miya

THE GLOBAL NON-REVENUE WATER ISSUE:

HOW REDUCING NRW CAN HELP THE WORLD MITIGATE AND ADAPT TO CLIMATE CHANGE

GLOBAL NRW ESTIMATES

- 126 billion m^3/year
- 346 million m^3/day
- 77 litres per capita per day
- USD 39 billion per year

Source - R. Liemberger & A. Wyatt

ESTIMATED GLOBAL CARBON EMISSIONS FROM TOTAL NRW

- 187.2 million metric tonnes CO_2 / year
- 513 thousand metric tonnes CO_2 / day
- 0.6% of global CO_2 emissions

Global CO_2 emissions

- 1.9% from Aviation
- 1.7% from Shipping

LEAKAGE EMISSIONS

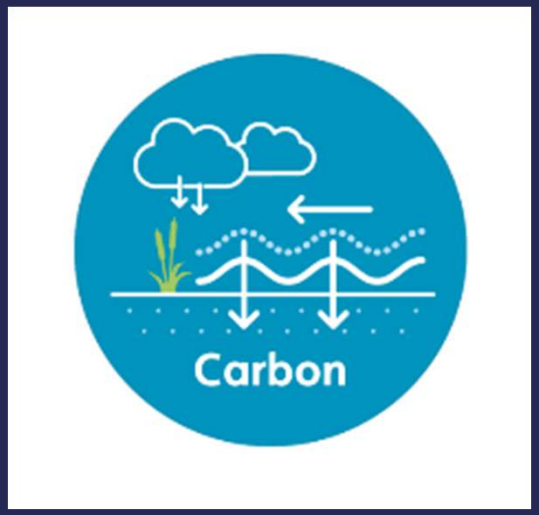
- Leakage Emissions are greenhouse gasses that are emitted as a result of Real Losses occurring in the network.
- Leakage Emissions are traceable and measurable.

HOW DO WE REDUCE LEAKAGE EMISSIONS

- We already know how…….. By reducing Real Losses!
- When we reduce Real Loss, we are reducing the amount of energy and resources used in our water supply chain for water that is ultimately wasted.

HOW DO WE REDUCE LEAKAGE EMISSIONS

- Where do we use energy in that supply chain?
  - Water Acquisition (Abstraction)
  - Water Treatment
  - Water Transportation (Pumping)
  - Reactive Repairs
  - Leak Location



GLOBAL LEAKAGE RECOVERY

- Global NRW – 126 billion m^3/year
- On average it has been found that 70% of NRW are Real Losses – 88 billion m^3/year.
- These losses have a Carbon Footprint and are being produced and lost and are Carbon recoverable.
- Apparent losses is estimated at 30% of NRW, 38 billion m^3/year, however not all of this can be accounted as carbon recoverable as some items of this water will be sold.

Basic Water Source - no pumping and minimum chemicals	Traditional Water Systems – combination of pumping / treatment / chemicals	Desalination Sea Water Reverse Osmosis (Average)	Desalination Sea Water Reverse Osmosis (high) and plants run by fuel oil
10%	60%	20%	10%

ESTIMATED GLOBAL WATER PRODUCTION PER SOURCE

Basic Water Source - no pumping and minimum chemicals	Traditional Water Systems – combination of pumping / treatment / chemicals	Desalination Sea Water Reverse Osmosis (Average)	Desalination Sea Water Reverse Osmosis (high) and plants run by fuel oil
30 g/m^3	298 g/m^3	3,170 g/m^3	6,700 g/m^3

CO_2 IN GRAMS PER M^3 OF WATER PER WATER PRODUCTION SOURCE

CO_2 SAVINGS METRIC TONS / YEAR				
Basic Water Source	Traditional Water System	Desalinated Sea Water – Reverse Osmosis	Desalinated Sea Water – RO using Fuel Oil	TOTAL
264,600	15,770,160	55,918,800	59,094,000	131,047,560

GLOBAL CO_2 EMISSION SAVINGS FROM LEAKAGE REDUCTION

THIS EQUATES TO 0.4% OF GLOBAL CO_2 EMISSIONS

CO_2 OVERVIEW PER WATER SOURCE PER YEAR				
Basic Water Source	Traditional Water System	Desalinated Sea Water – Reverse Osmosis	Desalinated Sea Water – RO using Fuel Oil	TOTAL
264,600	15,770,160	55,918,800	59,094,000	tonnes per year
10%	60%	20%	10%	% water source
30 g/m³	298 g/m³	3,170 g/m³	6,700 g/m³	CO_2 g/m³
0.21%	12.03%	42.67%	45.09%	% of CO_2

SO…. WHAT DOES THIS LOOK LIKE ?

