

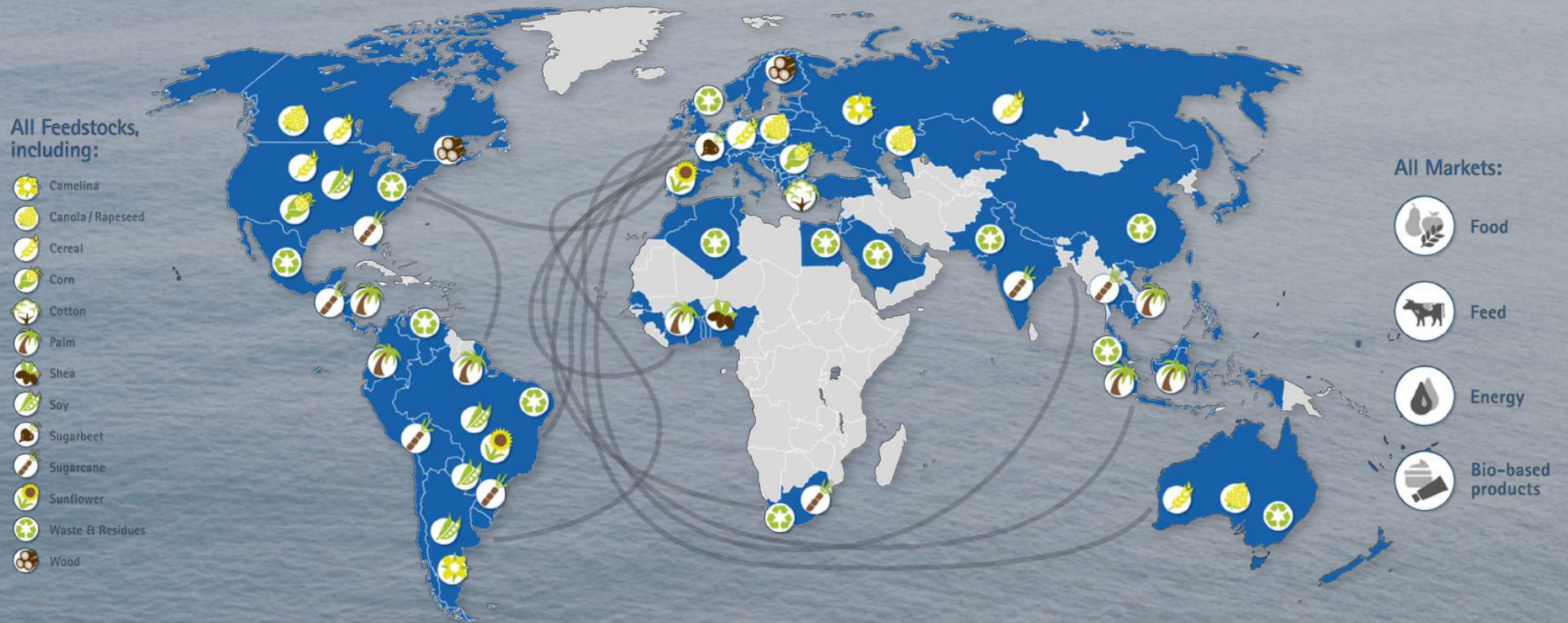


Supporting Deforestation-free Supply Chains and CO₂ Reduction for Bio-based Plastics

Dr. Peter Hawighorst, ISCC System GmbH
 ACI European Biopolymer Summit 2019, 14th February 2019, Ghent, Belgium



ISCC is a sustainability certification schemes applied on a global scale. ISCC system users are located in more than 100 countries worldwide



More than 20,000 certificates have been issued since 2010

System users in **100+**
countries

20,000+
certificates
3,000+
system users

32 certification bodies
360+
ISCC trained auditors

Training Program
(70 Trainings so far for
auditors and system users)

**Innovative tools and
procedures** to facilitate
audits



Use remote sensing to
**verify land use
change**

**8 Voluntary
add-ons**
to address specific customer
requirements

Stakeholder dialogue:
**115 ISCC Association
members**

Discussion platform with
**4 Regional
and 2 Technical
Committees**

Integrity Program
3 auditors

ISCC is a multi-stakeholder initiative organized in an association with currently 115 members



ISCC is leader in the certification of all kinds of agricultural and forestry feedstocks ...



Soy



Canola



Palm



Sunflower



Cereals



Corn



Sugarcane



Sugarbeet



Wood



Cotton



Shea Nuts



Camelina

... as well as wastes and residues to support the circular economy and renewable non-bio materials

Waste and processing residues



UCO



Landfill gas



Tall oil



End-of-life tires



Municipal solid waste



Crude glycerine

Renewable non-bio feedstocks



Power-to-Gas Power-to-Liquid



CO2

Forestry / agricultural crop residue



Forestry residue

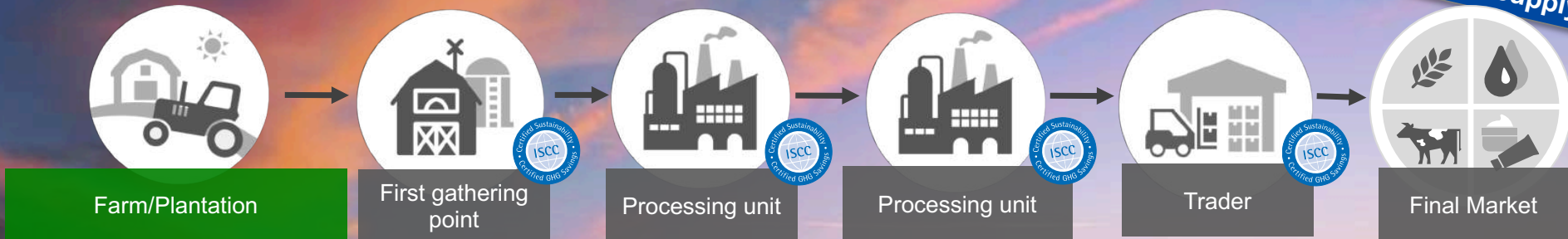


Husks

Straw

Each element of the supply chain becomes individually ISCC certified. Certificates are site specific and valid for one year

