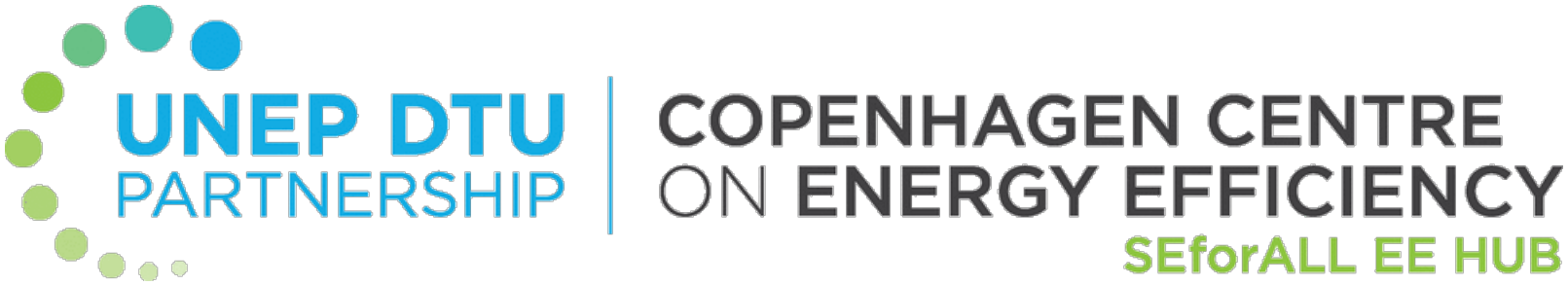
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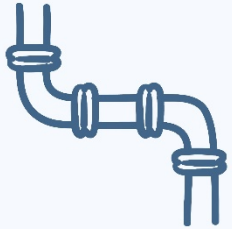
Agenda

Goal: share insights on the importance of energy efficiency and the wáter energy nexus to increase the sustainability of both water utilities and available resources (energy, water)

#	Minutes	Title	Description
1	5 min	Water sector status	Status of water utilities and existing challenges.
2	10 min	Energy efficiency in WSS	Energy inefficiencies, oportunities and holistic approach for electro-mechanical components
3	10 min	Water savigns and energy nexus in WSS	Water losses and existing synergies with the energy consumption
54	10 min	Q&A	Open sesión to respond to your questions

