Smart Flows:

Real-world Applications of Digital Transformation in Water Management

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Global Top 100 Software Company

FOCUSED ON INFRASTRUCTURE ENGINEERING

39
years in operation

>5,200
colleagues in 40 countries

>1,400
colleagues with doctoral and master's degrees

87%
colleagues recommend as a place to work

~$1.1B
annual revenue

>194
countries where BSY solutions are in use

$664M
in R&D in past 3 years

290
patents granted or pending

72%
Bentley Infrastructure Top 500 Owners

93%
ENR Top 250 Engineering Firms

BSY Nasdaq Listed
initial public offering September 2020

SUSTAINABLE DEVELOPMENT GOALS
advancing sustainable infrastructure

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Digital Solutions Solving Today's Water Challenges

Pressure to perform has never been higher, we've never had **more to do** and never had a bigger **need to improve efficiency**

1 **Need for investment**

2 **Staff turnover**

3 **Sustainability**

4 **Increased regulatory pressure**

5 **Rising costs**

6 **Technology & innovation**

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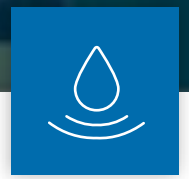
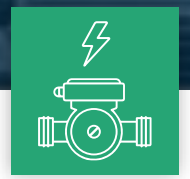
Digital Technologies (including AI) Are Changing the Future of Water



Reduce nonrevenue water



Improve energy efficiency and CO2 footprint

Reduce service interruptions

Reduce operational costs

Improve **capital planning** decisions

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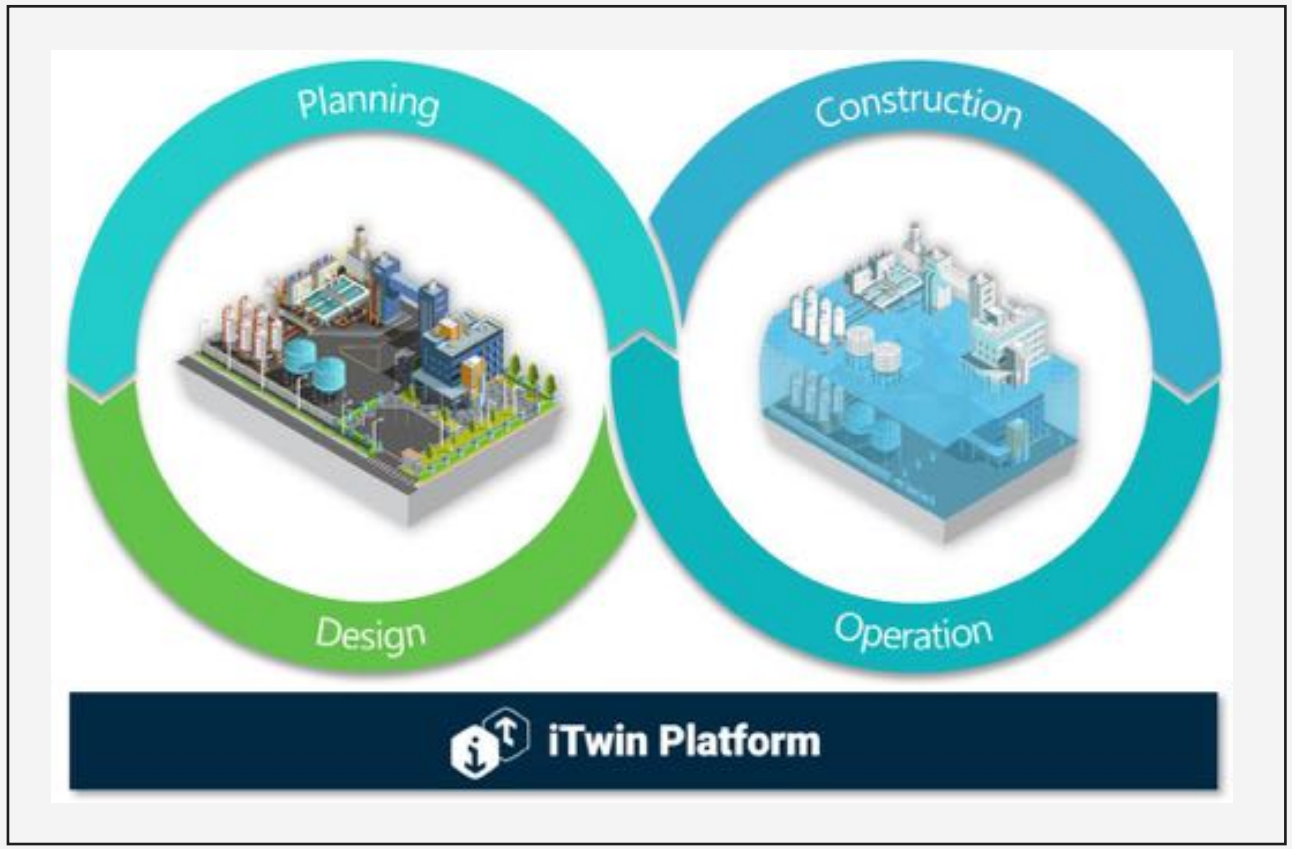
Bentley's Digital Twins Solutions For the Water Industry



