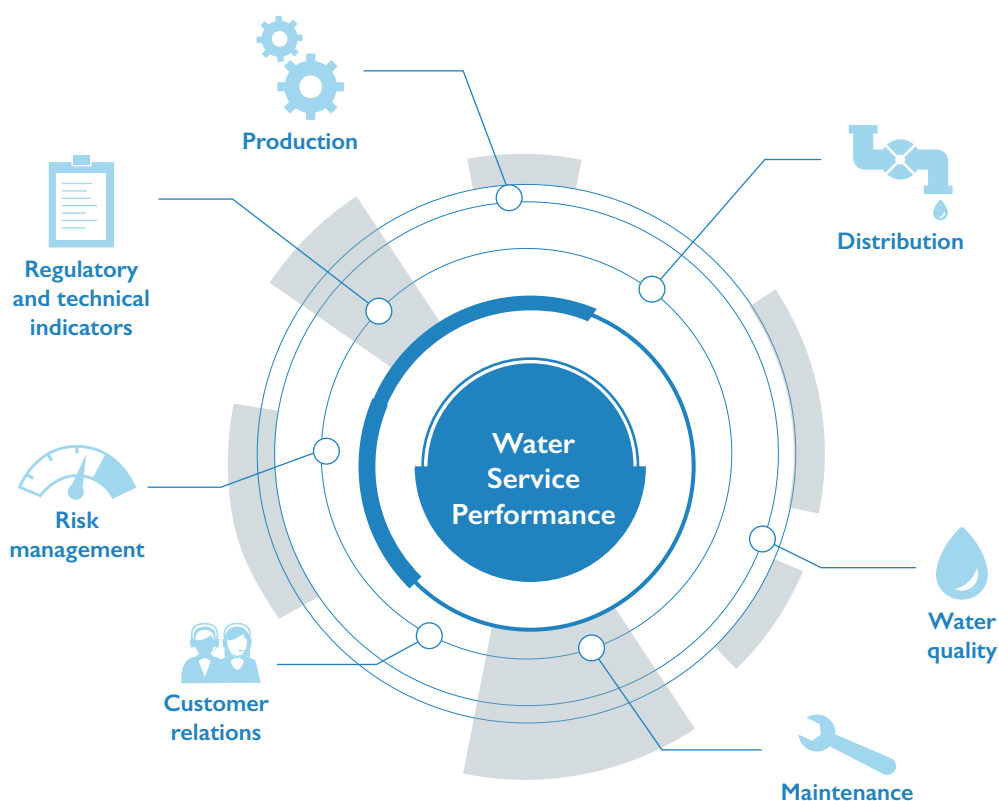
The ServO coordinates the major water service functions, including water production, distribution and quality, customer relations, reporting and risk management. Its role is not only to manage this service on a day-to-day basis, but also to measure and monitor the performance indicators.

By providing relevant, reliable information, it is an essential decision support tool for:

- producing and distributing high-quality water in sufficient quantities,
- ensuring service continuity in all operating configurations,
- guaranteeing the technical performance of the network (water traceability, loss control),
- providing predictive maintenance of the network and plants.

The ServO is therefore instrumental in continuously improving the performance of the water service.

The ServO is available 24/7 to SEDIF's crews. In this way, the organizing authority can directly monitor the operation of the service delegated to Veolia Eau d'Ile-de-France.



A powerful information system

The ServO is built around three concepts:

- interoperability with all the components of the information system,
- analysis of event flows and heterogeneous data,
- the ability to initiate and monitor the water service's business processes.

Equipped with powerful analysis engines, the ServO allows the acquisition and integration of large volumes of Big Data in real time, regardless of the sources, transmission technologies and acquisition frequencies.

This data can come from the plants' industrial information systems, the network's instrumentation or meter-reading.

Whether information is measured, calculated, simulated or predictive, the ServO makes it available via a web application portal equipped with a powerful search engine, an advanced mapping solution and 3D modeling elements. Reports on this data can be accessed easily and quickly by all water service employees in various forms (charts, dashboards) and on all types of media.

Given the sensitivity of the data processed by the ServO, special care is taken to secure it based on the recommendations of ISO 27001 (access protection, guarantee of reliability, secure interconnections), for which Veolia Eau d'Ile-de-France obtained certification in 2014.



