Online Workshop | 16 March 2021, 10:00 - 11:30

THE CONTRIBUTION OF WATER EFFICIENCY AND ENERGY SAVINGS TO THE EUROPEAN GREEN DEAL

10 YEARS 2011-2021

EUROPEAN ALLIANCE TO SAVE ENERGY

Creating an Energy-Efficient Europe

GOVERNMENT OF MALTA
MINISTRY FOR ENERGY, ENTERPRISE AND SUSTAINABLE DEVELOPMENT

#WaterEnergyNexus
#EnergyEfficiency

Miriam Dalli
Minister for Energy, Enterprise and Sustainable Development
Republic of Malta

Veronica Manfredi
Director for Quality of Life
DG Environment
European Commission

Robert Nuij
Deputy Head of Unit for Energy Efficiency, ***DG Energy***
European Commission

Simona Bonafè
MEP
Member of **ENVI** and **ITRE** Committees
European Parliament

Jure Sumi
Group Brand Manager and Green Solutions' Advocacy Lead
Knauf Insulation

Mads Warming
Global Segment Director Water & Waste Water
Danfoss

David Martin
VP & Country Manager Belgium & France
Ecolab

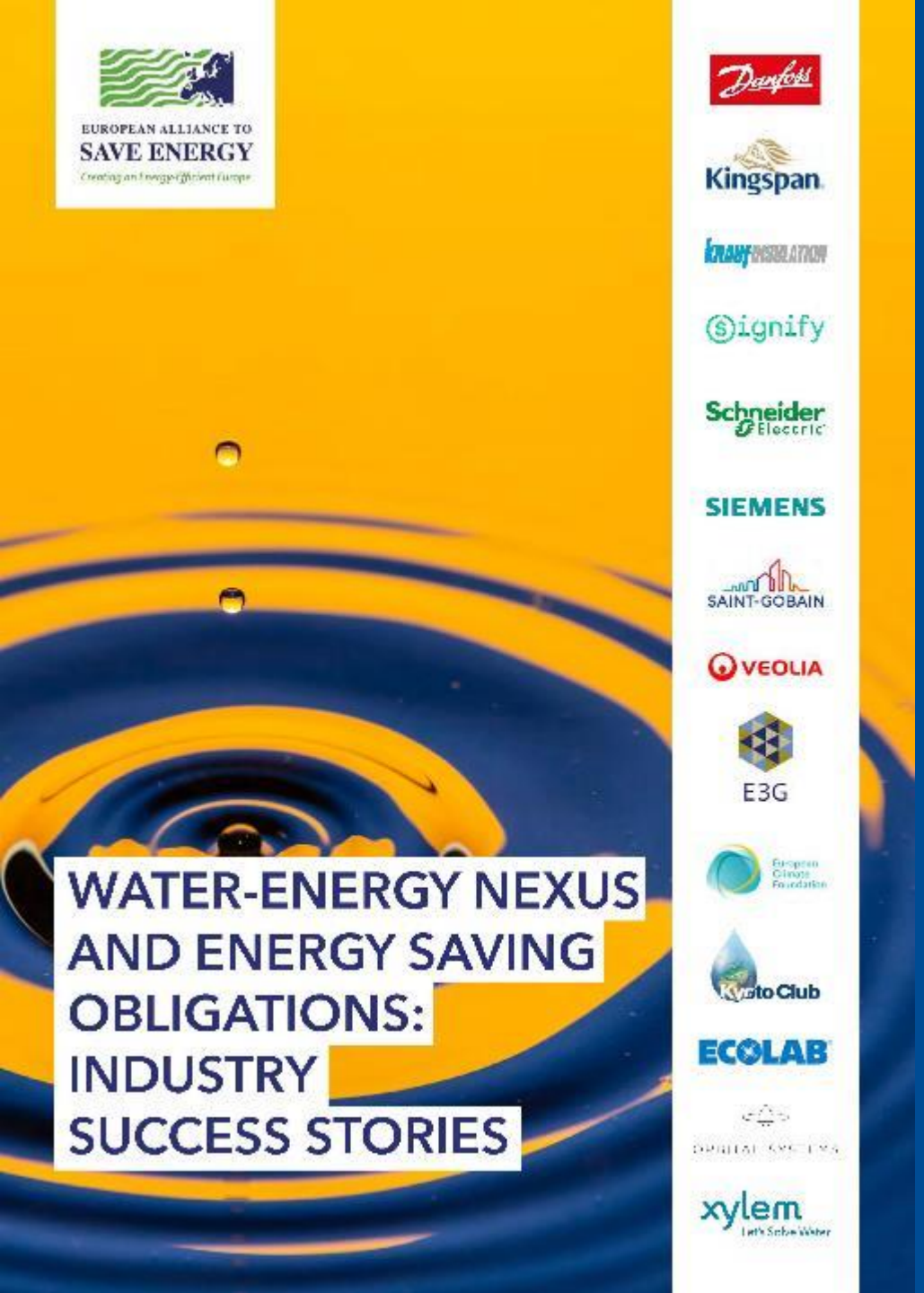
Alexis de Kerchove
Director Marketing and Business Development for Water Utilities
Xylem Inc.

David Sacco
Manager Desalination Services
Water Services Corporation
Malta

THE CONTRIBUTION OF WATER EFFICIENCY AND ENERGY SAVINGS TO THE EUROPEAN GREEN DEAL

EUROPEAN ALLIANCE TO SAVE ENERGY

GOVERNMENT OF MALTA
MINISTRY FOR ENERGY, ENTERPRISE AND SUSTAINABLE DEVELOPMENT



Water-energy nexus and energy saving obligations: industry success stories

Click here to view the publication.


Foto: Danilo Bevk, National Institute for Biology

Stormwater management through green infrastructure to save energy and cost in waste water treatment facilities

Jure Šumi Msc
Green Solutions' Advocacy Lead
Knauf Insulation

Known Green Roof Benefits

Urban Heat Island (UHI) Effect Reduction

Storm-water management

CO^2 footprint reduction

Thermal performance

Air cleaning

Natural habitat

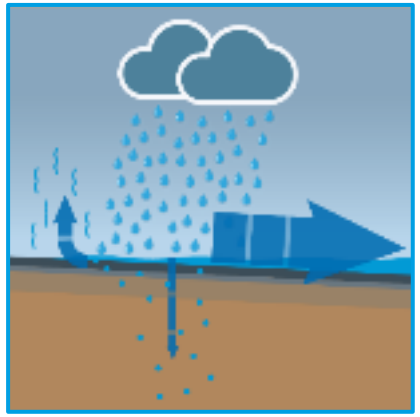
Natural look

Extended roof life

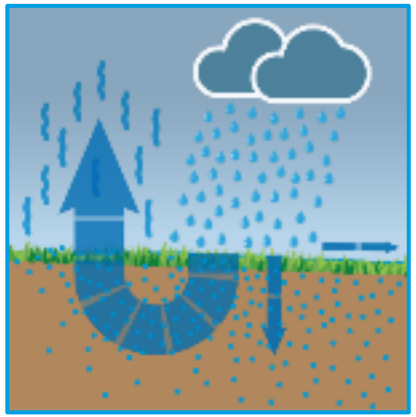
Improved comfortability for residents

Sound insulation

Restoring natural water cycle is green infrastructure's essence



Sealed (non vegetated) Surface will create massive storm water run-off (from roofs, streets,…) directly to sewage or even creeks and rivers.

