

Anuvia's Fertilizer Carbon Footprint



The world's leading sustainability consultancy

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About ERM

- **Environmental Resources Management (ERM)** is a leading global provider of environmental, health, safety, risk, social consulting services and sustainability related services;
- The company has more than 4,900 people in over 40 countries and territories working out of more than 160 offices. ERM is committed to providing a service that is consistent, professional and of the highest quality to create value for our clients;
- ERM has worked with many of the Global Fortune 500 companies delivering innovative solutions for business and selected government clients helping them understand and manage the sustainability challenges that the world is increasingly facing.



North America
68 offices in 2 countries

Latin America and the Caribbean
16 offices in 9 countries

Europe, Middle East and Africa
37 offices in 17 countries

Asia Pacific
24 offices in 13 countries

Limitations

- This Executive Summary presents the results obtained by ERM for Anuvia products' Carbon Footprint (16N and 17N).
- For more details, refer to the complete study (ERM report 0464492_Final Results_Anuvia_MAR15.19.pdf);
- All information considered derives either from publicly available databases or from credible independent sources (referenced in the ERM report). ERM has no responsibility over third parties' data;
- The Cradle-to-Grave results are valid for the specific blend with conventional fertilizers that were selected for the experiments carried out by independent entities. Higher fractions of Anuvia products in the blends will likely result in even better performance. However, ERM could not determine a correlation rule (linear, exponential, etc.) due to lack of data. The results currently available have demonstrated material reduction in GHG emissions over the life cycle on a significantly conservative approach.

Introduction

ERM was engaged to develop a CO2 Life Cycle Assessment (LCA) for Low Environmental Impact Products (LEIP) produced by Anuvia (Organic Fertilizers) at its industrial site located in Florida, USA:

- The study adopts a 'cradle-to-grave' approach for specific crops incorporating results from actual use of the products (based on credible studies from independent sources).

The fertilizers addressed in the study were:

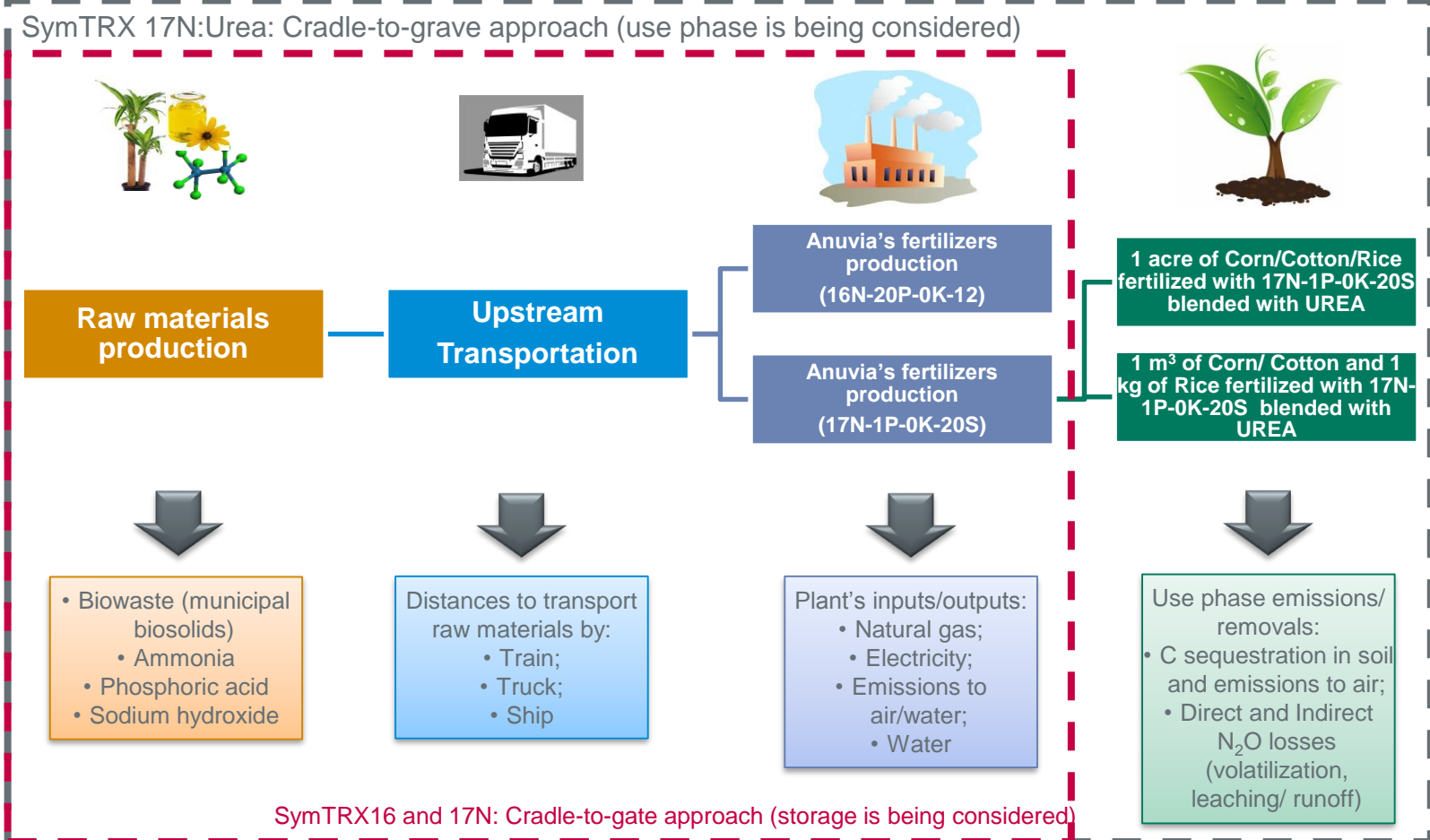
Organic Fertilizer*
16N-20P-0K-12S
Organic Fertilizer**
17N-1P-0K-20S