22
virtual machines



85
processors



1,000
management rules



150 GB
of RAM



1.25 billion
data



400,000
variables acquired
on a continuous basis



4 TB
of disk space





View and **MONITOR**

The ServO allows viewing of all the water service's data. The resource is monitored continuously with the help of warning stations. If need be, facing weather forecasts of drought, flooding and storms, which can cause power outages, the operators can change instructions or activate continuity and contingency plans.

Data regarding operation of the facilities from the automatic control systems of each of the three plants is monitored at a single point: reservoir level, water output, treatment processes, pumping stations, chlorination stations, etc. Real-time access to all this data is essential to crisis management.

The mapping of operational events along the network, such as water shut-offs, warnings from the sensors and the results of analyses, makes it possible to diagnose the causes of potential incidents and anticipate risks.

The ServO calculates and monitors numerous operational indicators related to:

- the quality of the resource,
- water supply security,
- operation of the facilities,
- technical performance of the network,
- service quality, etc.

"From data collection to decision-making, the ServO is an essential tool for continuously improving the control and performance of the water service."



Network maintenance

Emergency service is provided based on several criteria: location of crews, specific skills and urban traffic. The ServO monitors all maintenance operations on the network to prevent possible risks of water quality degradation along the network.



Production plant

The treatments are constantly tailored to the quality of the resource. In the event of accidental pollution in a river, the process can be interrupted, with other plants taking over. The ServO coordinates the necessary transfers.



