



# From waste to resource management: role of the Private Sector in moving towards a circular economy

*IPLA European Forum,  
IFAT 2014, Munich, Germany*



# Veolia, the global leader in optimized resource management

- Over 200,000 professionals dedicated to designing and implementing the best possible solutions for **local management of essential resources**: water, energy and raw materials.
- Veolia **partners with manufacturers, cities and local residents** to make optimal resource management the foundation for a **new approach** to human progress, regional appeal and sustainable growth.

Water, waste and energy:  
a unique combination of expertise

**€22.3 billion** in revenue

**202,800** employees on **5** continents

**94 million** people supplied with drinking  
water

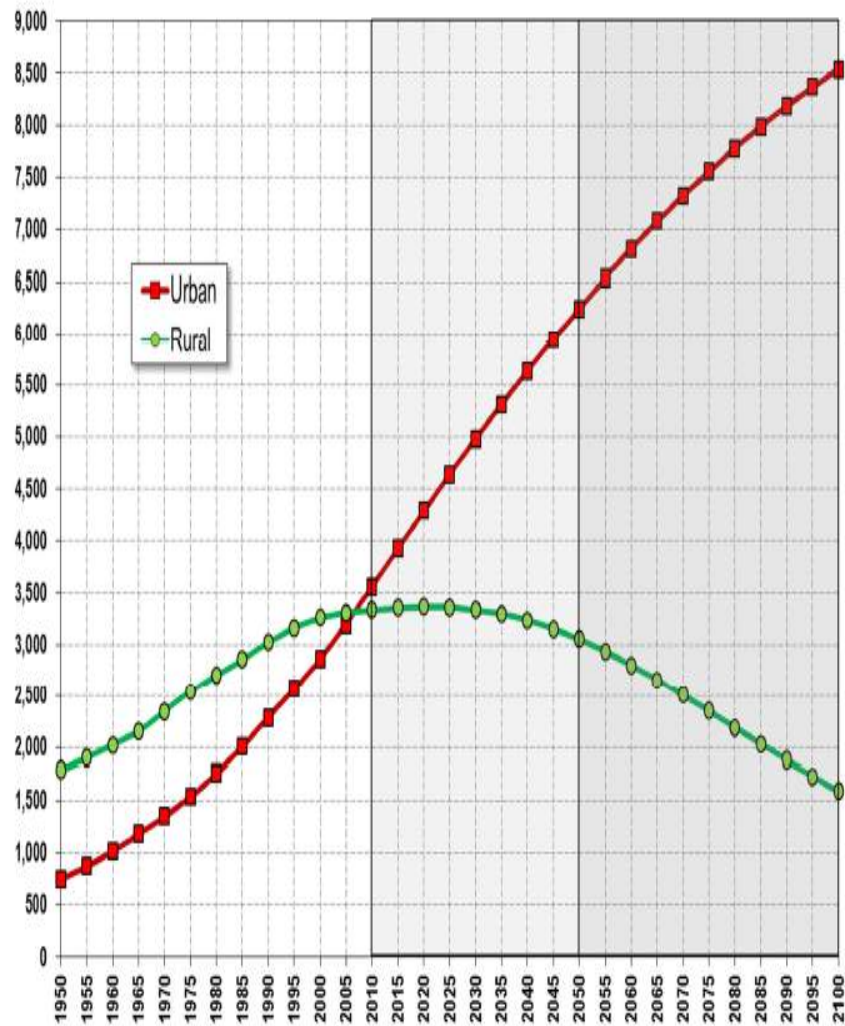
**62 million** people connected to wastewater  
systems

**86 million** MWh generated

**38 million** metric tons of waste recovered

*(2013 global data)*

# The challenge: Rapid increases in population and urbanisation



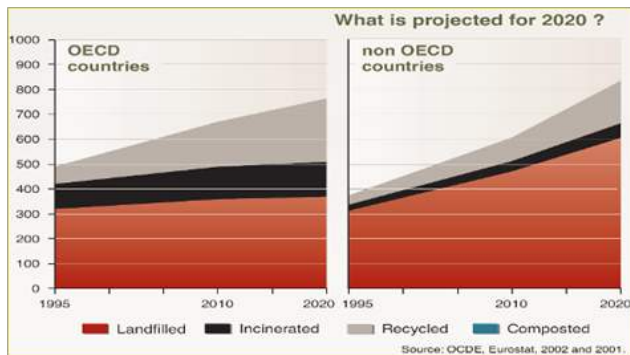
Source: United Nations, Department of Economic and Social Affairs, Population Division (2012): World Urbanization Prospects, the 2011 Revision, New York

Today, half of the world's population lives in cities.

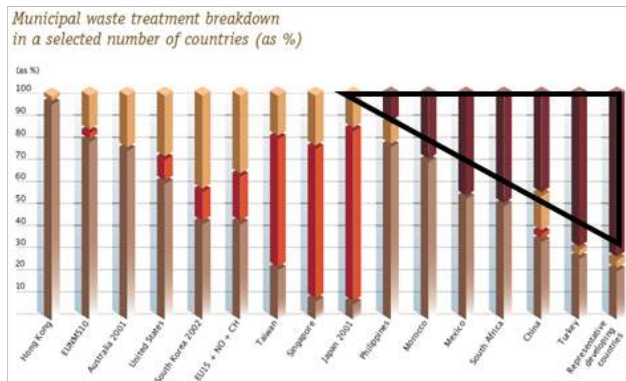


Each month, cities in developing countries absorb a supplemental population equivalent to the population of Singapore.