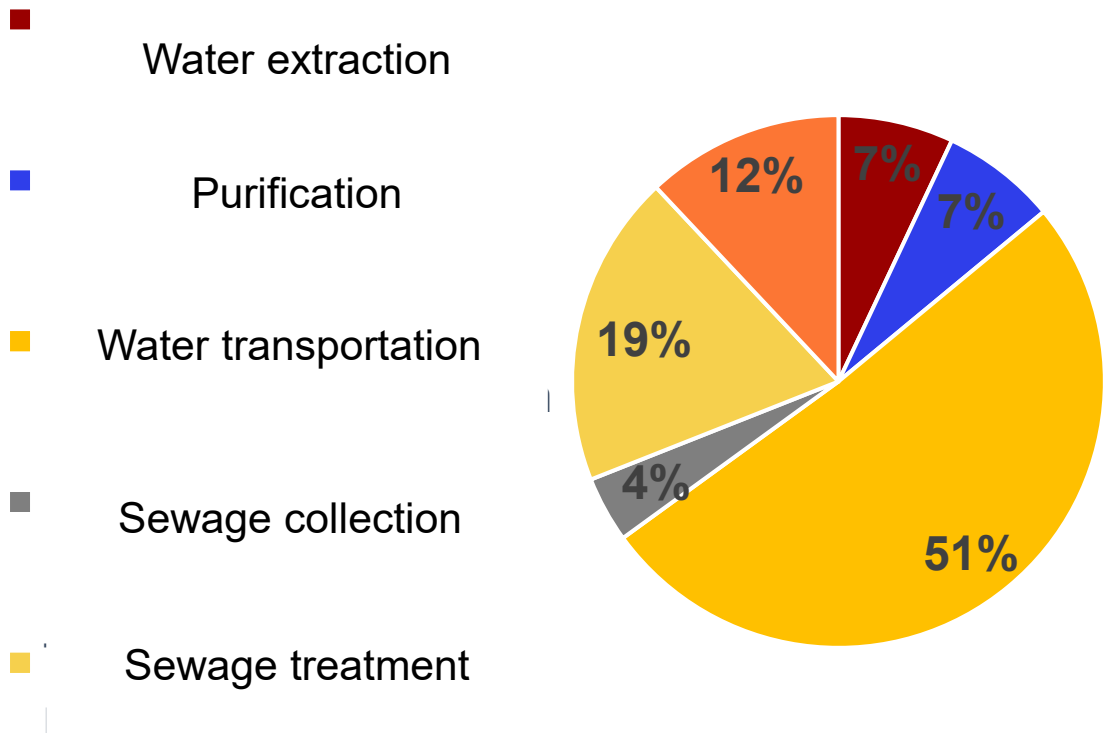
Water supply systems: Status

- **Production:** Represents 3-4% of the world power consumption. 80-90% of which is used to pump
- **Consumption:** By 2040 water consumption is expected to increase up to 40%. Need to create awareness of the value of having access to water
- **Regulation:** Planning can bring substancial savings both in resources (energy, water, financial) as well as in equivalent GHG emissions (CO2)



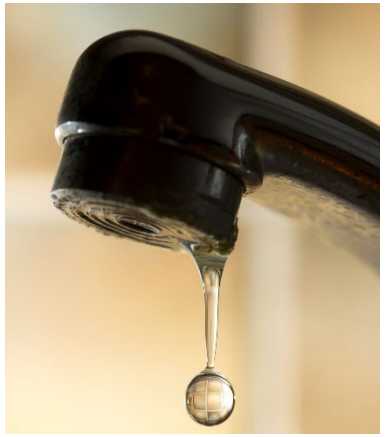
Water supply systems: Status

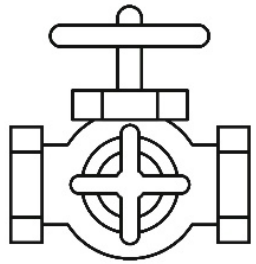
Energy consumed through the water cycle (superficial source)



Key aspects:

- Water supply represents up to 65% of the total energy consumed in the water cycle
- Water losses represents 25-50% of the water produced
- Large differences between different systems





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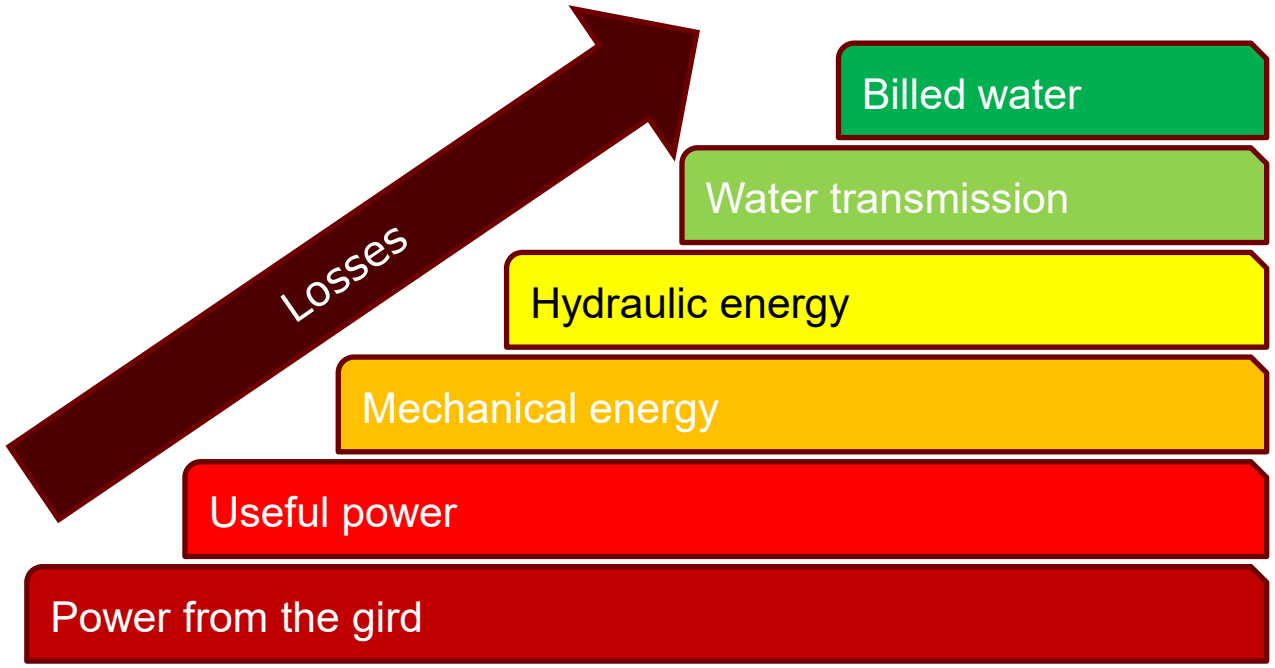
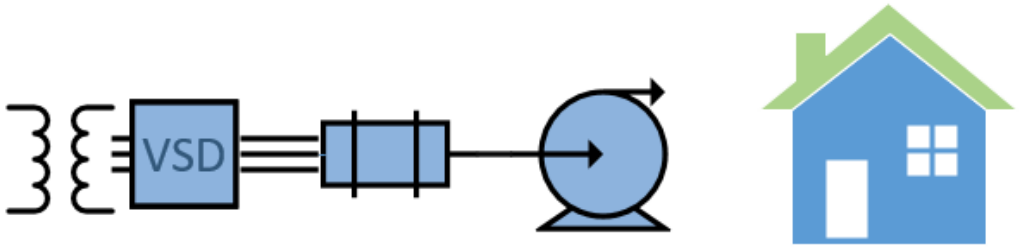
WSS: Energy inefficiencies and oportunities