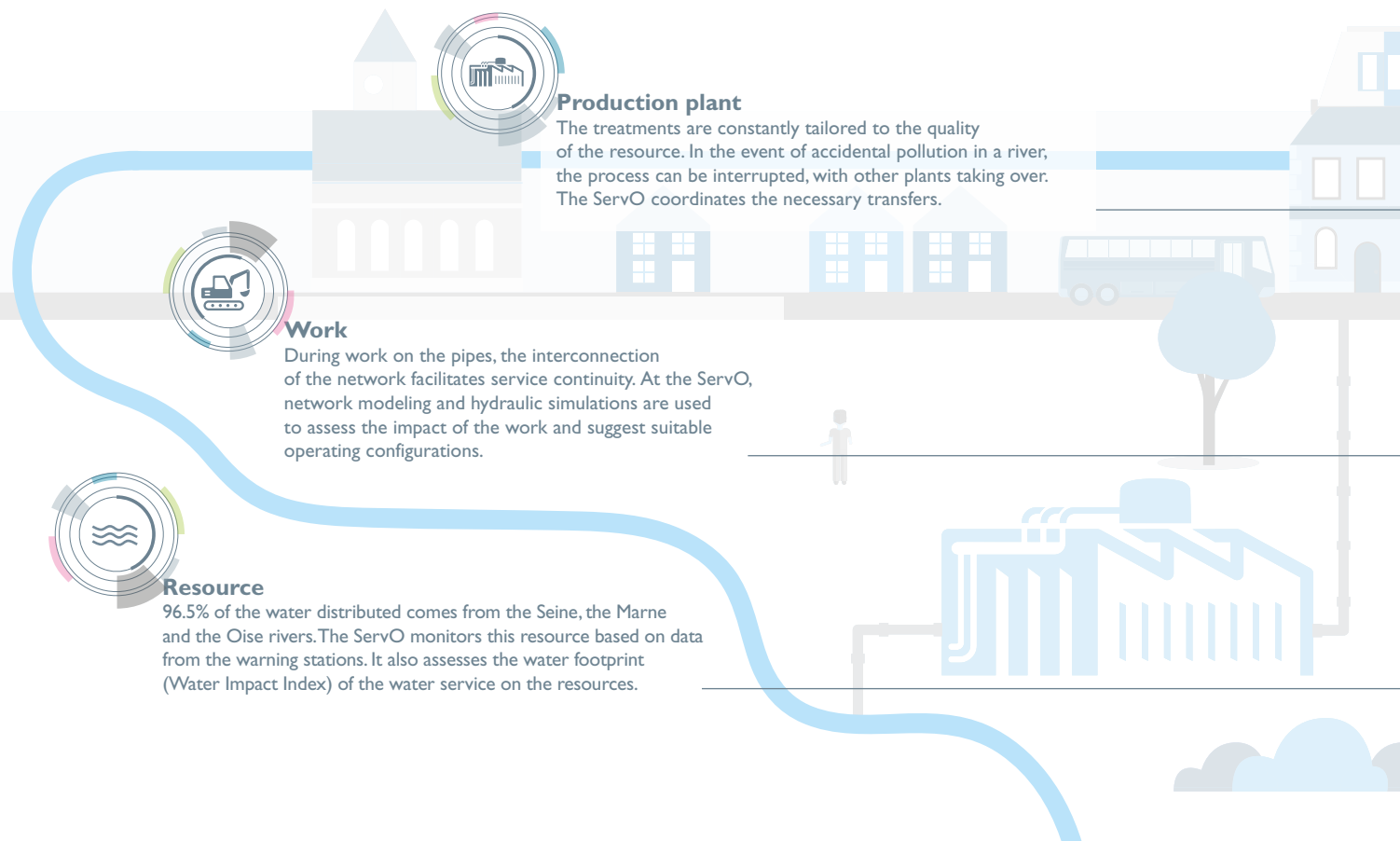
Work

During work on the pipes, the interconnection of the network facilitates service continuity. At the ServO, network modeling and hydraulic simulations are used to assess the impact of the work and suggest suitable operating configurations.



Resource

96.5% of the water distributed comes from the Seine, the Marne and the Oise rivers. The ServO monitors this resource based on data from the warning stations. It also assesses the water footprint (Water Impact Index) of the water service on the resources.





Schedule and CONTROL

The ServO uses a centralized system to coordinate and schedule all (preventive and corrective) maintenance work on facilities that may have an impact on water production, storage or transport.

Based on this schedule and operational events, the available production capacities are assessed and compared with the forecasted water demand estimated according to past production history and weather conditions.

The ServO makes responsible production possible. Operating strategies are developed to meet a sustainable development objective based on electricity consumed, chemicals used, water self-sufficiency and the performance indicators defined in the contract.

The ServO also provides the ability to anticipate risks. By assessing the impact of the unavailability of equipment or a change in hydraulic configuration on supply security, the ServO limits the likelihood of a crisis.

Its ability to monitor production data and take various operational events into consideration, while capitalizing on the know-how and best practices derived from the operators' experience, makes the ServO an essential planning and forecasting tool.



