Recycling wastewater,

a solution to contribute

to sustainability in water

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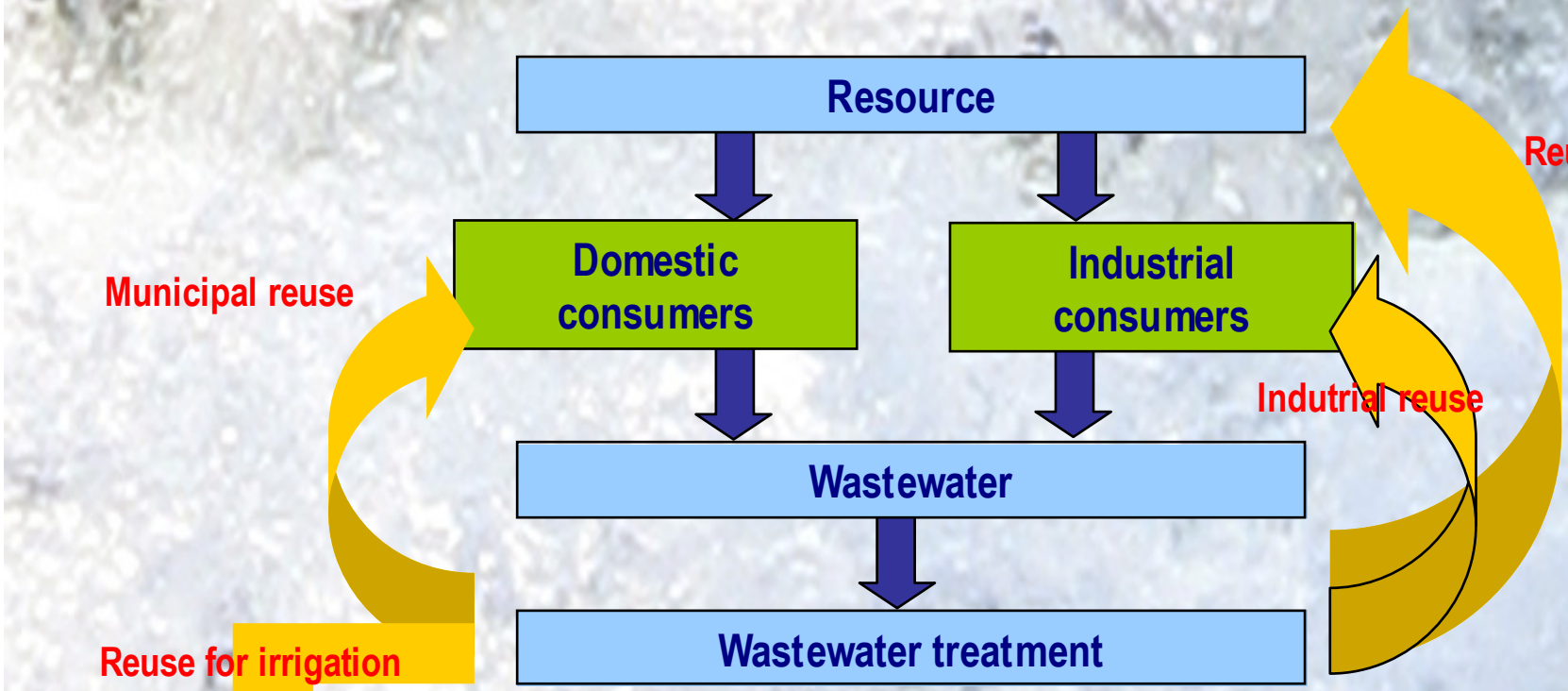
New resources to deal with new scarcities

- Water is too valuable a resource to be used just once before being returned to Nature.
- Wastewater recycling is a tool to face growing water scarcity in a context climate change
- Wastewater recycling allows us to increase water productivity.
- Wastewater recycling is a step towards water self-sufficiency

Wastewater recycling, a tried-and-proven solution



It produces water for industry, irrigation or domestic use

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Windhoek (Namibia): direct water reclamation for potable use (1)

- Operation and maintenance contract for the new drinking water plant of Windhoek, capital city of Namibia
- Veolia Water has the leadership for operation
- Namibia has the unenviable privilege of being the driest country in southern Africa.