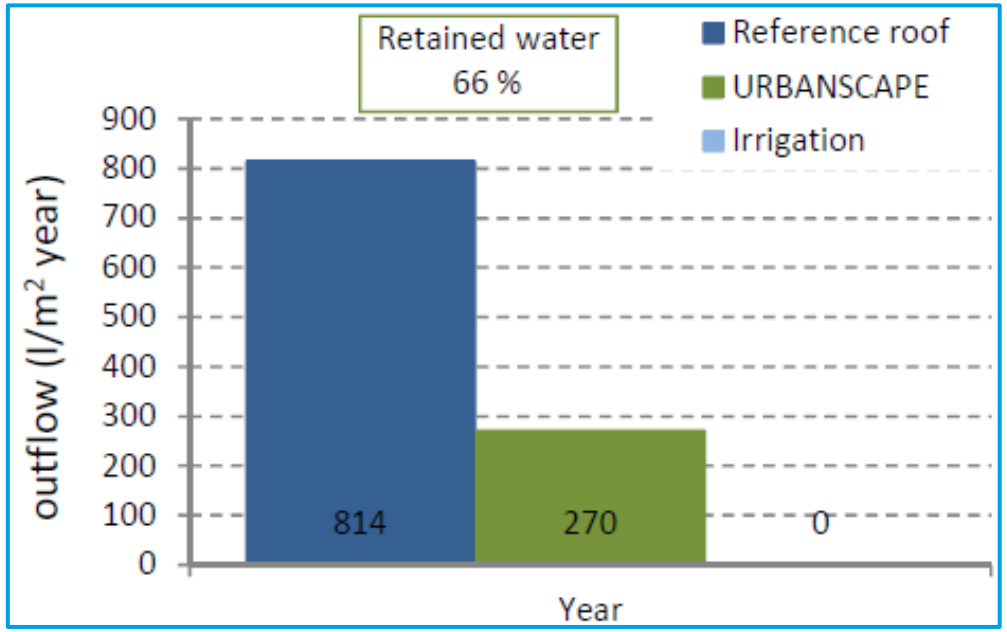


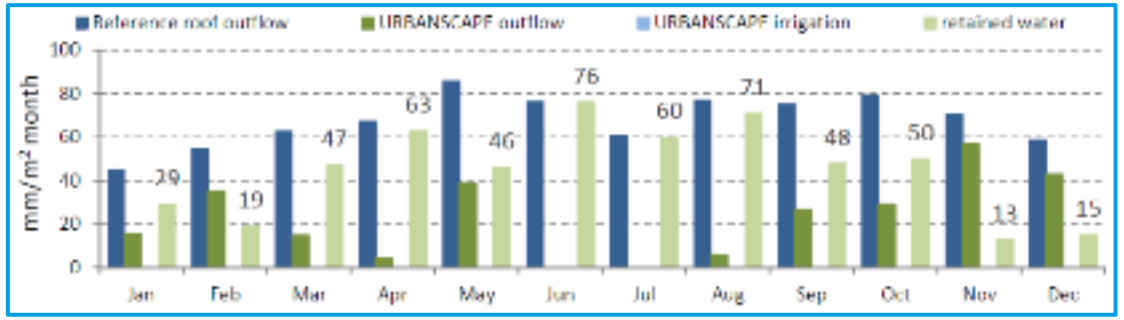
Natural (vegetated) surface will capture majority of storm water and will evaporate it back in to the environment.

Storm-water RETENTION is a key to energy saving.
Less or no run-off = less storm-water treatment = less energy used


Foto: Pikt Air

Urbanscape® Green Roof on Commercial building - Retail Park 2 in ZAC des Montagnes, Ouest à Champniers, France **will yearly retain almost 5.000 m3 of rain water**.
Considering average consumption on a yearly base in Waste Water Treatment Plants, **up to 2.9 MWh of energy saved** for the Municipality.





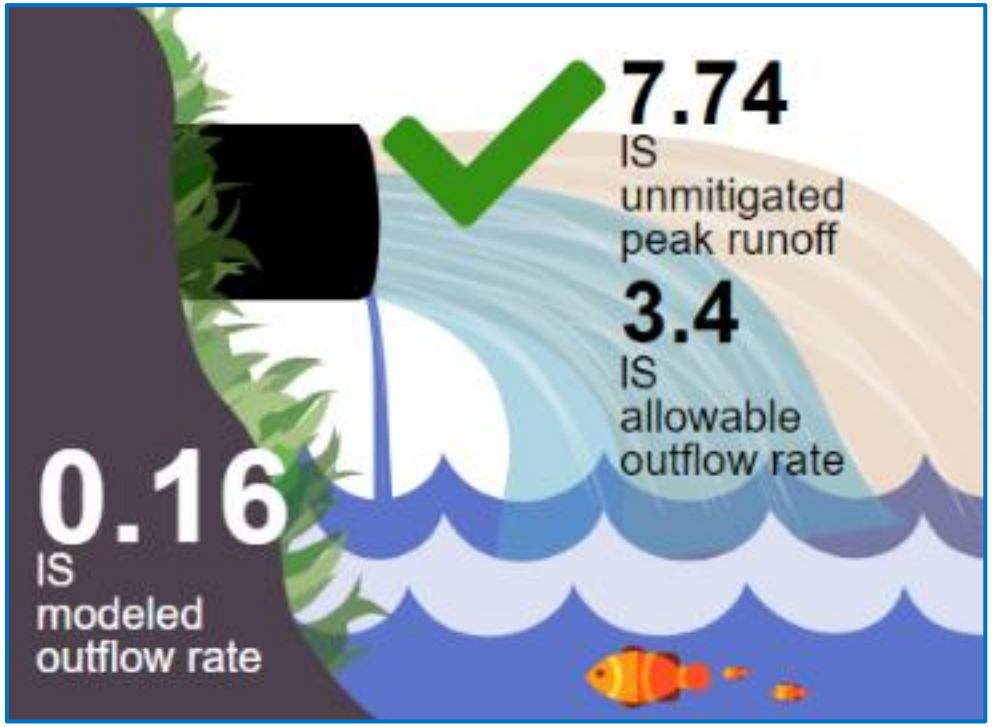
*Calculation modelling done by Urbanscape® P.E.T. software

Storm-water DETENTION helps with efficiency

Slower run-off = less expensive storm-water treatment = less energy used

Foto: Tomaž Lanišek, Prostorož

Urbanscape® Detention Green Roof on school in Kranj, Slovenia **will dramatically reduce the storm-water run off,** preventing sewage system flooding and reducing the needs to run sewage and stormwater treatment facilities to maximum capacities.



