

# The WaterMan project

## Final draft of the regional water recycling strategy for Berlin & Brandenburg

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KWB - Berlin Centre of Competence for Water



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2. Local Background
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8. Core measures & activities
9. Process



# 1. Model Strategy: Scope & focus area

Water sources  
& uses

Municipal Wastewater  
(Greywater)

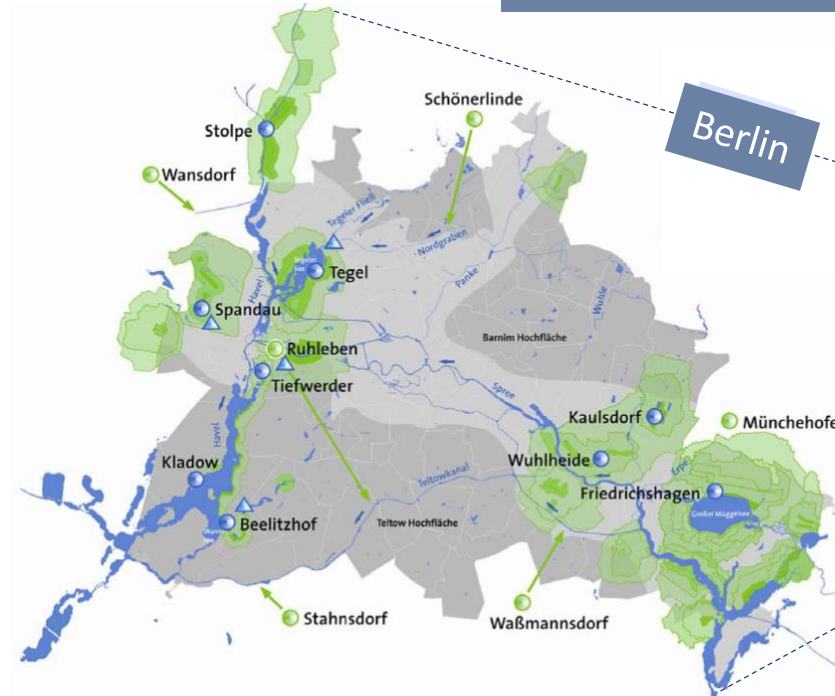


Industrial & commercial use  
Agricultural & urban  
irrigation

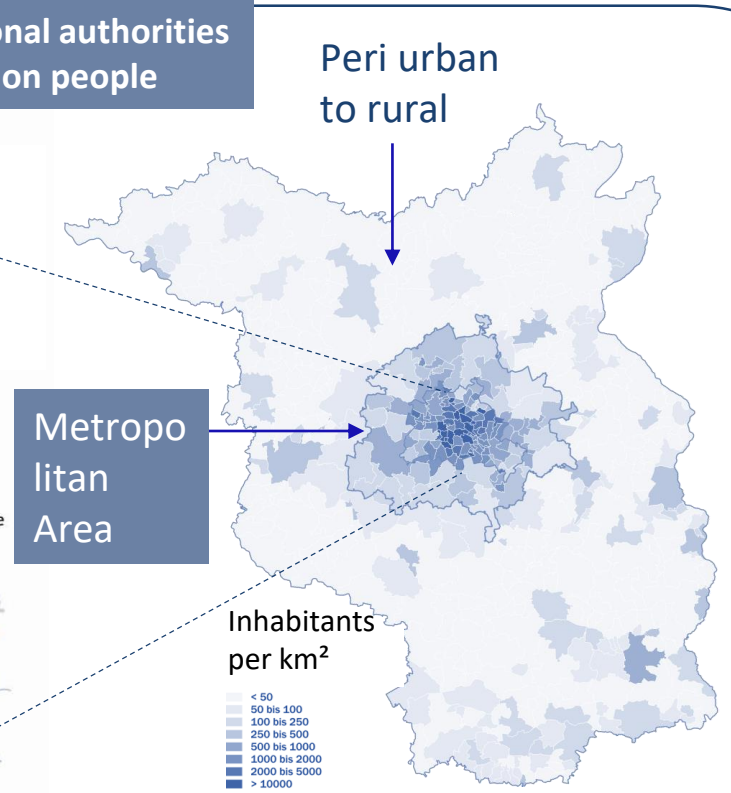
Focus area

Berlin vs. Brandenburg:

1	vs.	92 utilities
1	vs.	17 regional authorities
3.8	vs.	2.6 million people



Berlin water utilities (BWB)



Peri urban  
to rural

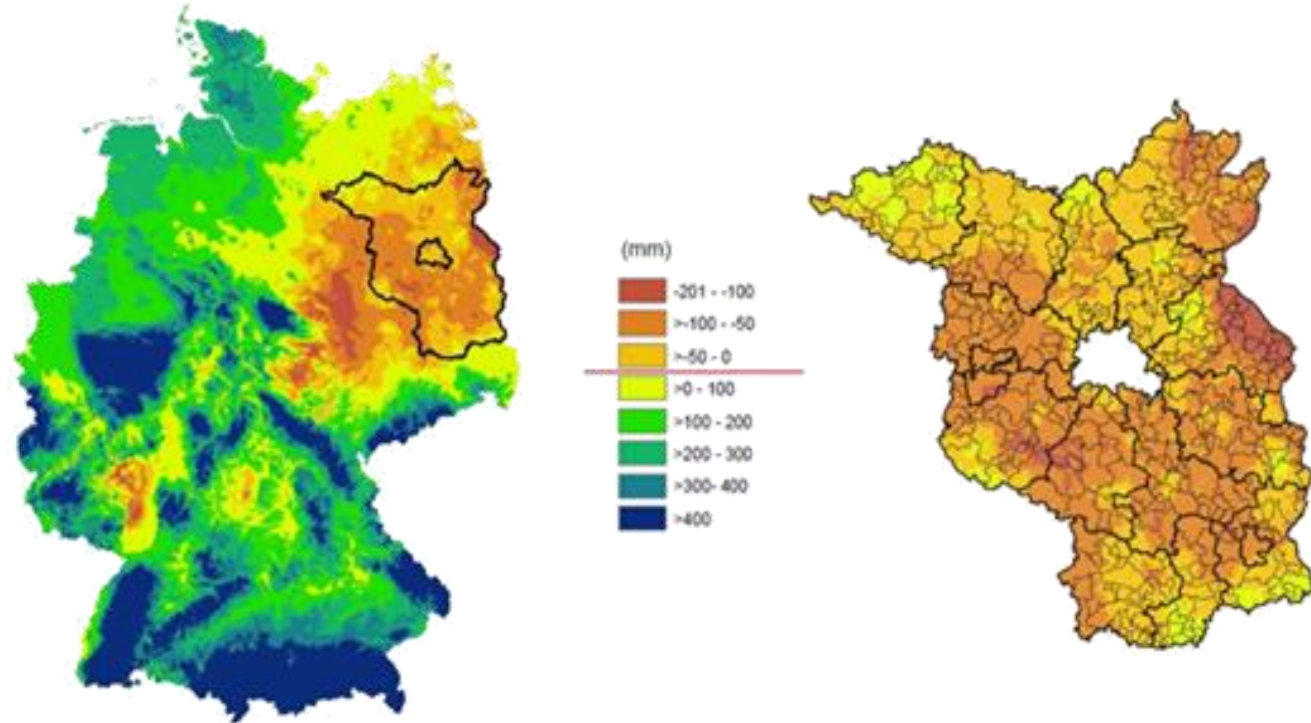
Metropo  
litan  
Area

Inhabitants  
per km<sup>2</sup>

Alexrk2,  
[https://commons.wikimedia.org/wiki/File:Metropolregion\\_Berlin-Brandenburg\\_Einwohnerdichte.svg](https://commons.wikimedia.org/wiki/File:Metropolregion_Berlin-Brandenburg_Einwohnerdichte.svg), change in color

