Biosynthetics E-Learning Series Part 1:
Feedstock Sustainability Standards with Bonsucro and NatureWorks

May 20, 2019 at 10:30 EDT/ 16:30 CEST (90 minutes)



Agenda

- Welcome
- Bonsucro
  - Presentation (20min)
  - Q&A (20min)
- NatureWorks
  - Presentation (20min)
  - Q&A (20min)
- Summary

Welcome to the Biosynthetics E-learning Series

Biosynthetics can play an important role in **replacing fossil-based resources** with renewable feedstock. At the same time, there are **various sustainability challenges** also associated with the use of renewable feedstock.

The Biosynthetics E-Learning Series will have a closer look at different **sustainability standards** which may provide solutions in order to transition and scale the uptake of more sustainable biosynthetics.

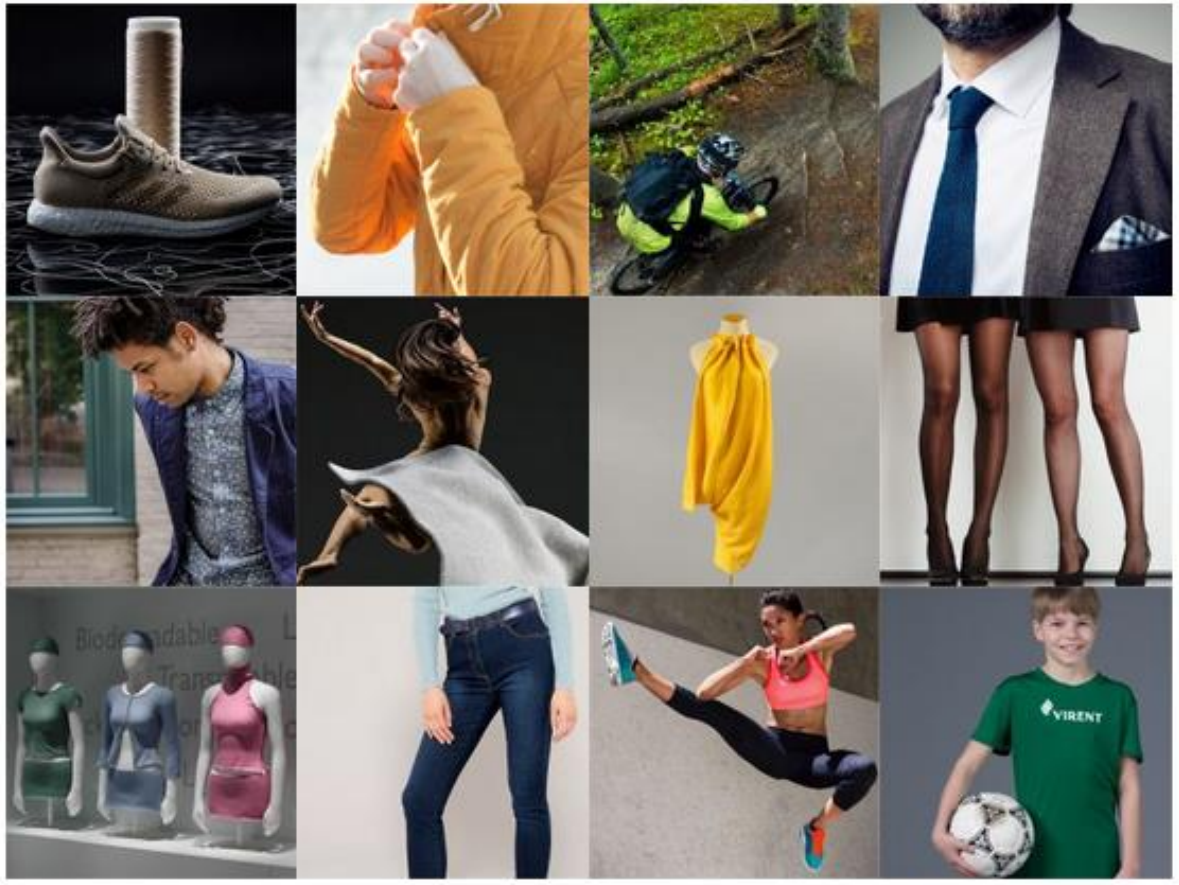
We will learn more about the following initiatives today:

Welcome and introduction of speakers

Rafael Seixas
Membership Manager

Erwin Vink
Senior Sustainability Manager

Learning More About YOU – Quick Polls



https://aboutbiosynthetics.org/

1. What type of company do you work for?
2. How would you assess your expertise with regard to feedstock sustainability standards for biosynthetics?
3. Is your company buying and/or selling biosynthetics?


BON
SUCRO
The global sugarcane platform
Biosynthetics e-Learning Series - May 2019

WHY SUGARCANE?

Biggest commodity by biomass

Grown in over 100 countries

Employment/income to hundreds of millions in developing regions

One of the most efficient plants in converting solar energy

Flexible in use, offering new solutions for a bio-based economy

WHAT IS BONSUCRO?

Bonsucro is the global industry platform with a vision of thriving, sustainable producer communities and resilient assured supply chains.

We help achieve this vision through supporting **performance improvement** and **verification** of sugarcane producers, linked together with a vibrant, diverse and **global community** of supply chain actors and support organisations.

BON SUCRO
The global sugarcane platform

A PLATFORM BUILT AROUND
GLOBAL, CREDIBLE STANDARDS

Production Standard

A comprehensive metric standard for sustainable farming and milling of sugarcane.

Production Standard for smallholders

Comprehensive metric standard for sustainable farming that facilitates data collection for smallholder farmers.

Chain of Custody Standard

Ensures the traceability of sustainability claims along the supply chain from the farm to the end user.

BONSUCRO PRODUCTION STANDARD:

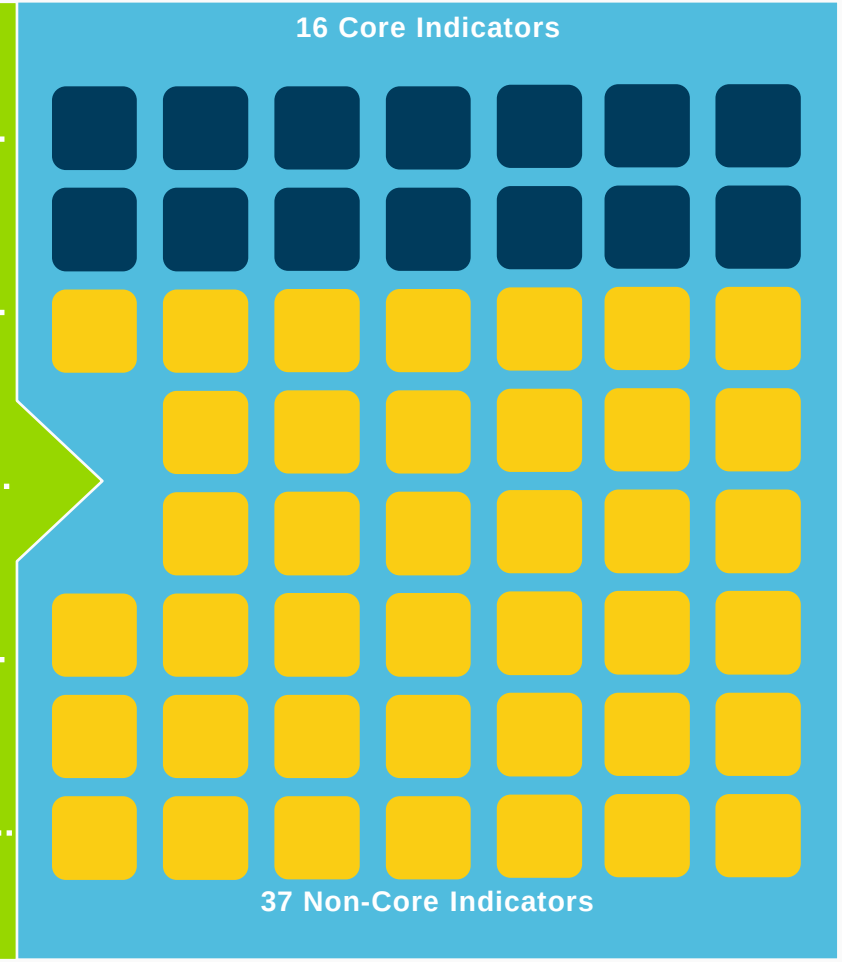
THE MOST GLOBALLY ADOPTED PERFORMANCE FRAMEWORK FOR SUGARCANE

5 Principles (+2)

1. Obey the law
2. Respect human rights and labour standards
3. Productivity – Manage input, production & processing efficiencies to enhance sustainability
4. Environmental – Actively manage biodiversity and ecosystem services
5. Continuous Improvement - Continuously improve key areas of the business
6. EU RED Compliance
7. Organisation of Farmers (Smallholder Standard only)

18 Criteria

53 Indicators



MASS BALANCE AND CREDIT TRADING

Mass Balance

- Requires Chain of Custody Certification
- No current fee to Bonsucro
- On-product claim allowed

Credit Trading

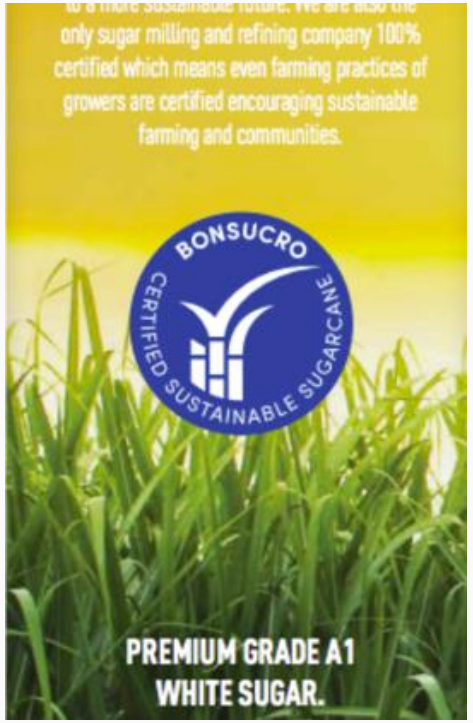
- Presently shifting online
- Decouples from physical
- $1.30 to Bonsucro (50% investment to improvement programmes)
- No on-product claims

MAKING CLAIMS

Bonsucro members who have Chain of Custody certification and purchase Bonsucro certified products can:

