

Benchmarking



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A Quick Outline

- The Water Environment Federation: **Forward Progress**
- Thoughts on Access to Water
 - **Facts about access to water globally**
 - **Facts about access to water in pictures**
- Concluding brief remarks

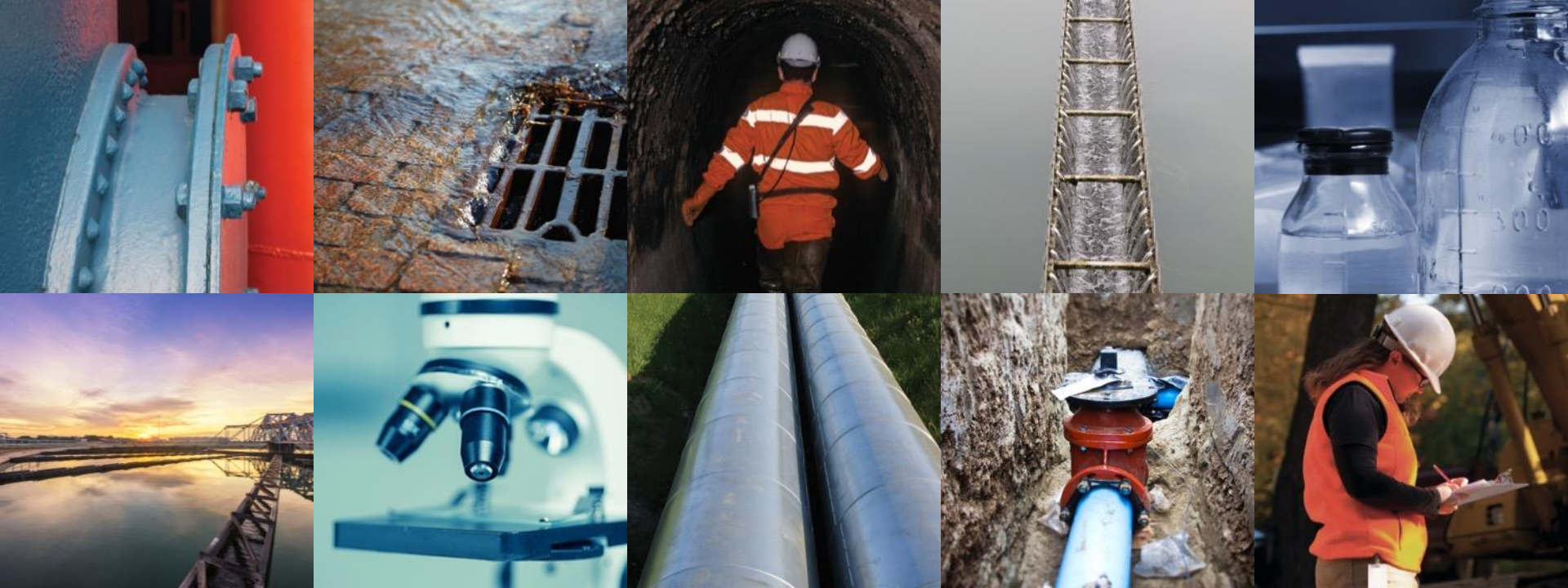




FORWARD PROGRESS

CREATING IMPACT, ENHANCING PARTNERSHIPS
& CELEBRATING ACHIEVEMENTS

Mohamed Dahab
Past President



WE ARE THE WATER QUALITY PEOPLE



A high-speed photograph of water splashing, creating a dynamic and energetic scene. The water is captured in various stages of motion, with droplets and larger splashes of varying sizes. The background is a clean, bright white, which makes the blue and white tones of the water stand out. A dark grey horizontal band is superimposed over the center of the image, containing the main text.

