

Risk prevention and managing in water systems vs different climate scenarios



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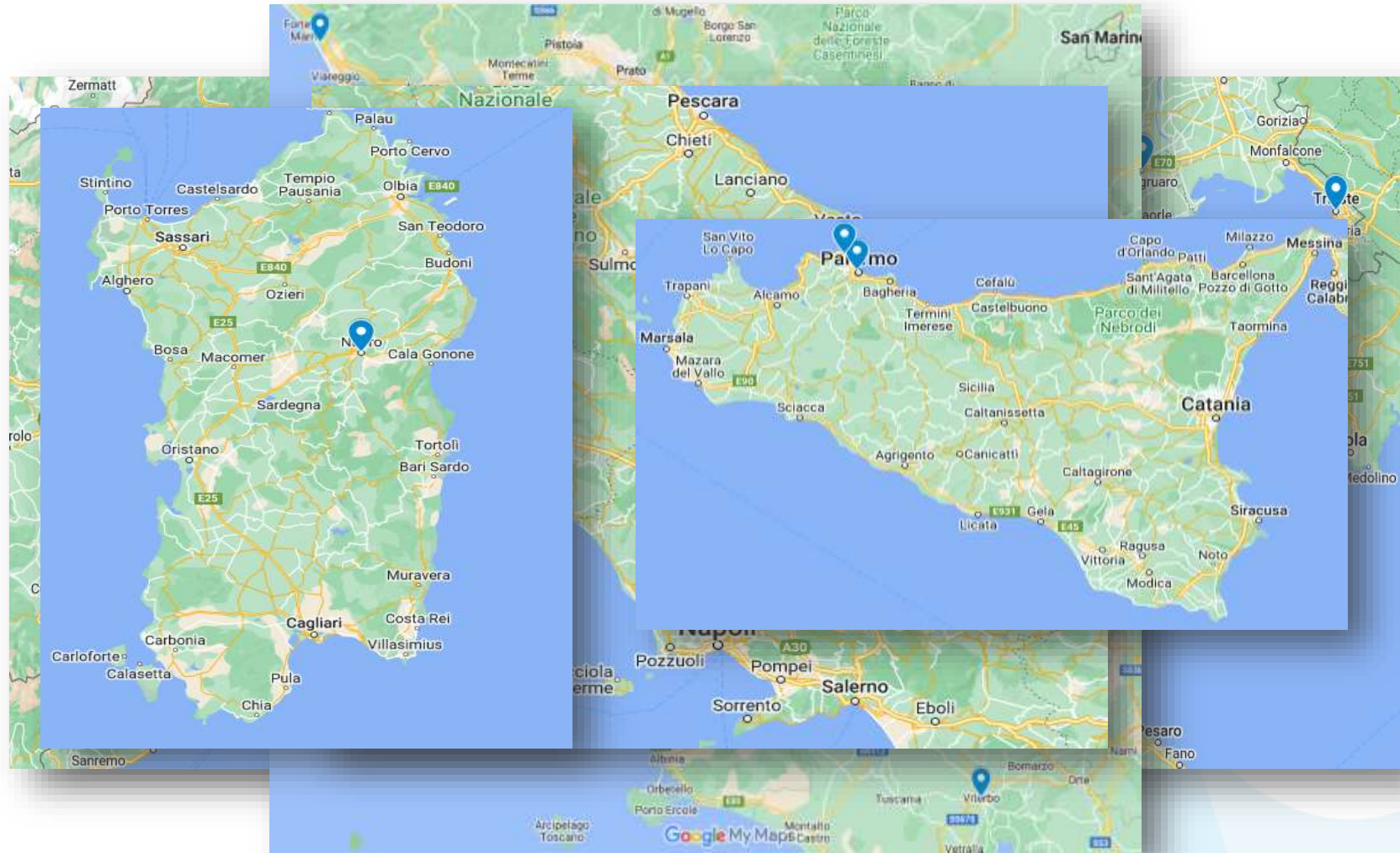
Strategic Roundtable on Increasing Resilience to Climate Change in the Water and Sanitation Sector

13 – 14 November 2023 | Geneva

Introduction

- ✓ Information obtained from the survey carried out on a national scale in Italy in 2022, concerning the effects found on drinking water supply systems deriving from climatic variations
 - survey carried out by the national Working Group coordinated by the University of Brescia on «**Safe drinking water supply and climate change**»
 - whole cycle of collection, treatment, and distribution of drinking water is evaluated and corrective actions taken to mitigate the problems assessed
- ✓ Objective: investigate key needs of water sector on climate-related finance and climate-related policy

Location of Survey managers



40 suppliers answered the questionnaire :

