Water and Environment Support
in the ENI Southern Neighbourhood region

Regional training on Water Demand Management

RW-3-REG Training Module 4: Implementing WDM (Part I)

10 February 2022, Videoconference

Presented by:

- Antony Gibson, Water Security and Efficiency Expert, Ramboll
- Cor Merks, Strategic Water Asset Planning Expert, Ramboll
- Seta Tutundjian, Founder and CEO Thriving Solutions LLC
- Thomas Barden, Strategic Asset Planning Lead, Severn Trent Plc

Supported by Andreea Florea, Arthur Streller and Fantine Hureau

Coordinated by Ms. Susan Taha, Key Water Expert, WES

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RAMBOLL

WONDERFUL ON TAP

SEVERN TRENT

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Welcome and explanation of today's programme

Welcome by Ms. Susan Taha

Explanation of today's programme: Cor Merks

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Training Module 4 programme Athens time (CET+1)

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09:30-09:40	Welcome and explanation of today's programme
09:40-10:05	Presentation "Pricing and economic tools for WDM" (incl. Q&A)
10:05-10:30	Presentation "Water security and efficiency planning" (incl. Q&A)
10:30-11:00	Presentation "Instituting water demand management in Jordan" Seta Tutundjian, Founder and CEO Thriving Solutions LLC
11:00-11:15	Short break (no breakout room sessions)
11:15-11:45	Presentation "Stakeholder management relating to WRM/WDM" Thomas Barden, Strategic Asset Planning Lead – Water Resources, Severn Trent Plc
11:45-12:05	Discussion "Role and responsibilities as a WDM manager" (Have your smart phone available for Mentimeter)
12:05-12:30	Presentation "Benchmarking" (incl. Q&A)
12:30-13:00	Plenary Kahoot! quiz, discussion and closure of Training Module 4

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Pre-training test Training Module 4 (1)

1. What are the most important stakeholders for water supply in your country?
   - Residential sector?
   - Commercial sector (tourism)?
   - Industrial sector?

2. Are roles and responsibilities of stakeholders well-defined?
   - Roles (yes/no)?
   - Responsibilities (yes/no)?
   - Participation in benchmarking (yes/no)?
   - Contribution to education (yes/no)?
   - Contribution to awareness-raising (yes/no)?

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Pre-training test Training Module 4 (2)

3. What are national enablers or hurdles for successful implementation of WDM interventions?
   - Current economic policy?
   - Current tariff and tariff structure?
   - Current regulatory framework?
   - Current technological setup?
   - Current environmental setup?

   (enabler/partially enabler/hurdle)

4. What is the current tariff and tariff structure?
   - Fixed (yes/no)?
   - Variable (yes/no)?
   - Block rates (yes/no)?
   - Seasonal rates (yes/no)?
   - Current fixed fee: …… (per connection)
   - Current variable tariff: …… (per m^3)

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Presentation “Pricing and economic tools for water demand management”

Cor Merks and Fantine Hureau

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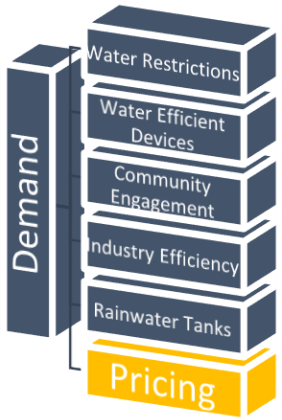
Pricing and economic tools for WDM



Price (tariff) structures are being modified to create water saving incentives and cost recovery

Caution needed!

- Take account of other national interests or policies
- Be competible with user incomes
- Cost must not exceed benefits, especiall in terms of water saving
- Not a single, bespoke solution

This short presentation:

- Tariff and tariff structure
- Economic tools
- Monthly utility bills with information as outreach tool

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Objectives of tariff structure design

- Primary:
  - Cost recovery
  - Economic efficiency
  - Affordability & equity
- Secondary:
  - Environmental sustainability
  - Promoting access
  - Quality of service

Consider the attributes

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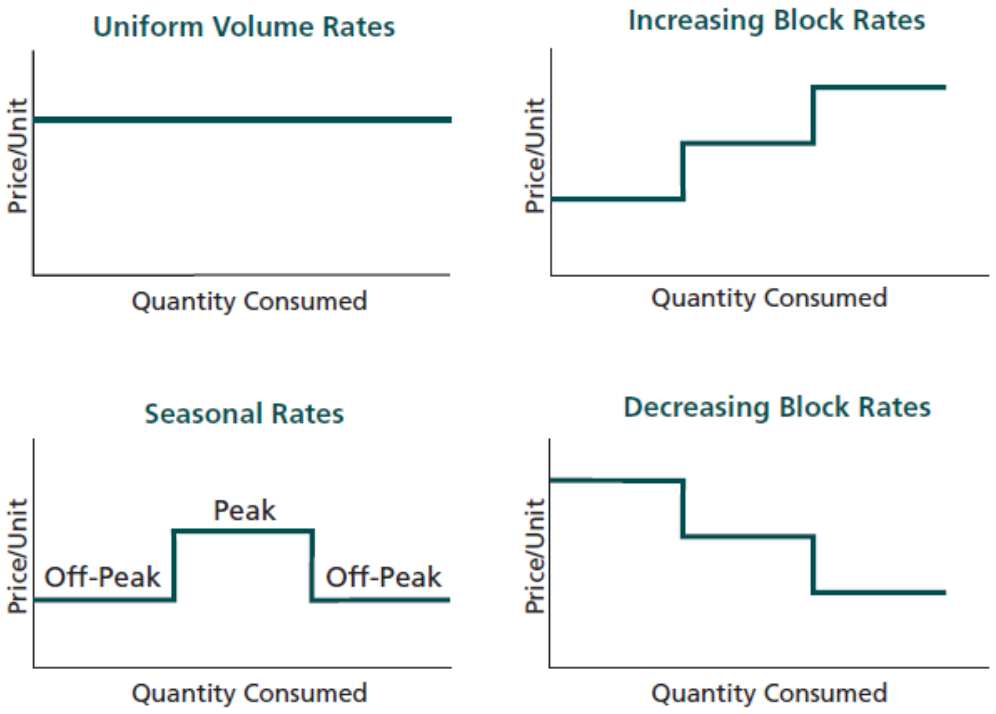
Tariff structures



- Fixed tariff per unit (or: Uniform Volume Rates)
- Block rates
  - Increasing (or: over-consumption penalties)
  - Decreasing
- Seasonal rates

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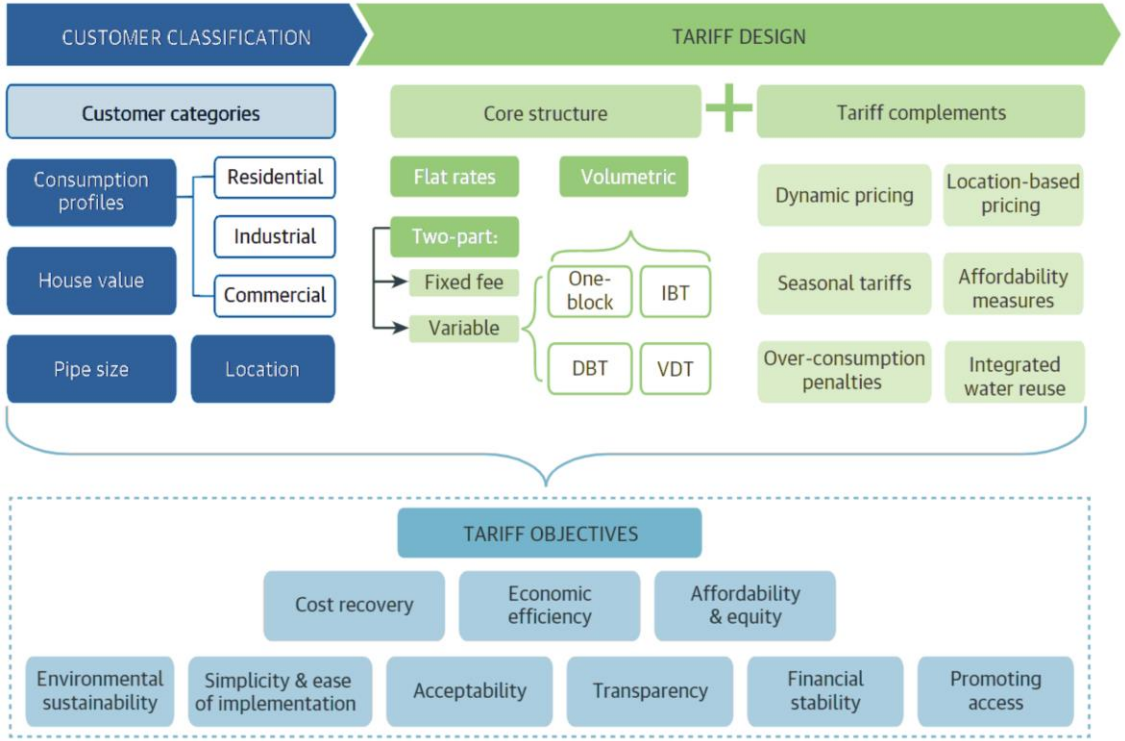
Tariff structure design

Main Steps in defining tariff structure:

- Classify customers in categories
- Select core tariff structure
- Apply tariff complements

Factors influencing tariff structure:

- Identifying and calculating costs
- Calculating consumption tariffs and connection charges
- Pursuing efficient cost recovery
- Financial analysis
- Economic efficiency



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How do tariff structures meet objectives?

Tariff Structure	Cost Recovery	Objectives		Affordability
		Economic Efficiency	Equity	
Fixed Charge	***Adequate*** Provides stable cash flow if set at appropriate level, but utility may be vulnerable to resale of water and spiraling consumption.	***Poor*** Does not send a message about the cost of use of additional water.	***Poor*** People who use large quantities of water pay the same as those who use little.	***Adequate*** If differentiated by ability to pay, but households are unable to reduce their bills by economizing on water use.
Uniform Volumetric Charge	***Good*** If set at appropriate level, moreover revenues adjust automatically to changing consumption.	***Good*** If set at or near marginal cost of water.	***Good*** People pay according to how much they actually use.	***Good*** Can be differentiated by ability to pay, and people can limit their bills by reducing consumption.
Increasing Block Tariff	***Good*** But only if the size and height of the blocks are well designed.	***Poor*** Typically little water is actually sold at marginal cost.	***Poor*** People do not pay according to the costs their water use imposes on the utility.	***Poor*** Penalizes poor families with large households and/or shared connections.
Decreasing Block Tariff	***Good*** But only if the size and height of the blocks are well designed.	***Poor*** Typically little water is actually sold at marginal cost.	***Poor*** People do not pay according to the costs their water use imposes on the utility.	***Poor*** Penalizes poor families with low levels of consumption.

