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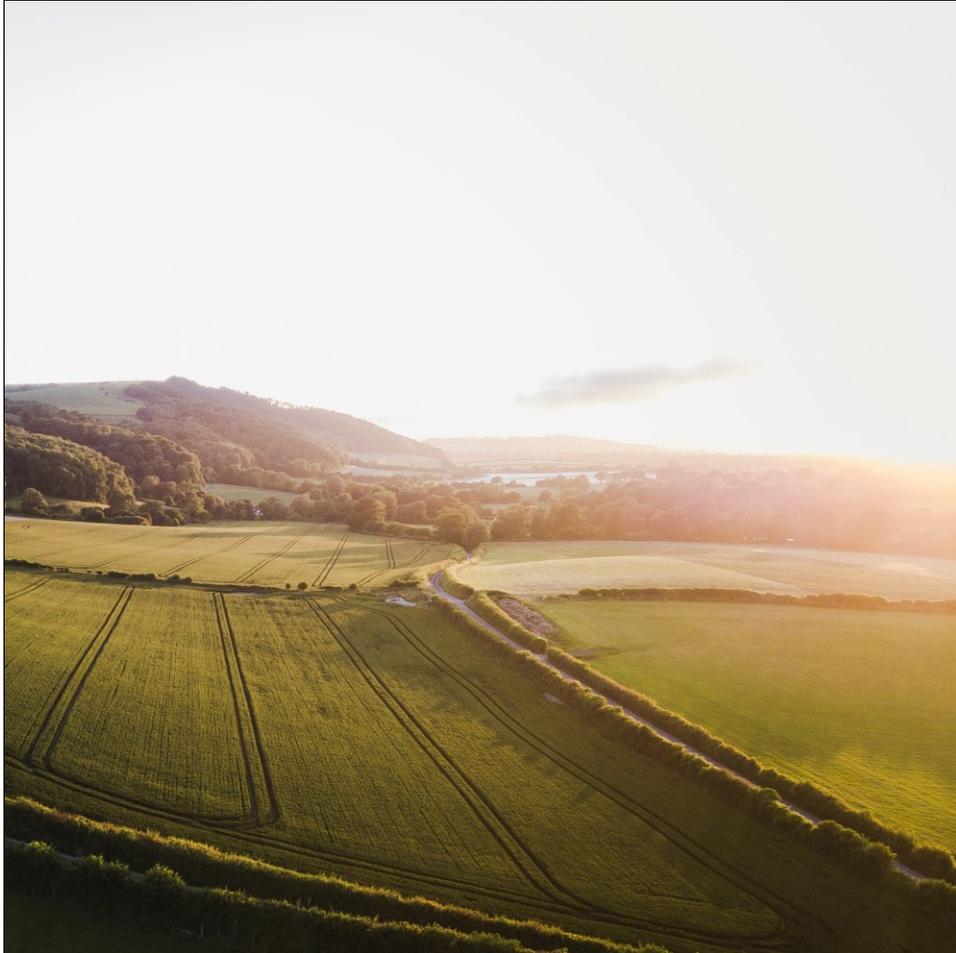
# How to benefit from science in practice?

## The opportunities and challenges of carbon footprint calculations



- « What is Biocode?
- « Basic principles of carbon footprint calculations
- « The need for carbon footprints
- « Challenges and solutions
- « Conclusion

# Our story



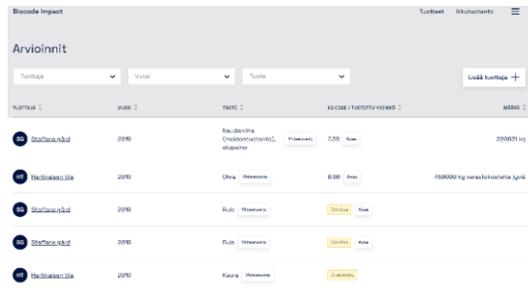
Improving the planetary conditions for life.

Our online services help conscious companies and individuals identify tangible ways to decarbonise food production for reversing global heating.

Majority-owned by two Finnish agricultural organisations, the Association of ProAgria Centres and Mtech Digital Solutions, we aim to create value to farmers and food brands alike.