# The challenge: waste volumes are growing...



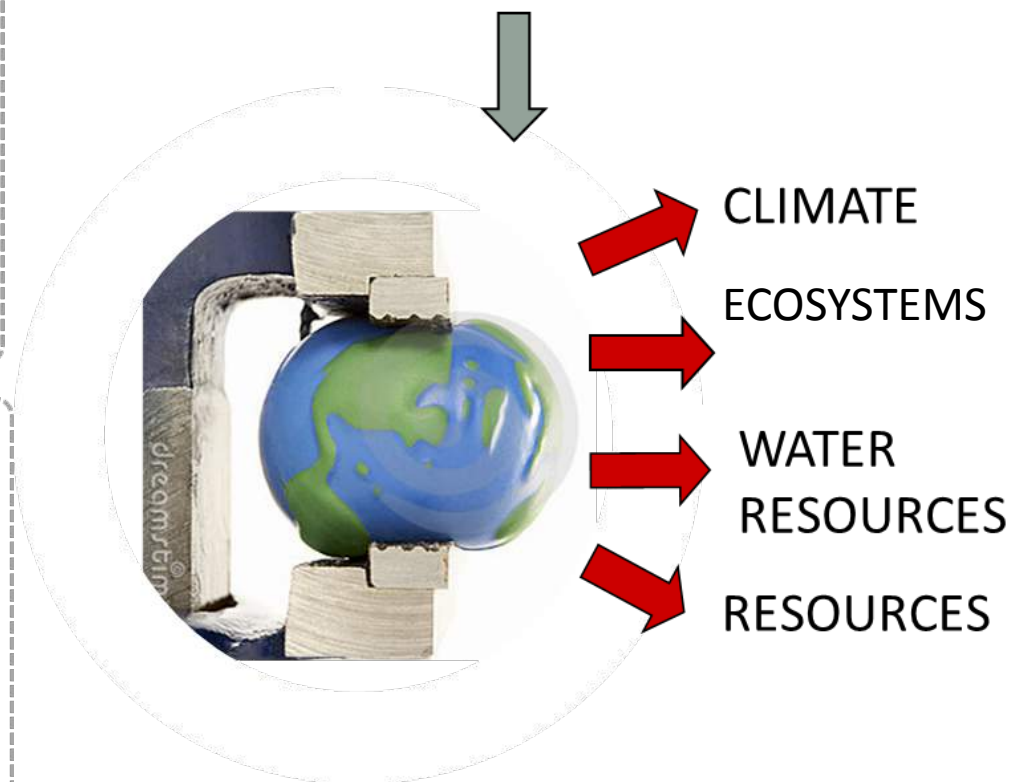
Rapid increases in population & urbanization: increased waste generation in developing countries.



(Uncontrolled) landfilling is still common practice



## INCREASING POPULATION & URBANISATION CONSUMPTION & PRODUCTION MODES



# Policy / Regulatory Enablers - EU Example



In 2011, 40% of treated municipal waste was recycled or composted, up from 27% in 2001.