## 2. Local background

- one of the driest regions in Germany
- annual mean rainfall of 580 mm
- extreme droughts in recent summers
- negative annual climatic water balance of -52 mm
- mean temperature of 9.7°C (1.4 °C in winter, 18.4°C in summer).



Annual climatic water balance of Germany (left) and the state of Brandenburg (right) over the period from 1991 to 2021. Colors indicate the local water balances, calculated from precipitation minus potential evapotranspiration. Based on data from the German Climate Data Center ([CDC 2023](#)).

Dittmann et al., 2024; doi: 10.2166/wrd.2024.081

## 2. Local background

### Future challenges of water supply in the Berlin Brandenburg Metropolitan Region



- Population Growth: Rising demand due to increasing population



- Climate Change: Reduced water availability (e.g., the dry five-year period 2018–2022)



- Decline in Spree River Flow: End of lignite mining and related mine drainage inflows



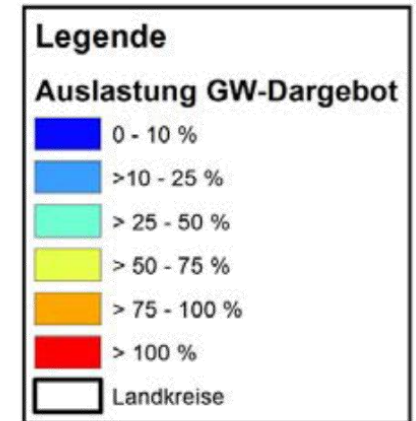
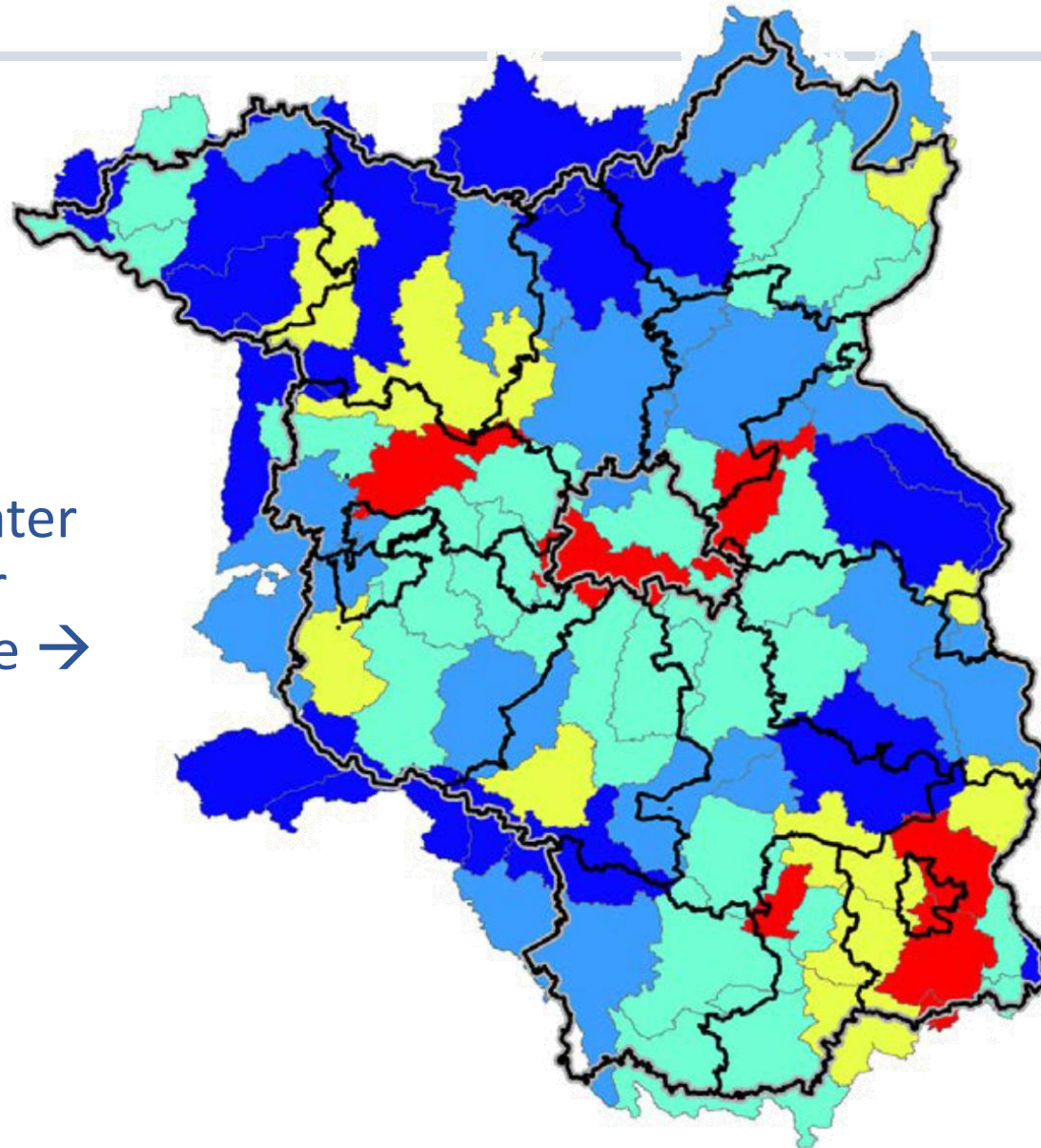
- Decline in Havel River Flow: Lower precipitation levels



## 2. Local background

### Groundwater utilisation:

- Target: Utilisation < 30%
- High share in the metropolitan region has reached its groundwater use target capacity → no further sustainable abstraction possible → other options to be found