*The organic material is swine manure residues.

** The organic material is municipal biosolid. For 17N product, the blend with UREA (SymTRX 17N:Urea) was considered only in the cradle-to-grave approach.

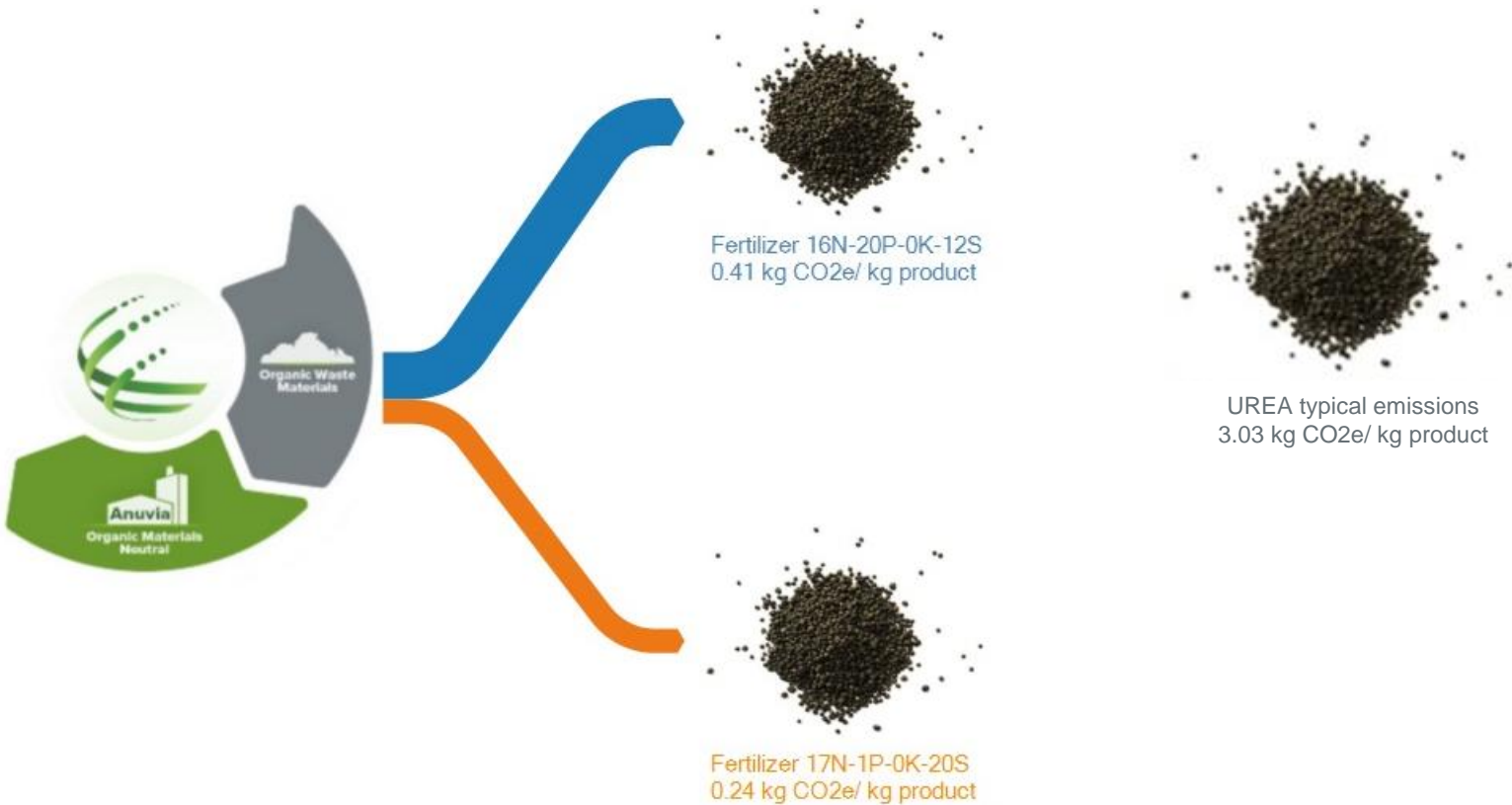
Goals, Scope and Boundaries

- The goal of this study was calculate the potential benefit of Anuvia's products to global warming (expressed as CO₂e) by quantifying all significant GHG emissions and removals over the product's life cycle and comparing with conventional fertilizers.
- The main stages of the life cycle of the products analyzed were as follows:



Results: Cradle-to-Gate

- The picture below shows the net GHG emissions, from the cradle (raw materials extraction) to the gate (fertilizer production), per kilogram of 16N-20P-0K-12S and 17N-1P-0K-20S fertilizers.



- Raw materials production is the main contribution to the total Carbon Footprints for both products on a cradle to gate basis.

GHG Emission Reduction using SymTRX 17N in Corn Crops (Cradle-to-Grave approach)

■ Comparison SymTRX (17N) vs Inorganic Fertilizer: Emissions (kgCO₂e) per acre for Corn crop



46% of total emissions – cradle to gate
54% of total emissions – use

- 100% Urea showed 11% higher Carbon Footprint than the SymTRX blend with UREA;
- 75% Urea:25% AMS showed 10% higher Carbon Footprint than the SymTRX blend with UREA.

GHG Emission Reduction using SymTRX 17N in Cotton Crops (Cradle-to-Grave approach)

■ Comparison SymTRX (17N) vs Inorganic Fertilizer: Emissions (kgCO₂e) per acre for Cotton crop