Which is equivalent to:

- A plane annually circumnavigating the earth 52,419 times

Or

- To offset the footprint annually planting 218.4 million hectares of trees – equivalent in size to a quarter of Brazil, the fifth largest country in the world.

To offset the Carbon Emissions from Leakage only, if no action is taken and leakage remains the same, the whole of the Earth's land area will be planted with trees over the next 64 years.

WHERE IT ALL STARTED

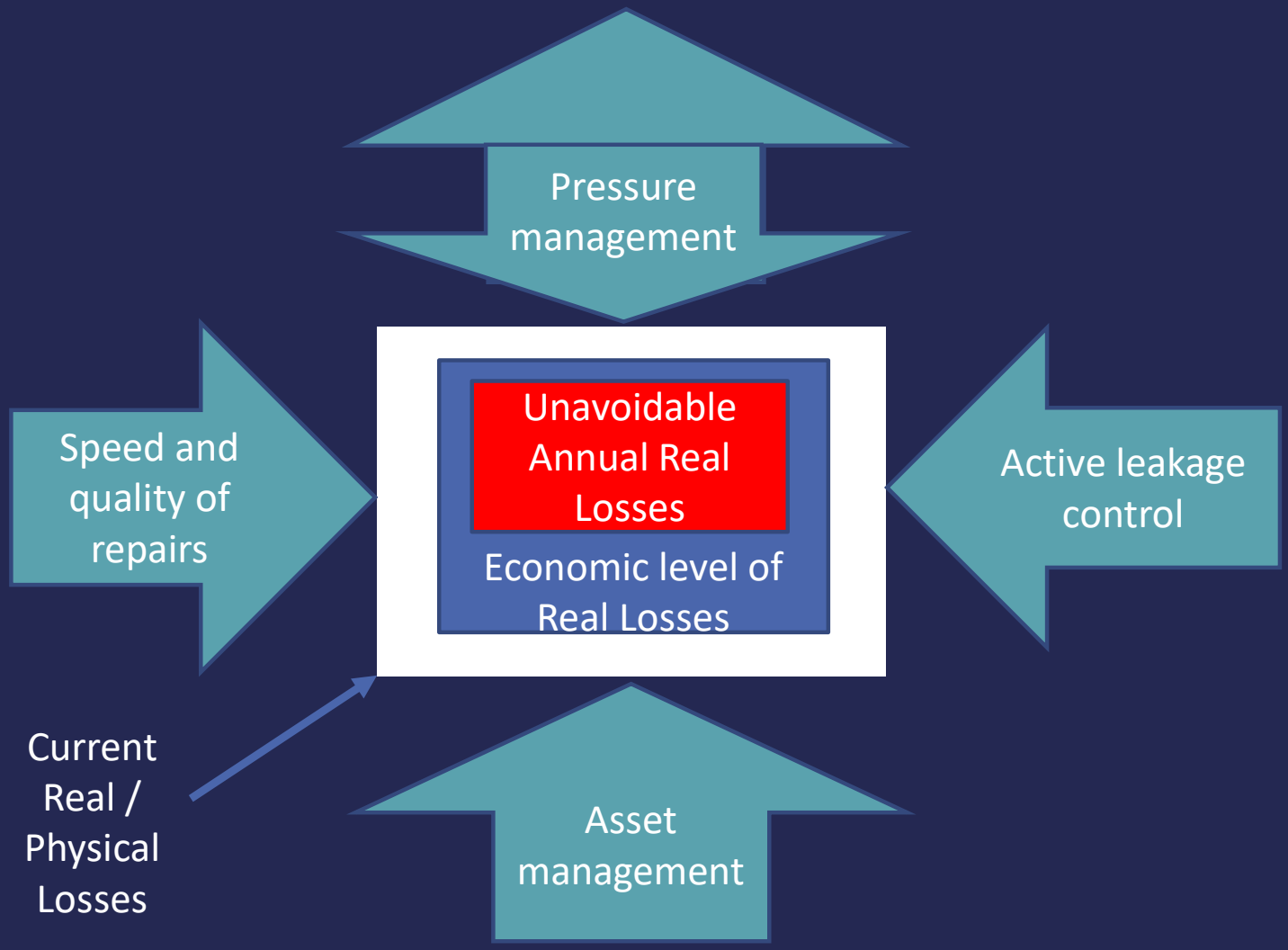
PARIS AGREEMENT 2015

- At COP 21 in Paris, on 12 December 2015, Parties to the UNFCCC being nearly 200 countries reached a landmark agreement to combat climate change and to accelerate and intensify the actions and investments needed for a sustainable low carbon future.
- It also prescribes that Parties shall communicate their NDCs (plans) every 5 years and provide information necessary for clarity and transparency. To set a firm foundation for higher ambition, each successive NDC will represent a progression beyond the previous one and reflect the highest possible ambition.