*Detention modelling done by Detention calculator

Storm-water DETENTION helps with efficiency
Slower run-off = less expensive storm-water treatment = less energy used

Our goal is for EU Commission to realise that green infrastructure should play a major role to make EU cities a better place for residents, while helping to fight climate changes.

Key legislation that can support green roof development:

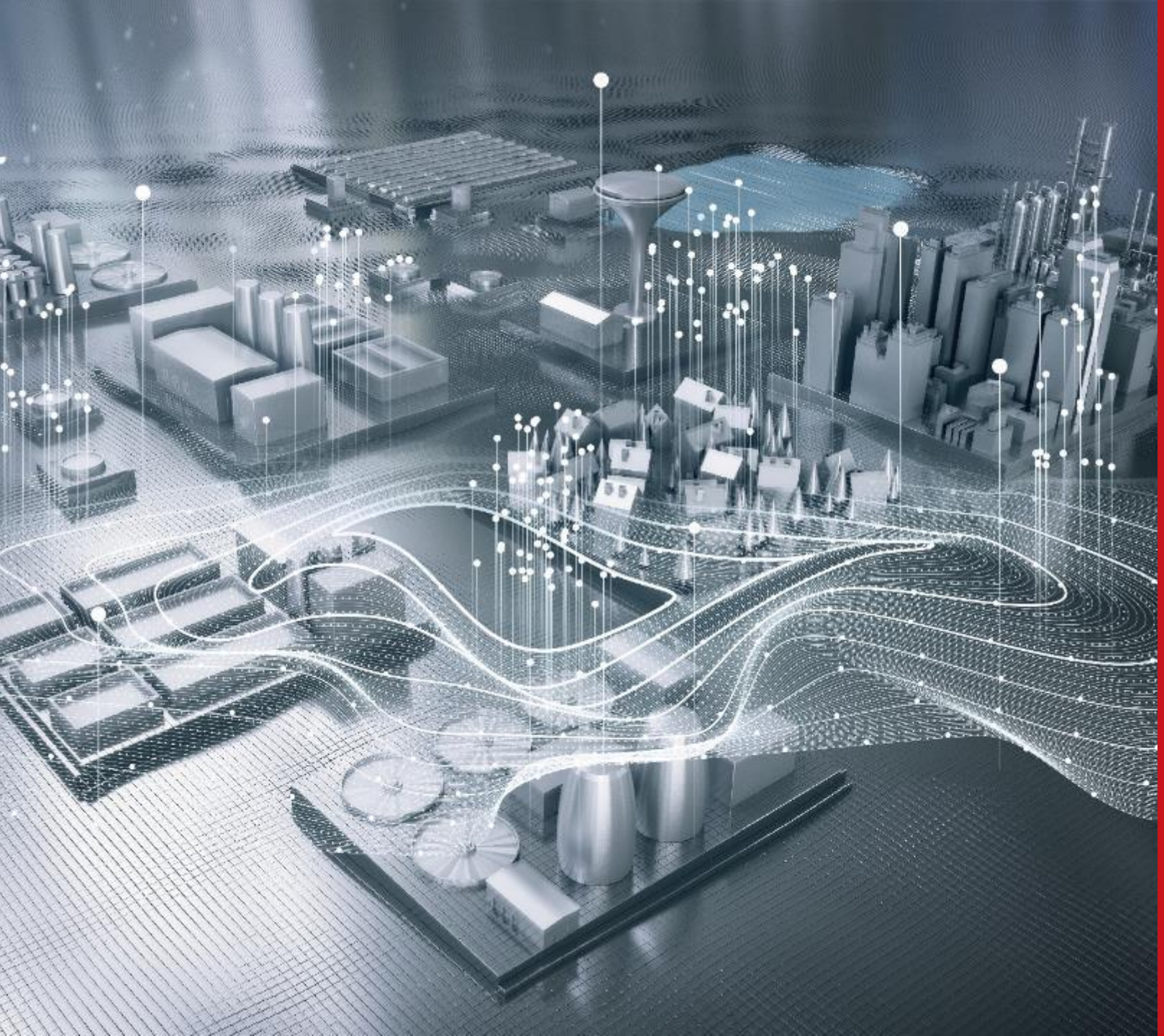
- Urban WasteWater Treatment Directive (UWWTD)
- Energy Performance of Buildings Directive (EPBD)
- Biodiversity Strategy 2030
- Climate Adaptation Strategy
- New EU Bauhaus Initiative

Thank you

for your attention

E-mail:
jure.sumi@knaufinsulation.com

Knauf Insulation
Trata 32
4220 Škofja Loka
Slovenia
www.knaufinsulaiton.com
www.urbanscape-architecture.com



ENGINEERING TOMORROW

An energy intensive wastewater treatment plant turned into energy producer

EU-ASE conference 16 – 03 - 2021

Global Head, Water & Wastewater, Mads Warming

The World Wide first energy-neutral catchment area – Marselisborg, Aarhus Water, Denmark