## 2. Local background: Current and future water demands

	Berlin	Brandenburg part of the metropolitan region
<b>Area (km<sup>2</sup>)</b>	891 <sup>6</sup>	2888 <sup>5</sup>
<b>Status quo (years 2020–2022)</b>		
<b>Inhabitants (Mio. inhabitants)</b>	3.78 <sup>3</sup>	1.02 <sup>5</sup>
<b>Raw water demand (Mio. m<sup>3</sup>)</b>	219 <sup>1</sup>	54 <sup>1</sup>
<b>inhabitants supplied by BWB (%)</b>	100 <sup>2</sup>	7 (85,000 inhabitants, 5.7 Mio. m <sup>3</sup> ) <sup>2</sup>
<b>Future scenario(s)</b>		
<b>Inhabitants (Mio. inhabitants)</b>	3.96 (2040) <sup>3</sup> 4.2 (2050) <sup>1</sup>	1.14 (2030) <sup>4</sup> 1.2 (2050) <sup>1</sup>
<b>Raw water demand (Mio. m<sup>3</sup>)</b>	248 (2050) <sup>1</sup>	77 (2050) <sup>1</sup>

1 ITM (2020), 2 BWB (o.J.), 3 SenWEB (2022), 4 Amt für Statistik B-BB (2021) (mittlere Entwicklungsvariante), 5 Amt für Statistik B-BB (2023), 6 Amt für Statistik B-BB (2024))

## 2. Local background

- Forecast for 2050: +49 million m<sup>3</sup>/a
  - Berlin: 28 million m<sup>3</sup>/a,
  - Metropolitan region in Brandenburg: 21 million m<sup>3</sup>/a
- Additional demand not evenly distributed across the metropolitan region
- Climate change issue: longer dry periods would reduce the available supply
- Assumption according to the Berlin Water Master Plan: loss of up to 55 million m<sup>3</sup>/a in Berlin (with 50% less groundwater recharge), requiring substitution
- Forecast: 50–100 million m<sup>3</sup>/a, additional and substitution demand



## 2. Local background: Measures in discussion

- Pipelines from
  - the Baltic Sea to Berlin (desalinated water)
  - reservoirs in the Central Uplands
- Local and regional interventions
  - Increased groundwater abstraction
  - Enhanced groundwater recharge (e.g., reuse, bank filtration)
  - Intensified water circulation (WWTP effluent discharge upstream)
  - Municipal wastewater reuse near WWTPs
  - Reduced water demand
  - Blue-green infrastructure for local infiltration
  - Remediation of contaminated sites



ITM 2020: Initiative Trinkwasserversorgung Metropolregion Berlin–Brandenburg. (2020). Masterplan Wasserversorgung Metropolregion Berlin–Brandenburg: Bestandsaufnahme und Ableitung von Erfordernissen für die Trinkwasserversorgung in der Metropolregion. Created by Wasserversorgungsunternehmen der Metropolregion. <https://www.ag-wasser.de/initiative-itm>

Kommunale Abwasserbeseitigung im Land Brandenburg – Lagebericht 2025, MLEUV

## 2. Local background: Measures in discussion

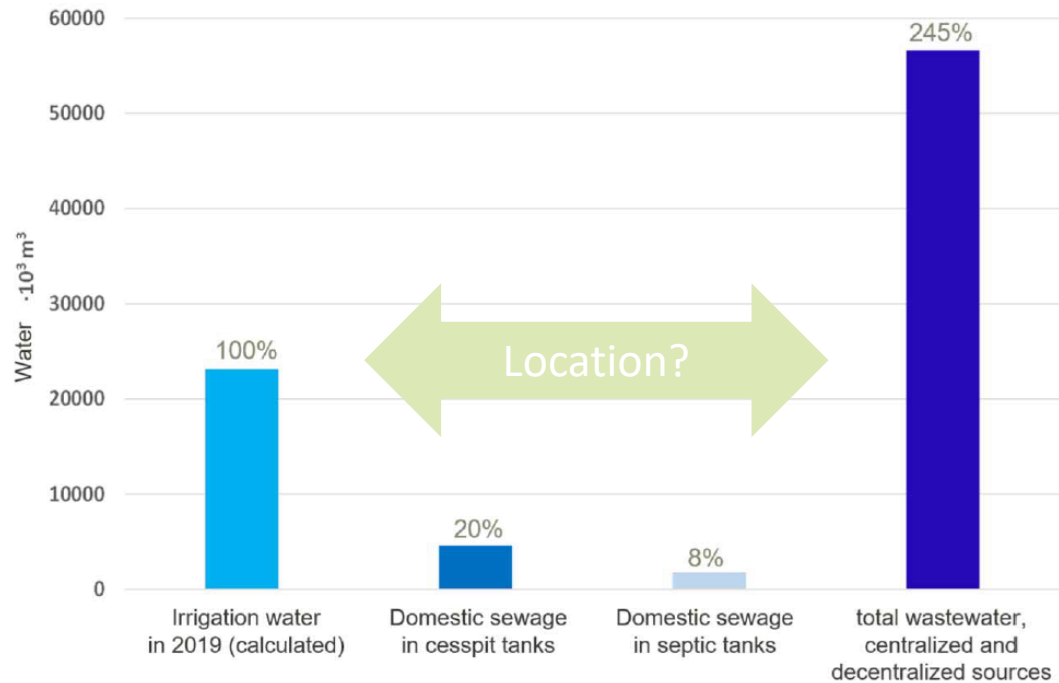
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  - **Municipal wastewater reuse near WWTP**
  - Reduced water demand
  - Blue-green infrastructure for local infiltration
  - Remediation of contaminated sites

→ **Local measures are highly promising due to simpler implementation and fewer stakeholders**