Make on-product claims

Display the Bonsucro certification logo



BONSUCRO – REACH & SCALE

27% of global production

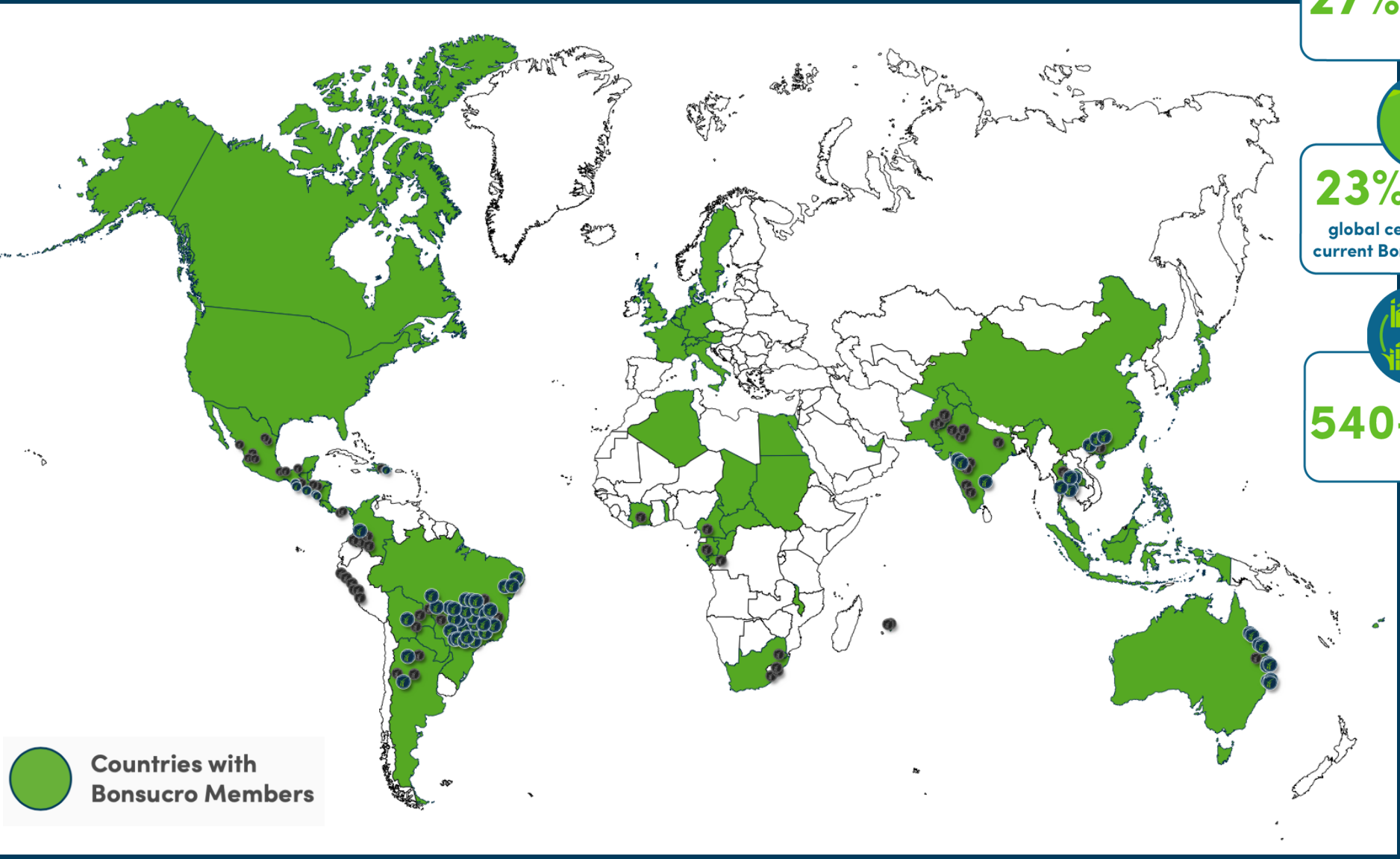
CRITICAL MASS

20% of global purchasing

Bonsucro brings together the supply chains of all leading buyers of sugarcane products.

Corbion
HERSHEY'S
Pernod Ricard
MARS
Cloetta
PEPSICO
ECOVER POWERED BY NATURE
The Coca-Cola Company
BACARDI
Nestlé
FERRERO
FrieslandCampina
Mondelēz International
nomba
WOOLWORTHS LIMITED
GENERAL MILLS
BARRY CALLEBAUT
Unilever

Scaling impact: key highlights



27% of the world's sugarcane land is engaged in Bonsucro

66 million tonnes of certified sugarcane produced

23% • growth potential of global certified land with current Bonsucro members

23% uptake of Bonsucro certified sugar in 2017/2018

540+ Bonsucro members

3.5% of the world's sugarcane production is certified to Bonsucro

South America

68 certified mills

51 mills working towards certification

Current programmes:
- Brazil accelerator

158 Members

HOW DO WE SUPPORT OUR MEMBERS?

Our global community brings together all industry players & stakeholders who can create value through sugarcane

We provide the insights, the network, and the alignment required to transform the industry

We provide an integrated set of tools & services to help producers who want to improve their performance

We offer performance verification to globally recognised standards


IMPROVING
SUGARCANE
PRODUCTION

IMPROVEMENT OPTIONS

Bonsucro offers buyers a range of options to improve supply chain performance

Clear Global Performance Framework

Set clear expectations for your business partners

Bonsucro Connect

Understand and communicate with your entire supply chain

Accelerator Plans

Focus on the regions and issues that matter to you

ACCELERATOR PLANS

Aiming for more thriving, sustainable farming communities, and resilient assured supply chains feeding into the national and international markets.

Objectives:

1. Engagement and ownership by local stakeholders
2. Targeted interventions to address most relevant issues and opportunities
3. Capacity building and support to farmers and mills in key origins

IMPROVEMENT OPTIONS

Bonsucro offers enablers a range of options to support better supply chain performance

Bonsucro Qualification & Technical Support

A variety of tools, trainings and assessments for businesses to build capacity

Innovation Incubator

Bonsucro's laboratory where members & partners can design, test and scale innovations to address sustainability issues

Adelante Initiative

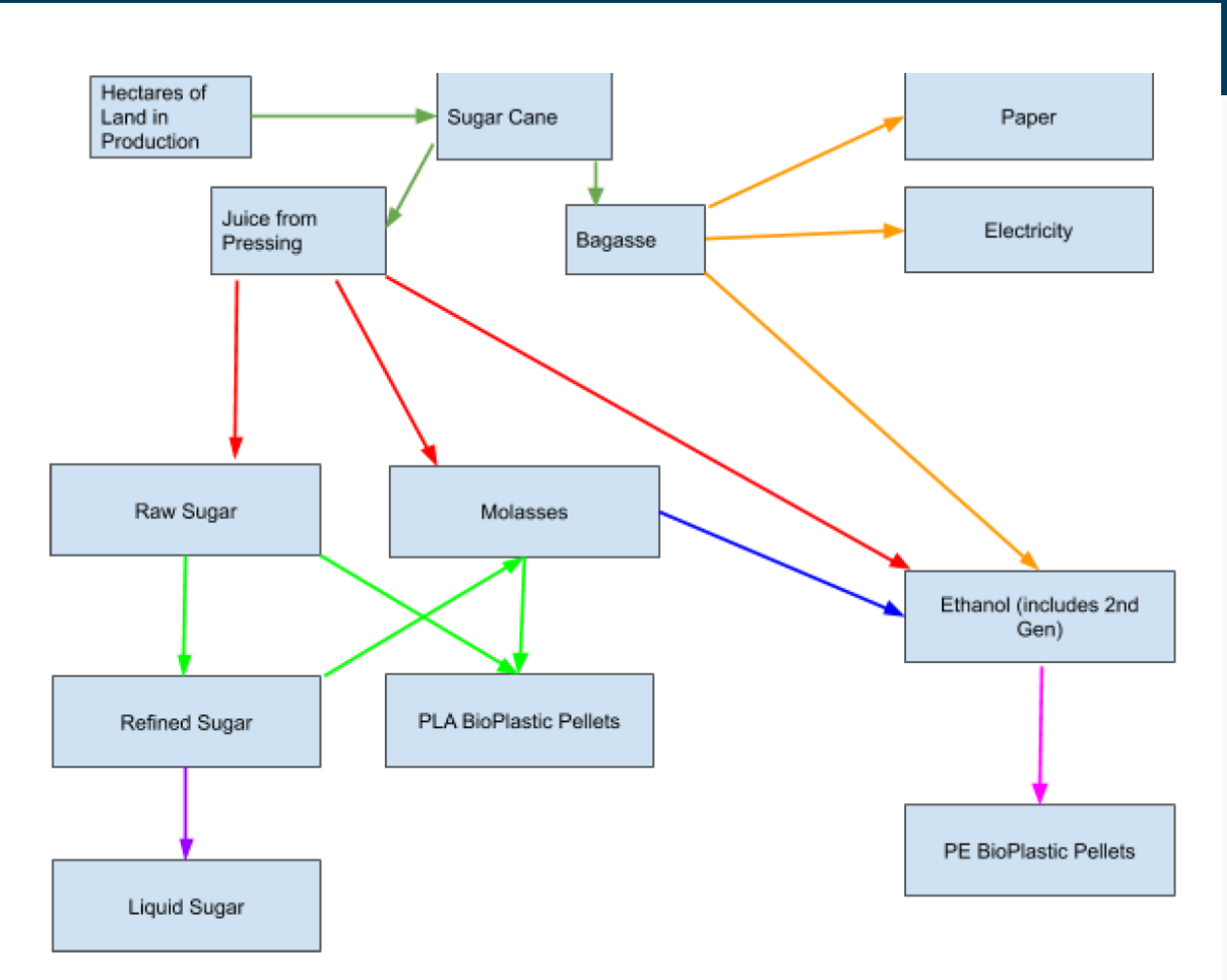
- Through the Adelante Initiative, agricultural producers and health organisations use a dedicated shared platform to better understand and address the causes of the disease, which causes fatal kidney deterioration, with 20,000 lives lost in Central America alone in one decade.
- In the sugar sector, this includes identifying risks posed by existing production practices and identifying ways to both improve safety and raise productivity, in order to slow progression of the disease and help to prevent its onset among the workforce. Additionally, the initiative seeks to influence policy, raise public awareness of the epidemic, and expand access to treatment for those suffering from the disease.
- La Isla Network, Mill San Antonio, CNPA and Bonsucro are developing and validating practical, on-the-ground initiatives to protect workers from undue heat stress and help prevent those already suffering from CKDu from experiencing rapid deterioration, while strengthening our understanding of the underlying causes.

- More information: http://adelanteinitiative.org/


OUR
EXPERIENCE
WITH
BIOMATERIALS

BIOMATERIALS FROM SUGARCANE

Exciting new opportunities in an fast-growing market



BRASKEM

Transforming ethanol into biopolymers for the world market

- Braskem decided to join Bonsucro on 28 December 2010, primarily due to business opportunities in the ethanol sector in Brazil.
- Braskem quickly saw potential for expanding its biomaterials portfolio and became a global leader in the sustainable bioplastic market. Its bioplastics team developed innovative sugarcane plastic products that are now being used in shoes, toys, packaging and other products.
- For Bonsucro, Braskem's case teaches an important lesson: that manufacturers in the middle of the supply chain can take a leading role in supporting improvement at farmers and mills as well as encouraging clients and final buyers to move towards sustainable procurement, improving collaboration and relationship, and securing market demand. This demonstrates that a top-down approach from final buyers is only one and not always the most effective tactic to transform a supply chain.

CORBION

First use of Bonsucro Certified material into PLA production

- Corbion is converting renewable, Bonsucro-certified sugar supplied by major Thai sugarcane milling groups and exporters Mitr Phol and Saraburi Mill from Thai Roong Ruang (TRR) group into lactic acid which is converted into polylactic acid (PLA) bioplastics by Total Corbion PLA.
- "With Bonsucro certification, we can now offer our customers the guarantee that the biomass used to produce PLA was grown supporting the principles of sustainable agriculture," François de Bie, Total Corbion.
- "By monitoring their use of inputs and adopting simple, sustainable practices, such as analysing soil health and using biological fertiliser, smallholders are already reducing their costs and improving productivity." Techanit Onaree, TRR Sugar Group.