Simplified supply chains



ISCC sustainability requirements principles 1-6

Traceability and GHG emissions



Traceability and GHG emissions

ISCC ensures deforestation free supply chains and the protection of valuable ecosystems – land use change of those areas after 2007 is forbidden



Primary forests and other wooded land



Forested areas



Designated nature protection areas



Highly biodiverse grassland



Wetland



Peatland

ISCC core principles for agricultural production areas – a balanced set of ecological and social criteria



Principle 1: Protection of biodiverse and carbon rich areas



Principle 2: Good Agricultural Practice



Principle 3: Safe Working Conditions



Principle 4: Compliance with Human, Labour and Land rights



Principle 5: Compliance with Laws and International Treaties



Principle 6: Good Management Practices and Continuous Improvement

Traceability, Chain of Custody and GHG emission calculation along the supply chain

How does the external auditor check compliance with ISCC principles?



Assessment of internal documents

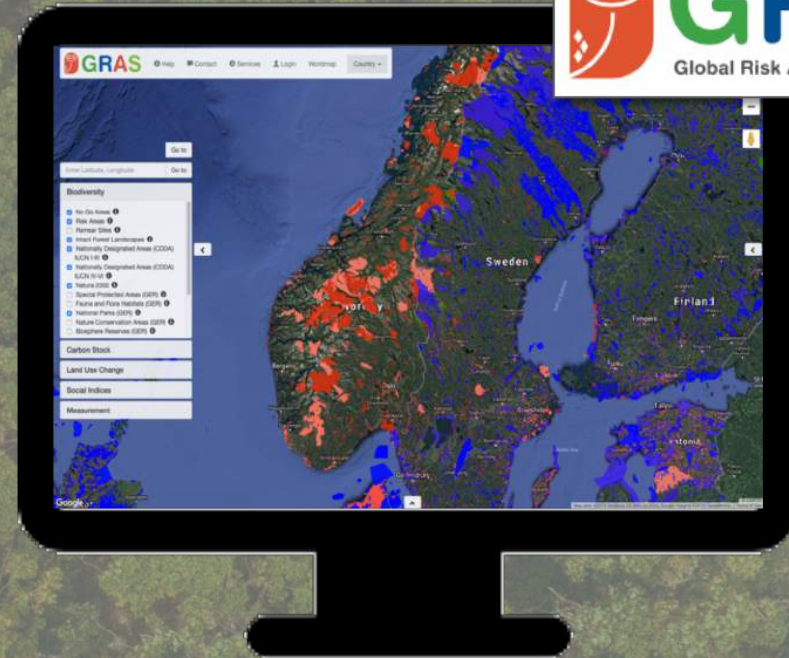
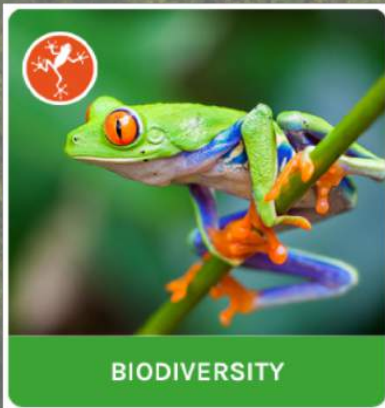


Interview of personnel, managing directors and stakeholders



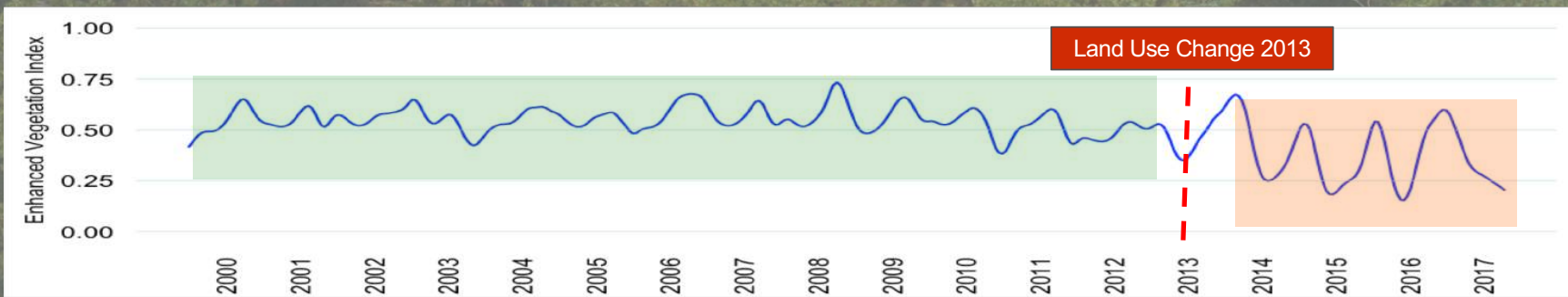
Visual inspection of areas, company facilities, storage, etc

ISCC uses innovative tools such as GRAS, a remote sensing tool to facilitate the risk assessment and the identification of deforestation



www.gras-system.org

The use of remote sensing data also supports the verification process providing additional information (e.g. LUC)



In addition, low GHG emission values for bio-based products will also play a more prominent role in the future. ISCC ensures credible and verified GHG calculation



