MITSUBISHI ELECTRIC
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Member of German Water Partnership

for a greener tomorrow eco Changes

SMART AUTOMATION SOLUTIONS FOR A SECURE WATER SUPPLY

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MEWF / GWP Online Seminar

New Water Technologies to Achieve Water Security in the Arab Region

26 August 2020

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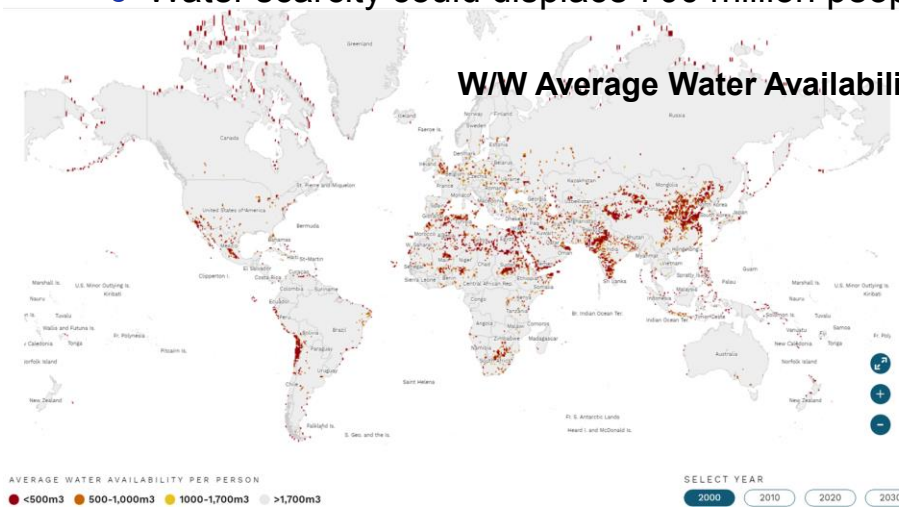
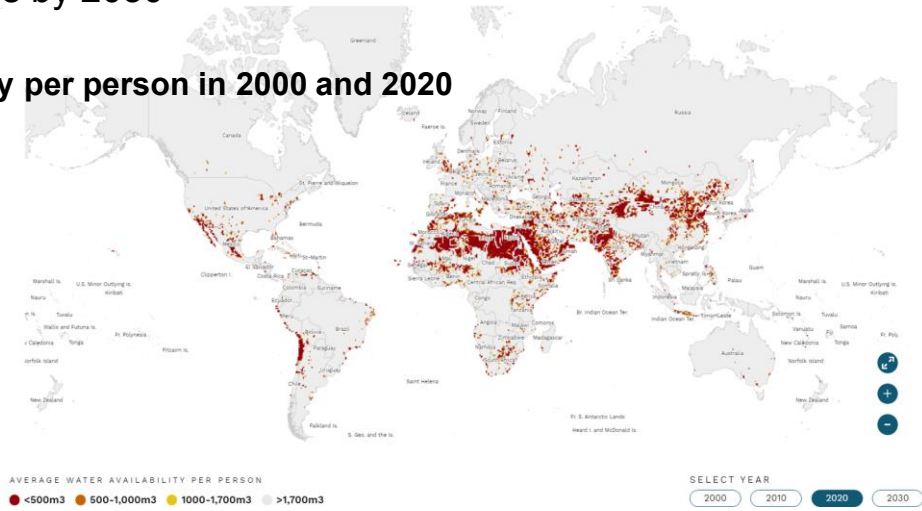
WATER STRESS INDEX

6 CLEAN WATER AND SANITATION

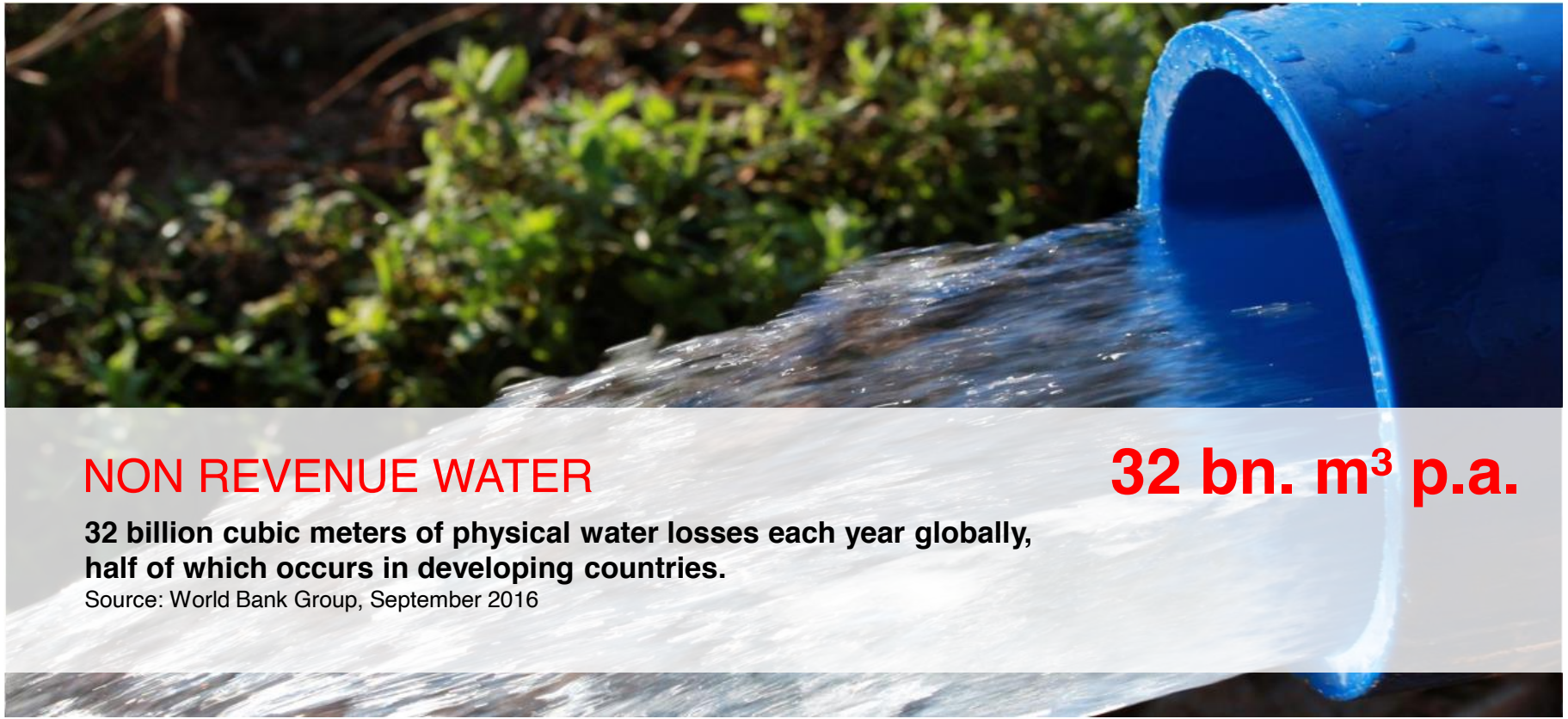
- Water scarcity affects more than 40% of the world's population
- More than 2.3 bn people lack safely managed drinking water
- Approx. 4.5 bn people lack safely managed sanitation
- Water scarcity could displace 700 million people by 2030

