

Circular Economy

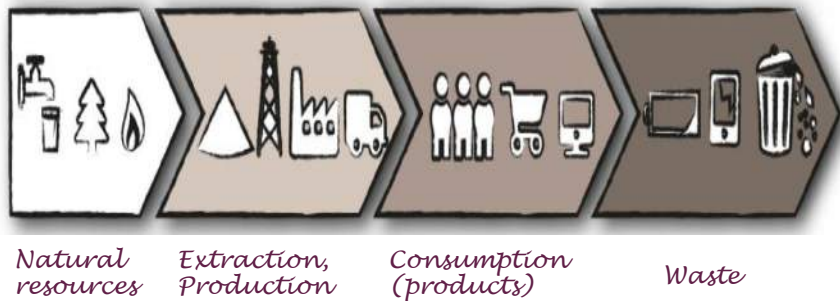
Dr. Forbes McDougall

Recovering Valuable Materials from Waste Event

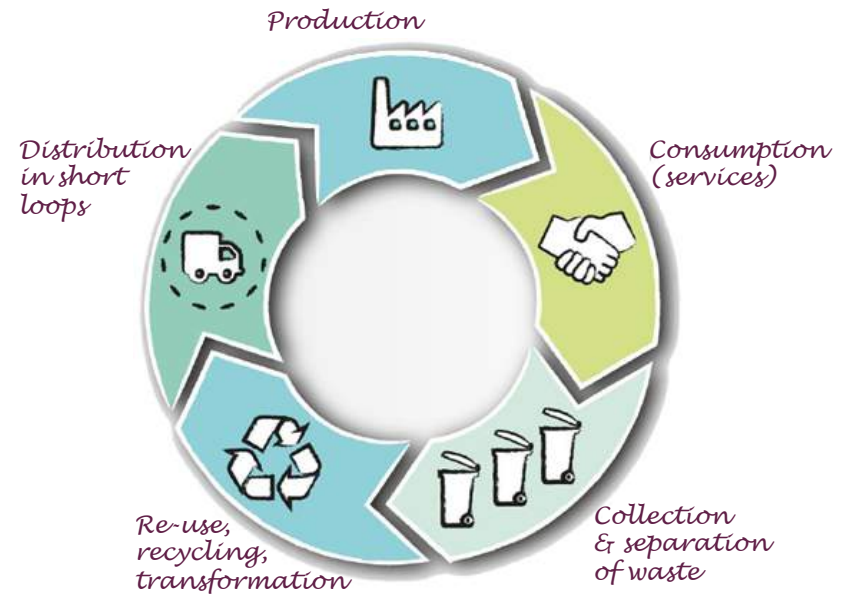
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What is the Circular Economy (CE)?

- Going from a linear to a circular approach
- Moving to a restorative economy ...
- ...without waste