## 2. Local background: Irrigation potential in Brandenburg

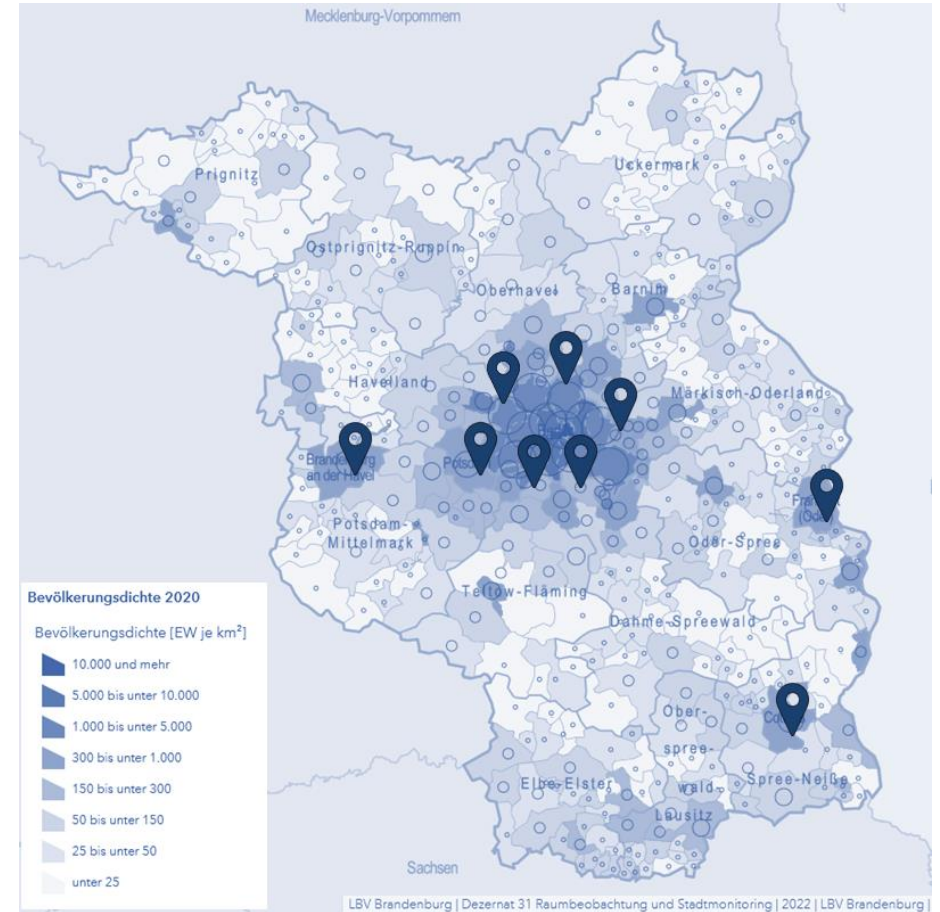
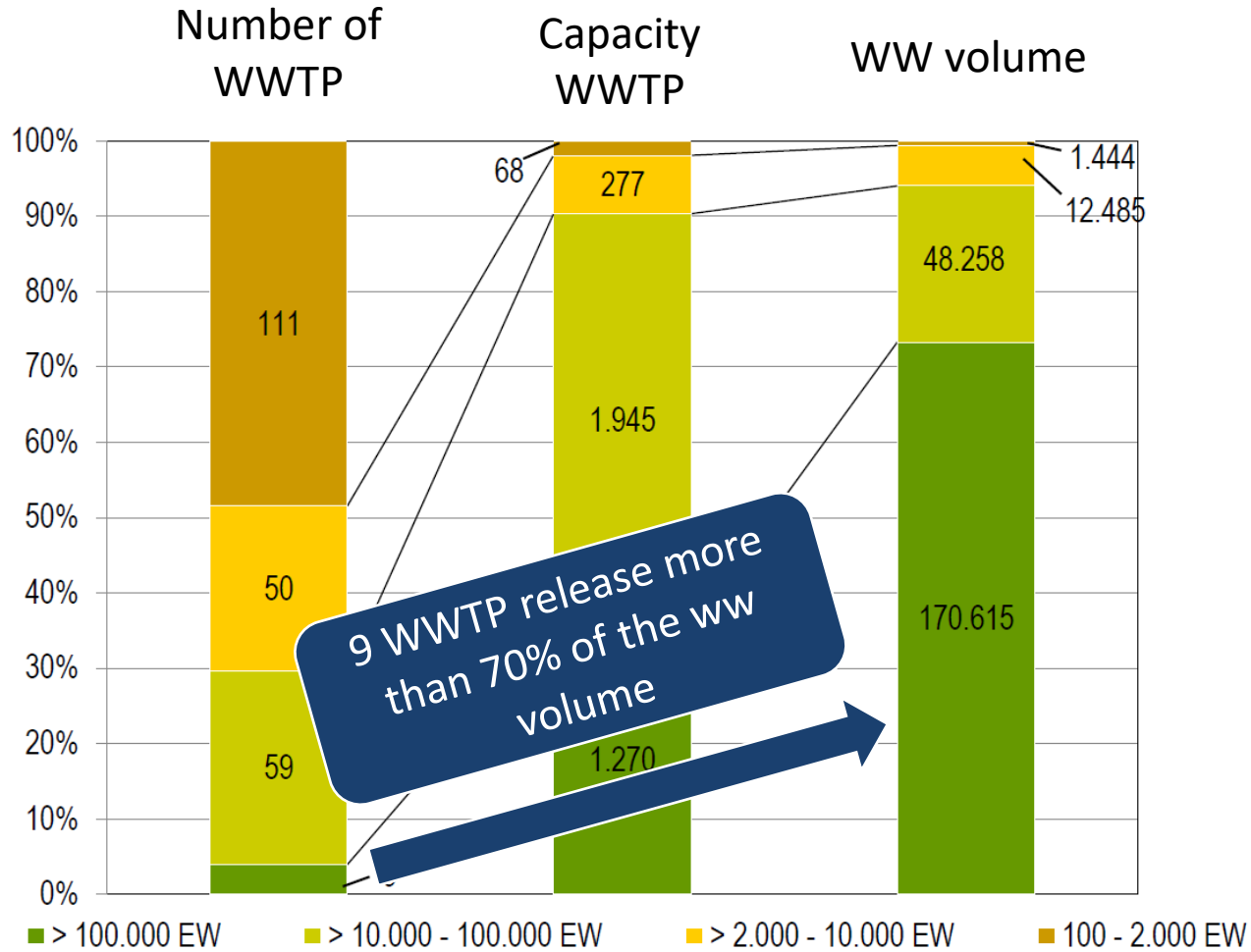
- Water irrigated demand for agriculture in Brandenburg was calculated to be 23.1 Mio m<sup>3</sup> in 2019 (average 72.2 mm)
- about 56.6 Mio m<sup>3</sup> total wastewater is generated in the growing season from April to October



**Figure 4** | Water balance during the growing season (April–October). Accounted for substitution potential for irrigation water used in 2019 with decentralized sewage sources and total wastewater in Brandenburg, Germany.

Dittmann et al., 2024; doi: 10.2166/wrd.2024.081

## 2. Local background: Wastewater volumes & spatial distribution



LBV Brandenburg | Dezernat 31 Raumbeobachtung und Stadtmonitoring | 2022;  
<https://raumanalyse.brandenburg.de/rm-be-bb/?page=Bev%C3%B6lkerungsdichte-2020&views=2.3.4-Lokalisierung%2CLegende>

## 2. Local background: Status quo of water reuse adoption in Berlin-Brandenburg

- Despite its potential, water reuse is not yet widely adopted due to unresolved uncertainties and governance gaps.
- High level of uncertainty: Open questions regarding regulation, health risks, economics, and public acceptance
- Role of research: These uncertainties are currently addressed primarily through research and pilot projects

