



SIWI - World Water Week 2017
Water and Waste - Reduce and Reuse

Opportunities and limits to water pollution regulations: Session I
Opportunities and limits to command and control approaches to water pollution management

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● Stockholm

An operator's view on wastewater regulations around the world

Nicolas Le Poder
Chief Operating Officer - Veolia Nordics

An operator's view on wastewater regulations around the world



Water pollution regulations around the world

Veolia wastewater operation around the world

Journey through few waste water treatment operation stories

1. **Protect water usage** in Beijing (China)
2. **Protect receiving ecosystems** in Brussels (Belgium), Hiroshima (Japan) and Milwaukee (USA)
3. **Reduce Carbon footprint** in Sofia (Bulgaria)
4. **Reduce water footprint** in Durban (South Africa)

Command and control approaches

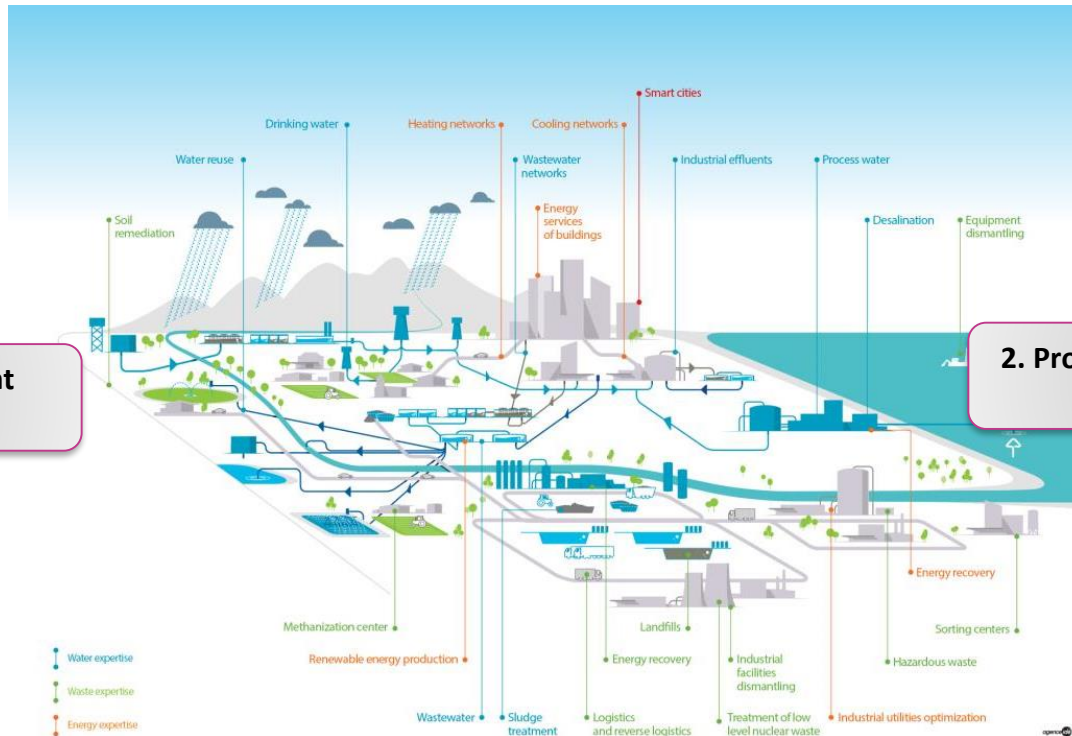
Water pollution regulations

1. Protect water usage

2. Protect receiving ecosystems (Nutrients removal)

4. Reduce Water footprint (reuse)

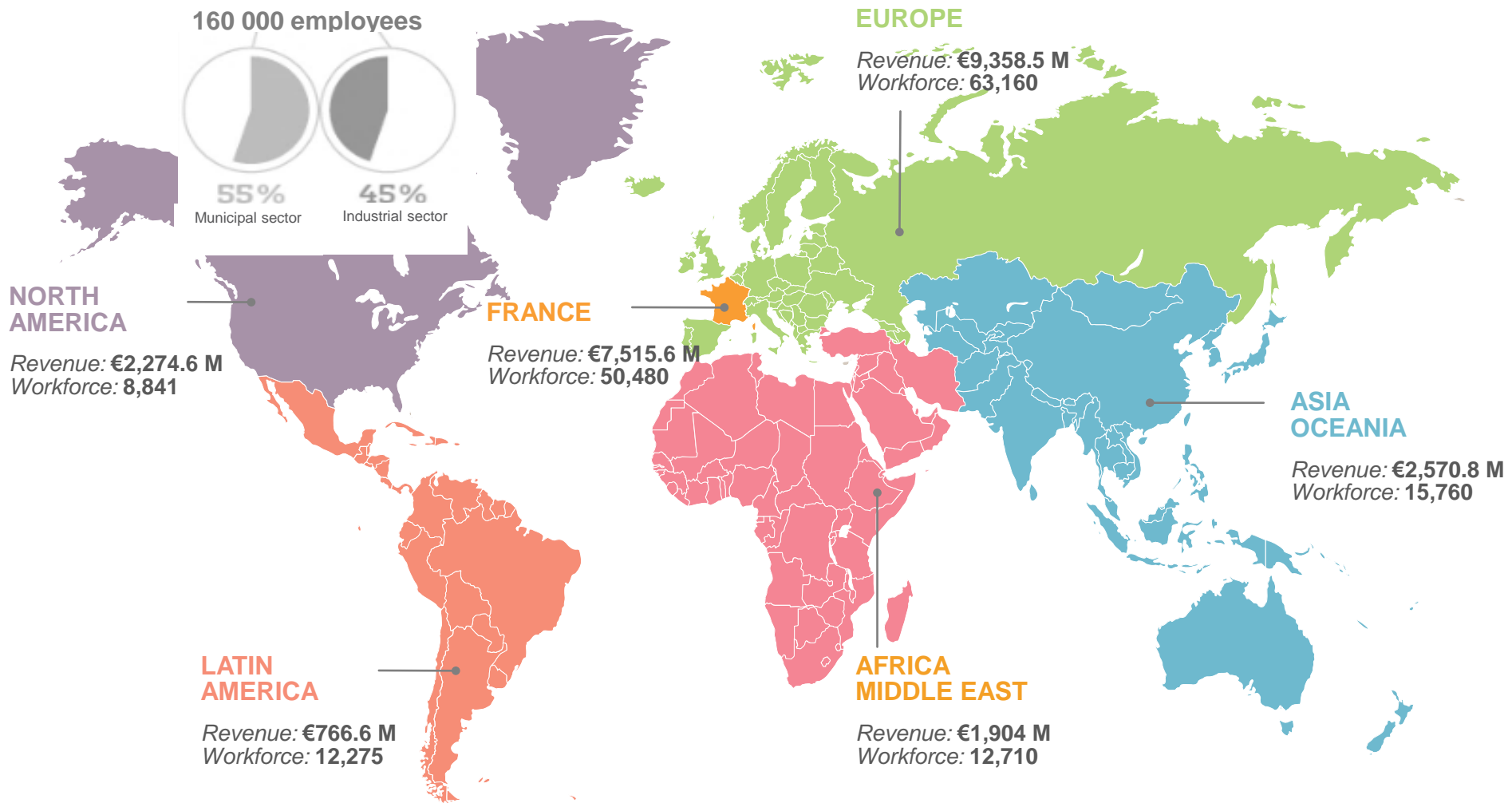
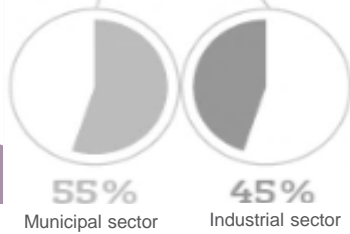
3. Reduce Carbon footprint (recovery)



