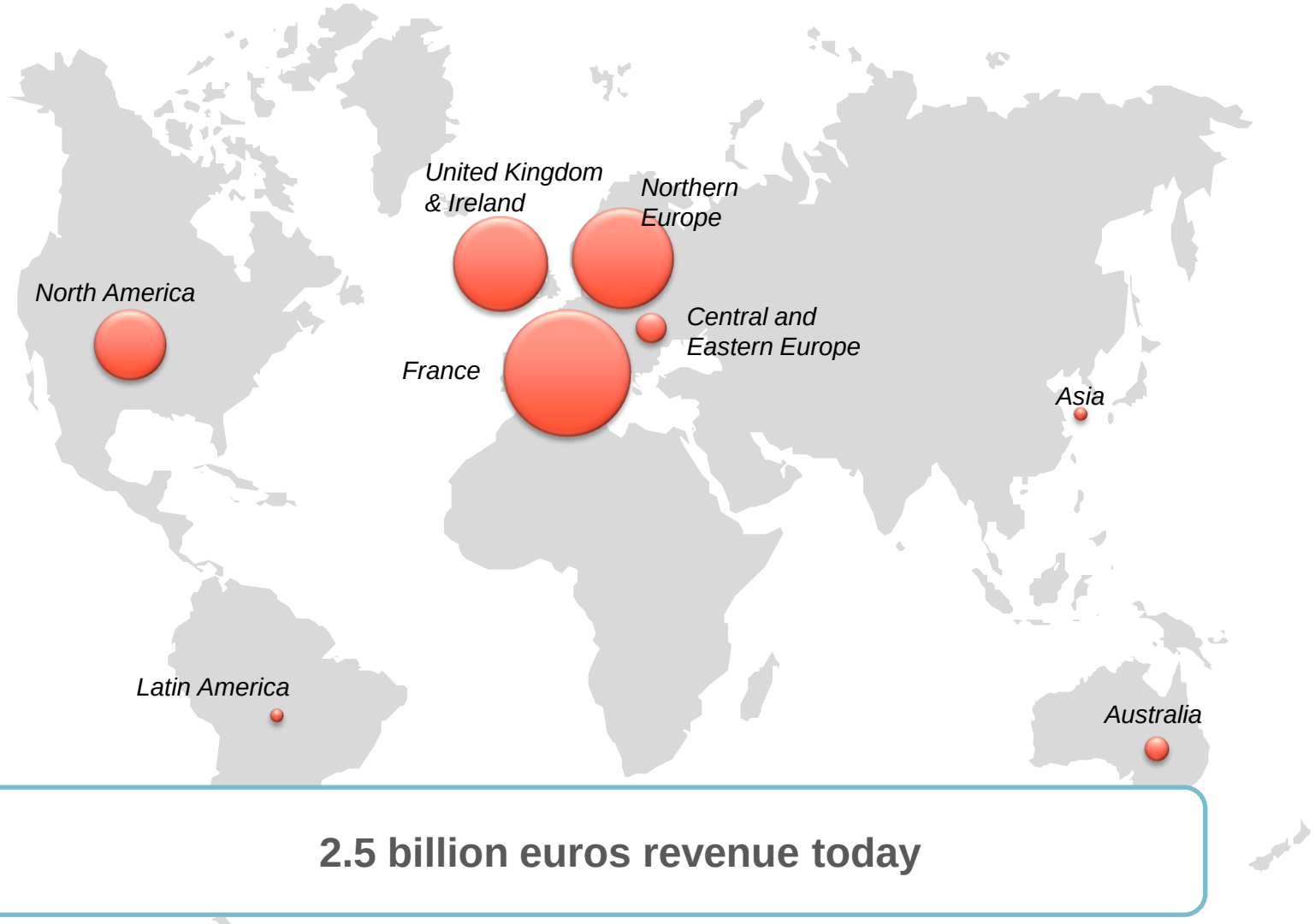

VEOLIA
PRODUCTS
USAGES
DISTRIBUTION
CIRCULAR
ECONOMY
NUTRIENTS
REDISTRIBUTION
PRODUCTION
REPRODUCTION
MATERIALS
PRODUCTION
RESOURCES