- The **energy intensity** per unit of sold water links the required energy to supply a cubic meter of water
- Individual EE actions have an impact of**10-40%**
- A holistic approach helps to prioritize EE actions, to reduce the required investment and O&M costs
- Payback period < 5 years





WSS: Energy efficiency

Tecnology	Old system	Efficient system
Transformer	85%	96%
Power factor	0.8	0.9
VSD	-	95%
Electric motor	90%	95%
Water pump	70%	88%
Total efficiency	**53.5%**	**76%**

Efficiency gains in the motor-pump set

- **Motor-pump set inefficiencies:**
  - **Motor losses:** Mainly caused because of being oversized, old, outdated and to poor maintenance
  - **Pump losses:** Working out of the operational design points (Best Efficiency Point) because of poor sizing or maintenance
- **Improvement of shaft and coupling connections**
  - Replacement of valves
  - Introduction of variable speed drives
  - Replacement of transformers

30% increase in EE

Study case: Energy efficiency in Guyana

IDB
Inter-American Development Bank

I. 6% of the national power demand => 60% of the water utility costs

II. Water losses of 70% and lack of consumption metering

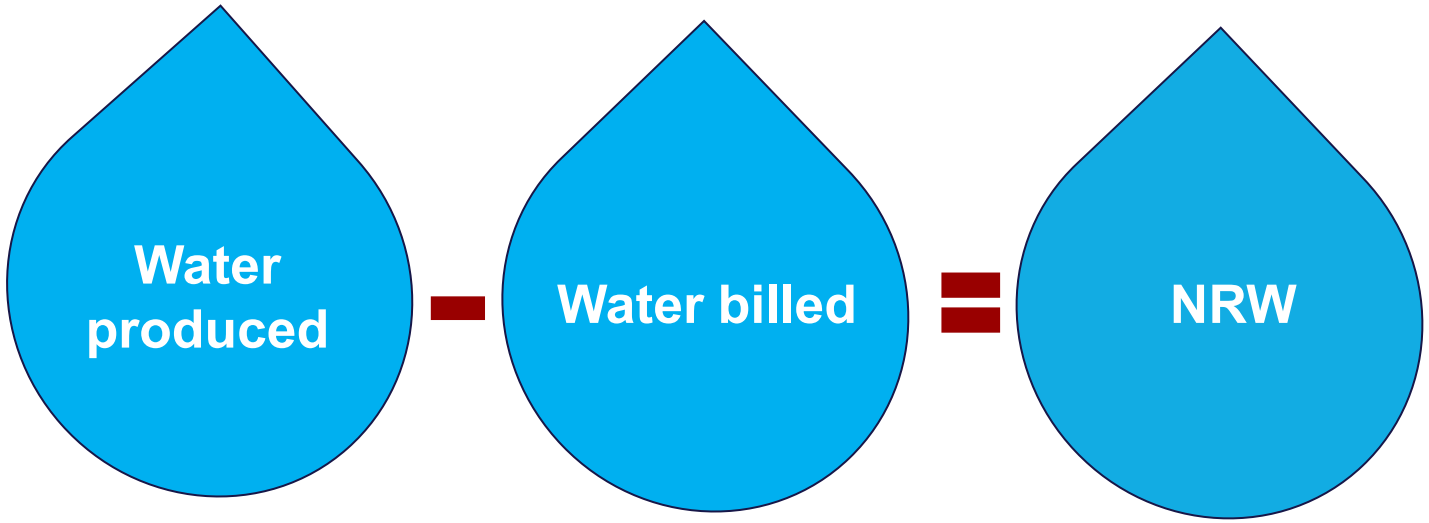
III. Energy audits found larger EE savings in existing power factors, electric motors and water pumps. Average electro-mechanical efficiency of 46%