A COMMUNITY OF EMPOWERED PROFESSIONALS CREATING A HEALTHY GLOBAL WATER ENVIRONMENT

wef membership

SUCCESS BY ASSOCIATION





- **Founded in 1928 as a “not-for-profit” technical and educational organization for water professionals**
 - Water Environment Federation (WEF)
 - Water Environment Research Foundation (WERF)
- **Membership: 35,000 members in 75 MA’s in the US and around the globe including the Saudi Arabia Water Environment Association (SAWEA).**



WEF is a great Resource that Links water professionals in the:

- Academic community,
- Government agencies,
- Utilities – W and WW systems
- Engineering Practice, and
- Industrial sectors

2017 TRENDS

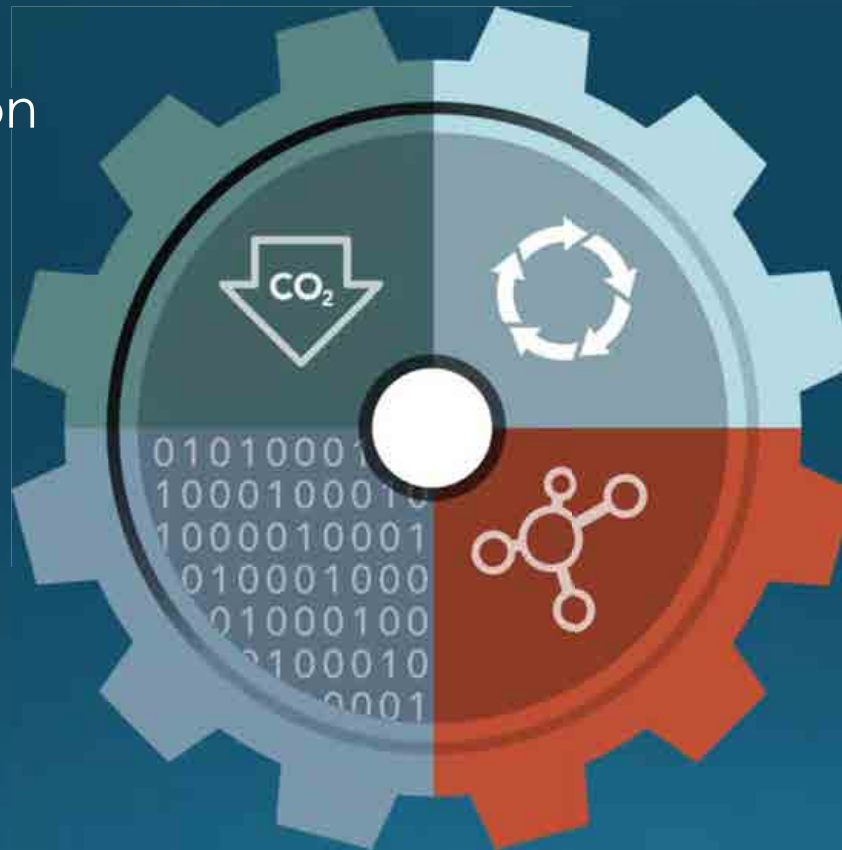
THE 4TH INDUSTRIAL REVOLUTION

Low Carbon
Economy

Circular
Economy

Digital
Economy

Advanced
Material
Sciences



Information provided by BlueTech Research, a WEF Innovation Partner

A person in silhouette is walking away from the camera through a brick-lined tunnel. The person is holding a flashlight in their right hand, which is illuminated. The tunnel walls are made of dark bricks, and the lighting is dramatic, with the flashlight beam illuminating the path ahead. Two overlapping semi-transparent banners are positioned across the middle of the image: a light blue one on the left and a darker teal one on the right.

