ISCC for Low Carbon Fuels – Update and Outlook for Road Transport and Aviation

Dr. Norbert Schmitz, ISCC System GmbH
ISCC is one of the leading certification schemes applied on a global scale. More than 18,000 certificates have been issued since 2010.
ISCC is a multi-stakeholder initiative organized in an association with more than 100 members. New members are welcome.
Biofuel mandates around the world – verification of low carbon fuels values and sustainability in supply chains increasingly required

- Clean Fuel Act: CI requirements for liquid, gaseous and solid fuels
  - E5, B2
- Longer term plans similar to LCFS*
  - Developments of CI-based clean fuel programs in Western US states (e.g. Washington)
  - RFS2 no timelines beyond 2022
  - Minnesota at B5 winter, rising to B20 from 1 May 2019
- E5, E8
- B5, E7.8
- E10, B2.5 (nominal)
- E5, B5 (voluntary)
- B10, E12

- 14% renewable energy in transport by 2030 (RED II)
- Ethanol blending: 2022: 30%
  - 2030: 40%
- Ethanol: 2-3%

- 11 provinces blending E10
- Rest to follow by 2020
- 12% ethanol
- Aiming to hit B20, 30% by 2020
- E2, rising to E5 by 2020%
- Aiming to hit B10
- Between E2 and E10 since 2015, but not enforced


Source: adopted, based on PRIMA
ISCC is widely recognized for biofuels and bioliquids certification around the world

**European Union:** Recognition by the EC for all European since 2011

**Germany:** Recognition since 2010

**Poland:** Recognition by the ARR in 2016

**Queensland (Australia):** Recognition as certification standard for biofuels since 2017

**Indonesia:** ISCC in close cooperation with national authorities

**Malaysia:** ISCC in close cooperation with national authorities

**Colombia:** ISCC considered to be used to determine GHG emissions and reductions of biofuels

**California (USA):** ISCC in discussions with ARB regarding use of vol. schemes

**Japan:** Recognition as certification standard for biofuels since 2018

**ICAO:** ISCC active in the development of Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA)

**CDP (Carbon Disclosure Project):** Recognition as certification standard for palm and soy to measure, disclose and reduce deforestation in supply chains
To reach low carbon goals, key drivers of carbon intensity (CI) need to be verified throughout the supply chain – Example ethanol

CI driver: type of feedstock
- Sugar cane ethanol: 75%
- Waste-based ethanol: 85%
- Corn ethanol: 40%

CI driver: process
- Corn ethanol with biomass as process energy: 60%
- Corn ethanol with biomass and CCR: 90%

CI driver: land use change
- Ethanol with LUC prohibited under ISCC: -10%
- Ethanol with sustainable LUC (degraded land to sugar cane): 85%
ISCC has comprehensive methodologies and tools to facilitate reliable GHG calculations of low carbon fuels.

<table>
<thead>
<tr>
<th>Occurrence of waste</th>
<th>Processing</th>
<th>Final processing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emissions for waste / residue material is considered to be 0</td>
<td>Processing $e_p$</td>
<td>Processing $e_p$</td>
</tr>
<tr>
<td>Collecting Point: Upstream transport $e_{td}$</td>
<td>Upstream transport $e_{td}$</td>
<td>Upstream &amp; downstream transport &amp; distribution $e_{td}$</td>
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<tr>
<td></td>
<td>Excess electricity $e_{ee}$</td>
<td>Excess electricity $e_{ee}$</td>
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<tr>
<td></td>
<td>CCR $e_{ccr}$</td>
<td>CCR $e_{ccr}$</td>
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<td></td>
<td>CCS $e_{ccs}$</td>
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ISCC is well established in certifying waste/residues, renewable materials and all kinds of other bio-based feedstocks

<table>
<thead>
<tr>
<th>Waste and processing residues</th>
<th>Renewable non-bio feedstocks</th>
<th>Forestry / agricultural feedstocks</th>
<th>Forestry / agricultural crop residues</th>
</tr>
</thead>
<tbody>
<tr>
<td>UCO</td>
<td>Power-to-Gas</td>
<td>Palm</td>
<td>Forestry residue</td>
</tr>
<tr>
<td>Tall oil</td>
<td>Power-to-Liquid</td>
<td>Canola</td>
<td>Husks</td>
</tr>
<tr>
<td>Crude glycerine</td>
<td>CO2</td>
<td>Wood</td>
<td>Straw</td>
</tr>
</tbody>
</table>
Top 10 of waste and residue materials covered currently under ISCC

Input materials as indicated on valid ISCC certificates*

- UCO (of veg. & animal origin) 21%
- Animal fat (uncategorized, cat 1-3) 7%
- (Free) Fatty Acids 4%
- Palm oil mill effluent (POME) 2%
- Food waste 1%
- Crude Glycerin 1%
- Brown grease / grease trap fat 1%
- Spent bleaching earth 1%
- PFAD 1%
- Grape marc 1%