GHG emissions calculation

$$E = e_{ec} + e_l + e_p + e_{td} + e_u - e_{sca} - e_{ccs} - e_{ccr}$$



Agricultural substrates



Cultivation emissions e_{ec}

Land use change e_l

Improved agricultural management e_{sca}

Wastes and residues



Pre-Processing e_p

Processing unit



Processing e_p

Upstream transport e_{td}

Excess electricity e_{ee}

CCR e_{ccr}

CCS e_{ccs}

Processing unit



Processing e_p

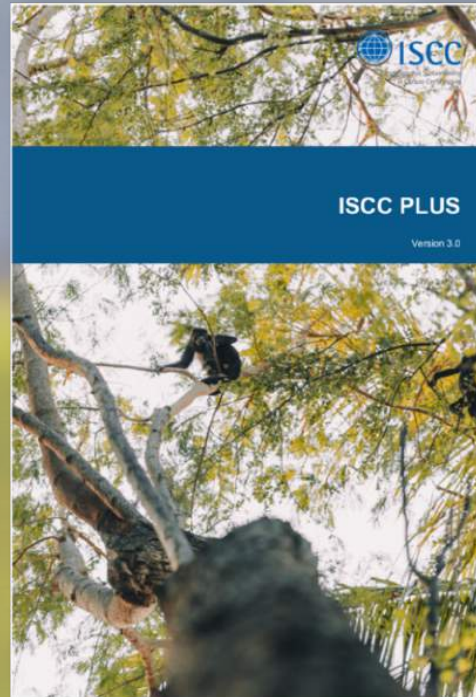
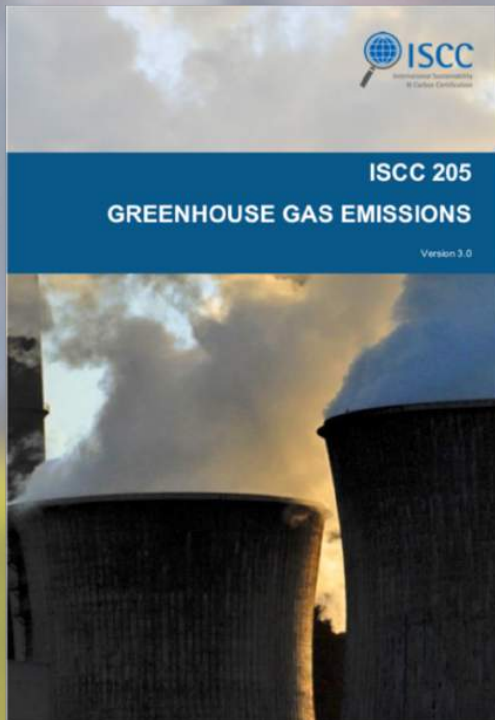
Transport & distribution e_{td}

Excess electricity e_{ee}

CCR e_{ccr}

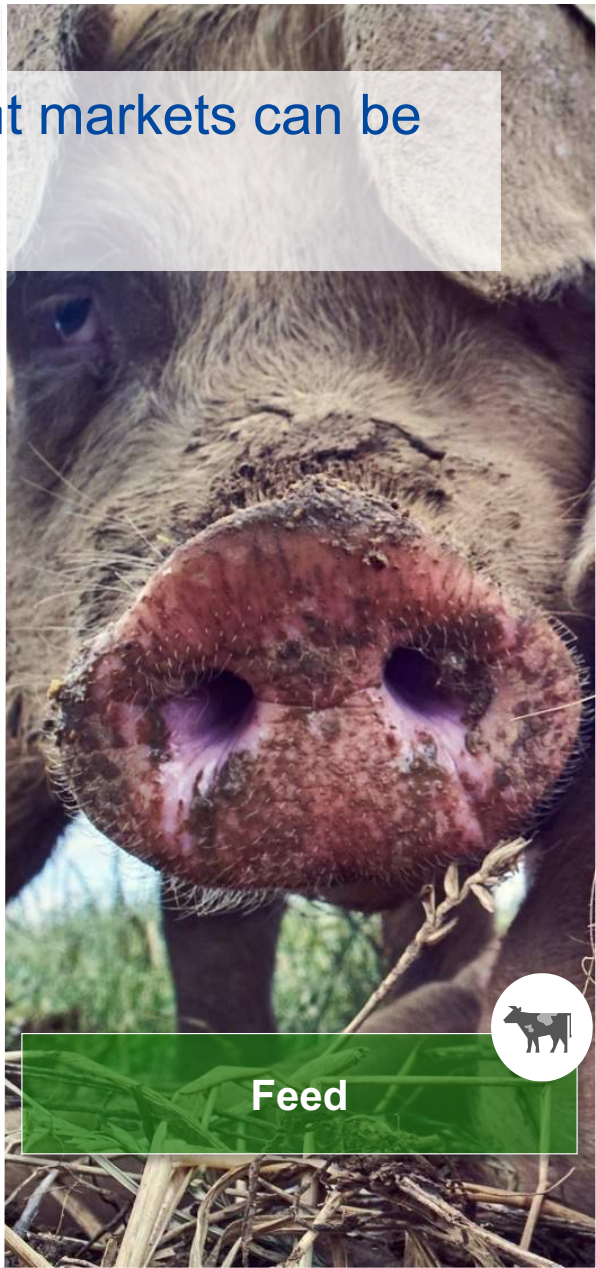
CCS e_{ccs}

Using ISCC PLUS, system users can calculate GHG emissions covering the whole life cycle (*cradle-to-gate*) or only emission up to the factory gate (*cradle-to-gate*)



- GHG calculation based on RED methodology or LCA possible
- Use of relevant databases or literature possible
- Allocation of emissions using different options (e.g. energetically, based on mass)
- On product claims referring to GHG savings possible under ISCC PLUS

Voluntary and mandatory sustainability requirements in different markets can be addressed via ISCC



