Wie gelingt die „Polyolefins Circular Economy“?

„RETHINKING PLASTICS - 10 Rezepte für nachhaltigen Kunststoff“

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Content

- Borealis at a glance
- Plastics – Material of Today!
- The various ways towards a Polyolefins Circular Economy
- Summary
Borealis at a glance

**Worldwide**
Head Office in **Vienna, Austria.**
Operating on **five continents**
in **120 countries**

**Market Position**
#2 among polyolefin producers in **Europe**

**Employees**
More than **6,800 employees**

**Line of Business**
Production and distribution of
polyolefins, base chemicals
and fertilizers

**Ownership Structure**
64% Mubadala, United Arab Emirates / 36% OMV, Austria

**Financial figures**
Net profit 2018 – **MEUR 906**
Net sales 2018 – **MEUR 8,337**

**Joint Venture**
**Borouge** – the world’s largest integrated polyolefin complex in Ruwais, UAE

**Joint Venture**
**Bayport Polymers** – brings Borstar® technology to American polyethylene markets

**Circularity**
Two polyolefin recycling operations in Europe

**Patents**
117 priority patents filed in 2018

Source: Borealis 2019 data
Plastics – Material of Today!

“One word: Plastics.”

What the neighbour man told Ben when discussing about a really viable career future...

The Graduate, USA 1967
Plastics – Material of Today!

- **Carbon Footprint** - lower than for most other materials
- **Lower Density** - ideal for lightweight construction

PO saves 5-9 x more CO₂ emissions during the usage phase than needed for production

PO packaging protects and preserves food

PO enables safe and reliable energy transport over long distances

PO Pipes prevent water loss and reduce installation costs
The various ways towards a Polyolefins Circular Economy

The Imperative

Plastic waste is the Achilles heel of the plastics industry

The Chance

Circular economy could deliver €1.8tn for Europe (McKinsey, 2015)
The various ways towards a Polyolefins Circular Economy

Carbon dioxide (CO2) emissions

Use of finite resources and exhaustion of fossil fuels

Plastic waste leakage into environment

The Chance

Circular economy could deliver €1.8tn for Europe (McKinsey, 2015)
The various ways towards a Polyolefins Circular Economy

1. Förderung von Recycling-Kreisläufen
2. Gespräche mit Handel und betroffenen Industrieverbänden zur Prüfung von Einweg-Pfandsystemen für Getränkeverpackungen
3. Steigerung des Anteils von Kunststoff-Mehrweg-Produkten
4. Ausbau des chemischen Recyclings für Ströme, bei denen stoffliches Recycling nicht möglich ist
5. Faktenbasierte Politik durch verpflichtende Verwendung von Ökobilanzen
6. Optimierung von rechtlichen Rahmenbedingungen
7. Ausbau der Technologieführerschaft Österreichs
8. Engagement auf globaler Ebene
9. Sensibilisierung der Konsumenten
10. Vernetzung und Zusammenarbeit aller Stakeholder
The various ways to achieve a „Polyolefins Circular Economy“
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2006-2016 evolution of plastic waste treatment (EU28+NO/CH)

- **Recycling**: +79%
- **Energy recovery**: +61%
- **Landfill**: -43%

Total waste collected:
- 2006: 24.5 m t
- 2016: 27.1 m t

Source: PlasticsEurope: Plastics – the Facts 2018
The various ways to achieve a „Polyolefins Circular Economy“

Entwicklung der Abfallverwertung in einer Zeitreihe von 1994 - 2017

More discussion about Chemical Recycling – however less Chemical Recycling…

Source:
Conversio: Stoffstrombild Kunststoffe in Deutschland 2017
The various ways to achieve a „Polyolefins Circular Economy“
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In 2016, for the first time, recycling overtook landfill

In 2016, 27.1 million tonnes of plastic waste were collected through official schemes in the EU28+NO/CH in order to be treated. And for the first time, more plastic waste was recycled than landfilled.

Plastic post-consumer waste treatment in 2016 (EU28+NO/CH)

A lot of room for various approaches!
(urgent need for various approaches!)

31.1% Recycling
63% Inside EU
37% Outside EU

27.3% Landfill

41.6% Energy recovery

27.1 m t collected plastic post-consumer waste

Source:
PlasticsEurope: Plastics – the Facts 2018
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Borealis contribution

- **Mechanical / Chemical recycling:** not EITHER OR but AND
- Chemical Recycling will have a role in the Plastics Circular Economy
- Borealis actively studies new technologies like solvent based or chemical recycling
- Borealis will mainly focus on Mechanical Recycling
- Borealis takes decisions based on integrated Life Cycle assessments
The various ways to achieve a „Polyolefins Circular Economy“
Borealis contribution will focus on Mechanical Recycling

Virgin PO solutions following principles of Design for Recyclability (DfR)

Compounds with virgin + recycled contents
The various ways to achieve a „Polyolefins Circular Economy“
Borealis contribution will focus on Mechanical Recycling
The various ways to achieve a „Polyolefins Circular Economy“
Mechanical Recycling includes Design for Circularity

Design for Circularity:

- Design for **Reuse** (same application)

- Design for **Repurpose** (different application)

- Design for **Recycling**
The various ways to achieve a „Polyolefins Circular Economy“
Mechanical Recycling includes Design for Circularity

Design for Circularity:

Packaging is done for a purpose!

By no means, should packaging designed according to DfC / DfR Codes impact the functionality (e.g. preservation/protection of food)!
The Circular Economy – Design for Circularity

- Partnership since July 2018
- Greentech foam injection moulding technology
- Speciality Borstar and Daploy PP products by Borealis
- Joint development and commercialisation
- Disruptive products (>50% weight savings, robust structure, designed for reuse and recycle)
- Disruptive business models (closed environment pilots ongoing)

PE solution offers 15% reduction
LCA study on Full PE Laminate
At recycling rate of 50%

High quality recycling

BorShape™ bimodal PE
allows the full PE laminate to be printed, laminated and run at packaging lines!

Shopping bag consisting of 100% recyclate of full PE laminate

Blown MDO suitable for thin lamination films

PE MDO film high speed rotogravure printing and lamination

High speed SUP production in VFFS with the Full PE Laminate
Together driving Circular Economy of Polyolefins

Borealis was the first PO company that joined the Ellen MacArthur Foundation’s New Plastics Economy (NPEC) programm and recently signed their Global Commitment.

Borealis is founding member and chair of the Polyolefins Circular Economy Platform (PCEP).

Borealis is an active member of the new CEFLEX project, successor to the former FIACE and REFLEX.

Borealis is developing recycling capacity as is committed to become recycling technology leader. Acquisition of mtm plastics and ecoplast.
Project STOP - a city partnership program established by Borealis and SYSTEMIQ

OUR GOALS
Zero leakage
Increased recycling
Social benefits

OUR COMMITMENT
3 cities over the next 5 years
Up to 15 MUSD
10,000 tonnes of plastic
Local employment
Replicable solutions

info@stopoceanplastics.com  #EndOceanPlastic
Summary

- Borealis at a glance
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- Polyolefins - Material of the Circular Future !!!

Develop in Europe – Export to the world!