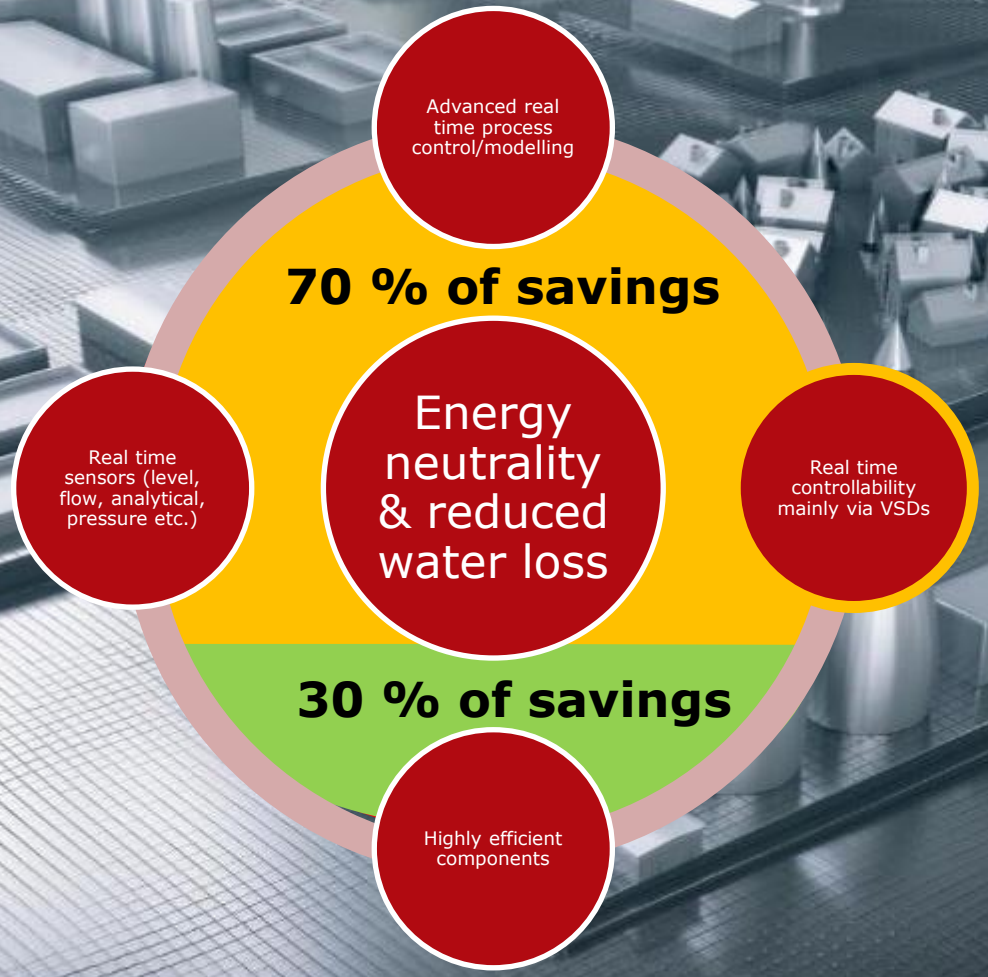
Fact box

- Energy neutrality for the whole water cycle *(water supply + wastewater)*
- Catchment area for 200,000 people. No wind, solar, heat pump, sludge from other facilities, FOG from food industry or sludge burning energy is produced
- Based on energy savings & household wastewater energy production *(no external carbon)*

Marselisborg catchment area	Status 2016	Status 2018
Energy consumption		
Water treatment, distribution [kWh] (avg. 0.51 kW/m^3, high)	3,2 mill	4,1 mill
Wastewater transport [kWh]	0,8 mill	0,5 mill
Marselisborg WWTP [kWh] (BOD_5 = 2,4/TN= 6,0/TP = 0.2)	3,2 mill	3,3 mill
Total energy consumption [kWh]	***7,2 mill***	***7,9 mill***
Energy production		
Electricity production [kWh]	4,8 mill	4,6 mill
Heat production [kWh]	2,6 mill	1,9 mill
Total energy production [kWh]	***7,4 mill***	***6,5 mill***
Own energy supply degree		
Wastewater treatment process, electricity and heat [%]	234 %	196 %
Wastewater treatment process, electricity [%]	150 %	150 %
Total Marselisborg catchment area [%]	***103 %***	*82 %*

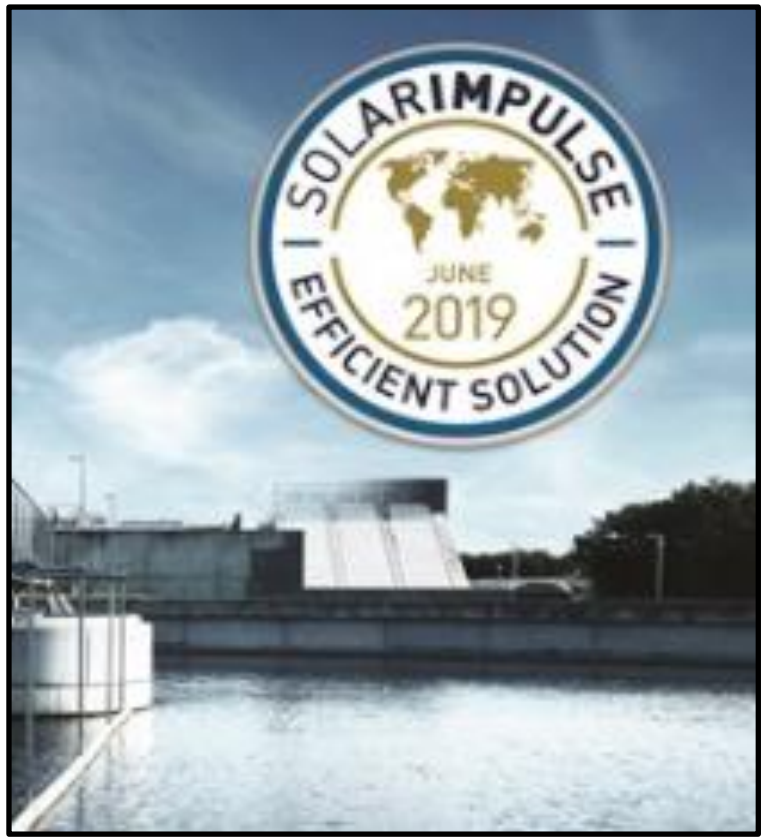
290 VSD's installed in catchment area

Digitalization in practice – created 70 % of the improvements



AAV/Marselisborg got 2 awards in UK, is highlighted in Sustainable EU 2030 and got SOLARIMPULS recognition + +

UK Pump Industry Awards 2018
Environmental Contribution of the Year +
Special Judges Award, holistic approach



The World Alliance, through the Solar Impulse Foundation, is selecting the 1000 most clean and efficient solutions that preserve the environment **in a profitable way**

WATER SAVINGS AND ENERGY EFFICIENCY IN THE HIGH-TECH INDUSTRY

David Martin
VP & Country Manager France & Belgium
VP Government Relations, Europe
ECOLAB

