ISCC Solutions for a Sustainable Bio-based and Circular Economy

Dr Jan Henke, ISCC System GmbH
Regional Stakeholder Dialogue Latin America, Antigua, January 21, 2020
Solutions to tackle plastic waste are urgently needed

Almost 350 million tons of plastic were produced in 2017

More than 90% of plastic is not recycled

Each year 9 million tons of plastic waste end up in the ocean

More than a third of plastic is used for packaging

Packaging waste accounts for half of the plastic waste

Roughly 5 grams of plastic every week find their way into the human organism

Sources: Geyer (2017); Jambeck et al. (2015); National Geographic (2018), Eco-Business (2019)
Regulators and Governments commit to taking measures for a drastic reduction of plastic waste

Many global brand owners communicate their efforts to contribute to the bio-based and circular economy.

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

"We recently unveiled a new target to reduce 35% of virgin plastics content across our beverage brands by 2025, driven by increased use of recycled content and alternative packaging materials."

P&G: “2030 goal: Ensure 90% of product packaging is recyclable."

"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."

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

"Evian pledged to make all of its plastic bottles from only recycled plastic by 2025."

ISCC contributes to the development of the bio- and circular economy

ISCC’s objectives:

- **Supporting companies** to achieve their **sustainability targets** and to implement the **SDGs**
- **Verification of the implementation** of social and ecological sustainability criteria
- Monitoring of **deforestation-free supply chains**
- Contributing to the implementation of a **circular and bio-based economy**
- **Protection** of high **biodiverse** and high **carbon** stock land
- Calculating and reducing **GHG emissions**
- Establishing **traceability** in global supply chains
- Allowing for **credible** and **justified claims** and logo use
ISCC provides solutions for credible certification for a sustainable bioeconomy and circular economy.
The market demand for ISCC PLUS certification is growing rapidly

Number of ISCC PLUS Certificates

- 2016: 105
- 2017: 153
- 2018: 198
- Today: > 340

New ISCC Website for bio- and circular economy

www.iscc-system.org/about/circular-economy/

ISCC supports the transition to a circular and bio-based economy
ISCC certification provides full traceability along the supply chain.

- Farms/Plantations/Points of Origin
- FGP/Collecting Points
- Processing Unit
- Trader/Storage
- Market
ISCC allows physical segregation in the supply chain if this is requested by customers

- **Physical segregation** of sustainable certified and non-certified material
- Deliveries **physically contain** 100% certified material
- **Possible claim**: 100% based on certified sustainable sources
Mass balance approach is mainly applied, e.g. to support the bio- and circular economy

- Sustainable, unsustainable or fossil material mixed, segregated in bookkeeping
- No entity sells more certified products than sourced (conversion factors applied)
- Possible claim: e.g. “linked to 100% recycled sources/ biogenic sources”
## ISCC mass balancing options

<table>
<thead>
<tr>
<th>Option</th>
<th>Approach</th>
<th>Principle</th>
<th>EMA- White paper</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mass Determination</td>
<td>Attribution Approach</td>
<td>Free attribution to one or several outputs</td>
</tr>
<tr>
<td>2</td>
<td>Energetic Determination</td>
<td>Molecular Approach</td>
<td>Determination based on chemical reaction</td>
</tr>
<tr>
<td>3</td>
<td>Trace-the-Atom</td>
<td>Measurement</td>
<td>Measurement of sustainable share</td>
</tr>
<tr>
<td>4</td>
<td>$^{12}$C/$^{14}$C Analysis</td>
<td>Measurement</td>
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ISCC sets crucial guard rails for credible and transparent attribution of the determined sustainable share

<table>
<thead>
<tr>
<th>Input A</th>
<th>Input B</th>
<th>Input C</th>
<th>Output D</th>
<th>Output E</th>
<th>Output F</th>
</tr>
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<tbody>
<tr>
<td>Site specific</td>
<td>Operational data</td>
<td>Process feasibility</td>
<td>Physical output</td>
<td>Transparency</td>
<td></td>
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<tr>
<td>Mass balancing must be site-specific</td>
<td>Determination of the conversion factor based on operational data</td>
<td>Chemically/technically possible, that the input molecular/atoms are included in the attributed output</td>
<td>Attributed sustainable output can not be higher than the physical output in a mass balance period</td>
<td>Information on the used option for MB (attribution) and on multi-site credit transfer provided via SD</td>
<td></td>
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Different logos and claims, depending on the chain of custody option applied