More information (see Outcome Report): http://www.bonsucro.com/our-impacts/


LATEST IMPACT REPORTING
Supporting the Global Goals

Validating sustainability standards

University of Minnesota, published in PNAS journal

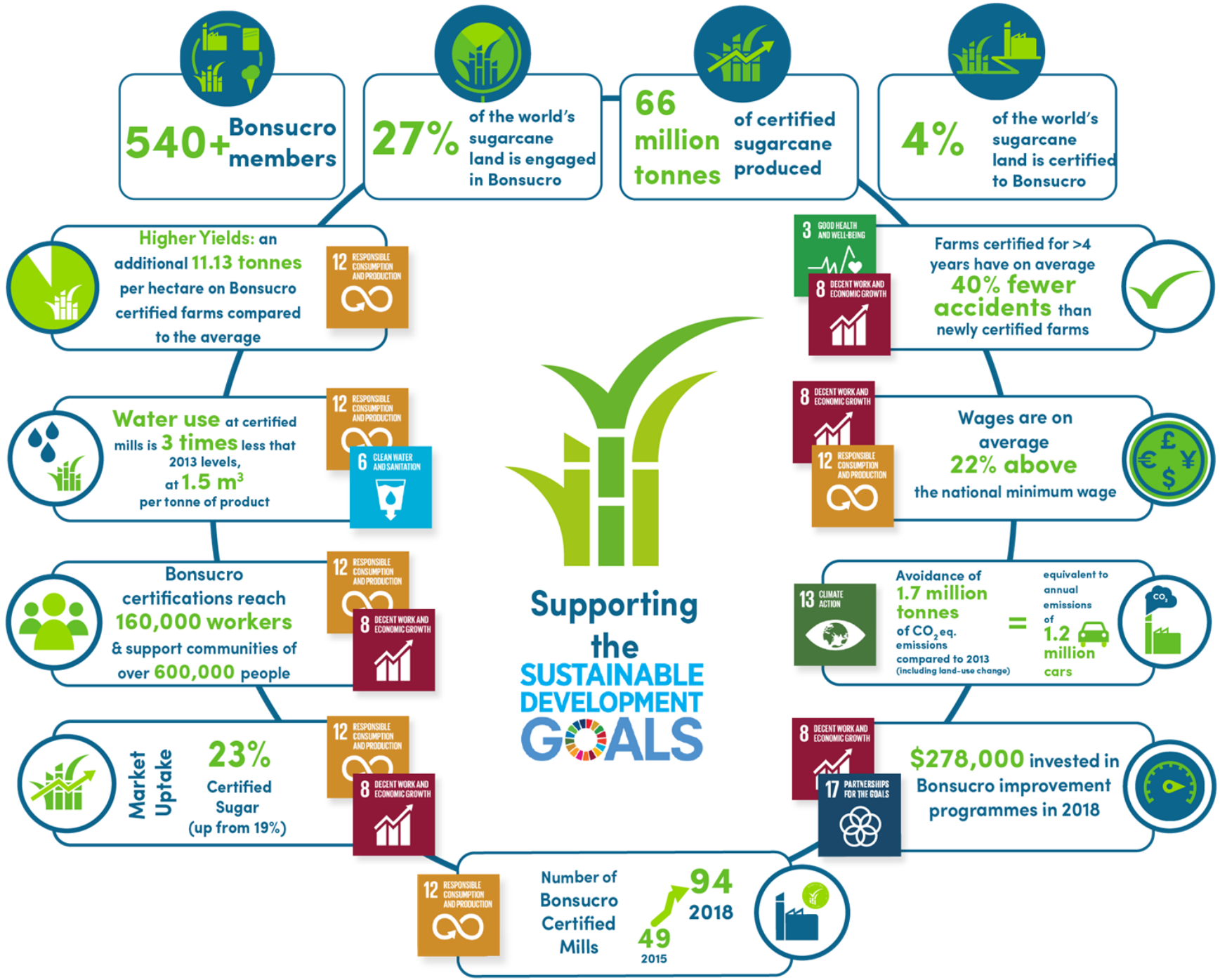
Global adoption of Bonsucro Standard would:

- **Increase sugarcane yields.**
- **Reduce water usage by 65%.**
- **Reduce GHG emissions by 51%.**

34%
reduction in
nutrient loading

51%
reduction in
GHG emissions

65%
reduction in
water use


540+ Bonsucro members
27% of the world's sugarcane land is engaged in Bonsucro
66 million tonnes of certified sugarcane produced
4% of the world's sugarcane land is certified to Bonsucro
Higher Yields: an additional 11.13 tonnes per hectare on Bonsucro certified farms compared to the average
Water use at certified mills is 3 times less that 2013 levels, at 1.5 m³ per tonne of product
Bonsucro certifications reach 160,000 workers & support communities of over 600,000 people
Market Uptake
23% Certified Sugar (up from 19%)
Supporting the SUSTAINABLE DEVELOPMENT GOALS
Number of Bonsucro Certified Mills
49 2015
94 2018
Farms certified for >4 years have on average 40% fewer accidents than newly certified farms
Wages are on average 22% above the national minimum wage
Avoidance of 1.7 million tonnes of CO_2 eq. emissions compared to 2013 (including land-use change)
= equivalent to annual emissions of 1.2 million cars
$278,000 invested in Bonsucro improvement programmes in 2018
12 RESPONSIBLE CONSUMPTION AND PRODUCTION
6 CLEAN WATER AND SANITATION
8 DECENT WORK AND ECONOMIC GROWTH
3 GOOD HEALTH AND WELL-BEING
13 CLIMATE ACTION
17 PARTNERSHIPS FOR THE GOALS

THANK YOU!

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BONSUCRO.COM

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BON SUCRO

The global sugarcane platform

Q&A with Rafael Seixas from Bonsucro

TextileExchange

NatureWorks

Sustainable Feedstock Sourcing for Ingeo Biopolymers ISCC PLUS Certification

Textile Exchange, Biosynthetics E-learning Webinar

Erwin Vink, Sustainability Manager

May 20, 2019

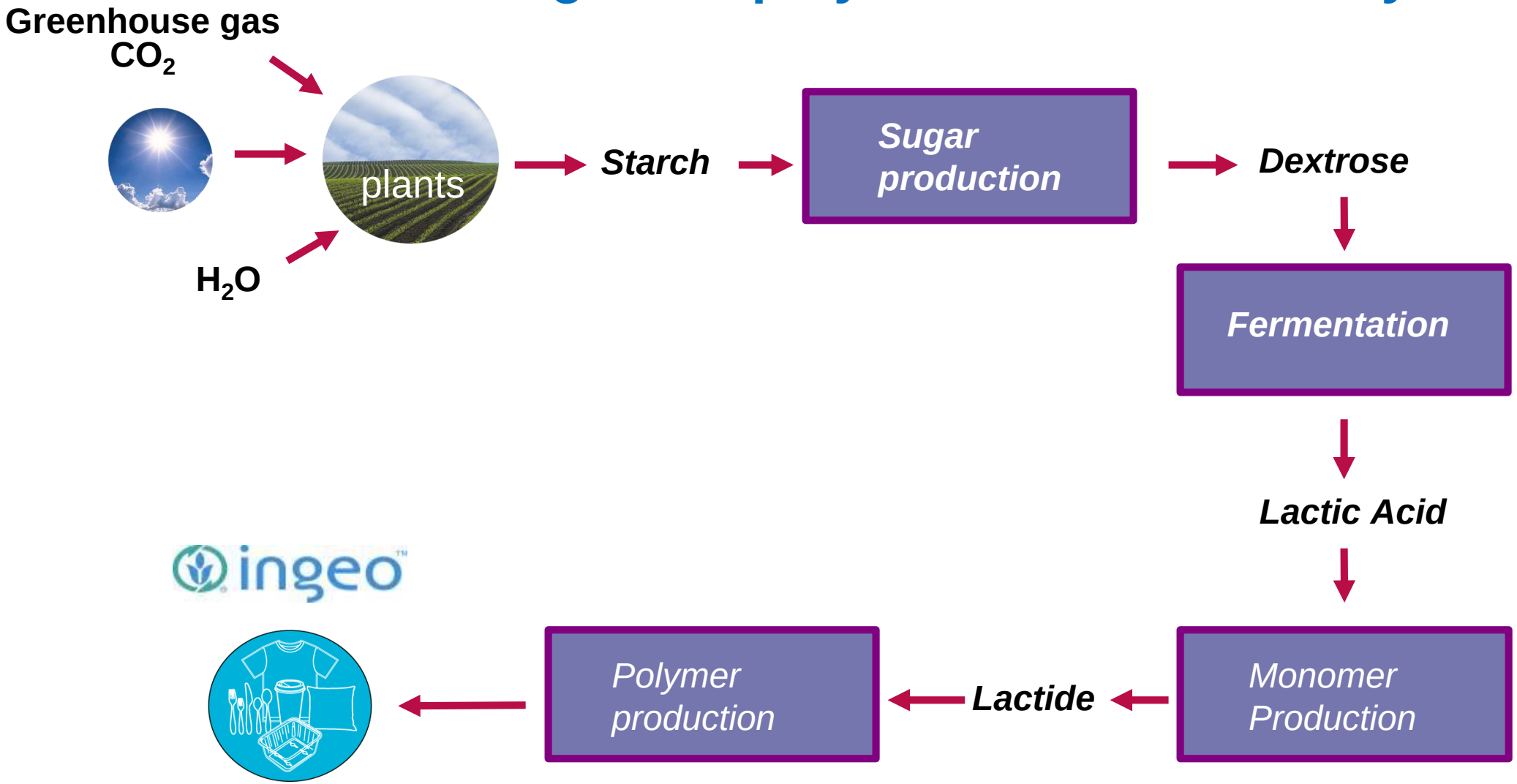
Overview

1. Introduction to NatureWorks LLC.
2. NatureWorks' Certification Tool Box.
3. The Need to move to Sustainable Biomass Production.
   - ✓ The Circular Economy for Plastics; EMF slides.
   - ✓ The need for Sustainable Feedstock Sourcing & NatureWorks' Commitment.
4. Where it all started.
5. ISCC PLUS Sustainable Feedstock Certification.
6. Value for NTR, our Customers and Society in general
7. Communication materials.
8. Background information ISCC Systems.
   - ✓ Stakeholder involvement, Recognition, Benchmarking.

NatureWorks LLC

- **World leading bio-polymer player**
  - 150,000 ton plant in Blair, NE
  - Significant manufacturing know-how with an extensive IP position
- **Jointly owned by Cargill and PTTGC**
- **Established global market channels**
  - Commercial partnerships with global brands
  - Sales team in 15 countries across North America, Latin America, Europe, and Asia
- **Dedicated in-house Applications Development and R&D Facilities**
- **Competitive on a cost and performance basis with traditional plastics (PS, PET)**
- **Strong environmental expertise and product characteristics**
  - Peer reviewed LCA's and eco-profile demonstrate smaller carbon footprint and lower fossil energy use
  - Products enable portfolio of end-of-life options
  - Dedicated internal team for understanding environmental and end-of-life impacts

How Ingeo Biopolymers are made today.



