

Veolia Korea Municipal e-Newsletter

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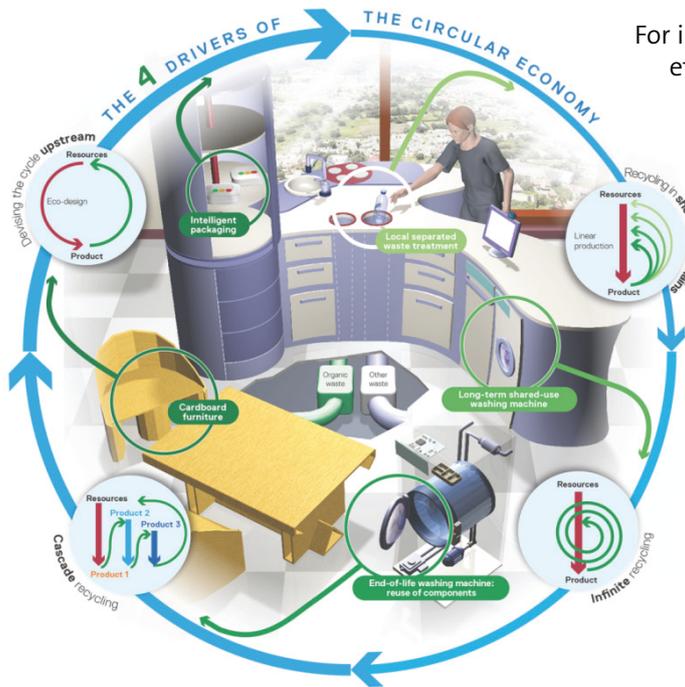
Making the Circular economy a reality

The integrated approach to water-energy waste resources is a key to the success of the circular economy, but it must be combined with a strategy allowing economic and social synergies to be developed.

Generally, energy, water and materials are managed separately, whereas the circular economy is a true nexus approach to water, energy and waste management, with a view to develop the synergies and find the most local solutions. This applies to industrial manufacturers and municipalities alike.

For instance, in Southwark, a London borough with 290,000 residents, an effective solution has been implemented in order to **produce heat and hot water from local waste**. On one side of the equation is the waste generated by the local residents (120,000 metric tons of waste treated & target of 40% recycled waste).

On the other, is the need for energy and heating. The dilemma was solved by the borough and Veolia: biodegradable waste is used as a fuel to generate heat and electricity. Almost 8,000 tons of carbon emissions per year will be cut, a reduction equivalent of taking 2,700 cars off its roads, and the system will be the first energy from waste district heating network of London.



Social silos between industries, cities and civil society

Municipalities and industries are exploring alternative water and energy sources to cover their needs, for example by recovering heat from water directly at the household level or further down in the sewers, or from underground resources. But untapped solutions lay in between municipal and industrial sites, and new collaborations of industries, cities and society are necessary.

A circular economy creates value for municipalities and businesses: for municipalities, it enhances their attractiveness and long-term resilience, and ultimately, the well-being of their residents and workers. For businesses, it is a hedge against their upstream risks including raw material availability and price volatility, and contributes to answering their consumers' expectations.



The time of partnerships has come, with the common goal of creating and sharing value, rather than competing and creating value independently. Municipalities or territories, in partnership with local industries, must take **three “smart” measures**:

1. Identify possible **synergies** between municipal and industrial resource (water, energy, recovered materials) producers and users, with a view to maximize recycling and local reuse, and reduce dependency on imports.
2. At a site level (industrial or municipal, e.g. health care, education etc), ensure the best possible **recovery** of material, water and energy and
3. At a final use level, drive down primary material, water and energy consumption, encouraging a **“smart citizen” approach**.

Resourcing the world

Today, natural resources are becoming increasingly scarce while our needs are growing in an ever more densely populated and urbanized world facing climate change issues. The world has to rethink its relationship with resources and come up with new social and economic growth models that are more efficient, better balanced and more sustainable.

Veolia’s innovation leads ensuring access to safe drinking water and energy services for cities and their inhabitants, services to industry that guarantee continuous supplies for production processes, and **recovery systems for materials within the circular economy approach**.

Durban: 98% of city’s wastewater is recycled

The Durban Recycling Plan was developed by Veolia to switch manufacturing processes to recycled water. 98% of the city’s wastewater is recycled, freeing up **40,000 cubic meters a day for consumption by citizens**.