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Tariff structure design – case CCT

Objective: Introduce more equitable tariffs and informative billing

- Revise Water Services tariffs and structure
  - Carry out a study to develop the most appropriate tariff structure for the next ten years, considering price elasticity, revenue requirements and various demand scenarios. The study should illustrate the potential future tariff savings due to the financial savings that WC/WDM can achieve.
  - Revise annually tariff rates according to financial planning and marginal cost rates
  - Publicize new tariffs
- Introduce informative billing
  - Develop a format of informative billing and make the necessary changes to the billing system
  - Implement a pilot phase of informative billing
  - Roll out informative billing to all clients
- Monitor demand and inform consumers of large deviations
  - Create a reporting system
  - Generate letters and post on a monthly basis
  - Monitor trends and follow up telephonically
- Introduce and insurance scheme to consumers for unknown leaks
  - Cary out initial research and develop a ToR for a tender process and appoint suitable company / companies
  - Market the scheme to all consumers (sent letters)
  - Develop a tariff levy and adapt changes to the Water Services bill to reflect the extra charge
  - Appoint and monitor the performance of the insurance company

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Economic tools – Examples (1)

- Often seen as the tools of choice for integrated water management
- Relatively little use is made of economic tools in the Mediterranean
- Water pricing should play a significant role in the recovery of costs
- Other tools, are much less widespread, or are used jointly with pricing
- In some countries the pricing system includes incentives. These seek balanced management of the resource
- Subsidies for the deployment of equipment which use less water

Type of tool	Examples of countries concerned	Degree of incentive to save water
Pricing	Nearly all Mediterranean countries	Tool prioritises recovery of water utility costs, but may lend an incentive to water saving. Incentive varies according to tariff structure and price level (see Table 5).
Quotas	Cyprus, France, Israel	Set a consumption limit which cannot be exceeded, without encouraging water saving within the quota limit, unless some special arrangement exists.
Financial aid (subsidies, loans on easy terms)	Cyprus, Spain, France, Israel, Morocco, Syria, Tunisia	Incentives to save water and prevent wastage, through aid in acquiring modern irrigation systems, which save more water, and planting drought-tolerant crops, etc.

Economic tools and water saving incentives for irrigation
Source: GWP (2012), Thivet in CIHEAM-Plan Bleu (2009)

Economic incentives	
• Water pricing and rate-making policies • Tradable water rights • Regional water markets and water banks • Subsidies and rebates to water users	• Cross-subsidization of agricultural conservation • Tax credits and incentives • Penalties for excessive use (quotas) • Privatization of water supply sector

Source: Dziegielewski and Baumann (1992), Dziegielewski et al (1993)

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Economic tools – Examples (2)

Sensitivity of water demand to price:

- Initial level of consumption (consumption band): in the low consumption bands, demand is relatively less sensitive to price because drinking water is essential. The higher bands, meeting non-essential needs, are more price-sensitive
- The amount of price increase imposed
- Feasibility and ease of access to an alternative resource, such as underground water, connection to a network distributing untreated water, or rainwater recovery

Type of tool	Examples of countries concerned	Degree of incentive to save water
Royalties for withdrawals (pollution and resource)	EU Member States, Israel, Morocco, Tunisia	Little incentive to save water, as taxation levels remain low.
Delinking aid from Common Agricultural Policy (reform of 2003).	EU Member States	Delinking should remove any incentive to irrigate under the CAP facilities (concerning areas irrigated for cereal-growing and oil seed plants).
Agri-environmental measures (AEM)	EU Member States	AEMs signal a shortage of the resource in the targeted territories. Voluntary measures. Little impact if not taken collectively at catchment level.
Cross-compliance	EU Member States	Strengthening cohesion between water policies and agricultural policies. Granting agricultural aid subject to a specific obligation to meter water withdrawals.

Economic tools and water saving incentives for irrigation, continued
Source: GWP (2012), Thivet in CIHEAM-Plan Bleu (2009)

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Economic tools – Examples (3)

- Pricing does not have significant effects as industrial water demand seems to be inflexible. Thus the only constraint on tariff adjustment is the issue of industrial competitiveness. This question arises especially for industries which use a lot of water
- As for use in tourism, estimates indicate that drinking water demand is very inflexible in response to price, but there is also quite a large degree of flexibility in income

Sector	Domestic						Industrial	Tourism
Water use band (m3/quarter)	0–20	21–40	41–70	71–150	151+	Total	Not significant	-0,22
Price flexibility	–0.4	–0.006	–0.38	–0.15	–1.47	–0.54		

Flexibility of pricing varies according to the domestic water consumption band in Tunisia
Source: GWP (2012), Hamdane in UNEP/MAP/Plan Bleu (2007)

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Customized monthly reports – PUB examples

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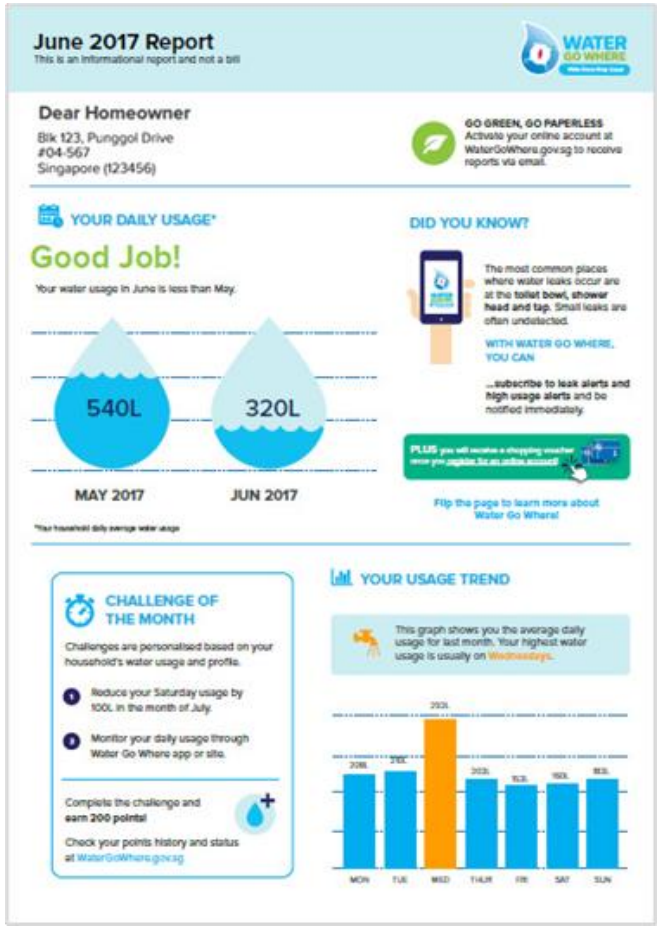

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Questions & Answers

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Water and Environment Support
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Presentation “Water security and efficiency planning”

Antony Gibson and Andreea Florea

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Water security

The capacity of a population to safeguard sustainable access to adequate quantities of acceptable quality water for sustainable livelihoods, human wellbeing and socio-economic development, for ensuring protection against water-borne pollution and water-related disasters and for preserving ecosystems of peace and political stability.

(UN-Water, 2013)

Availability of an acceptable quantity and quality of water for health, livelihoods, ecosystems and production, coupled with an acceptable level of water-related risks to people, environments and economies.

(Grey and Sadoff, 2007)

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Water security and efficiency planning

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Water security is essential to humankind as it supports public health, economic growth, environmental sustainability, political stability and disaster risk reduction.

Water security is the adaptive capacity to safeguard the sustainable availability of, access to, and safe use of an adequate, reliable, and resilient quantity and quality of water for health, livelihoods, ecosystems, and productive economies.

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GDP and water security (1)

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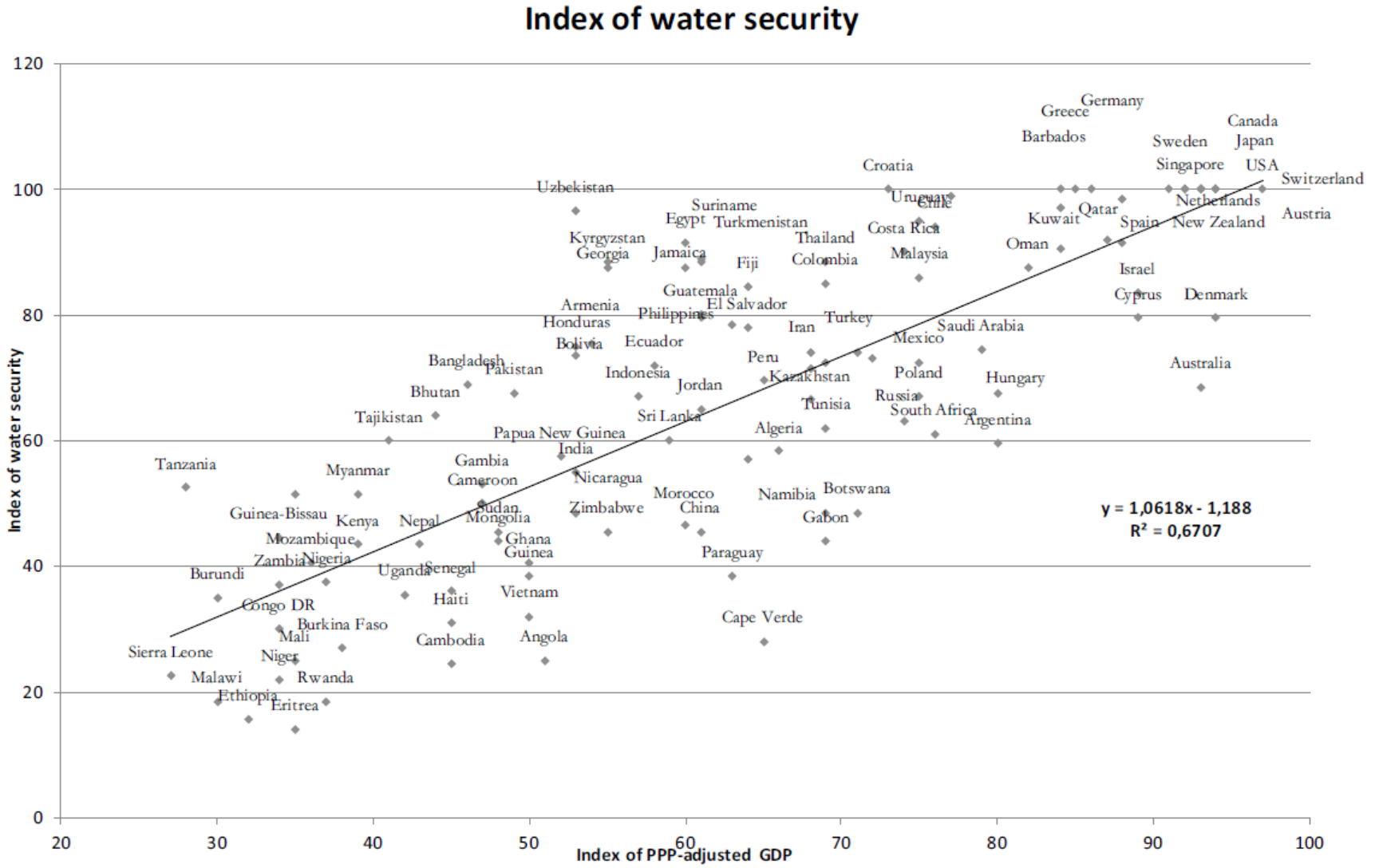

Figure 2. Index of water security

Strong positive relationship between water security and PPP-adjusted GDP (purchasing power parity-adjusted gross domestic product) per person for 147 countries.

Water security is a stronger function of economic development of a country than many other variables such as water availability. In other words – water security grows as GDP grows.