Veolia worldwide

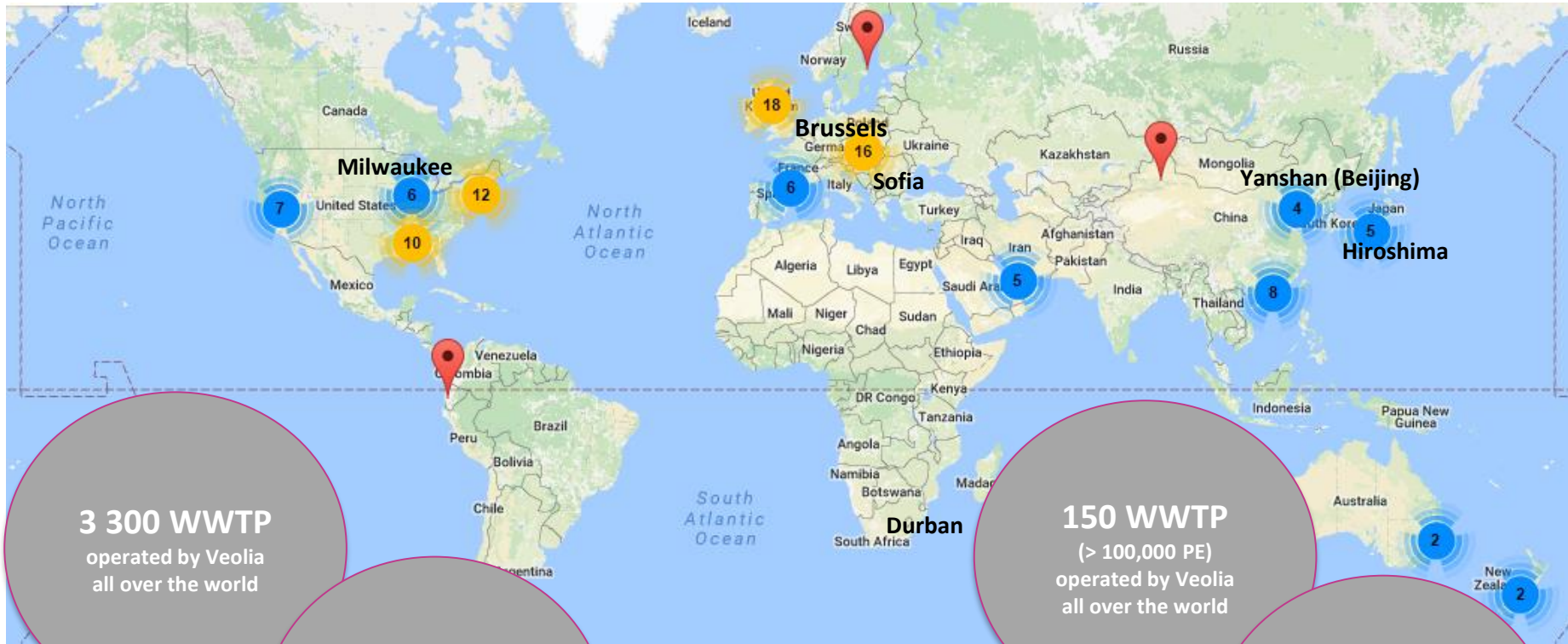
€24,390 million
revenue

160 000 employees



Veolia waste water operation worldwide

Numerous Waste water treatment plants in operation all over the world



3 300 WWTP
operated by Veolia
all over the world

Treatment capacity
86 million PE
operated by Veolia
all over the world

150 WWTP
(> 100,000 PE)
operated by Veolia
all over the world

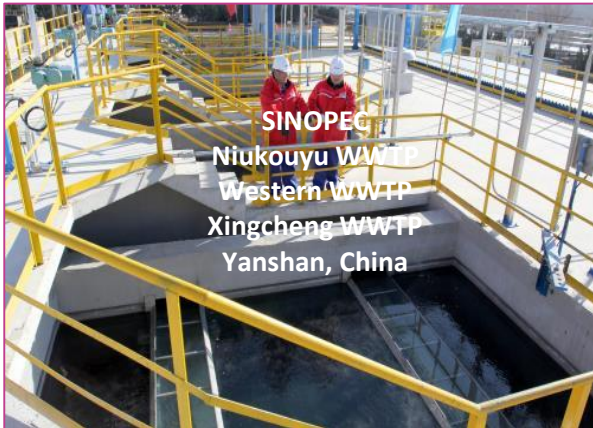
Treatment capacity
57 million PE
(> 100,000 PE)
operated by Veolia
all over the world



1. Protect water usage in Beijing (China)

CHINA, yanshan Sinopec WWTP

Towards a challenging COD 30 ppm discharge requirement



- One of the largest worldwide petro-chemical complex near Beijing
- Chinese government declared war on pollution in 2014 with game-changing policies related to water released in 2015
- As a result, stringent requirements were asked to Petro-chemical industries, especially in Beijing region, with a very challenging 30 mg/L COD discharge from technical and economical point of view

SINOPEC-VEOLIA partnership for COD 30 mg/L discharge challenge

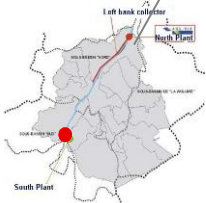
- ✓ Laboratory test in March 2015
- ✓ Pilot test with Veolia Actiflo-carb® treatment process in May 2015
- ✓ Client approval in September 2015 for Niukouyu WWTP (1000 m³/h) and Western WWTP (500 m³/h)
- ✓ Completion and commissioning of both plant in December 2015!