- ✓ 29 - North
- ✓ 4 - Center
- ✓ 3 - South
- ✓ 3 - Islands
- ✓ 1 - anonymous

Main Content



Questionnaire structure

Section I

General overview

General information on the drinking water supply system

Section II

Effects resulting from climate change

Description of the effects detected in the drinking water supply system

Section III

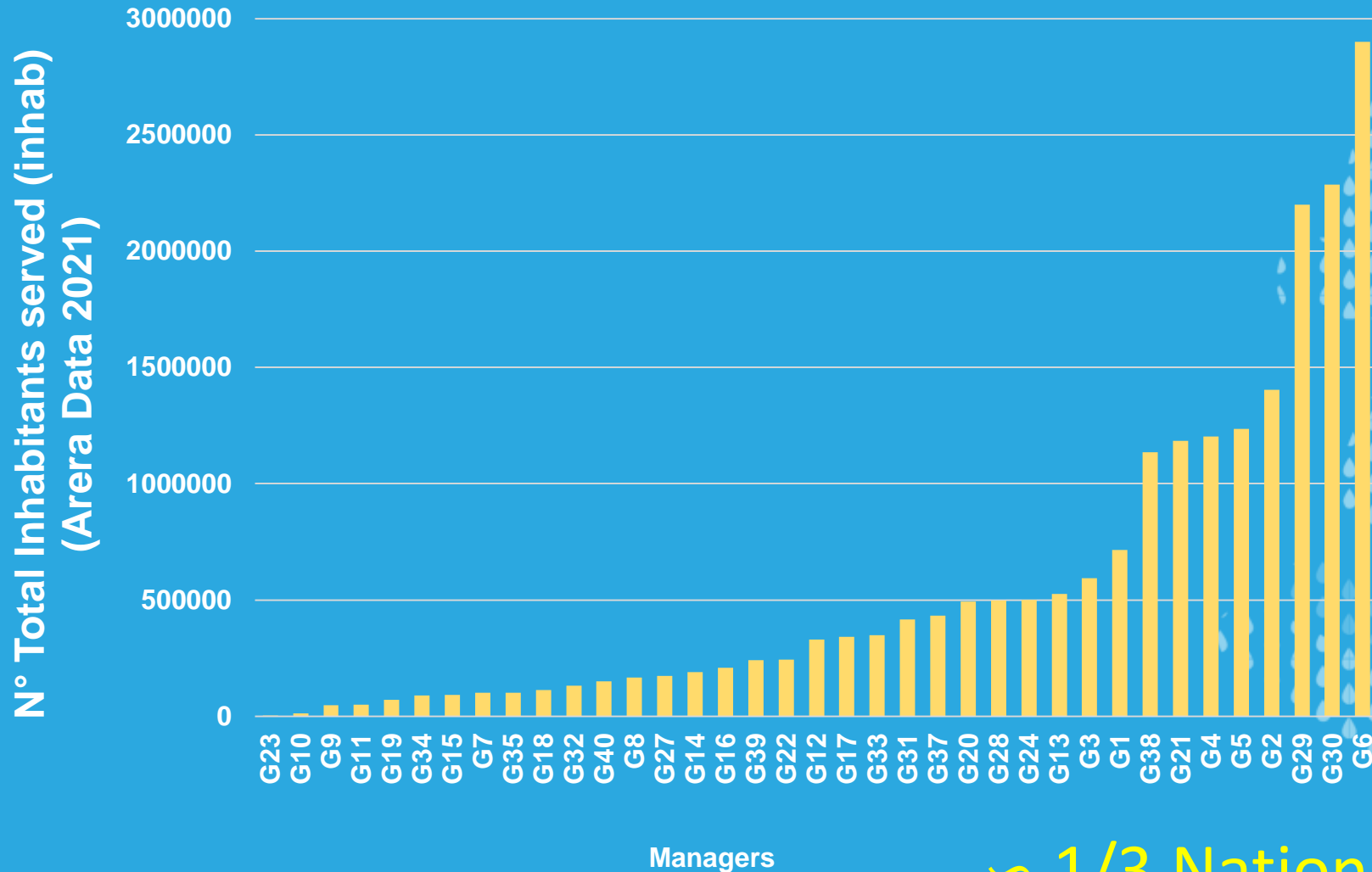
Control measures

Description of the actions undertaken to mitigate the effects of climate change on the drinking water supply system

Results Section I (General overview)



Total Inhabitants served

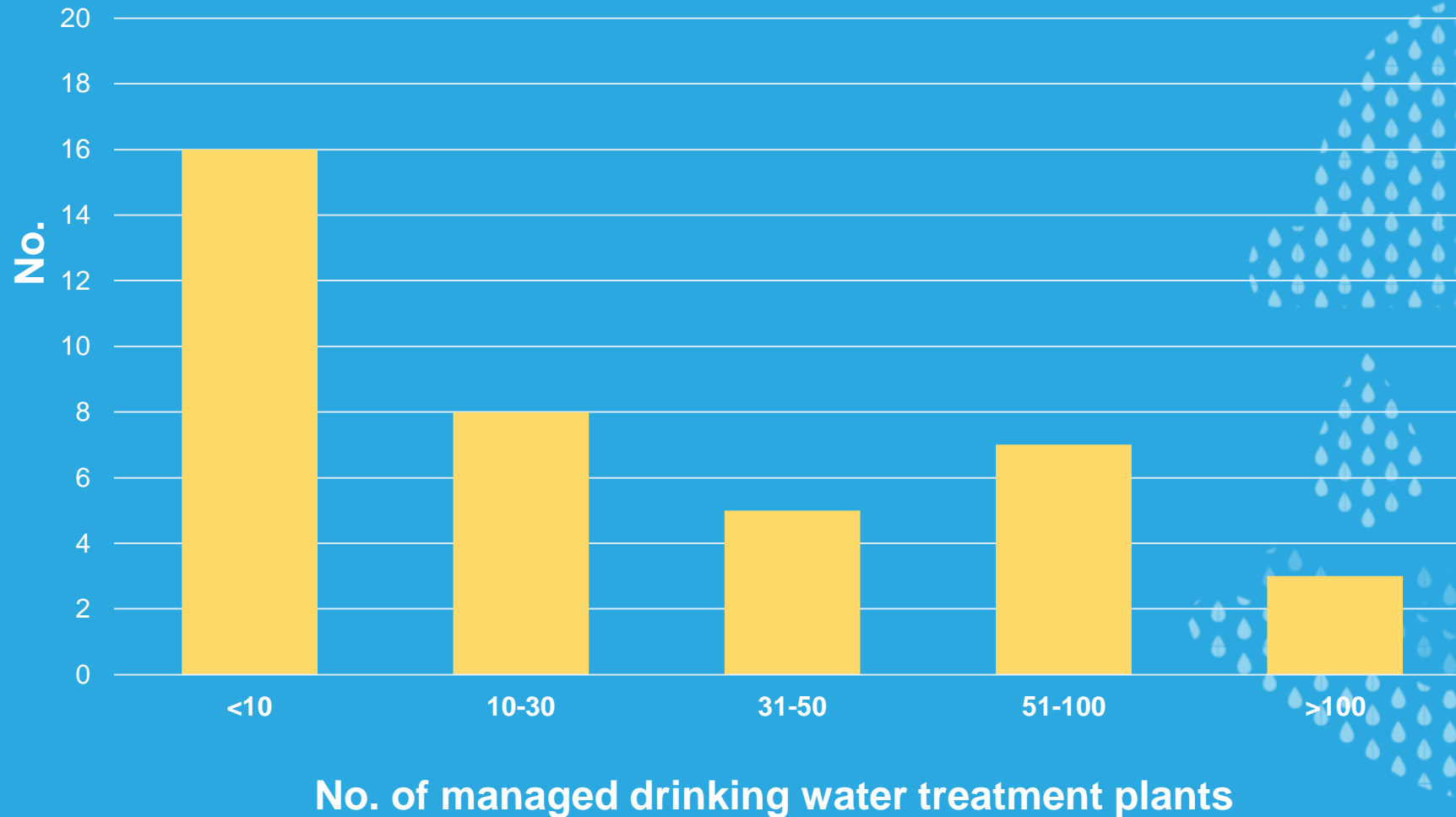


~ 1/3 National population covered

Results Section I (General overview)