High-income countries: formal water economy

Low-income countries: informal water economy

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GDP and water security (2)

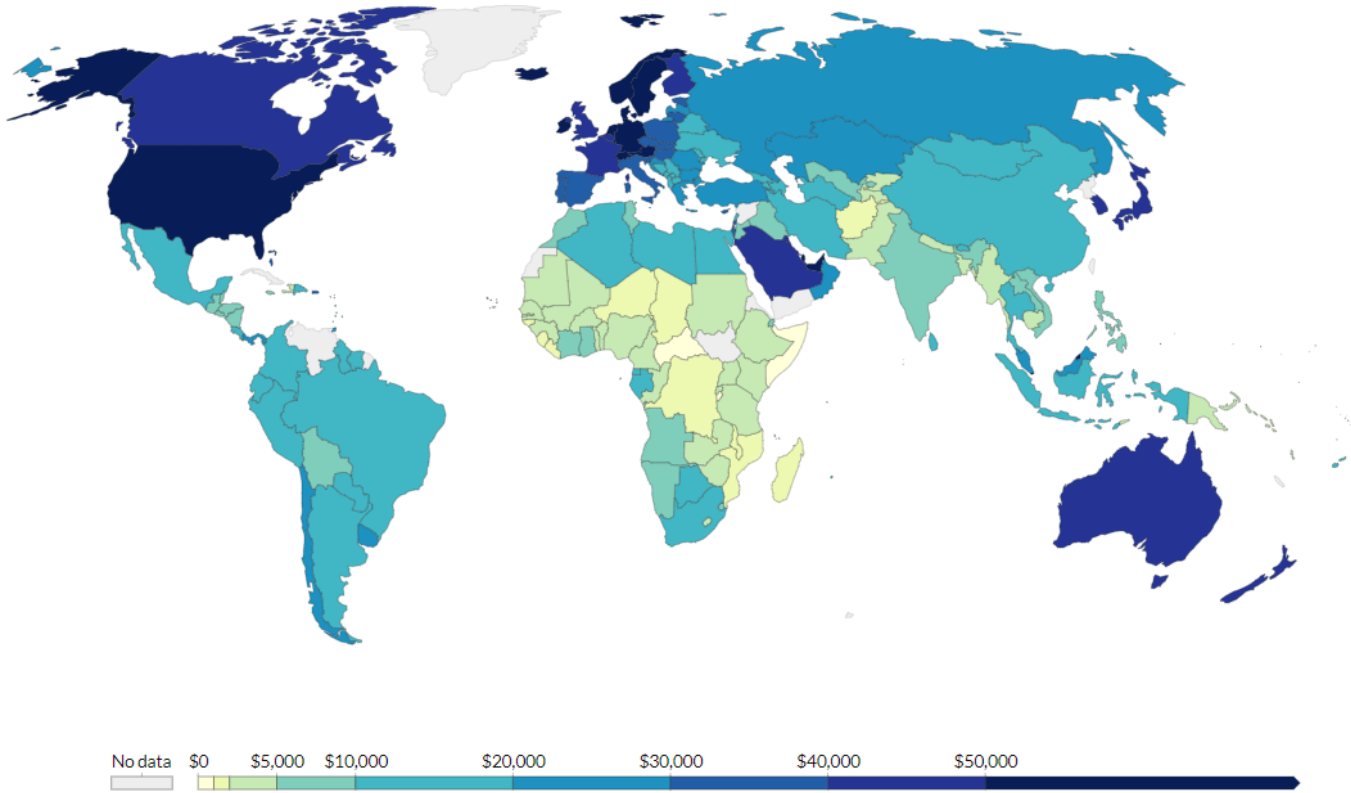
The three pillars of IWRM: Law, Policy, and Administration

Countries in the New World – Australia, Brazil, Canada, New Zealand, and the US – have used water law and property rights to introduce effective water governance.

In fragile economies, where formal water infrastructure and institutions are mostly non-existent, people rely on local and informal water supplies.

The most powerful driver is the overall level of a nation's economic development.

Simplistic but true - rich countries are water secure, no matter how limited their water resources endowment; and poor countries are water insecure, no matter how abundant their water resources.



GDP per capita, 2020
Source: ourworldindata.org, World Bank

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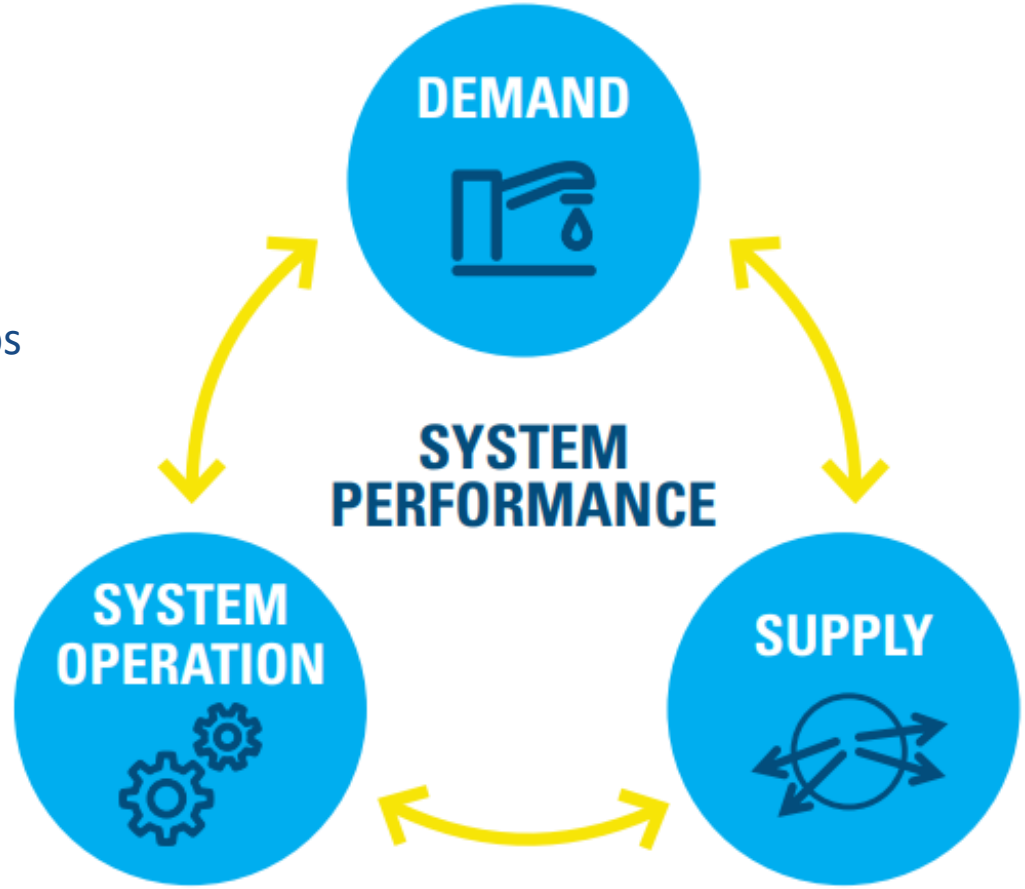
Water security planning (1)

- Understand the system
- Engage with stakeholders
- Determine objectives (consider backcasting, defining a desirable future vision and mapping the steps required to achieve that vision)
- Build scenarios (explore perspectives on potential risks, especially climate)
- Document a system plan
- Implement, monitor and review



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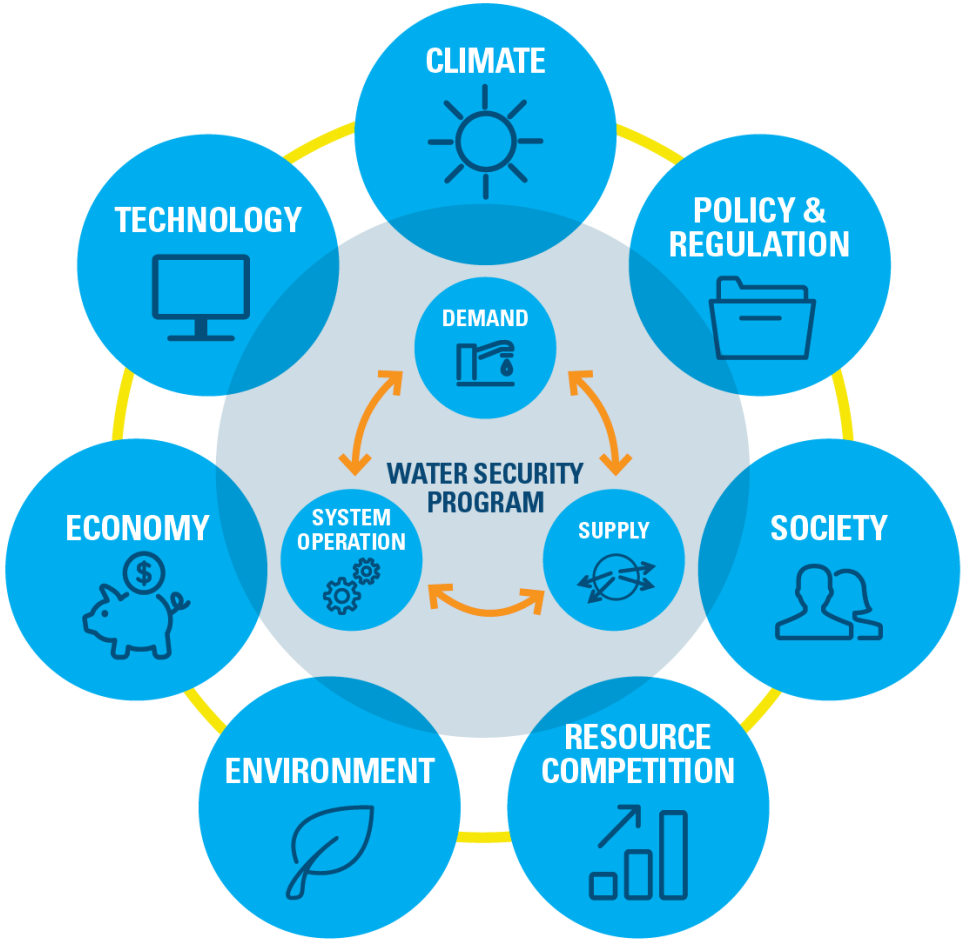
Water security planning (2)

Influencing factors:

- Climate
- Policy and Regulation
- Society
- Resource Competition
- Environment
- Economy
- Technology

Recognize PESTLE!



