ISCC Impact Report 2022

International Sustainability and Carbon Certification

Members in the ISCC Association

Members in the ISCC association as of June 2022

Abbreviations

APS	Audit Procedure System
BLE	Bundesanstalt für Landwirtschaft und Ernährung (Federal Agency for Agriculture and Food)
BMEL	Bundesministerium für Ernährung und Landwirtschaft (Federal Ministry of Food and Agriculture)
CCUS	Carbon Capture, Utilisation and Storage
CORSIA	Carbon Offsetting and Reduction Scheme for International Aviation
EC	European Commission
EU	European Union
esca	Emission savings from soil carbon accumulation
EVI	Enhanced Vegetation Index
FNR	Fachagentur für Nachwachsende Rohstoffe (Agency for Renewable Resources)
FSS	Food Security Standard
GHG	Greenhouse Gas
GRAS	Global Risk Assessment Services
HRDD	Human Rights Due Dilligence
ICAO	International Civil Aviation Organization
ILO	International Labour Organization
ISCC	International Sustainability and Carbon Certification
ISEAL	International Social and Environmental Accreditation and Labelling Alliance
ISH	Independent Smallholder
ILUC	Indirect Land Use Change
NGO	Non-Governmental Organisation
NDPE	No Deforestation, No Peat and No Exploitation
POME	Palm Oil Mill Effluent
PPP	Plant Protection Product
PtX	Power-to-X
RED II	Renewable Energy Directive II
RCF	Recycled Carbon Fuels
RFNBO	Renewable Fuels of Non-Biological Origin
RTFO	Renewable Transport Fuel Obligation
SAF	Sustainable Aviation Fuels
SOC	Soil Organic Carbon
WWF	World Wide Fund for Nature
ZEF	Zentrum für Entwicklungsforschung (Center for Development Research)

Summary

Foreword

This is the second ISCC Impact Report, covering the years 2019 to 2021. The last two years have been challenging and forced many people to adapt to new realities. Yet in any crisis, there is an opportunity to grow - the pandemic has shown that fast collective action, creative entrepreneurship, and innovation-driven change is possible in the face of emergency. This makes me optimistic that a green recovery and a more sustainable future is within reach.

As an example, the European Green Deal and the Fit for 55 Package set a solid foundation for many diverse and ambitious climate-friendly initiatives to be translated into domestic law. These aim to steer the greenhouse gas (GHG) emissions of the European Union (EU) to net zero by 2050. The EU's initiatives also include, among others, a Circular Economy Action Plan and Single-Use Plastics Directive, as well as the Farm to Fork Strategy on sustainable food production. National initiatives such as the German Supply Chain Act, which was approved recently, also create incentives for more sustainable business practices. We see similar developments in other European countries such as mandatory human rights due diligence (HRDD) in France, Belgium and Switzerland. The EU taxonomy complements this by introducing specific informational requirements that provide important incentives for financial markets and sustainable business investment activities. Similar developments can be seen globally, for example, in Asian and American markets. At ISCC, we continue to support companies in complying with today's and tomorrow's mandatory sustainability requirements, but also in their voluntary contributions towards a more sustainable world.

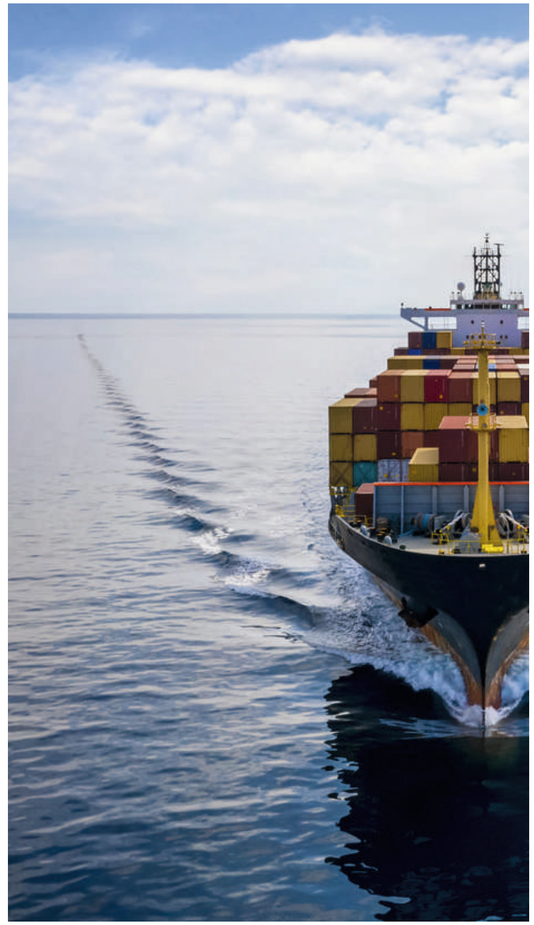
In the last two years we have not only witnessed many interesting trends in the industry, but also evolved as ISCC. Some of the notable achievements were:

- More than 5,000 ISCC certificates have been issued in 2021, with a tremendous increase of ISCC PLUS certificates in the chemical industry, as well as in the food and feed sector. To support ISCC certified supply chains, ISCC has updated the ISCC PLUS system document, launched a new licensing scheme for brand owners and created a new set of on-product logos for ISCC certified end products in 2021.

- During the re-recognition process of ISCC certified bioenergy under the RED II, we have updated the ISCC EU system documents and included not only additional requirements, but also stronger criteria to strengthen our system. We were happy to include feedback from stakeholders and took numerous external sources into account during the revision process.

- The ISCC CORSIA certification system has been approved by the International Civil Aviation Organization (ICAO) for the certification of CORSIA eligible sustainable aviation fuels (SAF). The first training courses have already been conducted and ten ISCC CORSIA certificates have been issued in the first year. ISCC is planning to establish a similar system in the maritime sector as soon as an appropriate regulatory framework is in place. ›

»The last two years have been challenging and forced many people to adapt to new realities.«



Foreword

Increasing public awareness of the climate crisis has led to a significant rise in green technologies and more environmentally friendly products. The demand for certified sustainable products rises in the process as well. When it comes to building trust in innovative approaches and credible communications, third-party certification is a proven tool to verify compliance with sustainability and traceability requirements. ISCC creates innovative solutions for new products and technologies that can become certified such as recycled carbon fuels (RCF) or renewable fuels of non-biological origin (RFNBO) that use non-biomass feedstocks like fossil fuel waste streams, green hydrogen, and CO_2 from carbon capture, utilisation and storage (CCUS). Not only have we started certifying new feedstocks such as mixed plastic waste, but also developed a certification approach for renewable electricity.

Despite the restrictions imposed by the COVID-19 pandemic, ISCC has expanded and intensified the communication with stakeholders. In 2020 and 2021, 15 virtual stakeholder committee meetings were held with over 2,000 participants. These meetings provide valuable input for the improvement of the ISCC processes and for the further development of sustainability certification.

As we had already started digitalising our processes before the COVID-19 outbreak, we were able to ensure the certification process through our automatic procedure system (APS) for ISCC remote certification audits. The system also provides a data base that can reveal the impact of ISCC more accurately than we were able in our last Impact Report of 2018.

We invite you to take part in our sustainability journey and to share our efforts to continuously grow, seek new challenges and find new ways in making this world more sustainable. To those who have worked with us, we thank you for your trust in ISCC – your support keeps our mission alive!

»To those who have worked with us, we thank you for your trust in ISCC – your support keeps our mission alive!«

Gernot Klepper

Vision & Mission

01 _ Vision and Mission

The International Sustainability and Carbon Certification (ISCC) is an independent multi-stakeholder initiative and leading certification system that contributes to climate and environmental protection, decarbonisation and traceability along supply chains. ISCC certification covers biogenic wastes and residues, recycled carbon-based materials, forestry and agricultural biomass and non-biological renewable materials. ISCC supports the UN Sustainable Development Goals (Chapter 1.2) and improves its approach based on the theory of change (Chapter 1.3). The latter is managed through our monitoring and evaluation system (Chapter 1.4).

ISCC's vision is a carbon-neutral world and a true circular economy in which we stop producing waste in the first place and instead, create circular products and regenerate nature. Sustainable agriculture that increases biodiversity and creates healthy ecosystems is part of this vision as well as a resilient economic system which ends the consumption of finite resources.

ISCC's mission is to promote the transition to a circular economy and sustainable bioeconomy, support companies in reducing GHG emissions and increase transparency and traceability along supply chains. This includes the protection of forests, high-carbon stock lands and biodiversity. Since sustainable supply chains are crucial to fight the most severe impacts of the climate crisis, the identification and reduction of GHG emissions will become increasingly important in the future.

ISCC offers different certification schemes to address various market requirements. ISCC EU is recognised by the European Commission (EC) to demonstrate compliance with the legal requirements of the Renewable Energy Directive II (RED II) and by the United Kingdom under the renewable transport fuel obligation (RTFO). ISCC PLUS is a voluntary certification scheme for non-regulated markets and covers food, feed, plastics and chemicals on a global scale, as well as biofuels for non-European markets. ISCC PLUS is e.g. recognised by the Japanese government for the verification of sustainability requirements for the Japanese biofuels market. In addition to the ISCC EU and ISCC PLUS schemes, the ISCC CORSIA certification system was approved by the ICAO Council in November 2020. CORSIA eligible fuel producers and companies along the supply chain can now use this new scheme to demonstrate compliance with CORSIA sustainability, traceability and life cycle emission calculation requirements. In recent years, ISCC has developed an innovative certification approach for renewable fuels of non-biological origin (RFNBO) and recycled carbon fuels (RCF), new feedstock categories that have the potential to cut emissions substantially. ISCC has also introduced a certification concept for Power-to-X (PtX) projects that use renewable electricity from wind, solar or water and convert it into new materials.

More than
15,000
newsletter and social media subscribers

More than
5,000
certified companies

ISCC is governed by
200+
members

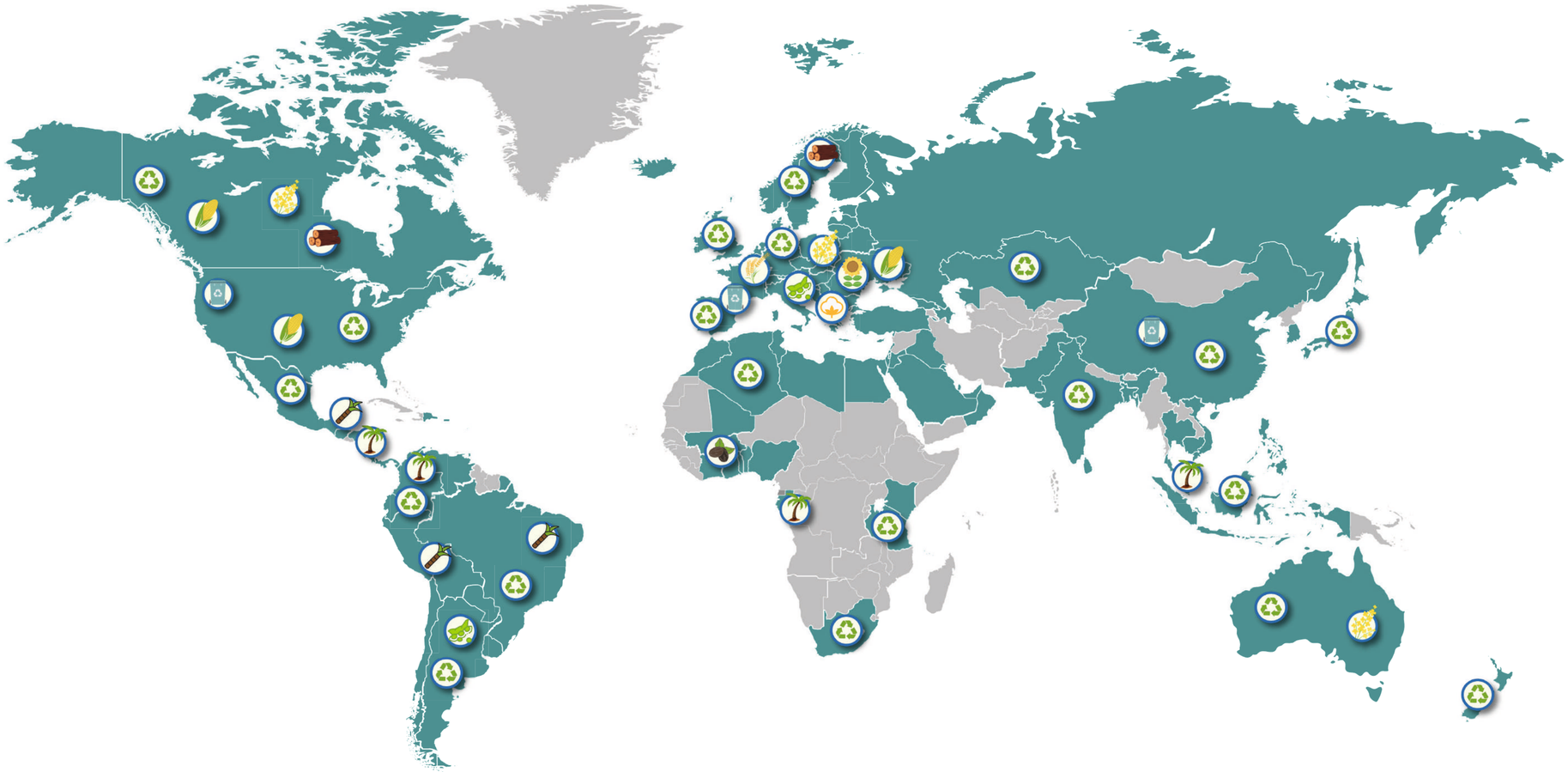
ISCC is being used in more than
100
countries