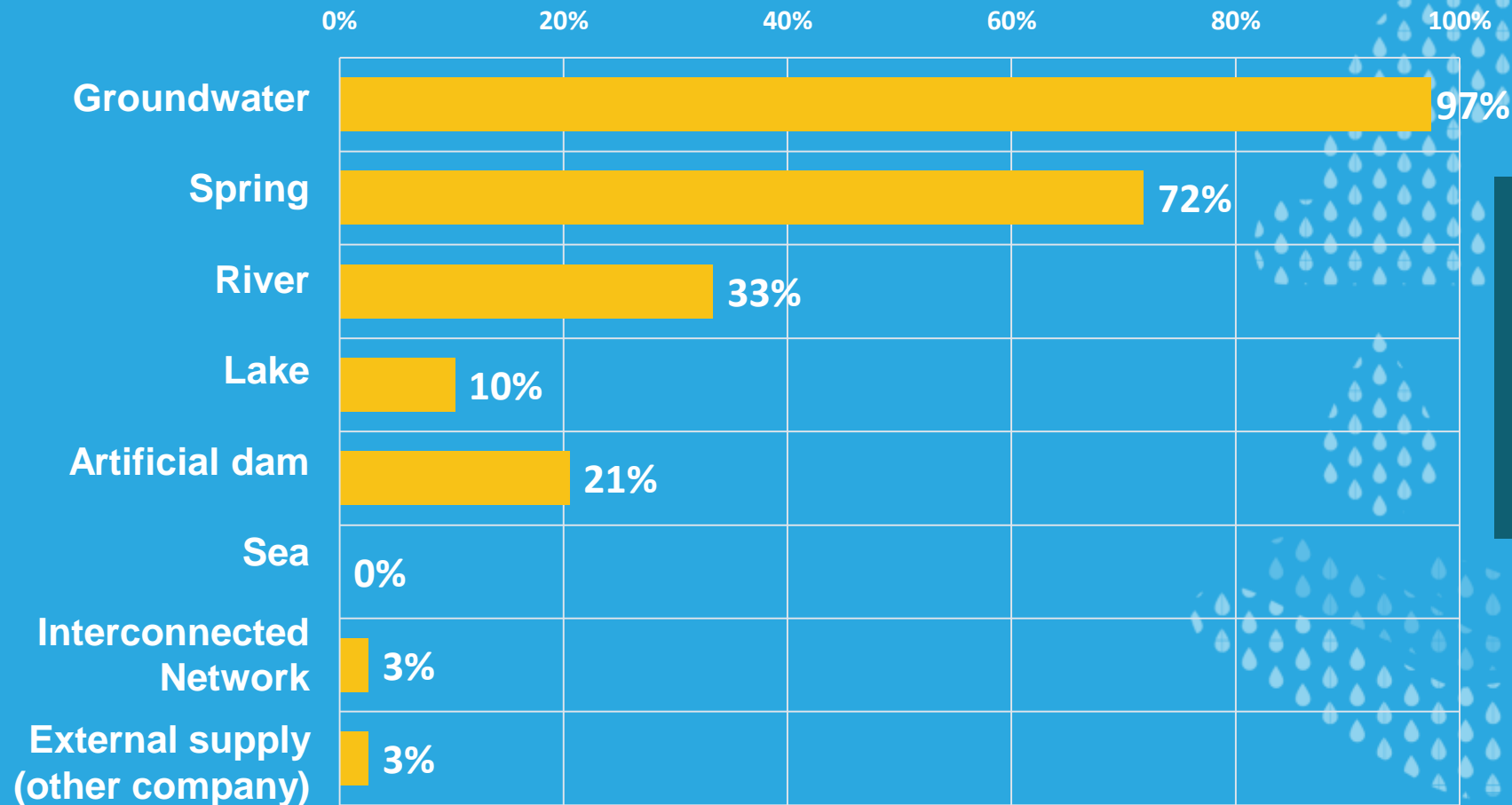
Water treatment plants



Results Section I (General overview)



Type of supply sources used



- Mainly underground aquifers and springs
- Minor catchments by rivers & surface reservoirs

N° of answers: 39

Results Section I (General overview)



Have there been phenomena linked to climate change with consequent alterations to the drinking water supply systems you manage?



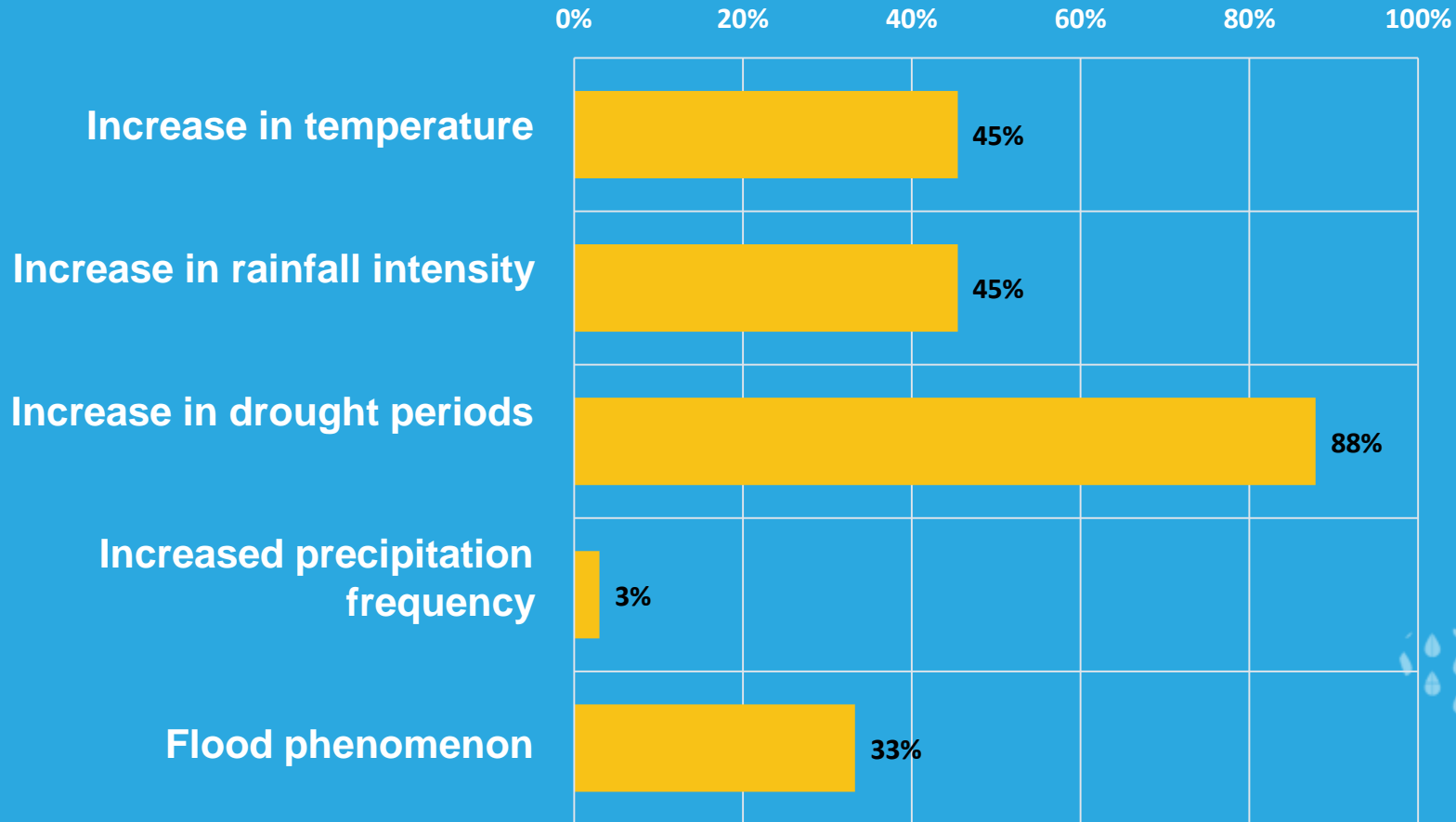
33/40 (82%) suppliers highlighted CC related phenomena impacting their supply systems

N° of answers: 40

Results Section I (General overview)



