

Keynotes (10 minutes each)

Global challenges in the water and waste sector – Germany's way to solve national problems and to support international transfers

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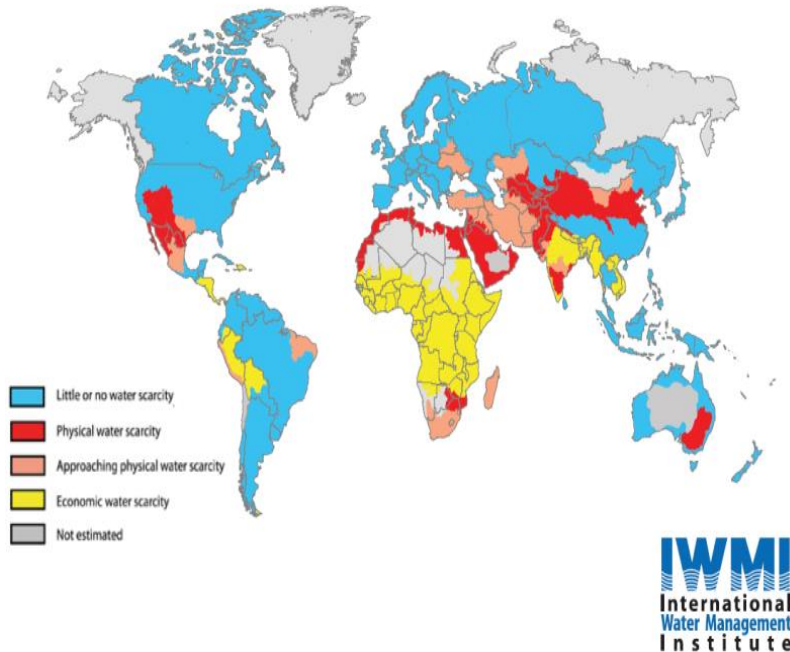
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# World Challenges – a water perspective



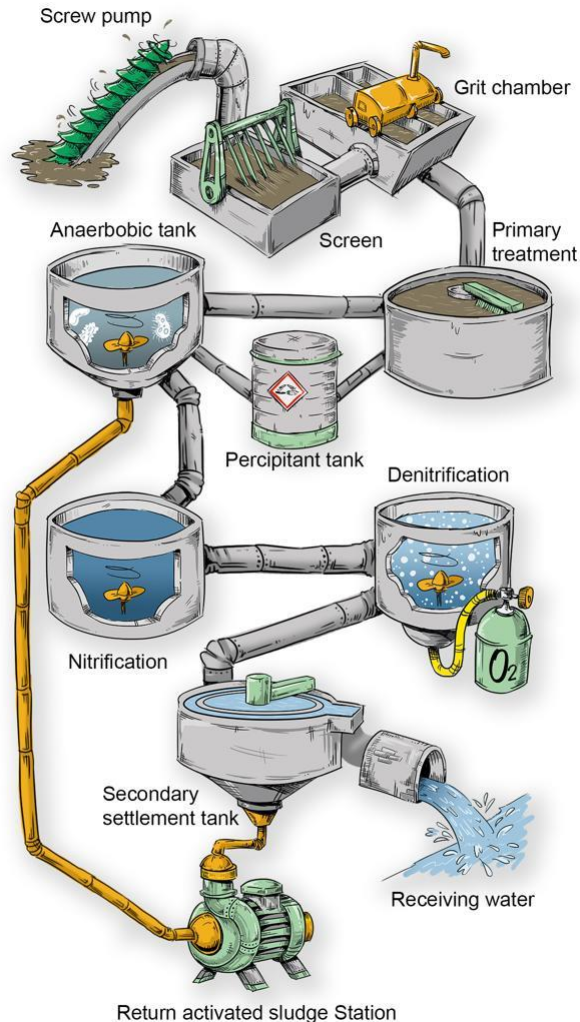
## Today - the sad 'bottom billion':

- 1 billion poor
- 1 billion hungry
- 1 billion without safe water
- 2-3 billion without sanitation
- 1 billion without electricity