Food

Energy

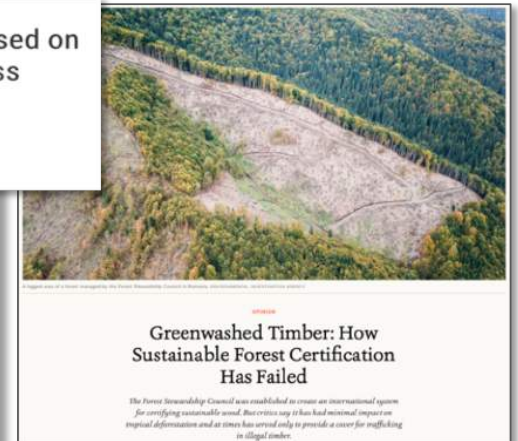
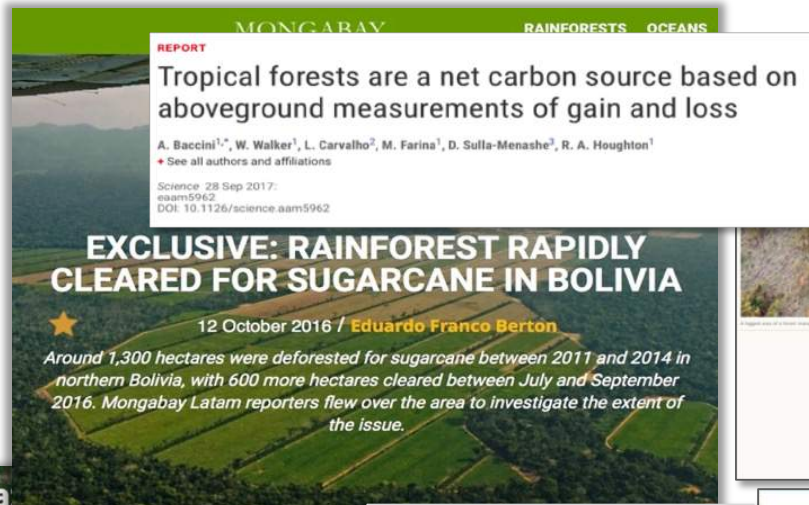
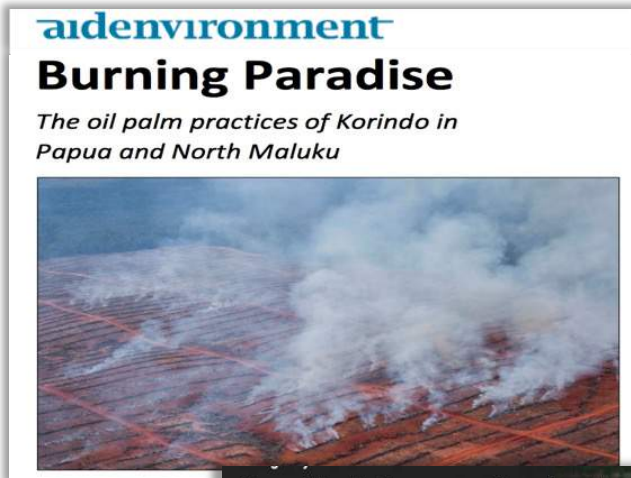
Industrial applications

Feed

ISCC is a one stop shop for all crops and markets, and is compliant with many important platforms and industry standards



Substantial risks could be linked to the use of renewable resources due to deforestation, grassland conversion and biodiversity loss



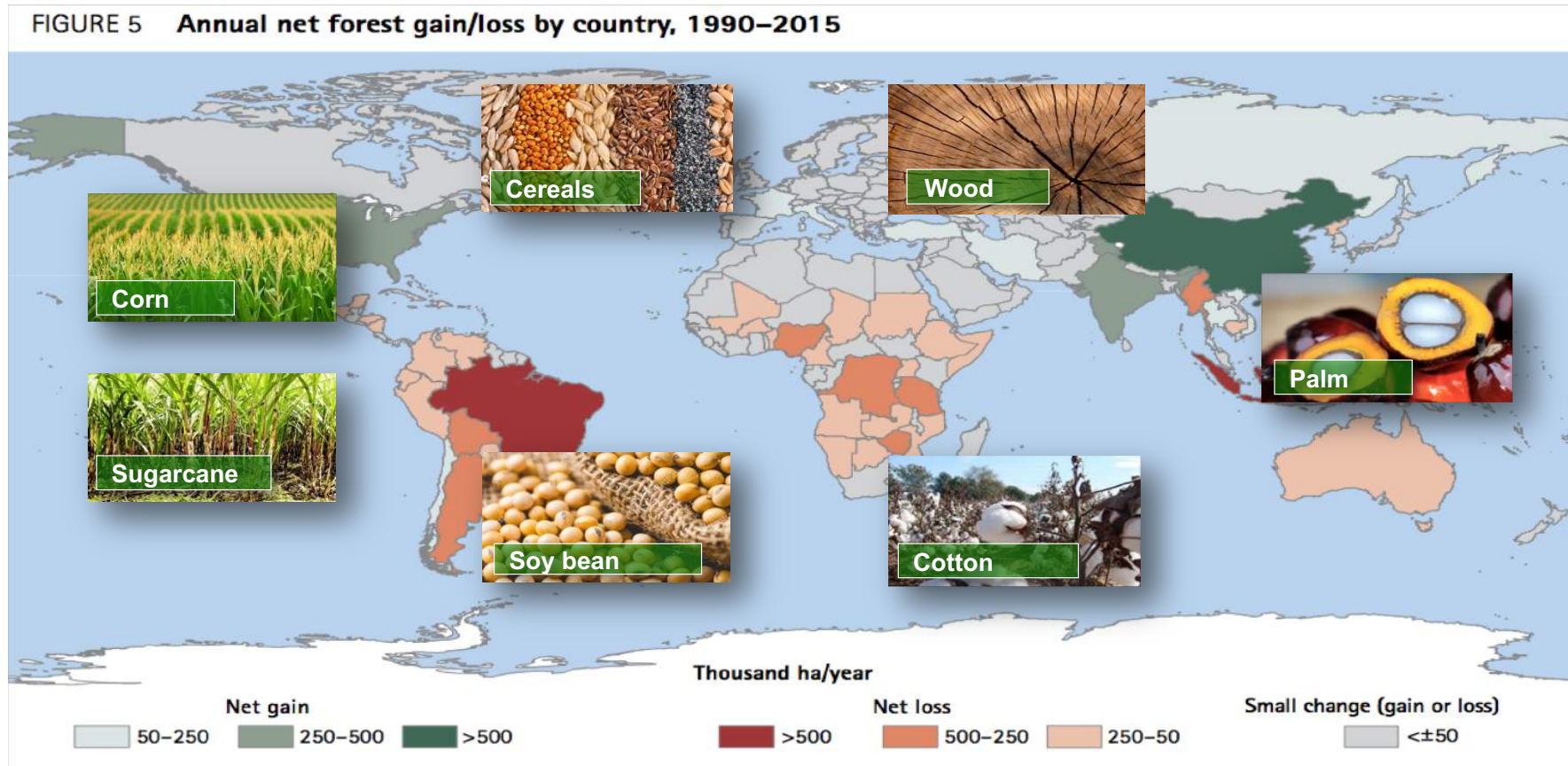
Brazil: deforestation in the Amazon increased 29% over last year