Phenomema related to climate change

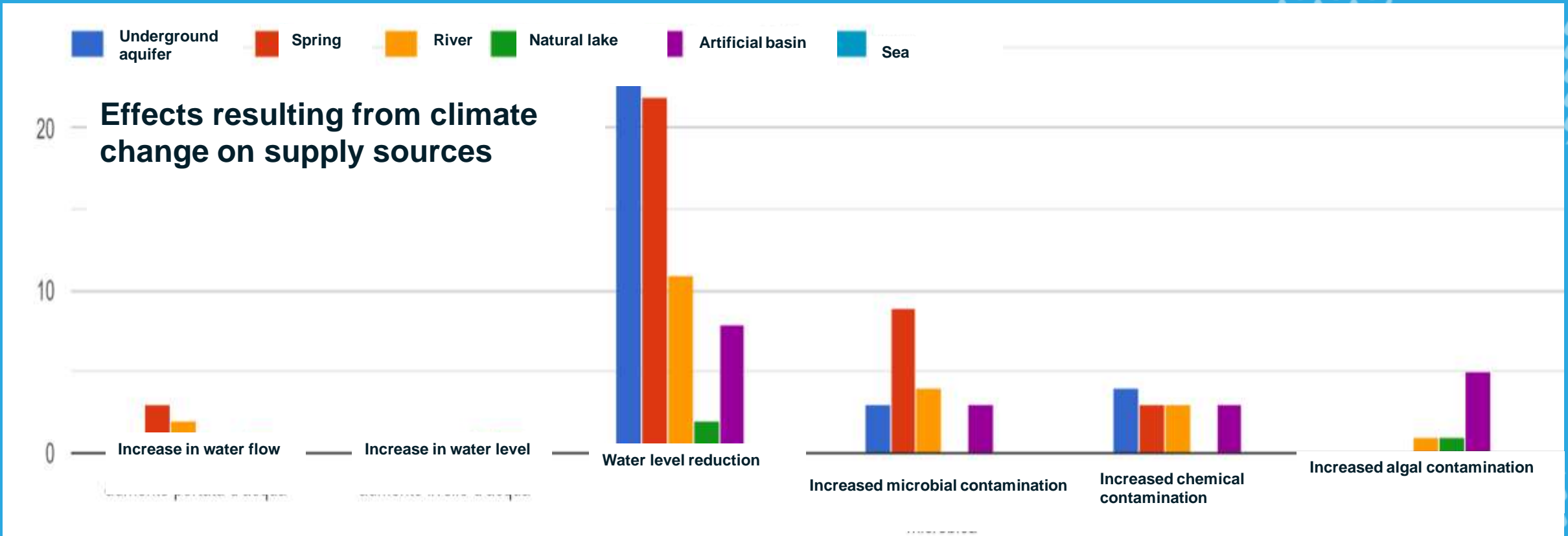


N° of answers: 33

CC drivers impacting systems:

- ↑ drought phenomena
- ↑ rainfall intensity
- ↑ flooding
- ↑ temperature

Results Section II (CC related effects)



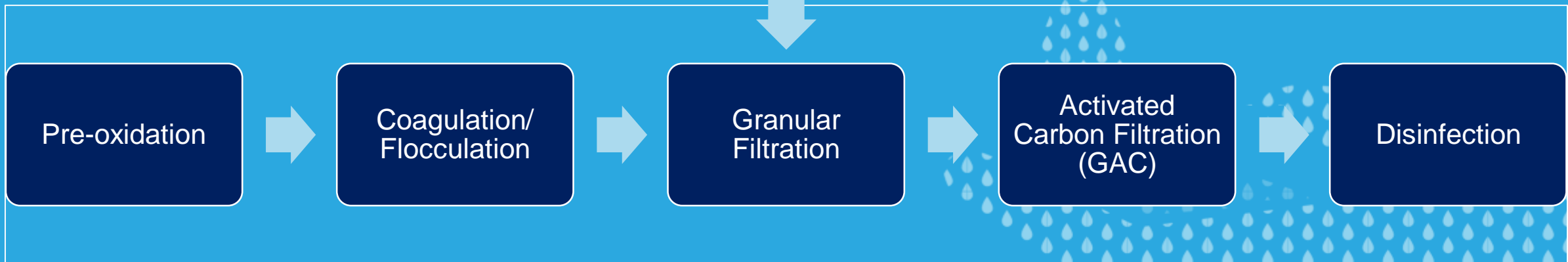
N° of answers: 33

- ↓ **water level**: main effect on all the sources
- ↑ **chemical and microbial contamination** affect all the sources
- ↑ **algal contamination** has been observed in artificial reservoirs.

Results Section II (CC related effects)



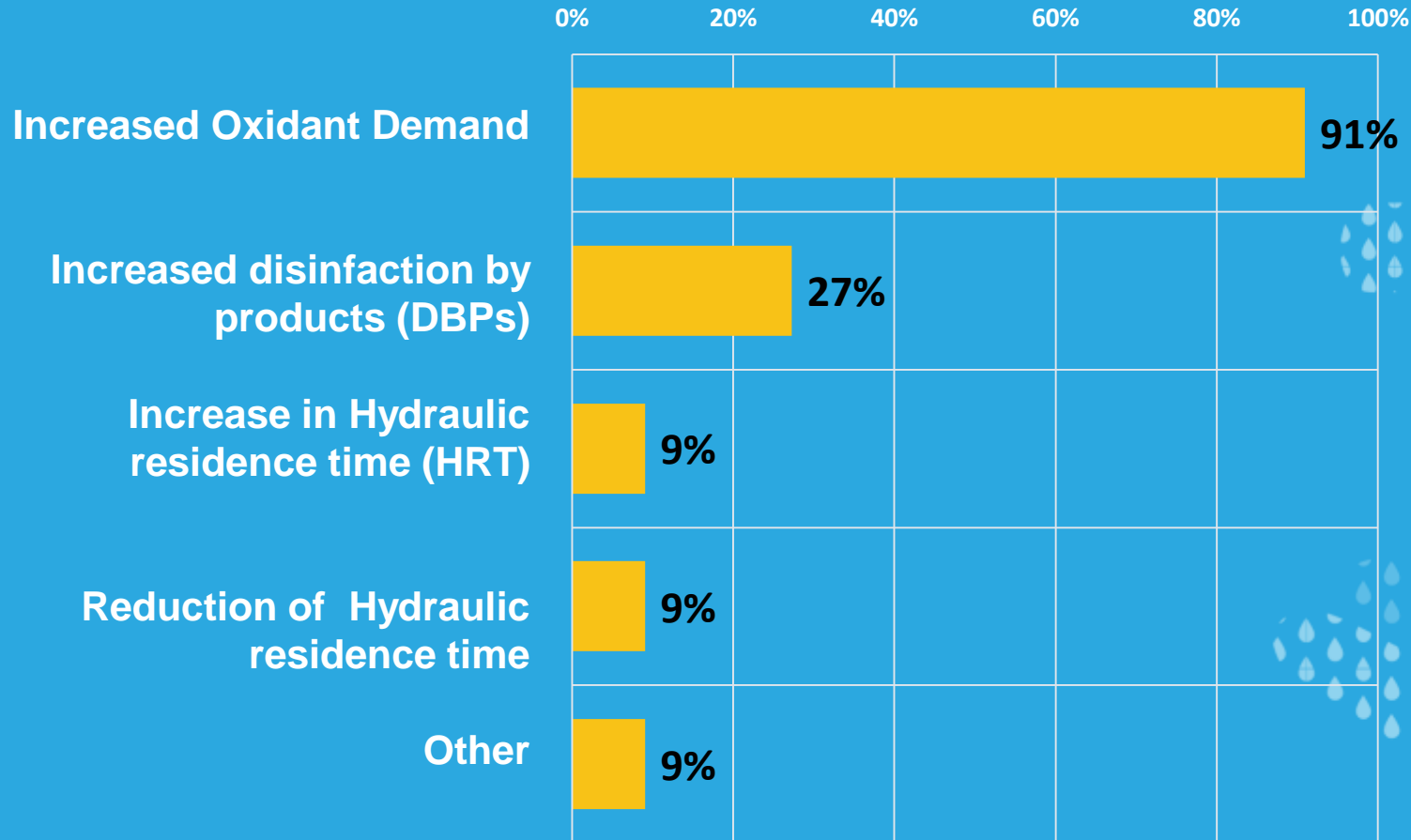
Conventional treatment scheme



Results Section II (CC related effects)