# Biocode's online solutions for managing the climate impact of food production

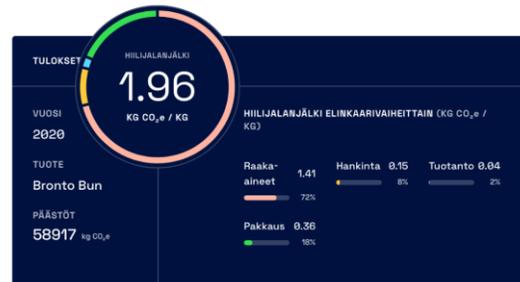
## Biocode Producer



Farm-level assessments of raw material producers

[producer.biocode.io](http://producer.biocode.io)

## Biocode Impact



Easy-to-use online service for product life cycle assessments

[impact.biocode.io](http://impact.biocode.io)

## Biocode Collective



Online platform for stakeholder communication and reporting

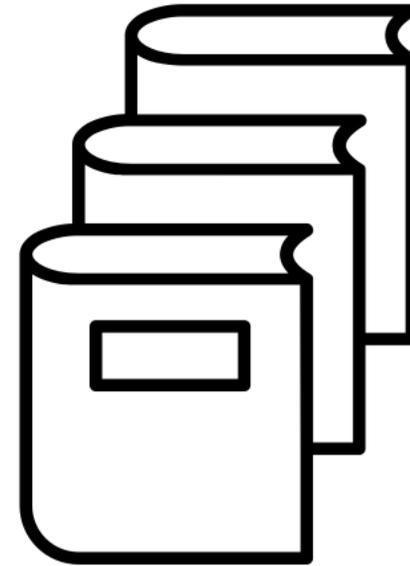
[collective.biocode.io](http://collective.biocode.io)

## Tailored ICT solutions



E.g. Valio Carbo environmental footprint calculator

# Basic principles of carbon footprints

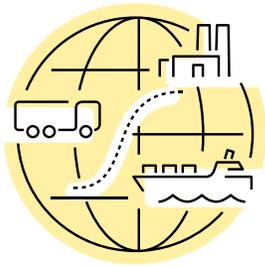


# Life-cycle assessment (LCA) for agriculture and food production

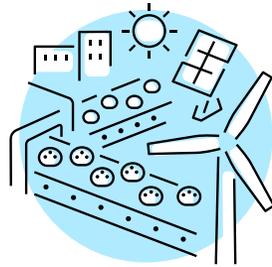
« A process of evaluating the effects that a product has on the environment over the entire period of its life



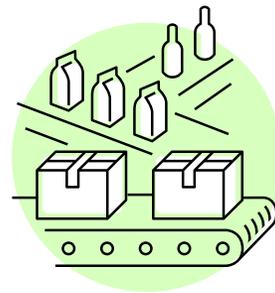
**Raw materials**



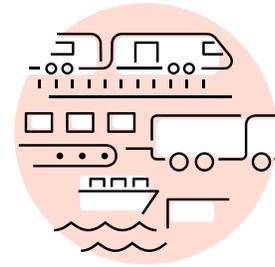
**Sourcing**



**Production**



**Packaging**



**Delivery**



**Customers**



**End-of-life**

# Carbon footprint

- « Carbon footprint consists of greenhouse gas emissions released during the product lifetime, e.g. **carbon dioxide** (CO<sub>2</sub>), **methane** (CH<sub>4</sub>), **nitrous oxide** (N<sub>2</sub>O).
- « The gases stay in the atmosphere different time lengths, but by converting them into equal amount of CO<sub>2</sub>, they can be expressed as **carbon dioxide equivalents** (CO<sub>2</sub>e).
- « Conversion to CO<sub>2</sub>e uses the factors defined by IPCC (2013).

	IPCC conversion factor (CO <sub>2</sub> e)
Carbon dioxide , CO <sub>2</sub>	1
Methane, CH <sub>4</sub>	28
Nitrous oxide, N <sub>2</sub> O	265

# The carbon footprint calculations enable improvements



All agree that there's a need to reduce the GHG emissions across the whole food industry sector. However, there's yet no consensus of the correct way to calculate the footprint and various methods are used in parallel. The work is still on progress and development will be carried out in several streams.

However, the challenge can be solved by systematic, long-term action. All scientific methods give companies the baseline figure to work on and consistent use of one method enables the follow-up of emission development. Familiarity with the biggest sources of emissions across the production process enables companies to focus on actions with the greatest climate impact.