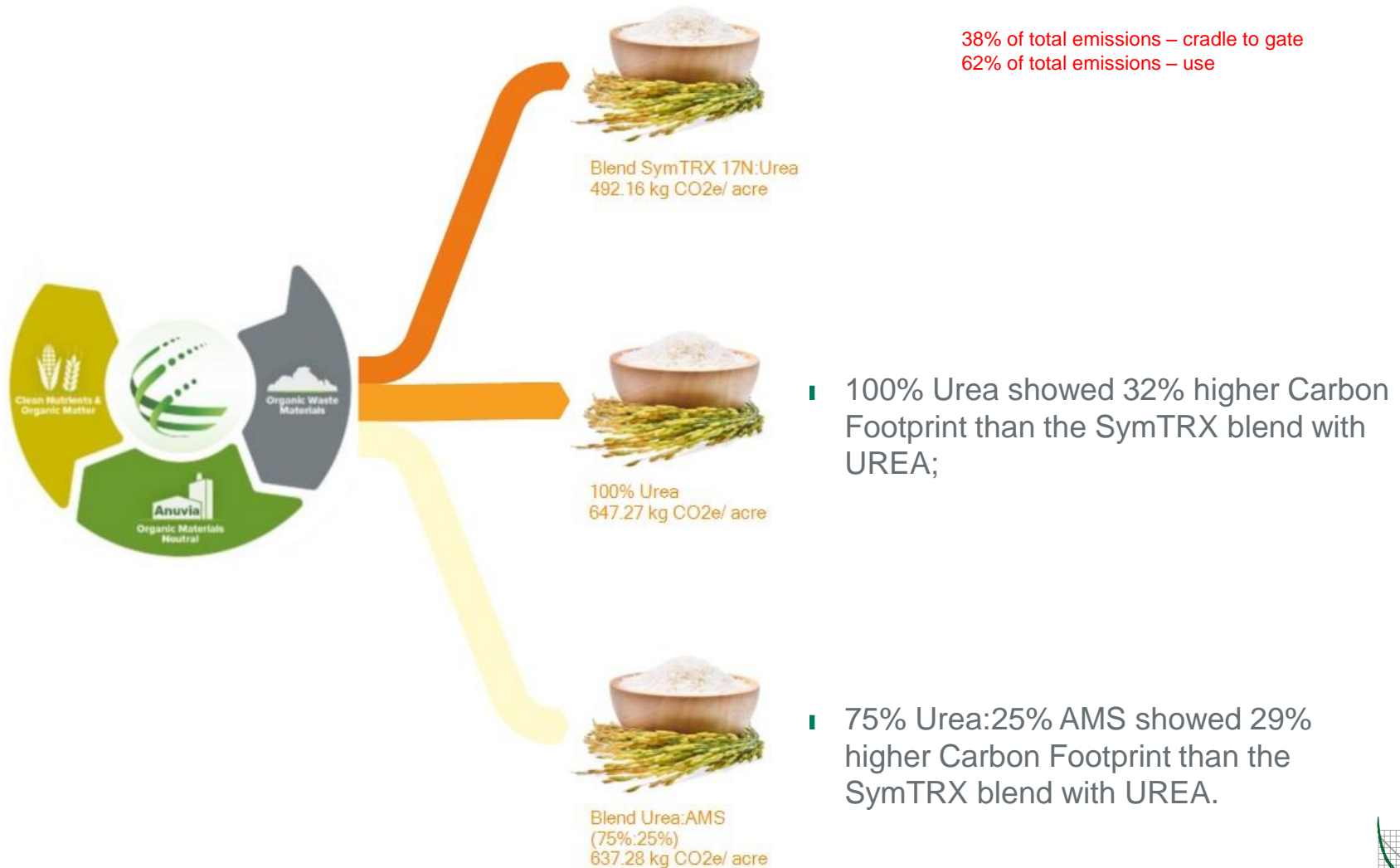


38% of total emissions – cradle to gate
62% of total emissions – use

- 100% Urea showed 32% higher Carbon Footprint than the SymTRX blend with UREA;
- 75% Urea:25% AMS showed 29% higher Carbon Footprint than the SymTRX blend with UREA.

GHG Emission Reduction using SymTRX 17N in Rice Crops (Cradle-to-Grave approach)

■ Comparison SymTRX (17N) vs Inorganic Fertilizer: Emissions (kgCO₂e) per acre for Rice crop



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