Pre- Oxidation phase



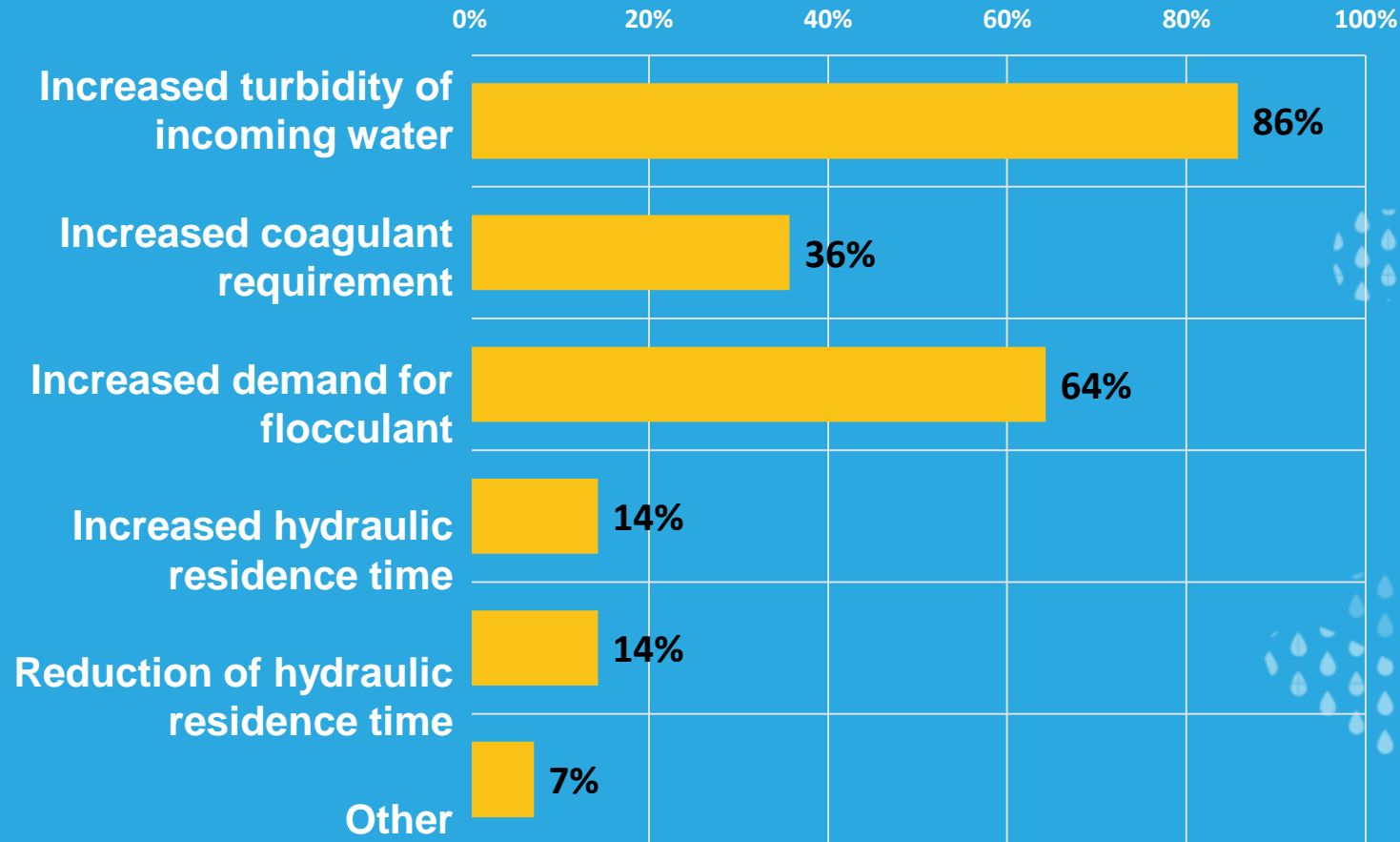
Pre-oxidation:
↑ oxidant demand
↑ DBPs

N° of answers: 11

Results Section II (CC related effects)



Coagulation Flocculation phase



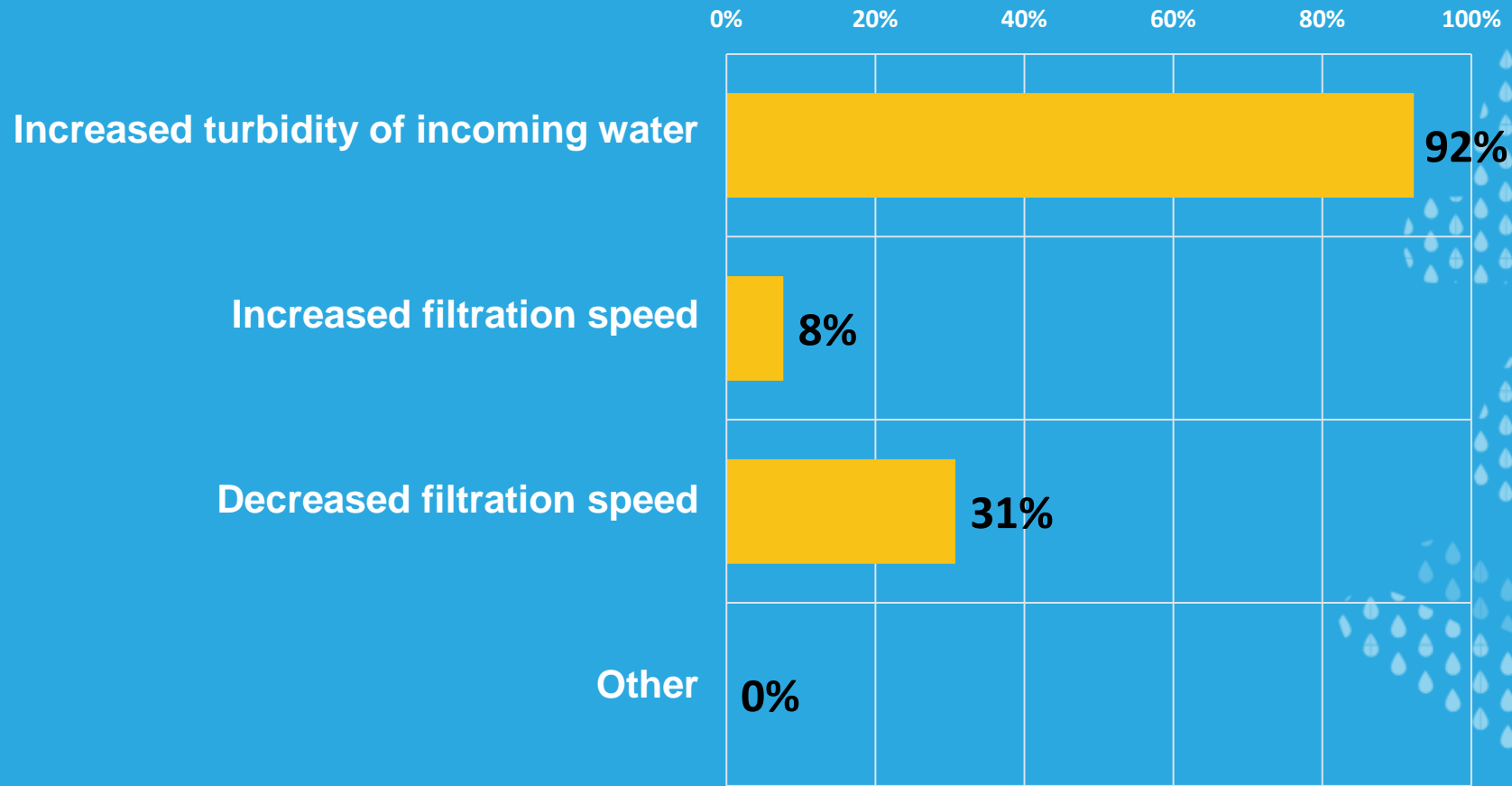
↑ turbidity of inlet water
↑ request of coagulant and flocculant