ISCC offers
6
different training courses

ISCC is engaged in stakeholder dialogues
4 Technical Committees and **4** Regional Committees

ISCC certified feedstocks (examples)

- Canola
- Corn
- Cotton
- Grains
- Palm
- Soy
- Shea
- Sugar cane
- Sunflower
- Waste
- Mixed plastic waste
- Forest biomass



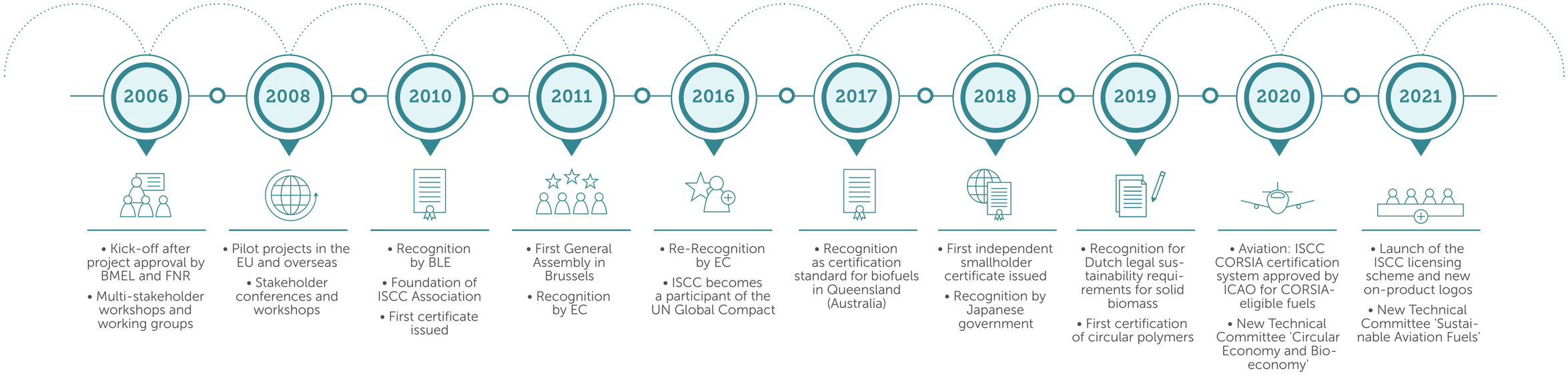
1.1 ISCC History

The ISCC story began in 2006 with a multi-stakeholder dialogue that brought together more than 250 stakeholders from around the world to share valuable insights on the certification needs of the biofuel industry. The German Federal Ministry of Food and Agriculture (BMEL) played an important role in this early phase and supported the establishment of the ISCC certification scheme through its Agency for Renewable Resources (FNR).

After an initial concept phase, ISCC carried out pilot projects covering different supply chains between 2008 and 2010. In 2010, the ISCC Association was founded in Berlin, the ISCC system was recognised by the Federal Agency for Agriculture and Food (BLE) and the first ISCC certificate was issued. By the end of the year, 162 certificates had been issued and the number has increased significantly every year since.

Over the coming years, ISCC quickly became the leading certification system for the EU renewable energy market regulated by the RED II (former RED). In 2012 already, ISCC responded to the growing demand for credible certification solutions in markets outside the energy sector by setting up its ISCC PLUS standard. By now, ISCC PLUS is broadly used in sectors such as packaging and chemicals, but also increasingly for food and feed.

Providing robust certification solutions across regions, commodities and markets has been at the heart of ISCC since its inception. This is reflected by ISCC's sustained engagement to provide and develop robust certification solutions, including all kinds of bio-based and recycled materials, sustainable fuels for the aviation (ISCC CORSIA) and maritime sector as well as the up and coming PtX applications.



1.2 Supporting the SDGs

The 2030 Agenda for Sustainable Development includes 17 SDGs that call for climate action, environmental conservation, an end to poverty, improved health and education, reduced inequality and economic growth. All UN Member States adopted these goals in 2015 to foster peace and prosperity for all people and the planet, today and in the future. Governments, civil society and especially the private sector must engage and act responsibly to build structures that lead to the achievement of these SDGs.

ISCC certification is based on the 6 ISCC Principles (p. 17), which must be met and are consistent with many of the SDGs. In addition, ISCC is a participant of the UN Global Compact and reaffirmed its support for the UN Global Compact principles on human rights, labour, environment and anti-corruption in 2022.

ISCC Principles	Sustainable Development Goals
Principle 1 Protection of land with high biodiversity value or high carbon stock	2 ZERO HUNGER; 6 CLEAN WATER AND SANITATION; 12 RESPONSIBLE CONSUMPTION AND PRODUCTION; 15 LIFE ON LAND
Principle 2 Environmentally responsible production to protect soil, water and air	2 ZERO HUNGER; 6 CLEAN WATER AND SANITATION; 7 AFFORDABLE AND CLEAN ENERGY
Principle 3 Safe working conditions	3 GOOD HEALTH AND WELL-BEING; 8 DECENT WORK AND ECONOMIC GROWTH
Principle 4 Compliance with human and labour rights and responsible community relations	1 NO POVERTY; 4 QUALITY EDUCATION; 5 GENDER EQUALITY; 6 CLEAN WATER AND SANITATION; 8 DECENT WORK AND ECONOMIC GROWTH; 10 REDUCED INEQUALITIES; 16 PEACE, JUSTICE AND STRONG INSTITUTIONS
Principle 5 Compliance with land rights, laws and international treaties	16 PEACE, JUSTICE AND STRONG INSTITUTIONS
Principle 6 Good management practices and continuous improvement	8 DECENT WORK AND ECONOMIC GROWTH; 9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

1.3 Theory of Change

A Theory of Change is the foundation of impact assessment approaches commonly used by sustainability certification schemes. The International Social and Environmental Accreditation and Labelling Alliance (ISEAL) first defined a Theory of Change concept for certification schemes as their mission to "[...] accelerate positive change by improving the impacts of ambitious sustainability systems and their partners". Theories of Change define and document what changes a standard system intends to achieve. They are based on reported and verified data that make it possible to assess the system's contribution to its proclaimed objectives.

ISCC commits to the ISEAL mission of strengthening sustainability standard systems for the benefit of people and the environment. Accordingly, the assessment and risk management process that ISCC uses considers best practice principles of the ISEAL code of good practice for assuring compliance with social and environmental standards.

ISCC's Theory of Change

VISION

A world without deforestation, an environmentally, socially and economically sustainable production of biomass and a true circular economy

IMPACT

Environmental Impact
Sustainable handling of bio-based and circular feedstocks as well as non-biological renewable and recycled carbon-based materials

Social Impact
Secure human, labour and traditional land rights

Economic Impact
Increased efficiency and transparency along supply chains

OUTCOMES

- Enhanced use of circular materials and products
- Increased GHG awareness and knowledge about reduction measures across industries
- Improved sustainable management of natural resources and ecosystems
- Improved working and living conditions for employees
- Increased transparency and traceability of sustainable material throughout the supply chain

OUTPUTS

- Credible and accepted certification standards for waste and residue-based supply chains
- Credible and accepted certification standards for sustainable practices on the ground
- Credible and accepted certification standards for GHG calculations throughout global supply chains
- Credible and accepted certification standards for human and labour rights
- Smallholder integration and capacity building
- Credible and accepted certification standards for traceable global supply chains
- Continous monitoring and improvement through multi-stakeholder dialogues
- Effective risk and quality management through an Integrity Programme

1.4 Monitoring and Evaluation System

ISCC developed its monitoring and evaluation system to generate information on the overall impact of the ISCC system. Goals that ISCC wants to achieve are formulated in the Theory of Change, which is why its continuous evaluation is necessary to keep track towards the ISCC vision and improve the quality of ISCC's impact measurement.

ISCC's impact assessment is based mainly on data from the internal data base, which include data from certificates, training sessions and stakeholder events as well as data from certification audits provided by APS (see infobox). Additional qualitative data was gathered through a survey that ISCC sent out to its cooperating certification bodies.

Non-conformities detected
6,000+

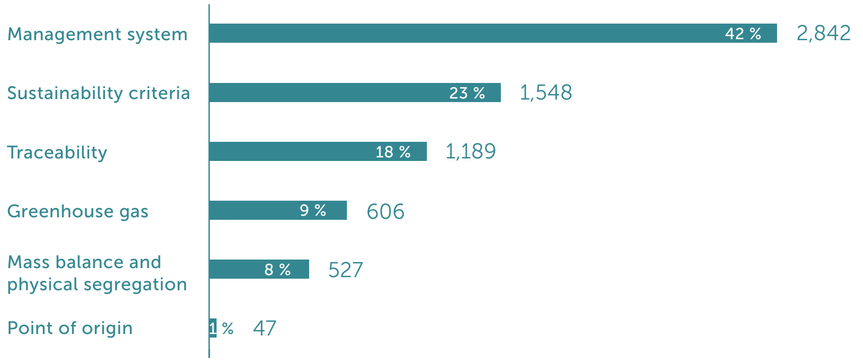
Certification audits without non-conformities
15,000+

Hectares of certified farming areas
12 M+

The audit procedure system (APS) is an audit software program developed by ISCC that facilitates ISCC audits and allows ISCC to easily collect and analyse audit data on a large scale. ISCC auditors confirm the benefits since APS leads to a clear reduction in time and error due to the intuitive interface and customised audit checklists. Since April 2021, the use of APS has been mandatory for all ISCC audits. This will further improve the data quality and lead to better results for future impact assessments.

The data on which ISCC's evaluation is based and for which ISCC presents the results in the following chapters consists of more than 16,000 ISCC certification audits conducted between 2020 and 2021. The evaluation particularly benefits from insights on non-conformities and the resulting corrective measures determined by the auditors. The analysed sample is representative regarding the distribution of audited scopes as well as the geographical distribution of audited entities.

Areas of non-conformities found in ISCC certification audits between 2020 and 2021



Impact of our Work

02 _ Impact of our Work

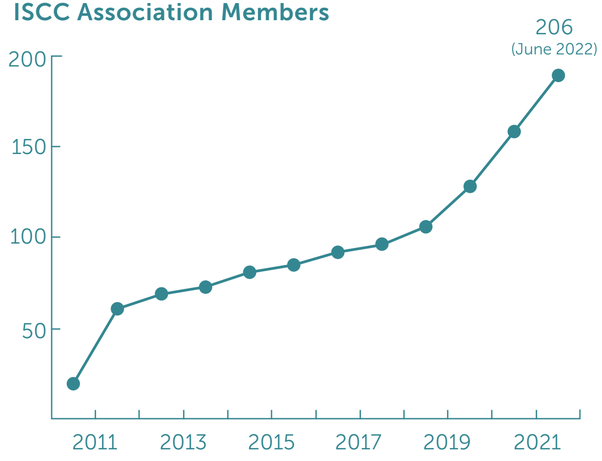
2.1 Governance and Transparency

ISCC has been developed through an open multi-stakeholder process and is governed by the ISCC Association. ISCC stakeholders can engage in different ways, either by becoming members of the ISCC Association, by participating in stakeholder committees and their working groups, through training sessions or by giving feedback through different channels such as the public consultation or the ISCC help desk.

The ISCC Association

The ISCC Association (ISCC e.V.) is the legally registered body governing the ISCC system. The General Assembly, comprised of all ISCC Association members, provides a forum for multilateral discussion of ISCC related issues and the development of strategies for the further development of ISCC. In addition, the General Assembly elects the members of the ISCC board, which consists of an equal number of representatives from each stakeholder group, ensuring a balanced representation of interests. The inclusion of public and civil society is an important pillar of the ISCC Association. Several non-governmental organisations (NGOs) have joined the ISCC Association over the years such as the American Lung Association, the Bodensee Stiftung (Lake Constance Foundation), the Welthungerhilfe (World Hunger Aid) and the WWF.

ISCC Association Members



Sharing knowledge at stakeholder events

Events and training courses have always been great opportunities for ISCC to share knowledge, connect with stakeholders and learn from one another. Due to the ongoing COVID-19 pandemic, ISCC has decided to host all training courses and events in a virtual format in 2021.

In 2018, ISCC founded the ISCC Technical Stakeholder Committee 'Waste, Residues and Advanced Low Carbon Fuels' to support the use of materials derived from wastes and residues. The committee and its technical working group have continuously worked on solutions to safeguard the integrity of the ISCC certification system. In 2020, ISCC introduced several measures for market operators in waste and residue-based supply chains, e.g. mandatory surveillance audits, a conflict resolution system and a mandatory waste and residues training course for ISCC auditors.