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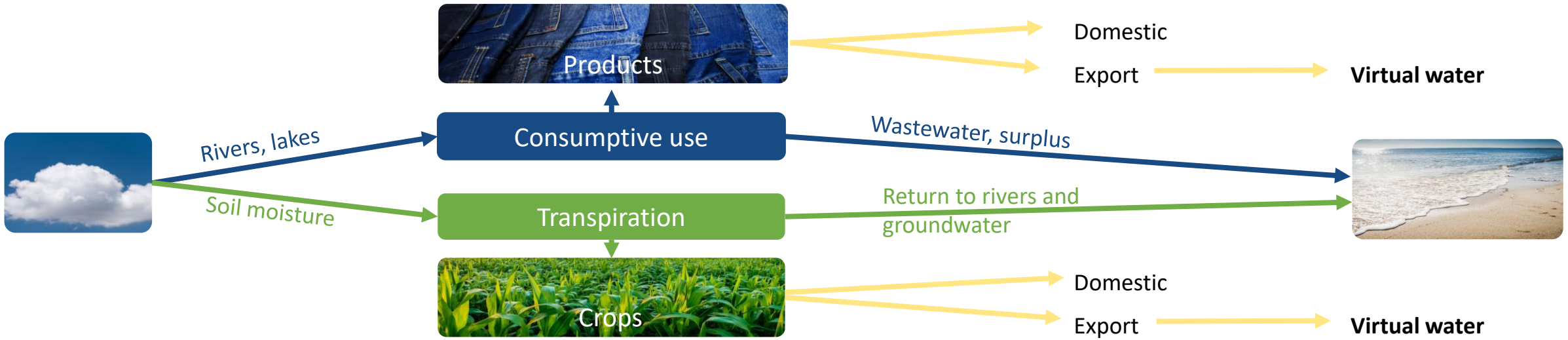
Virtual water (1)



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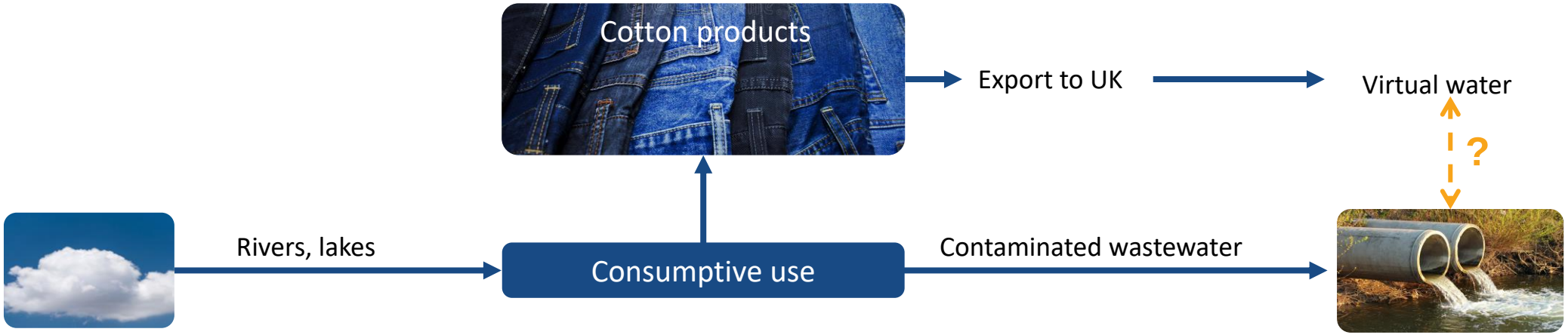
Virtual water (2) – case UK



- UK is one of the biggest importers of virtual water. UK produces no cotton crops internally, so almost all of its cotton water footprint is external.
- The World Bank estimates that 17%–20% of industrial water pollution comes from textile dyeing and treatment.
- Many cotton producers either do not treat water, or apply minimal treatment before discharging the wastewater back into rivers.
- Pricing of water in the UK includes the collection and delivery of water to households, but does not include the cost of virtual water treatment.

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Resource planning - Involve stakeholders

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For a holistic analysis, identify issues, risks and opportunities with the involvement of stakeholders

Participatory processes

- Decision making processes can be facilitated in workshops
- Divergence is when participants are encouraged to debate and generate ideas
- Partnership approaches help stakeholders make an informed contribution to urban water planning, including consideration of the appropriate supply/demand balance

Perth and Melbourne

- Large-scale community involvement in the water strategy development
- Extensive involvement of utilities, state agencies, NGOs and interested members of the community through submissions and workshops
- Significant input from various stakeholder groups
- In Perth several large public meetings culminated in a summit held at Parliament House
  - Participation of randomly selected citizens

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Questions & Answers

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Water and Environment Support
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Presentation “Instituting water demand management in Jordan”

Seta Tutundjian, Founder and CEO Thriving Solutions LLC

Q&A facilitator: Cor Merks

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Short break (no breakout room sessions this training module)

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Presentation “Stakeholder management in times of drought & hot weather”

Thomas Barden, Strategic Asset Planning Lead – Water Resources, Severn Trent Plc

Q&A facilitator: Cor Merks

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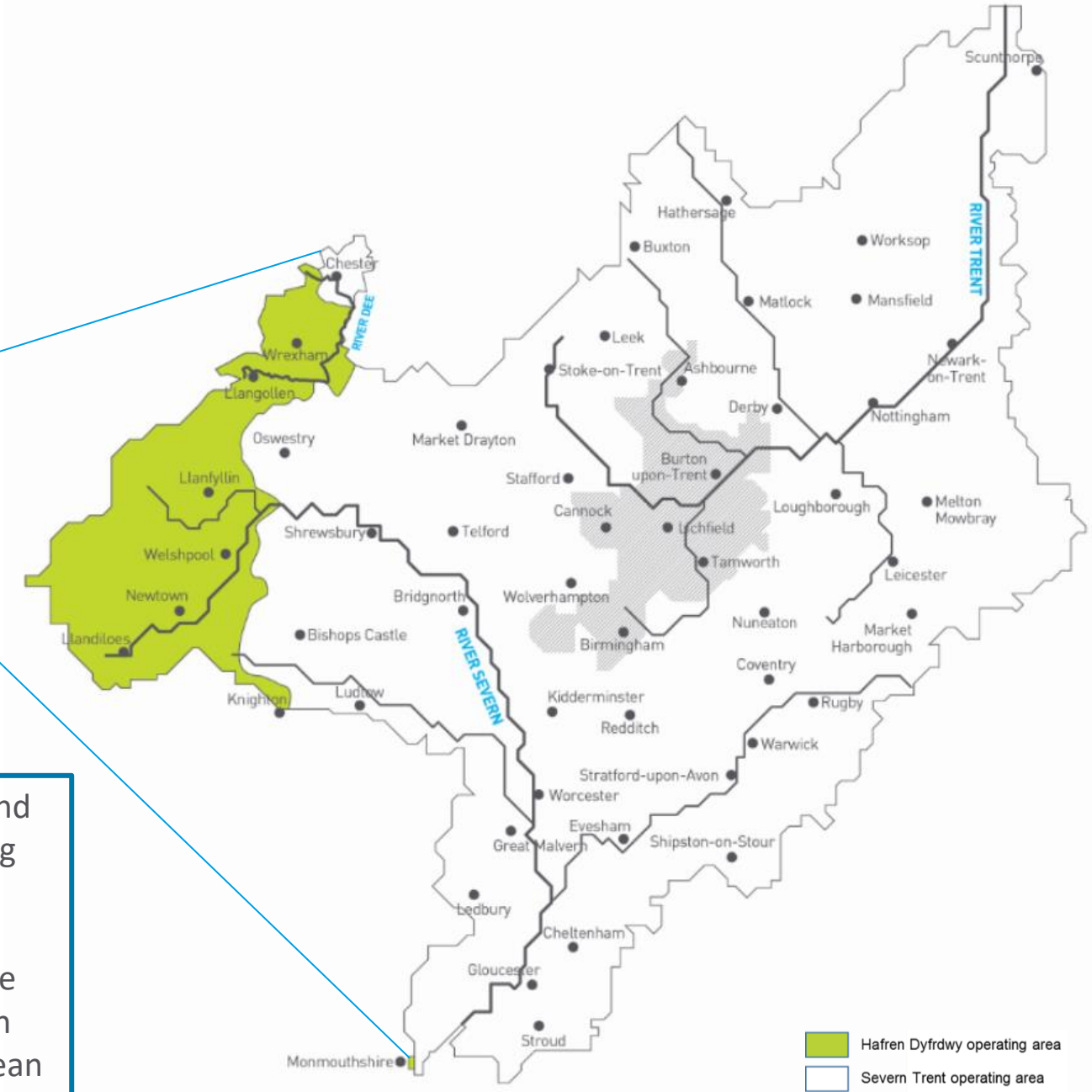

Supply over 8 million people and businesses in an area stretching across the heart of the UK

Second largest water and waste provider in the UK providing on average 2,000 megalitres of clean water per day

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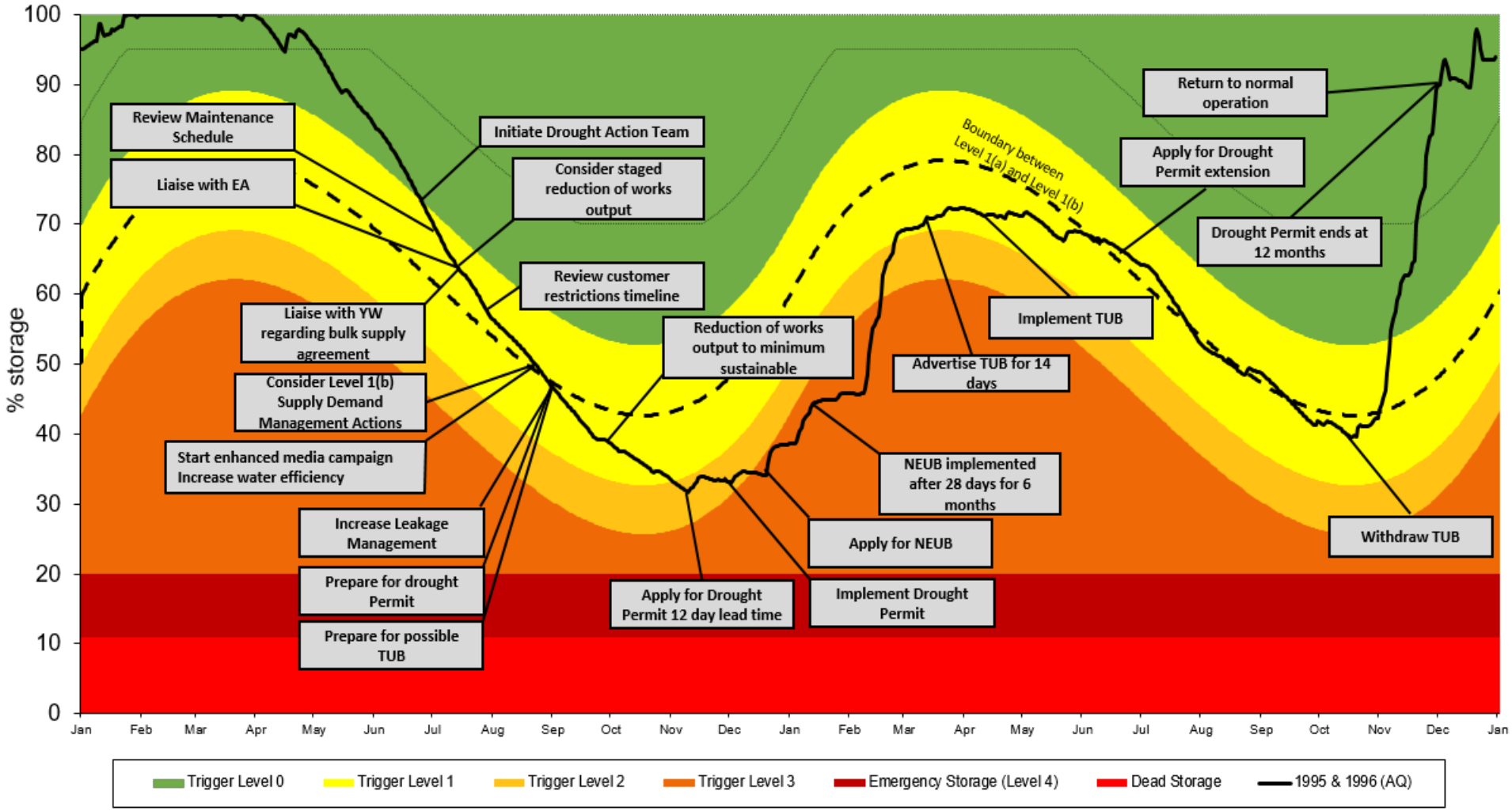
THE ACTIONS WE TAKE ARE DICTATED BY RAW WATER STORAGE