ECOLAB – WHAT WE DO

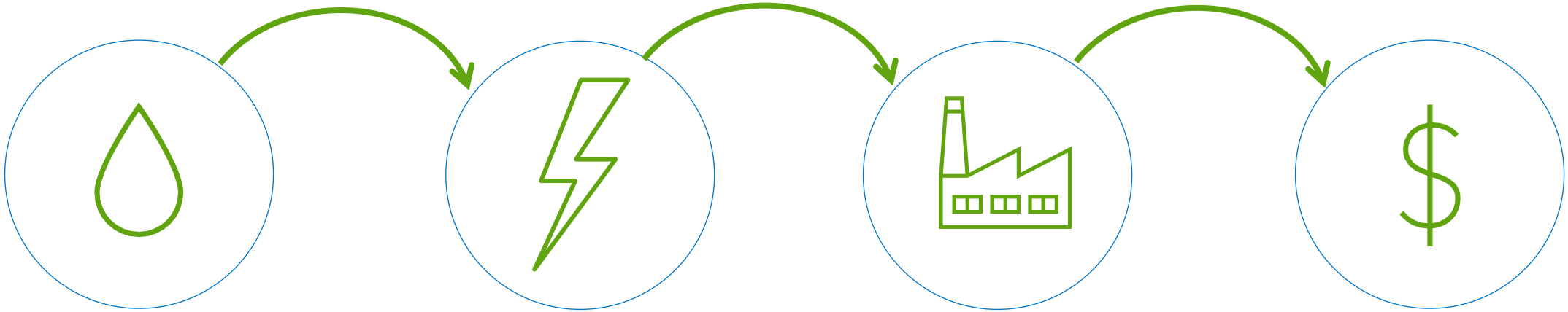
SAFE FOOD

CLEAN WATER

ABUNDANT ENERGY

HEALTHY ENVIRONMENTS

ECOLAB IN THE WATER-ENERGY NEXUS



WATER

780

BILLION LITRES SAVED

per year

ENERGY

8.2

BILLION KWh SAVED

per year

EMISSIONS

1.5

MILLION Mt GHG

per year

ANNUAL COST SAVINGS

>$500M

eROI℠ **>15%**

Source: 2020 Sustainability Report; 2020 Annual Report

CASE STUDY: DATA CENTRE

SITUATION

Ecolab helped a research company with a central water treatment centre that provides cooling for an on-site data centre. The plant operates 24/7 generates 3,000 tons of cooling. The city requires all new facilities to use recycled waste water for cooling towers from a municipal source. The waste water contained high and variable levels of impurities causing significant issues with cooling tower operating cycles and increasing energy costs due to reduced heat transfer.

SOLUTION

3D TRASAR Technology allows:

- Modelling and analysis of water source and flows
- Determining treatments and optimal operating conditions
- Permanent monitoring with auto-dosing to maintain water quality
- Communications platform to monitor remotely in real-time

RESULTS

11M litres of water saved per year
€13K saved annually

eROI℠

564,677 kWh of energy saved per year
€61K saved annually

ECOLAB®

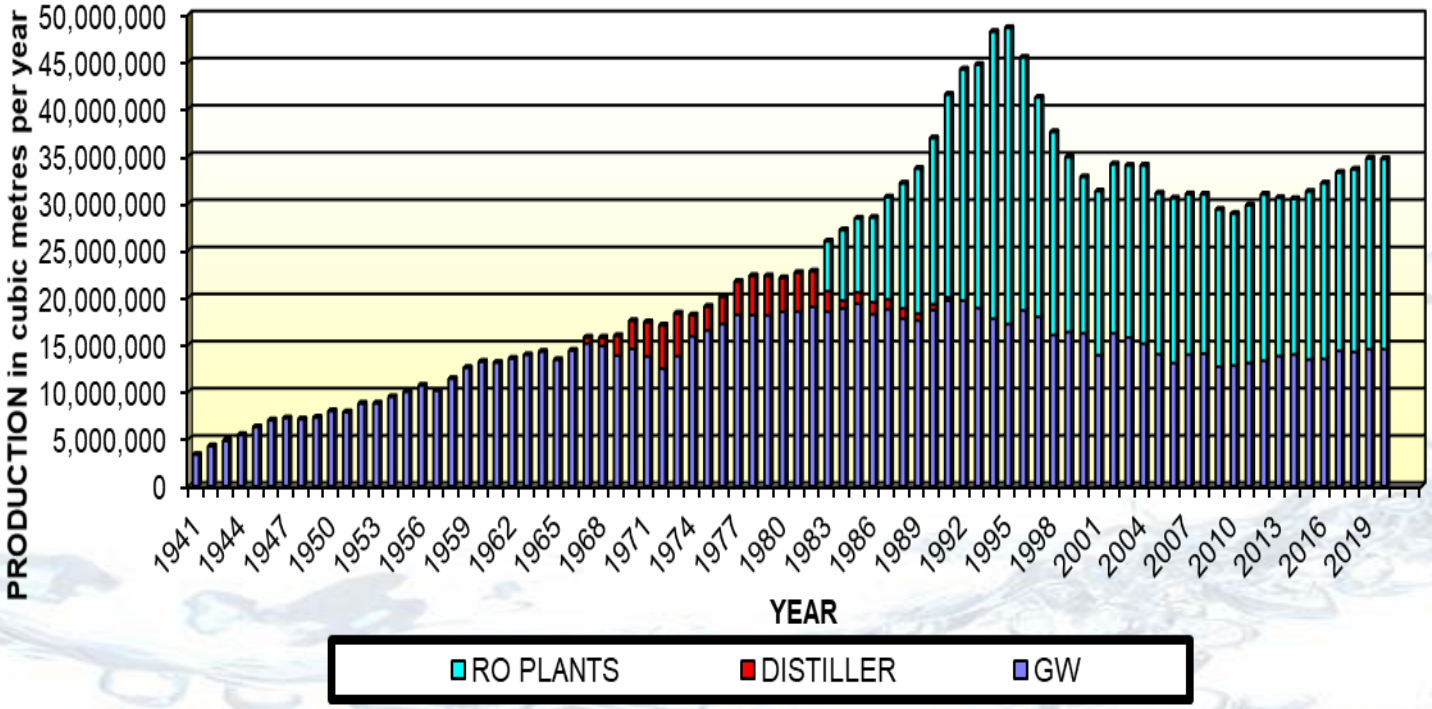
Applying the Water - Energy Nexus at a Water-Utility Level

Ing. David Sacco
Water Services Corporation
Malta
16-03-2021

System characteristics

(i) Investments in water production technologies since the mid-1960's to supplement water sourced from natural water resources

(ii) Application of demand management measures (leakage management) since early 1990's



Specific Energy : Desalination

Energy efficiency in desalination identified as a priority measure.