In the past two years, ISCC founded two more Stakeholder Committees – the ISCC Technical Committee 'Circular Economy and Bioeconomy' and the ISCC Technical Committee 'Sustainable Aviation Fuels'. The former has been introduced to discuss current market developments, to find a common understanding of mass balance systems and to establish a credible implementation of the ISCC PLUS certification system. The ISCC Technical Stakeholder Committee 'Sustainable Aviation Fuels' focuses on the commercial deployment of sustainable aviation fuels (SAF), the regulatory framework conditions and the further development of the ISCC CORSIA certification system. Moreover, ISCC established two working groups in 2021: one for the development of mass balance guidelines and one for logos and claims. ›

Stakeholder groups of the ISCC Board

Raw material producers and processors

Trade, logistics and users

NGOs, social affairs, science and research, public sector

In addition to daily exchanges with auditors, ISCC organises specific certification body meetings twice a year to receive feedback, discuss practical experiences and best practices, identify and reduce potential risks and facilitate improvements of the system. In 2021, ISCC cooperated with 40 certification bodies, most of them acting on a global scale to verify the ISCC standard's sustainability requirements. The number of participants in certification body meetings grew from 54 in 2020 to 94 in 2021 – the digital format is a main driver for this development.

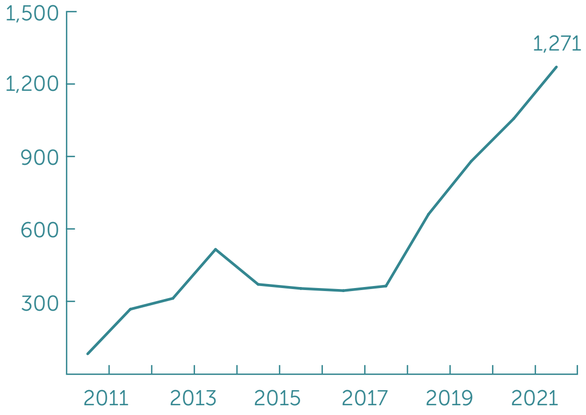
Participants in the ISCC Global Sustainability Conference 2021

400+

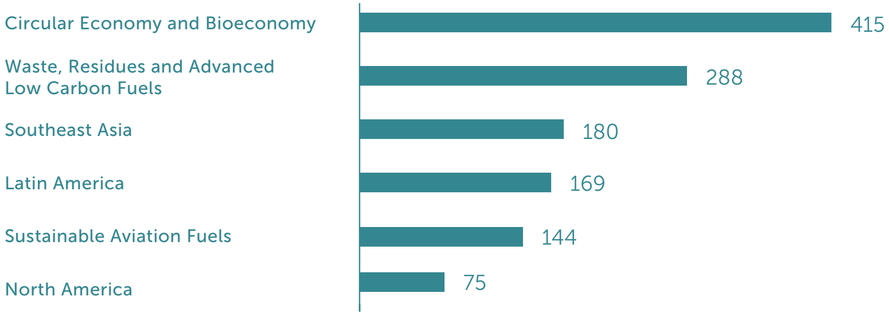
Partnerships

ISCC cooperates with several initiatives to expand its knowledge and drive progress on sustainable projects. ISCC is an associate member of SUSTAIN which uses integrated collaborative blockchain technology to ensure full traceability, NDPE (No Deforestation, No Peat and No Exploitation) policy compliance and smallholder inclusion. Additionally, ISCC is a member of the Forum for Sustainable Palm Oil (FONAP), a partner of the Tropical Forest Alliance, a member of Donau Soja and the German Initiative on Sustainable Cocoa. ISCC is also part of the EU-funded BIKE project which conducts research on low-ILUC[1]-risk feedstocks and focuses on mapping and assessing the rise in crop production on abandoned or degraded land. In the aviation sector, ISCC engages as a member of aireg, the aviation initiative for renewable energy in Germany. Aireg provides a platform for stakeholders in the aviation industry that are committed to increase the production and use of SAF. ISCC also intends to strengthen and expand multi-stakeholder projects with interested partners in the future, for instance, in finding digital solutions supporting sustainability certification, analysing landscape approaches and developing impact assessments that go beyond the current scope of evaluations.

Development of Participants in ISCC Technical and Regional Committees



Participants in ISCC Technical and Regional Committees in 2021



[1] *https://www.iscc-system.org/how-to-deal-with-indirect-land-use-change/*

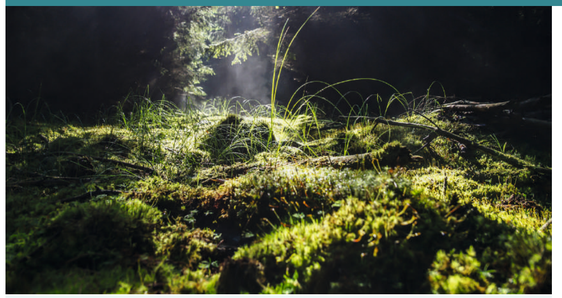
2.2 Sustainability Requirements

To put ISCC's commitment to the UN Global Compact into practice and continuously improve our contribution to the UN SDGs, ISCC supports companies to act more responsibly by setting sustainability standards for farms and plantations, wastes and residues as well as forest biomass. With specific guidance for audits and their preparation, ISCC facilitates the correct implementation of its sustainability requirements and allows sustainable production of various feedstocks across continents.

The ISCC sustainability requirements for farms and plantations are laid down in the form of six principles. ISCC Principle 1 covers the legal requirements of the RED II, whereas Principles 2 - 6 go beyond the legal requirements as they cover further environmental, social and economic requirements. Similar to the approach for sustainable agricultural raw materials, ISCC has developed a certification approach for forest biomass, which is also divided into six principles and currently in the process of being assessed for recognition by the EC.

The compliance of system users with these principles contributes to ISCC's vision of a world without deforestation and a sustainable agriculture which maintains and increases biodiversity and creates healthy ecosystems on earth.

The six ISCC Principles



Principle 1

Protection of land with high biodiversity value or high carbon Stock

Principle 2

Environmentally responsible production to protect soil, water and air

Principle 3

Safe working conditions

Principle 4

Compliance with human and labour rights and responsible community relations

Principle 5

Compliance with land rights, laws and international treaties

Principle 6

Good management practices and continuous improvement

2.2.1 Agricultural Raw Materials

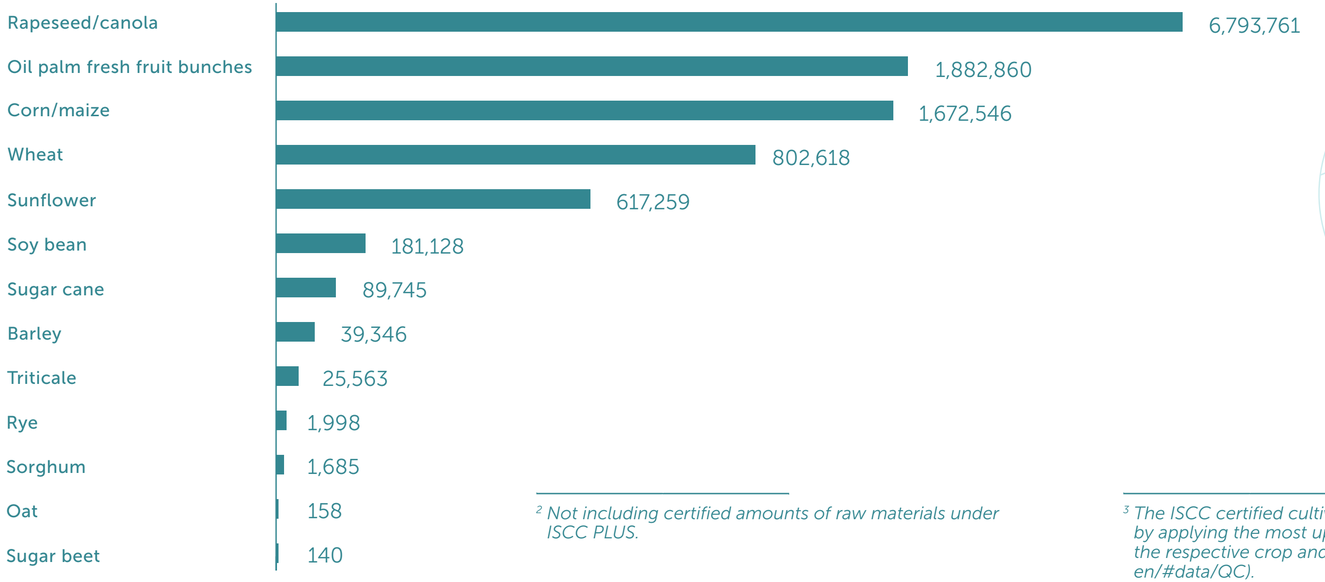
12,1 million hectares of agricultural land have been certified by ISCC in 2021[2,3] ⟶ that's equivalent to 16 million football fields

As can be seen in the graphic, ISCC's most certified crops are rapeseed/canola (6,79 M ha), oil palm fresh fruit bunches (1,88 M ha) and corn/maize (1,67 M ha). By far the highest amount of ISCC certified rapeseed/canola has been reported from Australia (3,64 M ha), followed by Ukraine (0,54 M ha) and Romania (0,49 M ha). High amounts for oil palm fresh fruit bunches were reported mainly from Indonesia (1,39 M ha), Malaysia (0,40 M ha) and Honduras (0,04 M ha). The largest amounts for corn/maize were reported from Hungary (0,54 M ha), Ukraine (0,49 M ha) and Romania (0,24 M ha). In comparison to the last ISCC Impact Report 2018, ISCC's total certified area increased by 44%.

Process description of the reporting data assessment

To meet its reporting obligation to the EC, ISCC collects the quantities from relevant companies that were certified under ISCC EU on a yearly basis. Companies that do not produce a final biofuel and companies only trading and/or storing sustainable material are not subject to the ISCC EU Reporting. For this purpose, ISCC sends out personalised mailings to all concerned system users. System users are obligated to submit the data within 30 calendar days after the first mailing has been sent out by ISCC. Once the reported quantities have been processed by ISCC, the system user receives a confirmation email confirming that it has fulfilled the reporting obligation. Therein, the type of product, type of raw material, its country of origin and the quantity of the respective materials are listed. This confirmation mail and the data submitted to ISCC shall be reviewed and verified by the independent auditor during the next certification audit. If system users do not comply with their reporting obligation because they do not provide the requested information in due time (or not at all) or if they submit incorrect information to ISCC, this will be marked as a non-conformity. ›

ISCC certified agricultural raw materials in 2021 (ha)



[2] Not including certified amounts of raw materials under ISCC PLUS.

[3] The ISCC certified cultivation area for crops was calculated by applying the most up-to-date yields published by FAO for the respective crop and country (http://www.fao.org/faostat/en/#data/QC).

ISCC Principle 1 and ISCC Principle 2 protect biodiverse and carbon-rich areas and require good agricultural practices. ISCC will further evaluate the impact that these principles have on farms and plantations. Based on the data evaluation results, it is possible to assess and quantify how environmental aspects have improved on the farms that have been certified. Non-conformities with the ISCC Principle 1 make a farm ineligible for ISCC certification.

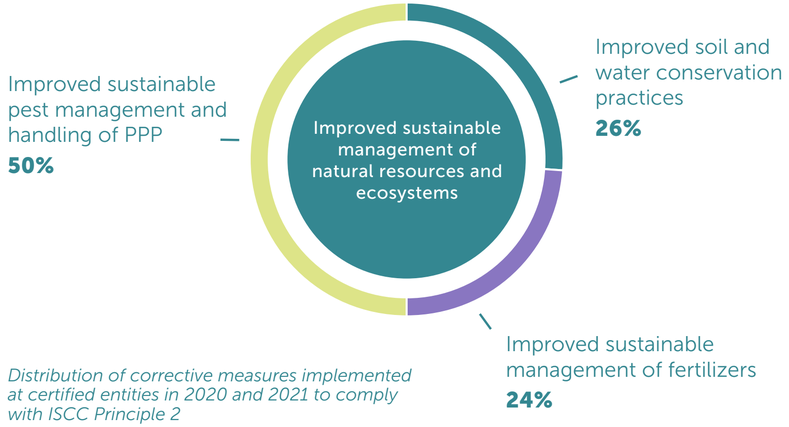
In contrast, non-conformities with the ISCC Principle 2 can be corrected. Hence, the ISCC certification has a direct positive influence on the environmental performance of the farms and plantations that did not meet the ISCC requirements for good agricultural practices before their ISCC certification. The majority of 2020 and 2021 corrective measures intended to improve the sustainable management of natural resources and ecosystems (see upper graphic) by e.g. more sustainable pest management and handling of plant protection products (PPP).

After the non-conformities were discovered, the farms and plantations implemented preventive measures that strengthen the crops' resilience against diseases and pests due to e.g. the reduction of the total amount of chemical PPP used, as well as measures to ensure the environmentally friendly application of PPP. This covers the installment of tank washing facilities to prevent groundwater contamination, the correct disposal of surplus application mixes and a correct calibration for application equipment. ISCC moreover promotes precautionary measures in its sustainability requirements for the protection of the environment and neighbouring communities. This includes not only examining weather conditions and appropriate distances before starting any ground-based spraying activities, but also keeping detailed record of activities and the maintenance of relevant PPP tools.

Further on-farm improvements in 2020 and 2021 refer to sustainable practices in fertiliser application and considered e.g. the right amount and type of fertilisers to support plant growth while simultaneously preventing and reducing potential negative effects on natural resources and biodiversity.