<table>
<thead>
<tr>
<th>Physical Segregation</th>
<th>Bio-based economy</th>
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| ISCC                 | www.iscc-system.org
| CERTIFIED            | sustainable material |

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<tr>
<th>Circular Economy</th>
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<tbody>
<tr>
<td>ISCC</td>
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<tr>
<td>MIX supporting</td>
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<tr>
<td>certified sustainable material</td>
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|                  |
| ISCC             |
| www.iscc-system.org |
| MIX supporting   |
| certified recycled material |
ISCC PLUS Training
Bio-based and Circular Economy

17 – 18 March 2020 in Cologne, Germany

- Comprehensive two day training on ISCC PLUS certification and requirements
- Insights into the practical certification of the circular and bio-based economy
- Certification of complex supply chains in the chemical and downstream industries
- Physical segregation and mass balancing under ISCC PLUS
- Logos and claims for attributed products
- Auditing requirements
SABIC announced in 2019 the introduction of ISCC certified circular polymers in Davos.

SABIC, a global leader in the chemical industry, has announced another major milestone in its groundbreaking 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, known as TACOL, has been produced by UK-based PLASTIC ENERGY Ltd at their plant in Spain 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 Kuipers, 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.

Companies increasingly communicate their ISCC PLUS certified products for industrial applications

- NatureWorks Announces 100 Percent Third-Party Certified Sustainable Feedstock by 2020
- ISCC certified PLA
- ISCC certified medical devices
- ISCC certified beverage cartons
- ISCC certified PE

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Examples of press releases: DSM introduced ISCC certified bio-based and recycled alternatives for its engineering plastics portfolio.

As an immediate step, today, DSM Engineering Plastics is launching bio-based grades of its Arnitel® and Stanyl® product portfolio manufactured via a mass-balancing approach of bio-based feedstock. The Stanyl bio-based grades are already available with the globally recognized sustainability certification ISCC Plus.

Examples of press releases: Eastman introduced its carbon renewal technology supporting ISCC certified production

Eastman in the circular economy

Eastman’s recycled materials will be certified by International Sustainability & Carbon Certification (ISCC), an independent agency for tracking sustainable content in a variety of industries. Costa said Eastman will work across the value chain – with Eastman customers, potential feedstock suppliers, product manufacturers, brands, and non-governmental organizations such as the Ellen MacArthur Foundation (EMF) and others – to implement this large-scale circular solution for recycling waste plastics. Eastman became a member of EMF’s Circular Economy 100 Network earlier this year.

“The problem of waste plastics is not one that can be solved by a single company, but Eastman is taking definitive action to do our part,” Costa said. “Beginning commercial production of carbon renewal technology is a proof point of our determination to act quickly and decisively to accelerate the circular economy. Bringing this project to fruition so quickly – just eight months after we announced our intention to be a leader in chemical recycling – required innovation by some of the world’s brightest minds and effort by thousands of members of the Eastman team.”

Examples of press releases: Jindal Films announced its ISCC PLUS certification

Jindal Films has identified different sources of ISCC PLUS certified polypropylene, made of various vegetal renewable sources like sunflower, soybean, rapeseed, tall oils and other vegetal oils via a mass balance approach. These are ethically sourced and used to produce naphtha, which is itself converted into propylene, before being polymerized into polypropylene and introduced into Jindal Films’ production process. As a result, without any compromise in the final film properties or its food contact approvals, Jindal Films is proud to announce a film range made out of these ISCC PLUS certified sustainable sources, through the mass balance concept used along the supply chain according to ISCC requirements.

More and more companies rely on the credibility of the ISCC certification system for the bio-based and circular economy.

Independent ISCC certification guarantees:

- Sustainability
- Segregation or mass balance
- Traceability
- Feedstock identity
- Conversion factors/ volumes
- Add-ons (e.g. GHG/ LCA)
- Logos and claims
Many thanks for your attention!

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