W/W Average Water Availability per person in 2000 and 2020





Sources: Water Scarcity Clock (by Worlddata Lab), https://worldwater.io/ (August 2020); https://www.un.org/sustainabledevelopment/water-and-sanitation



NON REVENUE WATER

32 bn. m³ p.a.

32 billion cubic meters of physical water losses each year globally, half of which occurs in developing countries.

Source: World Bank Group, September 2016

REASONS FOR WATER SCARCITY

- Long-term droughts
- Climate change
- Increase of population
- Influx of refugees
- Ageing water infrastructures / leaking pipelines
- Institutional / operational failures
- High level of NRW
- Illegal use
- Transboundary water competition
- Contamination by agriculture and industrial waste water

SMART WATER SOLUTIONS TO MITIGATE WATER SCARCITY

- Metering Systems
- Energy Efficiency
- Monitoring & Process Control
- Safe and Continuous Operation
- Elimination of Human Failures
- Predictive Maintenance
- Alarm Handling
- Equipment Lifetime Increase
- Optimised Technical Support

SMART WATER SOLUTIONS TO MITIGATE WATER SCARCITY (cont.)

- Data Analytics – Digital Twins
- Artificial Intelligence
- Elimination of Excessive Pressure
- Leakage Reduction
- Pipeline Burst Detection
- Automatic Control of Irrigation Systems
- Cyber Security

WATER LOSS REDUCTION

Minsk (BY):
Complete process control and frequency controlled booster pumps
✓ 7% network pressure reduction
✓ Leakage reduction of ~3 mio. m³ p.a.

Mogilev (BY):
Complete process control and frequency controlled borehole pumps
✓ 7% network pressure reduction
✓ Leaks cut by 5.5%

Nominated for the GWI Award 2020
"Smart Water Project of the Year"

AQUATORIA®

Precise Control for
Urban Water Systems

- Energy consumption reduction from 15 up to 40%
- Leakage reduction of 5-15%
- Reduction of pipe burst risk
- Equipment lifetime increase

ENERGY EFFICIENCY

Samara (RUS):
Process optimisation across 37 BPS
✓ 51% decrease in power consumption
✓ 8% less emergency call-outs

Frankfurt a.M. (D):
Retrofit of VSD for pumping, screening and aeration
✓ Energy saving of approx. 60%

Minsk (BY):
Complete process control and frequency controlled booster pumps
✓ 20% less energy consumption

Riyadh (KSA):
Replacing soft starters of high pressure pumps with VSDs
✓ >50% less power consumption

Image: Stadtentwässerung Stuttgart

Sludge Incineration Lines Stuttgart (D):
Process management and automation stations
✓ Approx. 230,000 EUR less energy cost p.a.
✓ Covering 33% of the WWTP's energy demand
✓ Approx. 1,200 t less CO_2 emissions

EASE OF OPERATION AND MAINTENANCE

WWTP Hamburg (D):

Complete process management, operation and monitoring of entire plant from a central point

- ✓ Highest reliability, flexible network structure
- ✓ Ease of maintenance and further upgrades
- ✓ System-wide engineering from a central engineering workplace
- ✓ Archiving of all incoming alarms & messages during the entire life cycle
- ✓ Modernisation under running operation

Map: Google

Water Treatment Works in the UK:

Predictive maintenance system

- ✓ Clear text messages
- ✓ Reducing unplanned stops
- ✓ 3 to 9 times less cost than reactive maintenance

CLOUD & EDGE ANALYTICS – DIGITAL TWIN

EFFICIENCY IN WASTE WATER TREATMENT

Improving Operational Performance of a UK Water Utility

Created a digital twin of a waste water aeration plant to better understand all the factors effecting the operation of the plant in order to ensure that the real world process always performs at optimal efficiency.

Overall energy saving effect and ROI of one year.

WE'RE THERE WHEN YOU NEED US!

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WATER

GOLD
2019
ecovadis
CSR
Rating

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