NatureWorks is committed to feedstock diversification and Sustainable Feedstock Sourcing.

by producing Ingeo biopolymers from the right, abundant, local resources,

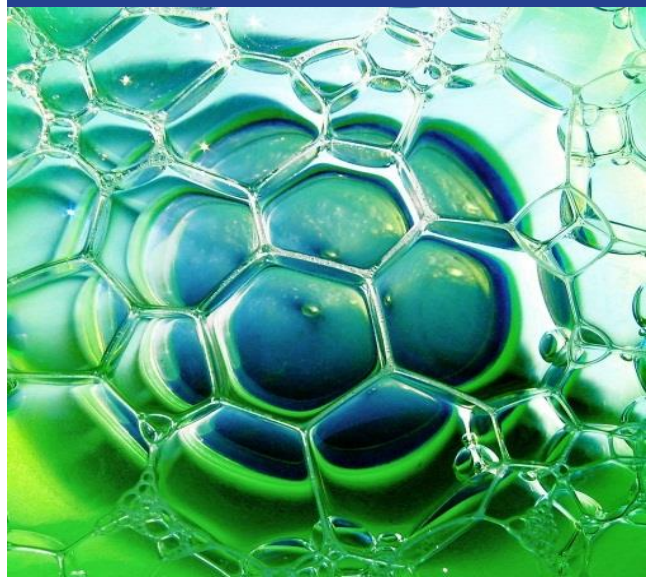
Today

Sugars from corn, sugar cane, wheat, beets or cassava.

Industry developing

Sugars from cellulosic materials like corn stover, wood, bagasse, switch grass and straw.

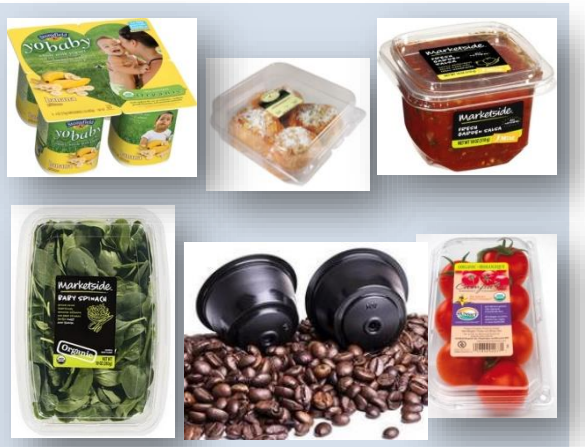
Industry developing



CO_2 to lactic acid technology
CH_4 to lactic acid technology
“Direct GHG Conversion”

The Global Market for Ingeo biopolymers

Rigids



Food Serviceware

Films

Wovens Non Wovens

Durables

Lactides

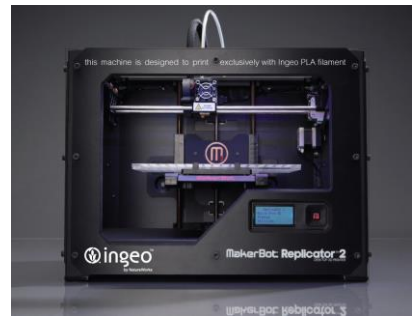
Coatings

Adhesives

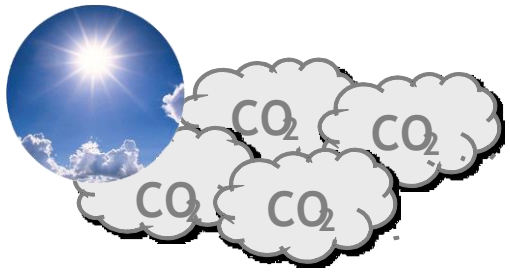
Intermediates

vercet

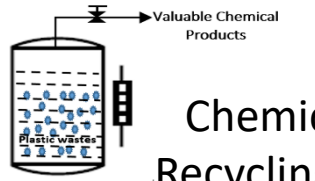
3D printing



End of life options



ingeo™



Chemical Recycling by hydrolysis

Lactic acid market

Incineration with Green Energy Recovery

Organic Recycling – Industrial composting – Anaerobic Digestion

Mechanical Recycling

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   - ✓ Stakeholder involvement, Recognition, Benchmarking.

Feedstock related 3rd party Certification Toolbox for Ingeo Biopolymers

BASE CERTIFICATIONS

BIOBASED CARBON CERTIFICATION
Verifies that 100% of the carbon in Ingeo comes from renewable resources.

GENESCAN CERTIFICATION
Verifies that Ingeo biopolymer is free of any genetic material.

ISCC PLUS
Verifies the sustainable production of the agricultural feedstock used for Ingeo biopolymers, including the chain of custody.

OPTIONAL CERTIFICATIONS

1. **ISCC PLUS & Non-GM Feedstock**
Verifies the sustainable production of Non-GM agricultural feedstock used for Ingeo biopolymers, including the chain of custody.

2. **WORKING LANDSCAPE CERTIFICATES**
Alternative 3rd party (IATP) certification scheme for the sustainable production of Non-GM agricultural feedstock for the production of Ingeo biopolymer.

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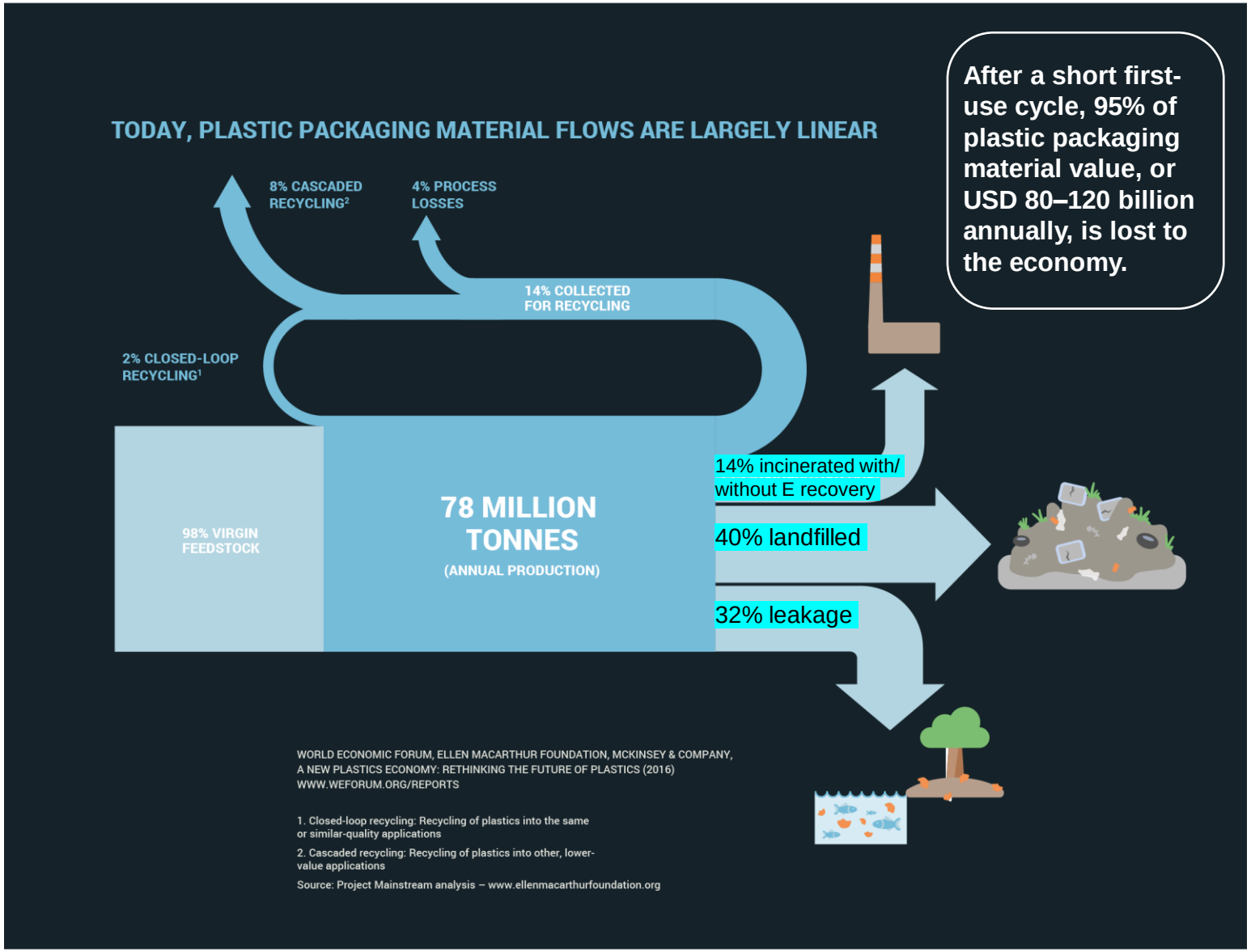
The New Plastic Economy – Linear Model