Reserving resources is the second dimension of **Veolia’s commitment**, which is about the balanced protection of ecosystems – extracting only what is strictly necessary, from the right place, at the right time and using the right methods. This approach makes sure nothing is lost throughout the usage cycle while also minimizing downstream impacts so as to guarantee there are no harmful effects on human health or the natural environment.

Replenishing resources is about creating new secondary resources that are gradually offsetting the growing scarcity of natural primary materials. Through innovation in recycling materials and recovering waste, Veolia is providing solutions that significantly extend the lifespan and usage value of extracted resources.

The **Circular Economy dynamic** is the most sustainable path offering the ability of enlarging this horizon to energy, material and all resources, for a brighter future.

Qatar: Pearl GTL Project

The Pearl Gas-to-Liquid (GTL) complex is the largest plant of its kind in the world.

It is also **a great example of the circular economy**.

Each day it **produces 140,000 barrels of oil equivalent**, of which **120,000 barrels are converted into liquefied natural gas and ethane**.

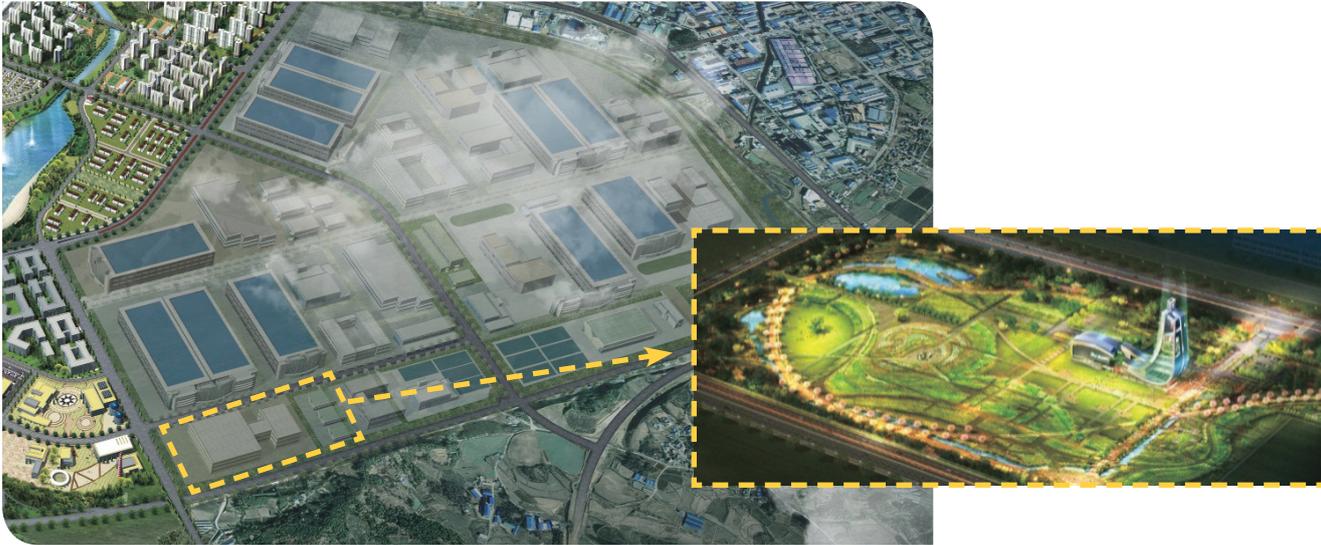
Shell and the Qatar Petroleum chose Veolia to develop a unique process for recycling 100% of water generated (45,000 cubic meters of water a day) during the gas-to-liquid transition so it can be fully reused on site.

This innovative solution meets the **ZLD target for the world’s largest gas-to-liquid plant**.



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New contract: Tertiary treatment solutions for Godeok STP, Korea



According to the development of Godeok Industrial Complex located in Pyungtaek si, Gyeonggi-do province, Veolia has been selected to supply **Tertiary treatment solutions for the industrial wastewater in the complex**. Its EPC partner, Daelim is designing and building the wastewater treatment facility to collect wastewater from the area of 3,950,000m².

The **capacity of tertiary treatment by Actiflo is 102,000m³ at the Phase 1 which will be completed by 2016**. Veolia will supply, install and commission the Actiflo™ upon the whole WWTP construction schedule.

Actiflo™ is the **stable and reliable high-efficiency tertiary treatment process** which has been already proved, considering flowing the **high T-P electronic wastewater**. It is very small footprint; up to 3-5 times smaller than conventional process, which is easy and available for the multi-tasking operating to extend the facility capacity for the pre-treatment in emergency.

It has over 750 references including Gwangju STP (600,000m³/d) both nationwide and worldwide.