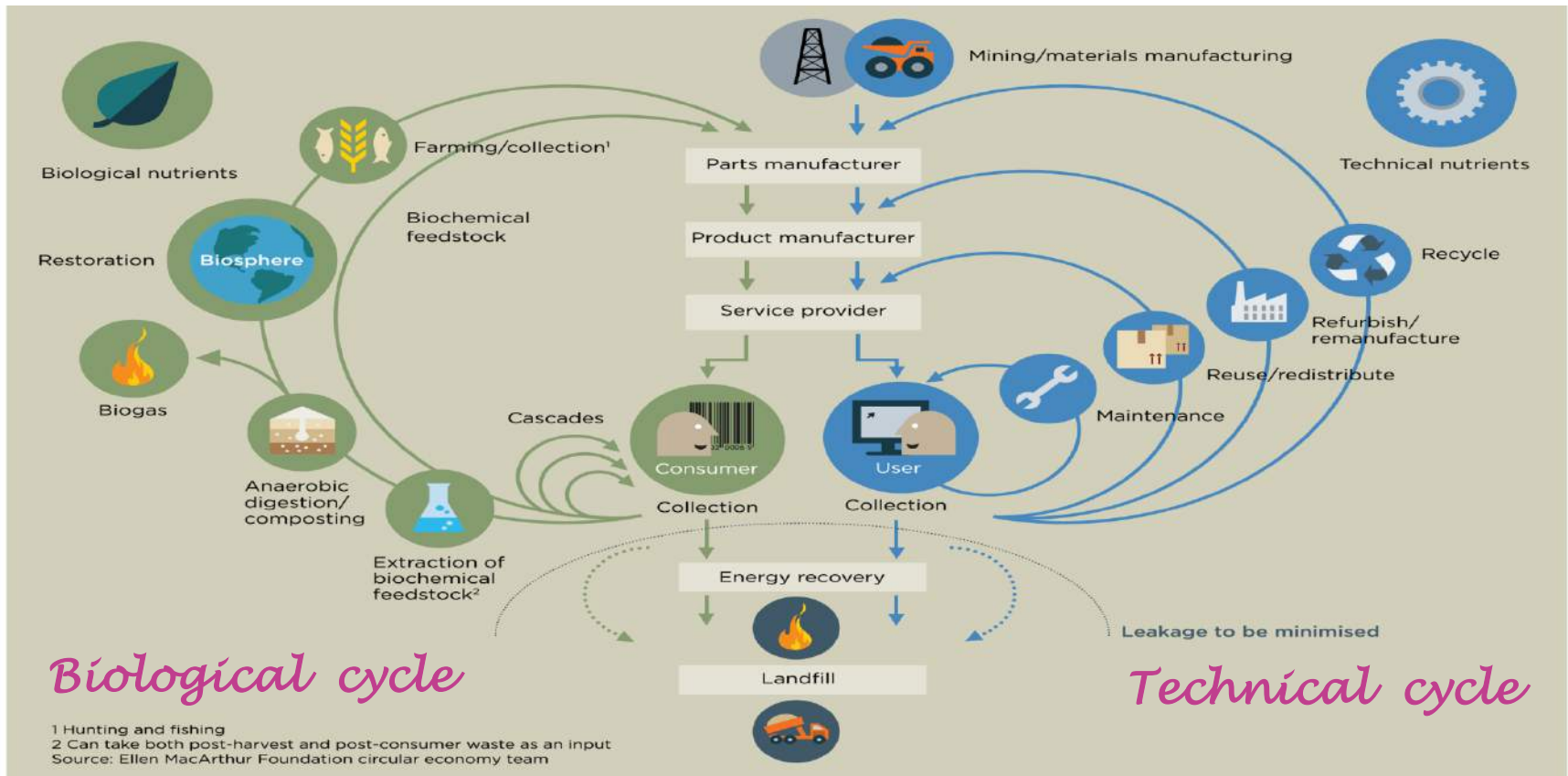
Linear



Circular

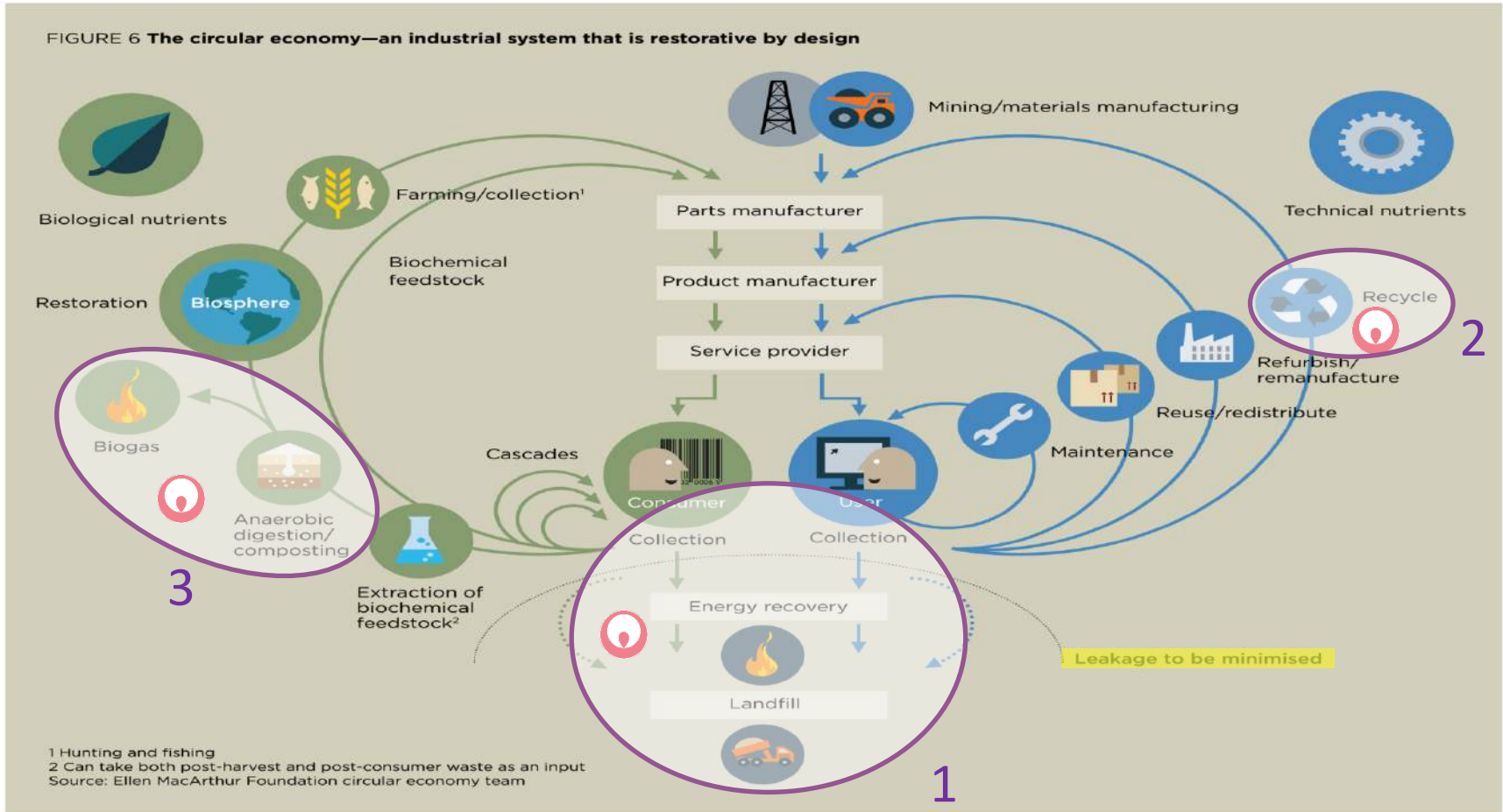
What is the Circular Economy (CE)?

