Developments in Sustainability of Aviation Fuels
- The Role of SCS -

Dr Norbert Schmitz, Managing Director, International Sutainability and Carbon Certification (ISCC)

Content

- What are the key features of SCS?
- How does certification work in practice today?
- Who is ISCC and RSB?
- How could the CORSIA sustainability requirements for SAF be implemented?

How do SCS support the implementation of CORSIA requirements?

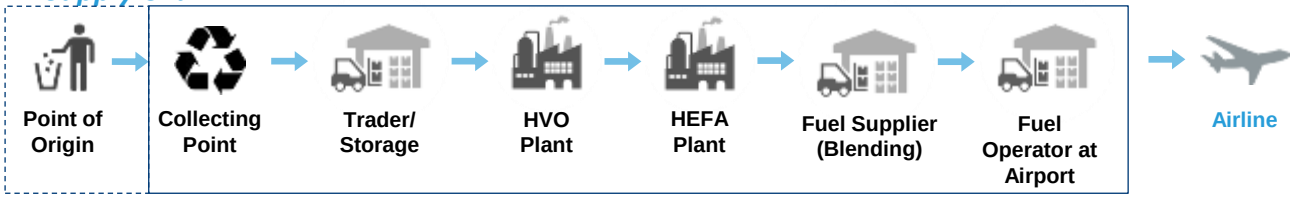
- SCS verify compliance of economic operators with voluntary or mandatory criteria
- Under the current CORSIA Framework, SCS would certify sustainable aviation fuel against the sustainability criteria set:
    - SCS confirm that SAF achieves at least 10% emissions reduction, and that fuel producers calculate actual life cycle emissions values using the agreed methodology and that appropriate default values are applied
    - SCS confirm that SAF is not obtained from agricultural feedstock deriving from high carbon stock land converted after 1 January 2008
- Compliance with those criteria is confirmed based on audits carried out independently by 3rd parties (certification bodies) cooperating with the SCS

SCS certify the sustainability of supply chains

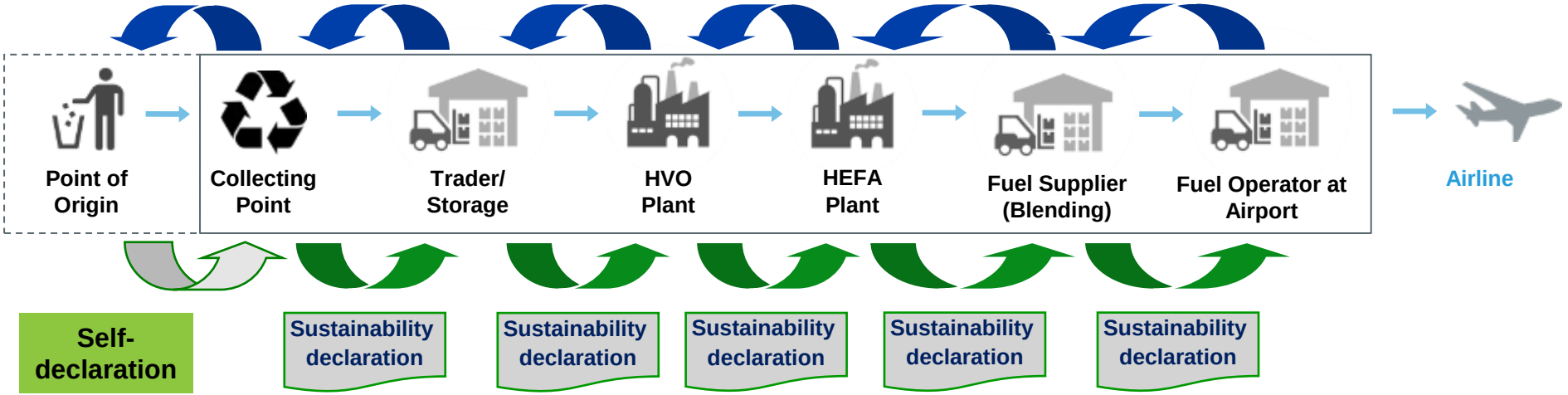
- CORSIA will approve SCS for certifying SAF CORSIA based on CORSIA Eligibility Framework and Requirements for SCS
- Surveillance required to ensure level playing field for all players in the market
- Certification of each entity along entire supply chains
- Audits conducted to verify information