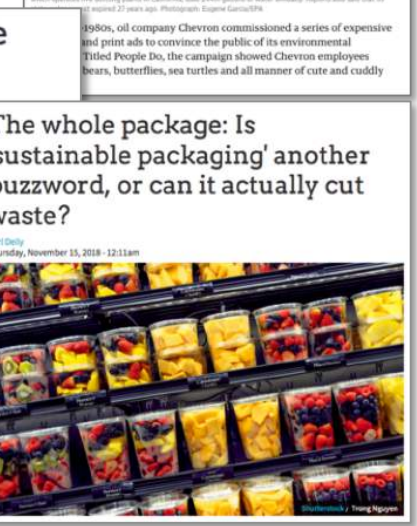
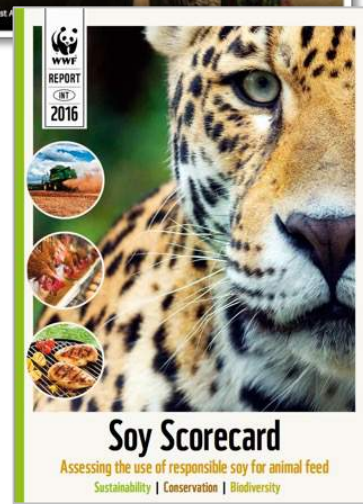
New HSBC 'no deforestation' policy first step towards sustainable palm



Many supply chains of agricultural commodities for bioplastics origin in regions with high deforestation rates



Many companies publicly claim their sustainability efforts. However, there is a the risk of greenwashing allegations



Companies from the chemical industry make commitments to increase the use of bio-based materials

Examples



Nestlé



“Danone and Nestlé Waters have joined forces (...) to form the Natur’ALL Bottle Alliance. Their aim is to be the first to commercialize **100% bio-based and recyclable PET bottles**. (...) First bottles are expected to hit the shelves by 2020.”



“The ultimate goal for ElopaK is that both our company and our products shall become carbon neutral, meaning that we have a **zero net impact** on the drivers of **climate change**.”



“PlantBottle packaging (...) is the first ever fully recyclable PET plastic beverage bottle **made partially from plants**. The material looks and functions just like traditional PET plastic, but has a **lighter footprint** on the planet and its scarce resources.”



As a member of the Consumer Goods Forum (CGF), we share their commitment to net-zero deforestation by 2020 through the **sustainable sourcing** of pulp, paper, packaging and palm oil

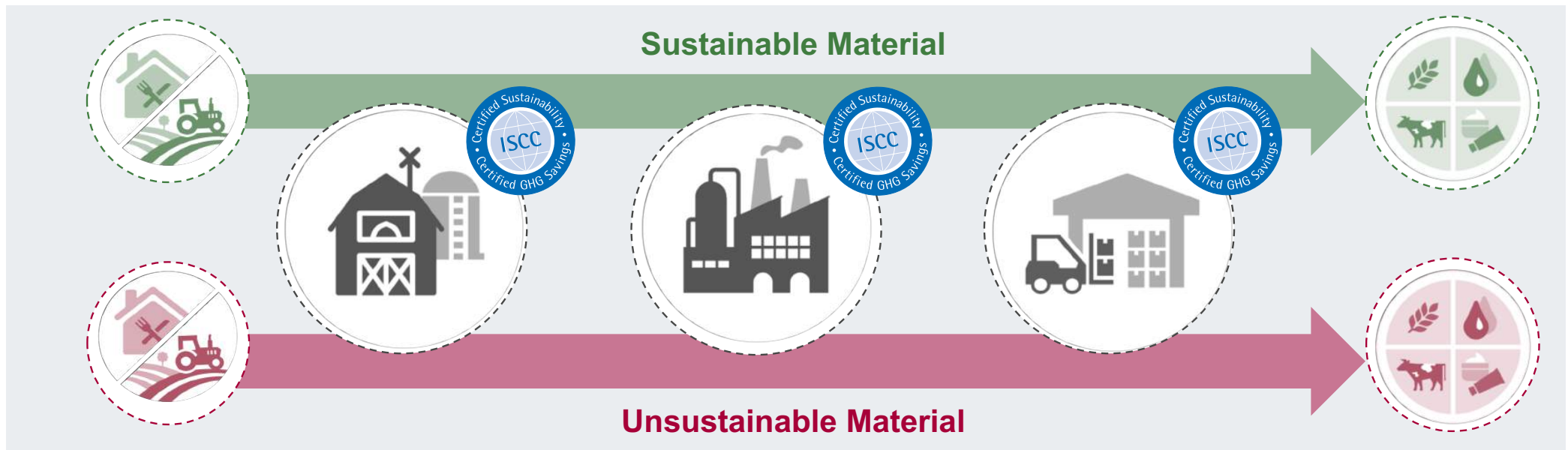


ISCC supports companies and initiatives from the chemical industry striving for sustainable renewable feedstock

