ISCC Solutions for a Sustainable Circular Economy and Bioeconomy

ISCC System GmbH
Climate change and environmental concerns pose the number one risk for companies’ growth!

2019 Global CEO Outlook (KPMG)
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.
- More than 90% of plastic is not recycled.
- Packaging waste accounts for half of the plastic waste.
- 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, governments and consumers demand measures for a drastic reduction of plastic waste

At the same time, global brand owners communicate their efforts to contribute to the circular economy and bioeconomy.

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

"2030 goal: 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."

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

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

Different types of plastic form the basis for many everyday items

Different plastics, such as PC, PA, PMMA, PUR, ABS, ASA, SAN and other thermoplastics

- Suitcases, CDs & DVDs, clothing, ropes, parachutes, tooth brushes, toys, electronic article covers
- Food packaging, polystyrene packaging, insulation material
- Food packaging, DVD cases, Interior trims, bumpers, child seats
- Plastic bottles, cleaning containers, pipes for gas and drinking water, houseware
- Boots, shower curtains, window frames, pipes, flooring, electric cables, synthetic leather
- Plastic bags, cling film, refuse sacks, tubes, milk carton coatings

Source: Umweltbundesamt (2019)
Diverse materials respectively allow for different reuse and recycling options

Source: Own depiction referring to waste hierarchy according to Article 4 Waste Framework Directive

1. **Mechanical Recycling**
   - Sorting, grinding, melting, reforming

2. **Chemical Recycling**
   - Breaking polymer bonds e.g. via pyrolysis processes
Many companies rely on the credibility of the ISCC certification system

ISCC certification stands for:

- Sustainability
- Segregation or mass balance
- Clear attribution rules
- Traceability
- Feedstock identity
- Conversion factors/ volumes
- Logos and claims
- Add-ons like LCA
ISCC PLUS requirements are in line with important initiatives

- Feedstock identity
- Defined system boundaries
- Clear allocation rules
- Credible claims
- Transparent documentation
- Third-party verification


Plastics Europe Industry View Paper (2020)

ISCC PLUS offers solutions for the **circular** economy and **bio**economy.
Over 4,000 ISCC certificates in more than 100 countries are currently valid – 50% in the waste and residues sector

All Feedstocks, including:
- Camelina
- Canola / Rapeseed
- Cereal
- Corn
- Cotton
- Palm
- Shea
- Soy
- Sugarbeet
- Sugarcane
- Sunflower
- Waste & Residues
- Wood
- Mixed Plastic Waste

All Markets:
- Food
- Feed
- Energy
- Industrial applications
The number of ISCC PLUS certificates increases steadily

Valid ISCC PLUS certificates

Note: Numbers as of 29 April 2020
ISCC certifies all kinds of agricultural and forestry feedstocks for industrial applications

Soy

Canola

Palm

Sunflower

Cereals

Corn

Sugarcane

Sugarbeet

Wood

Cotton

Shea Nuts

Camelina
In addition, ISCC is the leading system for the certification of waste and residue-based supply chains

<table>
<thead>
<tr>
<th>Waste and processing residues</th>
<th>Renewable non-bio feedstocks</th>
<th>Forestry / agricultural crop residue</th>
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<tbody>
<tr>
<td>UCO</td>
<td>Power-to-Gas</td>
<td>Forestry residue</td>
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<tr>
<td>Landfill gas</td>
<td>Power-to-Liquid</td>
<td></td>
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<tr>
<td>Tall oil</td>
<td></td>
<td>Husks</td>
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<tr>
<td>End-of-life tires</td>
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<td>Straw</td>
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<tr>
<td>Municipal solid waste / mixed plastic waste</td>
<td></td>
<td></td>
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<tr>
<td>Crude glycerine</td>
<td></td>
<td></td>
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<tr>
<td>CO2</td>
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Examples:
ISCC promotes physical segregation in the supply chain if this is requested by customers