We cannot wait anymore for the exact consensus of methodologies to be reached. We have to start now.

The opportunities and  
challenges of carbon  
footprint calculations



# Challenge 1: Scarce resources

Starting calculations from scratch is a large project:

- « Standards and guidelines
- « Adoption of life cycle stages in a single production process.
- « Determination of emission factors and the modifications needed in them

In a nut-shell: Time, initial data requirements, standards, guidelines, and high costs restrict from doing the calculations

Biocode's solution:

- « You need to know company's own production inputs and processes only, nothing else.
- « Impact-platform is fast and easy-to-use:
  - « Intuitive and userfriendly
  - « Emission inventory is produced as a by product of carbon footprint.
- « Easier to collect the initial data in consecutive years since after the first year it is known what information is needed to be collected over the year



Yksityiskohdat kategorian mukaan

Yksityiskohdat päästöjen mukaan



HIILIJALANJÄLKIOSUUS 0.94 kg CO <sub>2</sub> e / kg	PÄÄSTÖT 938 kg CO <sub>2</sub> e	SUURIMMAT LÄHTEET (KG ... Kurkku (tuore) 562 Tomaatti (tuore, kasvihu... 217
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YKSITYISKOHDAT (KATEGORIAN MUKAAN)



GS1-integration: The list of raw materials is automatically brought to Impact-tool.

Functional unit (i.e. kg CO<sub>2</sub> e/kg) possible to change in the future.

In order to find the best ways to reduce one's emissions, it is important to understand **the emission sources** and **their magnitudes**, not the decimals.

# Challenge 2: Carbon footprint of raw materials

Collection of primary data requires plenty of resources:

- « Data collection is time-consuming
  - « No guarantees that estimates are available. And if they are, the system boundaries may vary.
- « Generic estimates neglect variation and local production styles
  - « Generic emission factors are often behind paid licenses.

Biocode's solution:

- « By using Producer-tool, you can estimate the emission factor of your own primary production:
  - « Access to estimates at field plot level
  - « Recognizes annual variation
- « Collection of emission factors and licence cost managed by Biocode



ASSESSMENTS

All assessments

Crop production

New assessment +

# Welcome, John Sandell 🙌

Here's your Sandell farm overview. Below we have created an example model and assessment for the current year for you to start filling the initial inputs. Create new or edit the example assessment to your needs. Happy assessing!

View example assessment

New assessment +

## LATEST ASSESSMENTS



DRAFT

### Example assessment

CROP MODEL 2022

Possible short description of the assessment  
lorem ipsum dolor sit amet pellentesque.

IN PROGRESS

Just now

## Help & Support

Add some description here about help center, help bar and contact details dolor sit amet consectetur quod.

Tell the user about the info icon across the application.

Help center ↗

Open help

+ Invite people

? Help & Support



Carbon footprint is always an estimate of the reality and it is affected by chosen e.g. **system boundaries** and **emission factors**.

# Challenge 3: Different calculation methods and models

There are many ways to carry out the calculations and the following things must be considered for instance:

- « Which life-cycle stages are included?
- « How the system boundary is defined?
- « What emissions are allocated to side streams and with which allocation method?
- « At which level the estimates are calculated (Tier 1 , Tier 2, or Tier 3)
  - « What equations are used in calculations?

Biocode's solution:

- « Easily updated online platform
- « Transparency
- « Harmonisation projects (e.g. LCA Foodprint-project funded by Ministry of Agriculture and Forestry of Finland)
- « Comparability considered
  - « Basic rule: Compare only results calculated with the same methods and system boundaries

**Product specific carbon footprint** and **continuous** monitoring **throughout the supply chain** enable distinct possibilities to influence the carbon footprint.

# Challenge 4: Implementation of insights

Requires **understanding** of the results:

- « What do single numerical results tell?
- « How to benefit from the carbon footprint calculations?
- « How to communicate the results internally and externally?

**Biocode's solution:**

- « Continuous calculations
  - « Ready structures facilitate recalculations
- « Follow-up and development of company's own activities
- « Defining the most effective emissions reduction areas
- « Transparency
- « Considering the comparability



# Explore the Climate Smart products

These products are under continuous impact management. Climate action is taken to improve performance and reduce product carbon footprints throughout supply chains following company climate goals and targets.