Our business in the circular economy

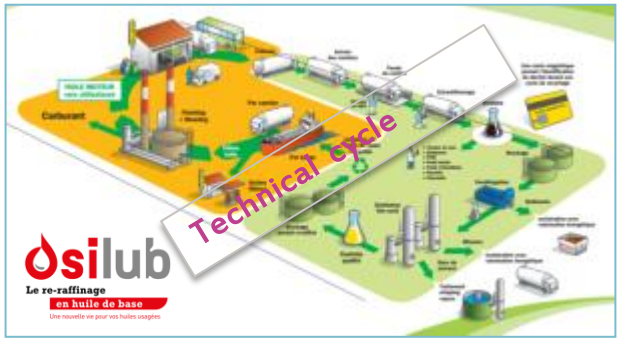


2.5 billion euros revenue today

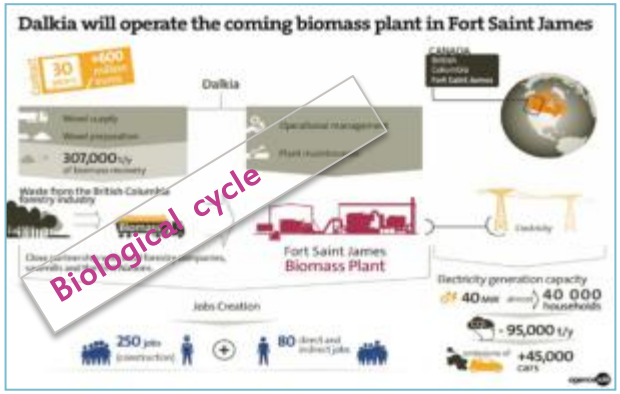
Case studies

Veolia is already in the Circular Economy …

- Waste, Water, Energy…



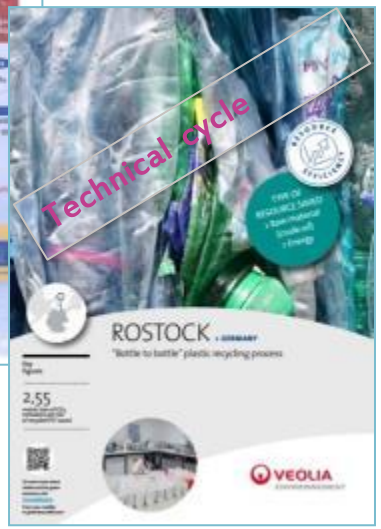
Osilub: used-oil regeneration



Veolia Energy: Energy generation from biomass

Veolia Water: Phosphorus recovery from waste water

Veolia Waste (Angibaud): Production of fertilizers from organic waste



Veolia Umweltservice: Bottle-to-Bottle PET recycling

SARP (Sevia): Parts cleaning rental offer

Circular Economy : Material Recycling

Technical materials

- Hard plastics
- Food-grade / non food-grade PET
- Building materials
- Bottom ashes
- Precious metals / rare earths
- Recovered materials or components from Electric and Electronic Equipment (WEEE)

WEEE dismantling & material recovery

The Veolia WEEE sorting and recovery facility in Angers

Eco Mobilier → Veolia → SEB

— 55,000 metric tons of WEEE delivered including refrigerator, screen components, small appliance and etc.

— Recovered materials or components from WEEE with high efficiency

- ✓ *Precious metals / rare earths*
- ✓ *WEEE plastics close loop recovery for SEB group guarantees a purity level close to virgin materials.*

— Reduce CO2 emission of 71,297 metric tons of equivalent (MTCDE) a year.

Mattresses recycling

Since Sep 2015 Veolia recycles mattresses in Rennes

- 4000 mattresses treated/month = 1000 T/y
- Chemical disinfection, cut and dissemble.
- 90% of material are potential for recycling metal, foam, latex, textile
- Reuse in automotive, construction, furniture industries as heat and sound insulation or even reuse in new mattress making

Tarkett ReStart® program

Anticipate European regulations seeking 70% of reuse rate of materials by the building industry

— Collection of vinyl and linoleum flooring off-cuts from installation

— Sorting in Veolia centers

— Recycling and re-using of materials in Tarkett's own production sites to manufacture new quality flooring.

— Tarkett and Veolia ensure the full traceability

Creating a recycled and recyclable kitchen countertop

Castorama

Challenges

Castorama, a leader in home furnishings has committed to being “Net Positive”, by going one step further of environmental protection and seeking to have a positive impact on the planet’s future.

Veolia's solution

- R&D work carried out in cooperation with the Castorama teams.
- An ad hoc logistics system has been set up to collect timber waste from Castorama stores in France.
- Design and production of wood flour made up of 35% wood and 65% fully recycled plastic that can be recycled industrially.

Customer benefits

- A commitment to supply 1,000 metric tons of wood flour a year for 5 years.
- Enhanced water resistance and a finished product that is 40% lighter.
- An unprecedented achievement in France with a 100% recycled composite timber enabling a laminate worktop to be produced, a pure circular economy product.