Challenge

INFRASTRUCTURE



Challenge

CLIMATE CHANGE



Challenge

SUSTAINABILITY

$$\sqrt{\left(\frac{A+B}{2}\right)^2} + \sqrt{\frac{(x-1)^2}{2\pi\phi 2x}}$$

$$2\sigma\left(\frac{2\sqrt{x}}{2\sqrt{x}}\right) \pi\tau\left(\frac{\partial}{\partial\theta}\right) \int \tau(z) f(z)\theta^z$$

$$V^2 + V^2 = D^2 \quad \tau(x, y, z) = x^6 + 4x^2 + 4x^3 + 4x^2$$

$$\Rightarrow \tau(x, y) = x^3 + 4x$$

$$\frac{df}{dz}, \frac{\partial f}{\partial \tau x}, \frac{\partial f}{\partial x^1} : \frac{x}{z^{x^2}}$$

$$\int_0^1 \frac{\tan^{-1}(\sqrt{x^2-t^2})}{\sqrt{x^2+t^2}(x+1)^2} dx = \frac{21}{96} \tau^2$$

$$f(x) = \sum_{j=0}^{\infty} a_j P_j(x)$$

$$\sum_{i=1}^n f(x_i) \Delta x_i$$

$$dA = (1+x^2+u^2) du \wedge dv$$

$$I = m_1, m_2 \quad \text{Analogic System}$$

$$x = \frac{m-\sqrt{b^2+2b}}{3(m_1-m_2)}$$

$$d_s^L = d_t^L - dx^2 - dt^2$$

$$P(p) \Gamma(q) (x+1) \sqrt{\frac{(x^2-1)^2}{x}}$$

$$f(x) = 4x^2$$

$$N \int_0^1 [N(1-y)^2 \Theta_m + 7\Theta_m]$$

$$N \int_0^1 x^1 |a_2 \neq \frac{m_2(1+2)}{2m_1+2} | a^2$$

$$\frac{3-\sqrt{5}}{2} \text{ps}_f(x), \frac{2}{5} (3x^2 + 16x^4 + 2dx)$$

$$x^2 + 5x^2 + 4x \frac{4}{3} \rightarrow 2 \cos 2\pi \left(\frac{22}{x-1}\right)$$

$$\lim_{x \rightarrow \infty} \frac{b-a}{n} \sum_{k=1}^n f\left(a + \frac{b-a}{n} x\right)$$

$$T. \text{ of } \text{mg}(\theta) \left(L - \frac{r^2}{4a} + r \left(\cos(\omega r) + \frac{r}{4a} \cos(2\omega r) \right) \right)$$

Solution

EDUCATE



Solution

INNOVATE



Critical Directions:

- Resources and Energy Recovery
- Multiple water reuse
- Microconstituents, residuals, and biosolids management



Solution

ENGAGE



STUDENTS & YPs



Work Force



EVERYTHING YOU NEED FOR SUCCESS



Random Water Thoughts – Water Facts

- **844 Million** = Number of people without access to safe water (1 in every 7 people worldwide)
- **2.3 Billion** = Number of people without access to sanitation (1 in every 4 people worldwide)
- **6 hours** = Time spent by girls and women collecting water for their families
- **Every 90 seconds** = A child dies of water-related disease
- **In addition, 1 Million** = Number of people killed each year by water, sanitation and hygiene-related disease
- **The cost** = \$260 billion lost globally each year because of lack of water and basic sanitation



Water Facts – in Pictures



In Gujarat, India



Water Facts – in Pictures



In Zimbabwe



Water Facts – in Pictures



In Mumbai, India



Water Facts – in Pictures



In Damascus, Syria



Water Facts – in Pictures



In Aleppo, Syria



Water Facts – in Pictures



In Somalia



Water Facts – in Pictures



In Saddam City, Iraq



Water Facts – in Pictures



In Pakistan



Water Facts – in Pictures



In South Sudan



Water Facts – in Pictures



Rohingya Refugees collecting rain in Myanmar



Water Facts – in Pictures



In Chennai, India



Water Facts – What we should all do?

What should we all do?

- Celebrate the blessings of water that we so reliably enjoy
- Always be thankful to our creator for the blessing and the gift of water
- Think about all other people who struggle to have safe and accessible water for basic living
- Think about how we can help others who so desperately need our help.



Title here!



**Thank You for the
Privilege of Your time**