Solutions:

- New water tariffs that reflect the real cost of water- US 0.3 to US 0.55 per cubic meter
- Motors and pumps replaced in 34 supply points (25% of the enrgy consumed by the utility)
- An investment of US 160,000 increase the EE a 29%, bringing a total anual savings of US 700,000 => 3 months payback
- Energy savings of 2,000 MWh/year and 2,000 tCO2

WSS: Water losses and Non-Revenue Water (NRW)

- **Physical losses**. Due to filtrations during the whole cycle. The main cause is the lack of a correct operation and maintenance
- **Commercial losses**. Lack of real consumption metering, census inaccuracies and illegal connections
- **Authorized consumption not billed**. Firefighting, watering gardens or given to certain social strata with risk of social exclusion



NRW is the difference between water produced and billed

WSS: Reduction of water consumption

Impact of climate change in water supply systems:

- Damage to water supply systems
- Shortage of water

Solutions

- Water Demand Management (WDM)
- Preventive maintenance instead of corrective maintenance and better control systems (SCADA)
- Public campaigns for citizen awareness on the correct use of water and its value

Less water means less energy required, less peak energy consumption and not overexploiting the water reservoirs, reducing the **energy intensity and increasing the sustainability of the available resources**

Study case: SANASA, Brasil

In value:

- 6% of the national electricity demand
- Reduction of physical losses
- Tariff optimization by storing drinking water in tanks during off-peak hours
- Replacement of obsolete electro-mechanical equipment

Results:

- Increase of 22% of the population supplied to 98% (mostly low income households)
- 6% reduction in water losses
- Electricity consumption remained constant, reducing energy intensity

SANASA CAMPINAS
NOSSA VIDA É INOVAR

Benefits of energy and water efficiency actions

- Energy consumption reduction (MWh/yr)
- Water volume produced reduction (m3/)
- Financial savings through lowered costs and higher income (USD)
- Reduction of equivalent emissions (ton eq. CO2)
- Short payback period (yr)

Thank you

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Block #4

Q&A session

10 Septiembre 2020 | Copenhague

What is a rapid assessment?

- El informe de evaluación rápida incluye evaluaciones técnicas y financieras de alto nivel de proyectos futuros o existentes en las ciudades e identifica barreras para su implementación.

- Supone un paso fundamental en la evaluación de datos energéticos de los proyectos municipales

Fuente: EnergyStar

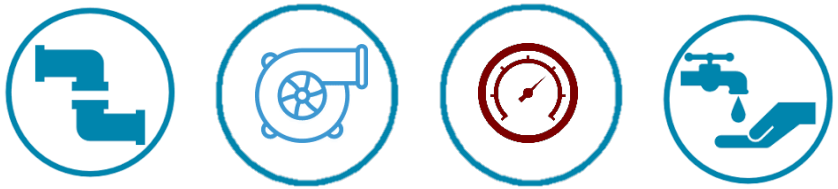
Project bundling

Agregación de actores:

1. Municipalidad A o Empresa de Servicios A
2. Municipalidad B o Empresa de Servicios B
3. Municipalidad C o Empresa de Servicios C
4. Municipalidad D o Empresa de Servicios D

Municipalidades/ empresas de servicios → **Previsión individual de ahorros y agregación** →

→ **Factibilidad y Desarrollo del proyecto** → **Financiamiento** →



→ **Compras Públicas** → **Implementación**

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RED ARGENTINA DE MUNICIPIOS FRENTE AL CAMBIO CLIMÁTICO