WaterSight
Water Distribution

SewerSight
Urban Sewer

PlantSight
Plant Infrastructure

Dam Monitoring

Bentley

Bentley WaterSight

Digital Twin for smart water distribution networks

- Network monitoring & anomaly detection
- Event & leak management
- Automated Water balance
- Efficient Pumping Operation
- Real-time online simulation
- Modeling of emergency events
- Rehabilitation & replacement planning

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Imagine the Possibilities

Some of the key utility's goals for improving operational efficiency and cost reduction?

↓15%

Reduction in Nonrevenue Water

↓35%

Reduction of Customer Service Interruptions

↓30%

Reduction in Pumping Energy Costs

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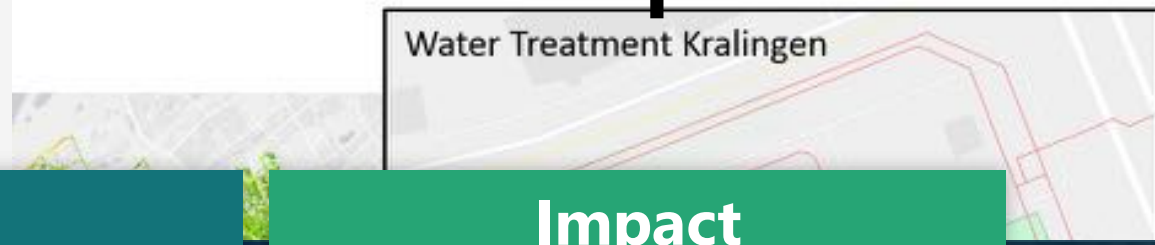
Evides Adopts Smart Water Solutions to Minimize Environmental Impact and Reduce Carbon Footprint



Challenge

- Evides provides **clean and safe drinking water** to 2.5 million consumers.
- Evides was rethinking how to cope with their water supply challenges while **reducing their carbon footprint**.
- Evides sought to **reduce their emissions by optimising the operations** of the pumping stations, lowering fuel needs, while guaranteeing consumer satisfaction.

Solution

- Evides initiated an **energy efficiency project** to optimise pumping station operations and lower fuel requirements.
- Using Bentley's WaterGEMS and WaterSight, they **implemented a digital twin, enabling real-time insights** to water operations and facilitating automation for pumping.
- Evides' demonstrated **commitment to sustainable development goals**, including the goal for climate action.

Impact

- Developing a digital twin to analyze pumping operations enabled Evides to **achieve energy cost savings of 33%,** equivalent to EUR 300,000 annually.
- Bentley's digital twin solution helped **reduce annual CO2 emissions** by 942 tons per year only at Kralingen site.
- Evides will **expand their water digital twin**, incorporating engineering, asset, and operational data to implement **a smarter and more sustainable water system**.

