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Unlocking carbon finance for greener supply chains.

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Methodology Matters

July 18, 2024

Webinar

Methodology Matters: Deep Dive into Low Carbon Fertilizer

Presented by:

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Date:

July 18th, 2024

Contact:

hello@proba.earth

Speakers

SIJBRAND
Tieleman

Founder of Proba

DAN
Holmes

President NA of Atlas Agro

KONSTANTINOS
Dimitriou

Consultant at Proba

Part 1:

Introduction

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July 18th, 2024

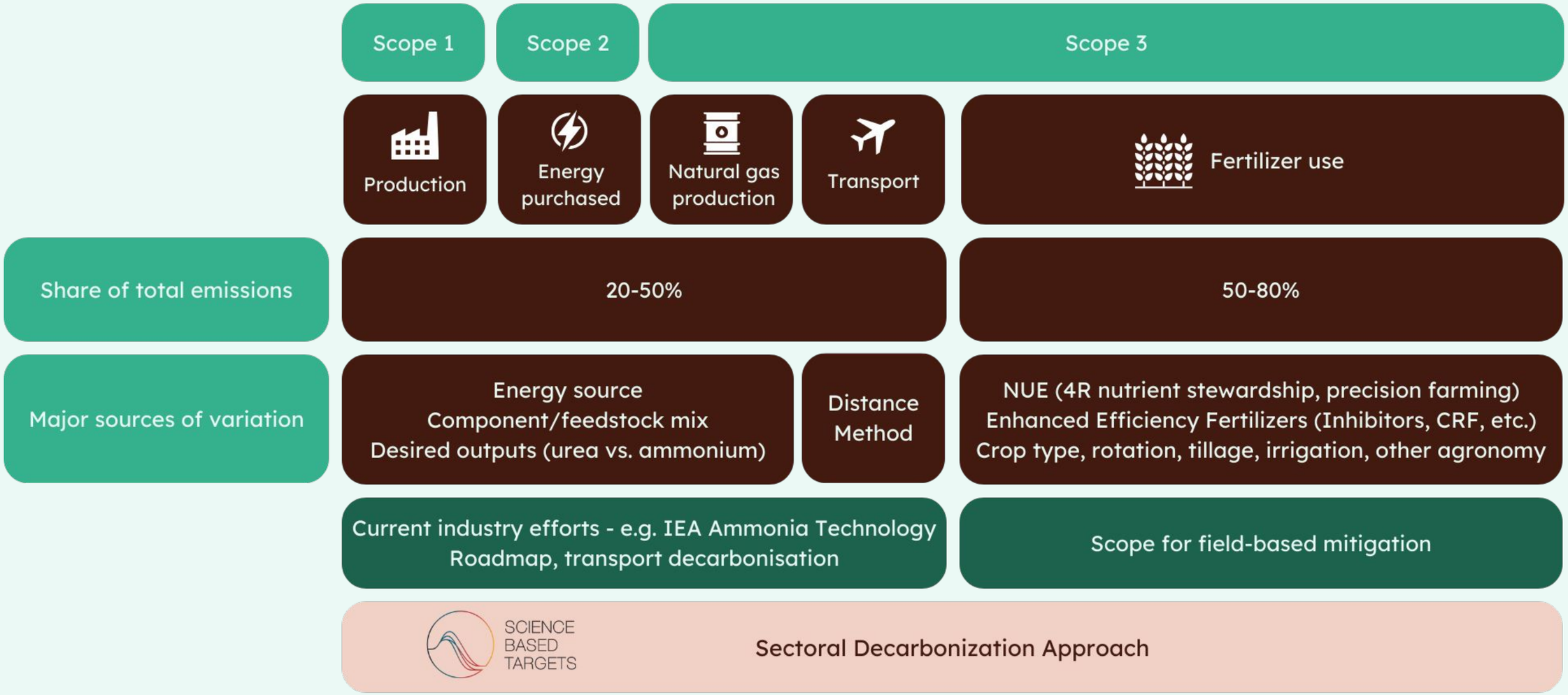
Problem

2.6Gt

(per year)

5% of global emissions

They are everywhere



How to get rid of them

1. On field: more adoption of enhanced efficiency technologies, such as nitrification inhibitors and controlled release fertilizers
2. **Production: more low carbon fertilizer production capacity**

How to get there

1. Stick:
    - taxes
    - more regulation

2. **Carrot:**
    - subsidies
    - pay more for greener product
        i. green premium
        ii. carbon finance

But first you need:
the **bold vision**
the **plan**
and the **people**

The people who are crazy enough to think they can change the world, are the ones who do.

