



KOPPLUNG VON  
REGENERATIVER  
ENERGIEGEWINNUNG MIT  
INNOVATIVER  
STADTENTWÄSSERUNG

b.is<sub>water</sub>

# (Re)Use options for grey water in a German urban quarter

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GEFÖRDERT VON

Bundesministerium  
für Bildung  
und Forschung



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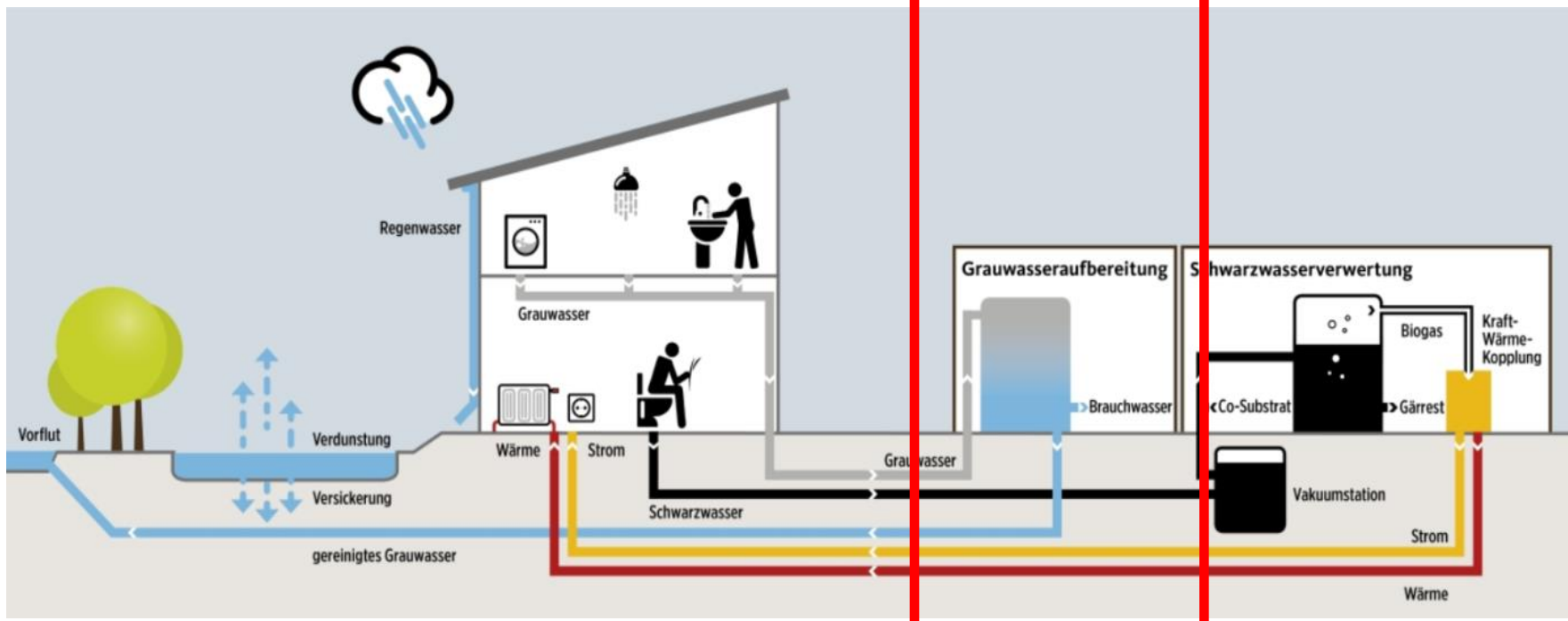
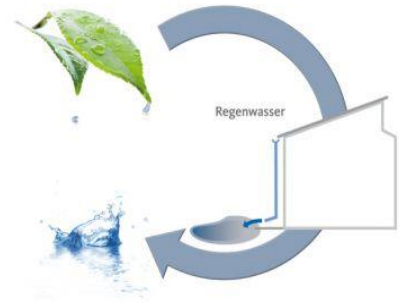
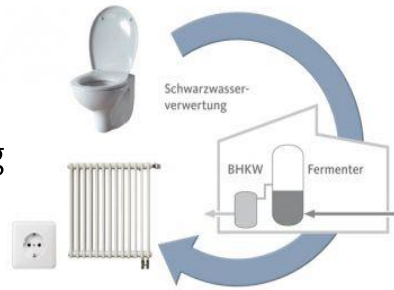
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  - grey water compounding
  - volume flow
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# Background