THE NEW PLASTICS ECONOMY RETHINKING THE FUTURE OF PLASTICS, EMF, 2016

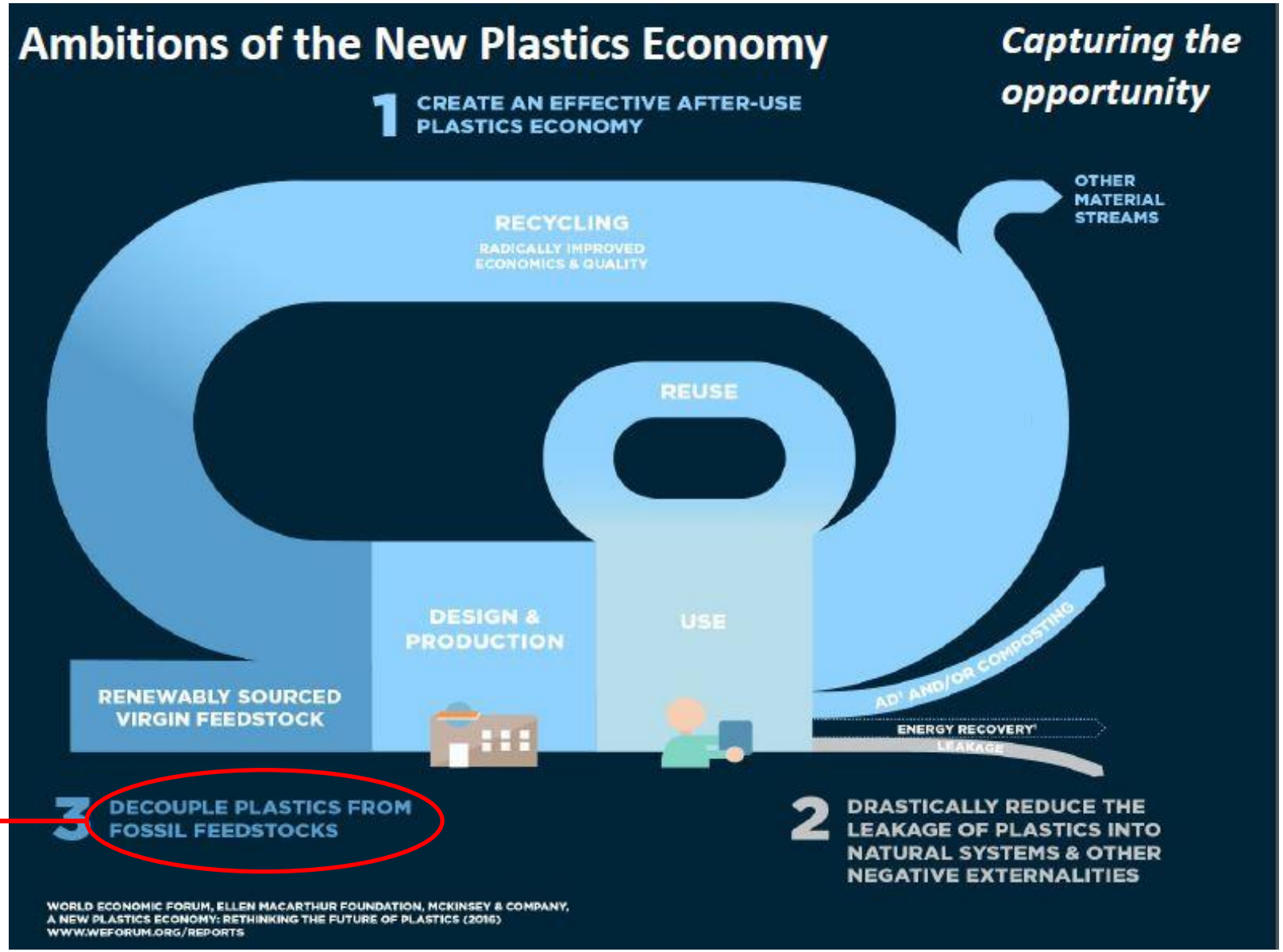
GLOBAL PARTNERS OF THE ELLEN MACARTHUR FOUNDATION

DANONE Google H&M RENAULT SOLVAY Unilever INTESA SANPAOLO PHILIPS



The New Plastic Economy – Circular Model

THE NEW PLASTICS ECONOMY RETHINKING THE FUTURE OF PLASTICS, EMF, 2016



Need to secure that renewable resources are produced in a sustainable way.

How does the EMF bring these ambitions into practice?

On the Our Ocean Conference in Bali on 29th October 2018 the Ellen MacArthur Foundation launched the New Plastic Economy Global Commitment to eliminate plastic waste and pollution.

This commitment was signed by 350 organizations,
(150 businesses, 16 governments, 26 financial institutions,
6 investors, Leading Institutes like WWF, WEF, CGF and IUCN)
representing 20% of all plastic packaging used globally.

Targets include:

- ✓ **Eliminate problematic or unnecessary plastic packaging through redesign and innovation.**
- ✓ **Reuse models are applied where relevant.**
- ✓ **All plastic packaging can be reused, recycled or composted by 2025.**
- ✓ **The use of plastic is fully decoupled from the consumption of finite resources (fossil fuels).**
- ✓ **All plastic packaging is free of hazardous chemicals, and the health, safety, and rights of all people involved are respected.**

WEF: World Economic Forum, CFG: Consumer Goods Forum; IUCN: International Union for Conservation of Nature.

NatureWorks contribution to the New Plastics Economy Global Commitment

NatureWorks committed to the following goals in support of sustainable agriculture for biopolymer production:

NEW PLASTICS ECONOMY Global Commitment

1. **By 2019, 60% of our feedstock will be sustainably produced via ISCC PLUS.**
2. **By 2020, 100% of our feedstock will be sustainably produced via ISCC PLUS.**
3. **By 2025, we ensure that 100% of new feedstocks for additional manufacturing capacity will be sustainably produced via an independent, 3rd party program.**

ISCC International Sustainability & Carbon Certification

The commitments of all 350 signatures are described in:
New Plastics Economy Global Commitment, Spring 2019 Report, March 13, 2019.

https://newplasticseconomy.org/news/spring-2019-report

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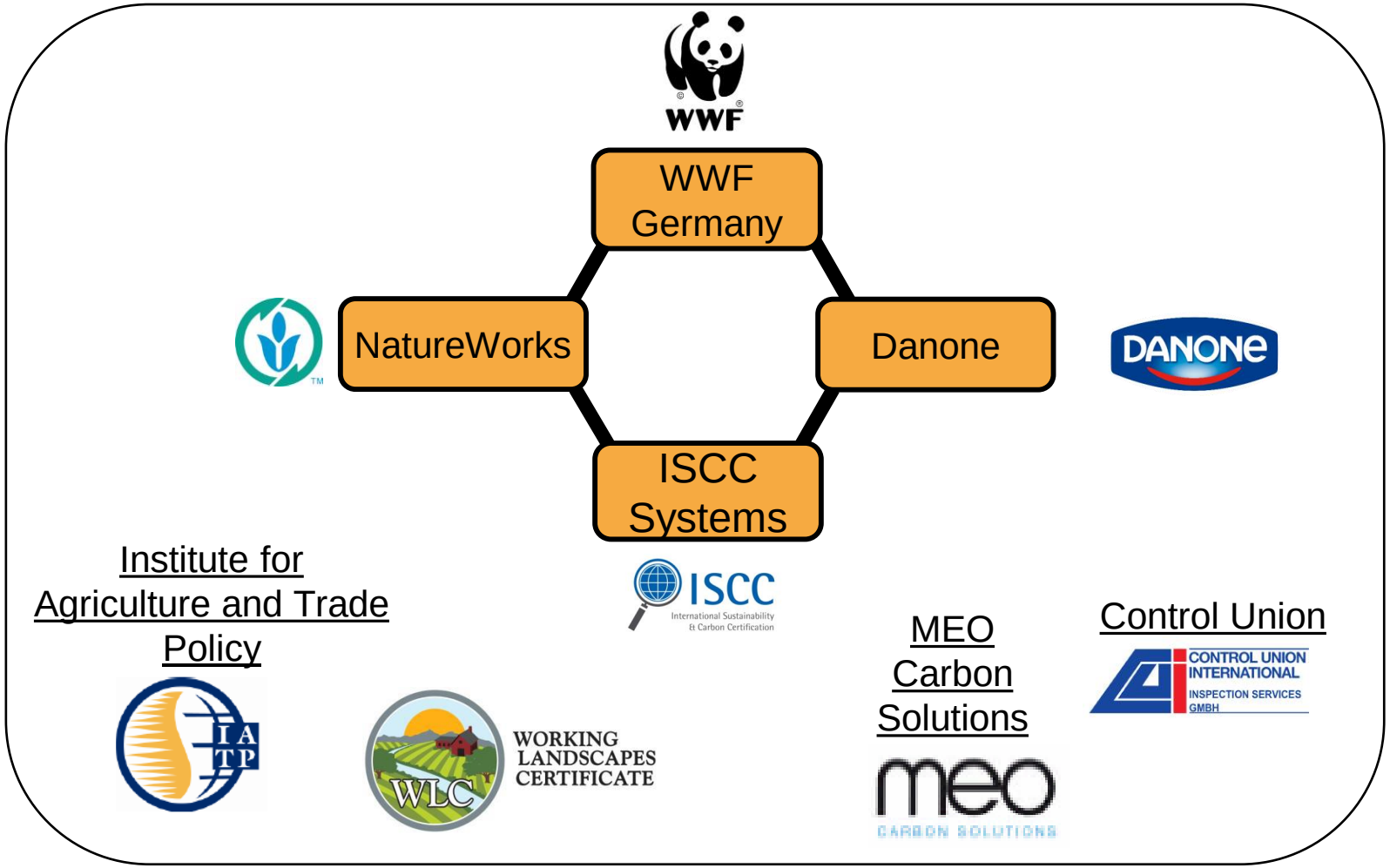
Sustainable Feedstock Sourcing Program: Where did this all started?
Early 2011: Multi-party Project Kickoff:



October 2011: Audit the Ingeo production chain







ISCC
International Sustainability & Carbon Certification

- In Feb 2012, ISCC Systems GmbH launched the ISCC PLUS Certification scheme.
- ISCC PLUS is a *scheme certifying the sustainability of agricultural feedstocks used for bio-based products.*
- www.iscc-system.org/en/

PCU DEUTSCHLAND

Certified Sustainability ISCC ISCC PLUS

ISCC PLUS Certificate

Certificate Number: ISCC-PLUS-Cert-DE105-82892104

PCU Deutschland GmbH
Dorotheastr. 30, D-10318 Berlin
certifies that
Natureworks LLC
650 Industrial Drive, Blair, NE 68008
United States of America

complies with the requirements of the certification system
ISCC PLUS
(International Sustainability and Carbon Certification)

This certificate is valid from 08.03.2018 to 07.03.2019.

The certified site of the system user is a (type of operation):
Bioplastics Plant

The scope of the certificate includes the following chain of custody options:
Mass balance

Berlin, 08.03.2018
Place and date of issue

PCU Deutschland GmbH
Dorotheastr. 30 · D-10318 Berlin
Stamp, Signature of issuing party

The issuing Certification Body is responsible for the accuracy of this document.
Version / Date: 1 (no adjustments) / 08.03.2018

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ISCC: The International Sustainability & Carbon Certification Scheme

ISCC PLUS	ISCC EU	ISCC Non-GMO
Food, Feed, Bio-based products, Energy, Bio-fuels outside EU.	Biofuels in EU	Non GMO Feed and Food

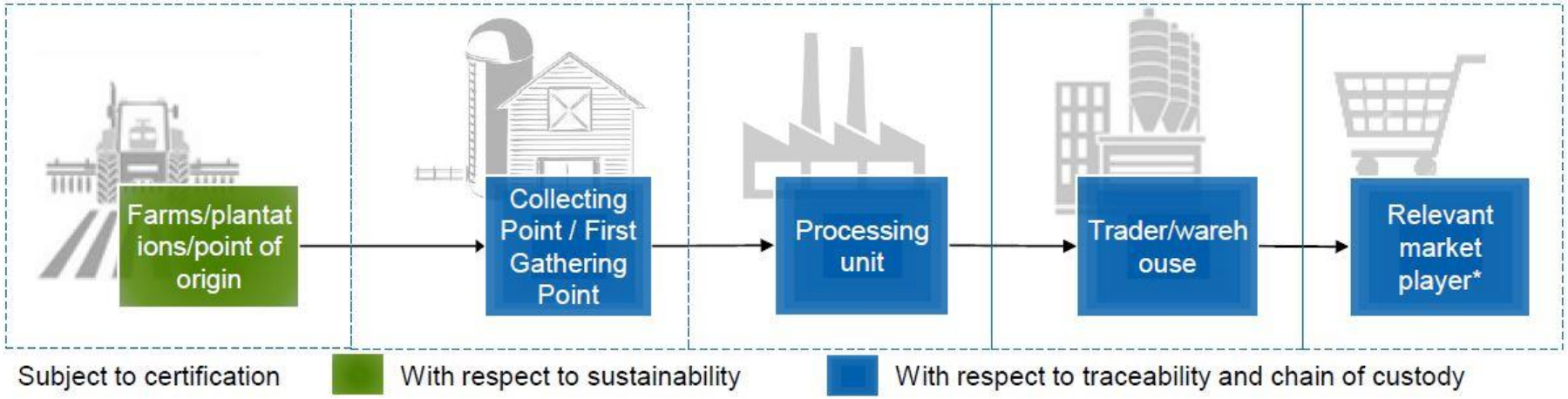
Voluntary Add-on implemented by NatureWorks:

- Non GMO technical markets

ISCC is a leading certification scheme active on a global scale

- ✓ ISCC Certification applies to Food, Feed, Fuel and Biomaterials.
- ✓ 10,000 + certificates.
  Used by 3400 companies.
  In more than 100 countries.
- ✓ 32 certification bodies with 600 trained auditors.
- ✓ Yearly trainings on: Basics, PLUS, GHG, LUC, waste.
- ✓ Annual Regional Stakeholder and Technical Committee meetings in Europe, SEA, North and Latin America.
- ✓ Annual Global Sustainability Conference.

