

Fighting Global Warming

through energy transition and biobased-circular economy solutions

Fighting Global Warming



The Paris Agreement *a historical commitment*



This agreement, signed in December 2015 by 195 countries and the European Union, marks **an important milestone**. Now is the time for action; starting with the formal ratification of the agreement by the countries and followed by the implementation of the decisions taken.

Objective :

Keep the rise in temperature below +2°C by 2100.



Obama at COP 21 in Paris, December 2015

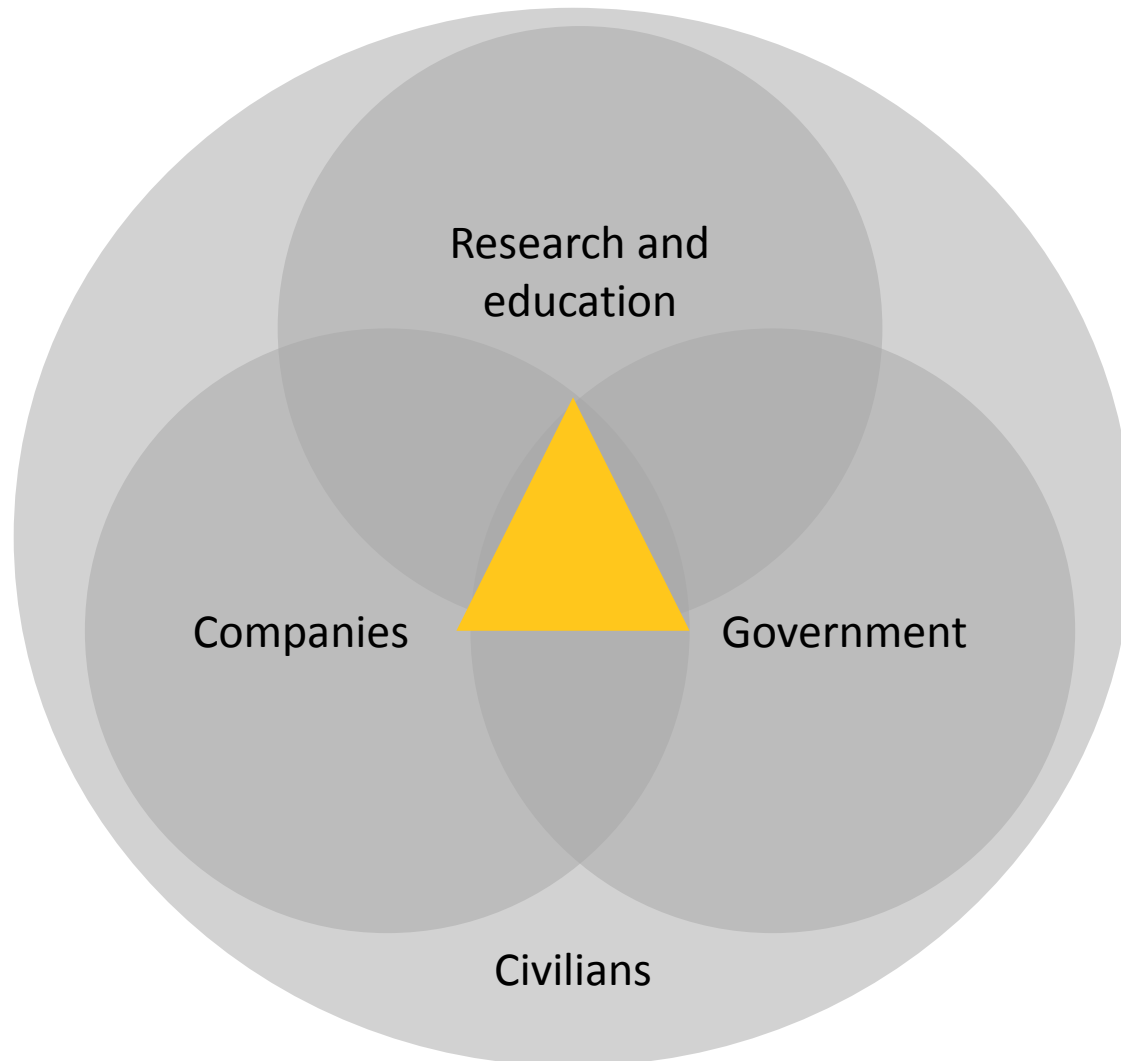


"We are the first generation to feel the effect of climate change and the last generation who can do something about it."