Recycling beauty products packagings

Recycling for Marionnaud

— Marionnaud offer their customers a discount of purchase when returning used beauty products to their stores in France whether or not they were bought in their stores

— Veolia is collecting & recycling 160 tons of waste bottles and packaging for the 1st year, while glass perfume bottles will be recycled into new bottles. Pots and empty tubes will be used to produce thermal energy.

— Reduced the emission of 104 kg of CO_2, equivalent to the emissions produced by a car travelling 650 kilometres.

Close-loop bottle to bottle recycling

Europe

Veolia receives and treats 80KT/y baled PET within its 3 plants in Europe.

— The baled scrapped PET is sorted, washed and cut into flakes or reprocessed into pellets

— End customers are including the global beverage giants such as Coca-cola and nestle.

Traceability for Walls' refrigerator
China

Protect brand image by insuring the traceability of end-of-life treatment of Walls' refrigerator

Monitor the traceability of their end of life product in order to ensure they do not end up in informal markets for further usage after manual refurbishing, or are stored in landfills.

Unilever Walls' ice cream cabinet's treatment: Veolia provides consulting to Walls on the treatment of its ice cream cabinets in China. Based on a list of cabinets to be treated, their location in 20 collection points in China, Veolia advises Walls on three recycling companies able to treat the ice cream cabinets. Once treated, Veolia and provides total traceability reports to the client.

Recycling more than 90% of French Navy ships Bordeaux

Challenges

Carry out on behalf of the French Navy an environmentally virtuous cycle of work, enabling more than 90% of the materials from the former Jeanne d'Arc and subsequently the former Colbert, the former teaching and training ship of the French Navy while guaranteeing the safety of personnel working on this project.

Veolia's solution

Ensure de-polluting operations and the removal of asbestos followed by deconstruction and dismantling work. Preparing and recovering materials.

Customer benefits

- 90% of materials recovered: scrap, non-ferrous metals, waste electrical and electronic equipment, liquids and fluids
- Veolia guarantees that the most stringent safety *standards will be complied with to ensure the safety of staff protection of the environment during these sensitive operations.*

Circular Economy : Energy efficiency

Reduction of emissions

- waste to energy**:** SRF/RDF
- Recycled CO_2
- Recovered chemicals
- Regenerated solvent, oil

Waste-to-energy treatment of wastewater sludge from a region with 7.2 million inhabitants

Hong Kong

Challenges

- Provide waste-to-energy treatment for the sludge produced at the 11 wastewater treatment plants serving Hong Kong's population of 7.2 million

Veolia's solutions

- Veolia built a 21st-century wastewater sludge recovery plant
- The plant is entirely water and energy autonomous
- The plant's installed capacity makes it the world's largest wastewater sludge incineration plant

Customer benefits

- Energy and water autonomy
- 600 m^3 of drinking water is produced each day by the site's integrated seawater desalination plant
- Production of more than 14 MW of electricity, which exceeds the site's requirements
- Positive environmental impact
- Raised public awareness and comfort

Circular Economy Materials and products

Biogenic materials

— Fertilizers, compost

— Recovered biogas from waste water sludge and/or cultivated biomass / crops

— Green heat and electricity produced out of CHP fueled with our own biogas, and delivered to private customers

Producing biogas to supply heat and electricity
Billund Biorefinery

Challenges
- Transform wastewater and waste from a source of pollution into an opportunity for sustainable development
- Make the Billund Biorefinery (Denmark) a real laboratory for large-scale technical innovation to open the door to a new way of treating wastewater and biowaste

Veolia's solutions
- A facility equipped with Veolia's proprietary thermal hydrolysis and anaerobic digestion technology, EXELYS™, that simultaneously treats the wastewater from the city's 70,000 residents and the 4,200 metric tons of organic waste from agriculture, industry and local households

Customer benefits
- Production of biogas from the biowaste and treatment sludge to provide heat and electricity to the site
- Production of organic fertilizer for agriculture and bioplastics for industry
- The treated water will be discharged back into the neighboring stream
- City-country-industry loop
- Reduced environmental footprint
- Protection of the local biodiversity

Developing the functional economy
Solvent leasing

Challenges
- Solvents are liquids used to dissolve, dilute or extract other substances; they are essential and used intensively by the pharmaceuticals and automobile industries

Veolia's solutions
- Network four recycling units in France, Switzerland and the United Kingdom
- Develop several economic models for solvent recirculation, resale or lease
- Collect solvents directly from the industrial concerns to which they are again made available after regeneration
- Collect and consolidate for treatment at our SPR unit based in Picardy (France), and redistribute throughout Europe

Customer benefits
- Maximize performance
- Guaranteed supply and quality
- Budget management
- Reduced environmental impact