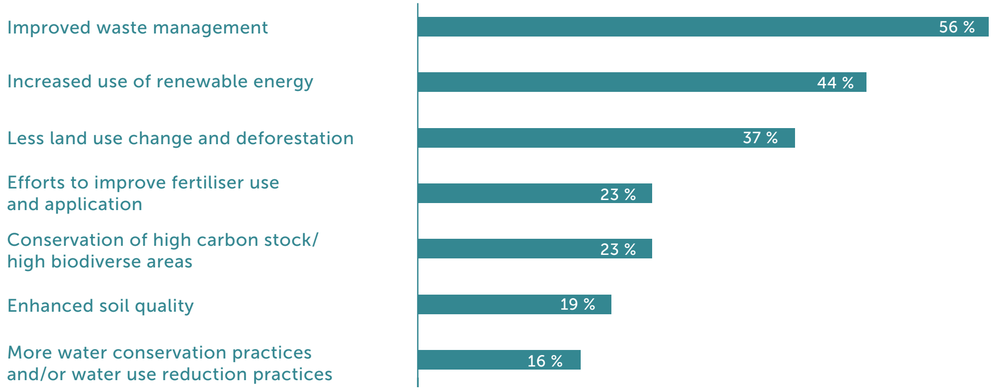
ISCC Principle 2 also requires a diverse set of soil and water conservation practices on farms and plantations, e.g. to control potential soil runoff caused by erosion, to conserve or drain soil water, and maintain and improve soil characteristics. Most of the corrective measures indicating improved soil and water conservation practices resulted in farms and plantations providing a soil organic matter balance, and investments in analyses showing that crops are grown on suitable soils. Such analysis required by ISCC must not only include the current soil status, but also the measured improvement of the soil conditions over time.

ISCC's auditors' survey (see graphic below) underlines the positive environmental impact due to an ISCC certification. 55% of auditors reported an improved waste management, while 44% noted an increased use of renewable energy at ISCC certified entities. Furthermore, about 35% of auditors answered that ISCC has contributed to reduce deforestation and land use change. Lastly, still more than 20% recognised an improvement in fertiliser application and the conservation of high carbon stock or high biodiverse areas at certified entities.



Distribution of corrective measures implemented at certified entities in 2020 and 2021 to comply with ISCC Principle 2

Environmental impact of ISCC certification in 2021 (according to auditors)



ADM is growing with ISCC PLUS certified consumer products

ADM has brought vegetable oils ranging from corn and canola to soybean and sunflower to market for nearly 120 years. They partner with growers to develop and enhance sustainable practices, and for many years the company sold to other businesses rather than directly to the consumer. However, a few years ago, they decided to launch their own food brand and chose ISCC PLUS to show customers that they care about sustainability. Their first brand product, bottles of edible rapeseed oil, carries the ISCC PLUS logo.

»It is surprising that the implementation of the assumptions of the ISCC programme actually does not generate costs, but economic benefits on my farm.«

Sławomir Rybak,
Farmer
at Agrosystem Gościejewo

As an international agricultural commodities processor, ADM engages with farmers worldwide, helping growers of oilseeds to improve agricultural practices and support carbon sequestration by following sustainability principles. Trained farm representatives, who are in close contact with the farmers providing ISCC certified rapeseed, offer guidance and support to improve agricultural operations on site. One example is ADM's work to establish a document archive, including all the documents needed to prove ISCC compliance. This not only promotes supply chain transparency, but also the traceability of raw materials. ISCC PLUS ensures full traceability along the supply chain, all the way to the production of the raw material. Implementing good management practices also increases yields for growers.

The positive impacts of ISCC PLUS certification extend further than improved farming practices, important though they are. ISCC Principles of 'no deforestation' protect valuable biodiversity that is vital to the planet's survival. These commitments align with ADM's pledges on responsible sourcing and reductions in greenhouse gas emissions, energy intensity, water intensity, and landfill use. Mr. Sławomir Rybak from Agrosystem Gościejewo, a farmer supplying ISCC certified crops to ADM, states that "It is surprising that the implementation of the assumptions of the ISCC programme actually does not generate costs, but economic benefits on my farm - use of conservation tillage reduces fuel consumption. I also save on purchase of working parts and use of tractors. In addition, the management of crop residues and sowing catch crops improves the soil structure and increases its fertility, which is a benefit for me and increases biodiversity and the amount of life in the soil, which has a positive effect on the local environment."

Independent certifications are becoming increasingly valuable to help meet the growing demand for sustainability across different supply chains. Ana Yaluff, ADM's Head of Sustainability EMEAI, says, "ISCC plays a critical role in working towards a more sustainable world by helping to implement fully traceable supply chains that are free of deforestation. Through the ISCC certification – a robust sustainability scheme with high standards to protect the environment, agricultural resources, and the communities involved – we can offer the market reliable and ethically sourced products that help our customers advance their own sustainability agenda and meet the consumer demand."

»ISCC plays a critical role in working towards a more sustainable world by helping to implement fully traceable supply chains that are free of deforestation.«

Ana Yaluff,
Head of Sustainability
at ADM

Barilla helps farmers to become more sustainable

Barilla has reached the third year of the La Carta del Mulino project at the heart of its commitment to sustainable agriculture. In 2021, the company could source 100% of its soft wheat from ISCC PLUS certified farms. Barilla has worked with ISCC since 2018, starting with the wheat for one specific biscuit in 2019 and some items of the bread range that are part of the Mulino Bianco brand. With the 2021 harvest, Barilla covered more than 100 products with the Mulino Bianco brand, such as further biscuit products, breads, cakes and snacks.

The ISCC PLUS certification covers the whole supply chain from wheat to the final food product. In 2021 it encompassed around 370,000 tonnes of wheat, making 244,000 tonnes of flour from 2,600 farms throughout Italy and other parts of Europe. In certification terms, this means more than 80 first gathering points, 14 mills and six Barilla production plants. The physical segregation ensures that the certified wheat and flour for Mulino Bianco products are kept completely separate from non-certified raw materials. One farmer, Paolo Pizzoccheri, working at the ISCC certified Mulino mill stresses that "By now the importance of guaranteeing sustainability in agricultural production is known to all. The adhesion of my farm to a supply chain such as that of Carta del Mulino which has among its rules that of complying with ISCC requests, represents an excellent opportunity in terms of visibility of my business and at the same time allows me to be able to access an interesting economic valorisation of my wheat".

The sustainability journey starts at the farm with specific measures to improve biodiversity and support wildlife habitats. Farmers follow a rotation plan that includes a minimum of three different crops over five years to enhance soil fertility. One legume or one oilseed is mandatory. At least three percent of the wheat's planting area is cultivated with wildflowers and left untreated with chemicals to favour pollinating insects. Through this approach, about 1,800 hectares could be returned to nature by 2021. WWF, one of the project's technical partners, has helped select the flowering species most suitable for promoting pollinating insects. The objectives are to ensure insects' food supply and revive wild species such as poppy, cornflower, clover and chamomile.

ISCC PLUS has allowed Barilla to help small farms change their working methods and focus more on managing natural resources and ecosystems. Certification has brought important indirect social impacts and spill-over effects too. According to the company, the voluntary ISCC PLUS certification standard also motivates young people who care about responsible production to stay working on the family farm. Additionally, Barilla pays a price premium on sustainable wheat to ensure a fair return on their suppliers' efforts. The price is calculated by adding an agreed sustainability value to the economic value of the product.

Barilla is proud to publicise its ISCC PLUS certification both on the website and on product packaging. The company is the largest soft wheat buyer in Italy, which brings responsibility and desire to contribute to the well-being of farmers and the cultivated land. ISCC PLUS certification is, therefore, a solid and measurable demonstration of their commitment to responsible agriculture.

»The adhesion of my farm to a supply chain such as that of Carta del Mulino which has among its rules that of complying with ISCC requests, represents an excellent opportunity in terms of visibility of my business and at the same time allows me to be able to access an interesting economic valorisation of my wheat.«

Paolo Pizzoccheri,
Farmer
at Barilla Mulino mill

2.2.2 Wastes and Residues

15 million tons of waste-based materials have been certified by ISCC in 2021[4,5] ⟶ that's equivalent to 1,5 million roll off garbage trucks used for commercial waste disposal

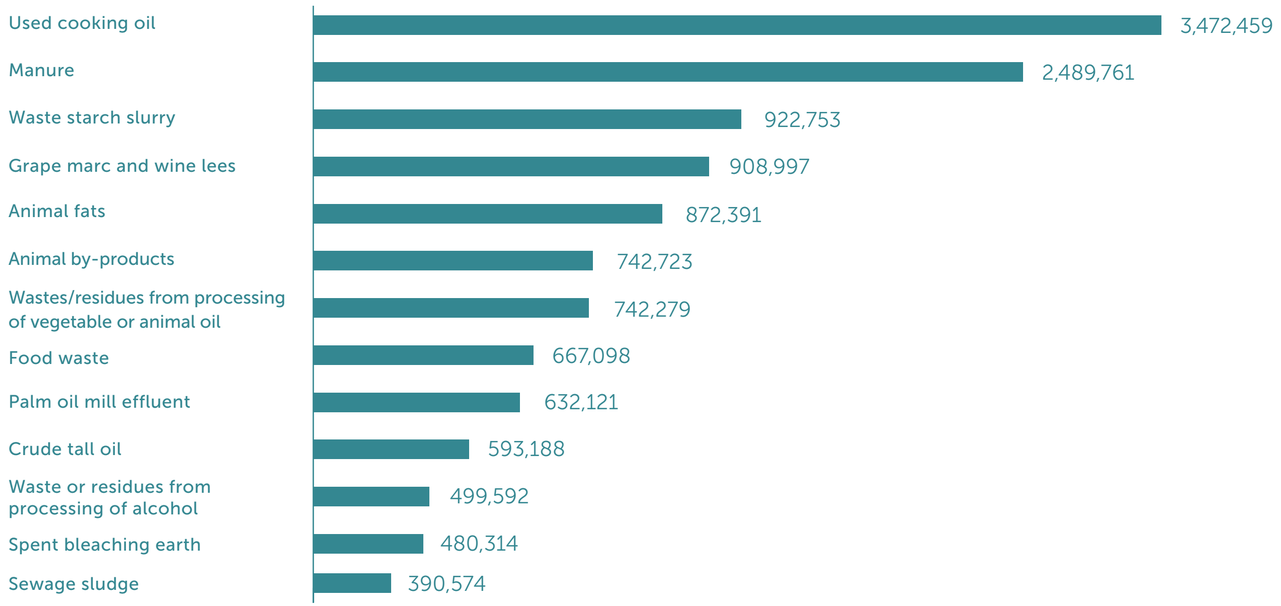
As can be seen in the graphic, ISCC's most certified wastes and residues are used cooking oil (3,47 M t), manure (2,49 M t) and waste starch slurry (0,92 M t). By far the highest amount of used cooking oil has been reported from China (1,17 M t), followed by UK (0,30 M t) and Malaysia (0,29 M t). High amounts of manure that have increased by nearly 50% since 2020, were mainly reported from Denmark (2,18 M t), Netherlands (0,30 M t) and Slovakia (0,01 M t). Waste starch slurry shows as well an increase of about eight percent with large amounts reported from certified units in Germany (0,54 M t), Poland (0,20 M t) and Lithuania (0,07 M t). In comparison to the last ISCC Impact Report 2018, ISCC's total reported amounts of wastes and residues have more than doubled (+109%).

Growing relevance of waste and residue-based supply chains

The concept of the circular economy - reduce, reuse, recycle - is gaining attention worldwide as many benefits it brings. The use of wastes and residues, for example, supports the transition to a renewable and more sustainable economy by enabling the replacement of finite resources such as mineral oils: it can reduce GHG and pollution and the need for landfills. In addition, its use can reduce the pressure on agricultural land, as waste and residues do not compete with food or feed crops. For this reason, many EU Member States offer incentives for the use of biofuels from wastes and residues under the RED II, which highlights the importance of wastes and residues and also the value of third-party certification.

In support of this concept, ISCC provides a certification standard for a wide range of wastes and residues such as used cooking oil, forestry residues or mixed plastic waste that can be converted into new materials. ›

Most ISCC certified wastes and residues in 2021 (t)



[4] *Not including certified amounts of raw materials under ISCC PLUS.*

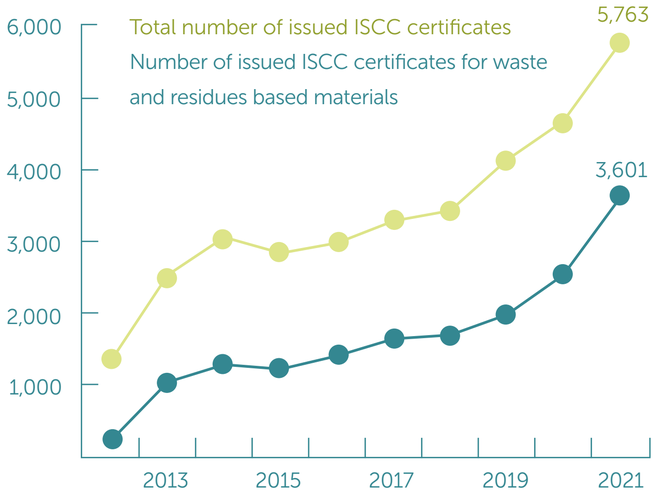
[5] *The certified quantities of both agricultural raw materials and wastes and residues must be approved by ISCC auditors by 2022 to be regarded as provisional as outlined in chapter 2.2.1. (p.20).*

Improved handling of wastes and residues

The ISCC chain of custody certification of wastes and residues begins at the point of origin, the place where the waste is originally produced. A point of origin can, for example, be a fast-food restaurant that uses cooking oil for deep-frying. The used cooking oil can in turn be used as a waste material for the production of biofuels or bio-based plastics.

