ISCC Solutions for a Sustainable Bio-based and Circular Economy

Dr Jan Henke, ISCC System GmbH
Regional Stakeholder Committee North America, Las Vegas, November 19, 2019
Solutions to tackle plastic waste are urgently needed

- Almost 350 million tons of plastic were produced in 2017.
- More than a third of plastic is used for packaging.
- Packaging waste accounts for half of the plastic waste.
- More than 90% of plastic is not recycled.
- Each year 9 million tons of plastic waste end up in the ocean.
- 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” has pledged to make all of its plastic bottles from only recycled plastic by 2025.

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

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

“P&G” has committed to ensure 90% of product packaging is recyclable.

“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.”

“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.”

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

Selection

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 diverse 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
Both bio-based and recycled feedstocks can be covered under ISCC
In 2018*, over 70 million tonnes of raw material were ISCC certified – among those are many potential biopolymer feedstocks.

<table>
<thead>
<tr>
<th>Certified potential biopolymer feedstock (t)</th>
<th>~ 7,000,000</th>
<th>~ 225,000**</th>
<th>~ 1,800,000</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>~ 3,150,000</td>
<td>~ 750,000</td>
<td>~ 225,000</td>
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<tr>
<td></td>
<td>~ 1,500,000</td>
<td>~ 65,000</td>
<td>~ 45,000</td>
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* Preliminary amounts

** Forestry processing residues, waste wood, roadside grass cuttings
The number of ISCC PLUS certificates increases steadily

Note: Numbers as of 11 November 2019
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>Mass allocation</td>
</tr>
<tr>
<td>2</td>
<td>Energetic Determination</td>
<td>Free attribution to one or several outputs</td>
<td>LHV</td>
</tr>
<tr>
<td>3</td>
<td>Trace-the-Atom</td>
<td>Molecular Approach</td>
<td>Carbon counting</td>
</tr>
<tr>
<td>4</td>
<td>$^{12}$C/$^{14}$C Analysis</td>
<td>Determination based on chemical reaction</td>
<td>Measurement of sustainable share</td>
</tr>
</tbody>
</table>
ISCC sets crucial guard rails for credible and transparent attribution of the determined sustainable share

Mass balancing must be site-specific

Determination of the conversion factor based on operational data

Chemically/technically possible, that the input molecular/atoms are included in the attributed output

Attributed sustainable output can not be higher than the physical output in a mass balance period

Information on the used option for MB (attribution) and on multi-site MB must be provided via SD
Different **logos and claims**, depending on the chain of custody option applied

<table>
<thead>
<tr>
<th>Physical Segregation</th>
<th>Bio-based economy</th>
<th>Circular Economy</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ISCC</strong></td>
<td>CERTIFIED</td>
<td>sustainable material</td>
</tr>
<tr>
<td><a href="http://www.iscc-system.org">www.iscc-system.org</a></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ISCC</strong></td>
<td>CERTIFIED</td>
<td>recycled material</td>
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<th>Mass Balance</th>
<th>Bio-based economy</th>
<th>Circular Economy</th>
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<tr>
<td><strong>ISCC</strong></td>
<td>MIX supporting</td>
<td>certified sustainable material</td>
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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
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
Companies increasingly communicate their sustainability efforts related to an ISCC certification to external stakeholders.
NatureWorks announced that 100% of their feedstock for biopolymers and performance chemicals will be ISCC PLUS certified by 2020.
Braskem is producing green PE processed from sugar cane. The company is ISCC PLUS certified since 2012.
Examples of on-product label for final products: Hammarplast uses the ISCC logo on its medical devices.
Elopak uses ISCC PLUS certified PE aiming to reduce the use of fossil-based materials and to minimise CO$_2$ emissions.
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.

SABIC announced the introduction of ISCC certified circular and bio-based polymers, produced on a mass balance approach.

Using SABIC’s certified circular polymers to create some of the world’s first food and personal care packaging made entirely from recycled mixed plastic waste, SABIC presents Unilever’s wholly recycled Magnum® ice cream tubs. These are made from SABIC’s newly

SABIC’s certified renewable polymers are high-quality virgin polymers, based on second-generation, animal-free, bio-based feedstock such as waste from wood pulping process. Like SABIC’s certified circular polymers, its certified renewable polymers have been accredited through the International Sustainability and Carbon Certification (ISCC PLUS). SABIC’s renewable polyethylene (PE) and

Braskem is producing green PE processed from sugar cane. The company is ISCC PLUS certified since 2012
NatureWorks announced that 100% of their feedstock for biopolymers and performance chemicals will be ISCC PLUS certified by 2020.
Examples for off-product communication: DOW and UPM partner to commercialise wood-based UPM BioVerno renewable naphtha

Example for off-product claim for sustainable packaging solutions on System User’s website and CSR report

“...That drives the replacement of conventional plastics from fossil fuels plastics 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
Example for off-product communication: Sustainability report and print material

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.

ISCC Certification

ISCC stands for International Sustainability & Carbon Certification and is a global certification system used in over 100 countries, with over 3000 system users and more than 15,500 certificates issued.

The certification is verification that our products are sourced and produced sustainably and is a way of securing that the Green House Gas (GHG) emission calculations are done correctly with proof of every input used. Perstorp is the first chemical company to gain the ISCC certification for its pro-environment polyols. Best of all each certificate highlights the CO2 savings you contributed to through each of your purchases, and show that our products live up to the requirements for a more livable future.

Source: Perstorp website and brochure

Note: Based on requirements from former logo document
ISCC certified biochemicals (partly bio-based polyols) – Video explaining mass balance on company website

Note: Based on requirements from former logo document


Clip on www.perstorp.com explaining the co-processing approach
Many thanks for your attention!

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