ISCC certifies farms that comply with the ISCC PLUS sustainability standard and certifies the supply chain to guarantee Traceability.



Farms/plantations: ISCC Sustainability Standard

Economic operators in supply chain: Traceability and Chain of Custody (CoC)

CoC "Mass balance":
Physical mix, Separation of ISCC compliant materials in bookkeeping

CoC "Physical Segregation":
Physical and bookkeeping separation of ISCC compliant materials

Sustainable products sold with ISCC Sustainability Declarations

Logo use and claims depend on type of certification

ISCC PLUS ‘Sustainability Requirements’ are based on 6 Principles determined in a Multi-Stakeholders Process. (+ examples of measures)

- No sourcing from land with high biodiversity (forest & grass land or land with endangered species or ecosystems), high carbon stock (wetlands); and peatland.
- Ref. year is 2008.

- Protection of soil, air and water quality.
- Best Tillage practices; Best Fertilizer application practices
- Irrigation practices
- Reduce soil erosion
- Maintain Soil organic C
- Handling pesticides (storage, calibration, waste disposal)
- Protect vegetation and watercourses surrounding the acres. Etc. etc.

- Defines safe working conditions including health, safety and hygiene policies, training, the use of protective clothing and procedures in case of accidents.

- Covering the rights of workers and local communities.
- Biomass production does not impair food security.
- All children living on farm have access to education.
- No forced labor nor discrimination.

- All biomass production shall take place in compliance with applicable regional and national laws and shall follow international treaties.

- The minimum requirements of good management practices (basic economic and management documentation)
- which shall be implemented by the audited party.

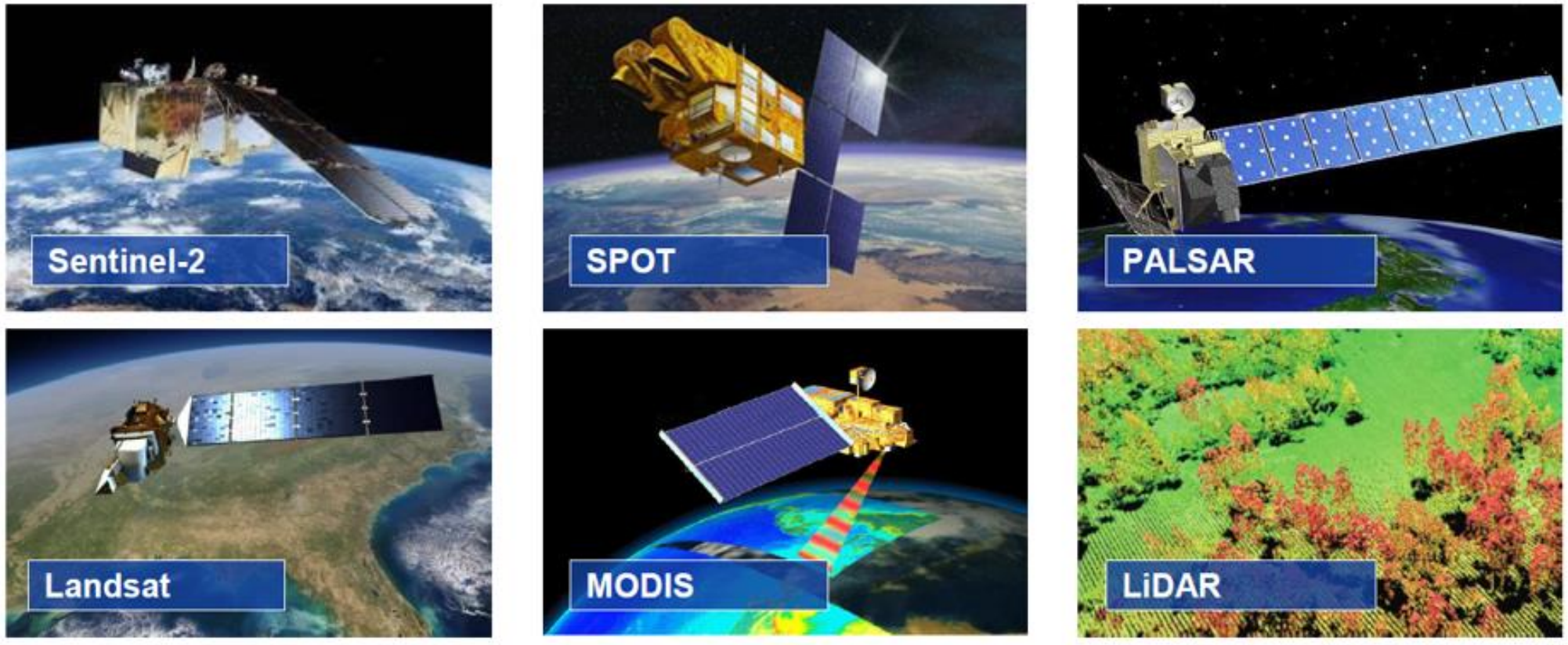
Source: ISCC-202, Sustainability Requirements Version 2.0, 2016 ISCC Systems GmbH.

ISCC PLUS ‘Sustainability Requirements’ are based on 6 Principles determined in a Multi-Stakeholders Process. (+ examples of measures)

- ISCC is working in total with 86 different criteria.
- 46 are Major Musts and need to be fulfilled like no deforestation and certain social issues.
- 40 are Minor Must of which 60% must be fulfilled.

Source: Innovation takes route, San Diego, September 10, 2018, ISCC Certification – sustainable and non-GMO feedstocks for the Bioplastics Industry, Dr. Norbert Schmitz, ISCC System GmbH

ISCC uses latest remote sensing technology and sensors to identify land use change, deforestation and degradation of land cover.

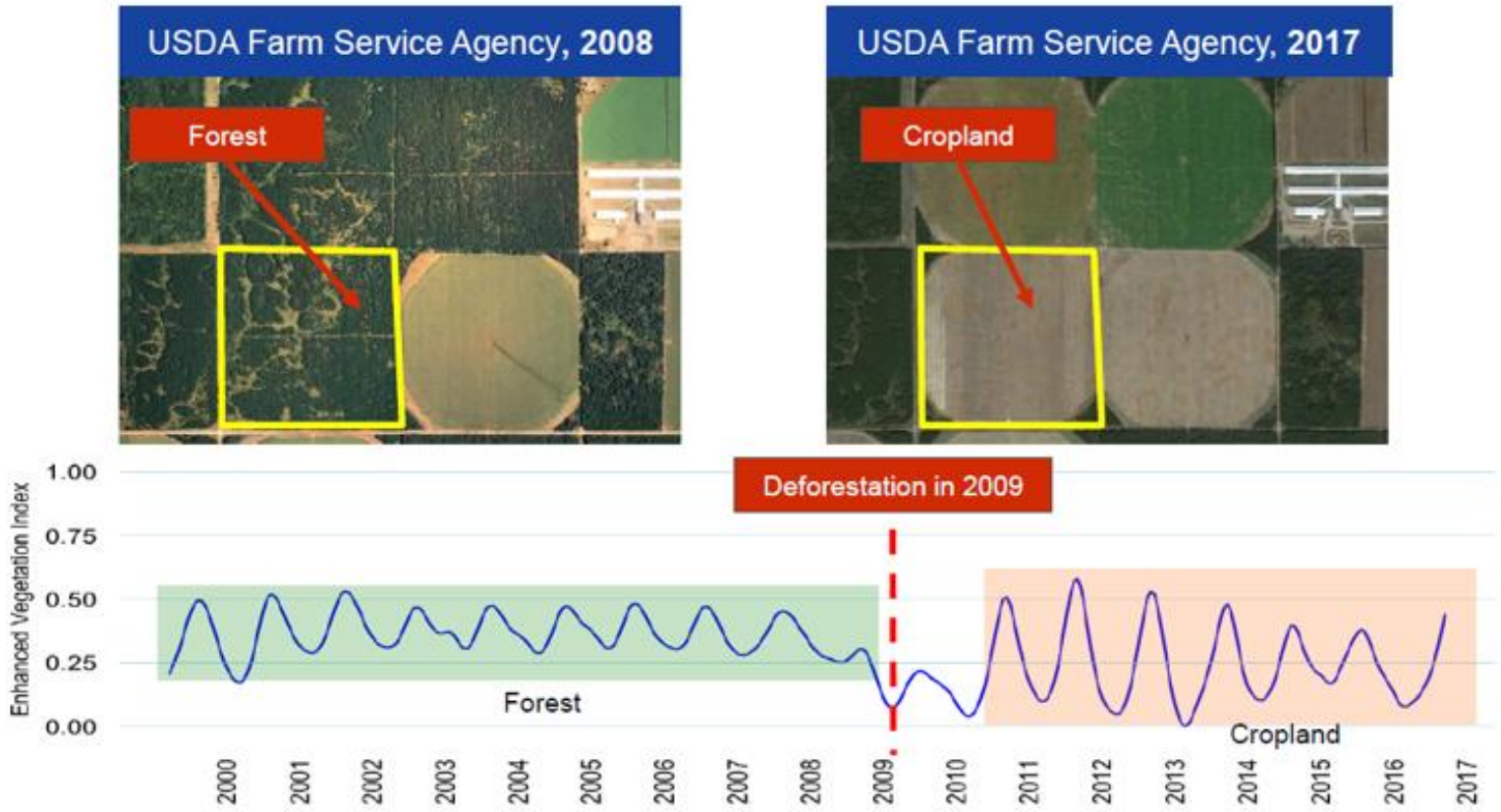


ISCC

Source: Innovation takes route, San Diego, September 10, 2018, ISCC Certification – sustainable and non-GMO feedstocks for the Bioplastics Industry, Dr. Norbert Schmitz, ISCC System GmbH

NatureWorks

The conversion from forest to annual crop can be analyzed by comparing high resolution satellite images and EVI time series



Source: Innovation takes route, San Diego, September 10, 2018, ISCC Certification – sustainable and non-GMO feedstocks for the Bioplastics Industry, Dr. Norbert Schmitz, ISCC System GmbH

Innovative Technology support the credibility and efficiency of ISCC
Part of continuous improvement process

Verification of ISCC compliance with GRAS – Remote sensing technology to detect land-use change

Development of new audit procedure tool to increase practicability and decrease audit costs (APS)

ISCC
International Sustainability & Carbon Certification

Management of risks and fraud prevention with a resource intensive and stand-alone Integrity Program