- Biological materials safely re-enter the biosphere (consumables).
- Technical materials re-circulate at high quality.
- Energy is of renewable origin



Where is Veolia today in the CE?

- Veolia is mainly in the outer loops of the Circular Economy



Biological cycle

Technical cycle

Veolia has embraced a CE business model globally

• Veolia can:

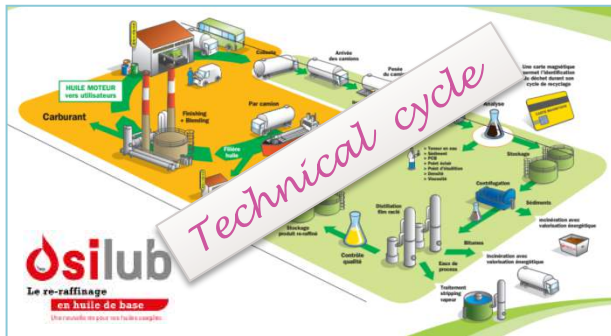
- Secure material (waste) **input** and material **output** streams via strategic partnerships with municipal and industrial clients
- Produce materials in line with **industrial standards** (quality & quantity) required by the clients
- Propose **innovative business models leveraging synergies across waste water and energy** that move Veolia from a contractor to a supplier and business partner

• ... so that our customers are able to:

- Recirculate or recover valuable materials or components ⇒ **save costs, generate revenues and secure supply**
- Reduce environmental liabilities ⇒ **reduce risk**
- Support Corporate sustainability commitments ⇒ **enhance image**

Veolia is already part of the Circular Economy ...

- o We have many complete projects that demonstrate Circular Economy thinking across all of Veolia's core activities: Waste, Water, Energy

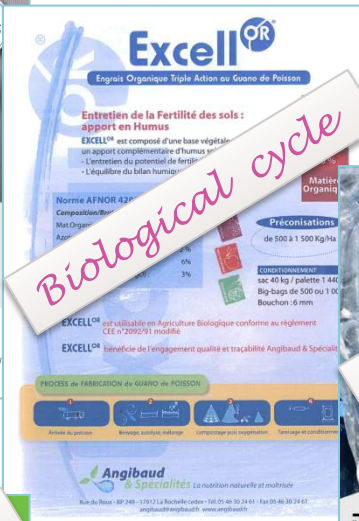


Osilub: used-oil regeneration



Veolia Water: Phosphorus recovery from waste water

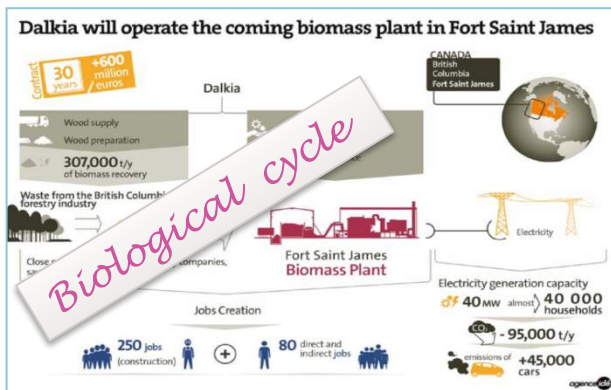
Veolia Propreté (Angibaud): Production of fertilizers from organic waste



SARP (Sevia): Parts cleaning rental offer



Veolia Umweltservice: Bottle-to-Bottle PET recycling



Veolia Energy: Energy generation from biomass

Veolia UK circular projects include:

- Veolia driven examples:
 - Pro-Fibre – non recycled paper recovery from MSW
 - Pro-Grow – organics recycling from separate green waste collections
 - Paint recycling – with an external partner
 - Sludge incinerator Ash – used as an ingredient in aggregates
 - Catalyst recycling from street sweepings
 - Recycling water for power stations – from sewage treatment works
 - Recycling ammonia from landfill leachate

Veolia UK circular projects include:

- Customer driven examples:
 - Green Clean – reusing waste surfactant
 - Recycling water for food production
 - Utilising bio-energy in the Whiskey industry
 - Recovering phosphate from biomass ash in the Whiskey industry
 - Recovering starch in the food industry
 - Platinum recovery from pharmaceutical hazardous waste
 - Capturing Nitrates – sodium nitrate wastewater converted into fertilizer

A more detailed write up of these current Veolia case studies that demonstrate the value in recovery and transformation of waste is available here:

www.veolia.co.uk/circulareconomy

Thank you