EXAMPLE

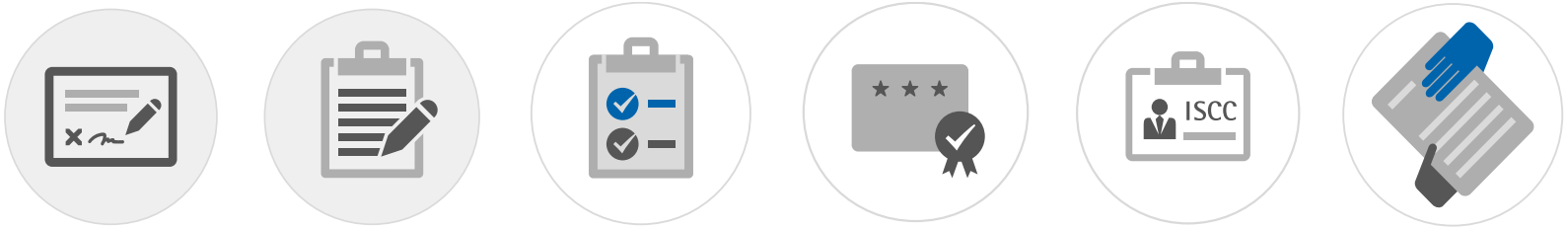
Supply Chain HEFA



How will the relevant information be forwarded in the supply chain? Step by step approach



Steps for economic operators to become certified by an SCS



What are the costs of certification?

Reference: CAEP-SG/20183-WP/012 – Assessment of Costs of Sustainability Certification

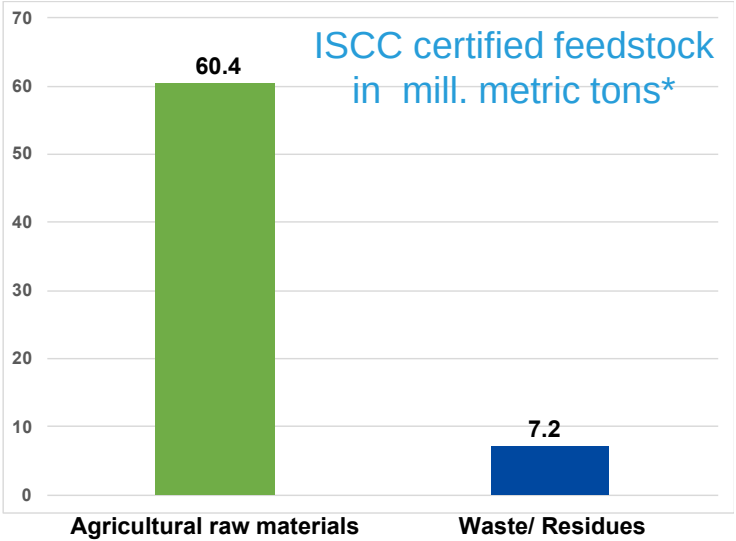
- The sustainability certification cost estimates for supply chains **range from 0.66 to 1.36 Euro per ton** of certified SAF
- Sustainability certification **costs depend on multiple factors**: type of raw material, number of on-site audits (sample), company size, complexity of the supply chain, certification system used, preparation and awareness, first certification or recertification
- Many companies relevant as **suppliers for SAF are already certified** / verified, and thus implementation costs will be low (in particular internal costs)
- Entire costs of **complying with a full set of sustainability requirements will be only marginal higher** than the costs of a reduced set of sustainability requirements

Who is ISCC? ISCC a global sustainability certification scheme governed by an association with 115 members from 28 countries

Today, approx. 3,300 companies in 100+ countries are ISCC certified

- Camelina
- Canola/ Rapeseed
- Cereals
- Corn
- Palm
- Shea
- Soy
- Sugarbeet
- Sugarcane
- Sunflower
- Waste & Residues
- Wood

60+ mill tons of ISCC certified feedstock is available to be used mainly for the production of renewable fuels