### Focus on applied research as a prerequisite for scaling water reuse



### 3. Stakeholders

#### Local decision makers

- Facilitate safe & sustainable water management
- Ensure resource protection

#### Water utilities

- Ensure safe, sustainable (& economic) water supply & disposal

#### Associated organizations

- Support interests of target group
- Mapping of regional water reuse activities

#### Potential end-users

- Ensure economic & safe water supply

- **Senatsverwaltung Berlin für Mobilität, Verkehr, Klimaschutz & Umwelt (SenMVKU)**
- Ministerium für Landwirtschaft, Umwelt & Klimaschutz Brandenburg (MLUK)
- Landesamt für Umwelt (LfU)
- Gesundheitsämter (Public health authority)
- Pflanzenschutzamt Berlin (Plant protection authority)
- Senatsverwaltung für Justiz und Verbraucherschutz
- Local politicians & political parties

- Berlin: **Berlin Water Utility**
- Brandenburg: Organized on a local level in water and wastewater associations



- German Environment Agency
- Chambers of Commerce & Industry Berlin & Brandenburg
- Landeswasserverbandstag Brandenburg e.V.
- Universitys: e.g. Technical University of Berlin
- **Berlin Partner**
- Julius Kühn Institute
- Standardization bodies: DIN ISO, DWA, VDI, DVGW
- Brandenburgische Wasserakademie
- Fachverband Bewässerungslandbau Mitteldeutschland e.V.

- Industry & businesses
- Public companies: e.g. municipal disposal company (BSR)
- Districts and municipalities

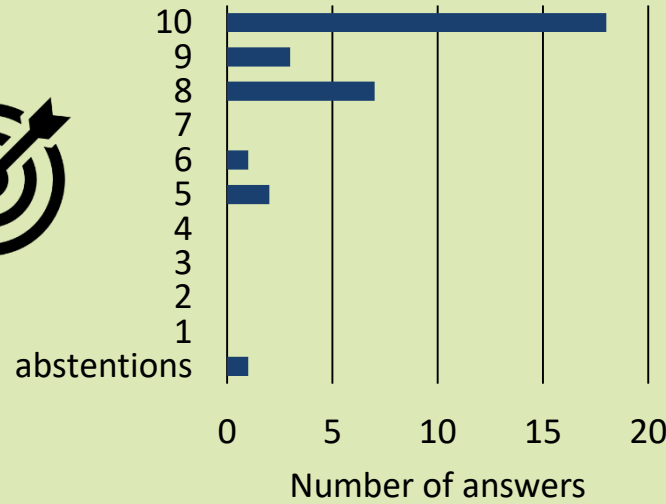


## 4. Survey

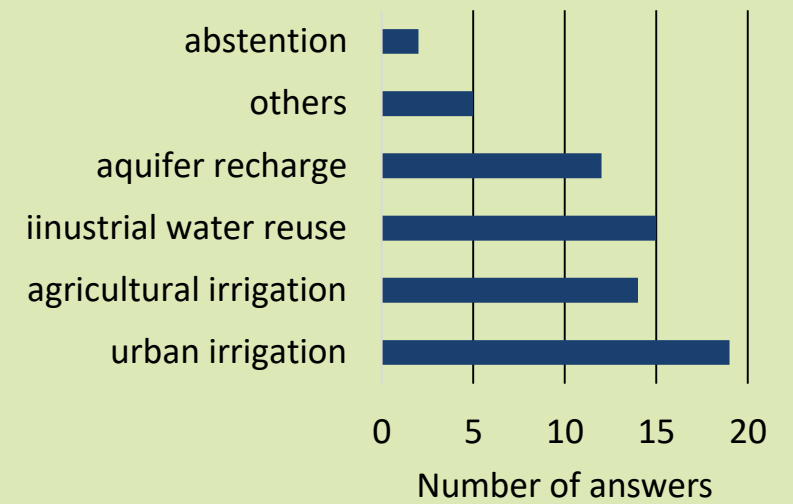
- Survey excerpt from local stakeholder event, Potsdam, November 2024 (n=32)
- More than 80% of participants work in Berlin and/or Brandenburg



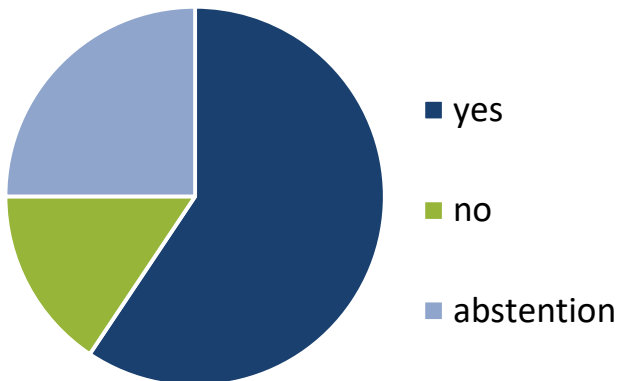
How interesting is water reuse for your work and region?



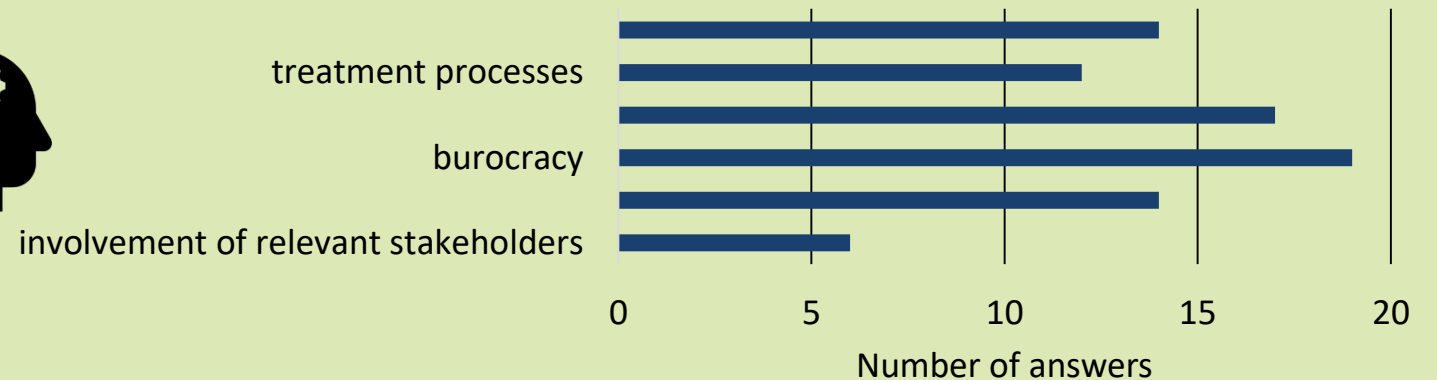
Which type of water reuse is most interesting for your region?



Are you considering implementing water reuse?