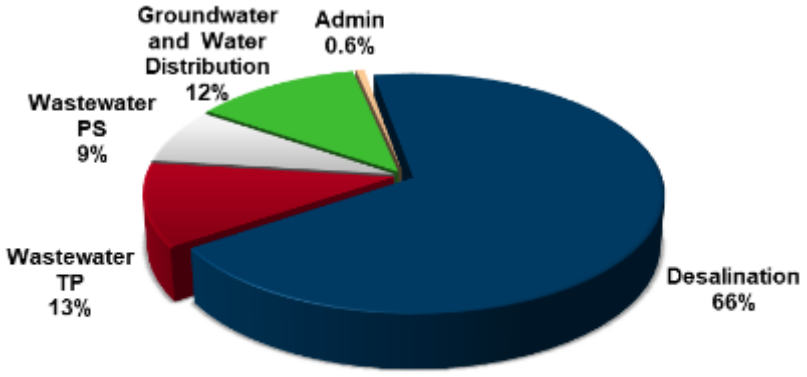
What actions have been implemented to improve energy efficiency?

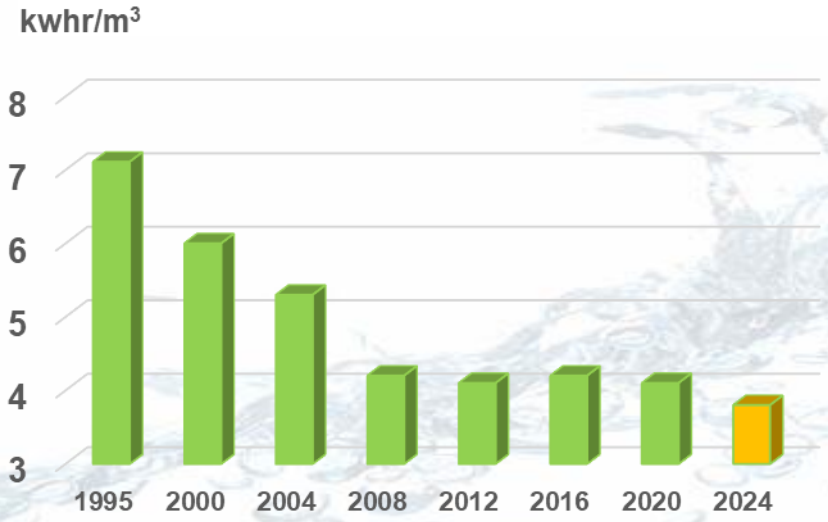
- Installation of high efficiency energy recovery devices (>97%)
- Replacement of membranes (69Bar vs 82Bar)
- Installation of Variable speed controllers
- Development of an in house SCADA system to control and monitor the various processes through on line energy audits . The system assists the operator with real time decisions to ensure optimal operating efficiencies at all times

Result: Energy required to produce 1m³ of water reduced from 7kWh to 3.8kWh

Energy consumption for Seawater Desalination Plants

1995 : 219 GWhr → 20% of the National Demand.
2020 : 93 GWhr → 3.8% of the National Demand



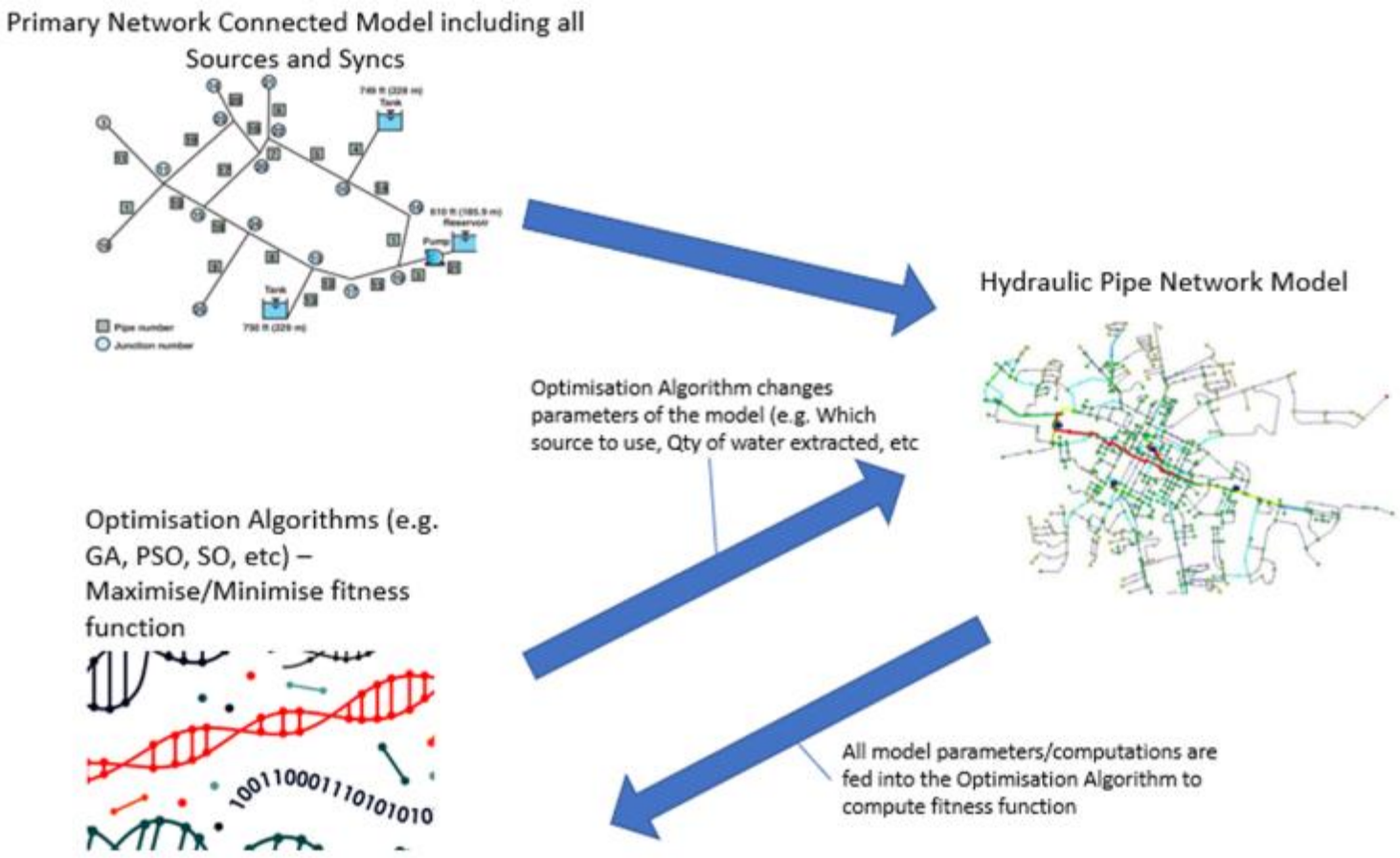


Transforming Water Services

Reduction in RO energy requirements has placed increase importance (relevance) on the energy consumption in other segments of water services provision.