N° of answers: 14

Results Section II (CC related effects)



Granular Filtration phase



Granular filtration:
↑ suspended solids

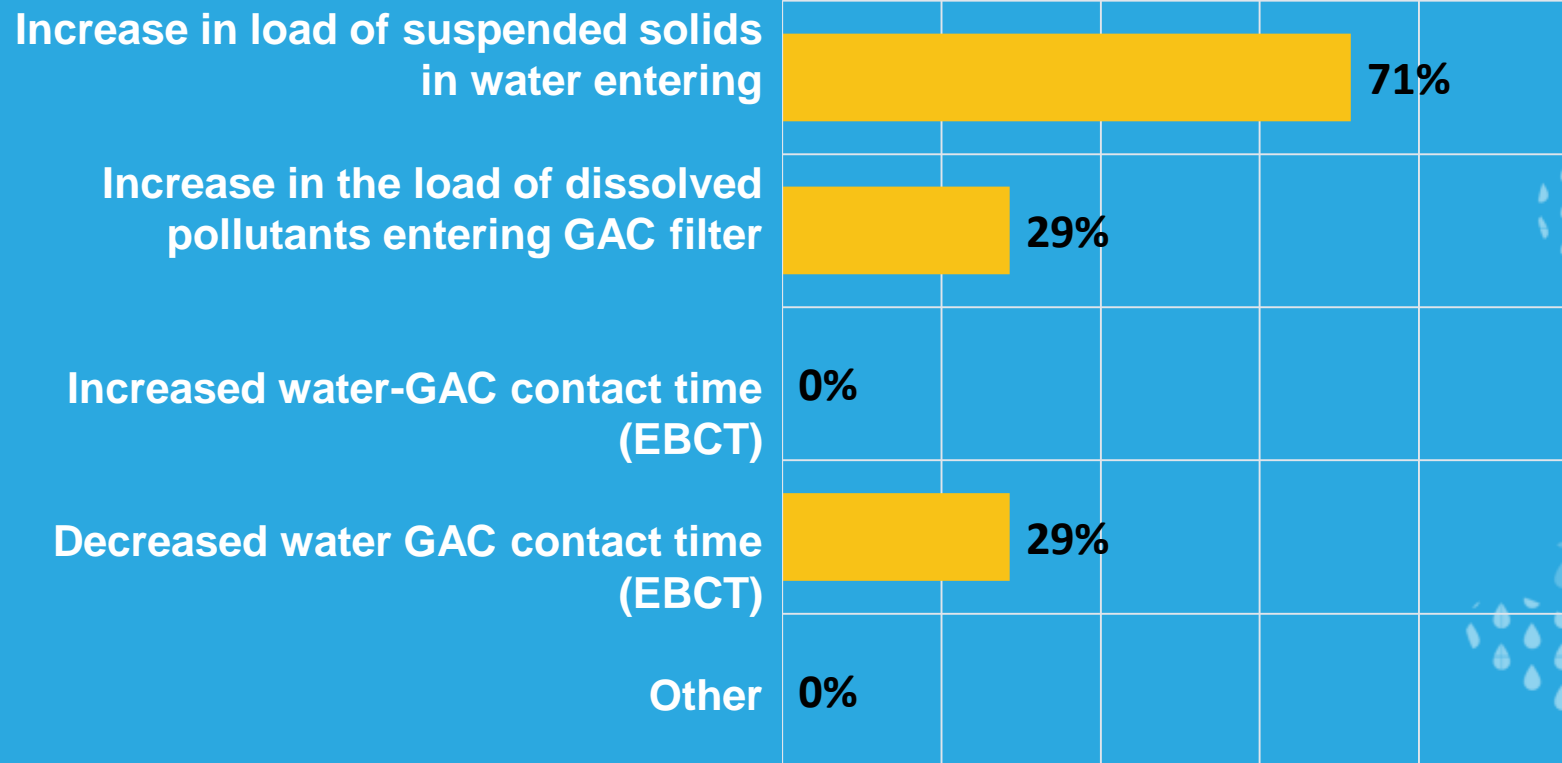
N° of answers: 13

Results Section II (CC related effects)