## KREIS

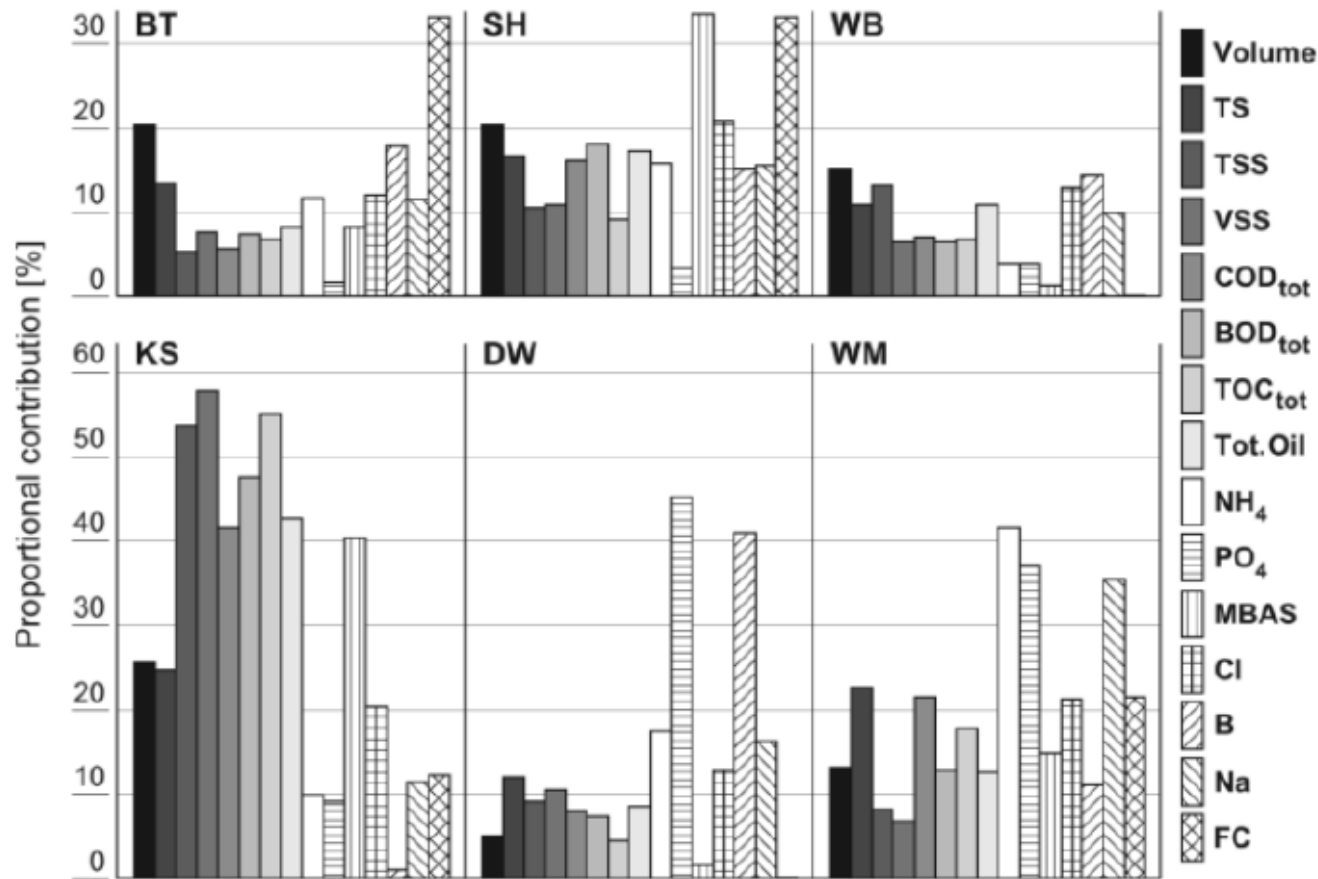
Versorgung durch Entsorgung



Bauhaus-Institute for Infrastructure Solutions (b.is)  
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# Challenges for grey water (re)use (1)

