VALIDATION REPORT

Connecterra

2022 JW0017

IMPACT FORECAST

Contents

Details of the validation process

Connecterra	Validation request	First review	Feedback call	Hand-in revisions	Final review	Wrap-up call
Date	18/03/22 13h33	26/03/22 13h47	05/04/22 15h30	08/04/22 15h24	09/04/22 10h32	
Result	Invalid, unclear and significant			Plausible, positive within limits and significant		

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More information: Impact-forecast.com

Introduction and definitions

This Validation report documents the Validation of a Climate Impact Forecast:

Validation is a review process performed by an impartial impact expert to determine if a CIF is Valid, Positive and Significant.

The Validation process usually takes two weeks and includes a first review, a first feedback call between the team and validator, time for revisions if needed, a final review and a final results call. For a detailed description see www.impact-forecast.com/cif-validations

The review comprises a structured check using our CIF Validation tool, a sensitivity analysis and the writing of an Impact story. CIF trainers with LCA expertise are trained to perform this process in a uniform and objective way.

CIF Validations are made on the request of the project team, and possibly commissioned by an impact organisation. The results are used by teams and organisations to compare and communicate the climate impact of projects.

A Climate Impact Forecast or CIF is an LCA based calculation of the GHG reduction or climate adaptation potential of a project. Using our CIF tool, the project team found the net climate impact of the key differences between business as usual and their innovative solution.

The Impact data in this report, and in CIF in general, is calculated with information from the project team and from the CIF tool. Technical details, amounts and assumptions in the calculation are provided by the project team. Impact factors (LCI data), impact equivalents and the calculation itself are provided by the CIF tool.

The CIF tool is used by teams to improve their impact and support design and business decisions with impact data.

CIF results are the project's potential or actual avoided emissions in tCO_2eq.

Every CIF Validation result consists of three independent outcomes:

Valid

A CIF is valid if it is representative of the project, using appropriate data and well justified assumptions. Therefore, the CIF and its results are representative of the potential for the project to mitigate, enable or adapt to climate change.

Detailed requirements for validity are specified on www.impact-forecast.com/cif-validations. A CIF can be Valid, Plausible, Improbable and Invalid.

Positive

A CIF is positive when it shows that the project has a lower climate impact than business as usual, or improved climate resilience in the case of adaptation. A positive mitigation or enabler CIF shows the avoided GHG emissions in $-tCO_2eq$.

This outcome depends on a sensitivity assessment. CIF results can be Positive, Positive within limits, Unclear, Sensitive and Negative.

Significant

A CIF is significant when the project has a climate impact (positive or negative) greater than 5 tonnes of CO_2eq per year. This is roughly the global average annual CO_2 emissions per person, and the mass of a male African Elephant.

The threshold for significant impact can be set to a higher amount for a particular organisation or occasion. The result can be Significant or Marginal.

Impact story

An impact story is a summary of how a project makes a positive climate impact. It is written by the validating impact expert and contains the key impact data from the Climate Impact Forecast.

Better decision making of farmers results in more efficient and sustainable operations

Connecterra enables dairy farms to make better decisions through their app called Ida. Ida uses artificial intelligence and machine learning to provide easy-to-understand insights for farmers to improve their performance. A good performance is measured in producing a higher output with a lower environmental impact.

In this Climate Impact Forecast, Connecterra models the mitigation case of an Ida client who runs a standard dairy farm in the Netherlands. They compare their tool to short term decisions because no tool is used (baseline solution).

They compare the two solutions by 1 kg of milk because they aim to lower the kg CO_2 per kg of milk while the output stays the same (functional unit). The client's standard Dutch farm produces 2'000'000 kg of milk in 2021 which is the scale in this Climate Impact Forecast.

Ida provides insights to the farmer via a digital app to optimize their kg CO_2 per kg of milk in this use case .The insights come from their models to predict the impact of different management decisions. Ida reads actual farm data for relevant KPIs from the Dutch farmer's Management System and uses the model to predict which levers will have the highest impact on feed efficiency. Ida calculated the impact now and over the coming years by anticipating long term farm changes. In their use case, they were able to optimize the farms usage of silage, soy and water for their milk production.

Training an artificial intelligence consumes electricity and also needs a high amount of hardware to function (source: https://www.nature.com/articles/s42256-020-0219-9) . This is not considered in this Climate Impact Forecast. Further, providing the information on the digital app also requires electricity but the assumption that this has a negligible impact for the outcome is fair.