# LANDFILL DIVERSION WITH RECYCLING





LANDFILL DIVERSION WITH  
**GREEN ENERGY PRODUCTION**

# Integrated Waste Management Facilities



**Southwark**  
Integrated Waste Management Facility



**Newhaven**  
Energy Recovery Facility



**Gillmoss**  
Materials Recovery Facility



**Padworth**  
Integrated Waste Management Facility



# Mechanical Biological Treatment (MBT) technologies



## London, Southwark, UK

**Process:** MBT and Biodrying

**Capacity:** 87,500 tonnes/yr

**Input:** MSW

**Recovery:** SRF (44,000 tonnes/yr)



## Rostock, Germany

**Process:** MBT and Dry AD

**Capacity:** MBT (195,000 tonnes/yr) and AD (40,000 tonnes/yr)

**Input:** MSW

**Recovery:** SRF (71,000 tonnes/yr);

**Electricity** (5,900 MWh/year) and **Biogas** (11,200 MWh/year)



## Graincourt, France

### **Artois Methanisation**

**Process:** Wet AD

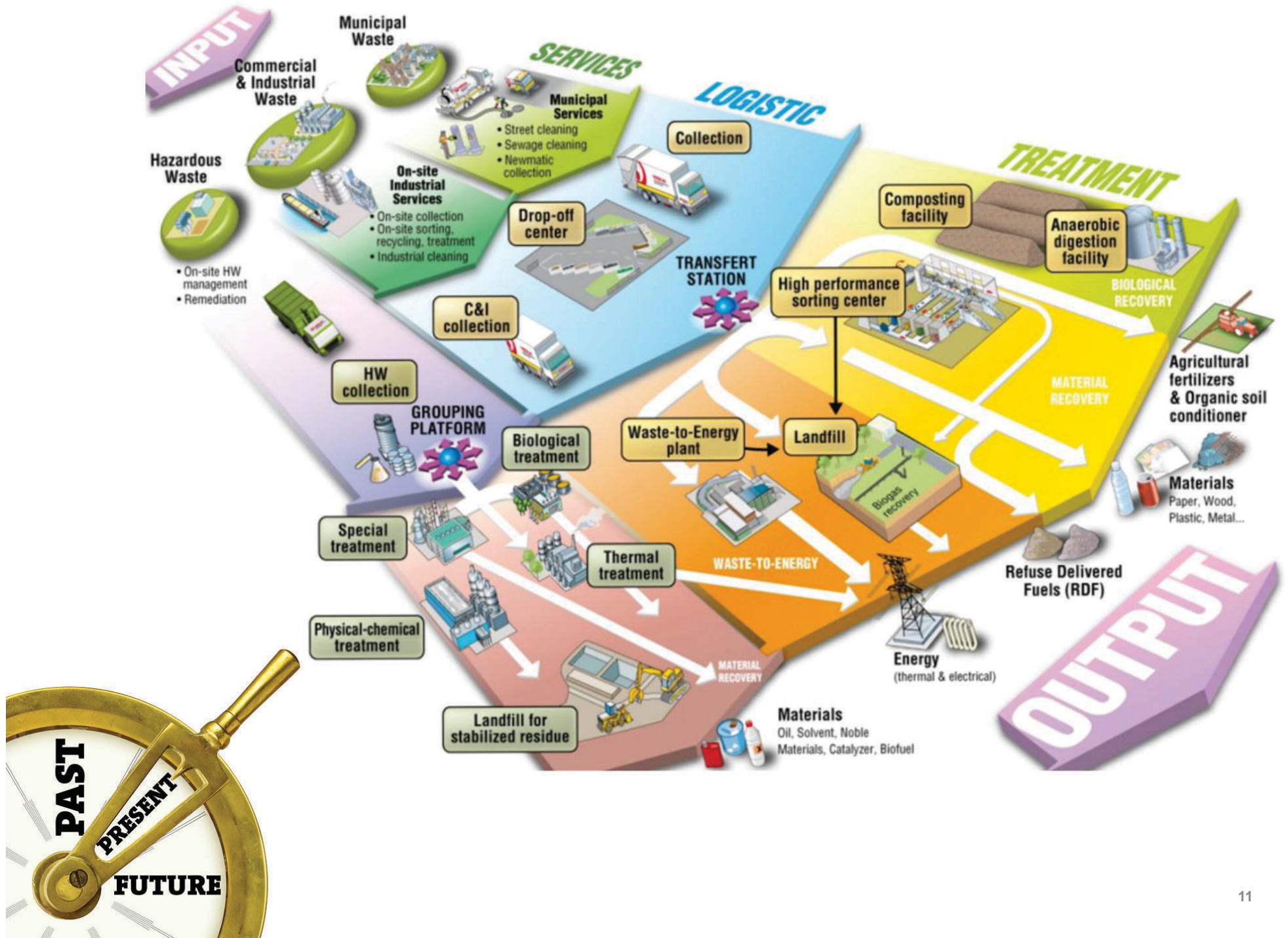
**Capacity:** 50,000 tonnes/yr

**Input:** Organic waste (90% industrial and 10% urban)

**Recovery:** Electricity (8,000 MWh/year) and Heat (8,000 MWh/year)

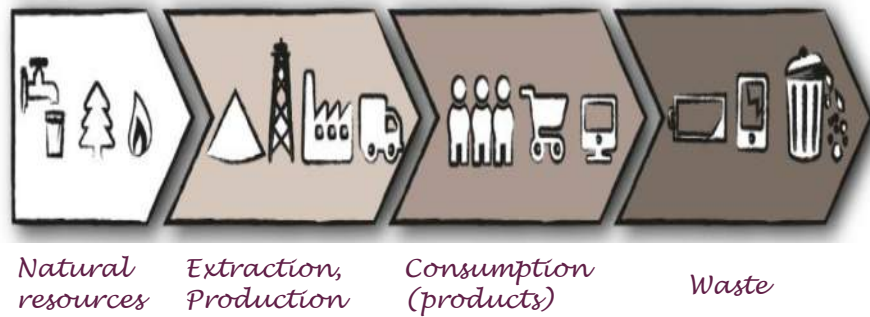
# TRANSFORMING ORGANIC WASTE



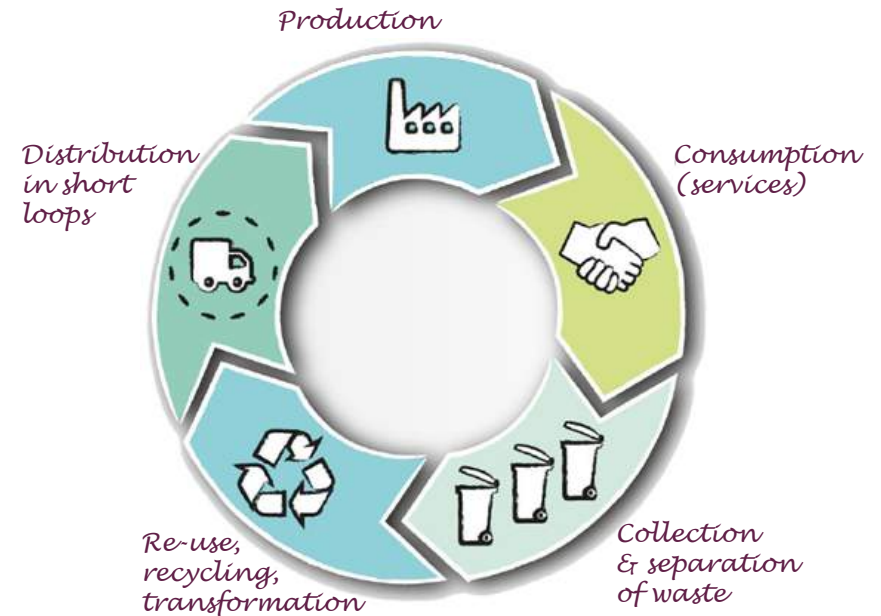


# What is the Circular Economy (CE)?

- Decouple economic growth from resource use
- From a linear to a circular approach



*Linear*



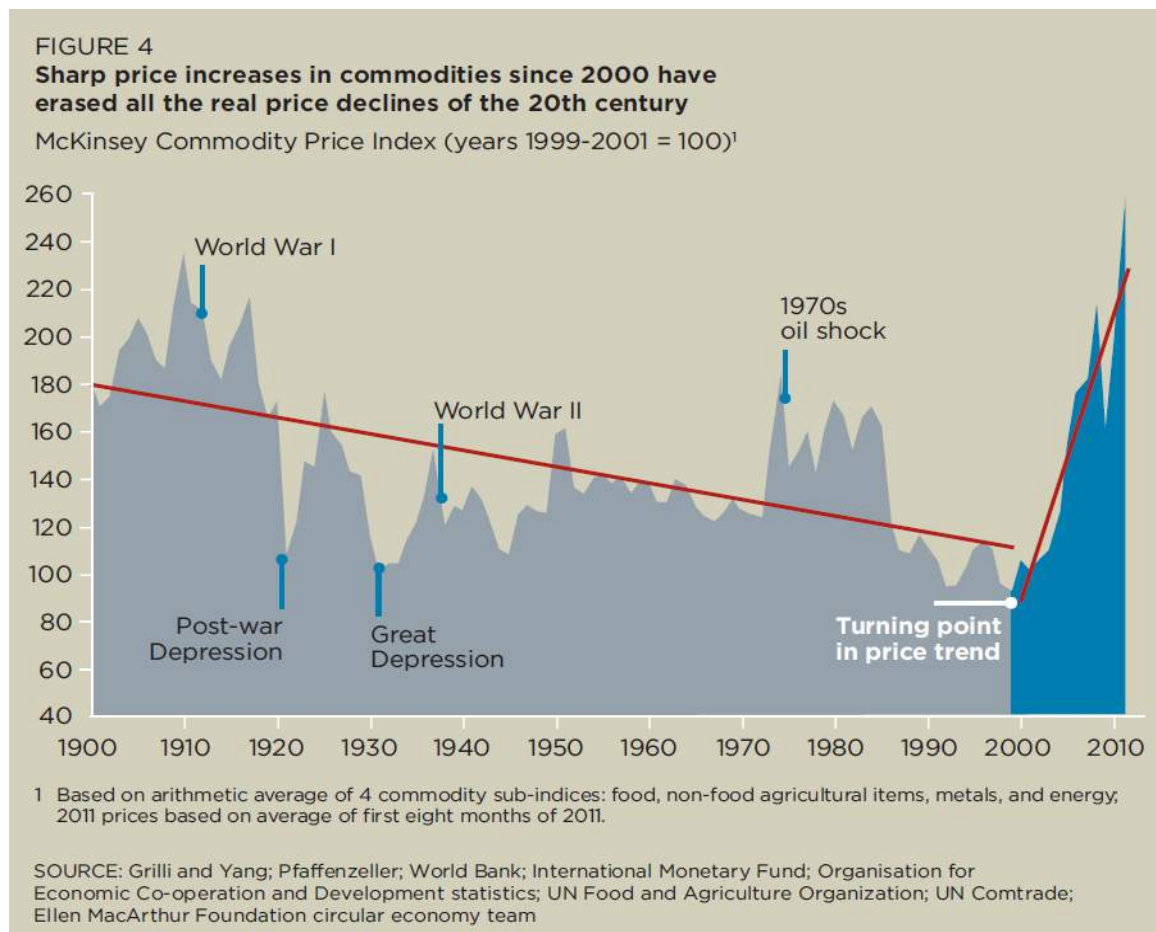
*Circular*

# What are the drivers?

- Scarcity and increasing difficulty to extract natural resources
- Sharp increase in raw material price and volatility