The analysis of corrective measures at the point of origin shows that due to the ISCC certification, companies set up appropriate signs and instructions on public containers and improve the waste management on farms and plantations. For example, farms and plantations have adopted best practices by establishing a farm waste management plan and setting up waste reduction, reuse and recycling structures, avoiding the use of landfills or on-site burnings.

Number of issued ISCC certificates for waste and residues based materials



New circular feedstocks emerging

The number of ISCC PLUS certificates for industrial applications has grown tremendously since 2019, partly because ISCC has started to certify fossil-based circular materials such as mixed plastic waste or textile waste. The first ISCC certified circular material was pyrolysis oil based on recycled mixed plastic waste. Pyrolysis is a technology used to convert plastic waste into high quality oil which can be processed via steam cracking and polymerisation into virgin grade polymers, making the polymers applicable even for food-grade packaging.

ISCC certifies mechanically and chemically recycled materials. Mechanical recycling has its limitations due to high sorting requirements and decreasing material quality, but is very resource efficient and thus, the preferred choice when applicable. When mechanical recycling is not technically possible, chemical recycling is an innovative approach to get mixed or diluted materials back into the value chain to reduce the worldwide waste problem.

With the ISCC PLUS chain of custody certification, circular materials can be traced back throughout the supply chain, resulting in more credible and trustworthy claims on end products.

Increasing the impact of waste-based fuels

Dealing with waste from households and industry is a growing problem worldwide: it is difficult to recycle or reuse, even for countries that can afford the necessary sorting and treatment facilities. An increasing number of ISCC certified companies tackle the problem with innovative technology to collect and convert waste into sustainable transportation fuels. Enerkem and Münzer Bioindustrie are two organisations that have their own ingenious approaches.

Enerkem has invented an advanced thermochemical process that chemically recycles carbon molecules contained in waste into low-carbon fuels and circular chemicals. Since the beginning, as a small Canadian start-up founded in 2000, they have treated many types of waste, ranging from municipal solid waste to wood residues and used tyres. Enerkem, as project leader in partnership with CRB Innovations, was selected by an independent panel of international aviation experts as the winner of "The Sky's the Limit Challenge" competition organised by Natural Resources Canada.

Münzer Bioindustrie has produced biodiesel from waste oils and fats for over twenty years in Austria and has grown to become one of the largest private traders in Europe. They have been ISCC certified since 2010; now their challenge is to collect more used cooking oil from households that typically dispose of it down the sink. For this, they have designed new collection items, including funnels, flasks and bins, to streamline the journey from the kitchen to the collection vehicle. Infographics and pictures on the sides of the containers explain the amount of emitted CO_2 that is avoided when the waste cooking oil is transformed into biodiesel. The bins with their clear message have motivated people to deposit their used oil, with more collected in five months since than in the entirety of the previous year.

»ISCC's clear, rigorous approach allows us to demonstrate to customers that our waste-derived products meet the highest sustainability standards of our industry.«

Andrea Redford,
Chief Business Development Officer
at Enerkem

Both companies are having significant impacts on the decarbonisation of transport fuels, and they welcome the strict ISCC approach to traceability: "ISCC's clear, rigorous approach allows us to demonstrate to customers that our waste-derived products meet the highest sustainability standards of our industry," explains Andrea Redford, Chief Business Development Officer at Enerkem. Christian Dyczek, Sustainability Manager at Münzer Bioindustrie, puts it like this: "Following ISCC certification allows us to build trust with our stakeholders in sustainable and traceable waste collection."

The fuels follow ISCC rules for greenhouse gas emissions accounting and meet the minimum saving requirements given by the European Commission under the RED for the road transport sector. Enerkem transportation fuels have greenhouse gas savings ranging from 60% to 80% for fuel produced with their latest technology. Münzer Bioindustrie's biodiesel achieves savings of more than 88%. Both firms started as small companies with a vision to give a second life to waste as a transport fuel. And, like thousands of others, they have chosen ISCC to show that they are serious about putting the brakes on greenhouse gas emissions.

»Following ISCC certification allows us to build trust with our stakeholders in sustainable and traceable waste collection.«

Christian Dyczek,
Sustainability Manager
at Münzer Bioindustrie

New circular plastics join ISCC

There is increasing public awareness of the need to stop using fossil oil and gas to produce the chemicals and plastics we rely on – recognising that these useful substances need to become fully decoupled from the consumption of finite resources. In addition, more and more companies are now replacing fossil feedstock with recycled and renewable raw materials for their production. ISCC supports this transition to circular economy and bioeconomy models. Cyclyx, Orkla, Regenyx, Trinseo, Tupperware® and Vynova are companies active right across the value chain all active in stopping waste going to landfill, instead converting it into a valuable product.

ISCC PLUS certified **Cyclyx International** is a US-based post-use plastic feedstock management company founded by Agilyx and ExxonMobil. Cyclyx works with its consortium of industry members from various parts of the plastic supply chain to develop innovative recycling solutions for all types of post-use plastics. It does this by sourcing post-consumer plastic waste that would otherwise be destined for landfill. This material channels back into circular pathways through lab analysis, logistics optimisation and AI – ensuring that it meets individual member specifications along the way.

> »The advancements we have made at Regenyx, along with ISCC PLUS certification, are further concrete proof that we have created a circular recycling pathway for polystyrene recycling.«

Tim Stedman, CEO at Agilyx

Regenyx, a joint venture between Agilyx and AmSty, recently gained ISCC PLUS certification and takes Cyclyx sourced post-use plastics and uses a pyrolysis process to convert it to its original feedstock form, Recycled Styrene Monomer (RSM). The recycled material can be used to make new circular polystyrene. Regenyx has diverted a significant amount of polystyrene from ending up as waste in landfills. Regenyx transitioned its Tigard, Oregon facility to a Renewable Energy Credit (REC) program, offsetting its energy usage through the purchase of credits for 100% renewable wind energy. "We are proud of the work that has been done at the Regenyx facility to accelerate the available capacity of recycled content for producers," stated Tim Stedman, CEO of Agilyx. "The advancements we have made at Regenyx, along with ISCC PLUS certification, are further concrete proof that we have created a circular recycling pathway for polystyrene recycling."

Many companies rely on the mass balance approach to track recycled or renewable raw materials as they are converted into chemicals and plastics alongside conventional feedstocks. **Trinseo** received certification for four product families manufactured at three European sites; polystyrene produced in Tessenderlo, Belgium, polycarbonate produced in Stade, Germany, synthetic rubber produced in Schkopau, Germany and ethylbenzene styrene monomer produced in Terneuzen, the Netherlands. Intermediate products from Trinseo are used to produce packaging, consumer electronics, construction products, medical devices, home appliances and tyres. Francesca Reverberi, Vice President and Chief Sustainability Officer of Trinseo, says, "The mass balance certification is another step taken by Trinseo towards helping ›

»The mass balance certification is another step taken by Trinseo towards helping our customers bring more recycled products onto the market.«

Francesca Reverberi,
Vice President and
Chief Sustainability Officer
at Trinseo

our customers bring more recycled products onto the market. I am proud that Trinseo does not simply talk about being sustainable or environmentally friendly, but that it is taking a leadership role to drive sustainability in our industry".

Vynova, a PVC producer, achieved ISCC PLUS certification in early 2020 for its bio-attributed PVC that is manufactured using ethylene produced from second-generation biomass. In November of the same year, the company launched a circular-attributed PVC range produced using circular ethylene made from mixed plastic waste. Since then, multiple customers have become certified, with several others in the process. In addition, Vynova has recently started commercial shipments to customers. Rudy Miller, Vice President Vinyls Business at Vynova, explains. "By using bio or circular feedstock in the production of PVC, we are supporting our customers in achieving their sustainability goals and offering differentiated solutions to their customer base".

There has been a significant increase in the number of companies seeking ISCC certification along the entire supply chain. This includes the certification of converters, who receive plastic granulate from polymerisation plants and transform it into other forms to make products for our daily use, such as films, tubs, bags and more. ›

»By using bio or circular feedstock in the production of PVC, we are supporting our customers in achieving their sustainability goals and offering differentiated solutions to their customer base.«

Rudy Miller,
Vice President Vinyls Business
at Vynova Group

Tupperware® is one of those converters and has been certified under ISCC since 2019. The company started by bringing a circular, reusable straw and an on-the-go coffee cup onto the market as part of its ECO+ product line, which includes food-safe products derived from sustainable material sources. Tupperware then expanded its use of new circular materials for other on-the-go products, like Oysters and Sandwich Keepers. The reusable products are not only a sustainable alternative to single-use packaging but are also made of bio-circular and recycled materials. The quantities of mixed plastic waste used for circular polymer production are currently in the hundreds of tons, but Tupperware expects volumes to grow. Josh Decktor, Global Head Environmental Social Governance and Sustainability at Tupperware®, says, "At Tupperware, we nurture a better future by creating sustainable solutions to store food so it can last longer, with less waste and ultimately reduce single-use plastic. We value the ISCC certification as an indication of our dedication and our commitment to sustainable sources. We are proud to work with the organisation that sets the industry standard for sustainable material certification."

Consumers also see the ISCC PLUS logo on products in shops all over the world. **Orkla**, a leading Swedish brand owner for confectionary and snacks, is one of the latest companies to join the growing band of consumer brands displaying the logo. The company wants to help its consumers make climate-smart decisions and choose sustainable packaging. Working with their supplier, they use certified polypropylene produced with local tall oil on a mass balance basis for their packaging. They started with the four best-selling snacks in 2020 and have expanded the initiative further to most snack packaging, and the work continues. "The third-party certification approach from ISCC has been crucial for us in launching a new bio attributed plastics snacks packaging as the first player in the snacks industry worldwide," says Sara Malmström, Sustainability Manager at Orkla.

»We value the ISCC certification as an indication of our dedication and our commitment to sustainable sources. We are proud to work with the organisation that sets the industry standard for sustainable material certification.«

Josh Decktor
Global Head Environmental Social Governance and Sustainability at Tupperware®

These companies received positive feedback from their customers when they started to reduce their use of fossil feedstocks. They see ISCC PLUS certification as essential to verifying the bio and recycled contents of their products. ISCC's independent and rigorous approach assures customers that companies are dedicated to a circular and low carbon economy. They are proud to display the ISCC PLUS logo on their products, websites and publicity material. It is becoming increasingly clear that ISCC PLUS certified companies are leading the way in using renewable and recycled raw materials. All of them contribute in different ways, as waste collectors, processors, converters and brand owners. This concerted effort in all segments shows it is feasible to use circular and renewable materials for products essential to modern life. Now we, the public, can play our part by purchasing products displaying the ISCC logo.

»The third-party certification approach from ISCC has been crucial for us in launching a new bio attributed plastics snacks packaging as the first player in the snacks industry worldwide.«

Sara Malmström,
Sustainability Manager
at Orkla

2.2.3 Human and Labour Rights

Labour rights encompass a wide range of human rights, including a safe and secure working environment for all workers, equal opportunities and protection against discrimination. Several SDGs are relevant targets for human and labour rights as for example SDG 8 'Decent Work and Economic Growth'. ISCC supports the enforcement of human and labour rights through our certification standards. Social criteria regarding work safety as well as rural and social development are embedded in the ISCC Principles 3 and 4. The core labour standards, defined by the International Labour Organization (ILO), form ISCC's basis of the human and labour rights criteria in its standard.

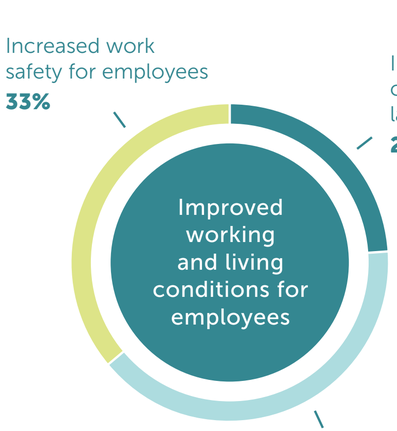
Good social practices at ISCC certified farms and plantations

Most of the analysed corrective measures in 2020 and 2021 improved the working and living conditions of employees (see graphic). A common improvement was the opportunity to participate in a mediation program as well as an election of a workers' representative that communicates the interests of the workers to the company's management (ISCC Principle 4). By requiring conflict mediation and resolution methods in the standard, ISCC strives for improving the rights and participation opportunities of employees at certified entities.

Further corrective actions for companies included the provision of a self-declaration on good social practices. This self-declaration must be communicated to all employees and be signed by the company's management and the employees' representative. Therewith, ISCC aims to raise awareness of solidarity and equality at certified entities. In some cases, it was only the corrective measures that led to farm workers being paid a living wage to meet at least the legal or industry minimum. To verify this, auditors are obliged to make sure that payment slips for all employees are available and that farms and plantations provide some discretionary income – laid down in fair and transparent contracts, understandable for all parties involved. Fewer measures, but no less negligible, were made for access to basic services, e.g. clean food storage areas, designated dining rooms and hygienic sanitary facilities.