Examples

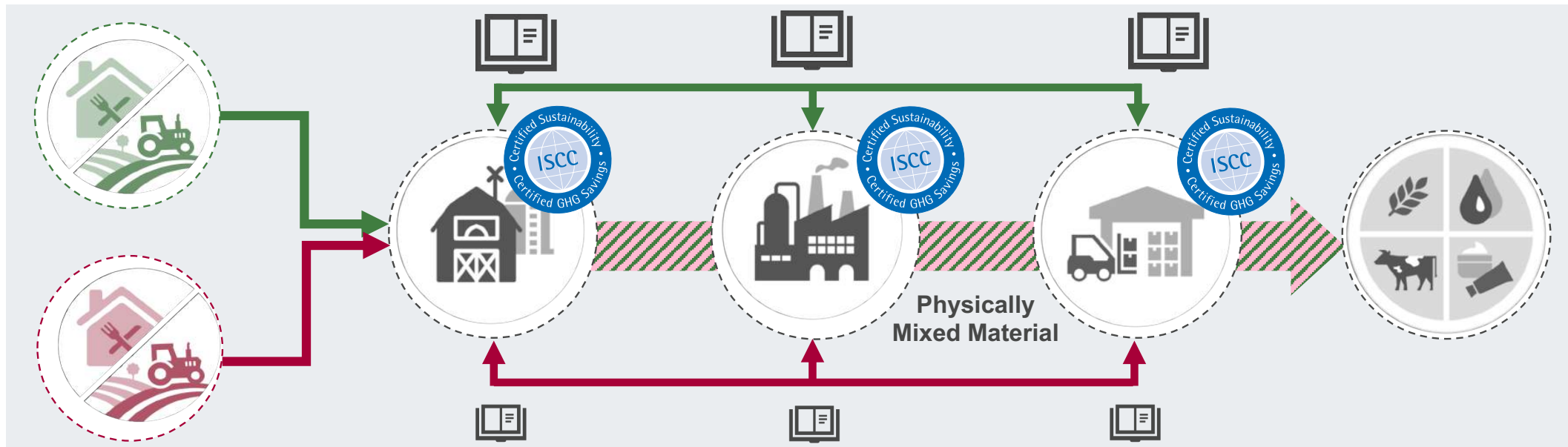


System users can chose using physical segregation



- Physical segregation of certified and non-certified products
- Deliveries physically contain 100% certified product
- Possible claim: 100% based on sustainable sources

... as well as mass balancing approaches for their chain-of-custody



- Products with different sustainability characteristics mixed, but segregated in book-keeping
- No entity sells more certified products than sourced (conversion factors applied)
- Possible claim: Linked to 100% recycled sources

NatureWorks has a segregated supply chain. It was the first ISCC PLUS certified company, and has been continuously certified since February 2012



Impressions from the first ISCC audit of the Ingeo production chain in October 2011



Images by courtesy of NatureWorks



- Audit in October 2011 was the pilot audit for the first ISCC PLUS certification
- NatureWorks ISCC PLUS certification covers the Ingeo production site in Blair, NE
- Feedstock for NatureWorks input materials is corn

	Optional Certifications		
	GM-Free Feedstock Sourcing	ISCC PLUS	ISCC PLUS & GM-Free Feedstock
Biobased carbon content	1	2	3
No GM material in Ingeo			
GM-free feedstock	✓		
Certified sustainable agriculture		✓	✓



Baskem is producing green PE processed from sugar cane. The company is ISCC PLUS certified since 2012

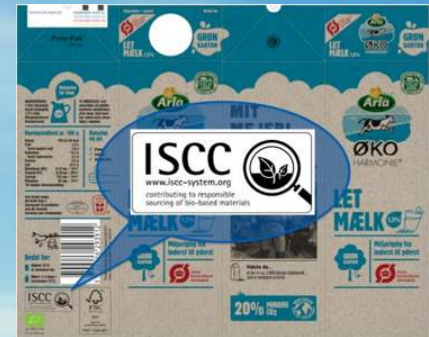


Elopak is using ISCC PLUS certified bio-based PE aiming to reduce the use of fossil-based materials and minimize CO₂ emissions



ELOPAK

Together we make packaging work



SIG is also using ISCC certification to proof compliance with its customers' requirements for renewable materials



SIGNATURE PACK: 100% linked to plant-based renewable material

Developing a pack solution that adheres to consumer demands, in addition to ensuring that it is innovative within the industry is no small feat. However SIG have created the world's first aseptic pack 100% linked to plant-based renewable material – a solution that holds added value, meets the demands of the industry and has a clear core message.



...100% linked to plant-based renewable material...

“...That drives the replacement of conventional plastics from fossil fuels plastics with certified and sustainable plant-based polymer materials...”



82%
FSC™-certified wood sourced paperboard

100%
linked to plant-based renewable material

Key Components

The **SIGNATURE PACK** is made from 82% FSC™-certified wood sourced paperboard (FSC™ trademark licence code: FSC™ C020428), providing packaging stability. The polymers used for laminating the paperboard and making the spout originate from renewable European wood sources and are certified according to ISCC PLUS (International Sustainability & Carbon Certification) or CMS 71 (TUV SÜD certification standard), respectively, via a mass balance system. This means that for the polymers used in the **SIGNATURE PACK**, an equivalent amount of bio-based feedstock went into the manufacturing of the polymers. That drives the replacement of conventional plastics from fossil fuels with certified and sustainable plant-based polymer materials.

Note: Based on requirements from former logo document

Source: www.sig.biz/responsibility/packaging/beverage-packaging/signature-pack-details



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Perstorp uses ISCC PLUS certification for its *Pro-Environment* polyols. One of the polyols achieve a carbon footprint reduced by 80%*

How we guarantee sustainable sourcing with ISCC

21 November 2017

Our Pro-Environment Polyols are all to become certified by ICSS. Practically this means that we have full traceability of the bio based material we use and an independent verification that our products are produced sustainably and responsibly. The fact that our products come with an ISCC certificate also guarantees that the bio-based input is sustainably sourced and lives up to requirements set for a more livable future. Read more about how you can rely on sustainable sourcing.