Part 2:

Atlas Agro

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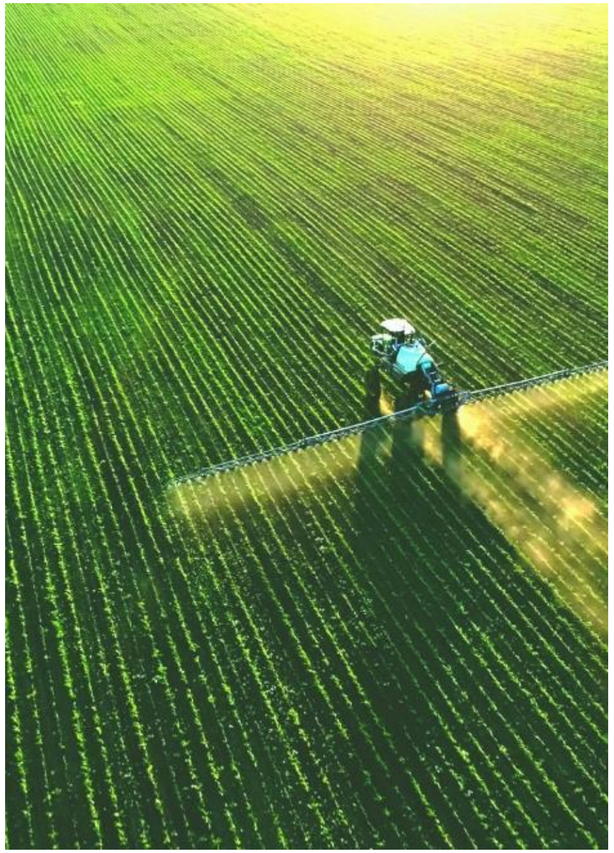
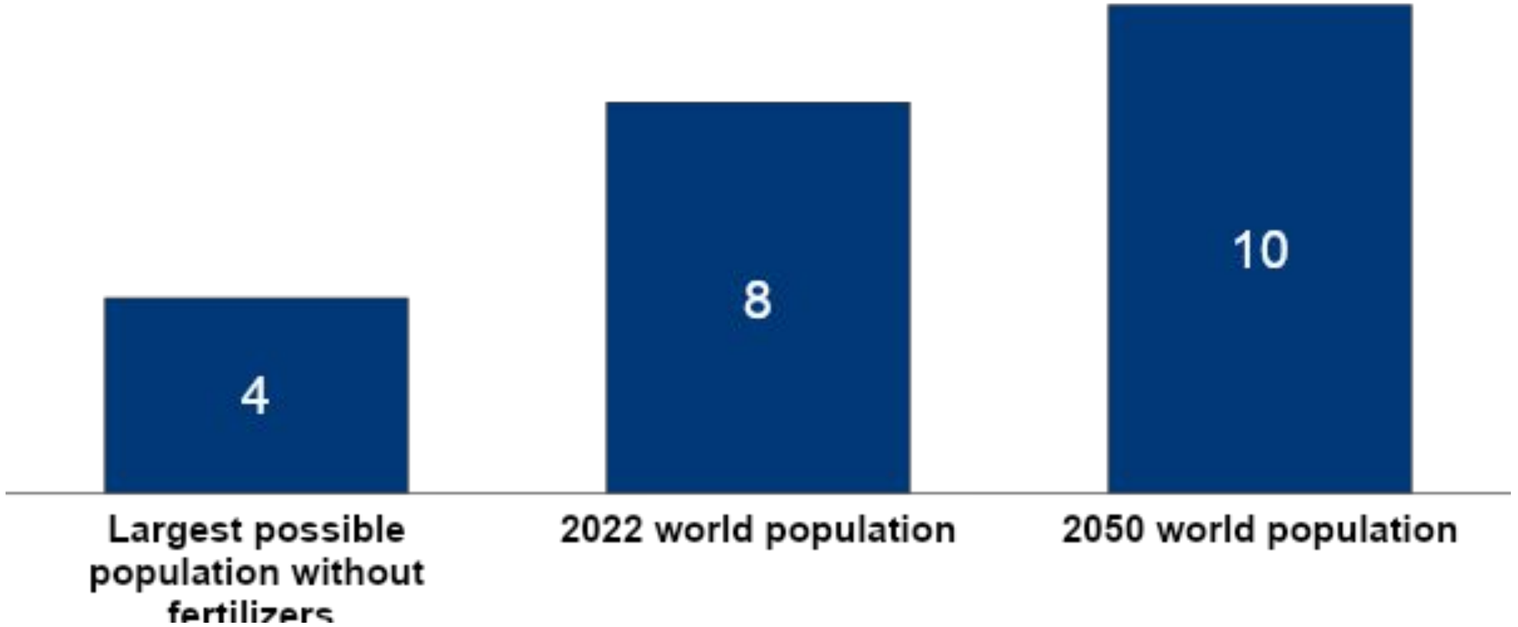
Feed The World Sustainably