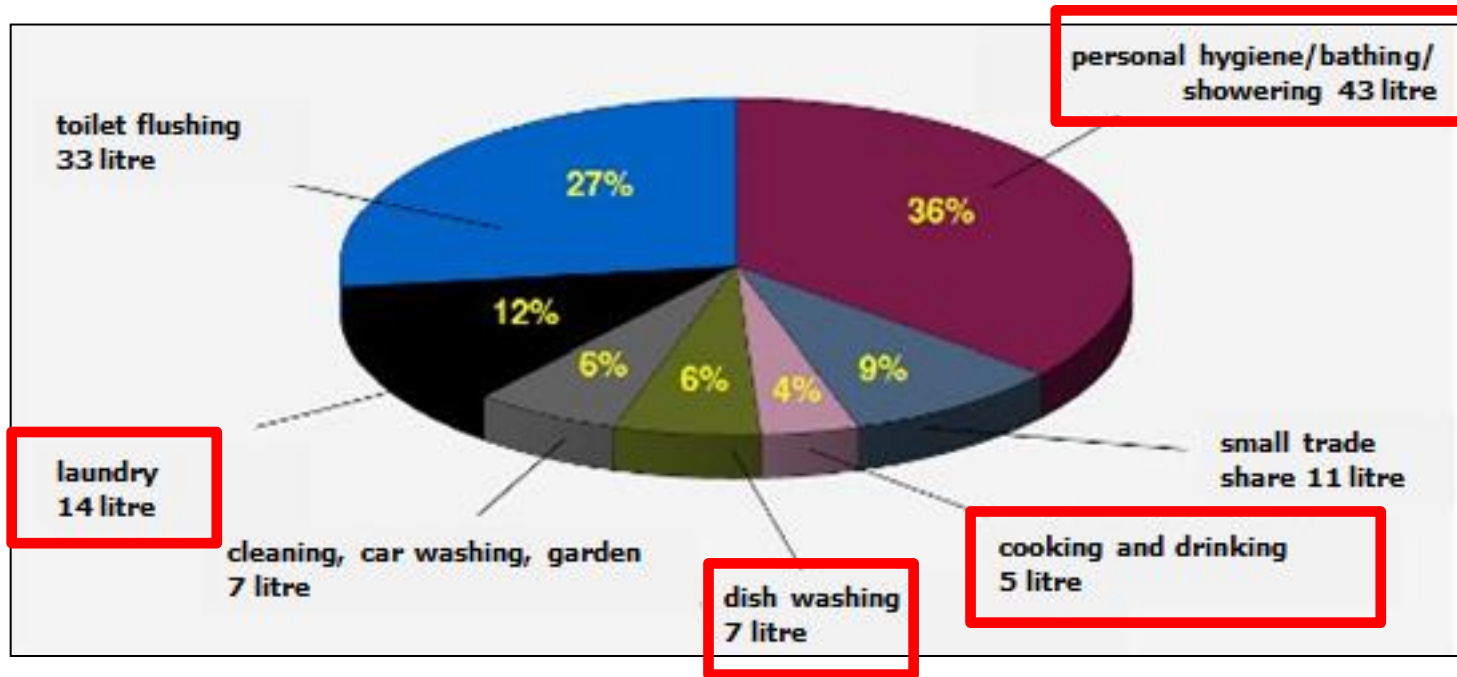
- less pollution with organic matters and nutrients
- more suitable for high quality reuse