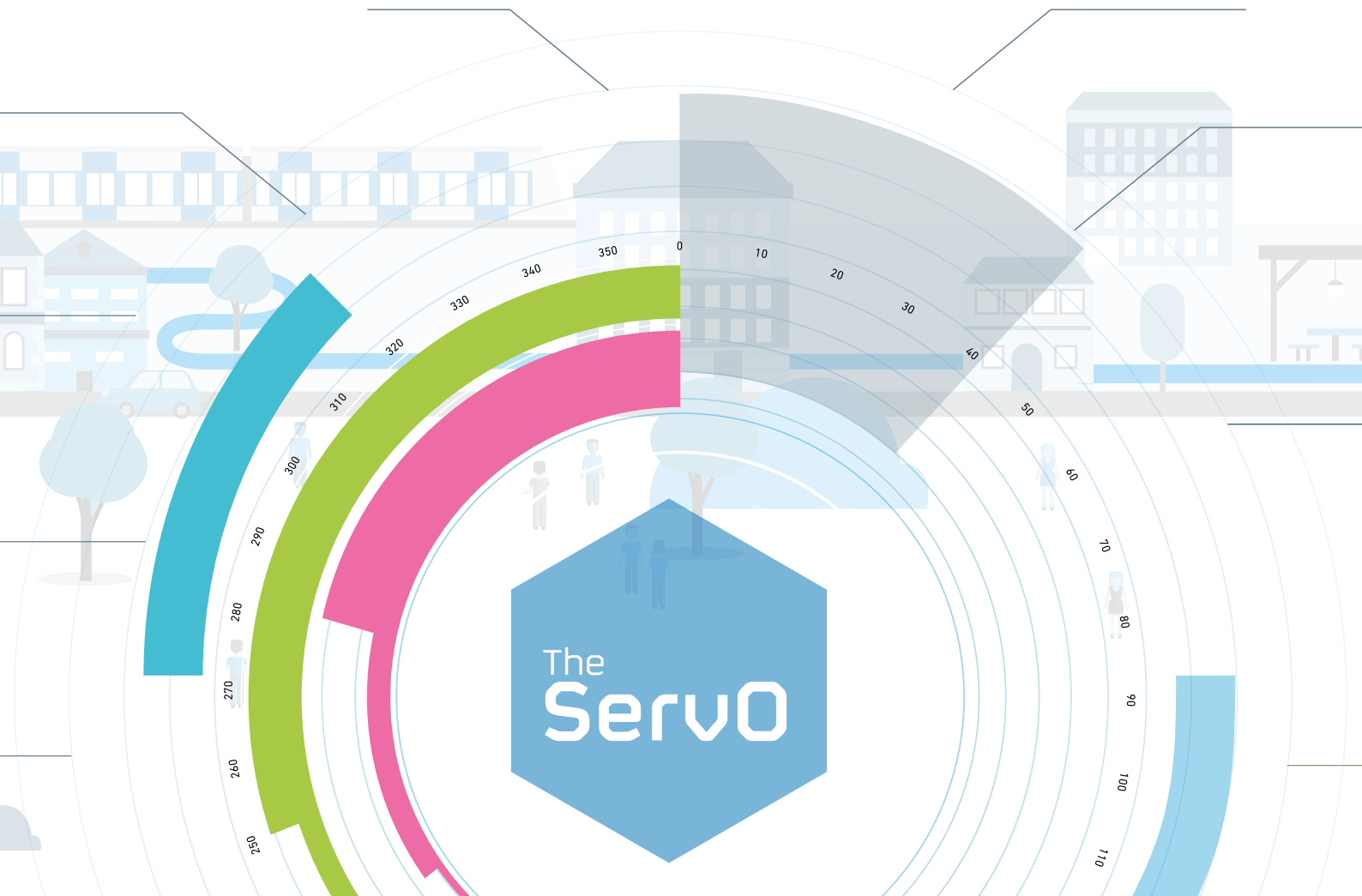
Teleo

With the remote water meter-reading system, each SEDIF subscriber has access to usage-based billing and services such as abnormal consumption detection. The ServO processes consumption data to assess network performance and monitor risks of pollution due to backflows.



Analysis

Each year, 350,000 analyses are carried out on the distributed water. Water quality is assessed from the resource to consumption points, particularly the most sensitive (schools, day care centers, hospitals, etc.) and all this data is integrated at the ServO and available for consultation.





Consolidate and **IMPROVE**

A large volume of past and current operational data is consolidated at the ServO. This provides the ability to access the "memory" of the service in order to build on know-how and replay the right scenarios based on operational events and contacts with users.

To continuously improve the service, the ServO's Big Data is processed in algorithms that make it possible to:

- assess projected water needs and potential degradation of the resource,
- identify deviations in the operation of the service,
- correlate events and data.

A concrete example: water traceability

Consolidating a large amount of various data makes it possible to acquire in-depth knowledge of the network and control risks, particularly those related to water quality. Operating data, which is combined with measurements from the Qualio sensors deployed along the network and then integrated into hydraulic behavior and water quality simulation tools, helps to trace the "path" of water. In case of a crisis, it becomes possible to clearly identify the network and customers impacted. Consumers can then be alerted by a telephone message or via social networks.



Customer Relations Center

In case of a localized event affecting water distribution or quality, customer advisors have mapped information, thanks to the ServO, which enables them to respond to consumers. The ServO also draws on incoming calls to identify risks of service degradation along the network.