* Figures based on data collected for the calendar year 2017

- Large certified feedstock basis already available (e.g. palm, soy, canola, cereals, sugarcane)
- Smallholder projects ongoing. Approach to certify low/zero ILUC biofuels
- Feedstock mainly used for biodiesel, bioethanol, HVO and co-processing (estimate of 18 mill. tons ISCC certified biofuels in 2018)
- Major fuel producers are users of the system (e.g. Exxon, BP, Shell, Total, Neste, ENI, OMV, Equinor, Petrobras)

Categories of materials that can be certified under ISCC

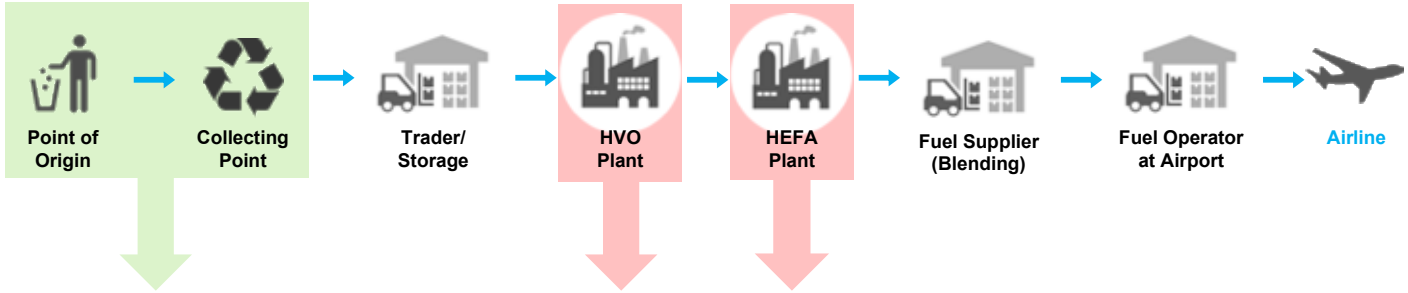
Agricultural feedstocks	• "Conventional" feedstocks, e.g. canola, palm, corn, soy (incl. high / low iLUC)
Agricultural crop residues	• E.g. straw, husks
Forestry feedstocks	• E.g. short rotation coppice, forestry residues
Wastes/ processing residues	• E.g. UCO, animal fat, crude glycerine
Renewable non-bio feedstocks	• E.g. hydrogen, power-to-liquid, power-to-gas
Recycled carbon fuels	• E.g. plastics, waste processing gases, exhaust gases

Implementation of CORSIA requirements can build upon experience economic operators have already gained – For example, ISCC is recognized for renewable fuels by EU, Japan and Australia (Queensland)*

	EU	Japan	Queensland (Australia)	CORSIA
General Requirements	• Protection of land with high biodiversity (e.g primary forests) • Protection of land with high carbon stocks (e.g. wetlands, peatlands) • Cut-off date: January 2008	• Exclusion of land use change from non-agricultural land (e.g. wood or grasland) to agricultural land • Cut-off date: April 2012 • No effects on food competition, ecosystems or the environment	• Biodiversity, ecosystems, areas of high conservation value • Water and soil quailtiy, etc. • ISCC certification approach accepted	• Protection of land with high carbon stock • Cut-off date: January 2008
CO_2 reductions	• Min. 60% • Min. 50% for old installations (in operation prior to October 2015)	• Min. 55%	• Min. 20%	• Min. 10%
Traceability method	• Traceability via mass balance approach	• Traceability via mass balance approach	• Not specified • ISCC certification approach accepted (i.e. mass balance)	Traceability via mass balance approach

*: ISCC is also recognized with the Carbon Disclosure Project (CDP) and several company and industry sector specific voluntary programs

CORSIA Sustainability Criteria 1 requires a 10% GHG reduction for a SAF to be recognized under CORSIA



Feedstock collection

- No emissions from cultivation or land use change
- Upstream transport (from collection) e_{td}

Processing Unit

- Processing e_p
- Upstream transport e_{td}
- Excess electricity e_{ee}
- CCR e_{ccr}
- CCS e_{ccs}