Source: LARSEN ET AL. 2013

# Challenges for grey water (re)use (2)

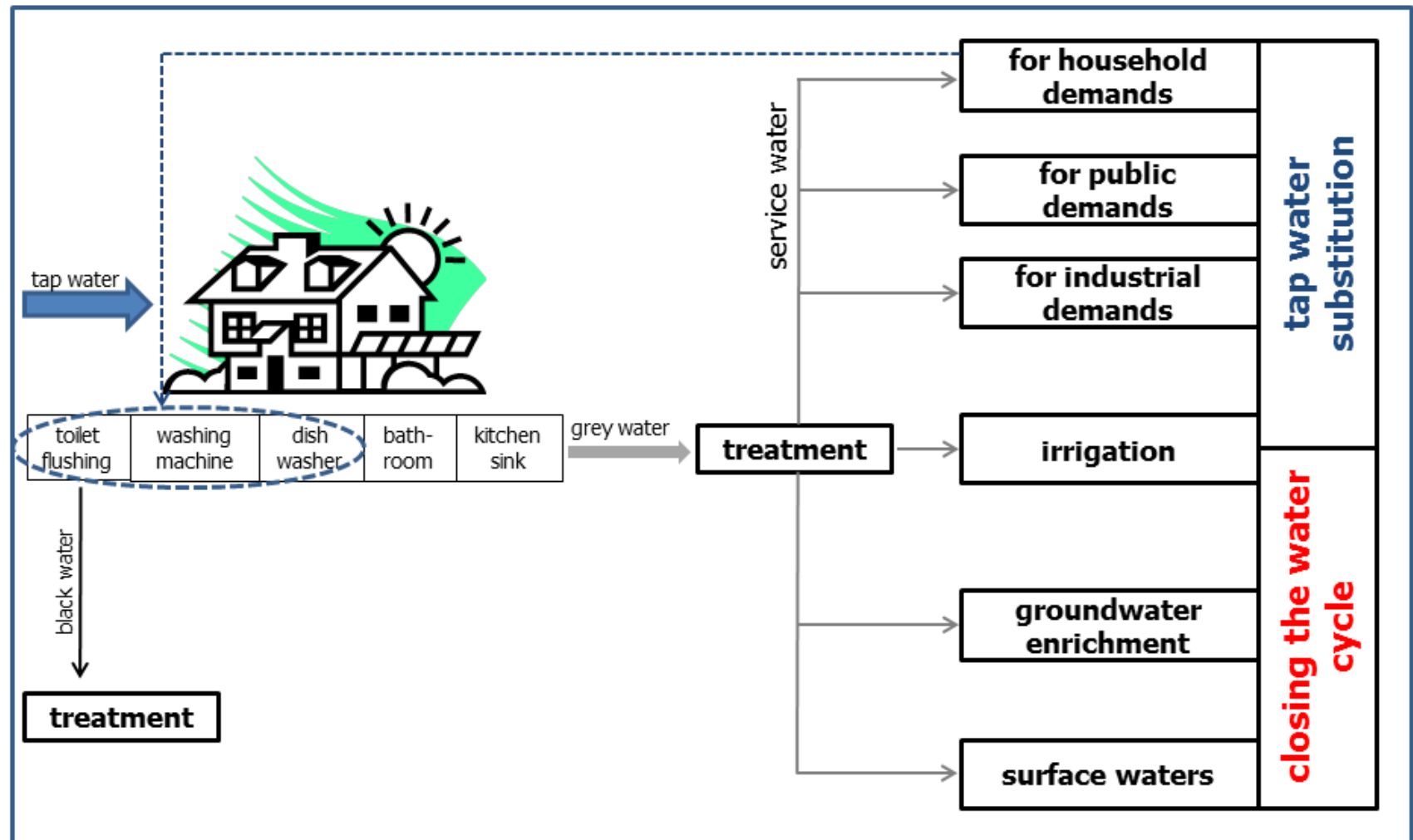
- constant daily volume flow
- reliable availability



Source: BDWE 2014

→ 69 litres per capita and day

# Grey water (re)use options in a German context



➔ additionally: usage for heat recovery or cooling

# Example of *Jenfelder Au* quarter (1)

- planning status: 720 accommodations, 610 HWC  
→ grey water volume flow: 127 m<sup>3</sup>/d
- grey water use in the quarter itself or in directly adjoining areas (distance < 2 km)
- household demands: toilet flushing, laundry, dish washing
- industrial demands: car washing site, hotels, laundry centre, office buildings
- public demands: fire fighting, street cleaning, sewer flushing, irrigation of public areas
- closing the water cycle: discharge in surface waters