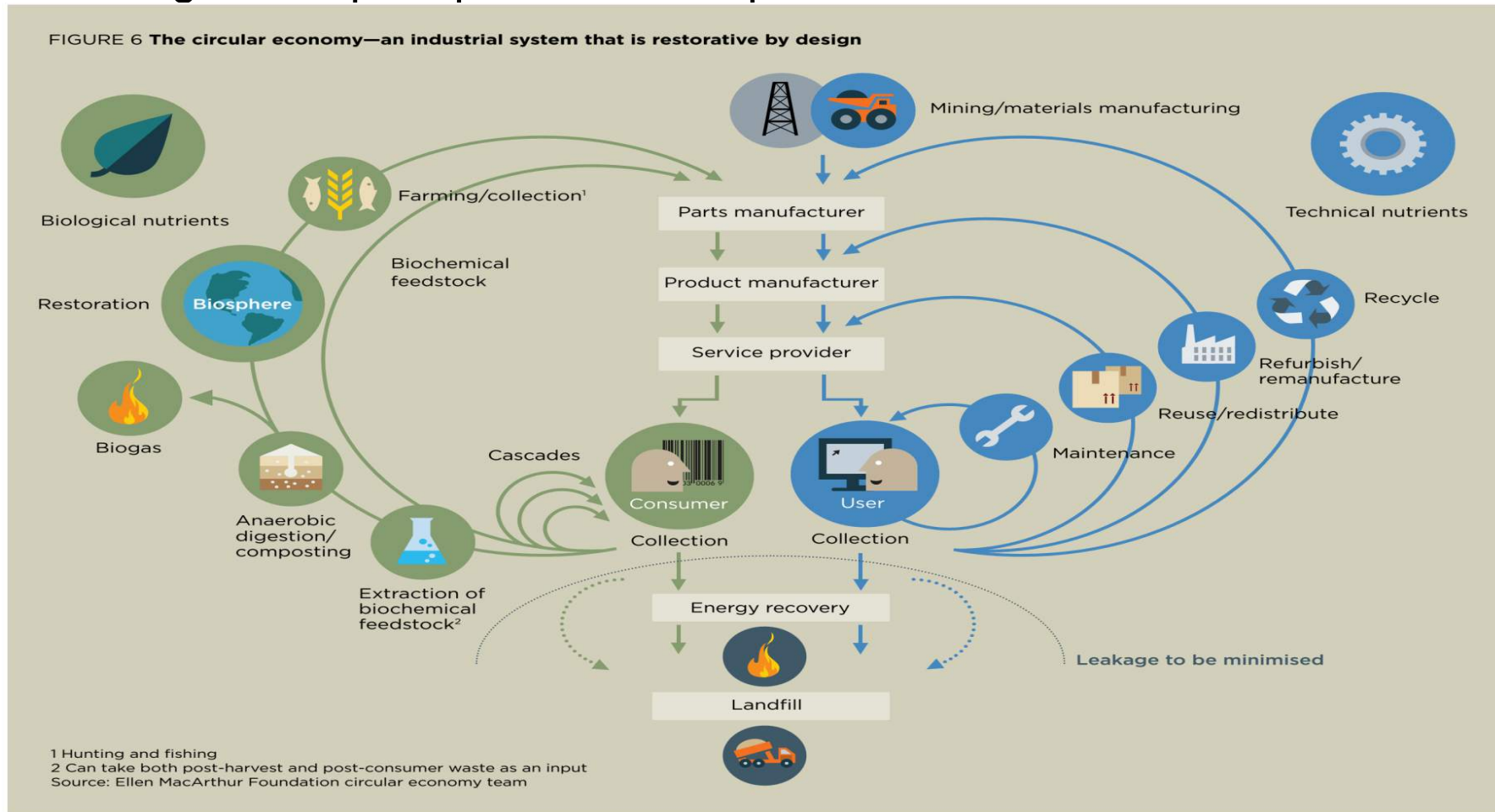


Graph: Global extraction of materials



# The Circular Economy

- The circular economy framework provides many opportunities for closing the loop on products, components and materials



Source: EMF

*Biological cycle*

*Technical cycle*

# Our mission: *Resourcing the world*

**The world is still developing and needs new resources: natural resources, economic resources and human resources.**

We play our part by designing and deploying solutions for **Resourcing the world:**

## **Developing access to resources:**

Veolia offers **operational solutions that consume fewer environmental resources and are more economically efficient**, so as to expand both the potential and the accessibility of the resources available.

## **Preserving resources:**

Veolia develops solutions **to conserve resources and optimize their use**, while protecting their quality and efficiency throughout the use cycle.

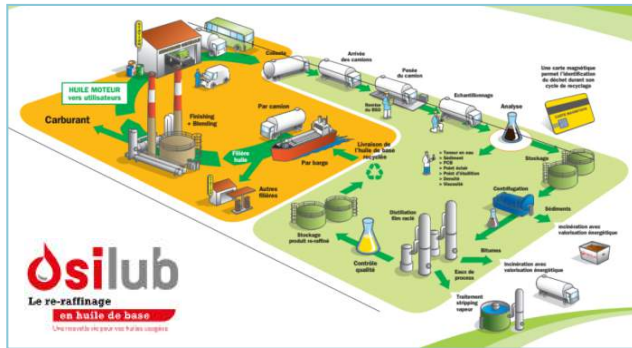
## **Replenishing resources:**

Veolia provides **solutions for creating new “secondary” resources** that will gradually offset the increasing scarcity of natural “primary” resources, generating new opportunities for social and economic development that protects the environment.