Final processing

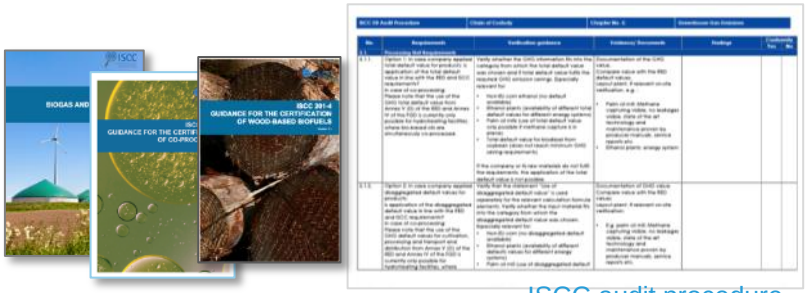
- Processing e_p
- Upstream & downstream transport & distribution e_{td}
- Excess electricity e_{ee}
- CCR e_{ccr}
- CCS e_{ccs}

To calculate this life cycle emission value of a SAF, GHG values are forwarded in the supply chain step by step

CCR: Carbon Capture and Replacement
CCS: Carbon Capture and Storage

ISCC has implemented a comprehensive set of measures to guarantee high quality of GHG calculation and verification

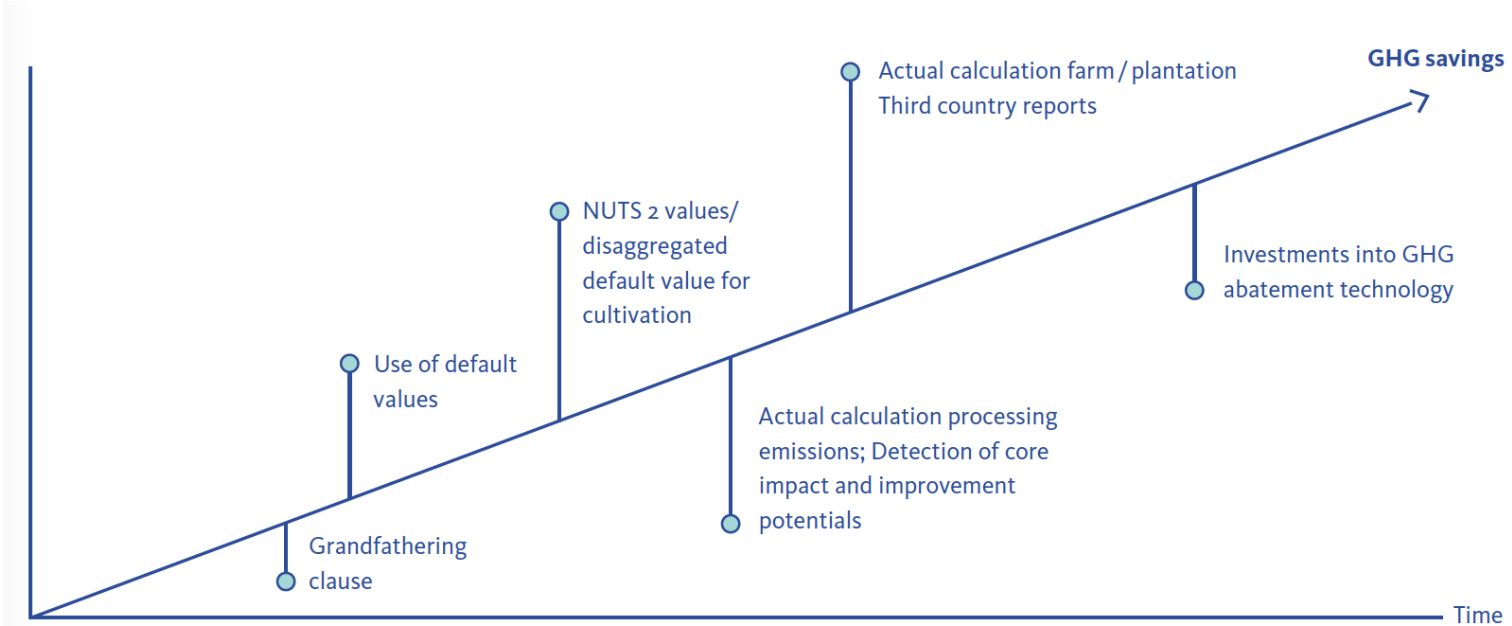
- Specific ISCC GHG Trainings for auditors and system users
- Audit procedures with detailed guidance on GHG requirements
- Specific System Updates on ISCC GHG requirements
- List of Materials eligible for certification under ISCC
- ISCC Integrity Program with focus on GHG calculations
- Application of the GRAS tool with lists and maps of regional agricultural values and carbon stocks