* Numbers as of 05 April 2018. Each certificate may be issued for more than one raw material.
ISCC certifies innovative processes such as different Waste-to-X and Power-to-X concepts

**Municipal solid wastes**
- Biomass fraction
  - Fuel production
    - Valuable products: Biofuels, Chemicals

**Landfill gas**
- Valuable products: Conversion plant
  - CH₄

**Tires**
- Pyrolysis/Polymer degradation
  - Valuable products: Coke, Oil, Metal, Syngas

**Power to X**
- Electricity
  - Electrolysis
    - H₂
  - Supplier
    - CO₂
  - Conversion plant
    - Valuable product: Fuels, Chemicals

- Water

Valuable products:
- Fuels
- Chemicals
- Heating
- Electricity
- Fuels
- Chemicals
- Heating
- Electricity
- Tires
- Municipal solid wastes
- Landfill gas
- Pyrolysis/Polymer degradation
- Power to X
Example I
ISCC certified CRI is producing non-bio advanced fuels and chemicals using CO₂ as a feedstock

- Certified since 2013
- ISCC Association member since 2013
- GHG calculation for renewable fuel under ISCC
Example II

ISCC certified Enerkem is producing innovative 2G biofuels out of Municipal Solid Waste (MSW)
Example III

ISCC certified BioMCN is processing biomethane into biomethanol and uses CO₂ to produce additional volumes.

RIG grants subsidy for CO₂ injection project BioMCN
April 11, 2017

- Subsidy granted by the province of Groningen
- Injection of green CO₂ from waste-based biogas production into the methanol reactor at BioMCN
- “This investment fits well with our strategy for “greening” the chemical industry”, noted Deputy Patrick Brouns
Example IV
ISCC certified companies producing Biofuels out of Palm Oil Mill Effluent (POME)
Example V
ISCC certified Raizen produces bioethanol from bagasse
ISCC verifies compliance of new agricultural production systems with regulatory requirements

Different options exist for low iLUC risk agricultural feedstocks:

- Alternative land use systems (e.g. silvopasture, agroforestry)
- Use of degraded land
- Double cropping in traditional crop rotation system
This is what ISCC stakeholders are saying about ISCC

In global commodity markets standards and certification schemes like ISCC are of critical importance to generate the sustainability and integrity of markets.

Sascha Mueller-Kraenner, Deutsche Umwelthilfe, Germany

With ISCC we have set ourselves apart as an example to our community, as the leaders in environmental and human rights protection.

Cristóbal Roda Vaca, Aguaí, Bolivia

ISCC is a multi-feedstock standard. This is a clear advantage compared to other certification schemes. You can easily use the scheme for various commodities and serve several markets. This makes ISCC highly efficient.

Albrecht Baetge, ADM, Germany

ISCC has become the industry standard for certifying supply chain traceability and sustainability of biofuels that we supply in the UK market.

Patrick Lynch, Greenergy, United Kingdom
Verifying sustainability requirements of low carbon fuels with ISCC

- Biofuel mandates around the globe increasingly require **verification of sustainable supply chains** and CI numbers

- **Increase in advanced biofuels** expected for the forthcoming years; already several companies using respective feedstock are ISCC certified

- **New feedstocks** and **new technologies** require **secure verification** of sustainability parameters

- ISCC offers **solutions for the certification of low carbon fuels**

- ISCC Board approved establishment of TC on “Waste, Residues and Advanced Low Carbon Fuels”

- TC to be chaired by **two Co-chairs** (Asia; America, Europe). Election of **Deputies** recommended

- **Regular** meetings of the TC

- **Working groups** may be established as requires
Starting point of the work of the TC is the agreement on a mission statement

- The Technical Committee’s **objective** is to support the development and deployment of low carbon fuels

- In order to reach this objective, ISCC provides and further develops a **reliable and practical sustainability certification standard** for low carbon feedstocks and fuels

- To do this successfully, ISCC needs to **tackle challenges** regarding regulative requirements, GHG emission calculation methodologies, traceability issues, and transparency

- It is especially relevant to find **solutions** to integrate **innovative feedstock** and **technologies** and to integrate scattered and fragmented supply chains

- Two **working groups** in the afternoon:
  - Waste and Residue Supply Chains
  - Non-Biogenic Feedstock and Fossil Carbon Recycling
Starting point of the work of the TC is the agreement on a mission statement

- Proposed working groups:
  - Waste and Residue Supply Chains
  - Non-Biogenic Feedstock and Fossil Carbon Recycling
  - GHG accounting (cross-cutting function)

- Next TC Meeting: Shanghai during July/August 2019
- ISCC and elected Co-Chairs will fix the meeting date soon and communicate it
- ISCC and Co-Chairs will discuss topics and procedures and establish working groups
- Presentation by the TC at the ISCC Global Sustainability Conference in Brussels on February 13 in Brussels
ISCC is very grateful for the support of the sponsors of this event
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