Nitrogen fertilizers keep half the world alive



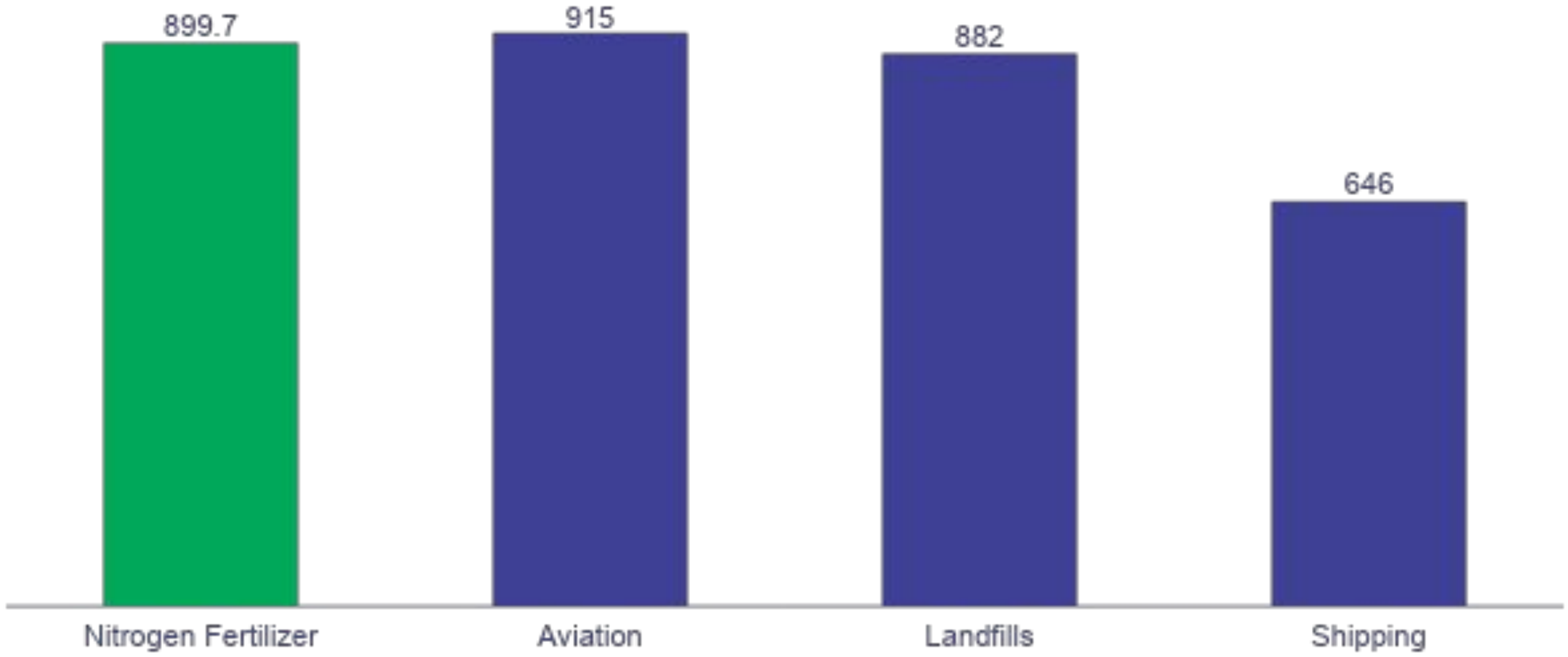
Global population (in billions)



Source: https://www.bbc.com/news/business-38305504

Nitrogen fertilizers accounts for ~2% of man-made CO_2 emissions

Estimated CO_2 emissions by sector; million tons p.a.



Source: Menegat, Ledo, Tirado Greenhouse gas emissions from global production and use of nitrogen synthetic fertilisers in agriculture, 2021; Atag; IEA; EPA; Global Methane Initiative