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WE HAVE A 5 STAGE STAKEHOLDER COMMUNICATION PLAN

Stage 1 – first fall in resources	• Ongoing water efficiency comms continues • Education activities continue
Stage 2 – projected likelihood of continued fall in resources	• Specific targeted focus through regional media and existing relationships • Social media campaigns • Extra leakage emphasis • Work with other water companies to ensure consistent messaging
Stage 3 – two weeks until proposed restrictions	• Formal media appeals and radio campaigns • Press features on what customers can do to help and increased social media use • Participate in any joint national media campaigns on water efficiency • Close liaison with stakeholders, regulators and large commercial customers
Stage 4 – restrictions in place	• Intense local broadcast activity • Advertising in media in specific problem areas • Withdrawal of softer messaging to avoid any confusion as hard messaging introduced
Stage 5 – removal of restrictions	• Strong message in media to thank customers for their help and support in reducing demand • Close liaison with stakeholders to ensure messaging is consistent

WONDERFUL ON TAP SEVERN TRENT

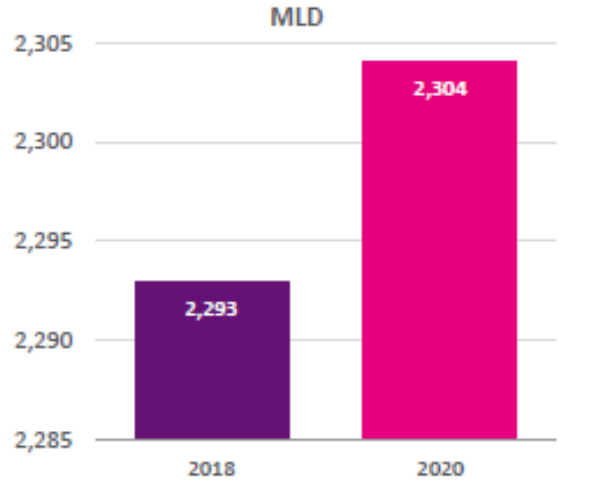
‘AGILE’ COMMUNICATIONS CAN HELP REDUCE DEMAND

- Targeted customer communications can help to reduce demand in a drought by raising awareness of the limited availability of water resources
- We aim to ensure that our drought communications will:
  - Show customers that their contribution to water efficiency is worthwhile
  - Explain to customers in simple terms how they can save water
  - Demonstrate that we are doing our bit to manage water resources wisely
  - Maintain confidence and customer trust

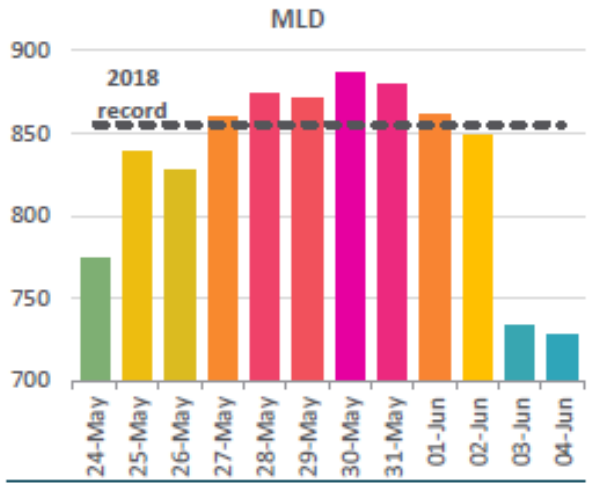
WONDERFUL ON TAP SEVERN TRENT

CASE STUDY – COVID19 HIGH DEMAND IN UK'S FIRST LOCKDOWN MAY/JUNE 2020

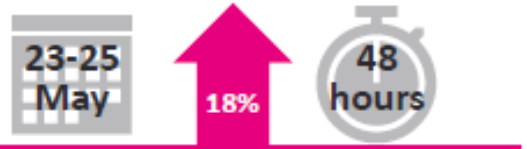
1) Total demand broke the 2018 record



2) We saw demand break the 2018 record 6 days running on the strategic grid



3) Following 10 weeks of dry weather we were tracking demand closely, when...



...demand jumped 18% in just 48 hours...

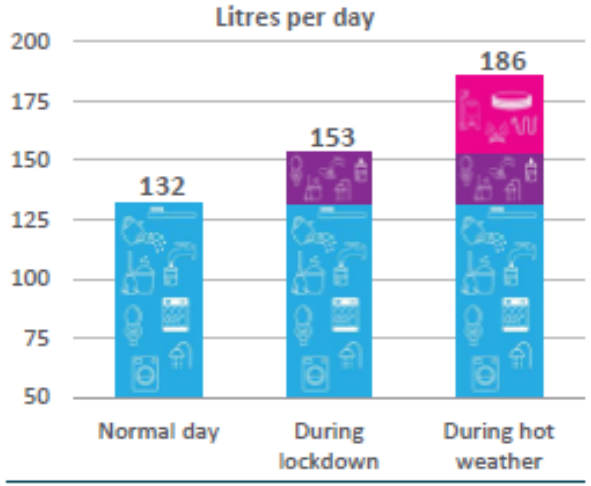
4) ...and remained high for longer than we'd seen before

2020 **6 days** running

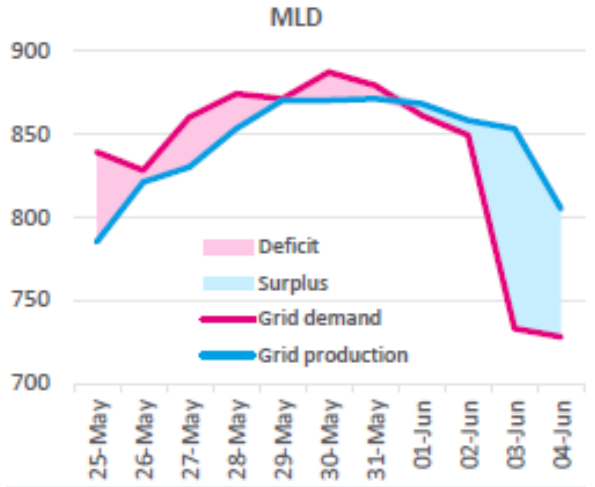
Strategic grid pumped >840MLD

2018 **2 days** running

5) Each of our customers is using more water than we've ever seen...



6) ...with customers using water faster than we can get it into the system...



7) ...resulting in service impacts for customers

Areas affected

Leics	Parkwood Oadby and Carlton Knaptoft High Tor
Warks	Long Compton
Warks/Worcs	Headless Cross/Sugarbrook
Shrops	Much Wenlock Helmeth Hill & Bryn Mawr
Worcs/Gloucs	Butts Wotton & Breakheart

Time off supply (mins:secs)

June 2020	Hot weather 18	Freeze-thaw 18
06:30 - 09:30	09:06	11:35

WONDERFUL ON TAP SEVERN TRENT

WE ARE ALWAYS IMPROVING OUR CUSTOMER AND STAKEHOLDER ENGAGEMENT

1. We engaged with customers for two key reasons

- to support those being impacted by service disruption
- to nudge down demand

2. Incoming calls were 300% higher than usual

- repurposed agents to increase capacity
- changed website routing & added self-help
- launching low pressure chat-bot

How we're responding
Continue to broaden customer contact options – social media, self-help, bots, WhatsApp etc – so that the call centre to focus on vulnerable customers at peak times

3. Some customers reporting issues to us were not being picked up by our loggers – we used customer escalations to inform our response

- our loggers are typically very good at identifying customers that go off supply in fairly large clusters
- this time we had customers going off supply in small pockets – too granular for the loggers to detect
- once we had missing intel we set up dedicated owners for managing customer and network control contact

How we're responding:
We working to accelerate the speed we get the escalations processes up and running. And, we're looking at how to improve the sensitivity of our loggers to smaller scale issues

4. We used nudge techniques to try to drive down demand, but found it difficult to move quickly

- limited structure to deploy targeted nudges quickly
- limited trials undertaken previously
- limited time for test runs

How we're responding:
Develop new workstream, trialling different messages and channels using behavioural inputs, new toolkit and structures being develop – and sharing insight gained more widely

5. We saw good engagement from LRFs

- supported with vulnerable customers
- distributed water efficiency messaging

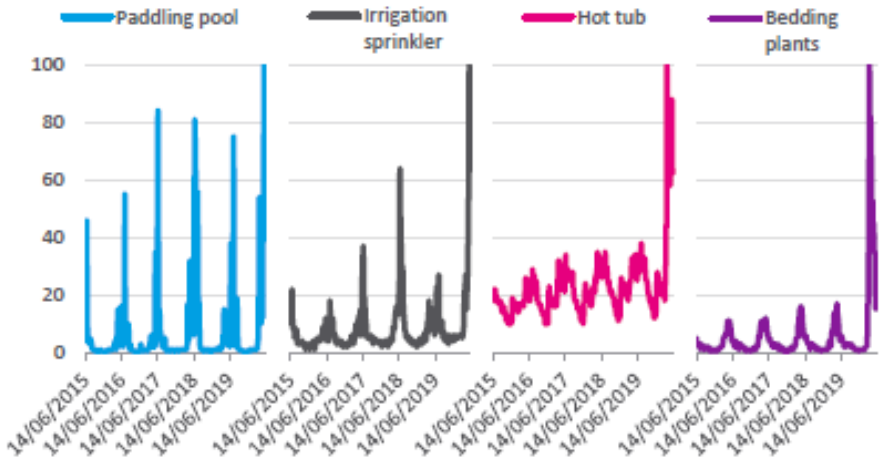
How we're responding:
Continuing to foster relationship with forward looking summer plan

WONDERFUL ON TAP SEVERN TRENT

WE BELIEVE MAKING DEMAND FORECASTING OPEN SOURCE WILL HELP TO MANAGE DEMAND

Demand forecasts – we struggled to predict the unprecedented demand

- demand forecasting traditionally involves learning from what has gone before to predict what lies ahead.
- the challenge is that unprecedented event can have an unprecedented impact on demand that is unforeseen by the forecasts.
- looking back we think there were some early warning signs that we could have spotted – **Google Trends shows interest in water intensive products has hit all times highs.**

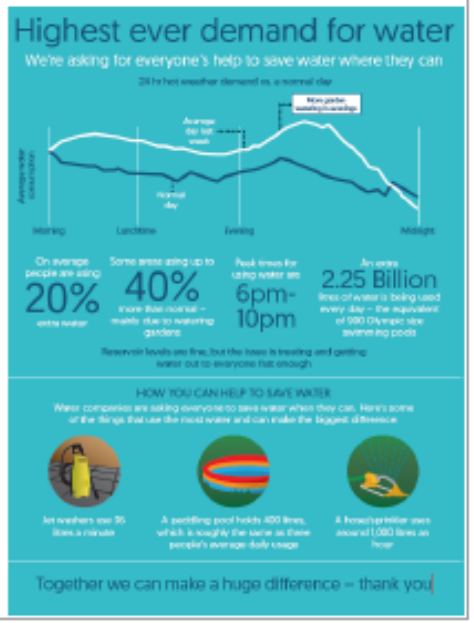


How we're responding:
Planning to make our demand forecasting 'open source' and readily available on our website, inviting scrutiny, challenge and fresh thinking – as well as encouraging water efficiency.

