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 and Governments commit to taking measures for a drastic reduction of plastic waste

- California proposes phaseout of single-use plastics by 2030
- European parliament votes to ban single-use plastics
- China's recycling ban has sent America's plastic to Malaysia. Now they don't want it -- so what next?
- Canada to ban single-use plastics as early as 2021

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

**Selection**

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

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

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

- **PEPSICO**: “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**: “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**: “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

Polyester fibres, food packaging & bottles, foil

Plastic bottles, cleaning containers, pipes for gas and drinking water, houseware

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

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

2. **Chemical Recycling**
   - Breaking polymer bonds e.g. via pyrolysis processes

Source: Own depiction referring to waste hierarchy according to Article 4 Waste Framework Directive
Sustainability certification enables brands to make correct and credible claims

- As companies strive for more sustainability, **B2B and B2C communication are becoming increasingly relevant**
- **Eligibility** of particular claims depends on the exact wording (e.g. “based on”, “featuring”, etc.) and **how this wording can be understood by stakeholders**
- Wrong claims can lead to **legal implications** and **reputational damage**
- Under ISCC, system users have to apply an **independent 3rd party verification** for their certification
- External auditors confirm **compliance of sustainability requirements** on which communication measures depend
- Additionally, ISCC conducts an **internal review, provides guidance** and supports system users at regular events
ISCC is a global sustainability certification system

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 economy and bioeconomy
- 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 certification solutions for a sustainable circular economy and bioeconomy
Over 4,000 ISCC certificates in more than 100 countries are currently valid – 50% in the waste and residues sector
The number of ISCC PLUS certificates increases steadily

Valid ISCC Certificates

<table>
<thead>
<tr>
<th>Year</th>
<th>Number</th>
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</thead>
<tbody>
<tr>
<td>01/2018</td>
<td>150</td>
</tr>
<tr>
<td>07/2018</td>
<td>171</td>
</tr>
<tr>
<td>01/2019</td>
<td>193</td>
</tr>
<tr>
<td>07/2019</td>
<td>266</td>
</tr>
<tr>
<td>02/2020</td>
<td>366</td>
</tr>
</tbody>
</table>

Note: Numbers as of 10 February 2020
ISCC certifies all kinds of agricultural and forestry feedstocks for industrial applications

Examples

- 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.

### Waste and processing residues
- UCO
- Landfill gas
- Tall oil
- End-of-life tires
- Municipal solid waste / mixed plastic waste

### Renewable non-bio feedstocks
- Power-to-Gas
- Power-to-Liquid
- Crude glycerine
- CO2

### Forestry / agricultural crop residue
- Forestry residue
- Husks
- Straw
ISCC is a comprehensive standard with a balanced set of ecological and social criteria for the certification of agricultural raw materials.

**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

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ISCC supports companies to measure and reduce their carbon footprint by providing comprehensive GHG methodologies and tools.
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”
<table>
<thead>
<tr>
<th>Option</th>
<th>Option</th>
<th>Approach</th>
<th>Principle</th>
<th>EMA- White paper</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mass Determination</td>
<td>Attribution Approach</td>
<td>Free attribution to one or several outputs</td>
<td>Mass allocation</td>
</tr>
<tr>
<td>1</td>
<td>Energetic Determination</td>
<td>Molecular Approach</td>
<td>Determination based on chemical reaction</td>
<td>LHV</td>
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<tr>
<td>2</td>
<td>Trace-the-Atom</td>
<td>Measurement</td>
<td>Measurement of sustainable share</td>
<td>Carbon counting</td>
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<tr>
<td>3</td>
<td>$^{12}$C/$^{14}$C Analysis</td>
<td>Measurement</td>
<td></td>
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<td>4</td>
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### Two ISCC chain of custody options for the circular economy and bioeconomy

<table>
<thead>
<tr>
<th>Physical Segregation</th>
<th>Bioeconomy</th>
<th>Circular Economy</th>
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<tbody>
<tr>
<td>§ Certified sustainable bio-based and unsustainable material <strong>physically segregated</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>§ Certified sustainable bio-based and unsustainable material is <strong>physically mixed</strong> but separated in bookkeeping</td>
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<table>
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Different **logos and claims**, depending on the chain of custody option can be applied.

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<th>Circular Economy</th>
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<tbody>
<tr>
<td></td>
<td>ISCC</td>
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<td><a href="http://www.iscc-system.org">www.iscc-system.org</a></td>
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<tr>
<td></td>
<td>CERTIFIED</td>
<td>CERTIFIED</td>
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<tr>
<td></td>
<td>sustainable material</td>
<td>recycled material</td>
</tr>
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<tr>
<td></td>
<td>MIX supporting</td>
<td>MIX supporting</td>
</tr>
<tr>
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<td>certified sustainable material</td>
<td>certified recycled material</td>
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</tbody>
</table>
More and more companies rely on the credibility of the ISCC certification system for the circular economy and bioeconomy.

Independent ISCC certification guarantees:

- Sustainability
- Segregation or mass balance
- Traceability
- Feedstock identity
- Conversion factors/volumes
- Add-ons (e.g. GHG/LCA)
- Logos and claims
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 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 Green production site in The Netherlands. The patented pyrolysis oil, known as TACOIL, 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 Kulipers, 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 utilizing plastic waste.
NatureWorks certified its Ingeo PLA-based polymers which are used in many products for daily use.
Elopak uses ISCC PLUS certified PE aiming to reduce the use of fossil-based materials and to minimise CO\textsubscript{2} emissions
Example of on-product label for final products: Hammarplast uses the ISCC logo on its medical devices.
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>
<thead>
<tr>
<th>Initiative</th>
<th>Recognition Details</th>
</tr>
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<tbody>
<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 We cover bio-based and recycled feedstocks
# 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!
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.
# 8 We are a living multi-stakeholder initiative organised in an association with 133 members
ISCC puts major emphasis on a regular and regional stakeholder dialogue

Regional Stakeholder Committee North America
Since 2012

Regional Stakeholder Committee Latin America
Since 2010

Technical Committee on Solid Biomass
Since 2011

Regional Stakeholder Committee Europe
Since 2010

Global Events
Since 2011

Regional Stakeholder Committee Southeast Asia
Since 2013

NEW in 2020:
Technical Committee “Circular Economy and Bioeconomy”
Date: 04 June 2020
Place: Cologne

Technical Committee “Waste, Residues and Advanced Low Carbon Fuels”
Since 2018
ISCC PLUS Training
Circular Economy and Bioeconomy

17 – 18 March 2020 in Cologne, Germany

Content:
- Comprehensive information about the ISCC PLUS certification system
- ISCC audit requirements and ISCC application along the supply chain
- Chain of custody options, mass balancing, yield calculations and attribution approaches
- Overview on logos and claims

Target Group:
- Auditors
- Companies (especially from the chemical and packaging industry)
- Brand owners and retailers
- Other interested parties
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
We take responsibility to protect our environment and the climate!
What about you?
Join us in our journey today and be part of the change!