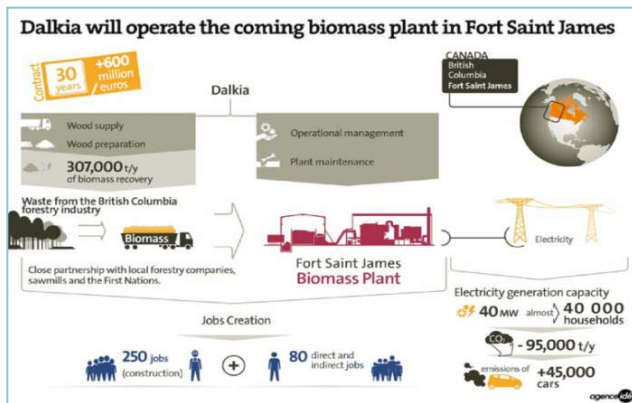


# Veolia is already in the Circular Economy ...

- There are examples for Circular Economy in all of Veolia's core activities: Waste, Water, Energy



Osilub: used-oil regeneration



Veolia Energy: Energy generation from biomass



Veolia Water: Phosphorus recovery from waste water

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



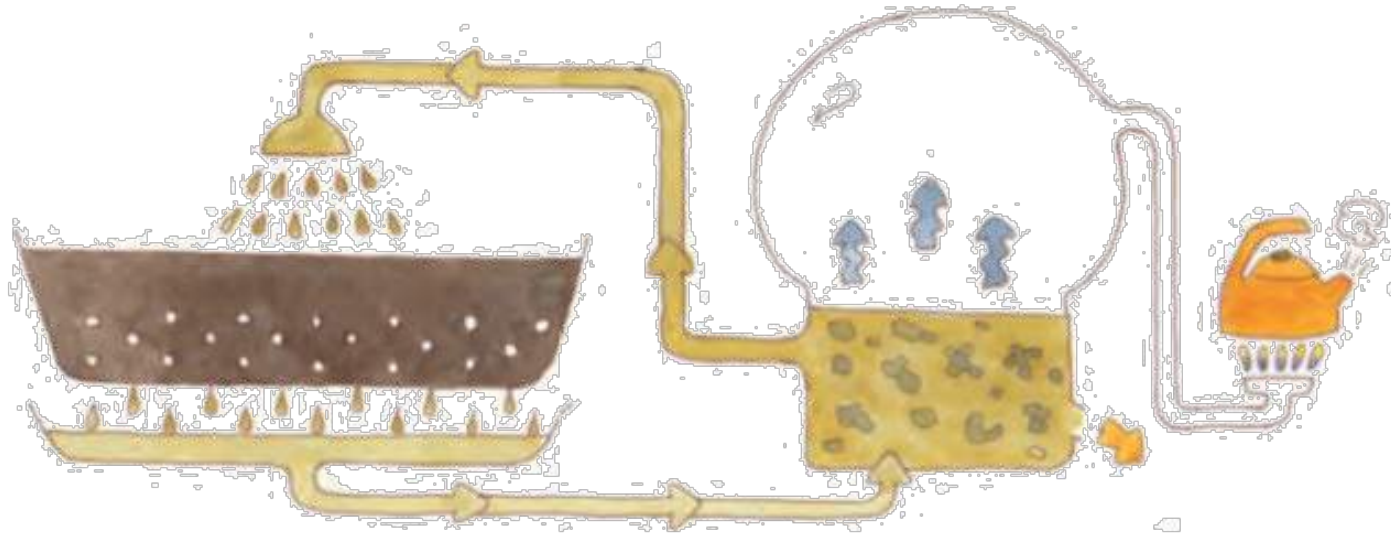
Veolia Umweltservice:  
Bottle-to-Bottle PET recycling



SARP (Sevia): Parts cleaning rental offer



# Hybrid Organic systems to recover materials and energy



Produces compost **and** recovers energy

Hybrid system - reduces compositional risk, produces energy and improves process carbon footprint



Plastic

Plastic

Plastic

Plastic

PLASTIC

PLASTIC

Plastic

Plastic

Plastic

PLASTIC

PLASTIC

Plastic

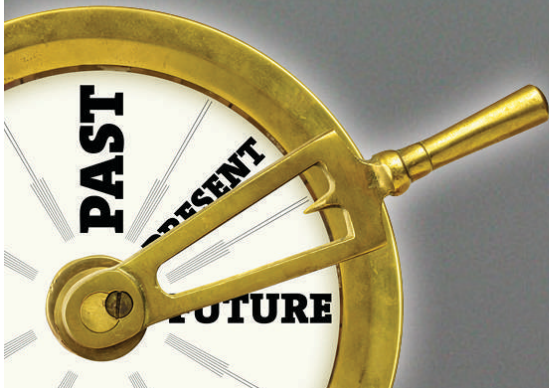
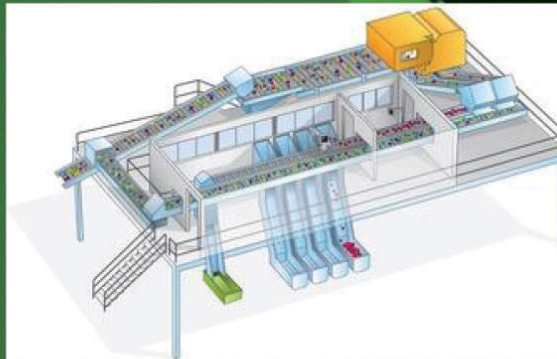