- Groundwater : Spatial abstraction improves quality and reduces energy required for blend
- Reducing unnecessary pumping pressures along the network and replacement of old segments with high frictional losses
- Reduce seawater intrusion in wastewater collection network lowering volumes hence less energy and more efficient treatment .
- Improve efficiency at the WWTPs : Upgrading of equipment/processes , increase energy recovered from process (biogas)

Future Outlook

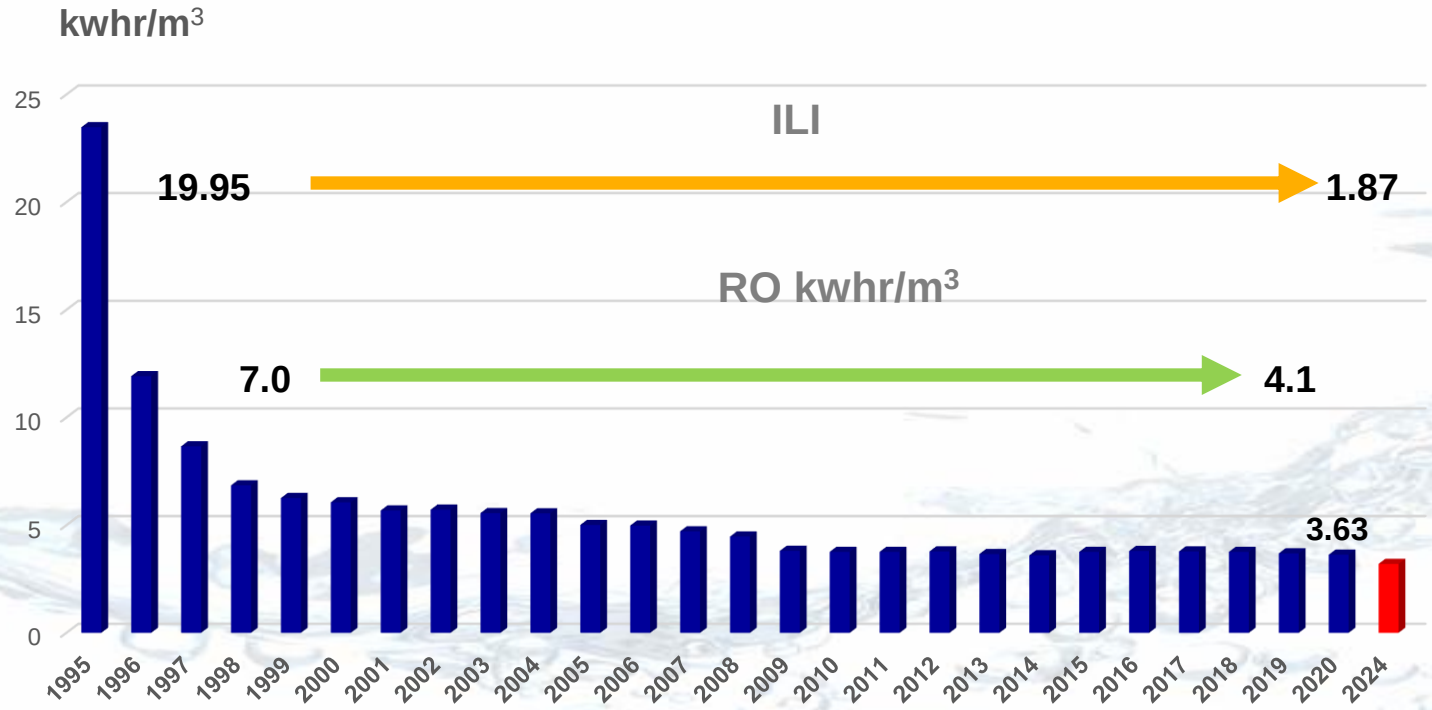


Conclusion

Significant reduction in energy requirements for each m^3 consumed in Malta achieved through conjunctive use of:

- Water demand management measures (each m^3 of water not produced represents energy saved)
- Energy efficiency measures (reduction of energy required to produce, distribute and treat water)

Vision: To keep reducing this value by operating on the comprehensive water services cycle, whilst continuing to emphasize water demand management at all levels.