## Better off by mid-century?

- with expected increases in demand:
  - + 70% food demand
  - + 60 % energy demand
  - + 55% water demand
- in a climate-changing world

# Total water withdrawals by 2050



- **Global water demand + 55 percent**
- **BRICS and developing countries + 80 percent**
- **OECD - 12 percent**

# The Global Challenge



**In 2025,  
2 out of 3 people won't  
have enough water**

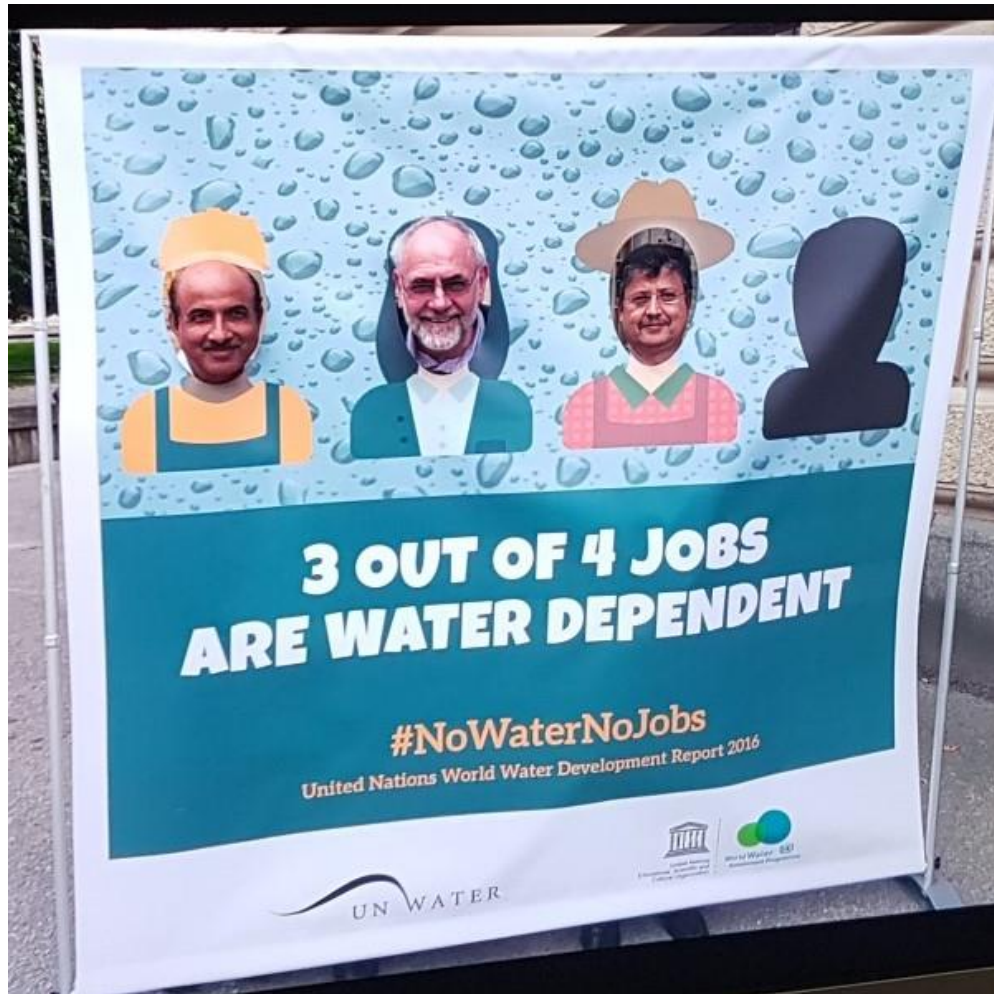
**2015      7,35 Billion**  
**2050      9 Billion people in the world**

# The Global Challenge



Over **80%** of the world's **wastewater** is released to the environment **without treatment**