*compared on fossil alternative; according to Perstorp

Source: Perstorp website and brochure

More and more companies are producing bio-based materials for industrial applications

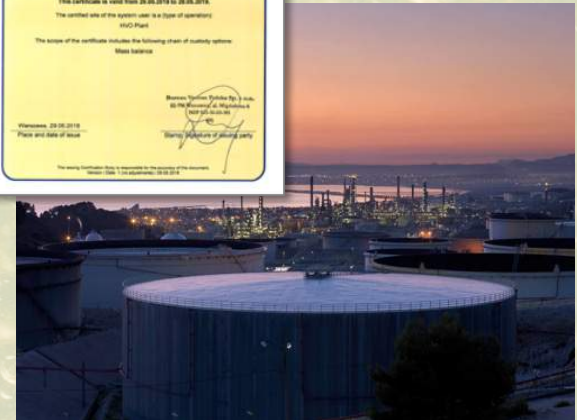
Examples



NESTE



Image courtesy of Neste Oil Corporation



Another focus of companies are solutions to tackle plastic waste – in the last ten years plastic production has grown by 40 %

450 mill. tons of plastic produced in 2015

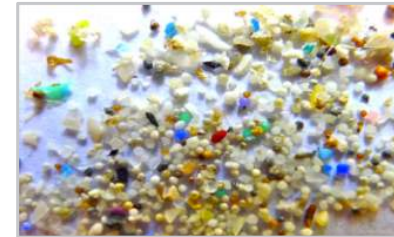
> 1/3 of plastic used for packaging

> 90% of plastic not recycled

Packaging waste 1/2 of plastic waste

80% of plastic waste to landfill/ environment

Each year 9 mill. tons of plastic waste to oceans



Microplastic



Ocean plastic



Unused raw material

Source: Geyer (2017); Jambeck et al.,(2015); National Geographic (2018)

Brand owners are committed to bio- **and** circular economy



„Unilever has committed to ensure all of its plastic packaging is **designed to be reusable, recyclable or compostable by 2025**“

Coca-Cola

“To increase the amount of **recycled content** in plastic bottles from "a paltry 7%" to 50% by 2030.“

DANONE

„Evian pledged to make all of its plastic bottles from **only recycled plastic by 2025**.“



„Nestlé has pledged to **phase out all plastics that are not recyclable or are hard to recycle** for all its products worldwide between 2020 and 2025.“

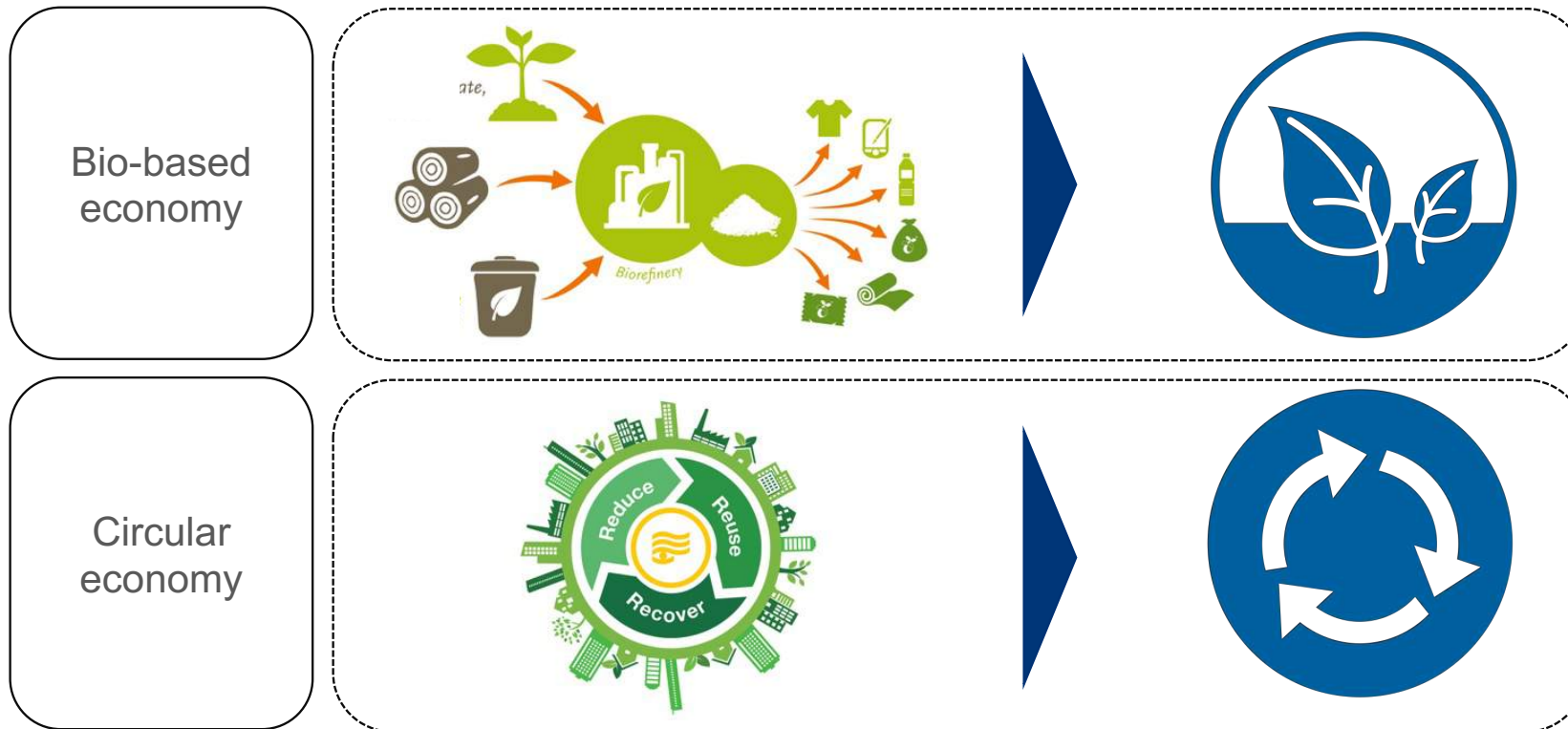


„2030 goal: **Ensure 90% of product packaging is recyclable**.“



Source: Companies' websites, The Guardian (2019), BBC (2018).