Managing demand

- we engaged twice a day with Britvic who gave us fantastic support by managing demand and using storage every day in the 4-hour evening peak
- we kept Rugby customers on supply throughout – a very different outcome from 2018.
- We worked closely with Water UK to craft their countrywide comms about water saving.
- produced the infographic they used on their social media channels

BRITVIC



WONDERFUL ON TAP SEVERN TRENT

REVIEW OF PERFORMANCE AFTER EACH EVENT LEADS TO RECOMMENDATIONS

Continue current approach	Tweak current approach	New approach
1) **Continue risk-based investments** – the high-risk areas in 2018 were not at risk in 2020.	1) Keep incident triggers under review in light of Covid19 (or other exceptional circumstances). Demand is not following normal patterns.	1) Make ST demand forecasting 'open source' and readily available on our website, inviting scrutiny and challenge (and also encouraging water efficiency).
2) Undertake **annual executive 'deep dive' of summer preparations** in forecasting, supply, demand, customer and incident management.	2) Allocate and provide regular volunteer incident roles in advance – support volunteers need clarity and to be well-practiced.	2) Undertake a review of demand management options (already underway).
3) Maintain approach of **running incidents from STC**. Seeking to operate remotely (albeit in exceptional circumstances) added extra complexity.	3) Introduce spot checks for third party suppliers (eg bottled water) to ensure they can deliver against the SLAs.	
4) **Plan maintenance when higher probability demand will be low** with regular reviews and options to re-instate production.	4) Activate software to prevent contacts ever being delivered to customers outside the 0900 to 2100 window (except in exceptional circumstances).	
5) Maintain new approach of having a **customer team 'manage' pockets of customer contact, comparing notes with Network Control** who might miss small pockets caused by airlocks and the like.	5) Pro-actively brief MPs and councillors in high risk areas, asking for their help to spread key messages.	
6) **Continue to broaden customer contact options** (social media, self-help, bots, WhatsApp etc) to enable call centre to focus on vulnerable customers at peak times.		
7) **Continue to strengthen PSR register**.		
8) **Continue 'peace time' relationship building with LRFs and other key stakeholders a priority** – it pays exceptional dividends in incidents.		

WONDERFUL ON TAP SEVERN TRENT

THE NATIONAL FRAMEWORK FOR WATER RESOURCES IDENTIFIES FUTURE WATER NEEDS

If no action is taken between 2025 and 2050 around 3,435 million extra litres of water per day will be needed for public water supply to address future pressures. This includes:

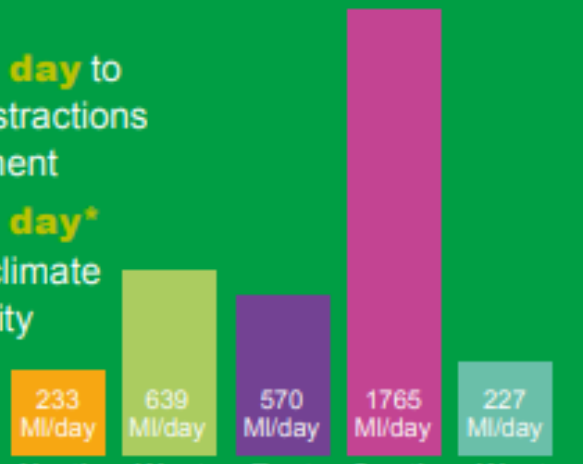
1,150 million litres per day (Ml/d) to make water supplies more resilient to drought

1,040 million litres per day to supply the growing population

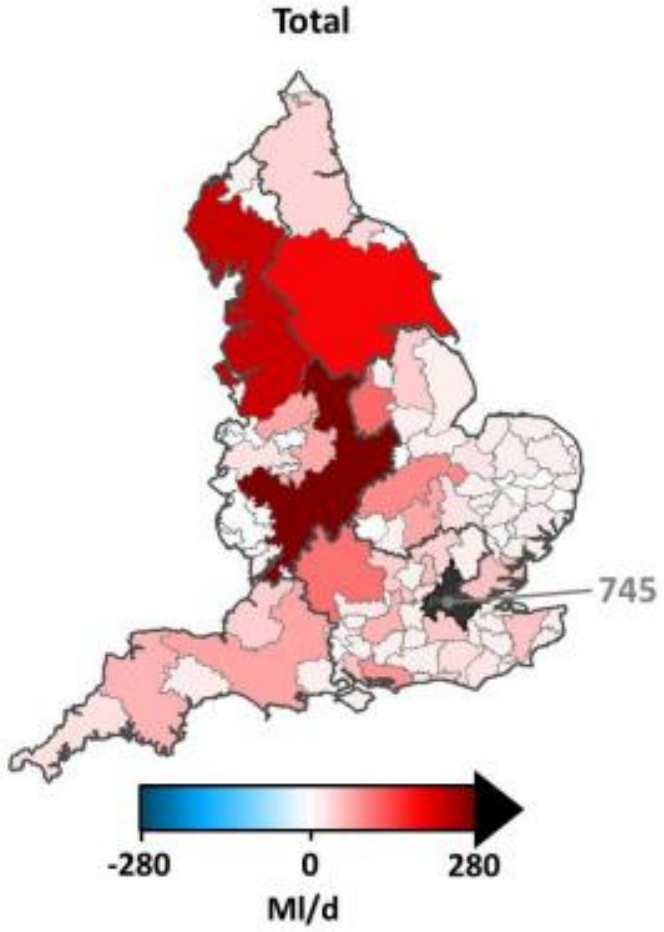
720 million litres per day to replace unsustainable abstractions and improve the environment

400 million litres per day* to address the impact of climate change on water availability

Around 50% of the national need is in the South East



*Water companies have included additional impacts from climate change of around 640 Ml/d in their plans up to 2025 which is before the start date for this analysis

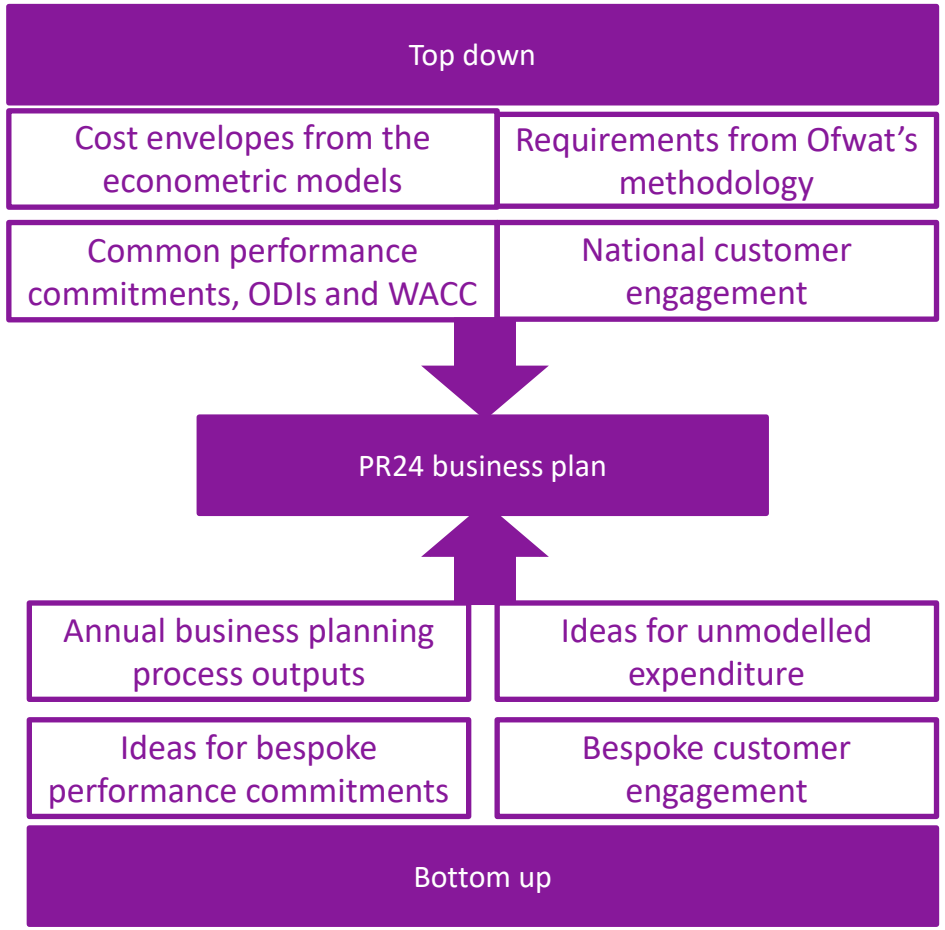


The estimated additional capacity required between 2025 and 2050

WONDERFUL ON TAP SEVERN TRENT

WE HOPE TO INCREASE OUR INVESTMENT TO TACKLE OUR SUPPLY-DEMAND DEFICIT

Ofwat We regulate the water sector in England and Wales



Regional water resource plans are being developed to support the national water resources need

Regional plans will inform water company Water Resources Management Plans and will:

- **reduce demand –** to 110 litres of water per person per day by 2050 and drive down water use across all sectors
- **halve leakage rates** by 2050
- **develop new supplies** such as reservoirs, water reuse schemes and desalination plants as well as innovative cross-sector options that bring broader benefits
- **move water to where it's needed** through more transfers of different scales and lengths
- **reduce the use of drought measures** that have an impact on the environment

WONDERFUL ON TAP SEVERN TRENT

WE NEED TO INFLUENCE OFWAT BY FULFILLING 6 PRIMARY REGULATORY TESTS

Assessment criteria/evidence	What Ofwat are trying to understand
Need for investment	What is the case for change?
	Is this part of a long term strategy? How does this investment fit into that strategy?
	Has the need arisen because of past choices (is it our fault?)
Need for a cost adjustment	If Ofwat's models already provide a financial allowance to cover this
Identification of the most cost beneficial solution	Have we left no stone unturned when looking for the best way of solving the problem – are we innovating/pushing the sector forward?
	Have we compared options robustly and consistently?
	Is our proposed solution the most cost beneficial option?
Evidence of robust costs	Is the cost we have proposed robust?
	Is it clear what has been costed and does it all relate to "proper functions" of a water company?
Evidence of efficient costs	Is our cost comparatively efficient?
	Is it as efficient as the costs Ofwat will set across the rest of the programme?
Evidence of customer protection	Will customers be compensated / protected if we don't deliver?

Questions & Answers

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Plenary discussion “Role and responsibilities as a WDM manager” (incl. Mentimeter)

Arthur Streller, Cor Merks and Fantine Hureau

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Roles and responsibilities

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Water efficiency measures & data collection activities

At Thames Water (UK):

- Smart Meter Rollout
- Data => Insight => Action
- Smarter Home visits
- Wastage fixes
- Smarter Business Visits
- Involvement Housing Associations
- Communities & Stakeholders
- Online Water Energy Calculator
- Greenredeem Incentives
- Discretionary Water Users

Role as a WDM manager?