We drink, eat and wear fossil fuel

Weight of Carbon Dioxide from nitrogen fertilizer

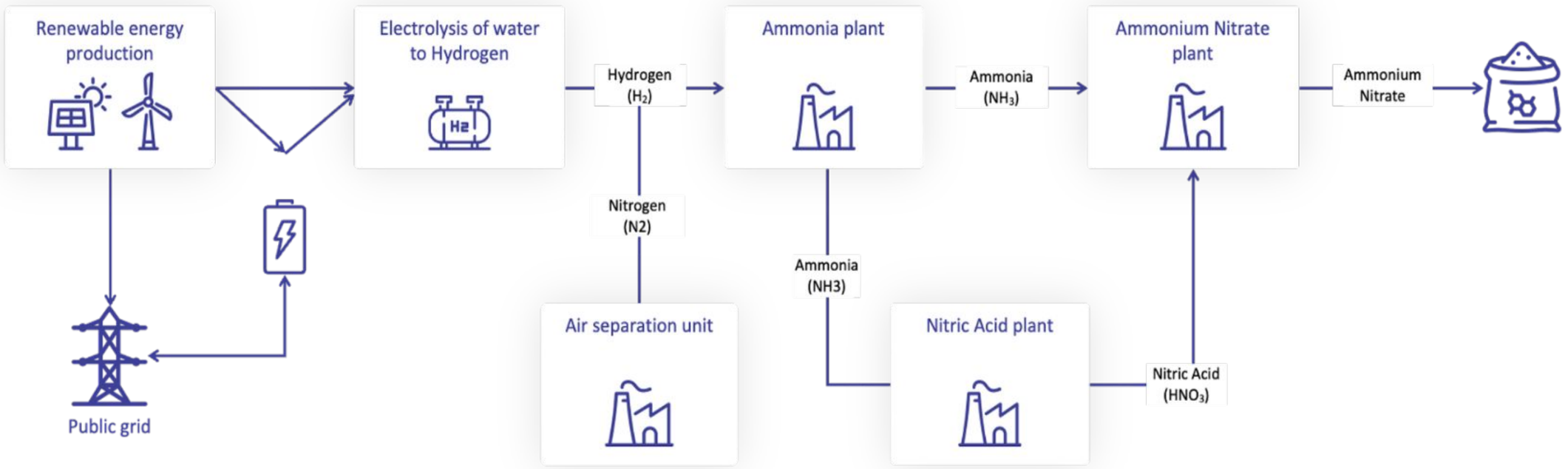
1 kg of coffee — **750 g of CO_2**

450g cotton hoodie — **860 g of CO_2**

1 kg chocolate — **540 g of CO_2**

Atlas Agro produces nitrogen fertilizer with 99% reduction in GHG emissions before reaching the farm step

We can produce chemically identical ammonia without the emissions and use of fossil fuels, this process can be verified with high carbon certainty



Pacific Green Fertilizer has completed FEED and Environmental Permitting. FID expected in Q4.


Atlas Agro aims to build 1-2 plants a year at a cost of USD 1-2.5 billion and to inspire the rest of the industry to join us move away from fossil fuels


ATLAS
AGRO

Part 3:

Methodology

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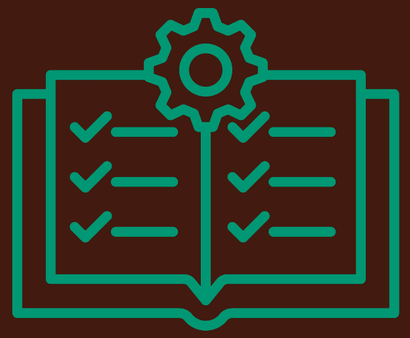
What is a Greenhouse Gas (GHG) Methodology?

"Standardized approach for quantifying, monitoring, and verifying emission reductions of a GHG Project."

Estimation of impact



Guideline for project design

Why do we need the GHG Methodologies?

They Support **Financing Green Innovation**

Green premium	Extra cost paid for choosing environmentally friendly products or technologies over conventional ones
Offsetting	Funding sustainability projects that reduce an equivalent amount of emissions elsewhere, through Carbon Credits
Insetting	Funding sustainability projects **within its own supply chain** , through Impact Units, to reduce Scope 3 emissions

What does a GHG Methodology entail?