# The Global Challenge



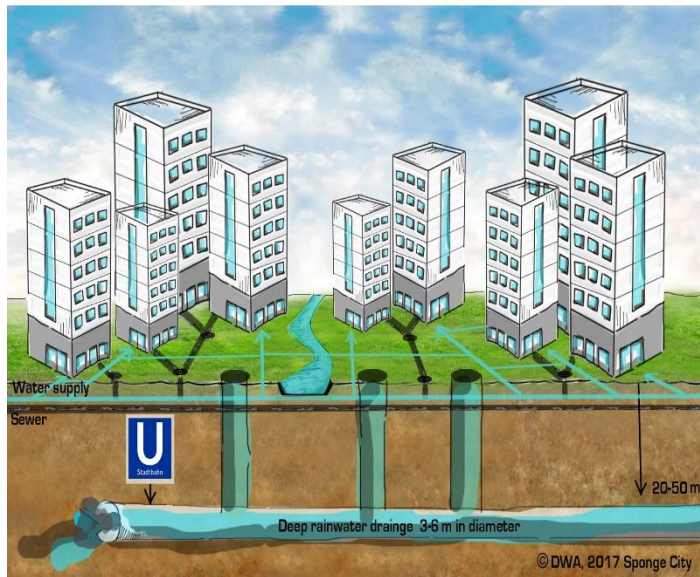
3 out of 4 jobs  
are water  
dependent

# The urban reality – and opportunity

## 60% of world population in cities in 2030

### Deep Rainwater Drainage

17



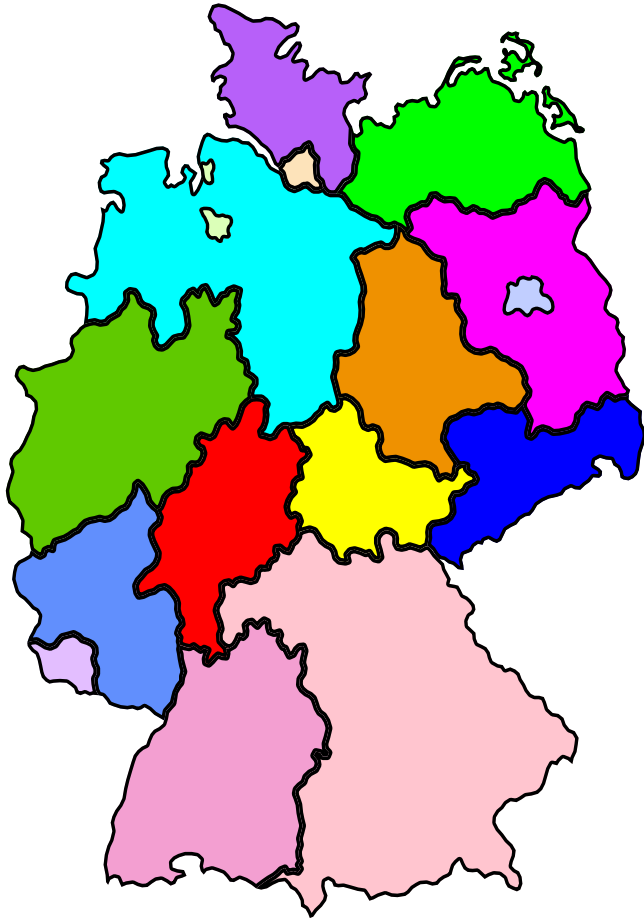
The urban reality – a few numbers:

- 2% of world's land
- but
- 70% of world economy
  - 60% of global energy consumption
  - 70% of global waste



**Need for new agenda:  
water, waste & energy  
smart cities**

# German Water Sector in Brief



## Water Supply

- 82 Million inhabitants
- 99.1% connected
- 122 l per Person per day
- 6.5% Water losses
- 6,557 Water Supply Utilities
- annually 2 Billion Euro invest

