Challenge 1: Sustainable and safe water infrastructures

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prêts pour la révolution de la ressource

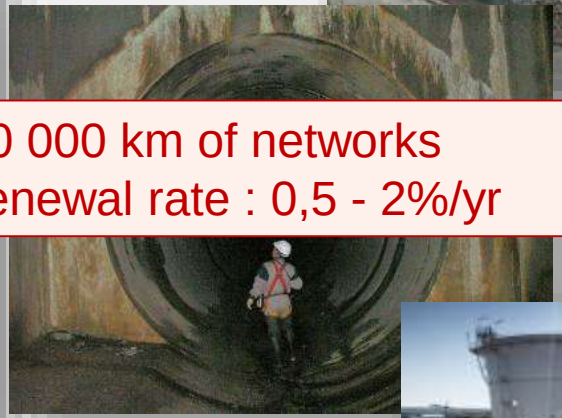
Water and wastewater infrastructures

Water production and distribution

4 000 000 km of networks
45 000 Mm3/yr supplied
23% of losses

Water and wastewater infrastructures

Wastewater & Stormwater collection and treatment

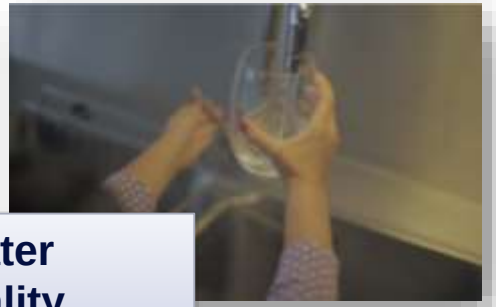


3 000 000 km of networks
Asset renewal rate : 0,5 - 2%/yr

Sustainable and safe water infrastructures

Main stakes

Water conservation



Water quality

Inspect

Monitor

Maintain

Water security

Water treatment

Sustainable and safe water infrastructures

Sub-Challenge 1

REDUCE CLEAN WATER LOSS (LEAKAGES)

Aerial, underwater and ground robots

- **Multi-sensing**
- For **remote inspections** of large areas
- For **pressurized water pipes** and **water reservoirs** inspections
  - ✓ Enter through **small access points**
  - ✓ **Identify defects**
  - ✓ Perform **repair tasks**
- For **safe and rapid access** to underground pipes
  (Pavement cutting, detection of underground networks, ...)

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Sub-Challenge 2

INCREASE EFFICIENCY OF WATER QUALITY CONTROL

Underwater and surface robots

- For **water** and **wastewater** pipes
- **Autonomous**
  - ✓ Perform continuous **measurements**
  - ✓ **Detect** water contamination issues, **trigger** alerts
  - ✓ **Grab** samplings
  - ✓ **Communicate** water quality
  - ✓ Operate **long-term** without human intervention

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Sub-Challenge 3

ENSURE WATER INFRASTRUCTURES ARE OPERATIONAL AND SAFE

Aerial, Ground, and surface robots

- Sewer **pipes**, underground **retention tanks** and treatment plants underground **facilities**
- **Empty** or **partially full** of water assets
- Inspect and **identify defects** *(multi-sensing)*
- Enter through **limited access** points
- **Geopositioning**, **communication**, **autonomy**

Sustainable and safe water infrastructures

Sub-Challenge 4

ROBOTICS TO ISOLATE WORKERS FROM RISKY INSPECTION IN CONFINED FACILITIES

Robots and cobots

- Avoid **human risks**
- Provide **safe and rapid access** to wastewater networks *(lifting of manhole covers)*
- Work in **confined** spaces
  - ✓ Perform **repair** and **maintenance** tasks
  - ✓ Increase **precision**

Water and wastewater infrastructures

Challenge 1
REDUCE CLEAN WATER LOSS (LEAKAGES)

Challenge 2
INCREASE EFFICIENCY OF WATER QUALITY CONTROL

Challenge 3
ENSURE WATER INFRASTRUCTURES ARE OPERATIONAL AND SAFE

Challenge 4
ROBOTICS TO ISOLATE WORKERS FROM RISKY INSPECTION IN CONFINED FACILITIES