Additionality

Regulatory

Prevalence

Financial

Quantification

Project boundary

Baseline estimation

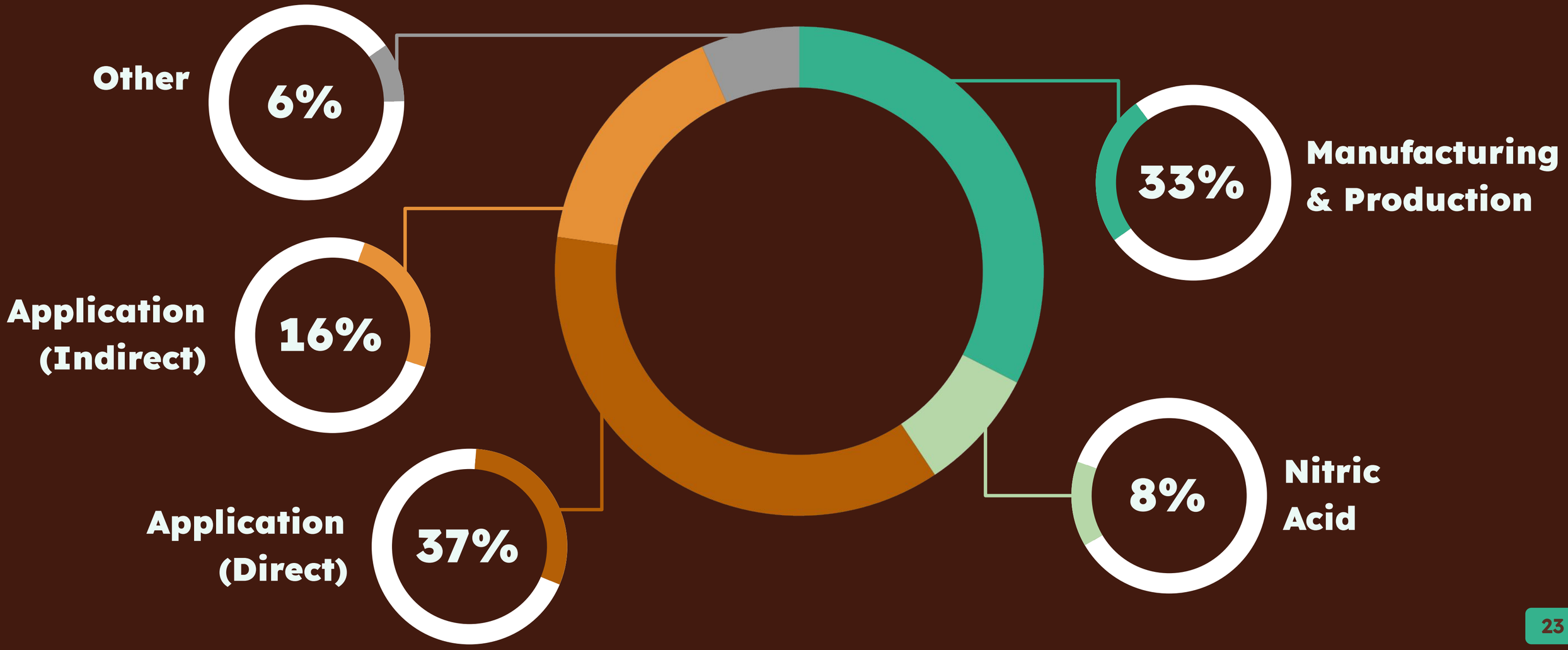
Emission calculations

Verification

Guidelines for Monitoring & Reporting

Data & parameters

Emissions from synthetic nitrogen fertilizers



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Source: Gao, Y., & Cabrera Serrenho, A. (2023). Greenhouse gas emissions from nitrogen fertilisers could be reduced by up to one-fifth of current levels by 2050 with combined interventions. Nature Food.

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Low-carbon fertilizers: Examples

Atlas Agro

Richland, Washington, USA

Renewable energy

Focus: ANSol, CN, CAN

Atome

Villeta, Paraguay

Zero carbon nitrogen

Focus: CAN

Yara

Porsgrunn, Norway

Renewable ammonia

Focus: Ammonia derived fertilizers

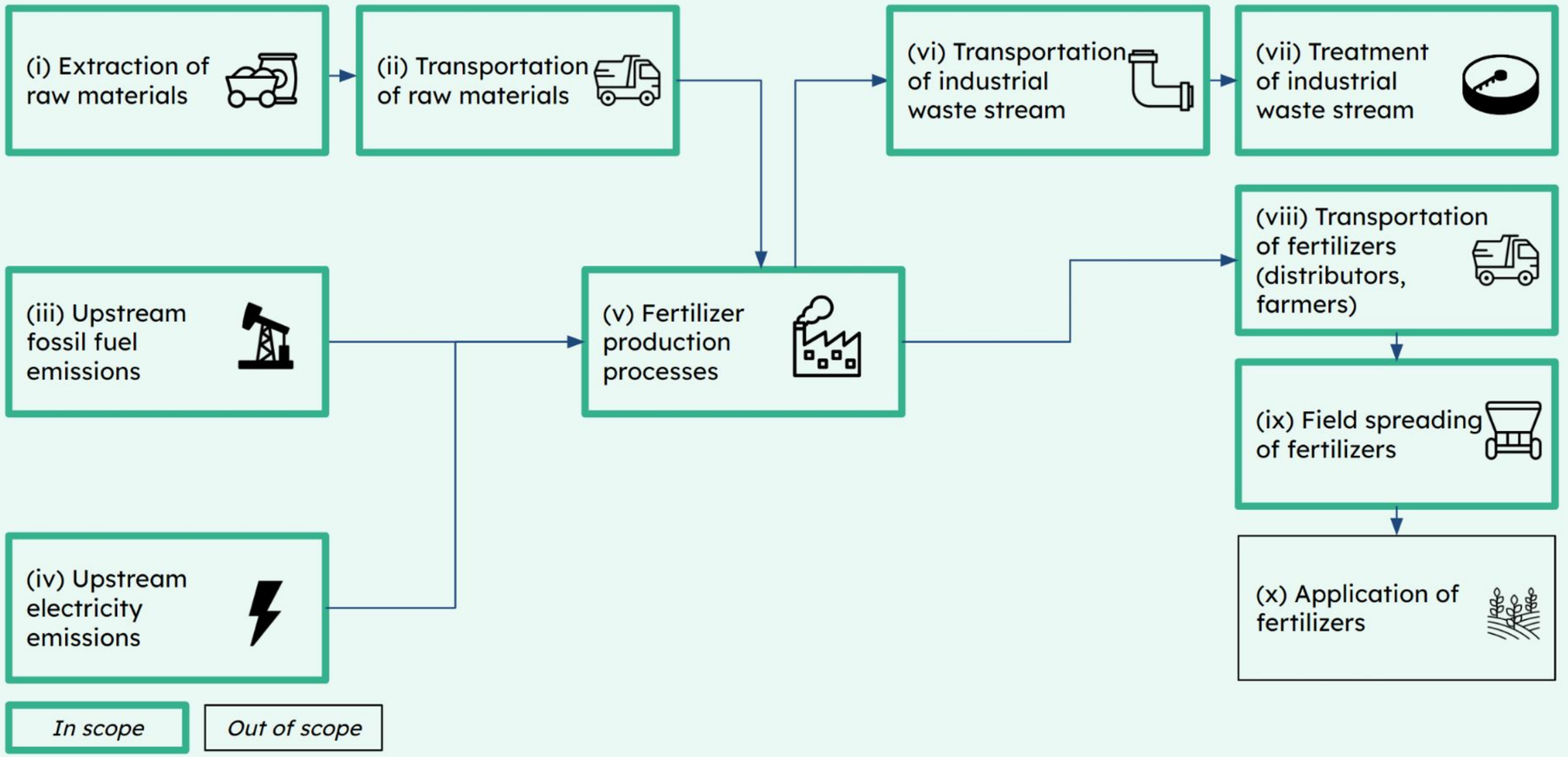
Source: https://www.atlasagro.ag/projects/pacific-green-fertilizer/
https://www.atomeplc.com/fertiliser/
https://www.yara.com/sustainability/transforming-food-system/low-carbon-footprint-fertilizers/what-you-need-to-know/