2. Protect receiving ecosystems in Brussels (Belgium), Hiroshima (Japan) and Milwaukee (USA)



Brussels-North WWTP



- Specific territory
- No sewage treatment facilities in 1990s
- BOOT with 20 years operation.
- Since start-up in 2007, river quality has drastically improved.



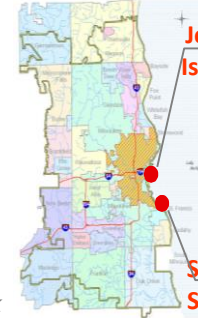
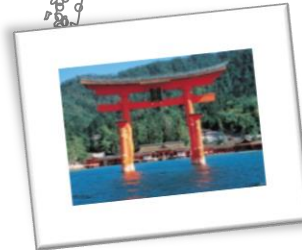
Hiroshima Seibu STP



Setouchi sea surrounded by 35 million inhabitants and large industries

Hiroshima Seibu is a 1 million p.e. WWTP 8km distance from Miyajima (World Heritage Site)

15,314 species registered Setouchi sea National Park with rare species (such as Finless Porpoise, Japanese Horseshoe Crab...)



Jones Island

South Shore

- Lake Michigan one of most sensitive receiving water in US
- Milwaukee Metropolitan Sewage District represents 1.1 million p.e.
- Jones Island: the oldest AS plant in US.
- Milorganite fertilizer produced for 90 years
- 45 km deep-tunnel in-line storage system
- Partnership with Veolia since 2008



Stringent requirements at once

- ✓ BOOT for a 1.1 million p.e. WWTP
- ✓ since beginning at full capacity (and more)
- ✓ O&M improvement successfully overcome influent overloading
- ✓ While continuously improving environmental footprint (Energy & byproducts)

Guaranteed
delivery in complex
situation

Continuous improvement through Performance based O&M contracts

- ✓ designed in 1980's for COD, NH4, and disinfection
- ✓ O&M performance contracts since 2006 with:
 - ❑ clear split of roles between stakeholders
 - ❑ comprehensive scope and stringent requirements for Water quality (SS, COD, BOD, NH4, TN, TP, Total Coliforms) but also Energy efficiency and by-products valorisation

Best use of existing
assets

Partnering for operation excellence using complex systems

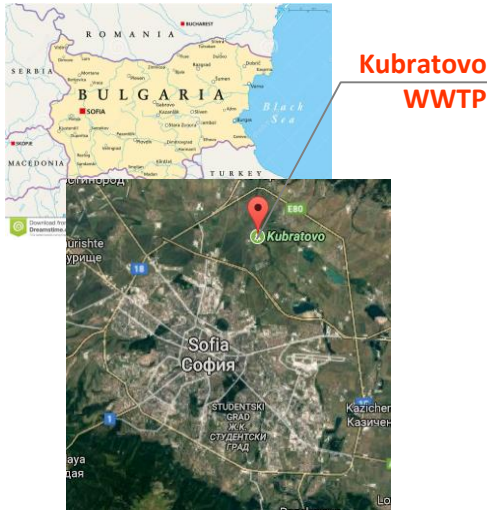
- ✓ 100% compliance with environmental permit since 2008 (Platinum peak performance awards)
- ✓ Deep tunnel inspection and maintenance without any safety incidents
- ✓ Development of green infrastructure
- ✓ Development of renewable energy (landfill gas and solar panel)