Energy transition through “Poldermodel”, Public Private Partnerships, Green Deals and Triple Helix



The golden triangle/ Triple Helix: Cooperation is key to success



Veolia mission: *Resourcing the world*

OUR VISION

Design and deploy circular solutions for water, waste and energy to improve efficiency for cities and industries:

Energy transition

Biobased-circular economy



KEY FIGURES

€ **23.8** billion revenues (2014)

179.000 employees

Present in **50** countries



900 experts worldwide
7 specialized international research centers
220 academic and industrial partners
250 pilot sites
Over 2,000 patents

Veolia: world leader in optimized resource management

Waste

51 million people provided with collection services on behalf of local authorities

38 million metric tons of waste recovered as materials and energy

570,000 business customers (excluding industrial maintenance)



94 million people supplied with drinking water

4,532 drinking water production plants managed

3,442 wastewater treatment plants managed



86 million MWh generated

4.5 million multi-family housing units managed

4,300 industrial facilities managed

(2013 global data)

How to fight global warming ?

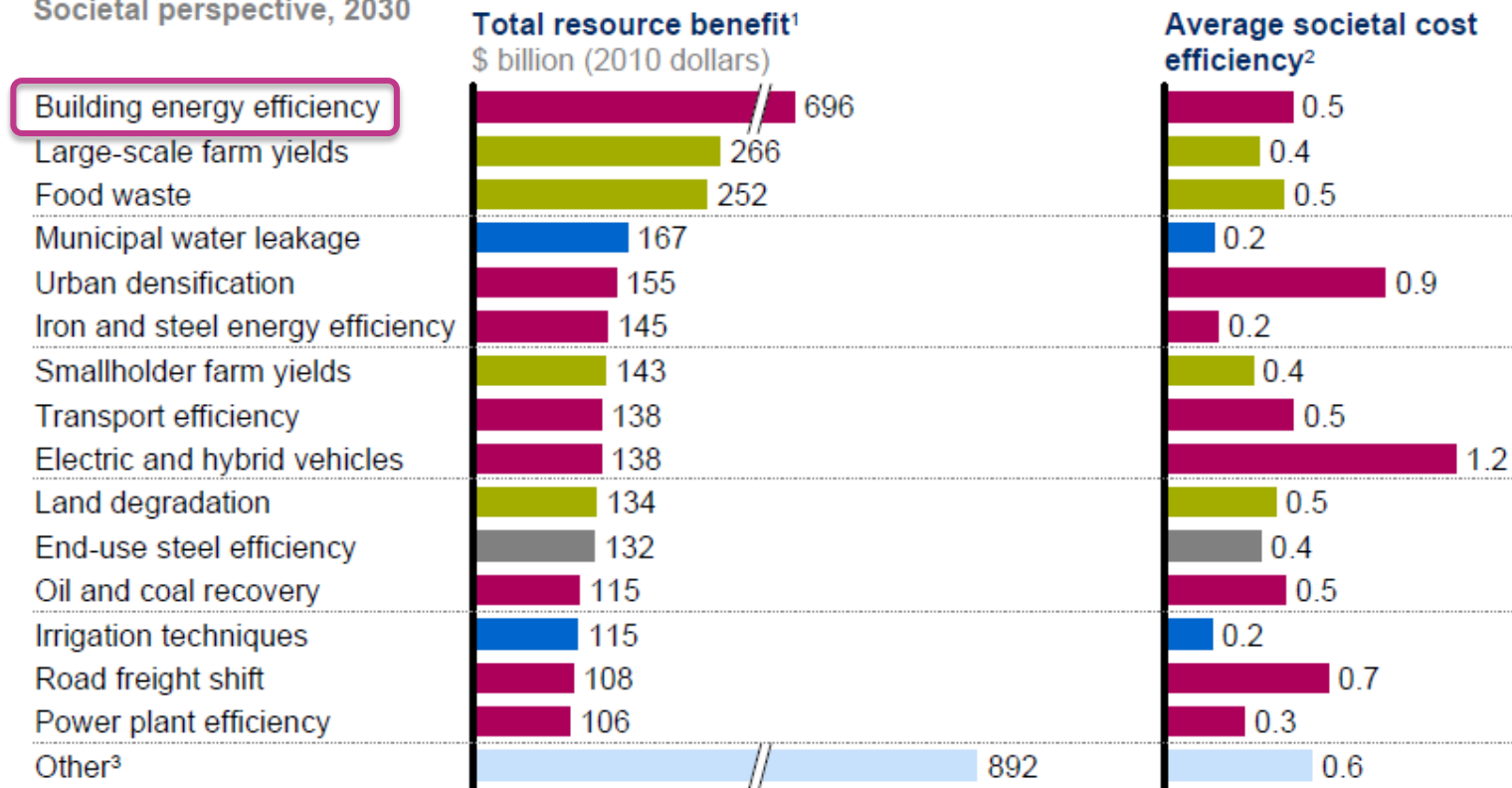
- Energy transition
 - *Monitoring Use of Energy*
 - *Use of Energy reduction*
 - *Renewable Energy*
- Biobased economy
 - *Shift from fossile to biobased production*
- Circular economy
 - *Reuse and recycle*

Energy – efficiency: Why the focus on buildings?