Guaranteeing safety at work

Other corrective measures that addressed ISCC criteria on work safety (ISCC Principle 3) ranged from demonstrating competence in handling hazardous substances to confirming health and safety training for the workforce and establishing warning signs or other on-site safety precautions of certified entities. Hence, several corrective measures at certified entities ensured that employees were well prepared before performing dangerous or complex tasks. This also includes first aid trainings and the provision of first aid kits, building emergency facilities to handle PPP and a revision of harvesting procedures e.g. for oil palm fresh fruit bunches. ›



Distribution of corrective measures implemented at certified entities in 2020 and 2021 to comply with ISCC Principles 3 and 4

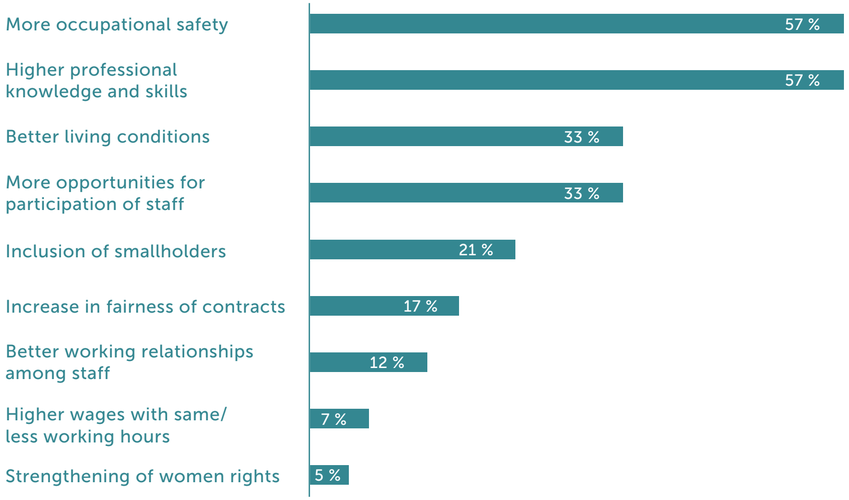
Increased welfare of employees

Results from ISCC's auditors survey (see graphic) underlines the before mentioned, as nearly 60% of ISCC auditors consider the occupational safety of employees at certified farms and plantations as improved, as well as the presence of professional knowledge and skills. Moreover, 30% of ISCC auditors answered that they indeed noted better living conditions and more opportunities for employee participation at certified entities due to the ISCC certification, and over 20% mentioned an improved inclusion of smallholders. As part of the update of the sustainability standard in 2021, ISCC already included strengthened criteria ranging from e.g. women's rights and those of vulnerable groups to grievance mechanisms and wages. Hence, for the next impact assessment, ISCC hopes to see a far-reaching positive development on its social impact. The challenge of auditing social sustainability criteria at the beginning of the supply chain often lies in detecting respective issues, so it is one of ISCC's key priorities to increase audit effectiveness e.g. by defining which questions should be asked in the audit, which tools should be used and providing adequate audit guidance in the ISCC documents.

Smallholders

Although the majority of the world's farms are managed by smallholders, small-scale farming often leads to deforestation, biodiversity loss, social conflicts, little income and a lack of market access. ISCC is convinced that sustainability certification of independent smallholders (ISH) contributes to environmental protection and social welfare. This is why ISCC, in cooperation with the non-profit organisation SNV Netherlands Development Organisation has developed an ISH certification concept. This includes a specific ISH mapping tool and an annual free GRAS[6] analysis of the sourcing area. By doing this, potential clearing of lands with a high biodiversity value or high carbon stock shall be avoided, and smallholders receive the opportunity to benefit from secured yields and better market access.

Social impact of ISCC certification in 2021 (according to auditors)



[6] *GRAS stands for Global Risk Assessment Services and is a company that provides several data sources on land use activities, carbon-stock areas and social aspects (further details in story on page 30)*

GRAS – Global Risk Assessment Services

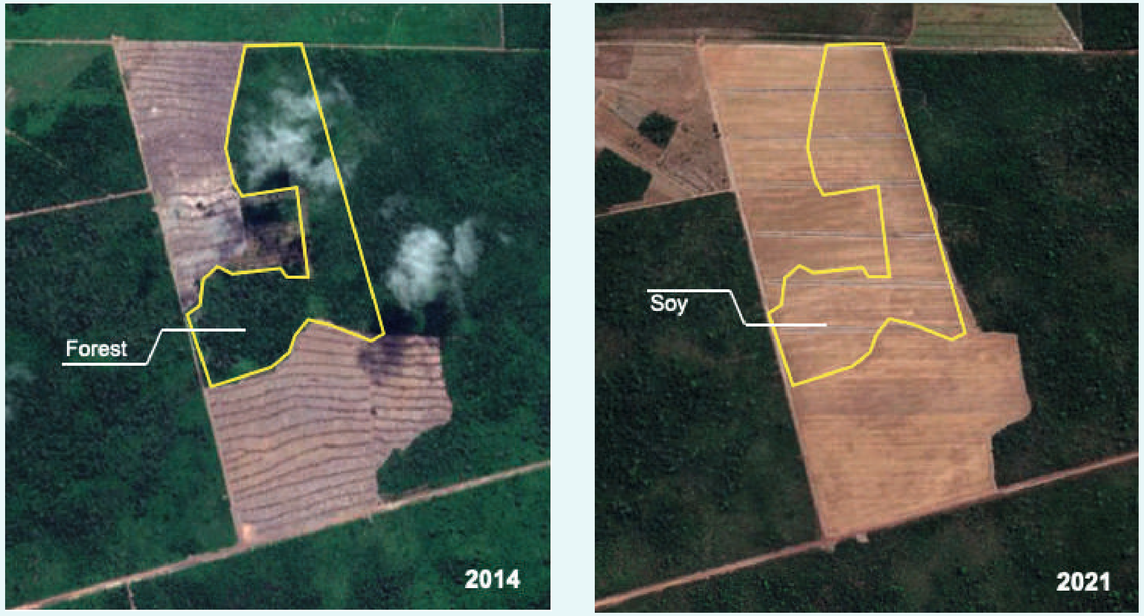
GRAS - Global Risk Assessment Services was established with the support of the German Federal Ministry of Food and Agriculture through its Agency for Renewable Resources. Services and tools developed by GRAS focus on the identification and evaluation of sustainability criteria such as biodiversity, land use change, carbon stock, and social indices, using the latest GIS and remote sensing technologies. GRAS risk approaches and in-depth location-specific detailed assessments are accurate, reliable, and independent and are used in the context of the requirements of the Renewable Energy Directive of the European Commission and the verification of sustainable supply chains for company-specific zero-deforestation commitments.

Auditors and companies are supported by user-friendly GRAS tools and reliable analysis services in verifying ISCC Principle 1 criteria on land use change and biodiversity for production sites and supply chains globally. Interactive GRAS tools like the online GRAS Tool and ARIA allow the conduction of sustainability risk assessments on the spot, including all relevant Principle 1 criteria and associated datasets on biodiversity and land use change. FARAMO supports the integration of smallholder farmers into sustainable supply chains, facilitating the efficient data collection on the ground with mobile devices, feeding the data directly into the farmer risk assessment and management system. Automated analysis and reporting modules allow an efficient verification and monitoring of large smallholder groups against ISCC criteria on biodiversity, land use change, agricultural management practices and social impacts. The methods and tools developed by GRAS can be adopted and applied for all relevant agricultural crops in all world regions.

GRAS uses high-resolution satellite images and Enhanced Vegetation Index (EVI) time series to identify the exact point in time and the type of land use changes. For instance, daily cloud cover in tropical areas often hinders the use of optical satellites and makes regular deforestation monitoring challenging. Therefore, GRAS implements radar technology to verify deforestation, which can be used independently of weather conditions and allows continuous monitoring. In an automated process, radar data recorded from different dates are processed and compared in a change detection method to identify deforested areas separate from land use changes in replanting areas.

Due to the implementation of supply chain regulations within Europe and other world regions during recent and upcoming years, focussing on the protection of biodiversity, the avoidance of deforestation and land use change, and the compliance with human rights, GRAS services and tools show an increasing regulatory value. The easy-to-use, reliable, and independent applications support companies to fulfil regulatory requirements regarding environmental and social risk monitoring, to prove compliance with RED criteria and to meet their own commitments on sustainable and zero-deforestation supply chains.

Identifying land use change with GRAS



Satellite images indicate the conversion of a forested area to a soy field after 2014. GRAS develops automated analysis approaches and tools to efficiently and effectively identify land use change activities for agricultural production areas

Food Security

SDG 2 aims to establish 'Zero Hunger' – a topic which is not losing its importance as time progresses. Although the global average standard of living has increased enormously in the last centuries, 690 million people were still considered 'hungry'[7] in 2020.

Despite the responsibility of countries to establish (inter)national structures that provide their populations with resources for life without hunger, certification standards should certainly make use of the possibilities at their disposal to contribute to achieving this goal. Therefore, ISCC's sustainability criteria cover many social and environmental aspects related to the topic of Food Security. To integrate the topic into its standard to an even higher degree over the last three years, ISCC has participated in the mutual Food Security Standard (FSS) project from Welthungerhilfe (WHH), WWF Germany and the Center for Development Research at the University of Bonn (ZEF), enabled by financial assistance from the German Federal Ministry of Food and Agriculture (BMEL) via its Agency for Renewable Resources (FNR).

In the 2018 pilot phase, the FSS team accompanied several ISCC audits and ISCC provided feedback on the practicability of criteria. The audit feedback showed that companies regard FSS criteria as positive and see engaging with them as an important learning experience. After the FSS had finalised their standard criteria, ISCC went through benchmarking during the module development. The main standard already showed a high degree of fulfilment with the existing FSS requirements. In addition, ISCC set up a specific FSS module and integrated an audit checklist, which the project partners recognised in November 2020. Furthermore, ISCC took the feedback from this process to update the main sustainability standard, which was published in 2021. With joint efforts, the project partners quickly adapted to COVID-19 circumstances and on-site audit restrictions, and ISCC was already able to offer the first FSS training modules less than a month later. The FSS training covers knowledge on the set of Food Security Principles, Criteria and Indicators in an interactive way. It provides a detailed overview of the additional documents to be used in the FSS audit: a handbook for auditors, and three helpful audit tools, the Audit Procedure Tool, the National Food Security Assessment Tool (NaFSA) and Local Food Security Quick Assessment Tool (FSS-QAT).

Under ISCC, companies can already address many aspects of food security directly. And with the FSS module, this can be scaled up to create lasting market-linked impact on the ground.

[7] *Welthungerhilfe, 2020: https://www.welthungerhilfe.de/presse/pressemitteilungen/2020/welthunger-index-2020-corona-krieg-und-klimawandel/*

2.2.4 Economic Sustainability

Economic sustainability means that a company operates sustainably in the long-term and this correlates equally with its long-term economic development, the protection of the environment and social stability. By prioritising economic sustainability, ISCC certified sites can produce materials that not only benefit the environment, but also sustain a permanent profitability that secures livelihoods and contributes to social well-being.

Correct documentation and sound management systems

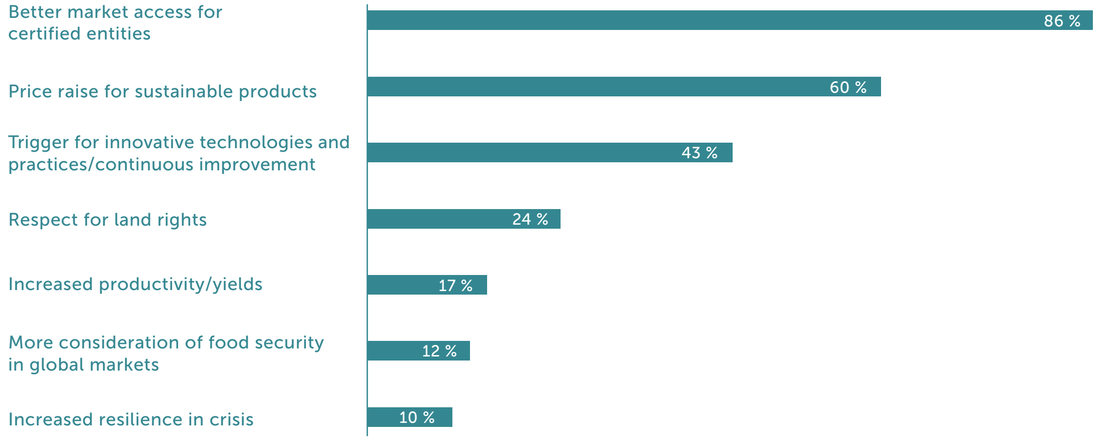
The majority (42%) of all corrective measures analysed by ISCC in 2020 and 2021 indicated an improved general management system at certified sites. These included training classes for employees, properly documented internal audit reports and a sufficient documentation on traceability, as well as mass balance and greenhouse gas calculations. At certified farms and plantations, many of the measures addressed the legitimate land use and traditional land rights. The ISCC standard does not only safeguard the rights and livelihoods of certified entities, but also protects the rights and livelihoods of the surrounding population, for example those of indigenous people or smallholders. Further corrective measures referred to the recording system (e.g. the field size or cultivated crops), as well as the stock inventory. By requiring farms and plantations to properly document the agricultural production, ISCC increases the awareness of entities' resource consumption and provide monitoring opportunities to implement changes that are based on substantiated documentation and recording.

ISCC auditors' assessment of economic benefits due to ISCC certification

The answers to the auditors' survey (see graphic) indicate clear positive impacts in various areas for certified entities that can be attributed to ISCC certification.