Comprehensive
performance based
Operation Partnering

3. Reduce Carbon footprint in Sofia (Bulgaria)

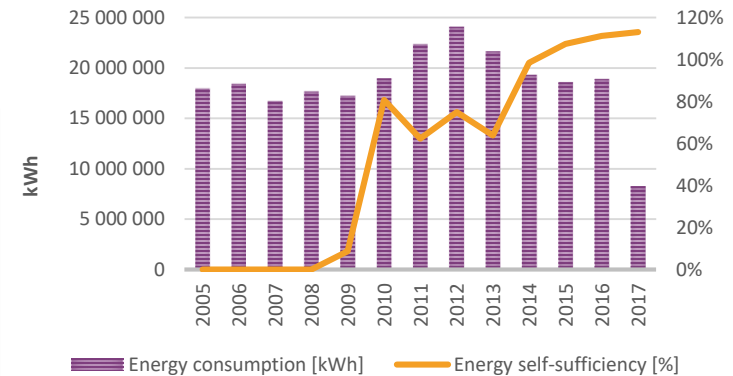
BULGARIA, Sofia Kubratovo WWTP

Reliability and energy efficiency through step-by-step improvement



- 1984: the first large urban WWTP in Bulgaria treat its first m3
- 2000: Sofiyska Voda JSC took over water supply and sewerage services of Municipality of Sofia by virtue of a 25 year concession agreement
- 2004 Commissioning of water treatment line first stage reconstruction
- 2006: Commissioning of sludge treatment facility reconstruction
- 2009: Commissioning of largest cogeneration installation using biogas from sludge treatment resulting in a 100% energy self-sufficiency
- 2010: Veolia became the majority shareholder of Sofiyska Voda and succeed in treating Nitrogen and Phosphorus for a sustainable protection of Iska river

TREND OF WWTP ENERGY CONSUMPTION AND SELF-SUFFICIENCY



Partnering for reliable performance along years

- ✓ First WWTP in Bulgaria in 1984 but issues made difficult to obtain full results
- ✓ After 30 years step-by-step development, Sofiyska Voda treats **400,000 m3/d** in full compliance with EU standards while being **100% self-sufficient in energy**.
- ✓ At the forefront of Bulgarian wastewater operation, Sofiyska Voda enjoy the benefit of Veolia experience for development of skills in Bulgaria



4. Reduce Water footprint in Durban (RSA)

SOUTH AFRICA, Durban Southern WWTP

Water recycling



Durban Southern
WWTP

- 1990: Mondi paper factory asked for increase of its reclaimed water off take. WWTP marine outfall needs to be extended
- 1995: Pilot plant for supplying Mondi Paper with water recycling from WWTP
- 1996: Secondary treatment at Durban Southern WWTP
- 1999: 20 years concession contract awarded to Durban Water Recycling
- 2001: Plant commissioning and start of operation by Veolia representing 7% of Durban city water consumption
- 2002: Demin plant commissioning at Sapref factory



Durban Water
Recycling Plant

Partnering for win-win water recycling project

- ✓ Durban city avoided early extension of water supply and waste water discharge
- ✓ Discharge load in the sea from Durban Southern WWTP reduced by 24%
- ✓ Drastic improvement of Water Impact Index
- ✓ Mondi paper and Sapref extend their production while reducing water tariff and improving drought supply security
- ✓ Veolia and its financial partner bringing their knowhow on complex long term project



Command and control approaches

Continuous operational improvement

Comprehensive partnering

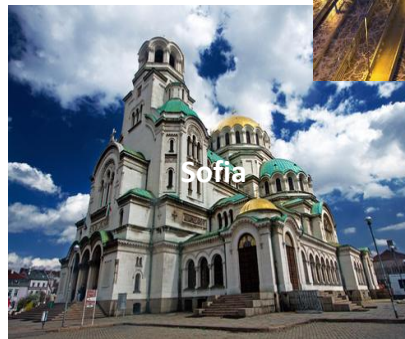
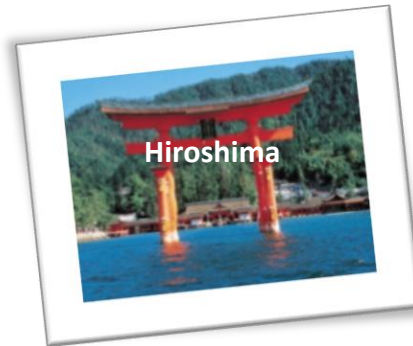
Complex project with committed value delivery

1. Protect water usage

2. Protect receiving ecosystems

3. Reduce carbon footprint

4. Reduce water footprint



Thank you for your attention

Questions ?

Nicolas.lepoder@veolia.com