## Waste Water Treatment

- Annually 4 Billion Euro invest
- 7000 Wastewater Utilities
- 450,000 km sewer + 900,000 km drains
- 96 % Connected to 10,000 WWTPs Plants
- BOD5 99% Degradation, COD 95%,
- Nitrogen 82%, Phosphorus 91%
- Sludge 52% Thermal, 29% Agriculture, 0% landfill rest landscaping
- Since 1957 National Water Law - Framework
- **250 000 people work in the water sector**
- **200 000 in the waste sector**



## German Water Sector – ToDo's

1. Energy saving and production on WWTP
2. Cyber Security for all Water Utilities
3. Flooding due to heavy rainfaff – Climate Changes
4. Micro pollutants, 4th stage for WWTPs?
5. Micro plastics in water bodies and oceans
6. Sewage sludge mono incineration and phosphor recovery
7. NEXUS – discussion with farmers, ernity companies  
water for irrigation, energy plans, cooling water
8. IWRM – river management, EU-WFD, e.g. fish ladders
9. Rehabilitation of existing infrastructure, leakages, pipes
10. Lack of qualified manpower for the future
11. Water sensisitive Cities – the future of the Cities
12. Benchmarking



## German Waste Sector – ToDo's

1. Highest recycling ratio in Europe 66%  
Private or municipal resource for paper, glass, metal
2. Landfills are full – export to China stopped
3. 70 Incineration plants are installed, rehabilitation needed
4. Construction waste – more recycling needed

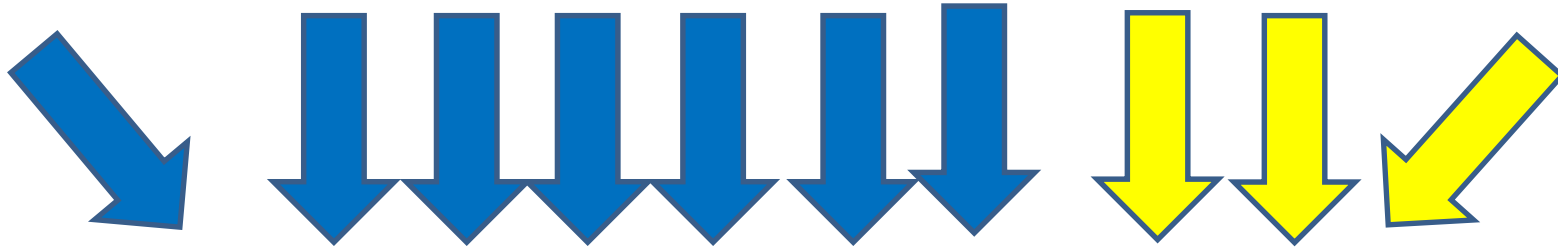
# The integrative approach of the United Nations - SDG since 2015



No success without clean water and sanitation.