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

- 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>Mass Determination</th>
<th>Energetic Determination</th>
<th>Trace-the-Atom</th>
<th>$^{12}$C/$^{14}$C Analysis</th>
</tr>
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<tr>
<th>Approach</th>
<th>Principle</th>
<th>EMA- White paper</th>
</tr>
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<tbody>
<tr>
<td>Attribution Approach</td>
<td>Free attribution to one or several outputs</td>
<td>Mass allocation</td>
</tr>
<tr>
<td>Molecular Approach</td>
<td>Determination based on chemical reaction</td>
<td>LHV</td>
</tr>
<tr>
<td>Measurement</td>
<td>Measurement of sustainable share</td>
<td>Carbon counting</td>
</tr>
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</table>
ISCC PLUS has been updated to cover the bio and circular economy

- System Document, v. 3.2
- Material List
- Self-declarations
- Sustainability Declaration
- Procedures
- Logo and Claims guidelines
- New Website
Different logos and claims, depending on the chain of custody option can be applied

**Physical Segregation**

- **Bioeconomy**
  - ISCC
  - www.iscc-system.org
  - CERTIFIED sustainable material

- **Circular Economy**
  - ISCC
  - www.iscc-system.org
  - CERTIFIED recycled material

**Mass Balance**

- **Bioeconomy**
  - ISCC
  - www.iscc-system.org
  - MIX supporting certified sustainable material

- **Circular Economy**
  - ISCC
  - www.iscc-system.org
  - MIX supporting certified recycled material
Borealis produces ISCC PLUS certified polypropylene (mass balance basis) from Neste’s renewable attributed feedstock

Borealis producing certified renewable polypropylene from Neste’s renewable propane at own facilities in Belgium

Published in Releases and news under Circular economy, Sustainability • Henkel, Renewable, Borealis, polypropylene

Neste Corporation, Press Release, 10 March, 2020 at 1:15 p.m. (EET)

Caption: Borealis has started to produce polypropylene (PP) based on Neste-produced renewable feedstock in its production facilities in Kallo and Beringen, Belgium. Aerial view of the Borealis site in Kallo, Belgium. Photos: © Borealis

Borealis has started to produce polypropylene (PP) based on Neste-produced renewable feedstock in its production facilities in Kallo and Beringen, Belgium. This marks the first time that Borealis has replaced fossil fuel-based feedstock in its large-scale commercial production of PP. The Belgian plants were recently awarded by the International Sustainability and Carbon Certification (ISCC) organization with ISCC Plus certification for its renewable PP. Taking its commitment to the next level for advancing the circular economy, Borealis once again furthers its EverMinds™ ambitions. This path breaking venture in sustainable production is being driven in close collaboration with upstream and downstream value chain partners such as Neste and Henkel. It also aligns with the Borealis’ aim to ensure that 100% of its consumer products are recyclable, reusable, or produced from renewable sources by 2025.
Aptar has created the world's first circular beauty packaging that is certified to the ISCC PLUS standard (on a mass balance basis)

The Villingen site received the ISCC PLUS certification, which guarantees the traceability of the raw material used for packaging injection. It certifies that the material has been used in compliance with ISCC PLUS standards, which ensures a reduction of virgin material use.

incineration or landfill, into virgin plastic, which has been audited and approved by the ISCC according to a mass balance approach.
Vynova has launched a new range of bio-attributed PVC using renewable ethylene referring to second-generation biomass

CERTIFIED MASS BALANCE APPROACH

We partnered with sustainability consultancy group Neo Carbon Solutions and selected the ISCC PLUS framework to certify our bio-attributed PVC grades according to a mass balance approach.

ISCC is a globally applicable sustainability certification system that covers all sustainable feedstocks, including agricultural and forestry biomass, circular materials and renewables. The ISCC certification scheme requires strict traceability with a chain of custody based on a mass balance attribution and is verified by independent third-party auditors.
SABIC announced in 2019 the introduction of ISCC certified circular polymers in Davos

NatureWorks certified its Ingeo PLA-based polymers which are used in many products for daily use.
Example 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.
ISCC certified System Users increasingly communicate their efforts to external stakeholders via CSR reports, press releases and websites.
8 good reasons why you should choose ISCC