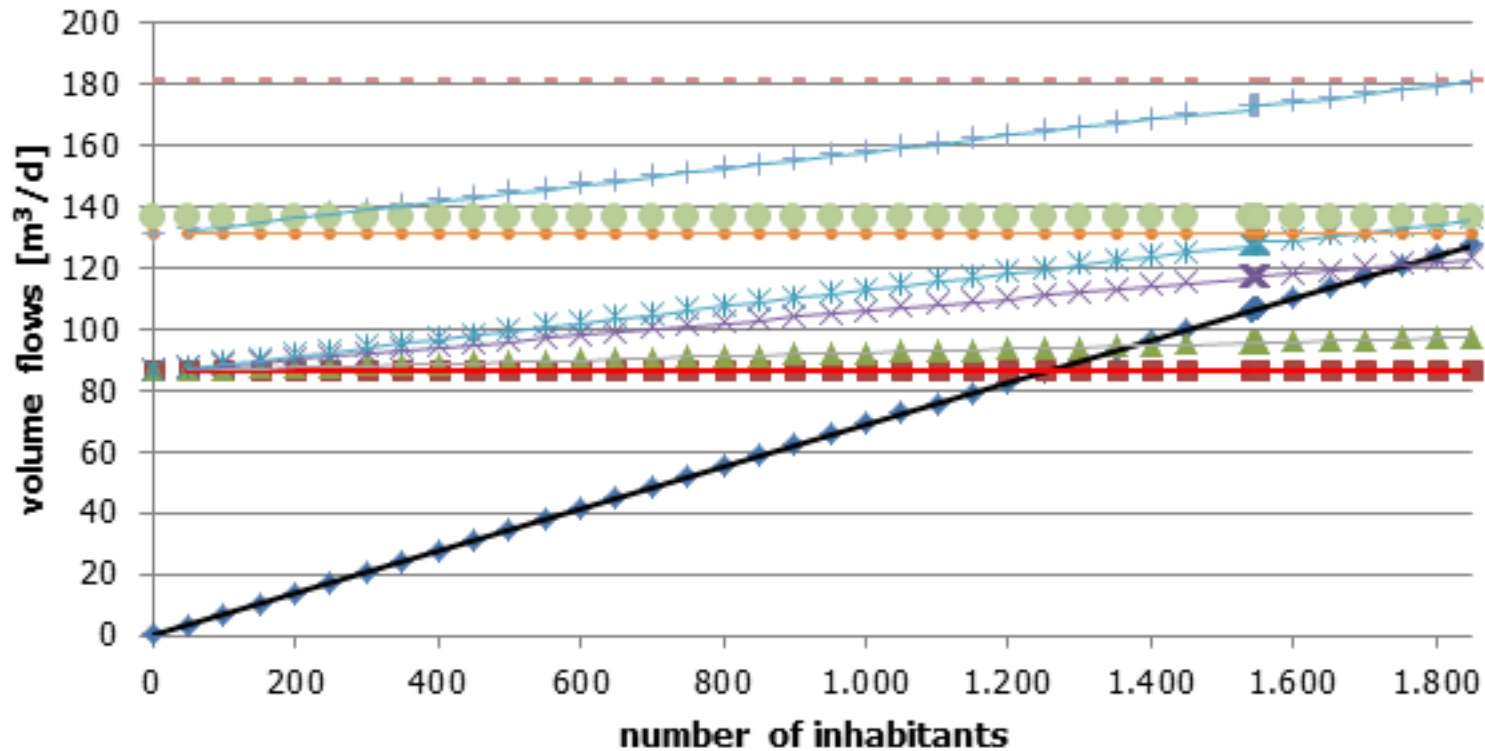
# Example of *Jenfelder Au* quarter (2)

	<i>Rahlau</i>	toilet flushing	laundry	dish washing	street cleaning	car washing site
scenario 1	X					
scenario 2	X	X				
scenario 3	X	X	X			
scenario 4	X	X	X	X		
scenario 5	X				X	
scenario 6	X	X	X	X	X	
scenario 7	X				X	X
scenario 8	X					X

→ anyhow: receiving stream is necessary



# Example of *Jenfelder Au* quarter (3)



◆ grey water ■ Scenario 1 ▲ Scenario 2 × Scenario 3 ✖ Scenario 4  
 ● Scenario 5 + Scenario 6 - Scenario 7 ● Scenario 8

	Rahlau	toilet flushing	laundry	dish washing	street cleaning	car washing site
scenario 1	X					
scenario 2	X	X				
scenario 3	X	X	X			
scenario 4	X	X	X	X		
scenario 5	X				X	
scenario 6	X	X	X	X	X	
scenario 7	X				X	X
scenario 8	X					X

# Conclusion and outlook

- new sanitation concepts need use options for grey water
- potential of grey water for (re)use is a challenge at once
- a lot of (re)use options are conceivable, but their adaptability must be surveyed
- a lot of questions left focussing social issues, economic issues, system boundaries, knowledge transfer, juridical issues
- a lot of research questions have to be answered

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