Process:



Guaranteed quality:

Parameter	BOD	COD	SS	T-N	T-P
Quality	6 mg/l	25 mg/l	8 mg/l	18 mg/l	1.8 mg/l

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2014 Water Expo Korea



Veolia has participated in **2014 Water Expo** taken place in Daegu city from October 22 to October 24, 2014.

It presented its three complementary business activities; water, waste and energy management solutions that contribute to the sustainable development of municipalities and industries.

As a global leader in optimized resource management, Veolia helps to develop access to resources, preserve available resources, and to replenish them.

Daegu is the host city for **World Water Forum 2015** from April 12 to April 17 and Veolia will participate in the Forum.



Sustainable and smart cities of the future



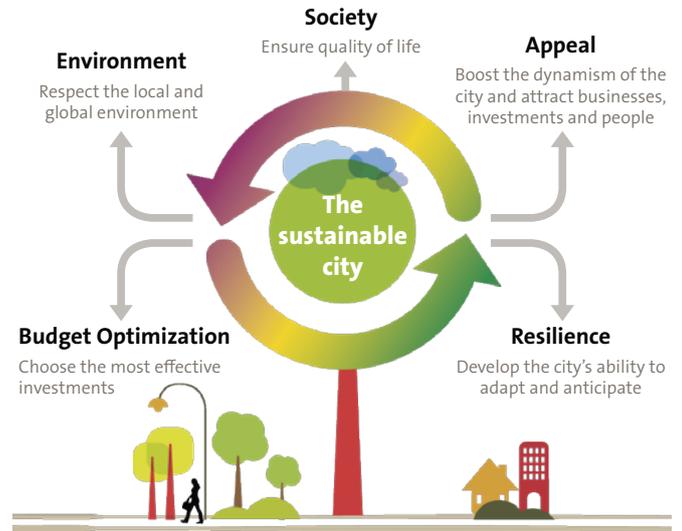
Building eco-neighborhoods and smart, sustainable cities has emerged as a key priority. New megacities are increasing in density and becoming more complex at a startling pace. It is vital that we reduce the environmental footprint of cities and improve quality of life.

Sustainable cities, new challenges

Veolia is rising to this key challenge by combining its expertise in water, waste and energy services to deliver comprehensive solutions for individuals, industries and municipalities in any given area. Examples include **smart network and smart building management solutions that provide qualitative and quantitative information in real time for a sustainable management of the utilities.**

Veolia delivers an integrated approach for sustainable cities with:

- Specific solutions tailored to each context
- Solutions based on global flows management and encouraging synergies between water and energy or between waste and energy
- Integrating high performance technologies into services at the best possible cost with end-uses solutions oriented
- And last of all, with an adapted governance and a long-term involvement

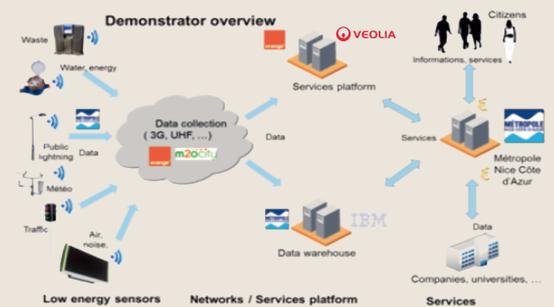


Tangible benefits of sustainable cities and Veolia's solutions:

- **Resource conservation:** wastewater recycling
- **Alternative energy:** using wastewater to produce energy
- **Quality of life & environmental health:** Waste collection, heat islands
- **Social equity:** developing access to water
- **Smart systems:** Urban monitoring using digital technology, drinking water traceability
- **Citizens empowering:** Awareness-raising services
- **Sustainable urban planning:** 2EI (Éco Environnement Ingénierie)

Case study: Urban Monitoring Services, Nice, France

- **Objectives:** increase environmental, economical and social performance of urban services
- **Veolia' solution:** smart sensors network + integrated data collection and processing infrastructure + services production
- **Pilot scope and planning:**
 - Private consortium including IBM, Orange and m2ocity lead by Veolia, and R&D partnership with NCA Metropole
 - 3000 sensors and 15 services (public health, water, waste and energy)



Building a Sustainable City Simulator, Santiago, Chile

The French Government has chosen the consortium headed jointly by Artelia (lead partner) and **Veolia to build a sustainable city simulator.** The facility will be applied to a concrete case of urban development in the city of Santiago, Chile, and will incorporate **urban planning solutions, services, products and technologies based on French know-how in the field of sustainable cities.**



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