# SORTING AND RECOVERING ALL **PARROT** POLYMERS



SORTING AND  
RECOVERING ALL  
**PLASTIC**  
POLYMERS





MANUFACTURING PLASTIC TO  
**CLOSE THE LOOP**

# BUILDING GREEN HOUSES



# BUILDING GREEN HOUSES

**Isolation**  
Paper pulp

**FLOOR SLABS**  
Recycled HDPE

**STAIRS**  
Recycled concrete  
and recycled PVC

**PARQUET**  
Wood waste  
glazed

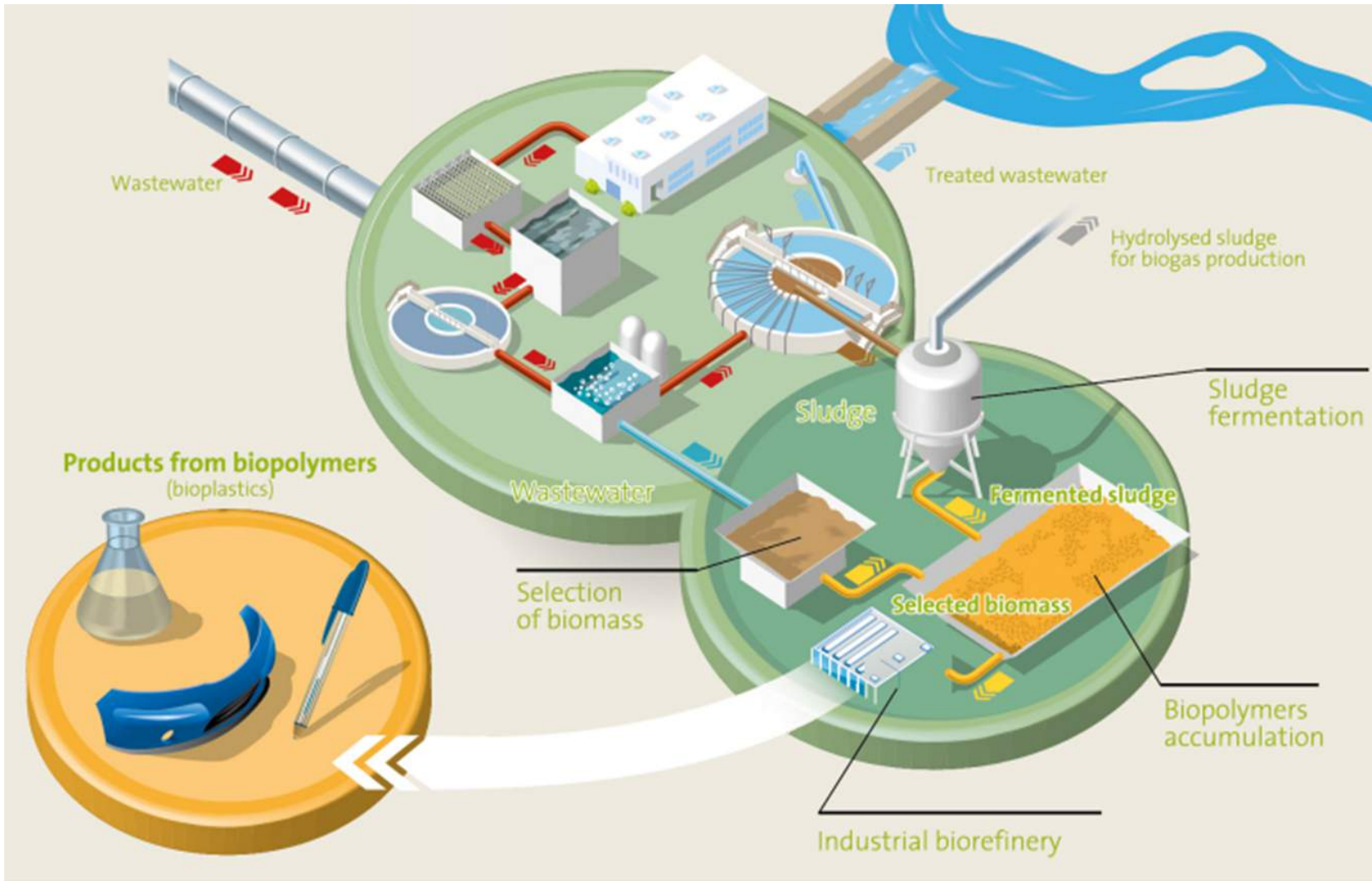
**TILES**  
Recycled plastic,  
paper and textile

**WALLS**  
Blocks of steel-mill  
slag and sawdust

**ROOFTOP BASE**  
Newspaper with bitumen



# Bio-Plastics from Sewage sludge







## Design of products

Circularity issue = many parameters!!