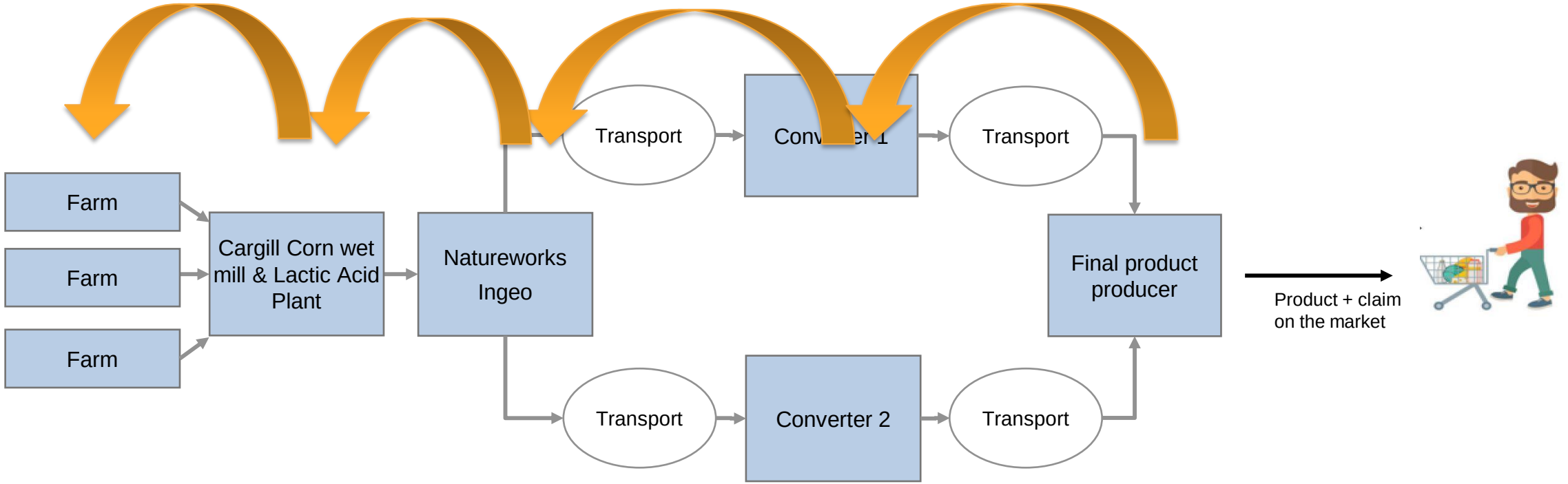
Cooperation with 32 Certification Bodies to ensure reliable third-party verification of System Users

Reference: Dr. Norbert Schmitz, ISCC Systems GmbH

ISCC PLUS “Chain of Custody“ - Traceability of volumes

The ISCC scheme *certifies the chain of custody* – each blue box is independently audited and certified.

Chain of Custody means that the total volume of Ingeo products put on the market by the “Final product producer” can be traced back (and documented through a “mass balance system”) to the equivalent amount of certified, sustainable corn produced and delivered.



Sustainability Standards for Major Commodities

Round Table on Sustainable Palm Oil (RSPO)
Palm Oil

Forest Stewardship Council (FSC)
Timber, pulp, paper

Round Table on Responsible Soy (RTRS)
Soy

BCI
Better Cotton Initiative

Better Cotton Initiative (BCI)
Cotton

Bonsucro
Sugarcane

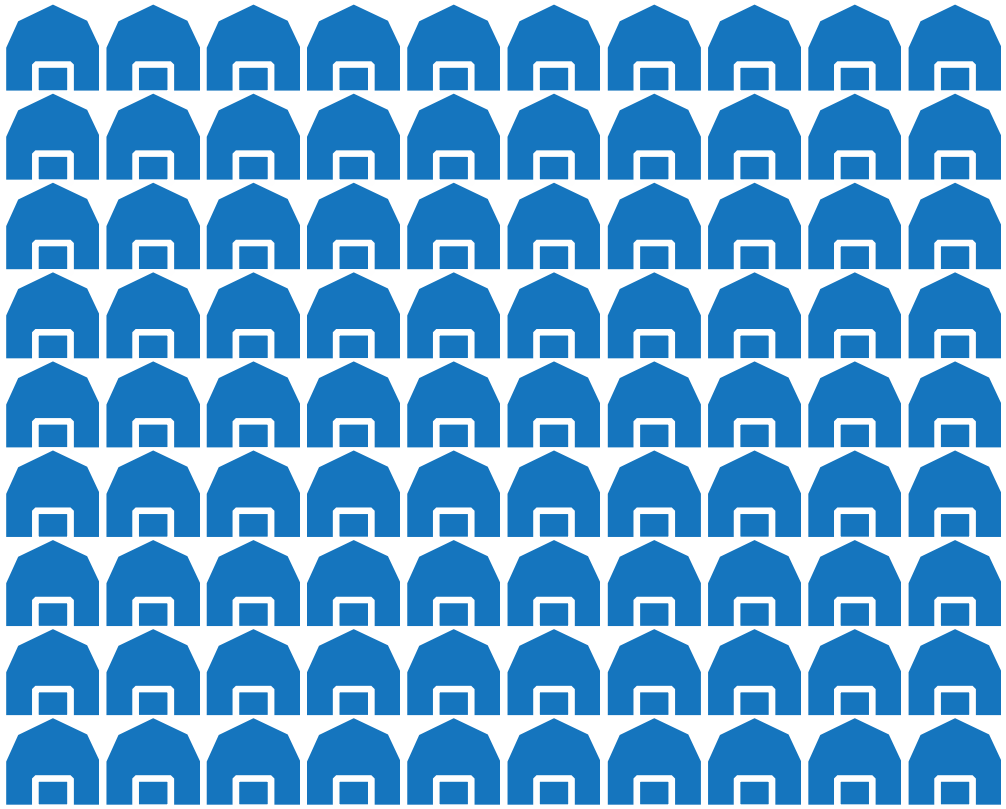
ISCC
International Sustainability & Carbon Certification

ISCC PLUS
Biomass

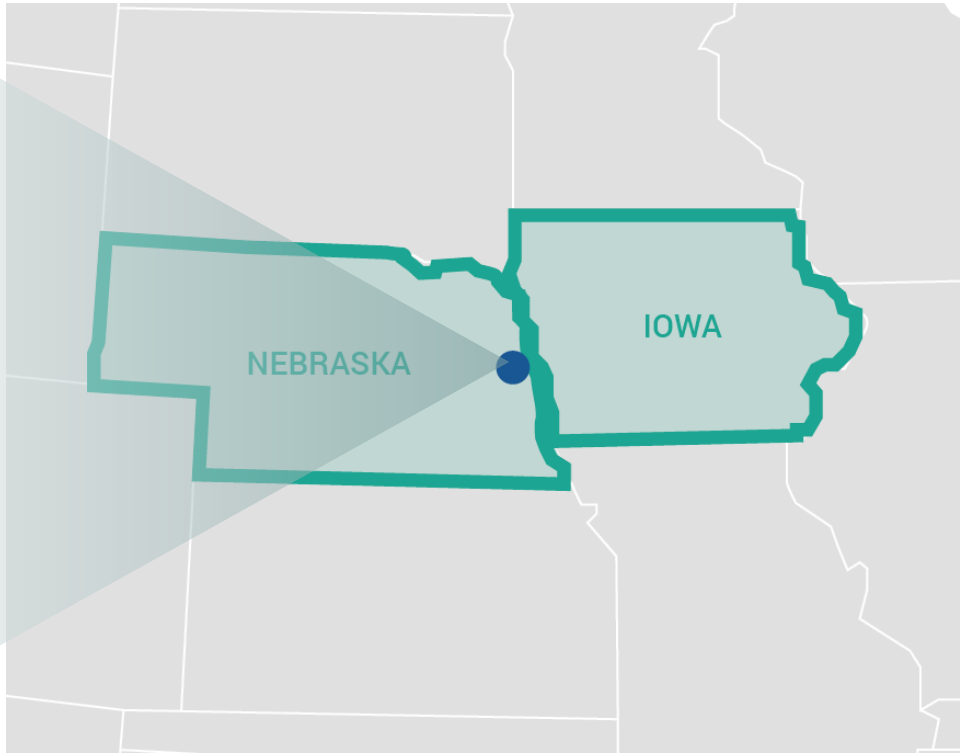
Ingeo Sustainable feedstock Sourcing Certification.

Nothing similar exists for any fossil based plastic (certification from the wellhead forward …)

ISCC PLUS: Changing local agricultural growing practices



90 farms / 85,200 acres



We implemented the basic ISCC PLUS Certification and included the Add-on: Non GMO for Technical Markets

Yellow Dent #2 feed corn sourced from farms within 50 miles of our plant in Blair, NE

Contract farmers for Non GM corn

100% ISCC PLUS certified by 2020

ISCC PLUS + Non GM for Tech. Markets certified

NatureWorks facility in Blair, NE

eurofins
Verified free of genetic material[2]
eurofins | GeneScan

ingeo™ vercet

General market for Ingeo products

Part of Ingeo market has the special request for a non GM feedstock*.

** Tracked using mass balance book keeping system.*

Overview

1. Introduction to NatureWorks LLC.
2. NatureWorks' Certification Tool Box.
3. The Need to move to Sustainable Biomass Production.
   - ✓ The Circular Economy for Plastics; EMF slides.
   - ✓ The need for Sustainable Feedstock Sourcing & NatureWorks' Commitment.
4. Where it all started.
5. ISCC PLUS Sustainable Feedstock Certification.
6. Value for NTR, our Customers and Society in general
7. Communication materials.
8. Background information ISCC Systems.
   - ✓ Stakeholder involvement, Recognition, Benchmarking.

ISCC PLUS
Value NatureWorks, our Partners and the Society in General

1. Take Responsibility by addressing Sustainable Feedstock Sourcing with 3rd Party Certification.
2. Provide Transparency / Traceability back to Farmer.
   - Maintain a database of the farmers that are in this program.
4. ISCC PLUS is Endorsed by multiple key stakeholders.
5. Differentiation from fossil based plastics; 'Fossils' have nothing in place.
6. Maintain Leadership in Sustainable Biopolymer Production.
7. Delivering on our Commitment to critically assessing the sustainability of each and every feedstock we use
8. Do our part to contribute to the Society for more Sustainable Farming.

ISCC PLUS
Value NatureWorks, our Partners and the Society in General

ISCC contributes to the UN Sustainable Development Goals

PRINCIPLE 1: Zero deforestation after 2007	Protection of primary forests and forested areas, high carbon stock land, peat- and wetlands, protected and highly biodiverse areas
PRINCIPLE 2: Good agricultural practice	Agricultural and forestry production shall protect soil, water and air and ensure a sustainable use of land
PRINCIPLE 3: Safe working conditions	Ensure workers health and safety during work. Improve competence and knowledge via training
PRINCIPLE 4: Social conditions	Ensure good labor conditions and limit impacts to surrounding communities
PRINCIPLE 5: Compliance with laws	Comply with all regional and national laws and international treaties
PRINCIPLE 6: Good management practices	Recording system and compliance of subcontractors

Contribute to:

ISCC is in line with OECD/FAO guidance for responsible agricultural supply chains.