Fifteen groups of opportunities represent 75 percent of the resource savings

Societal perspective, 2030

Energy Land
Water Steel



1 Based on current prices for energy, steel, and food plus unsubsidized water prices and a shadow cost for carbon.

2 Annualized cost of implementation divided by annual total resource benefit.

3 Includes other opportunities such as feed efficiency, industrial water efficiency, air transport, municipal water, steel recycling, wastewater reuse, and other industrial energy efficiency.

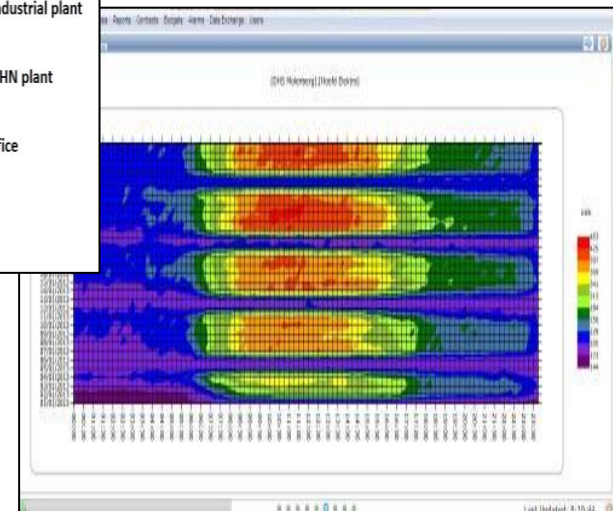
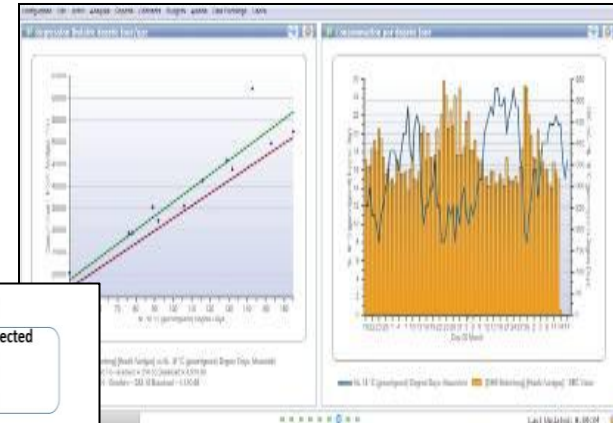
SOURCE: McKinsey analysis

Building and Energy Services: more and more focus on energy-efficiency

- ING
- Reinier de Graaff Hospital
- TU Delft
- TU Twente
- University of Amsterdam
- Energy-efficiency
- Energy monitoring first step



Energy Monitoring: Veolia Hubgrade - Nieuwegein



Industrial residual heat (Tata Steel) for district heating networks Amsterdam area