Main goals are

- Limit temperature rise 'well below' 2 C.
- First universal climate agreement.
- Helping poorer nations.
- Publishing greenhouse gas reduction targets.
- Carbon neutral by 2050.

NRW REDUCTION STRATEGY
REAL / PHYSICAL LOSSES



How does the carbon footprint reflect in the decision making when planning the repair or reducing real losses?

ACTIVE LEAKAGE CONTROL FACTORS AFFECTING CARBON

Listening on each stop tap

- Must get to and from site
- Don't know if any leaks present in the region surveyed
- Low footprint if area is surveyed by foot

Lift and shift of noise loggers

- Movement of staff in vehicles doing lift and shift and follow up Active Leakage Control activities
- Don't know if any leaks present in the region surveyed

Permanent installed equipment

- Once installed only go to alarms – reduced unnecessary vehicle usage

Satellite leakage

- Only go to areas of Interest – reduced unnecessary vehicle usage

Method of pipe installation	• Open-cut • Bored / pipe-bursting
Ground type	• Concrete / tarmac • Sand / grass
Material used	• Metallic • Non-metallic
Life expectancy 30 - 60 years	
Service pipe	• Material • Renew or use existing

ASSET MANAGEMENT
FACTORS AFFECTING CARBON

PRESSURE MANAGEMENT FACTORS AFFECTING CARBON

Installation of PRV and servicing valves	Single time installation
Type of pressure management	Chose right type of installation for best results
Lowest cost on carbons once installed	Reduces losses without needing to visit site
Controlled remotely and serviced annually	

- Repair or replace
- Repair quality
- Quality of fittings used
- Run time of leak

SPEED AND QUALITY OF REPAIRS FACTORS AFFECTING CARBON

OTHER FACTORS TO CONSIDER

- How is electricity produced
  - Fuel Oil
  - Renewable – Wind / Solar / Geothermal
  - Natural Gas
  - Coal
  - Nuclear
- Increase in cost of fossil fuel
- Resilience to catastrophic failure
  - Can you get fuel oil onto the island
  - Storage capacity for fuel oil
- Storage capacity of water
  - How long can you survive with high NRW
  - Reducing Real Losses can help countries adapt to impacts of climate change

HOW CAN I BECOME CARBON NEUTRAL BY 2050?

- Carbon footprint must be reduced
- Increase shift away from fossil fuel
- Extra storage facility
- Ability to survive a catastrophic failure
- Resilience insurance needs
- Look at the bigger picture
- What is your biggest usage of Carbon?

AS A UTILITY, REDUCING NRW WILL HELP YOU BECOME CARBON NEUTRAL BY 2050

- The funding of NRW can unlock many climate financing options
- Climate funding options are widely available and currently not being used to reduce NRW
- This is a widely untapped source and Govt., by necessity, must look at reducing carbon emissions
- Sources of finance include
  - Green Climate Fund
  - IFI funding
  - Commercial banks
  - Private operator

HOW ARE YOU GOING TO MAKE A **D**IFFERENCE

- The problem isn't financing, it's the will from the country and utility, but now there is a commitment to abide to the Paris agreement
- Common sense is now a priority, and a start must be made
- Begin changing the way we live for not only ourselves but our children and grandchildren – we can do our bit to help correct mistakes made in the past
- We cannot change the world, but we can change a small part of it and reduce NRW and carbon emissions
- Where will you be on this journey:
    - A leader?

      or
    - A follower?

Assess the carbon footprint and energy performance of your urban water utility

ECAM empowers water and wastewater utility operators to assess their greenhouse gas emissions and energy consumption.

- Perfect for climate reporting needs
- Overview of system-wide greenhouse gas emissions
- IPCC-2019 compliant and open source

Start your assessment

☐ Include tips for new users

Learn more about the project

Open source

ECAM is a free and open source tool. The source code is openly published for use and modification on GitHub.

Click here to access GitHub

About ECAM

ECAM's web interface and content were developed jointly by ICRA, GIZ and IWA.

Click here to learn more

WaCCliM

ECAM was developed as part of WaCCliM, a project that supports water and wastewater utilities to become climate-smart.

Click here to access wacclim.org

WaCCliM is a joint initiative between GIZ and IWA. This project is part of the International Climate Initiative (IKI). The German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) supports this initiative on the basis of a decision adopted by the German Bundestag.

On behalf of: Federal Ministry for the Environment, Nature Conservation and Nuclear Safety of the Federal Republic of Germany

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http://wacclim.org/ecam/

https://wacclim.org/

THANK YOU

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