85% of all questioned auditors stated that ISCC certified entities get better market access e.g. to the regulated biofuels market in the EU which requires certification by a recognised certification system. Additionally, nearly 60% of auditors state that ISCC certified entities receive a price benefit for sustainably certified products. The number of companies that prioritise climate action and commit to net zero emissions by 2050 has increased tremendously. Brand owners requesting sustainable sourced products from their suppliers are driving demand, as is pressure from consumers, who increasingly value environmentally friendly products. Moreover, 40% of all auditors are convinced that ISCC certification promotes new sustainable technologies and innovative practices which can be a direct result of better market access and expected price premiums.

Economic impact of ISCC certification in 2021 (according to auditors)



2.3 Greenhouse Gas Emissions

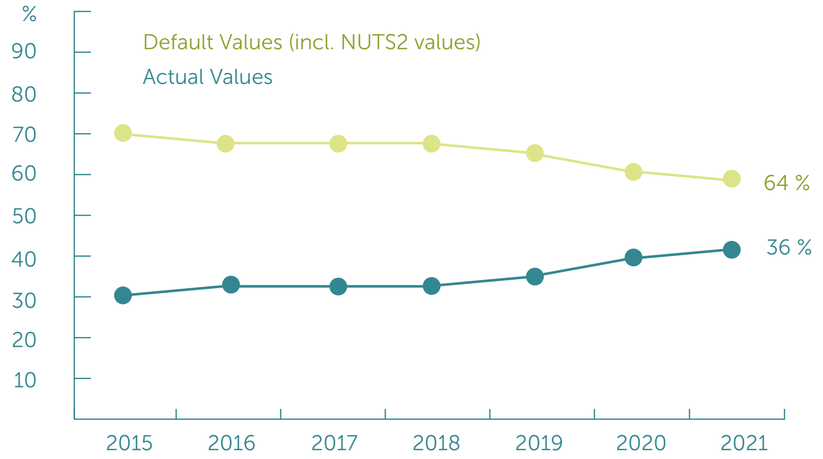
Stabilising the earth's temperature and limiting global warming to well below two degrees requires GHG emissions to reach net zero by 2050. Fast action is urgently needed by all market operators, governments, and individuals to reach this goal. ISCC supports companies in providing necessary tools for GHG emission calculation that are required to achieve the mandatory and voluntary targets of GHG emission reductions. In addition, ISCC searches for alternative carbon credits and compensation projects where reductions are not technically possible or economically feasible. To increase knowledge on such topics, ISCC continuously updates its training contents, certification guidance, calculation templates and supports innovative approaches in the field of GHG reduction along ISCC certified supply chains.

The use of actual values in GHG calculation is increasing

Since 2010, legislation in the European market (today via the RED II) dictates a mandatory GHG methodology and GHG reduction targets for biofuels. Over the years, GHG calculation methodologies have been improved and became more widespread, while different accounting methods are still available. The requirements for GHG emissions apply to all relevant market operators from raw materials production to the distribution of biofuels, including cultivation, collection and conversion processes, as well as the transport and distribution of intermediate and final products.

Market operators can choose to use standard values provided by the EC that are typical for the respective industry processes. However, more and more companies choose to calculate actual values for their industry processes that are verified by ISCC auditors during the certification audits. For this reason, the information on GHG savings is becoming increasingly precise over time since actual values are based on real processes that take place at the certified entity. The calculation of actual values also creates additional incentives to further reduce GHG emissions since those improvements have an immediate impact on the measurable environmental performance of a market operator. ›

GHG calculation methods used by ISCC certified entities



Improved GHG emission calculations

Most corrective measures for GHG emissions addressed adjustments to the data basis and allocation of emissions, resulting in more accurate GHG emission calculations. Many certified companies set up internal training sessions on how to forward ISCC Sustainability Declarations correctly and better identify potential critical control points. Due to a high number of non-conformities in this area, correct forwarding of ISCC Sustainability Declarations is also being discussed in ISCC training sessions with actual case studies.

Reduced GHG emissions along ISCC certified supply chains

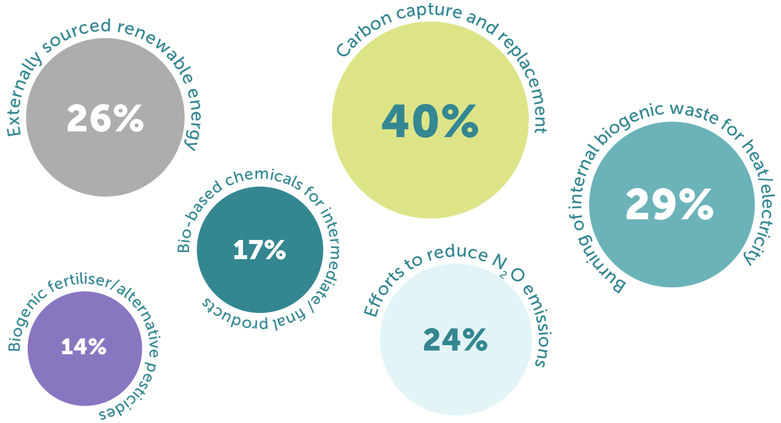
More than half of the ISCC auditors who took part in the auditors' survey reported the highest rate of implemented GHG emission reduction measures at continuously certified entities – compared to recently certified entities. This indicates the positive impact of ISCC certification on the reduction of GHG emissions over time. The auditors further reported that the most common GHG reduction measures (see graphic) are carbon capture and replacement installations, burning of internal biogenic waste for energy purposes, externally sourced renewable energy as well as the replacement of fossil inputs by renewable alternatives (chemicals, fertilisers, pesticides). In addition, just a few auditors stated that GHG reduction efforts from farm to processing level are exhausted – this indicates huge potentials to further reduce GHG emissions.

Methane capture as an effective GHG reduction measure

Since conventional wastewater treatment at palm oil mills is a significant source of GHG emissions, methane capture facilities have a substantial climate protection potential. Instead of storing the so-called palm oil mill effluent (POME) in open ponds that allow methane emissions to escape directly into the atmosphere, the captured methane can be used to produce heat and electricity at the palm oil mills, significantly reducing the need for external energy sourcing. Excess production can even be supplied into the local electricity grid as renewable electricity for external parties.

These benefits and the associated positive impact on the environment through GHG savings motivate ISCC to promote and enhance the use of methane capture facilities among system users now and in the future.

Most common measures to reduce GHG emissions at ISCC certified entities in 2021 (according to auditors)



Capturing carbon to protect the climate

In 2020, the International Energy Authority endorsed carbon capture utilisation and storage (CCUS) as crucial for reaching net zero emissions. Lantmännen, a farming to biorefining group in Sweden, was already ahead of the curve. In 2015, their subsidiary Lantmännen Agroetanol had invested in carbon capture together with AGA Linde, in Norrköping Sweden. This type of process is high on the list of those assessed by the IEA[8]. The biogenic carbon dioxide, captured from their ISCC certified bioethanol production, can replace fossil carbon dioxide in several applications.

These developments demonstrate how the biofuels sector is ideally placed to provide raw materials for low carbon fuels and chemicals. The fermentation of crops and wastes produces a high-quality stream of CO_2. The carbon dioxide is piped to an adjacent purification and liquefaction facility. The purified carbon dioxide is then delivered to customers who can use it as a refrigerant, in fire extinguishers, for foaming rubber and plastics, to promote the growth of plants in greenhouses and to carbonate beverages.

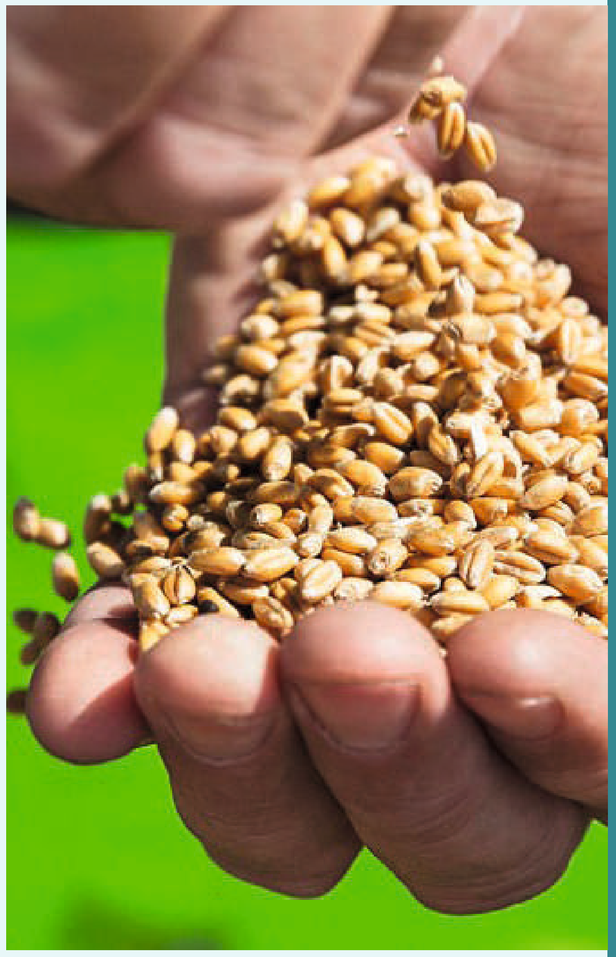
In the future, the chemical industry will be able to upgrade carbon dioxide to fuels and intermediates using renewable electricity, to replace more of their fossil counterparts. So, operators will be looking for the best source of carbon dioxide; the bioethanol industry will be high on their list. Carbon dioxide can also be captured from power stations and chemicals plants fuelled by gas and oil. But they often produce carbon dioxide that is diluted with other gases, which are expensive to remove.

»ISCC has a solid reputation and is highly trusted among our partners in Europe. It is a trademark of quality to have an ISCC certificate.«

Tannia Marinado,
Biofuel Manager
at Lantmännen

Back to the present, and sustainably certified biofuels are decarbonising transport right now. Bioethanol, the company's main product, comes from the fermentation of cereal crops and wastes. It can be blended with conventional gasoline at concentrations up to 85%, to reduce greenhouse gas emissions in transport. Lantmännen is part of an industrial energy conglomerate and uses biofuels in their own transport, which, together with carbon capture and excellent energy efficiency, means that their bioethanol achieves an impressive reduction in greenhouse gas emissions of >95% when compared with fossil gasoline.

The company is proactive in communicating the greenhouse gas savings potential of biofuels. Third party verification of these savings is therefore crucial. Tannia Marinado, Biofuel Manager from Lantmännen, explains: "ISCC has a solid reputation and is highly trusted among our partners in Europe. It is a trademark of quality to have an ISCC certificate".



[8] *https://iea.blob.core.windows.net/assets/0d0b4984-f391-44f9-854f-fda1ebf8d8df/Transforming_Industry_through_CCUS.pdf*

Carbon farming and healthy soils provide options for emission savings from soil carbon accumulation

Sustainable soil management is key when talking about climate action: agricultural soils can significantly contribute to the sustainable production of biomass and reducing global greenhouse gas emissions on different levels. Soils can absorb and retain CO_2 from the atmosphere and store it in carbon pools, such as soil organic carbon (SOC), potentially reducing the amount of carbon in the atmosphere (known as sequestration). This incentivises farmers to apply improved agricultural management practices capable of increasing carbon sequestration, thus contributing positively to climate change mitigation.

Improved agricultural management can have a positive impact on climate change and companies applying those can calculate GHG emission savings from soil carbon accumulation (esca). Adopting (one of) the following esca measures after the cut-off date[9] January 2008 can allow to benefit from a reduced carbon footprint under ISCC:

- Shifting to reduced or zero-tillage.
- Improved crop rotations and/or cover crops, including crop residues management.
- Improved fertiliser or manure management (e.g. use of organic fertilisers).
- Use of soil improver (e.g. compost, manure fermentation digestate, biochar).

To find practical and economically feasible criteria and respective verification options, ISCC started an intensive stakeholder dialogue on the topic in 2020. Solid and verifiable evidence must be provided to the third-party verifier since carbon sequestration in soil requires practices to be in place continuously in the long term – otherwise, no net benefit for the climate is achieved.

The outcomes of the stakeholder dialogue on giving the right to claim esca included the development of specific criteria for the greenhouse gas guidance document and a new esca guidance document to be published in 2022. ISCC is also supporting pilot projects with innovative approaches, e.g. new tools for in-soil measurements in the field. Healthy soils offer important possibilities for GHG reductions and are the basis for functioning ecosystems, including significant relevance for biodiversity and food security.

[9] The cut-off date January 2008 refers to the RED II which states that biofuels, bioliquids and biomass fuels that were produced from agricultural biomass must not be made from raw materials obtained from land that had in or after January 2008 a high biodiversity value and/or high carbon stock. Please see Art. 29 RED II (Directive (EU) 2018/2001) for further details.