overarching cross-sectional character

# German Konw How – Writing Standards

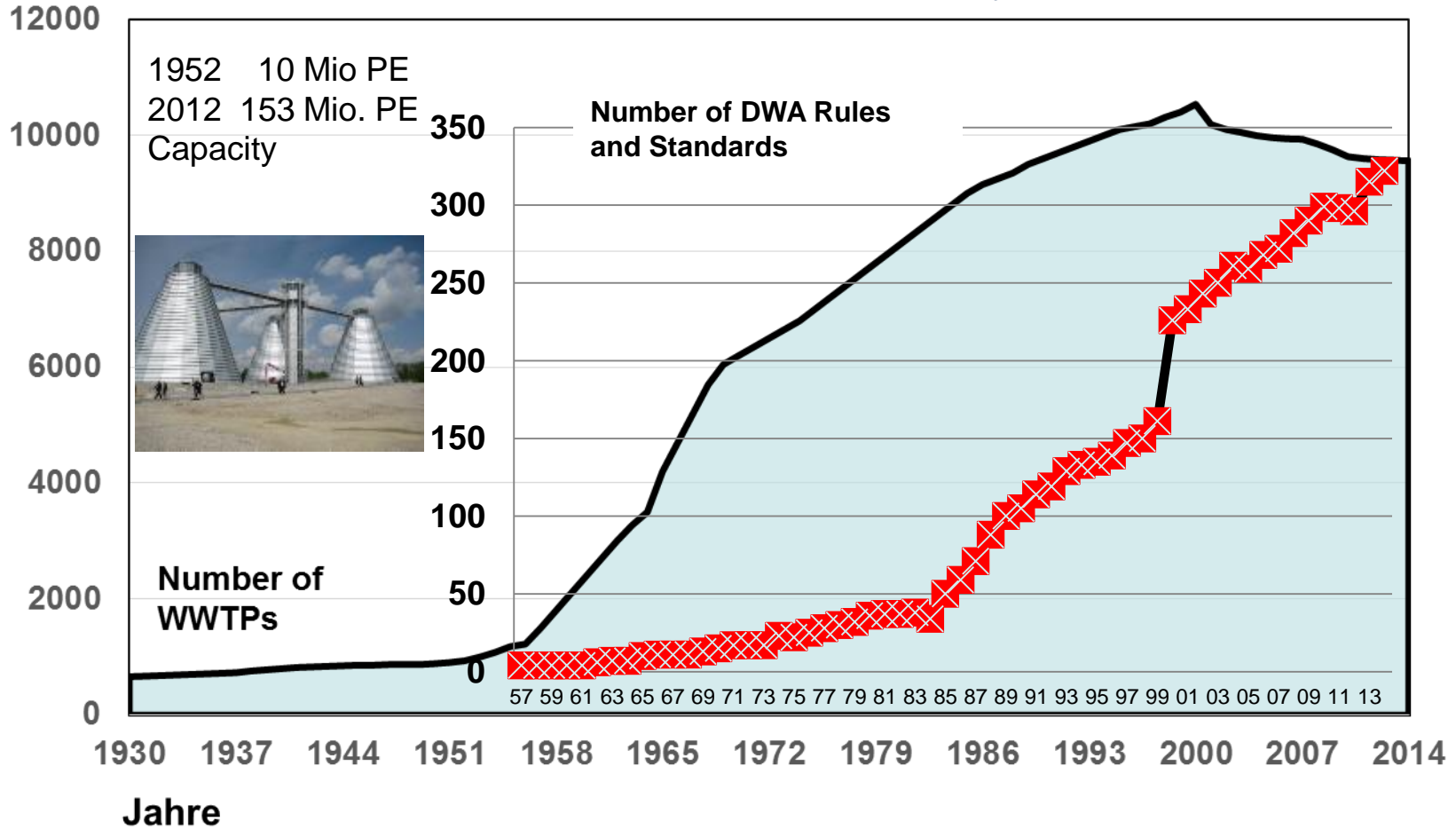


380 WG with 2300 voluntary Experts meets 500-600 times per year  
about 18.000 pages = 1,5 meter paper

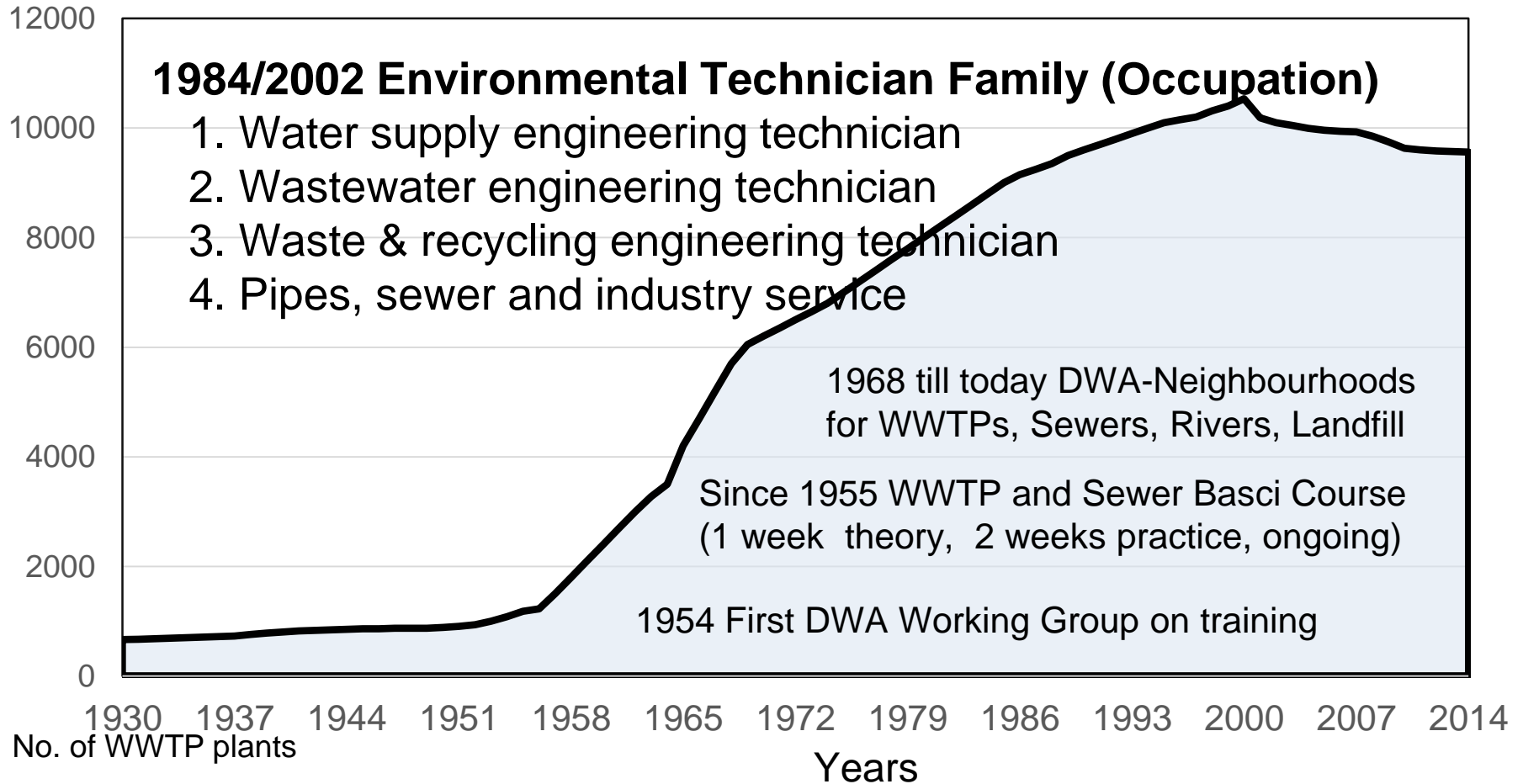


# „DWA-Rules and Standards“ since 1957

## Number of Wastewater Treatment Plants in Germany



## Qualification since 1954 – TVET since 1984



Source: Basic data from KA magazin, Nov. 2000 Page 183 Manfred Fischer, [www.dwa.de](http://www.dwa.de)  
 New data added and graph created by Rüdiger Heidebrecht,  
 DWA – German Association for Water, Wastewater and Waste, 2014

# TSM – Technical Safty Management



TSM Egypt 2009  
Qualified Managers

- Setting technical Standards since 1957
- Training of staff since 1954/1984
- Certifying Utilities (TSM) since 2005
  - Legal requirements
  - Technical requirements
  - Health and Safety rules

Public Utilities show their good performance in electricity, gas, water supply, waste water, dams, biogas plants