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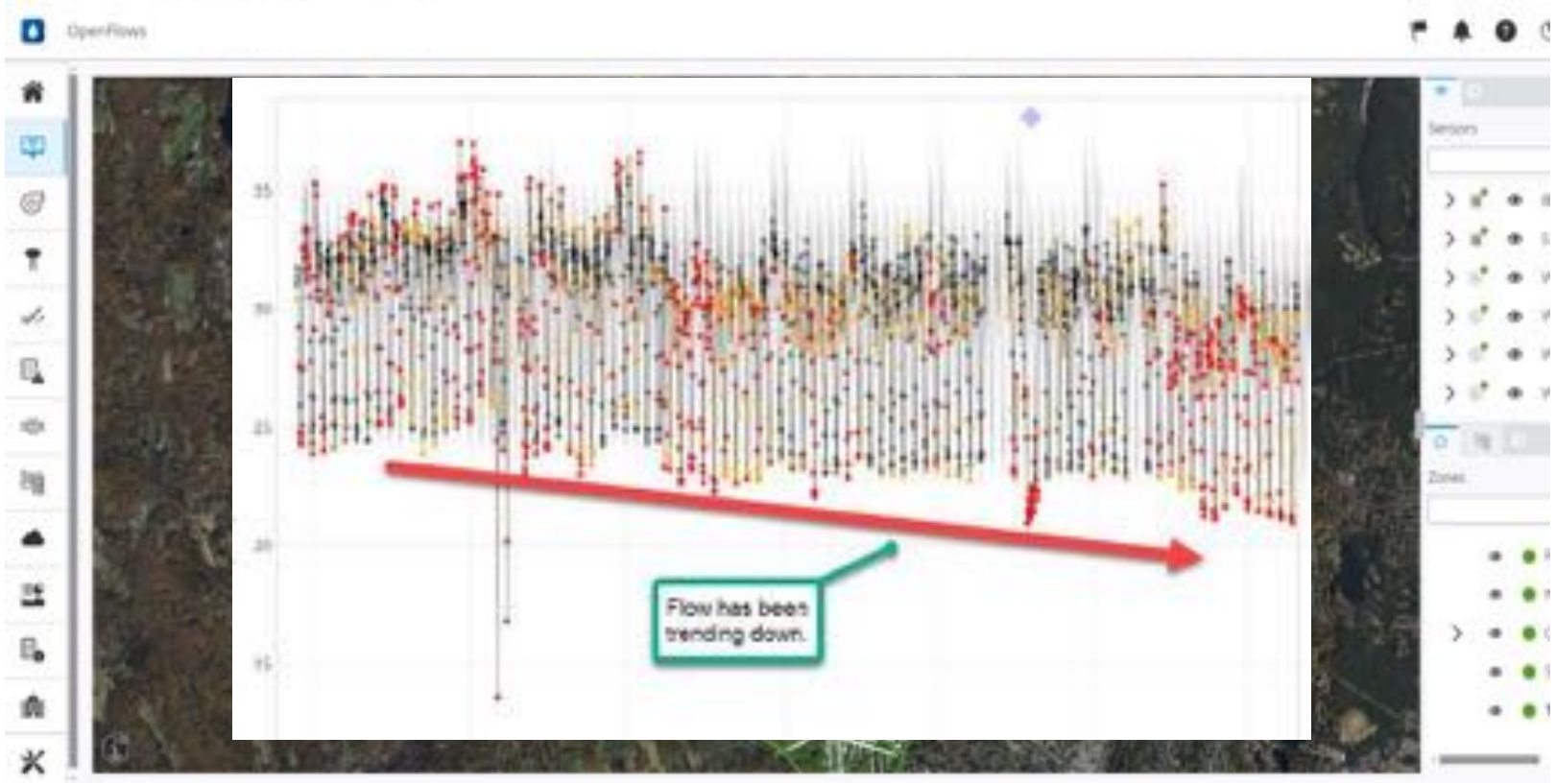
DEYAK (Water Utility of Kozani, Greece)

Improving monitoring, performance and operations, reducing nonrevenue water and response time to network events



- Unified SCADA data and Hydraulic Model to enable faster assessments and more accurate decision-making about possible system issues and necessary repairs
- 40% less time on pressure management tasks and 50% reduction in repair time
- Improved leak management with 20% less water flowing through the network

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Oporto Use Case: Integrated Water Cycle Management

CHALLENGE

- ✓ Over 20 different software systems to manage their daily life
- ✓ No communication among systems and departments
- ✓ No capacity to use numerical models in operations

SOLUTION

Digital Twin of Oporto's Water Cycle management:

- ✓ Water Supply Models, Sewer/Storm and Streams Model
- ✓ Coastal Circulation Model
- ✓ High Resolution Meteorological Model
- ✓ Real time Monitoring, alarms and water audit

BENEFITS

- ✓ Use of numerical models in Operations
- ✓ Integrated platform improved internal workflows
- ✓ Accessible anytime, anywhere
- ✓ Increased reliability and stability of information produced improved decision making

Oporto Use Case: Integrated Water Cycle Management

Official Results presented by Oporto at SWAN (Smart Water Network forum) Digital Twin Workgroup

:: Main results.