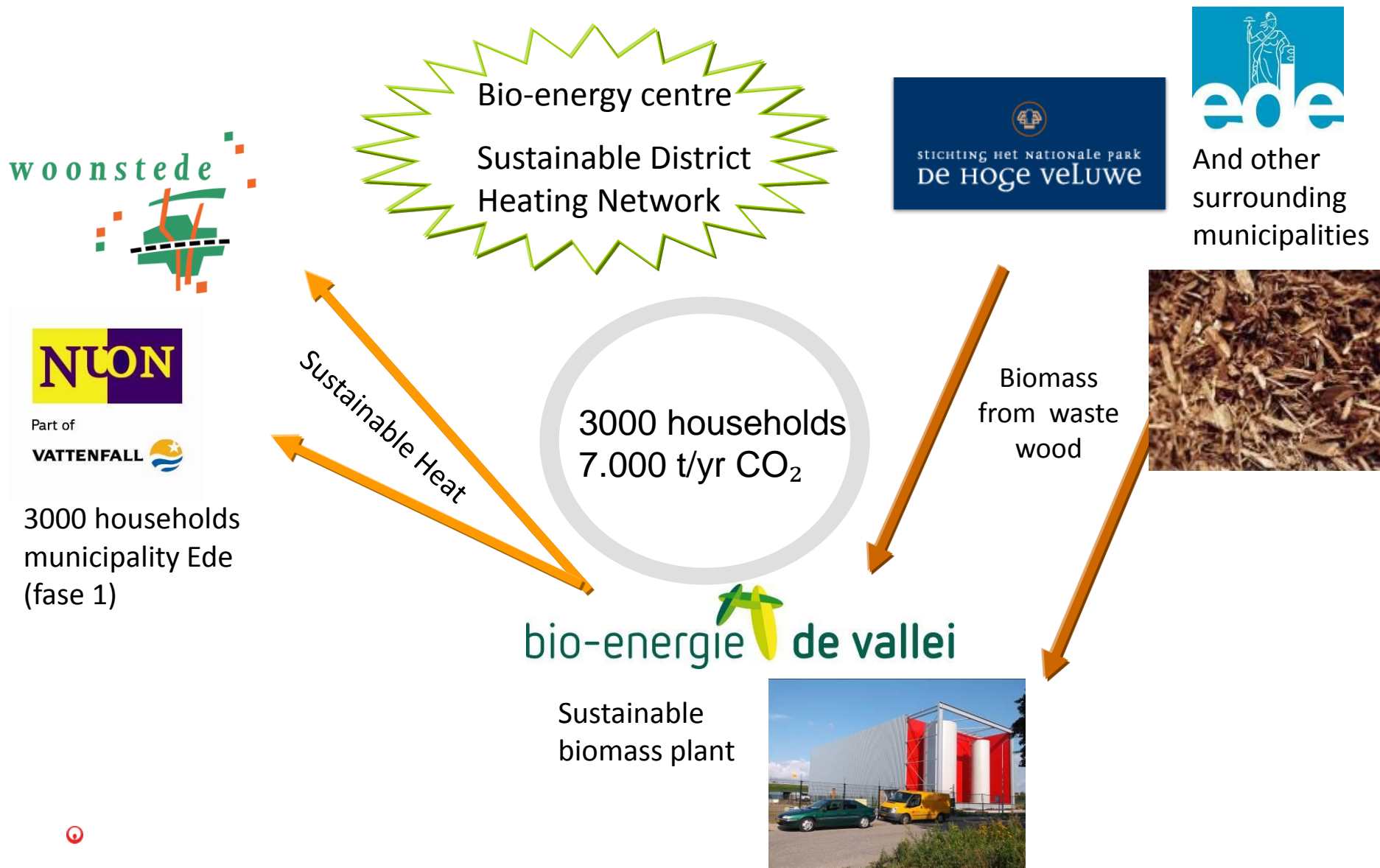


Project Kopenhagen: Acquisition DHN in NL

- Acquisition of complete Dutch District Heating Networks of Essent/RWE (2014)
- Partnership with the Dutch pension fund service provider, PGGM
- 64 networks spanning 1950 kilometers and serving more than 62000 households and 1200 businesses
- Target energy transition: more sustainable sourcing
 - *Geothermal energy*
 - *Biomass*
 - *Biogas*
 - *Bio-oil*
 - *Residual heat*



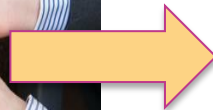
District heating from local waste-wood (municipality Ede)



Jacobs Douwe Egberts/Veolia: Circular economy and energy transition



Spent Coffee
Grounds used as
fuel for steam
production



Reduction natural
gas 2000 hh/yr

CO₂ -reduction
14.000 T /yr

Industrial park IPKW, Arnhem: focus on energy transition and biobased/circular economy

- Acquisition from NUON (2014)
- 23 Industrial partners, 50 – 90 ha
- Akzo, Tejin, Nedstack
- Collective utilities
- Steam, waste water, heat
- Biomass for steam production
- Attract start-ups
- Connect to DHN region Arnhem
- Ambition: Eco industrial park



Energie transition: Energy from waste



Resourcing the world/switch to biobased economy: Chemicals production from waste instead of oil