ISCC audit procedure

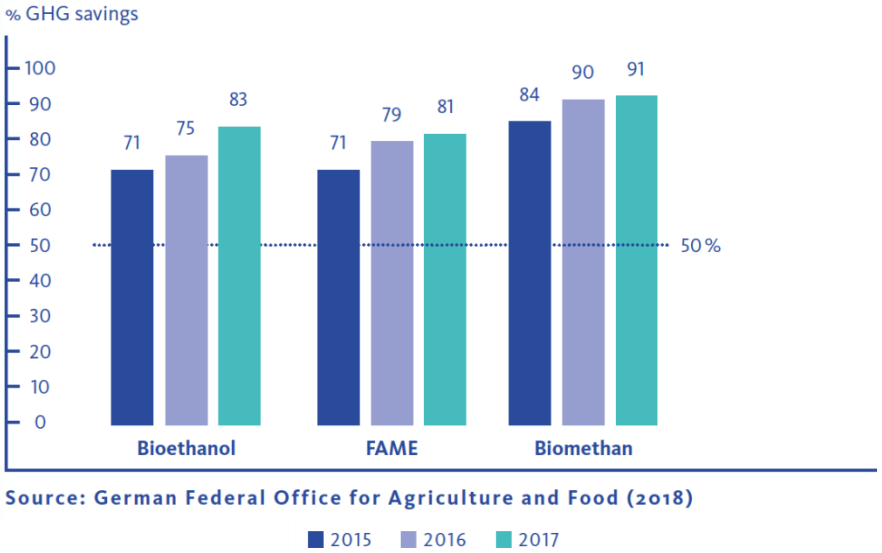
www.gras-system.org

Sustainability certification has contributed to the transition from virtual GHG savings to real GHG abatement investments



Data from national authorities and ISCC internal data show decrease in GHG emissions over time

GHG savings in Germany (similar data available for NL and UK)

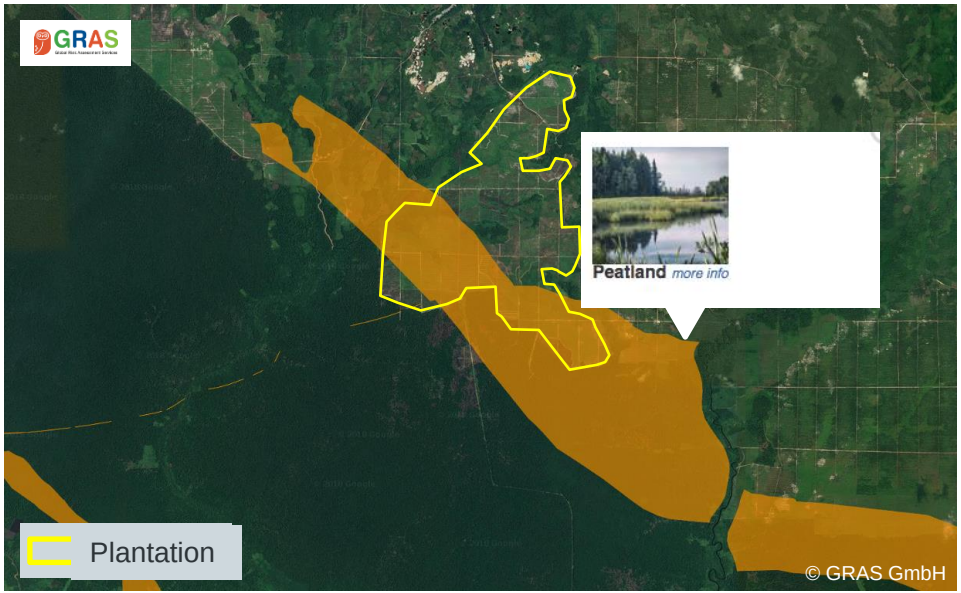


Source: German Federal Office for Agriculture and Food (2018)