Key figures:

- *250,000 people served*
- *Maximal treatment capacity: 21,000 m^3 per day*
- *Average treatment demand: 15,000 m^3 per day*

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Windhoek (Namibia): direct water reclamation for potable use (2)

- A large-scale direct re-use project:
  - ➔ *The new plant treats both the effluent drawn from the Gammams Waste Water Treatment Plant and raw water drawn from Goreangab Dam.*
  - ➔ *Multiple barriers against pathogens to control sanitary risks: pre-ozonation, coagulation,flocculation, dissolved air flotation, rapid sand filtration, ozonation, BAC/GAC filtration/adsorption,membrane ultrafiltration, residual chlorination*
  - ➔ *Without this new facility, the city's population will be deprived of 35% of its actual water resource availability.*
  - ➔ *The water reclamation scheme has been commonly accepted by the public for 40 years.*

The new Goreangab reclamation plant

Adelaide (Australia): wastewater recycling and aquifer recharge (1)

- Delegated management and engineering services of the Adelaide water and sanitation services
- The 1rst Public Private Partnership of water and sewerage services ever awarded by an Australian city to a specialised operating company

Key figures:

- *1,050,000 people served*

Drinking water: production and distribution

- *182.5 million m³/year produced and sold*
- *6 water treatment plants: 1.8 million m³/d*

Waste water: collection and treatment

- *91.2 million m³/year collected*
- *4 waste water treatment plants:295,000 m³/d*

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Adelaide (Australia): wastewater recycling and aquifer recharge (2)

- Bolivar plant: reuse & aquifer recharge for irrigation
  - *Reclaimed water production capacity: 45,000 m^3 / day*
  - *In the winter, aquifer recharge provides water to gradually return the aquifer to its initial piezometric level and store water in it.*
  - *Reuse provides water to irrigate horticultural operations (200 farmers) in the Virginia Region*
- Results achieved:
  - *Reuse rates: 28 % at Bolivar plant*
  - *Considerable reduction of environmental impacts of the Bolivar plant*
  - *Freshwater resource is preserved.*
  - *A lower degree of dependence on Murray river for the water supply*
  - *Bolivar plants received several awards*

VEOLIA WATER

Honolulu (Hawaii): wastewater recycling in industry (1)

- Closing locally the water cycles by reusing wastewater and the stormwater:
  - ➔ *A US Federal Consent Decree required that Honolulu recycled 38 Ml/d of its wastewater by 2001.*
  - ➔ *This city entered into a 20 year partnership with Veolia Water to design, build, and operate a 45,000 m^3/d water reclamation facility to comply with this Decree.*
  - ➔ *Processes generate two qualities of water. One is a high-purity water that is sold to the power and petrol-refining companies. The other quality is for irrigation of golf courses and landscaping, in order to support the tourism industry.*

VEOLIA WATER

Honolulu (Hawaii): wastewater recycling in industry (2)

- **Results:**
  - *For the residents: it saves 45,360 m^3 of drinking water a day. Wastewater re-use for industrial purposes freed up fresh water abstracted in order to allow the planned growth of the community.*
  - *For the city: it creates of a long term revenue stream from a levy raised on the production of recycled water, and reduces the city's operating costs;*
  - *For industrial clients: it provides an additional solution for satisfying their needs at a competitive price; actual price being achieved is lower than potable water;*
  - *For the environment: its provides a better protection in this very popular tourist region. It reduces pollution from the sewage being discharged to the sea in this exotic holiday location and and key tourist resort.*

Some of the challenges of wastewater recycling

- In many countries, a psychological reluctance will have to be overcome before treated wastewater is accepted.
- Energy remains an ecological and financial challenge when it comes to using non-conventional resources.
- Recycling won't develop up to its promising potential without establishing appropriate pricing policies. "*Too often reuse schemes turned out too expensive because of competition from undervalued conventional water resources. It makes the bankability of the water reuse project low*" (*Guiding the growth of water reuse, Boudewijn Van De Steene, IWA Yearbook 2007*)