Connecterra achieves a reduction of -0.02089 kg CO_2 eq per kg of milk. This saves 42 t CO_2 eq at a scale of 2'000'000 kg of milk one year which references one standard Dutch farm's milk production in one year.. This is equivalent to the combined carbon sequestration of more than 1898 trees.

In the sensitivity analysis for this forecast we explored that the electricity used for training the AI (and electricity required for using the app itself) must not be higher than 0,038 kWh (Netherland electricity mix) to still achieve a significant positive climate impact.

There is a huge potential in making farming more efficient and sustainable through AI and machine learning. I believe that there are many relevant use cases that could be covered with Ida. But working with AI also usually means that there is a high energy consumption which should be looked at. As a next step, I recommend Connecterra to model their climate impact as an enabling use case and include their overhead and electricity use per user there.

Climate Impact Forecast and Validation result

Validation quality mark can be checked on: www.impact-forecast.com

Connecterra provides assistance in management desicion making for farmers with simulation platform IDA instead of short term decisions without a digital tool. The difference in impact is calculated per year and the total impact of Connecterra per year is calculated for 2000000 times kg of milk.

Production	We have assumed a standard Dutch farm of 2000000 KGs of milk per year, where after out intervention we have been able to increase feed efficiency per KG of milk by this amount, through optimising fertility and making most use of productive days and peak production. For this use case, we assumed an average diet of 20KG intensively grown silage, 1KG of soy and 100L of European Drinking Water over 5 years for all lactating cows. Energy is not taken into account since this is a calculation done once and it's impact is marginal
Validation	By: Julia Weber, Started: Sat Apr 09 2022 09:58:37 GMT+0200 (Mitteleuropäische Sommerzeit), Completed: Sat Apr 09 2022 10:32:00 GMT+0200 (Mitteleuropäische Sommerzeit)
Strong points	The data used is from a real client and is therefore very reliable.
Weak points	The electricity consumption for training the AI is not included (also potential hardware that is required for it). That the electricity for the used app is neglibible is fair. Further, more transparent information on how much material is usually required for the production of 1 kg of milk to get a better understanding of the use case would have been helpful. So the 0,003 kg per milk. I didn't reject it though because they used with data from their real client in 2021, so they measured it already and it's not only assumption based. Moreover, I still believe that the enabling use case would have suited better the use case.
Sensitivity	In the sensitivity analysis for this forecast we explored that the electricity used for training the AI (and usage of the app itself) must not be higher than 0,038 kWh (Netherland electricity mix) to still achieve a significant positive climate impact.

Production

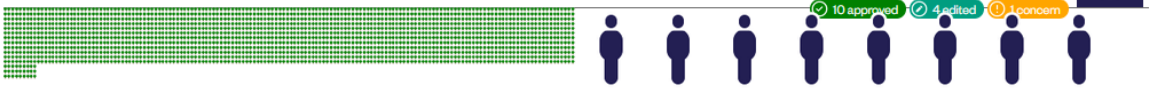
Soy meal at coast USA	0.494 per kg	0,003	kg	-0.00148
drinking water europe*	0.00064 per kg	0,32	kg	-0.0002
agricultural, animal feed, bovine feed,Grass sila	0,24 per kg	0,08	kg	-0.0192

Connecterra's total impact per year

eco-costs of human health euro	unknown
eco-costs of eco-toxicity euro	unknown
eco-costs of resource depletion euro	unknown
eco-costs of carbon footprint euro	unknown

	Carbon footprint CO_2eq.
Impact per kg of milk	-0.02089 kg
Impact of 2000000 times kg of milk	-42t
Impact validation	PLAUSIBLE, POSITIVE WITHIN LIMITS AND SIGNIFICANT (10 approved, 4 edited, 1 concern) JW 0017

Equivalent to



1898 trees

8 Average humans

5	42	81	18	8	8
times driving a car around the world	passengers flying London-New York	barrels of oil burnt	EU households annual electricity	elephants mass (5t) of CO_2	hot air balloons (2800 m^3) of CO_2

validated in April 2022
validation id:

JW0017

Verifyable at
www.impact-forecast.com

CONNECTERRA

Mitigates climate change with an impact reduction potential of:

-42 tCO_2eq / year

Validity of forecast
Plausible

Impact compared to baseline
Positive with limits

Magnitude of impact
Significant

More information

We help companies to know, show and grow their climate impact. More information about the validation process you can find on our website: www.impact-forecast.com