Get started with Biocode Impact

2021

2021

## Yönakki

Yönakki (240 g) from Helsingin Makkara tehdäs is clearly one of the best sausages you can get. It is spiced mildly and therefore the favourite of everybody...



helsinginmakkaratehdas.fi/makk... View product →

2021

2021

## Greek Goddess

ANTON & ANTON

Greek Goddess - A portion of fresh-tasting and wonderfully pink vegan salad with domestic Mø oat-based cheese, red quinoa and raspberry sauce. Anton &...



antonanton.fi View product →

2021

2021

## Korea Love

ANTON & ANTON

Korea Love - a wholesome salad with domestic rainbow trout, korean spices, spicy rice salad and lime-miso-mayonnaise. Anton & Anton's salad...



antonanton.fi View product →

2022

2021-2022

## Noodle Doodle

ANTON & ANTON

Anton & Anton's vegan classic bowl with domestic Jalotofu, Asian-flavored rice noodle salad and wasabi mayonnaise. Anton & Anton's salad portions are not...



antonanton.fi View product →

The target was to create a **simple** and **easy-to-use** tool for users that aren't necessarily LCA experts.

For the users, it's enough to know their **own production and services**.

# Conclusion

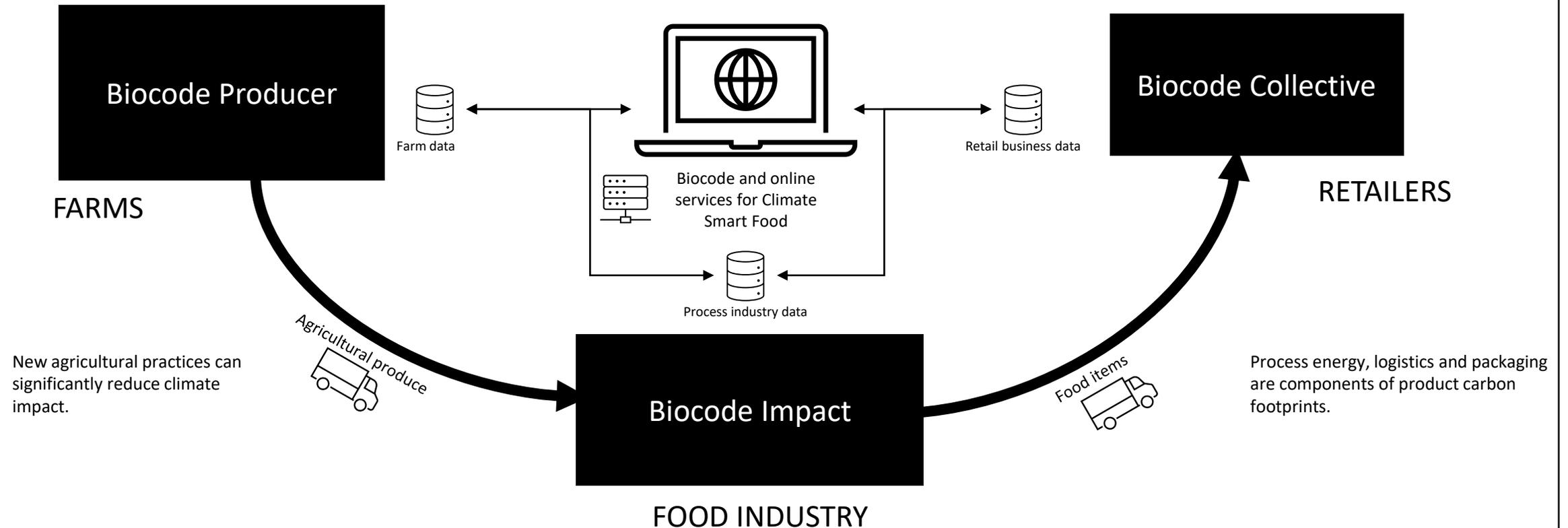
## **Challenge:**

- « Understanding and applying the standards and guidelines
- « Emission factors
- « Differences in calculation models and methodologies
- « Poor comparability of the results

## **Solution:**

- « Ready, easy-to-use online tool
- « Monitoring primary production by oneself or outsourcing the collection of emission factors
- « Transparency and reporting
- « Tools and support for communication

# How do we make Climate Smart Food?



**Thank you!**