2.3 Traceability and Chain of Custody

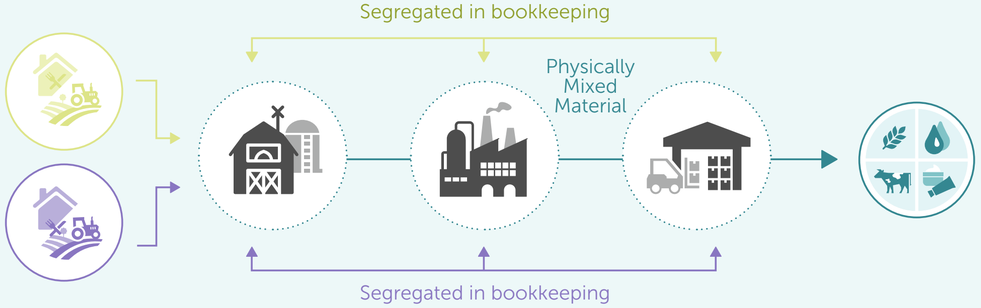
Increasing traceability along supply chains contributes to consumer trust and to sustained demand for ISCC certified products. The term traceability describes the ability to identify and trace the origin, distribution, location and application of products and materials throughout supply chains. Since all entities handling sustainable material must be covered by certification, ISCC allows full traceability. ISCC offers different chain of custody approaches to trace material back to its origin: physical segregation, controlled blending, and mass balance accounting (see graphics).

Deliveries of physically segregated materials contain 100% sustainable ISCC certified material. This approach requires separate/parallel processes for production, storage and transportation and allows for strong claims that directly refer to the physical characteristics of the material. Controlled blending refers to practices that constantly monitor and document verifiable content of biological, circular and renewable feedstocks in the final product. This approach is applicable under the voluntary scheme ISCC PLUS.

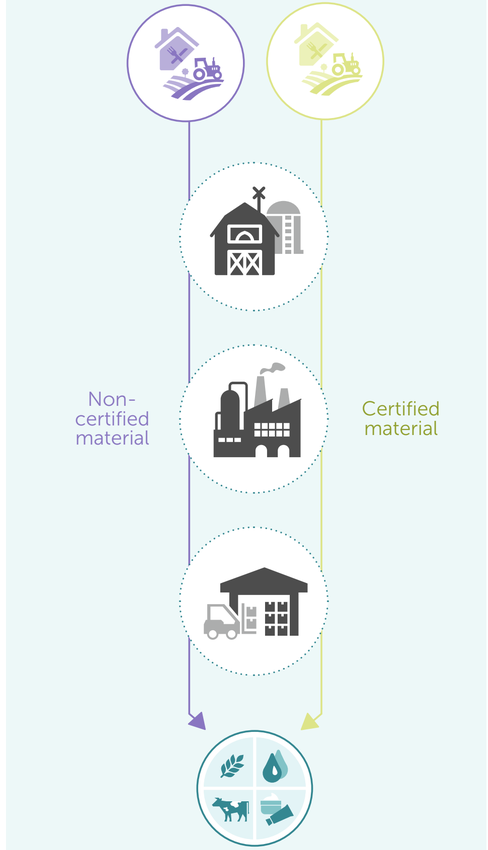
Mass balancing is a chain of custody option in which certified and non-certified materials are mixed physically but kept separate in the bookkeeping. This method is used to document and track biological, circular and renewable materials through complex manufacturing systems. By using mass balance, certified entities can track how much sustainable material has been used in their manufacturing systems and ensure that it corresponds exactly to the amount of certified content in the end products. ›

Physical Segregation

Mass Balance



Controlled Blending



Introducing a licensing scheme and new on-product logos for brand owners

One milestone in 2021 was the launch of the ISCC licensing scheme as a tailor-made concept for brand owners. It allows companies at the end of the supply chain to communicate and promote the use of ISCC certified materials. ISCC operates the licensing scheme to add value for consumers and to increase transparency and traceability at the end of the supply chain. Together with the new scheme, ISCC introduced a new set of on-product logos for end consumer products with the intention of increasing consumer understanding and awareness of the ISCC certification system. The ISCC on-product logos include symbols that are easily understandable for the average consumer and enable a quick recognition of its positive impact.

Keeping track of sustainable material on-site

Corrective measures at certified entities also indicate an increased transparency and traceability of sustainable material throughout ISCC certified supply chains. The majority of corrective measures addressed the conformity of different ISCC documents e.g. delivery notes and Sustainability Declarations, as well as the correct use of logos and claims.

The combination of ISCC traceability and chain of custody requirements ensures that the physical flow of sustainable materials can be traced back throughout the supply chain, which guarantees the integrity of sustainability statements. The transfer of sustainability characteristics along the supply chain must always be accompanied by a physical transfer of material – book and claim[10] is not allowed under ISCC.

[10] *Sustainability claim made separated from physical flow of these goods*

ISCC on-product logos

1. Circular

a. mass balance

b. physical segregation

2. Bio-Circular

a. mass balance

b. physical segregation

3. Bio

a. mass balance

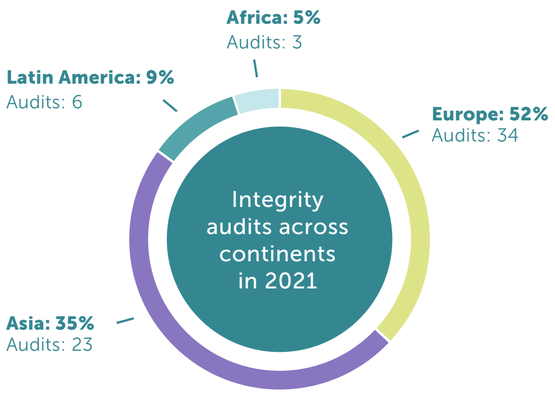
b. physical segregation

2.4 Integrity and Quality

Integrity is the foundation of the ISCC certification systems and the fundamental principle that guides ISCC's actions. ISCC strives to operate its systems consistently in accordance with a strong set of ethical values and a comprehensive quality assurance system to live up to ISCC's standard.

2.4.1 Integrity Programme

The Integrity Programme was launched as a tool to enable closer monitoring of the certification bodies' auditing activities and companies' compliance with ISCC requirements.



[11] *A high risk especially applies to materials which are or may be eligible for extra incentives in individual EU Member States (e.g. double-counting) or which are cultivated in high-risk areas. This includes, but is not limited to, wastes, residues, and products derived therefrom.*

Integrity Assessments

ISCC works with independent integrity auditors who are not cooperating with certification bodies or ISCC system users to avoid any conflict of interest. Integrity assessments are conducted mainly as a reaction to complaints or risks[11] and take place in the form of on-site audits or desk verifications (remote). Due to the ongoing COVID-19 pandemic, all 66 integrity audits in 2021 were conducted remotely.

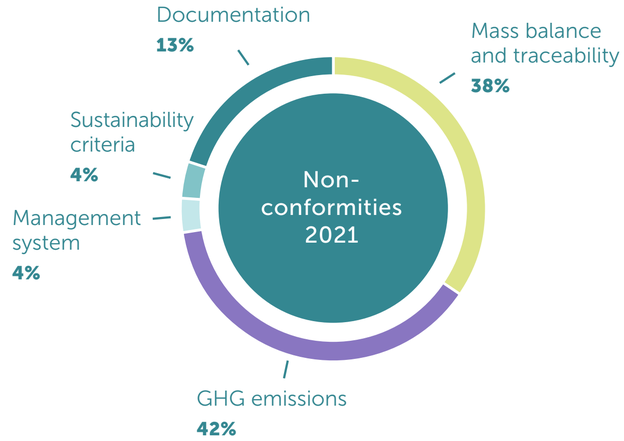
Apart from specific indications received via complaints, ISCC analyses market developments and other external information to identify entities that should be included in the ISCC Integrity Programme. In this way, the annual planning shifts from a random selection of candidates to a risk-specific approach. Some high-risk supply chains that are more often subject to surveillance audits under ISCC's Integrity Programme include e.g. waste and residue-based supply chains or those susceptible to land use change (non-compliance with ISCC Principle 1).

Integrity auditors as well emphasise the importance of the ISCC integrity assessments. Through the integrity assessments ISCC gains valuable feedback from certified system users and certification bodies regarding their understanding of the ISCC requirements and the practical use of the ISCC standards. The audits reveal mistakes (accidental or intentional), allowing the auditors to investigate fraud allegations and help ISCC in its mission.

Complaint procedure and risk assessments

In 2021, ISCC implemented several new measures to improve the complaint procedure and maintain its integrity and reliability:

1. ISCC developed a complaint template which is available on the ISCC homepage and strongly encourages stakeholders to submit complaints in case of possible fraudulent behaviour. Complaints that are based on substantiated evidence serve as one source for choosing potential candidates for the integrity assessments.
2. Due to the growing number of individual GHG calculations and the feedback that ISCC has gained from authorities like the Federal Institute for Agriculture and Food (BMEL) in Germany, one focus of the Integrity Programme has been the verification of individual GHG calculations on a risk basis.
3. Non-conformities can now be shared among certification bodies and their auditors to implement a robust feedback culture which is based on substantiated evidence. ›



Withdrawn certificates and excluded system users

In 2021, 27 ISCC system users were temporarily excluded from certification, and 61 ISCC certificates were withdrawn due to serious non-conformities with the ISCC requirements. Exclusions of system users and withdrawals of ISCC certificates are the consequence of non-conformities that are found either in the ISCC integrity audits, in regular certification audits or surveillance audits. For this purpose, ISCC set up a new mailing list in 2019 to immediately notify stakeholders about withdrawn certificates and excluded system users.

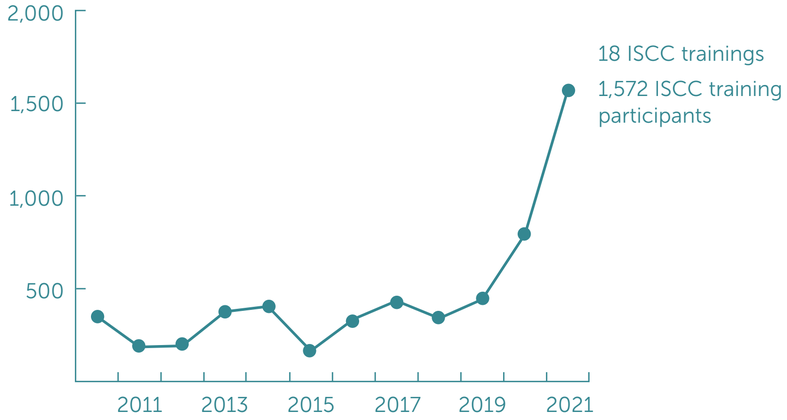
2.4.2 Training Programme

ISCC training courses are open to all interested parties. By offering extensive training programmes with case studies, interactive group work sessions and discussions, ISCC not only improves the knowledge of system users and other stakeholders, but also comprehensively trains the ISCC auditors. To further increase the learning effect of the ISCC EU and PLUS Basic Training sessions and deepen the newly acquired knowledge, ISCC has developed a mandtory online test for prospective ISCC auditors.

More participants in ISCC Training Sessions

The COVID-19 pandemic had its impact on the ISCC training programme: ISCC decided to pivot from in-person to virtual training sessions and set up a high-quality online training programme in the form of live webinars. The digital approach rapidly proved to be a success. In 2021, ISCC held more training sessions than ever before, counting over 1,500 participants (see graphic). This increase in participants is directly related to the digitalisation (eliminating the need for time-consuming travel) and the introduction of three new training courses: the ISCC Waste and Residues Training, the ISCC PLUS Training - Circular Economy and Bioeconomy, and the ISCC CORSIA Training.

ISCC trainings and participants



Training courses in 2021	Number of courses	Participants
ISCC EU and PLUS Basic Training	6	572
ISCC PLUS Training - Circular Economy and Bioeconomy	5	449
ISCC Waste and Residues Training	4	311
ISCC Greenhouse Gas Training	1	130
ISCC CORSIA Training	2	109

03 _ Concluding Remarks

Sustainability in the ways we produce and consume is of ever-growing importance – to companies, regulators, NGOs and the broader public. At the same time, ensuring sustainability across products, markets and supply chains can be challenging, given the heterogeneity of different feedstocks, production processes, market requirements and consumer preferences.

For more than ten years now, ISCC has demonstrated that credible certification can be a solution for living up to the sustainability challenge. Developed and continuously improved through a broad stakeholder dialogue involving NGOs, academia, regulators and companies across value chains, ISCC certification is based on both science and extensive experience. For many years now, ISCC EU has been the leading certification scheme for the EU RED market, including a strong and ever more important basis of waste and residue feedstocks.

Through the widespread application of its standards, ISCC stipulates positive impact on agricultural practices, the improvement of livelihoods, and secures deforestation-free supply chains. ISCC accelerates the course towards a carbon neutral world and true circular economy by issuing already most of its certificates in waste and residue-based supply chains with an upward trend. Through consistent greenhouse gas calculations across product life cycles including their robust auditing and verification, ISCC ensures credible GHG information that can be made available to market participants, regulators and other third parties. This, in turn, has led to significant investments in practices to reduce emissions along value chains. In addition, ISCC has shown that certification works along all supply chains, including those that are complex and globally-spanning.

In many instances, ISCC certification requirements go beyond legal local requirements and offer a holistic sustainability assessment. ISCC's own Integrity Program provides additional assurance particularly in high-risk supply chains.

ISCC looks to the future with confidence: certifications with ISCC PLUS are taking off, players in the food and feed market are increasingly interested in sustainability certification and ISCC sees great potential in further expansion to the PtX, maritime and aviation sectors.

To a degree unmatched by any alternative available today, certification allows for the differentiation between sustainable and non-sustainable supply chains. At a time when companies' sustainability claims are increasingly scrutinised by regulators, consumers and non-governmental organisations, sustainability certification like ISCC is an efficient and effective tool in making sure that sustainability claims indeed hold true. ISCC remains committed to support the path of a net-zero economy that can be considered truly sustainable.

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