- Briefing of newly involved stakeholders
- Involve and inform individual and relevant stakeholders adequately and ensure their engagement
- Define the actions to be undertaken and at what level
- Information is key – through all stake- and shareholder levels it is essential do disseminate the necessary knowledge

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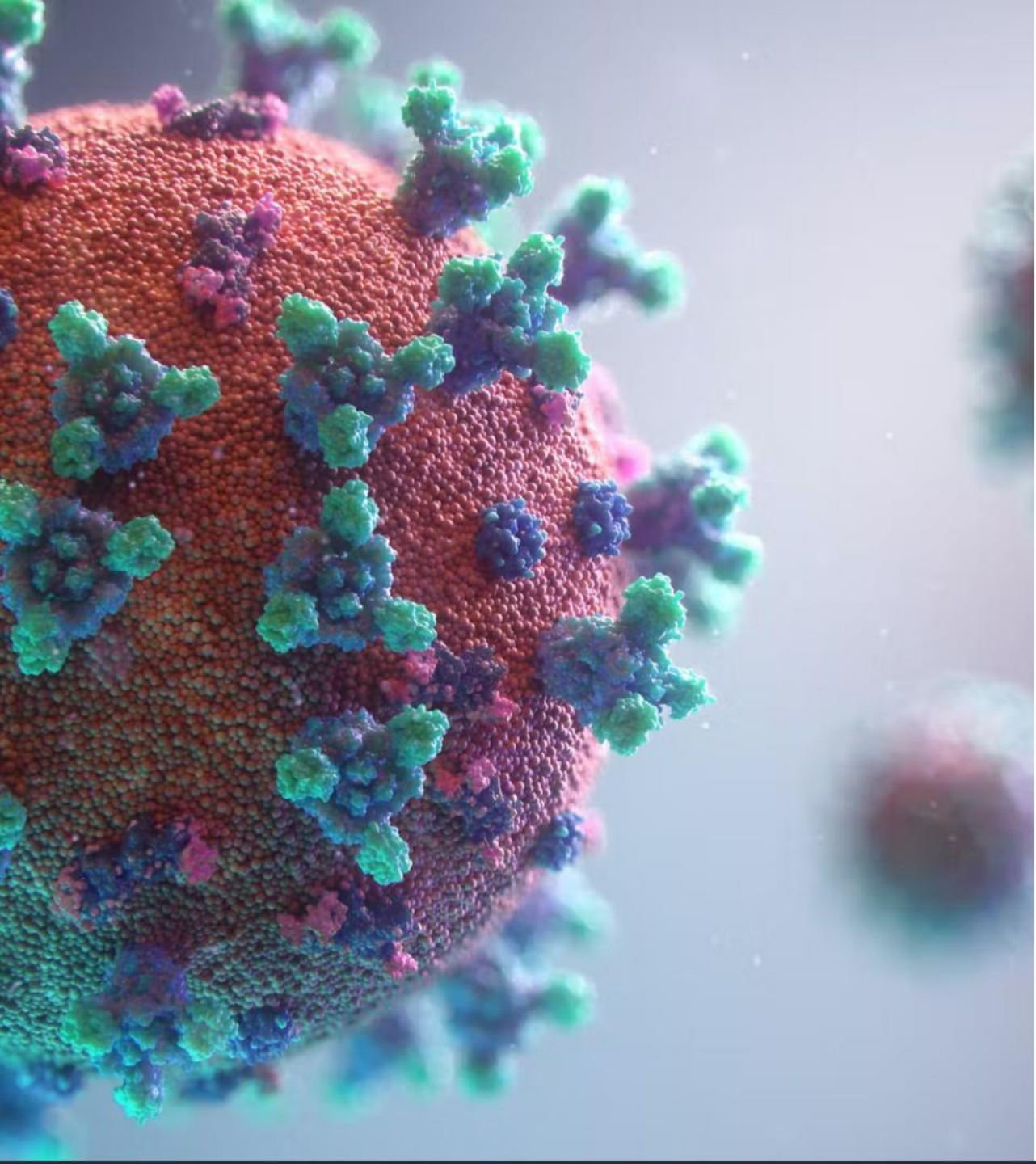
What WMD intervention is the first priority in your country?

Which responsibility as WDM planner do you take?



How did COVID-19 change your role and responsibilities?

Mentimeter

Go to **www.menti.com** and use the code **5611 0951**

The code lets your audience join the presentation. It expires in 2 days.

Mentimeter

Ask me anything

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Presentation “Benchmarking”

Arthur Streller and Cor Merks

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What is benchmarking?

"A metric is a unit of measure (or a parameter being measured) that can be used to assess the rate of water use during a given period of time and at a given level of data aggregation (e.g., systemwide, sector-wide, customer level, or end-use level) ..."

"A benchmark is a particular (numerical) value of a metric that denotes a specific level of performance, such as a water efficiency target."
(AWWA White Paper on Benchmarking 2009).

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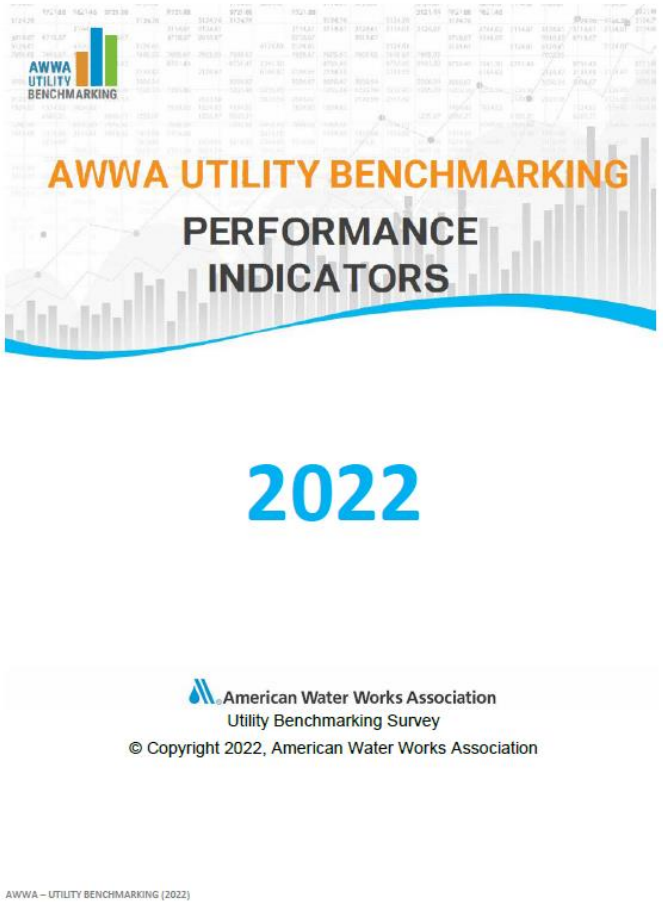
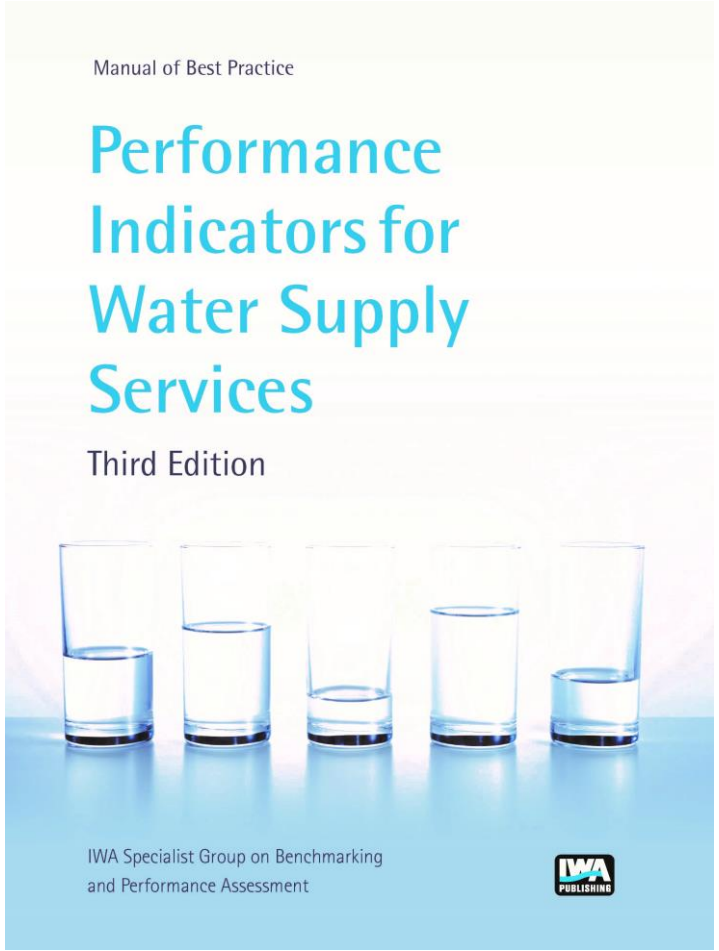
What does benchmarking require?

- Choice of a (relevant) metric
- Choice of a (useful) benchmark





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Opportunities and limits of benchmarking

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Opportunities:

- Insight into performance relative to peers
- Improve management of water services
- Identifies strength and weaknesses to improve performance
- Networking and knowledge sharing
- Standardizes the monitoring of key performance indicators (KPIs)

Limits:

- Reliability demands great effort through commitment and management
- Time, good data quality and sufficient resources to ensure data quality and data base management
- Costly depending on type of data and starting situation of utility
- Data interpretation should be used carefully

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Example – European Benchmarking Co-operation

Six key performance areas analyzed to provide a balanced view on utilities performance

- Access
- Water quality
- Reliability
- Service quality
- Sustainability
- Finance and efficiency

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EBCs 2020 performance assessment (drinking water)

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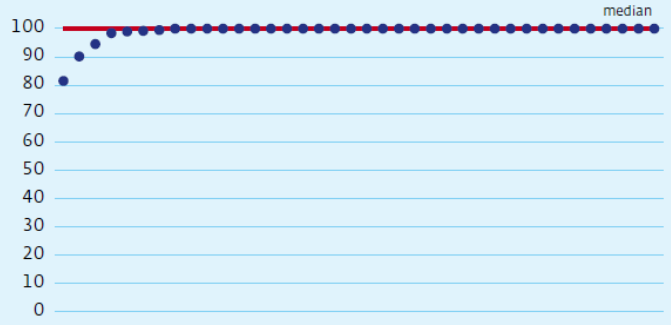
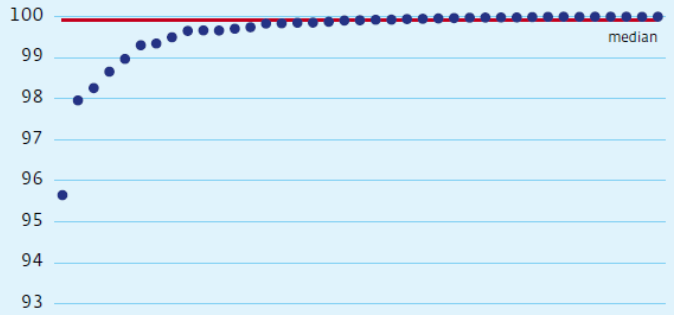
Access

Figure 1: Population coverage (%)



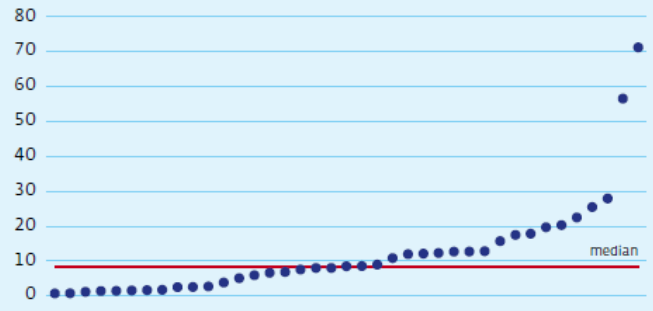
Water quality

Figure 2: Quality of supplied water (%)



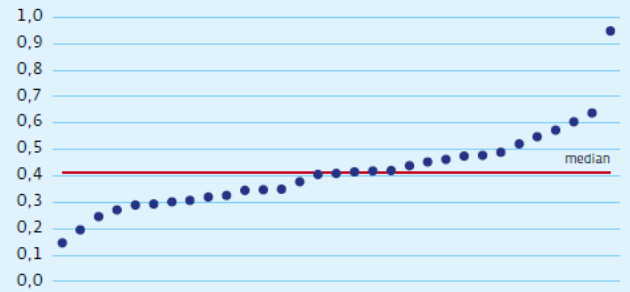
Reliability

Figure 4: Distribution losses per mains length (m³/km/day)