Thank you for your kind attention

Water-energy nexus: the EU policy and regulatory framework

Robert Nuij, Deputy Head of Unit

DG ENER - Energy Efficiency Unit

European Commission

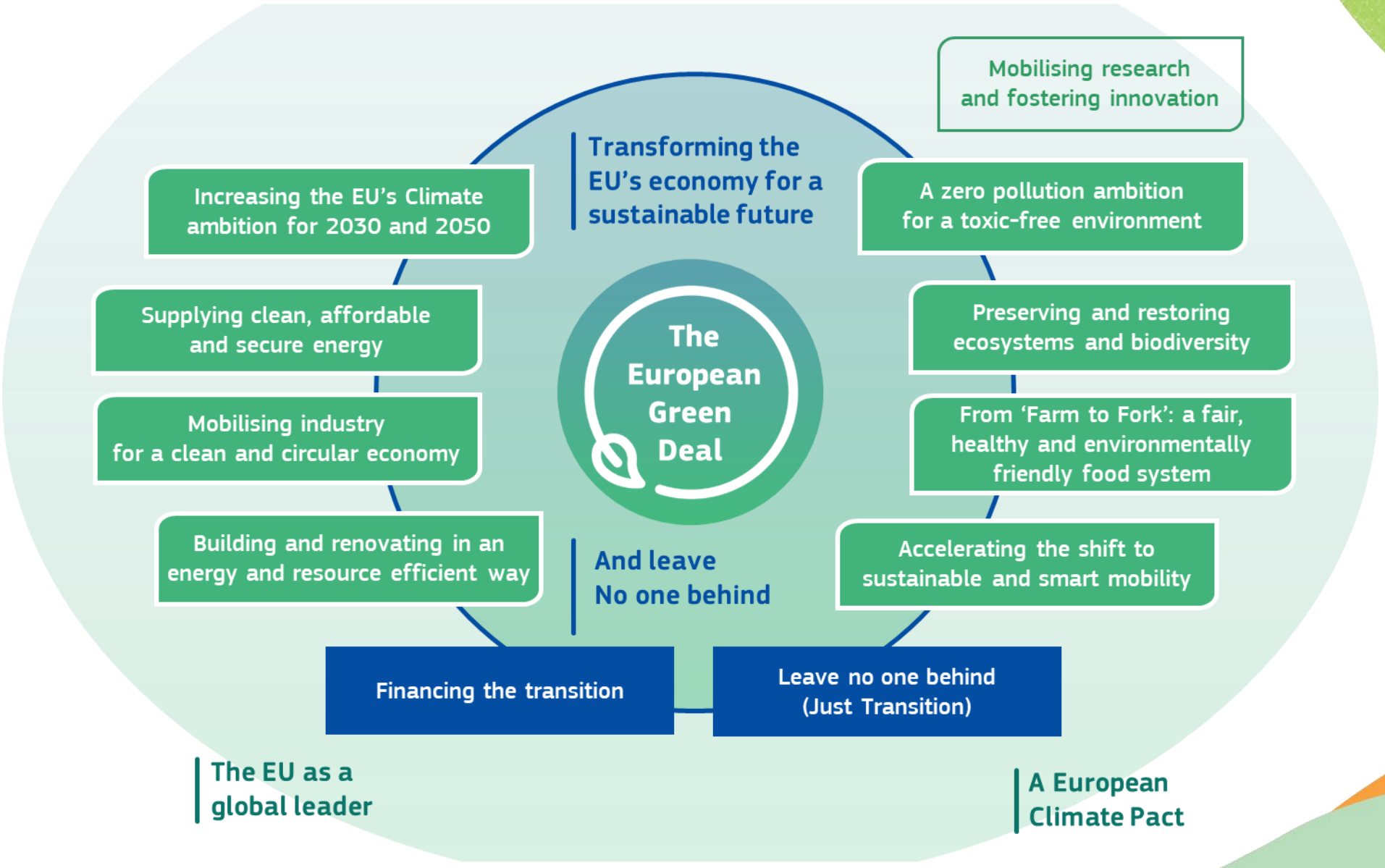
Workshop:

The contribution of water efficiency and energy savings to the European Green Deal

16 March 2021

European Union

The European Green Deal



Why is the water-energy nexus important?

- Water is used throughout the energy industry (44% of EU water use), and the public water system needs energy for collecting, pumping, treating and desalinising water (3.5% of EU electricity use).
- Increasing water and energy needs, or changes in water availability due to climate change, could have significant effects on the energy system.
- Since both sectors are closely linked, decreasing water and energy needs will help to fight climate change and will contribute to the climate neutrality goal by 2050 and the decarbonisation target of at least 55% by 2030.

The **European Green Deal**

Supplying clean, affordable and secure energy

Building and renovating in an energy and resource efficient way

- Assess the ambition of the final **National Energy and Climate Plans** by June 2020
- **Smart sector integration** strategy Q2/2020
- **Renovation wave** for the building sector Q3/2020 doubling the renovation rate
- **Offshore renewable energy** initiative Q4/2020
- Review the **TEN-E Regulation** (REFIT; in 2020)
- Review and revise, where needed, the **Renewable Energy and Energy Efficiency Directive** by June 2021

The EU as a global leader

A European Climate Pact

Energy Efficiency First: from principle to practice

- Article 2(18) of the Governance Regulation 2018/1999:

  " 'energy efficiency first' means taking utmost account in energy planning, and in policy and investment decisions, of alternative cost-efficient energy efficiency measures to make energy demand and energy supply more efficient, in particular by means of cost-effective end-use energy savings, demand response initiatives and more efficient conversion, transmission and distribution of energy, whilst still achieving the objectives of those decisions;"

- Main idea is to prioritise energy efficiency measures wherever cost-efficient
- Commission Recommendation (i.e. guidance) on the implementation of the principle in decision-making in the energy sector and beyond

Energy Efficiency First: Approach taken

- The principle aims at considering a wide spectrum of energy efficiency measures on the demand and supply side.
- Application of the principle should become integral part of relevant decision making processes.
- The principle applies to different types of decisions that relate to planning activities, policy design, preparation of investment projects and financing thereof.
- The principle is not limited to the energy sector, but could have a particularly relevant role in decisions regarding energy infrastructure.

Energy Efficiency First: Water sector

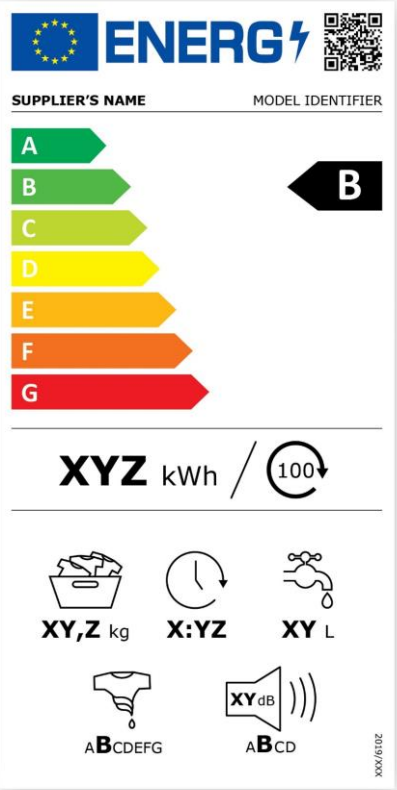
- Reducing the amount of energy used to produce and treat different types of water (e.g. by assessing the potential of the construction of two-tier system necessary for separate treatment of storm water and sanitary waste water).
- Reducing water demand and network losses, which translates into lower energy requirements for pumping and treatment.
- Using smart (e.g. digital) technologies and processes.

Role of the EED Article 7

- With the amendment of the Energy Efficiency Directive in 2018, the energy savings obligation has been extended beyond 2020.
- Member States have to achieve new annual energy savings of at least 0.8% of final energy consumption (Malta & Cyprus 0.24%) during the period 2021-2030.
- There are already good examples of policy measures in some Member States, e.g. Malta, Romania, Spain, Finland, (….), but Member States should implement more targeted action.
- Energy audits in the water sector could be very useful.

Role of Ecodesign & Energy labelling

- Several relevant product groups are covered or under investigation;
  - Washing machines, dishwashers, pumps, circulators, motors
  - Taps & showers, high-pressure cleaners, electric kettles
- These measures drive significant savings
  - E.g. water savings of 476 million m^3 a year by 2030



Thank you!

European Union