Quantification of emissions - Baseline

Retrofit

New factory

Quantification of emissions - Boundary



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Quantification of emissions – Example

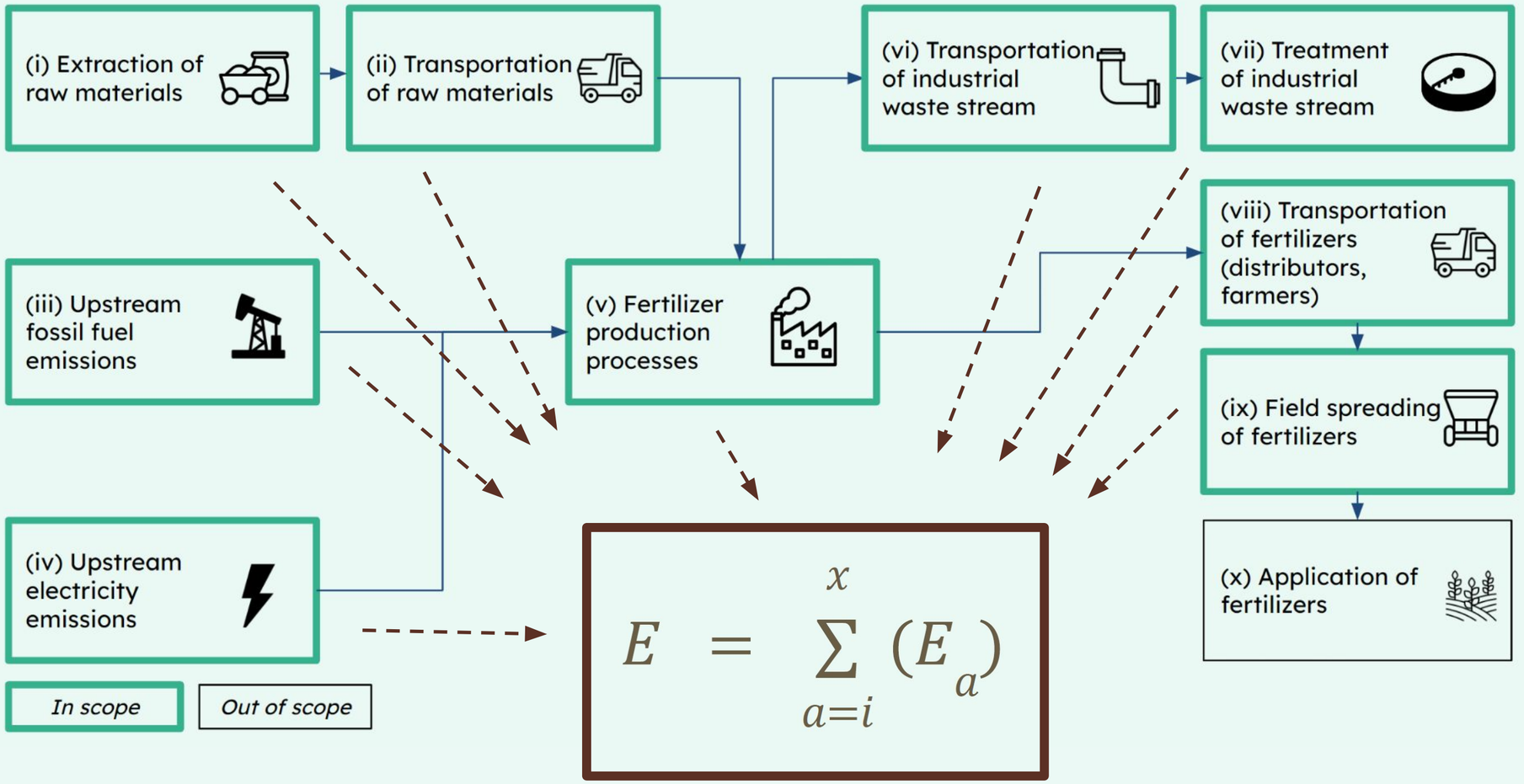
(v) Fertilizer production processes

$$E_{v,a} = \sum_{x} \sum_{p} (EF_{p,x} \cdot Q_x) + FE$$

Where:

$E_{v,a}$	=	Emissions of fertilizer production processes (tCO_2e/year)
$EF_{p,x}$	=	Emission factor of industrial process p, expressed for the amount of fertilizer x produced (tCO_2e/t of x)
Q_x	=	Quantity of fertilizer x produced (t of x/year)
FE	=	Fugitive emissions (tCO_2e/year)

Quantification of emissions - Total



Net GHG Emissions Reduction

Baseline emissions

Project emissions

$$ER = (BE - PE - LE) \cdot (1 - UF)$$

Leakage

- Displacement of increase of emissions
- Example: *indirect increase of gray electricity production*

Uncertainty

- Enhance conservativeness
- Variability in emission factors and input data

Example: Import of fertilizers in Europe

Russia — 45%

Egypt — 35%

Algeria — 20%

Based on: https://www.fertilizerseurope.com/wp-content/uploads/2023/07/Industry-Facts-and-figures-2023.pdf

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Example: Intervention

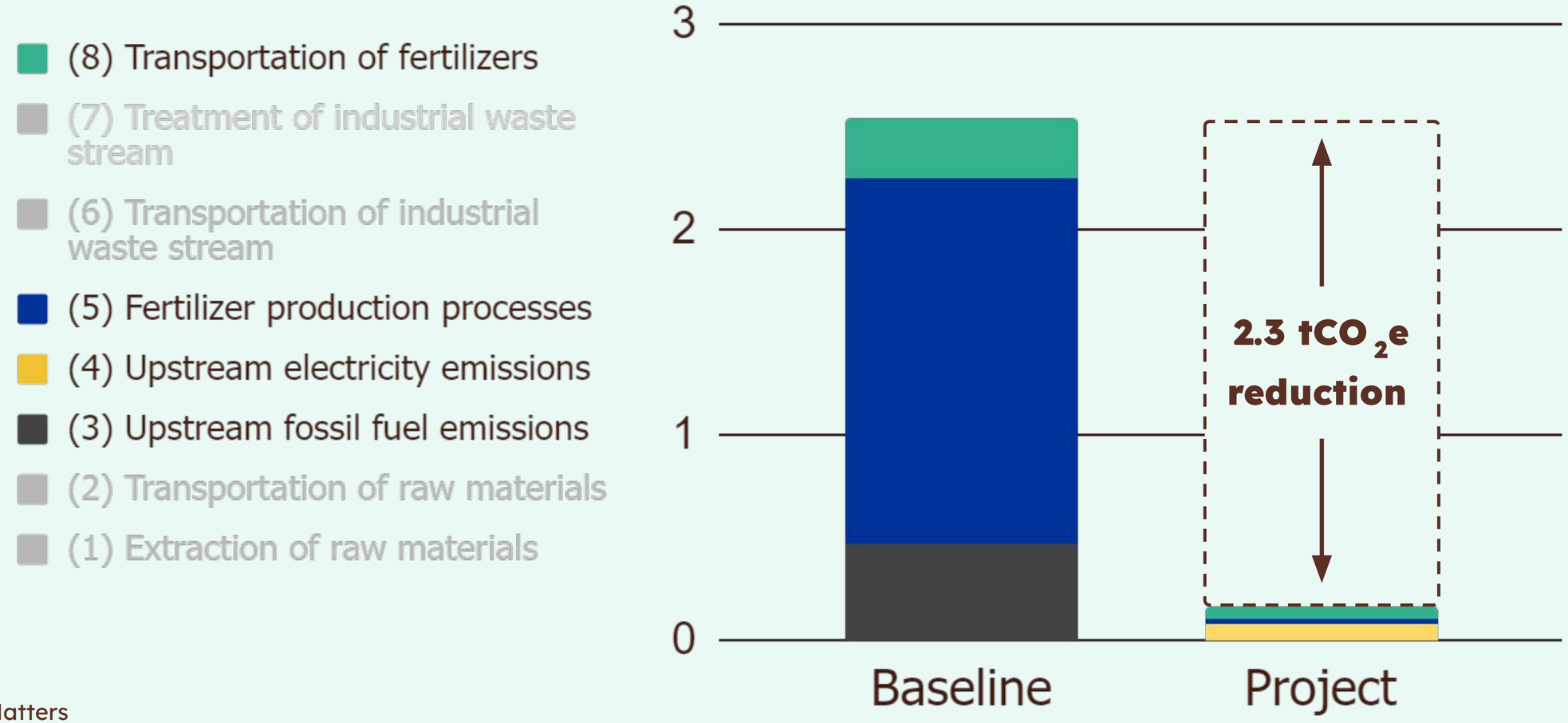
1. Production and distribution of the fertilizers **within the EU**