What are the main challenges for you in the context of water reuse



# 5. Mapping of documents



1



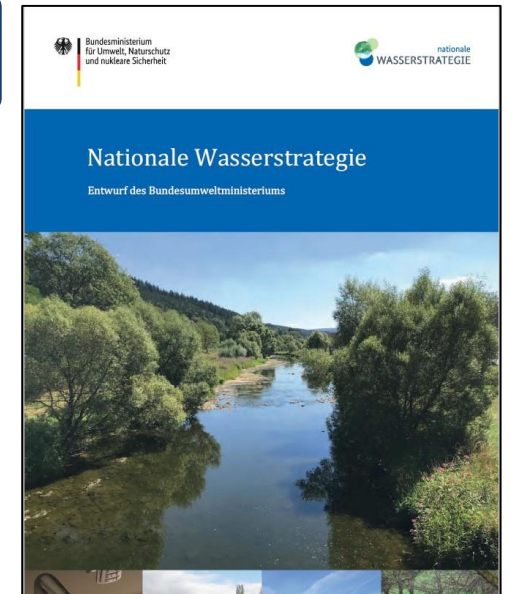
2



3



4



## 6. Best practices

### Treated Municipal Wastewater Reuse in Terneuzen (The Netherlands)<sup>1</sup>

- A cooperation between chemical industry (Dow Terneuzen) & the local water company
- Water Source: Secondary effluent from the WWTP Scheldestromen
- Further Treatment by: Evides
- Treatment: Reverse Osmosis
- Reuse Application: Cooling tower process



### Upcoming: Nordenham (Germany)

- Cooperation of OOWV and KRONOS TITAN to reuse treated municipal wastewater from 2026, reducing drinking water demand by up to 500,000 m<sup>3</sup>/year



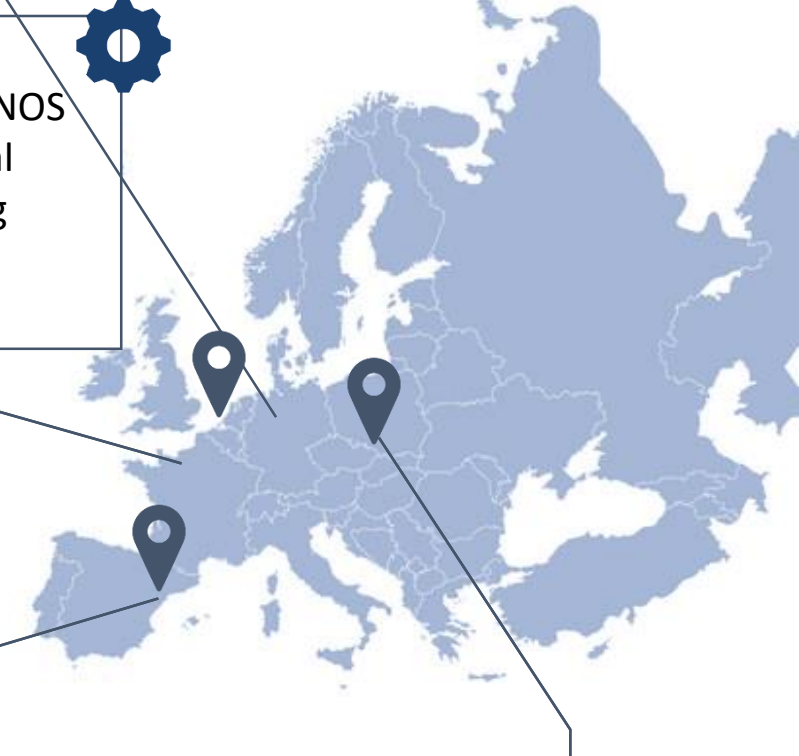
### Reuse of treated wastewater in Katowice (Poland)<sup>3</sup>

- Effluent flow 1,500,000 m<sup>3</sup>/y
- advanced treatment: microfiltration
- Reuse application: cooling tower



### Camp De Tarragona Water Reclamation Plant (Spain)<sup>2</sup>

- Water source: Secondary Effluent from Tarragona and Vilaseca-Salou wastewater treatment plants
- Treatment capacity: Average of 19,000 m<sup>3</sup>/d (Phase I)
- Further extension: 29,000 m<sup>3</sup>/d (Phase II) and 55,000 m<sup>3</sup>/d (Phase III)
- Reuse Application: cooling water for Tarragona Chemical Complex & boiler feed water at cogeneration power plant



<sup>1</sup><https://corporate.dow.com/content/dam/corp/documents/science-sustainability/066-00202-01-industrial-water-reuse-case-study.pdf>, <sup>2</sup>Sanz et al., 2015, doi: 10.2166/ws.2014.114, <sup>3</sup>Ramm et al., 2024, <https://doi.org/10.1016/j.jenvman.2024.120890>

## 7. Water reuse activities in Berlin-Brandenburg

- WaterMan – Feasibility study in Ruhleben and Stahnsdorf
- Pu2R – Decentralized water reuse for agricultural irrigation
- Flexility – Water reuse for agricultural irrigation
- TrinkWave Transfer – Full-scale sequential groundwater recharge
- IWIQ – Real world piloting of greywater recycling
- BWB: Treated wastewater is used to restore nature: in Hobrechtsfelde (Berlin), ~4,900 m<sup>3</sup>/day of effluent from Schönerlinde WWTP rehydrates former fields into a biodiverse green area

## 8. Core measures & activities: The KWB perspective



## 8. Core measures & activities

1. Knowledge  
generation

Capacity  
building and  
training

Stakeholder  
engagement  
and co-  
creation

Policy support  
and evidence  
based  
guidance

Communicatio  
n and public  
outreach

Research  
projects  
(national and  
international)