Material choice vs. energy required

Benefit for whom?  
Producers/consumer dilemma

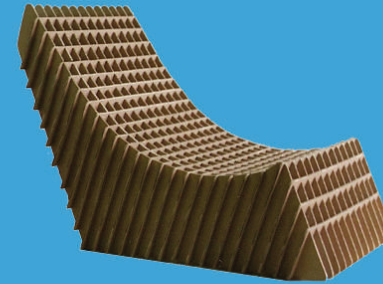
Product prices €

Market

Consumers

End of use

Manufacturer



Waste management

Material energy prices €



Technology available  
and material energy  
market €

Reprocessing disposal

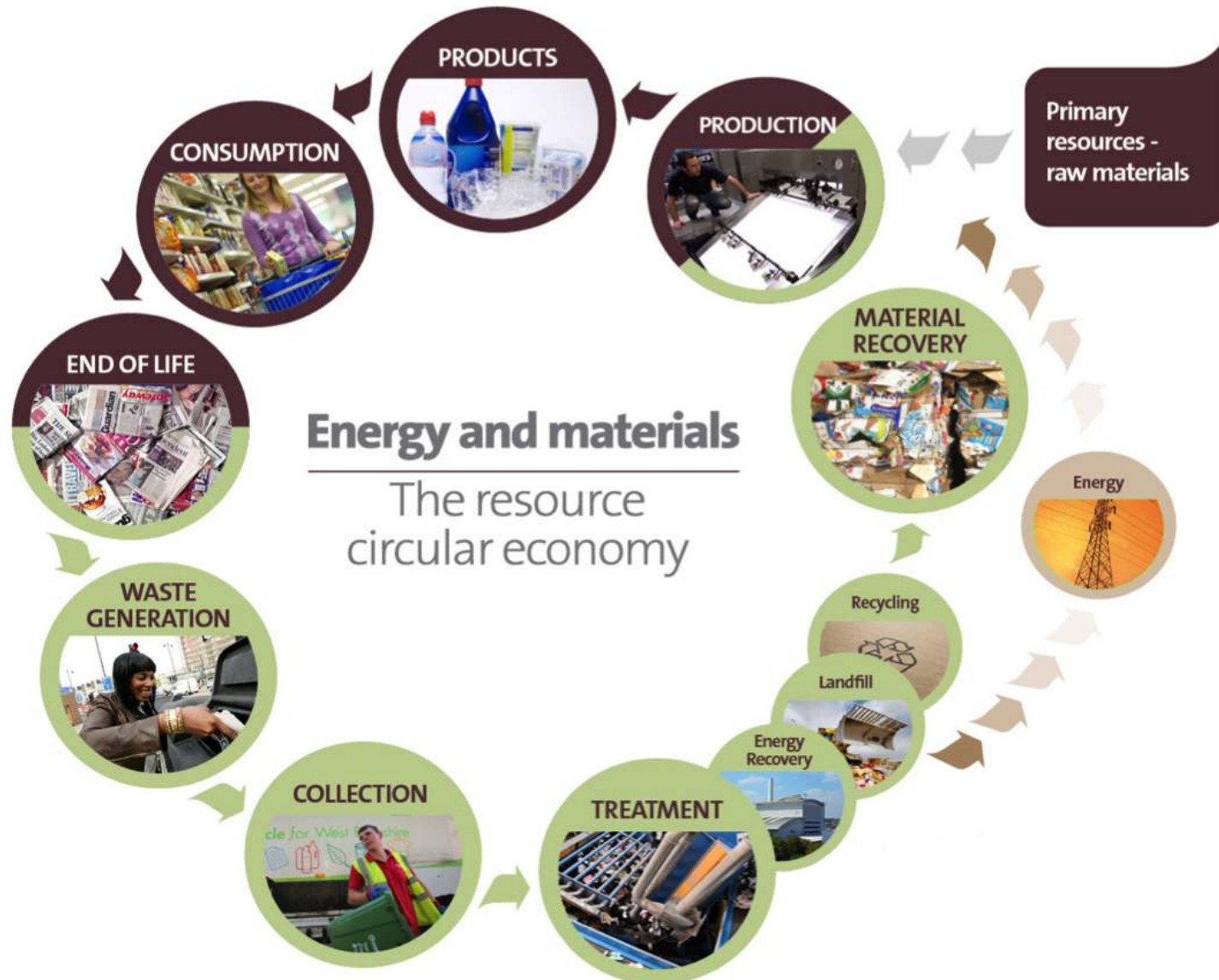


# Veolia joined the Ellen MacArthur Foundation (EMF) CE100



- ... because it takes a concerted effort to transition to a Circular Economy (CE).
- Veolia plays an active role in **Project Mainstream**
  - *Launched by the EMF, World Economic Forum & McKinsey at Davos in January, with A. Frérot, Veolia's CEO, as a member of the Steering Board.*
- **Project MainStream:** Programme of large-scale cross-sector, pre-competitive collaboration
  - *To achieve what companies / industries cannot do themselves*
  - *Builds closely on CE100 and WEF networks*
- Focus on the key enablers to accelerate the circular economy and achieve scale
  - *E.g. Pure materials flows, Information, regulatory / policy*
- Build successful proof of concept in 2 years for chosen material flows(s), which creates the tides for change across industries to go circular

# What is Driving the Value of Waste – The Circular Economy





Thank you for your attention!

Gary CRAWFORD  
Vice President - Emerging Markets  
**Veolia**  
36-38, avenue Kléber  
75116 Paris, FRANCE  
phone: +33(0)1 71 75 05 90