ISCC internal data on processing emissions

CORSIA Sustainability Criteria 2 requires that SAF “should not be made from biomass obtained from land with high carbon stock”

High carbon stock areas and direct land use change can be identified by using databases and satellite images



Peatlands

- Based on local databases

Total Organic Carbon

- Carbon stored above and below ground biomass and in top 30 cm of soil
- Maps calculated by GRAS based on local land cover maps
- Refer to the year 2009

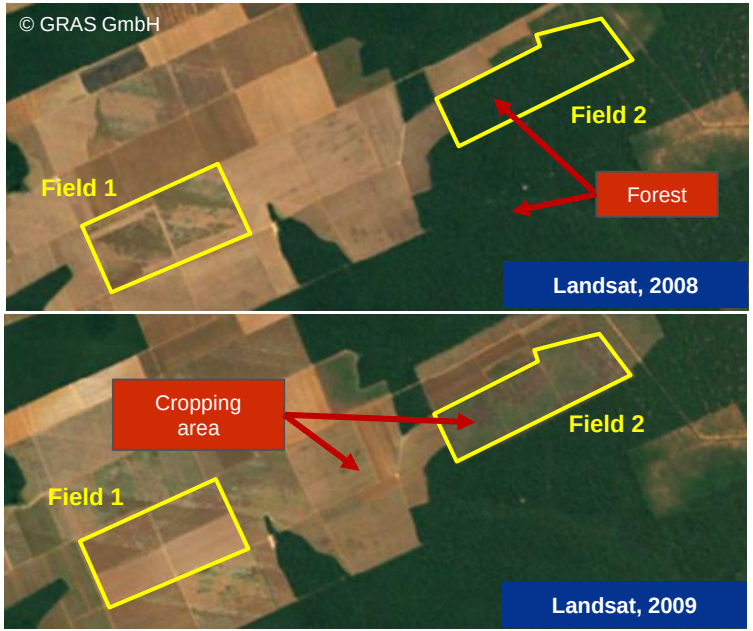
Total Biomass Carbon

- Carbon stored in above and belowground living vegetation
- Worldwide layer, resolution 1 x 1 km
- Refers to the year 2000

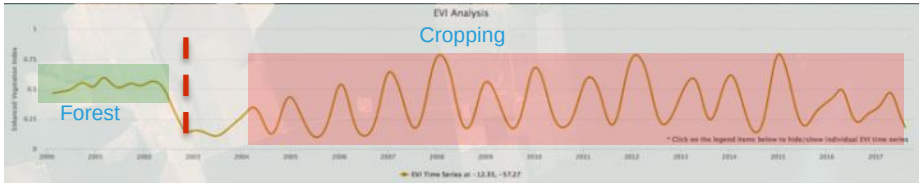
Datasets on areas with high carbon stock areas can be used to support verification with CORSIA criteria 2

Example Canada

The analysis of the EVI time series indicates the exact time of the land use change and the type of land cover before and after the conversion



Field 1: Conversion from forest to cropland **before** 2008



Field 2: Conversion **after** January 2008

Conclusions

- Approach to apply SCS in global supply chains for sustainability and GHG savings is **proven and is being increasingly adopted** by countries around the world
- Many economic operators in **potential SAF supply chains are certified** and are familiar with sustainability requirements and GHG calculations
- On a global scale, **larges volumes of certified feedstock** for the production of SAF **already available**
- **Using existing SCS for CORSIA purposes will help to bring commercial volumes to the market.** It also reduces the burden on companies in the supply chain and will increase acceptance
- **Costs for certification will be low**, and will not be a stumbling block for implementation. New technologies allow cost-efficient verification and increase credibility
- Sustainability regulation and certification shows **impact** on the ground, as e.g. improvements in GHG emissions of renewable fuels show
- Proper preparation of **regulatory framework** based on actual and potential SAF supply chains required to ensure success in practical implementation