- ↑ Mobile employees and real time management of teams
- ↑ Anytime, anywhere access to secure and consistent information
- ↑ More engaged and proactive workforce
- ↑ Increased infrastructure resilience and preventive maintenance
- ↑ Better customer experience

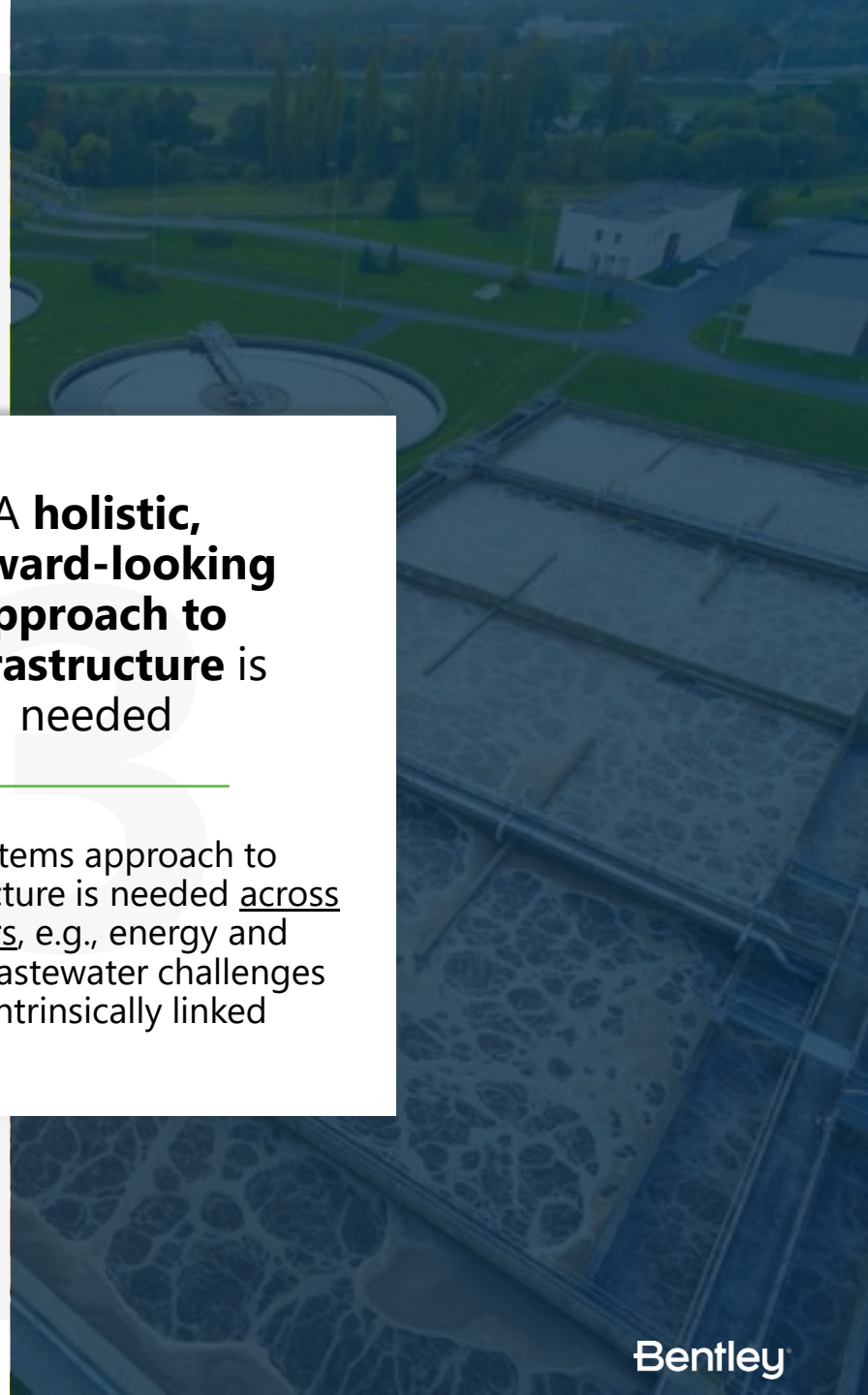
↑ Higher performance – better operation business KPI's. We get better every day!

What's Next …

1. Organize a Digital Workshop with the key Stakeholders to identify potential **Business Outcomes** to get started quickly

2. Identify key **Use Cases** aligned with the Business with budgetary proposal to start Proof of Concept (proof of value) implementation project

Some Thoughts to Conclude…



Water should be prioritised at the political level – there is no green without blue

The road to "net zero" critically depends on water policy and water infrastructure – this should be prioritised during the next investments cycle (2024-29)

Adoption of **digital technologies** should be fostered by all infrastructure-relevant legislative initiatives

Better sustainability outcomes depend on the ability to derive insights from countless sources of data – through tools like infrastructure digital twins

A **holistic, forward-looking approach to infrastructure** is needed

A systems approach to infrastructure is needed across sectors, e.g., energy and water/wastewater challenges are intrinsically linked

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Thank you for your attention!

Contact us for more information:
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