2. Usage of **renewable electricity** for the fertilizer production

3. No intervention related to **raw materials** and **waste treatment**

Example: Results

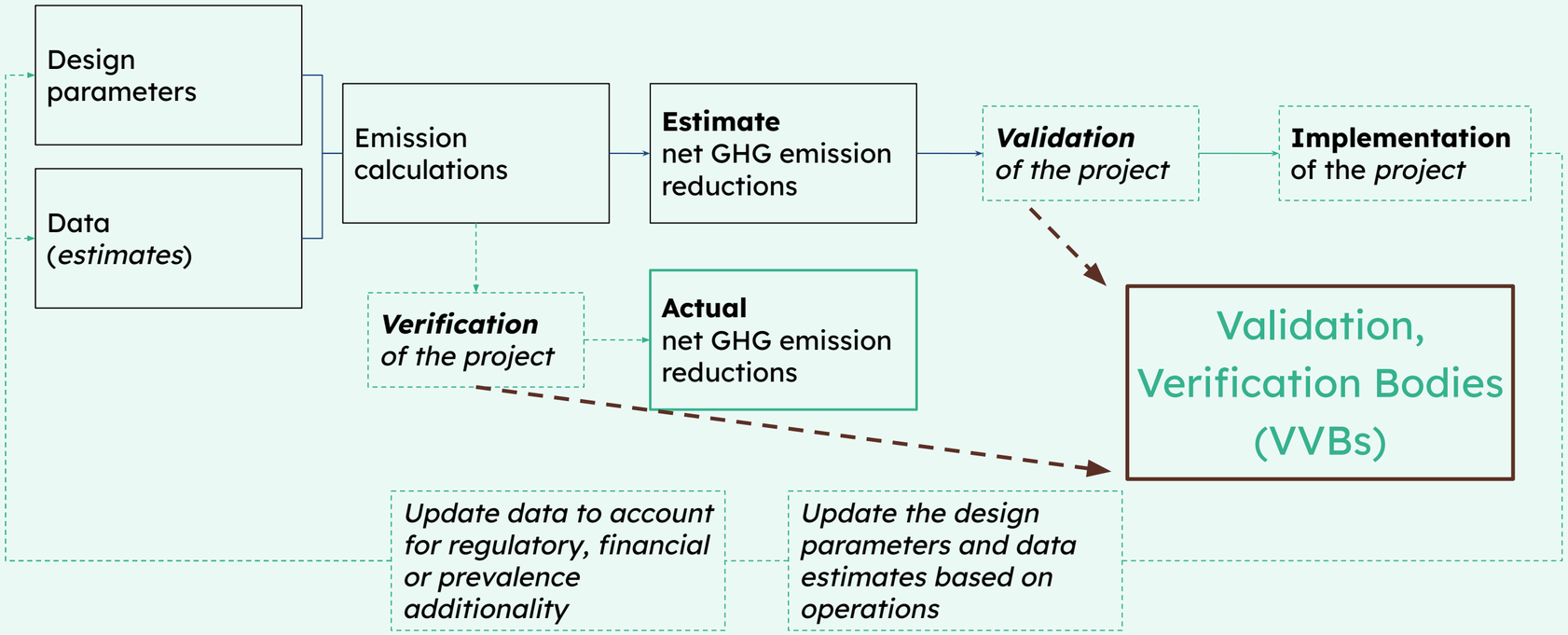
GHG emissions (tonnes of CO_2e / tonne of fertilizer produced)



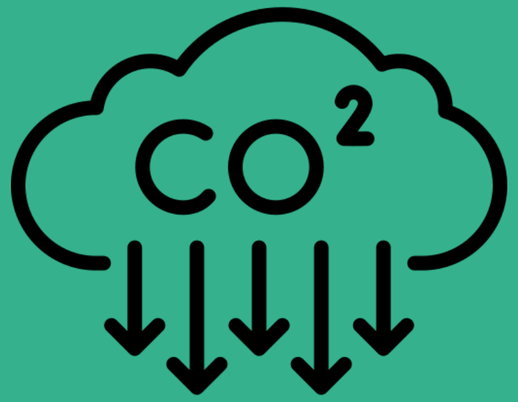
Project Monitoring, Reporting, Verification

Why?

- Accuracy, transparency, and integrity of GHG reduction
- High quality impact units

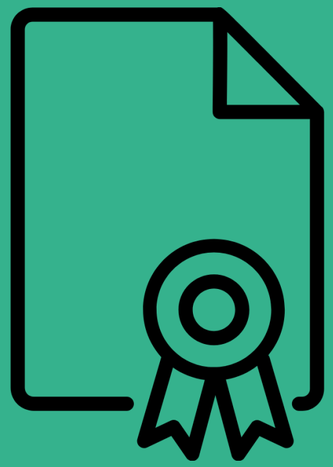


Conclusion: What does a project require?



GHG Impact

Need of finance



Credibility & transparency

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