Qualio: continuous monitoring of the sanitary quality of water

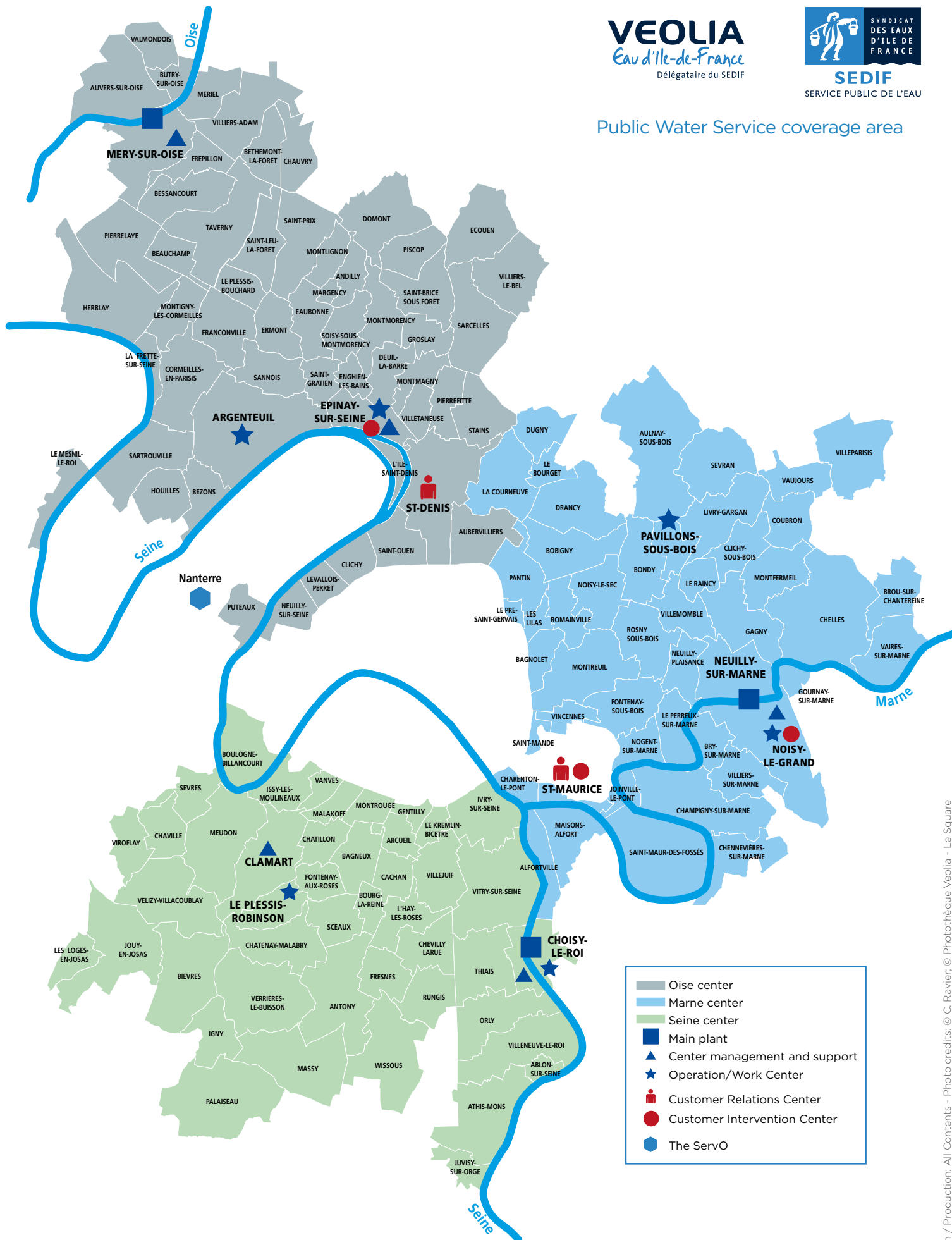
The distributed water is subjected to extremely stringent monitoring that requires sophisticated equipment, given the size of the networks and their interconnection. To further improve consumer health and safety, the SEDIF network is equipped with more than 200 sensors capable of providing continuous information about water quality, such as chlorine, conductivity, temperature and pressure.



Res'Echo: sensors to prevent leaks along the network

Controlling water loss requires a combination of renovation work and operational measures such as checking for leaks. The ServO facilitates leak detection through daily monitoring of data from 1,035 acoustic sensors installed along the drinking water network.

Public Water Service coverage area



- Oise center
- Marne center
- Seine center
- Main plant
- Center management and support
- Operation/Work Center
- Customer Relations Center
- Customer Intervention Center
- The ServO