# 1 We are recognized by global initiatives and brand owners
# 2 We perform outstandingly well in benchmarks
# 3 We provide solutions for individual customer demands
# 4 We do not accept compensation for deforestation
# 5 We cover bio-based and recycled feedstocks
# 6 We use innovative tools for credible and efficient audits
# 7 We “never stop looking and watching” in the ISCC Integrity Programme
# 8 We are a living multi stakeholder initiative
# 1 ISCC is recognised by important voluntary initiatives of brand owners and associations for industrial applications

<table>
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<tr>
<th>Initiative</th>
<th>Recognition Details</th>
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<tr>
<td>Der Blaue Engel</td>
<td>ISCC has been accepted by the German ecolabel „Der Blaue Engel“ for bioplastic granulate for writing utensils and stamps.</td>
</tr>
<tr>
<td>Textile Exchange’s “2025 Sustainable Cotton Challenge”</td>
<td>ISCC is recognised as a sustainable initiative encouraging brands to commit to source 100% of their cotton from the most sustainable sources.</td>
</tr>
<tr>
<td>INRO</td>
<td>ISCC is recognised by the German initiative for sustainable supply of raw materials for the industrial use of biomass.</td>
</tr>
<tr>
<td>Green Deal</td>
<td>ISCC is recognised by the Dutch Green Deal “green certificates” for sustainable biomass in chemicals and plastics.</td>
</tr>
</tbody>
</table>
# 2 We perform outstandingly well in benchmarks

The International Trade Centre (ITC), a joint agency of the United Nations (UN) and the World Trade Organization, has developed the Sustainability Map, an online platform to enable any interested party to explore and compare voluntary sustainability standards.

Source: ITC Sustainability Map (as of June 2018)
# 3 Our system can be adopted to specific customer requirements by using voluntary ISCC add-ons

- Environmental Management and Biodiversity
- Classified Chemicals
- Consumables
- SAI Gold
- GHG Emissions
- Non GMO Food Feed
- Non GMO Technical Markets
- Electricity and Heat from Biogas Plants
# 4 We do not accept compensation for deforestation

With ISCC deforestation and the conversion of biodiverse grasslands after the cut off date January 2008 is not allowed!

ISCC Principle 1 does not allow compensation for deforestation.
# 5 ISCC provides certification solutions for a credible sustainable bio economy and circular economy
# 6 We develop and use innovative tools such as GRAS, a remote sensing tool to support identification of deforestation.

With GRAS (www.gras-system.org) we can analyze deforestation and grassland conversion and ensure a more credible, effective and less costly certification!
# 7 We „watch the watchmen“ – ISCC Integrity Program

We monitor with our own independent auditors the compliance of our certification bodies and system users based on random and risk-based selection.

This ensures consistent, objective and reliable audits and preserves the high credibility and quality of our system.
We are a living multi-stakeholder initiative organised in an association with 144 members.
ISCC puts major emphasis on a regular and regional stakeholder dialogue
ISCC supports the UN Sustainable Development Goals and Paris COP21

ISCC PRINCIPLE 1 & 2: Protection of land with high biodiversity value or high carbon stock. Production in an environmentally responsible way including the protection of soil, water and air:
- SDG7 Affordable and clean energy
- SDG13 Climate Action
- SDG14 Life below water
- SDG15 Life on land

ISCC PRINCIPLE 3: Safe working conditions:
- SDG3 Good health and well-being
- SDG6 Clean water and sanitation

ISCC PRINCIPLE 4: Human rights, labour rights and land rights:
- SDG1 No poverty
- SDG2 Zero hunger
- SDG4 Quality Education
- SDG5 Gender equality

Governments agreed:
- A long-term goal of keeping the increase in global average temperature to well below 2°C above pre-industrial levels
- To aim to limit the increase to 1.5°C, since this would significantly reduce risks and the impacts of climate change
- On the need for global emissions to peak as soon as possible, recognising that this will take longer for developing countries
- To undertake rapid reductions thereafter in accordance with the best available science
- GHG requirements are already implemented in ISCC. Detailed methodology for international supply chains in place
Join us in our journey today and be part of the change!

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