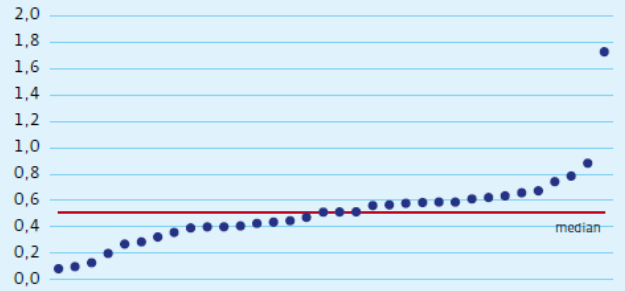
Social Sustainability

Figure 6: Affordability based on household consumption expenditures (%)



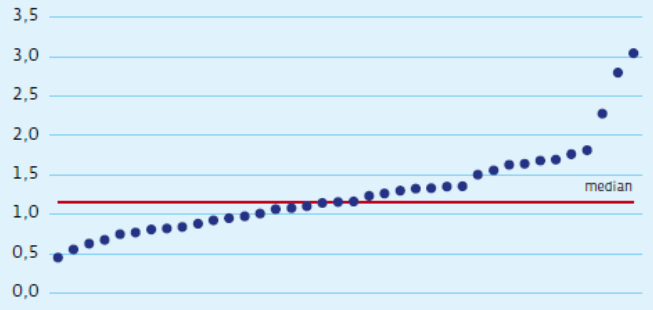
Environmental Sustainability

Figure 7: Electricity use for production and distribution per m³ water produced (kWh/m³)



Finance and Efficiency

Figure 11: Average water charges for direct consumption (€/m³)



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Example – Orange County (USA) Mesa Water

Measures for water benchmarking:

1. Aggregate data-based benchmarks → Measure for freshwater use , no indoor and outdoor distinction
2. Disaggregate data-based benchmarks → Good for cross utility comparison
3. Water budget-based benchmarks → Used for irrigation-only customers

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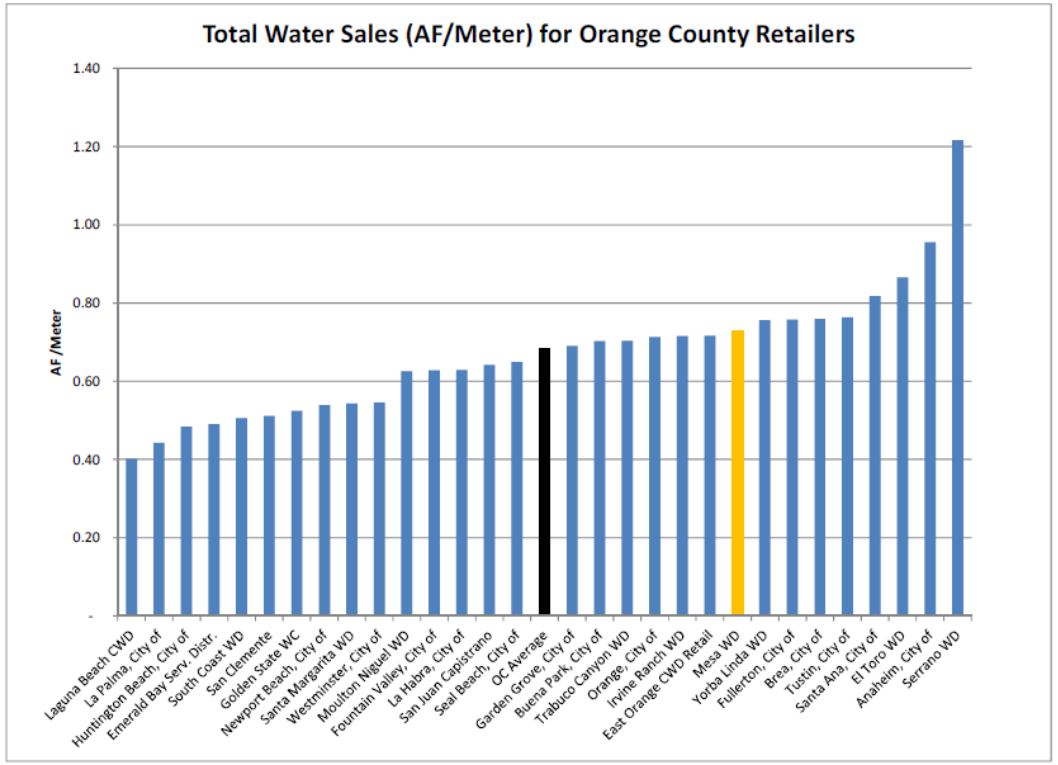
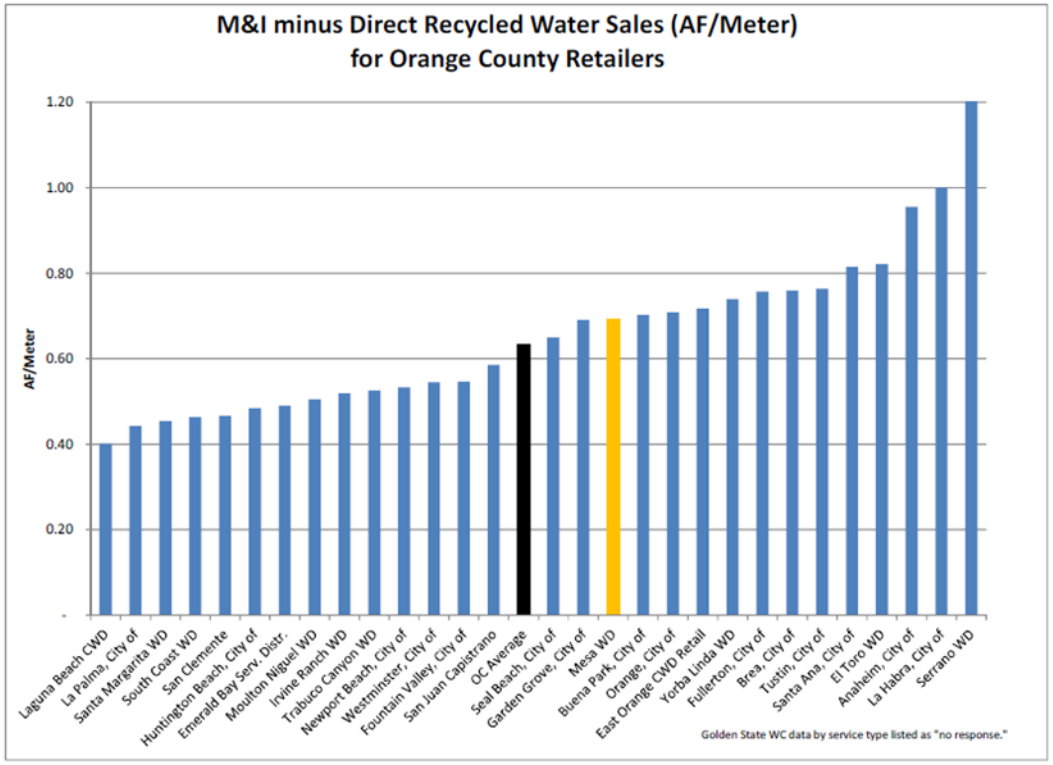
OC/Mesa Water – Measure 1: Aggregated data (1)



Higher than average consumption, agriculture is included



Slightly higher than average consumption, agriculture, power plants and recycled water excluded; no difference in customer base

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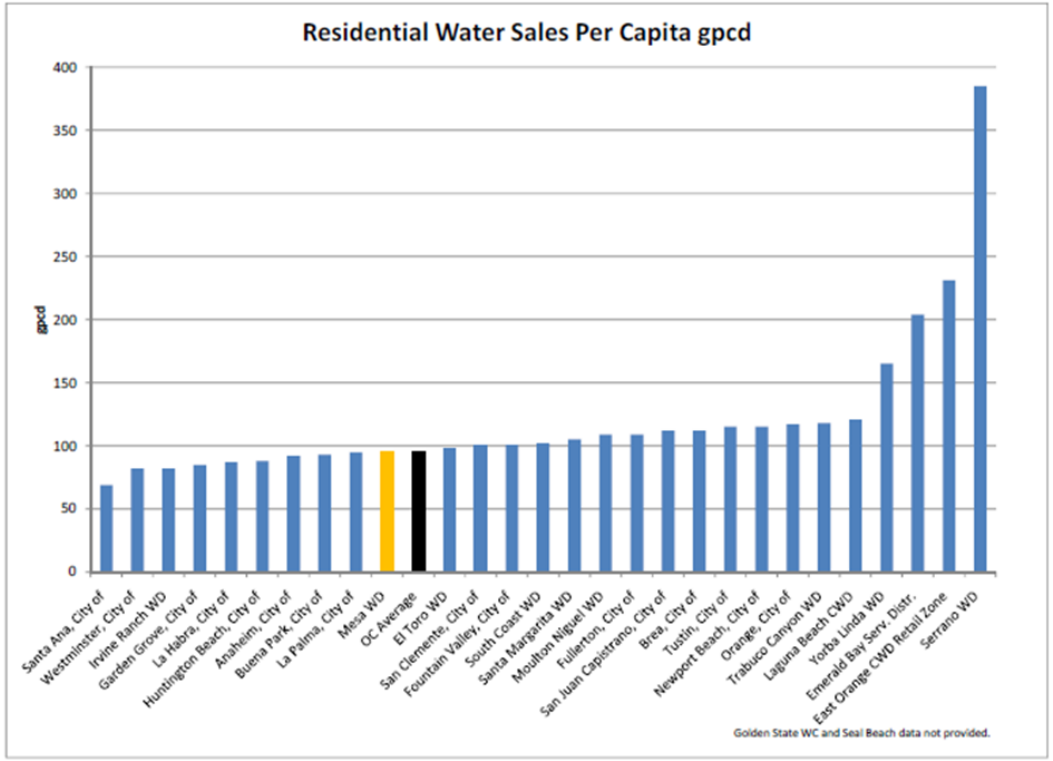
OC/Mesa Water – Measure 1: Aggregated data (2)



Direct potable water use per capita in GPCD just below the average consumption; recycled water is excluded

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Findings and recommendations (OC, USA)

- Using metrics on aggregate data (e.g., aggregate production or consumption) does not allow for accounting for differences in the service area customer base
- Disaggregate measures allow for more comparability between water retailer but may be constrained due to lack of comparable customer class distinctions. For example, there are retailers in Orange County that classify multiple family master meters as “commercial” accounts
- Indoor-Outdoor performance measures may be desired, but since not all outdoor water use is directly metered, only “estimates” of outdoor water use can be feasibly created
- Variation in service area characteristics (weather zone, customer base, persons per household, lot size, etc.) can provide hypotheses to explain spatial differences across service areas
- Variation of water demand drivers can explain variation in water use through time. Controlling for these factors more directly addresses the “Conservation” performance metrics

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Questions & Answers

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Plenary Kahoot! Quiz and discussion

Arthur Streller, Cor Merks and Fantine Hureau

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Discussion on ”surprising” answers

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Thank you for your attention!

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Training Module 5: Thursday, February 17, 2022, start at 9:30 AM Athens time (CET+1)