Activated Carbon Filtration phase

0% 20% 40% 60% 80% 100%



Activated carbon (GAC) filtration

- ↑ loads of suspended solids
- ↑ dissolved pollutants in entrance

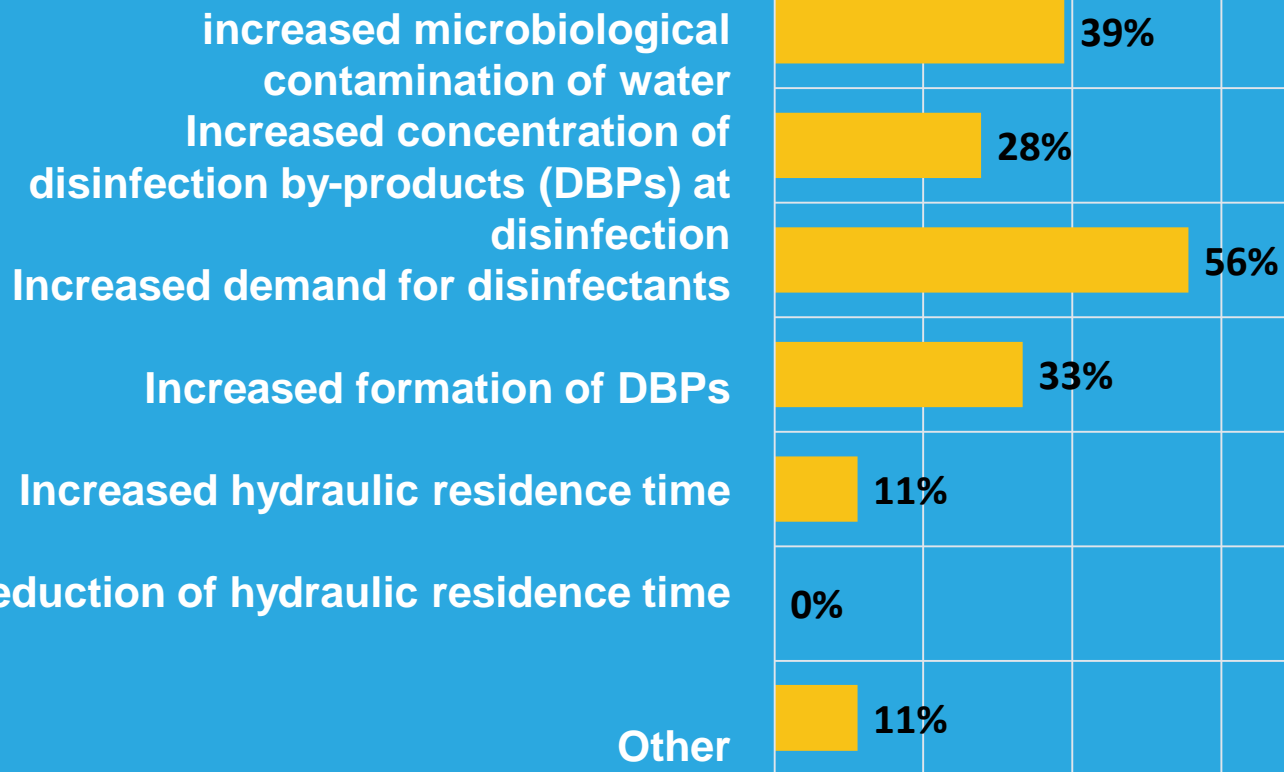
N° of answers: 7

Results Section II (CC related effects)



Disinfection Phase

0% 20% 40% 60% 80% 100%



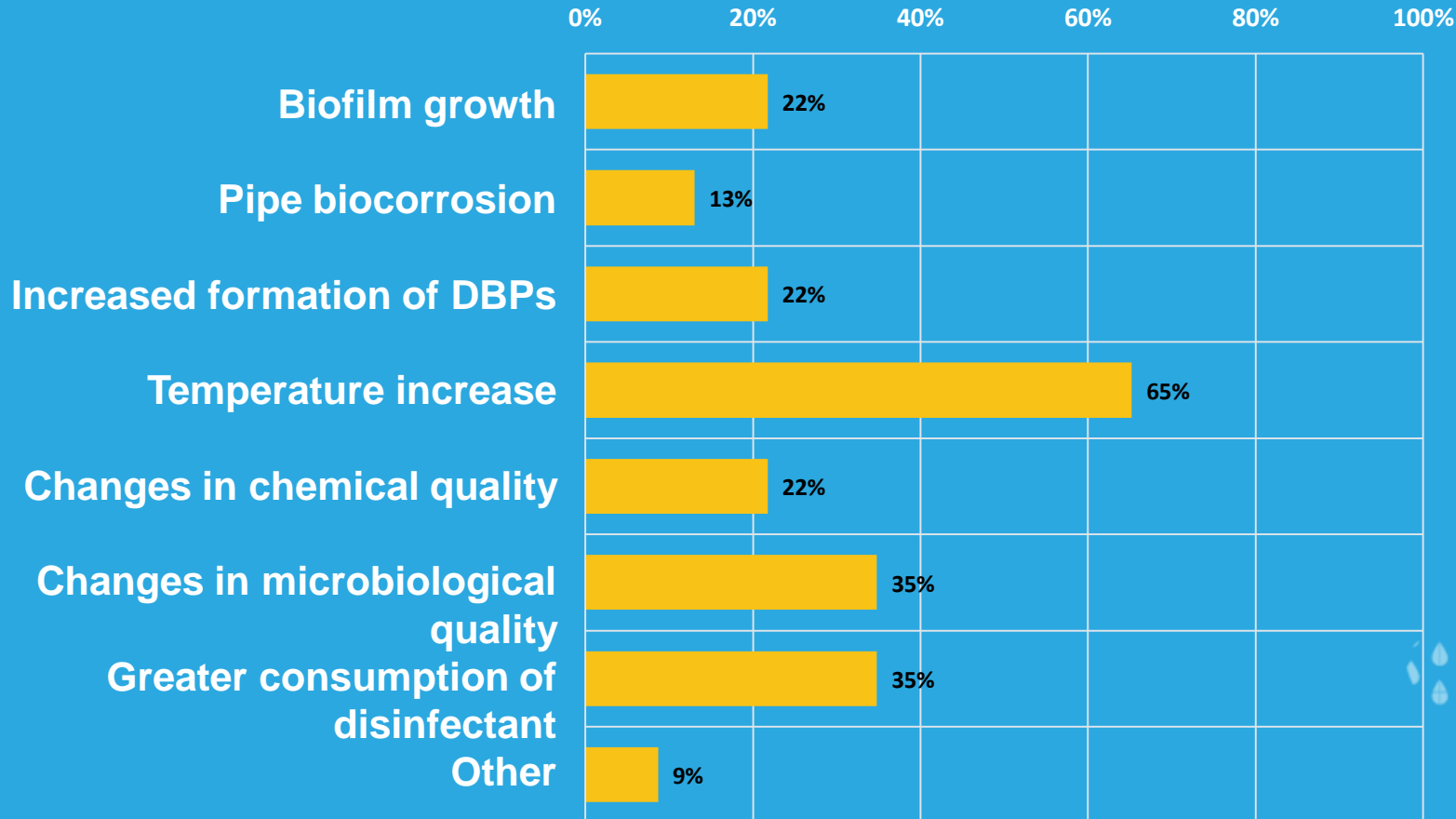
- ↑ request for disinfectants
- ↑ microbiological contamination of raw waters
- ↑ formation of DBPs

N° of answers: 18

Results Section II (CC related effects)