Organization for Economic Co-operation and Development /
Food and Agriculture Organization of the UN

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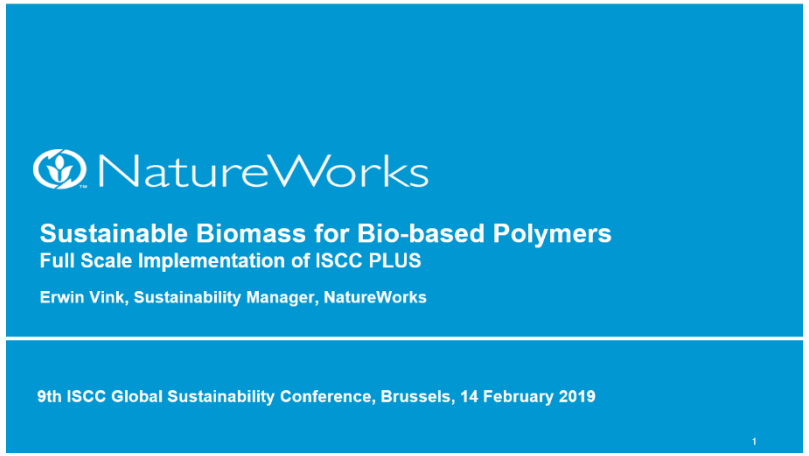
Communication around the 100% coverage with ISCC PLUS




NatureWorks

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NatureWorks Announces 100 Percent Third-Party Certified Sustainable Feedstock by 2020

Agricultural feedstocks for Ingeo biopolymer will be certified as environmentally and socially sustainable by the International Sustainability & Carbon Certification System.

MINNETONKA, Minn., February 14, 2019 — A new initiative at NatureWorks

ISCC International Sustainability & Carbon Certification

About Process Certificates Trainings & Events Stake

Press release from NatureWorks: 100% ISCC Certified Sustainable Feedstock by 2020

NatureWorks press release, Minnetonka (USA), 14 February 2019

NatureWorks has announced that 100% of their feedstock for biopolymers and performance chemicals will be ISCC PLUS certified by 2020. More than 90 farms will be involved in the program contributing to the production capacity of 150,000 metric tons of biopolymers. Currently, already 60% of NatureWorks feedstock are produced under ISCC PLUS.

Being certified since 2012, NatureWorks has been the first biopolymers manufacturer under the ISCC PLUS certification system. With their commitment to feedstock diversification and the decoupling of plastics from fossil feedstocks the company is an important driver of the bio-economy.

ISCC International Sustainability & Carbon Certification

100% commitment to sustainable biopolymers

Cologne, 13 March 2019

Biopolymers are increasingly being used to package consumer products instead of using fossil resources. Biodegradable polymers like PLA (polylactic acid) are ideal for these applications. NatureWorks has pioneered the commercialisation of Ingeo (PLA) biopolymers made from natural, renewable materials over the last twenty years. Its Ingeo biopolymer is made from locally grown crops in the USA and exported worldwide for both single-use and durable products, from coffee capsules and tea bags to nappies and appliances. As more of us eat 'on the go' we also need cutlery, cups and disposable containers that can be recycled separately or composted together with the food waste.


Corn farmers

The company has become a key driver of the bio-economy. In recognition of their leading role, and the importance of biopolymers in a Circular Economy, NatureWorks is now a signatory of the Ellen MacArthur Foundation's New Plastics Economy Global Commitment. NatureWorks first gained ISCC PLUS certification in 2012 for Ingeo production, one of the first biopolymers manufacturers to do so. Erwin Vink, Sustainability Manager at NatureWorks says; *'ISCC PLUS certification has been adopted by global brands and is supported by non-governmental organisations. We particularly value ISCC for its emphasis on no-deforestation, protection of the environment, social principles and the inclusion of a GM free option.'*

Currently over half of the corn used as raw material for Ingeo, is ISCC certified. NatureWorks will now ensure that by 2020, 100% of the agricultural input to its 150,000 tonne plant will be certified to the ISCC PLUS standard. This major commitment firmly aligns the company with the Ellen MacArthur Foundation's aspiration that all biopolymers should be made from sustainably sourced biomass.

More than 90 farms, with an average of 330 hectares of corn per farm, will be

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ISCC Stakeholder involvement - 1

ISCC is a multi-stakeholder association with 116 members. The association steers the overall development of the ISCC system

Reference: Dr. Norbert Schmitz, ISCC Systems GmbH

ISCC Stakeholder involvement - 2

Several NGOs and research organizations are ISCC members, contributing to the further development of the system

Examples

ISCC Members

WWF Germany	Danube Soya	Welthungerhilfe	University of Illinois at Chicago, United States	Fachhochschule Nordwest Schweiz	Kiel Institute for the World Economy	Deutsche Umwelthilfe e.V.	DBFZ – German Biomass Research Centre
▪ „A Standard for the standard“ ▪ Pilot ISCC PLUS ▪ Certified WWF-panda key chain ▪ Project on Food markets ▪ IKI land use change project ▪ Food security project	▪ Non-GMO	▪ Development of practical criteria and checklists for food security ▪ Planning pilot audits ▪ Use of social indices for certification ▪ Integration of social indices into GRAS	▪ LUC analysis ▪ GHG emission calculations ▪ Analysis of grassland to cropland conversion in the Prairies ▪ Policy advice	▪ Project on sustainable supply chain management ▪ Sustainability in the Swiss energy sector ▪ Nomination for Swiss innovation price	▪ Low iLUC approach ▪ Carbon mapping ▪ GHG calculation ▪ LUC analysis and GHG emissions from LUC ▪ Identification of low iLUC risk biofuels ▪ Policy advice	▪ Continuous information exchange w.r.t. ▪ Palm oil ▪ High iLUC risk ▪ Carbon recycling ▪ ISCC supports their network “bioeconomy”	▪ Continuous dialogue on GHG calculations monitoring of the bio-economy

Reference: Dr. Norbert Schmitz, ISCC Systems GmbH

ISCC Stakeholder involvement - 3

Various organizations conduct joint projects with ISCC. Results of the projects are implemented in the system (e.g. smallholder solutions)

Examples

Cooperating Institutions				
SNV	BirdLife International	The Nature Conservancy	DLR	University of Twente.
SNV Netherlands Development Organisation	**BirdLife Europe**	**The Nature Conservancy**	**Deutsches Zentrum für Luft- und Raumfahrt**	**University of Twente**
▪ Development of smallholder certification for palm oil ▪ SNV as "strategic partner" of ISCC	▪ Integration of biodiversity in certification ▪ Identification of small scale LUC using higher resolute on satellite images	▪ Identification of no-go areas in Brazil (high biodiversity, high carbon stocks) ▪ Deforestation analysis in Brazil, impact of the new forest code	▪ Identification of land use change based on satellite data for the establishment of deforestation free supply chains	▪ Utilization of remote sensing data for certification and verification of land use change / deforestation

Reference: Dr. Norbert Schmitz, ISCC Systems GmbH

ISCC Recognition - 1

ISCC is recognized by different Governments, important voluntary initiatives of brand owners and individual companies

Examples

Energy

- Renewable Energy Directive (RED) and Fuel Quality Directive (FQD) of the European Union
- Japanese Government
- Liquid Fuel Supply Regulation of Queensland
- Participation in CORSIA for sustainable alternative jet fuels
- AIREG – Aviation for renewable energy in Germany

Industrial Applications

- Der Blaue Engel
- Textile Exchange's "2025 Sustainable Cotton Challenge"
- European Committee for Standardization
- Sustainable supply of raw materials for the industrial use of biomass (INRO)
- Green Deal, sustainability criteria for biobased polymer products

Food

- Sustainable Agriculture Initiative (SAI) Platform
- Coca Cola's Sustainable Agriculture Guiding Principles
- Retailers' Soy Group (RSG) requirements for responsible soy of the Consumer Goods Forum
- Unilever Sustainable Agricultural code
- Diageo's Sustainable Agricultural Sourcing Requirements

Feed

- ISCC in line with FEFAC Soy Sourcing Guidelines
- Soy Network Switzerland
- Soy sourcing supply chains of Mars petcare
- Soy sourcing supply chains of ADM

Others

- Responsible sourcing practices in areas that are exposed to high risk of deforestation

Reference: Dr. Norbert Schmitz, ISCC Systems GmbH

ISCC Benchmarking - 1

After the WWF Benchmark ISCC was the only scheme that implemented improvements in requirements leading to highest shares of criteria fulfilment

WWF Benchmark Study

Source: WWF, „Searching for Sustainability – Comparative Analysis of Certification Schemes for Biomass used for the Production of Biofuels, 2013

Adaption of criteria recommendations

Benchmark Example

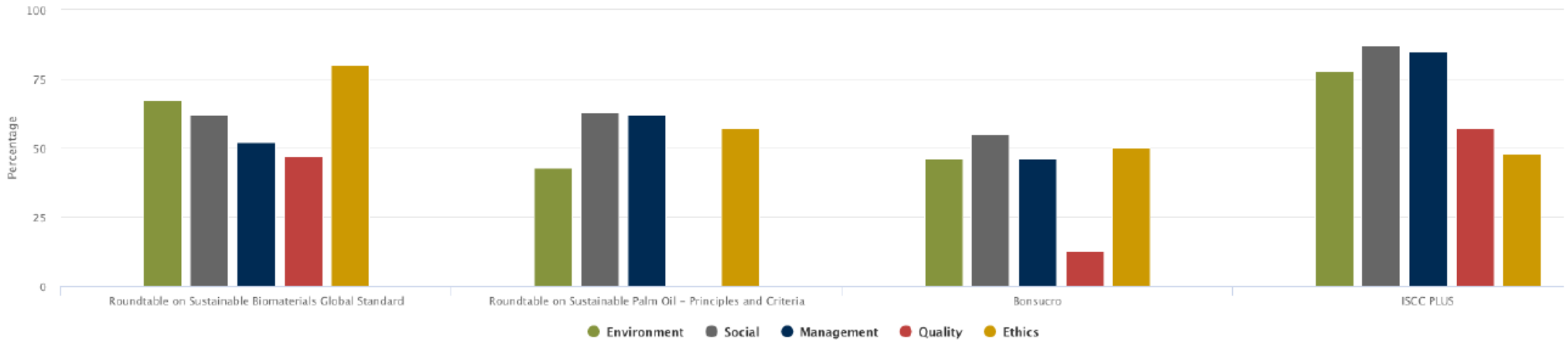
- The benchmark study acknowledged ISCC as one of the best performing certification systems but also indicated points for improvement
- This opened the opportunity for ISCC to enter into a constructive dialogue with the WWF
- As a result the ISCC system has undergone an improvement that addressed the points of improvement as indicated by the WWF benchmarking study.
- The adjustments have been incorporated in the ISCC System document 202. By this ISCC calculated an overall improvement by nearly 30%

Reference: Dr. Norbert Schmitz, ISCC Systems GmbH

ISCC Benchmarking - 3

ISCC PLUS performs outstandingly well in independent benchmarks – Sustainability requirements

Number of requirements for each of the standards broken down per sustainability area, as referenced in the sustainability map database



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

Source: ITC Sustainability Map (as of April 2019)

Reference: Dr. Norbert Schmitz, ISCC Systems GmbH






Thank you

Naturally advanced materials made from locally abundant and sustainable natural resources

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Q&A with Erwin Vink from NatureWorks

TextileExchange

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Register for the Webinar Part 2!

With The Roundtable on Sustainable Biomaterials (RSB) & SuCCESS
Tuesday, July 9 @ 7:30am PST/10:30am EST/4:30pm CET | 90 min
https://register.gotowebinar.com/register/3593625511315932684

Join the Biosynthetics Round Table Summit!

THANK YOU!

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