Key succes factors:
Chain co-operation
Public Private Partnership

Water Boards: Waste water treatment plants become Energy factories

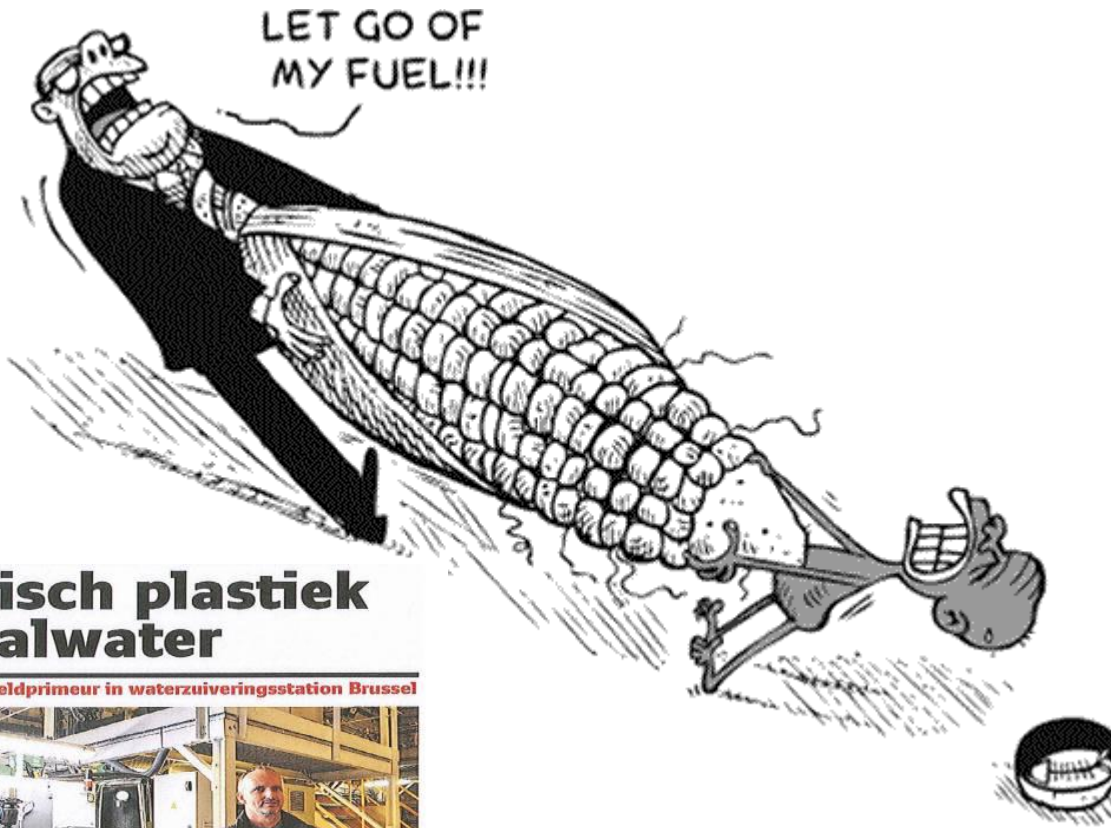


- Dutch Water Boards very ambitious in developing sustainable production processes
- Triple Helix and cross-sectoral co-operation
- Signed Green Deal Energy with national Government
- Focus on production of Biogas (and resource recovery) and recovery of heat from waste water
- Wwtp becomes an “Energy factory”

Co-operation Dutch Water Boards and Veolia: PHARIO: production of bioplastics from sludge



Resourcing the world: No oil, no food, but waste/sludge for production of bioplastics



Biologisch plastic uit afvalwater

Het Brusselse waterzuiveringsstation Aquiris start met de productie van biologisch afbreekbaar plastic op basis van afvalwater. Een jaar na de lancering van het proefproject produceerde Aquiris zijn eerste bioplastic.

Wereldprimeur in waterzuiveringsstation Brussel



ROBIN DE BECKER
BIJZITTER: 'Een revolutie voor de waterzuiveringssector', noemt Aquiris de situatie technologie. Het grootste waterzuiveringsstation van België, een dichtverdunde...

Aquiris produit des plastiques biodégradables à partir d'eaux usées

Aquiris, filiale belge de Veolia Eau, qui gère la plus grande station d'épuration de Belgique à Bruxelles, a présenté hier un dispositif pilote permettant de fabriquer des matières plastiques biodégradables à partir d'eaux usées. Grâce à une technologie nouvelle développée par AnoxKaldnes, la filiale suédoise de Veolia Eau, les substances présentes dans les eaux usées sont traitées via un procédé chimique et transformées en matière plastique biodégradable. Ce projet pilote devrait être appliqué à grande échelle dans deux ans. »



Resourcing the world: 2^e gen. plastics (PP) from plasticrecycling (Veolia Polymers, Vroomshoop)



Conclusions/Future developments

- After Paris agreement energy transition and biobased/circular economy will accelerate both in public and private domain
- Energy transition and biobased/circular economy will be become leading indicators in the Board Rooms and public sector
- Cross- Sectoral Co-operation and Triple Helix will be important succes factors
- Veolia will contribute to these developments through its mission: “Resourcing the World”