ISCC provides solutions for credible certification for a sustainable bioeconomy and circular economy



ISCC certified circular polymers are available in the market - the recycling of plastics minimizes the use of fossil-based materials and CO₂ emissions

24.01.2019

SABIC AND CUSTOMERS LAUNCH CERTIFIED CIRCULAR POLYMERS FROM MIXED PLASTIC WASTE



01.02.2019

SABIC pioneers first production of certified circular polymers



SITTARD, THE NETHERLANDS, February 1, 2019 - SABIC, a global leader in the chemical industry, has announced another major milestone in its ground-breaking project to pioneer the production of certified circular polymers using a feedstock from mixed plastic waste.

The latest achievement – the production of the first certified circular polymers – is part of what is known as a 'market foundation stage'. Launched in January, this stage is an important step towards creating a new circular value chain for plastics, during which, initial volumes of pyrolysis oil from plastic waste are introduced as feedstock at SABIC's Geleen production site in The Netherlands. The patented pyrolysis oil has been produced by PLASTIC ENERGY Ltd from the recycling of low quality, mixed plastic waste otherwise destined for incineration or landfill.

As part of the market foundation stage, SABIC has begun to produce and commercialize the first monthly volumes of certified circular polymers - polyethylene (PE) and polypropylene (PP), prior to the projected start-up in 2021 of the commercial plants planned by SABIC and PLASTIC ENERGY in the Netherlands to manufacture and process the alternative feedstock.

"Certified circular polymers are a disruptive innovation and SABIC's market foundation stage is a critical phase in their development", said Frank Kuijpers, General Manager Corporate Sustainability at SABIC. "It will act as a bridge moving from a linear economy to a circular one and will enable the value chain to become familiar with the products and consider how they can best be implemented in their own markets. It will allow confidence in this pioneering product to grow before SABIC goes into full scale production."

The polymers are certified through the International Sustainability and Carbon Certification plus (ISCC+) scheme that certifies circular content and standards across the value chain from source to end product. The ISCC+ certification works on what is known as a "mass balance system", meaning that for each tonne of circular feedstock fed into the cracker and substituting fossil-based feedstock, a tonne of the output can be classified as circular.


Certified circular polymers will help SABIC's customers to meet consumer demand for more sustainable products and will contribute to closing the loop on reutilizing plastic waste.

Relevantes Bildmaterial



Jeroen Castelijns, General Manager Geleen site and Frank Kuijpers, General Manager Corporate Sustainability celebrate the certified circular polymers produced in the Netherlands.

© SABICPR383a



Annex to the certificate:

ISCC PLUS compliant materials handled by the certified site (only applicable for material handled under this scope as: farm/plantation, point of origin, central office, first gathering point, conversion unit but not for material that is only traded and/or stored)

This annex is only valid in connection with the certificate:
ISCC-PLUS-Cer-DE129-36220642

Input material	Output material	Voluntary Add-ons
Tail Oil	Renewable Ethylene, Propylene, Butadiene, Benzene	
Renewable Ethylene, Propylene	Renewable LDPE, HDPE, PP Grades	
Pyrolysis Oil (recycled mixed plastic waste)	Circular Ethylene, Propylene, Butadiene, Benzene (recycled mixed plastic waste)	
Circular Ethylene, Propylene (recycled mixed plastic waste)	Circular LDPE, HDPE, PP Grades (recycled mixed plastic waste)	

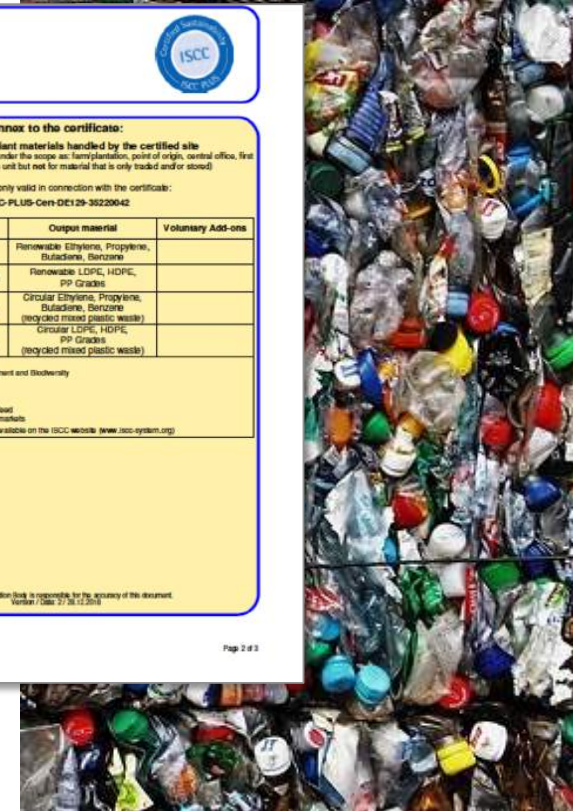
ISCC PLUS Add-ons:

- 201-01: Environmental Management and Due Diligence
- 202-02: Classified chemicals
- 203-01: GHG emissions
- 205-02: Consumers
- 206-02: Non-GMO for food and feed
- 207-04: Non-GMO for industrial markets

(Additional information on the add-ons is available on the ISCC website: www.iscc-system.org)

The Issuing Certification (Issc) is responsible for the accuracy of this document.
Version 7 (Date: 27.04.14.2015)

Page 2 of 3



With ISCC PLUS system users of all non-regulated markets meet their voluntary market requirements



- No deforestation
- No development in high carbon stock areas
- No development on peatlands
- Good agricultural practices
- Safe working conditions
- Respect the right of all affected communities / land rights
- Legal compliance





- **Safeguarding brand values** requires sustainable and deforestation-free supply chains for renewable feedstock
- The use of certification schemes contributes to **risk mitigation** in supply chains for bioplastics
- Sustainability certification of bio-based products is operational and already reality. Several **large scale players** already certified by ISCC
- **Traceability** along supply chains ensured. **Mass balance** and **segregation** possible
- GHG emissions can be forwarded along the supply chain to derive at a **carbon footprint** of the final product if required
- ISCC offers solutions for bio-polymer producers and processor, aiming to proof compliance with sustainability requirements in all relevant markets
- ISCC is a **multi-stakeholder organization**. The ISCC association is open to new members. Become member of the ISCC family!



Many thanks for your attention!

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