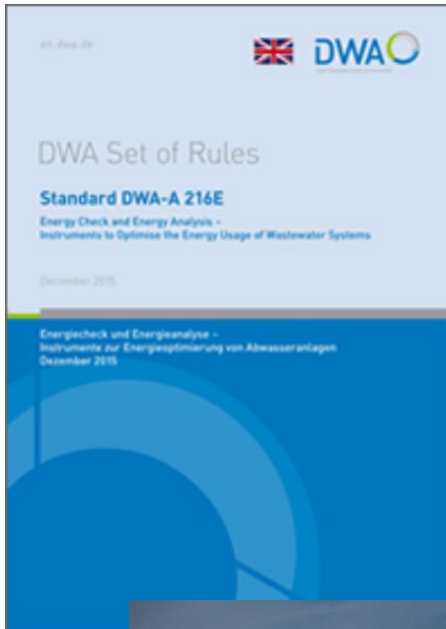
# Research Results from EXPOVAL



- BMBF Research Programme 9,5 Mio. Euro
- WWTP Design for hot and cold climate zones in the world
  - Activated sludge process
  - Trickling filter
  - Constructed wetlands
  - Wastewater Lagoons
  - UASB Reactor
  - Digester
  - Solar sludge drying
  
  - 306 Pages, english translation in progress
  - See [www.dwa.de](http://www.dwa.de)



# DWA-A 216



- ▶ DWA Standard: energy check and energy analysis ; Tools to optimize Energy efficiency on WWTPs.
- ▶ Draft version was published April 2013,
- ▶ White print December 2015  
Energy Check and Energy Analysis -  
Instruments to Optimise the Energy  
Usage of Wastewater Systems



## **International players from Germany**

- BMZ with GIZ (Advice) and KfW (Bank)
- BMBF – Research and Education Projects  
DAAD-German Academic Exchange Service,  
BIBB-Federal Institute for Vocational Training and Education
- BMWi – Trade shows support, delegations  
AHK-Chamber of Commerce, projects
- AA – foreign affairs, peace keeping
- NGO – like Borda, WHH, Churches, political Institutions
- Private Industry

**Brasil-Germany Government agreed 2015 on the support to secure biodiversity and introduce renewable energy**


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## 82 Wasserprojekte in 60 Ländern

82 water projects in 60 countries

**Brasil**  
Biodiversity  
Renewable Energy

Quelle: Cornelia Gerhardt, GIZ 2018

 Länder mit Wasser- und Sanitärprojekten

 Regionale Projekte

### Schwerpunkte:

- Wasserressourcensicherheit fördern
- Zugang zu Sanitär- und Trinkwasserversorgung & Hygiene sicherstellen
- Wasser als Friedensressource
- Beitrag zur Minderung und Anpassung an den Klimawandel

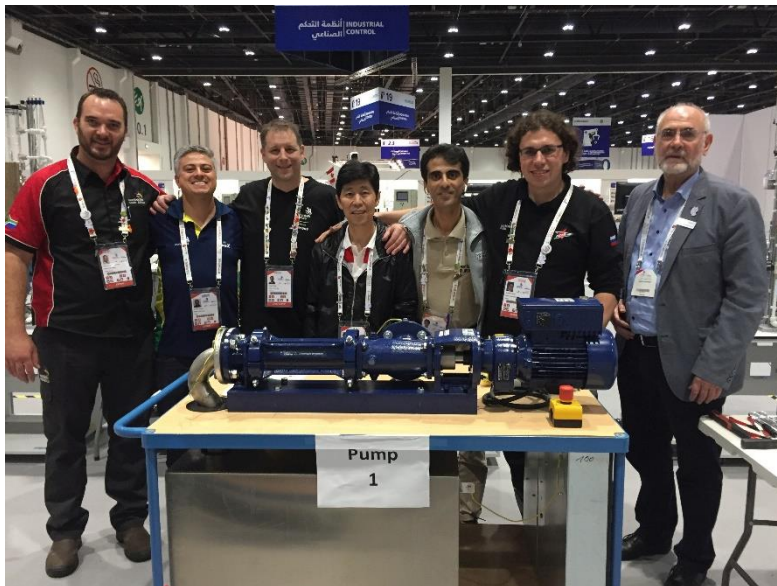
# „Water Technology“ – new Skill – Brasil - German cooperation started already



# WorldSkills „Water Technology“



Worldskills 2013 in Leipzig –  
showing the first competitions  
among 10 German Teams



Worldskills 2015 in Abu Dhabi –  
showing the first competition  
among 5 Countries