Effects in distribution network



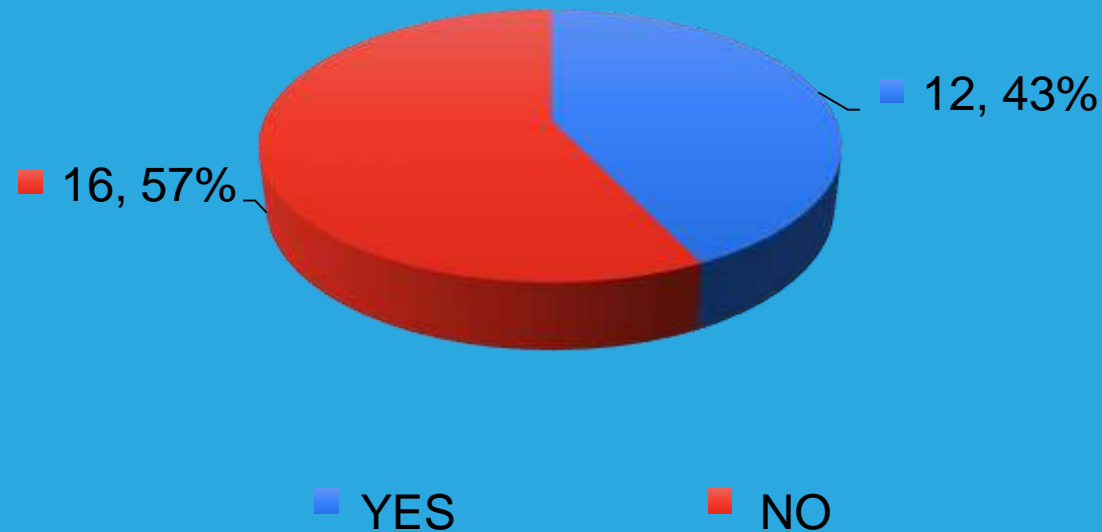
Distributions: managers
↑ temperature
↑ disinfectant

N° of answers: 23

Results Section II (CC related effects)



There have been episodes of non-compliance of distributed water resulting from climate changes with Legislative Decree 31/2001?



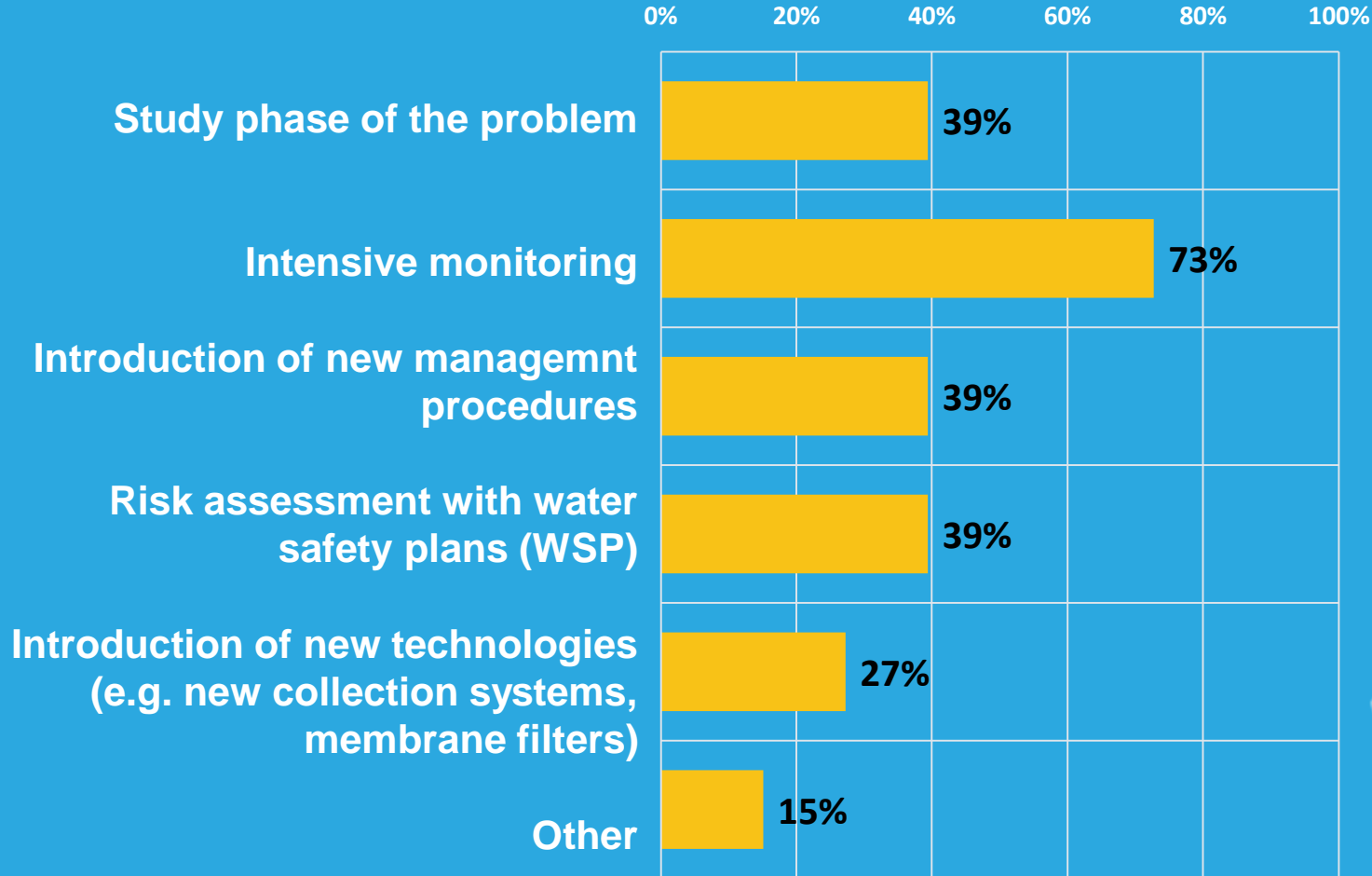
↑ episodes of non-compliance of the water quality vs regulatory standards

N° of answers: 28

Results Section III (control measures)



Control Measures



- ✓ most suppliers in assessment/study steps
- ✓ WSP
- ✓ new management procedures & new technologies

N° of answers: 33

Concluding remarks

Survey representative of a significant number of systems/served population, mainly north Italy

33 out of 40 water companies highlighted critical CC impacts on their systems

Impacting phenomena: drought periods, rainfall intensity and temperature, floods

Effects on water sources: reduction of water level, microbiological and chemical quality, algae growth

Effects observed on drinking water treatment plant (DWTP): increase of chemicals in pre-oxidation, coagulation/flocculation and final disinfection; clogging of sand and GAC filter and increase of DBPs

Most of the water companies are under **study and problem monitoring, adopting WSP**

- ✓ **Climate-related finance and climate-related policy should meet key needs of the water sector**
- ✓ **Water and sanitation should be incorporated in National Adaptation Plans and Nationally Determined Contributions**



Thanks



A2A Water CycleSpA
AbbanoaSpA
Aqueducts
Tirreni-SATSpA
AcegasApsAmgaSpA
WatersBiencaScrl.
Acque del Chiampo
SpA
WatersVeronesiScarl.
Water up SpA.
Alfa Varese srl

Alto Calore SpA
AMAP SpA
APM SpA
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Livenza Tagliamento
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Molise Waters
Mondo Acqua SpA
NovaretiSpA
Padania Acque SpA
Pavia WatersScarl.

Piave Servizi Srl
PubliacquaSpA
Riviera acqua SpA
SISAM SpA
SMAT SpA
SiciliaqueSpA
ThalesSpA
TeaSpA
Umbra Acque SpA
Veritas SpA Group

We thank the student Matteo Donghi who carried out his degree thesis work on this topic in Environmental Engineering, University of Brescia, year 2023



Thank you!