## 8. Core measures & activities

1. Knowledge generation

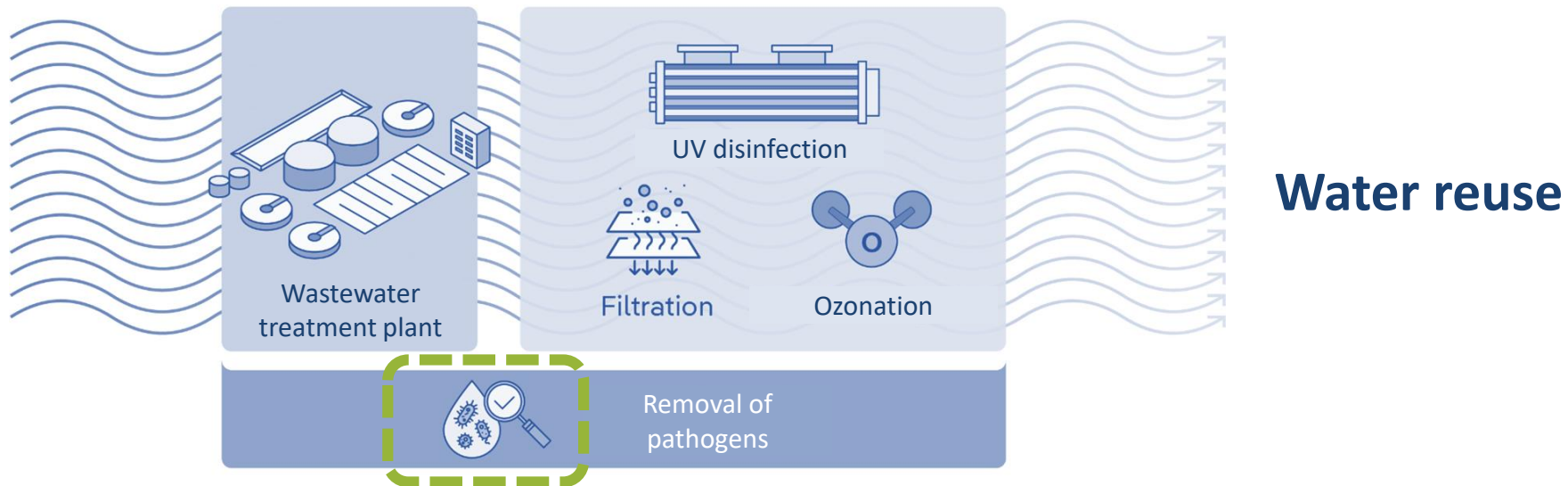
Capacity building and training

Stakeholder engagement and co-creation

Policy support and evidence based guidance

Communication and public outreach

Research projects (national and international)



## 8. Core measures & activities

1. Knowledge generation

Capacity building and training

Stakeholder engagement and co-creation

Policy support and evidence based guidance

Communication and public outreach

Research projects (national and international)

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LCA workshop

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QMRA Workshop & Tool Update

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Workshop on water reuse, treatment technologies, risk assessment and management

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WaterMan Excursion

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Infographics

## 8. Core measures & activities

1. Knowledge generation

Capacity building and training

Stakeholder engagement and co-creation

Policy support and evidence based guidance

Communication and public outreach

Research projects (national and international)



Stahnsdorf

## 8. Core measures & activities

1. Knowledge generation

Capacity building and training

Stakeholder engagement and co-creation

Policy support and evidence based guidance

Communication and public outreach

Research projects (national and international)



Stricter requirements compared to EU regulation

# 8. Core measures & activities

1. Knowledge generation

Capacity building and training

Stakeholder engagement and co-

Policy support and evidence based

Communication and public outreach

Research projects (national and international)



Direct communication

Special: Regenwasser

Pia Schumann; Eliza Rose

## Regenwasser als alternative Wasserressource im Ostseeraum

Im EU-Projekt WaterMan drehen sich alle Aktivitäten um die Wasserwiederverwendung als ein neues Element des Wassermanagements. Erste Anwendungsbeispiele aus Schweden, Lettland, Litauen und Polen zeigen, wie Regenwasser hilft, Trinkwasserressourcen zu schonen.



Bild 1 Beispiel Vasterik (Schweden): Ein Regenrückhaltebecken auf Granleby wird aus einem 10 ha großen Einzugsgebiet gespeist und dient der Bewässerung städtischer Flächen. Quelle: Andrijauskas

tigt werden sollten. Gegebenenfalls sollte eine Behandlung eingeplant werden, um eine sichere Wiederverwendung zu gewährleisten.

### Synergien im Ostseeraum

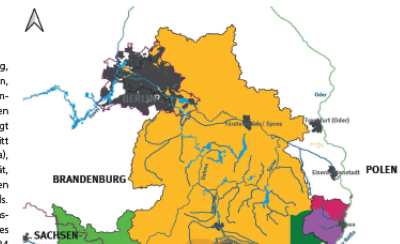
Das EU-geförderte Interreg-Projekt WaterMan demonstriert im Ostseeraum, wie solche Synergien entstehen. Die Kombination aus Klimaanpassung, Bildungsinitiativen und innovativem Wassermanagement eröffnet dabei neue Perspektiven für eine klimaresiliente Wasserwirtschaft. Im Unterschied zu den üblichen deutschen Standards wird hier der Begriff Wasserwiederverwendung breiter gefasst: Neben ge-

Wasserbewusstste Stadt

Eliza Rose; Pia Schumann

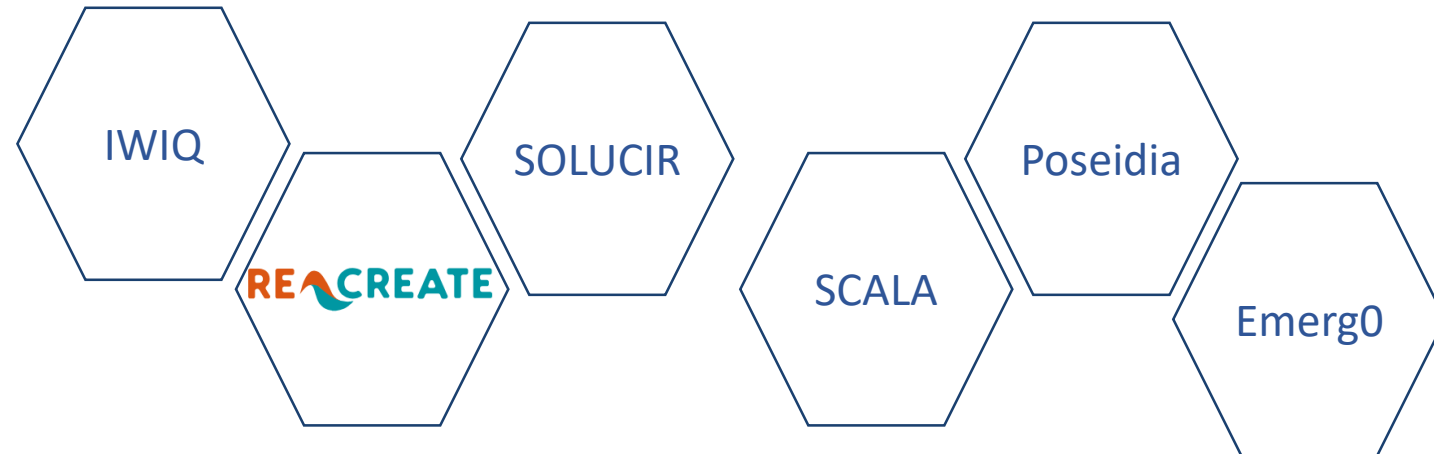
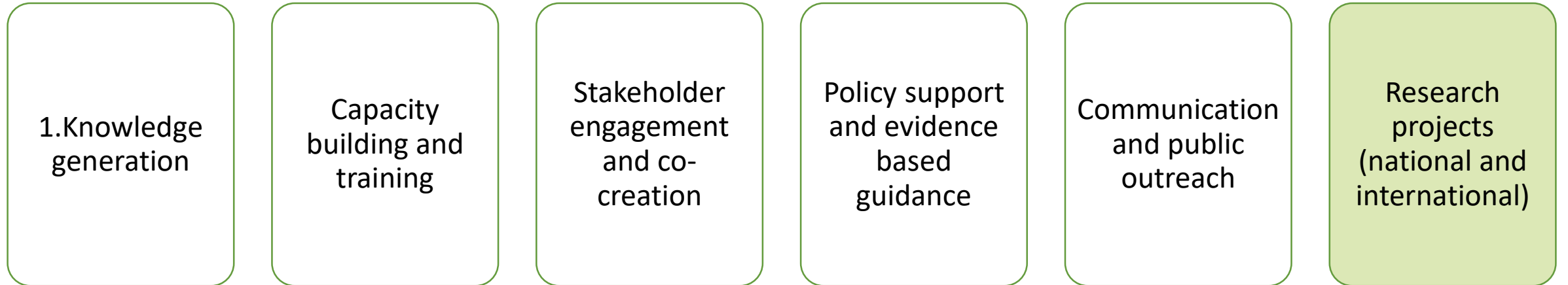
## Wasserwiederverwendung in der Hauptstadtregion als Strategie

Wie kann die Wasserwiederverwendung in Städten effizient umgesetzt werden? Das Projekt WaterMan widmet sich dieser Frage und fördert den lokalen Kapazitätsaufbau im Ostseeraum. Am Beispiel Berlin-Brandenburg werden die Potenziale der Wiederverwendung von aufbereitetem Abwasser untersucht.



Die Metropolregion Berlin-Brandenburg, in der knapp 6,4 Mio. Menschen leben, steht vor großen Herausforderungen hinsichtlich einer sicheren und klimaresilienten Wasserversorgung. Die Region ist geprägt durch weit unter dem Bundesdurchschnitt liegende Niederschläge (< 600 mm/a), Sandböden mit geringer Wasserkapazität, zunehmende Hitzeperioden und wachsenden Wasserbedarf aufgrund des Klimawandels. Die Oberflächengewässer und Grundwasserspiegel sinken langfristig, auch wenn es durch ungewöhnlich feuchte Jahre wie 2024

## 8. Core measures & activities



## 8. Core measures & activities: Building trust for scaling water reuse through local action and collaboration

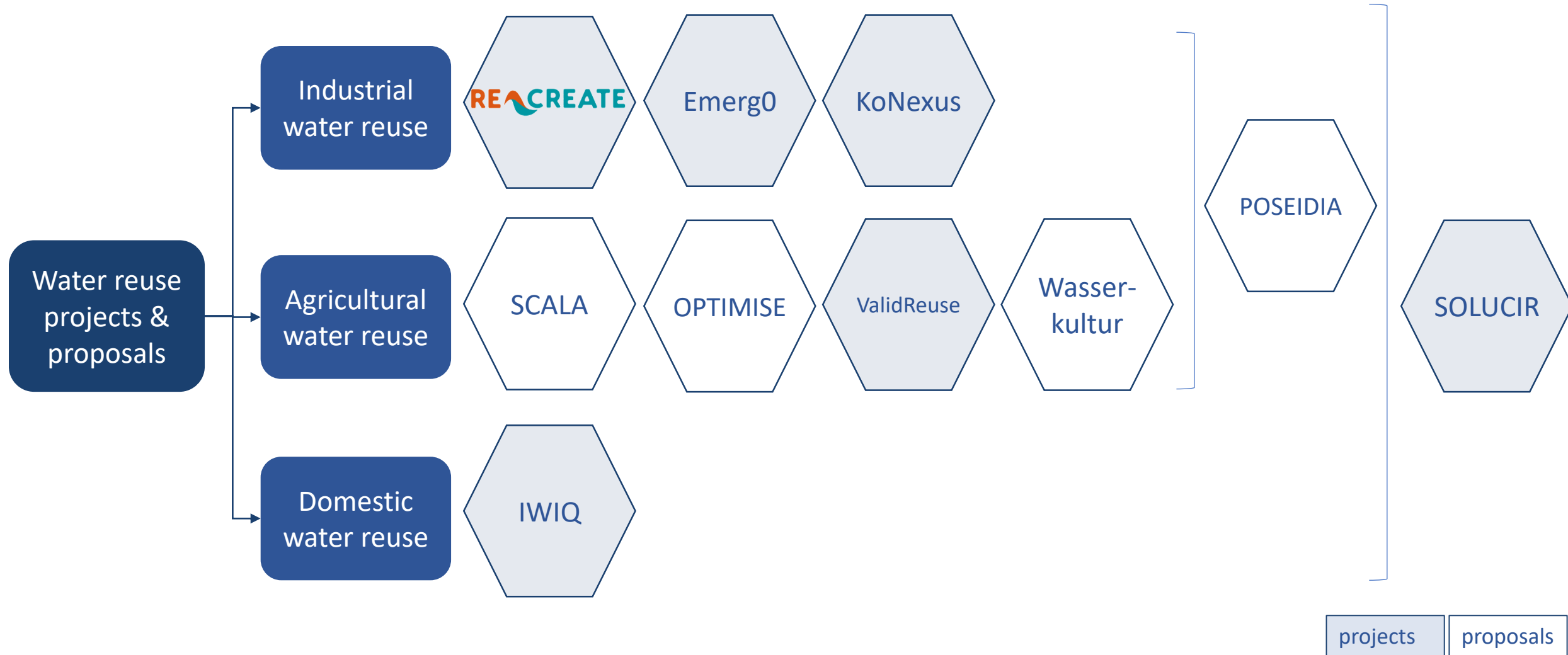
- **Lighthouse projects** at local level: Demonstration projects create continuity in water reuse
- Key enabling factors: **Trust, time, and transparency**, achieved through long-term, visible projects
- **Support through collaboration**: WaterMan supports project development through exchange



### Governance challenge:

- The joint regional water strategy of Berlin & Brandenburg has been discontinued since early 2025
- No ongoing dialogue to contribute to is currently available

## 8. Core measures & activities: KWB projects and proposals



## 9. Process

- Strategy developed by KWB's Water Treatment and Reuse team
- Continuous input from BWB, regulatory authorities (UBA, Berlin Senate, Brandenburg water authorities) and other stakeholders shaped focus and priorities





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The „BSR Water Recycling Toolbox” was elaborated as part of the WaterMan project, which is co-financed by the European Union (European Regional Development Fund) and implemented within the Interreg Baltic Sea Region Programme. More information:

[eurobalt.org/WaterRecyclingToolbox](http://eurobalt.org/WaterRecyclingToolbox)

[interreg-baltic.eu/project/waterman](http://interreg-baltic.eu/project/waterman)

WaterMan promotes a Baltic Sea Region-specific approach to water recycling, which makes use of the alternation of too much and too little water that has become typical for humid areas in the EU to strengthen the resilience of local water supply. Building on this approach, the project supports municipalities and water companies in adapting their water supply strategies.

*The contents of „BSR Water Recycling Toolbox” are the sole responsibility of the authors and can in no way be taken to reflect the views of the European Union, the Managing Authority or the Joint Secretariat of the Interreg Baltic Sea Region Programme.*

