



AgBalance™

What is the role of minimum tillage for sustainable agriculture?

Markus Frank, BASF SE
Odense | Feb 24, 2016

 **BASF**
The Chemical Company

Sustainability in agriculture

Creating value for the entire chain

Raw material
extraction



Agricultural
production



Ingredients



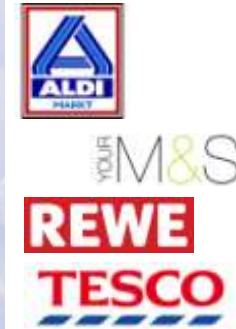
Processing



End consumer
industries



Retail



Consumer

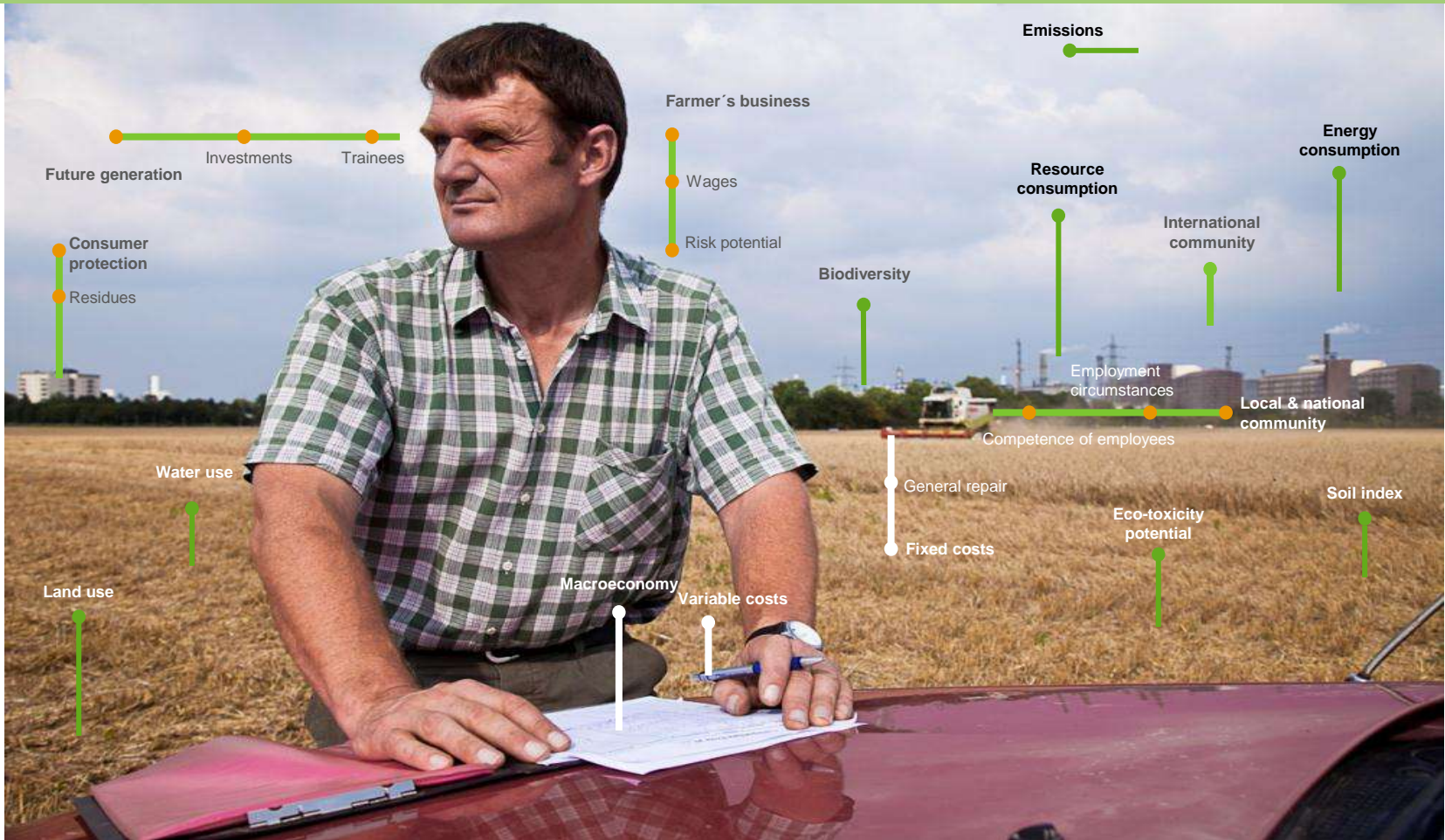


Translation into market
dynamics

Value chains respond to
sustainability need

Sustainable production
as a consumers
expectation and value
driver

Farming, the biggest job on earth



Farmers face a multitude of economic, environmental and societal needs

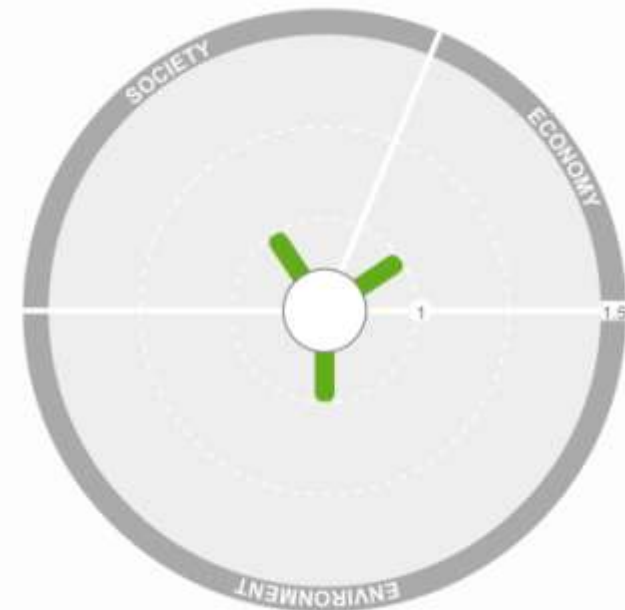
AgBalance Method Development

- Measure sustainability in agriculture

- Holistic method for life cycle assessment (LCA) in agriculture & food value chain
- Informed decisions on how to manage improvement
- Independent assurance of functionality and coherence by



- Innovation Award of the German “Rat für Nachhaltige Entwicklung” in 2012



- Production 1
- Production 2

AgBalance Methodology

- What does AgBalance assess?

Scope of AgBalance

- What are the key **sustainability drivers** for any given agricultural production system?
- Which conditions **impact sustainability** in agriculture / food production?
- How to make production systems **more sustainable**?



INPUT



AGRICULTURAL PRODUCTION



SALES



CONSUMER



RETAIL



PROCESSING

The Engine Room of AgBalance

- 3 dimensions and 70 indicators



Social aspects

include indicators like **working conditions, training, education, human toxicity, wages, gender equality, MRL exceedances,**

and also

rural employment, fair trade, land lease prices and social security.

Economic aspects

include indicators like **variable costs, fixed costs, farm profits**

and macro-economic indicators such as

Subsidies and gross value of production

Ecological aspects

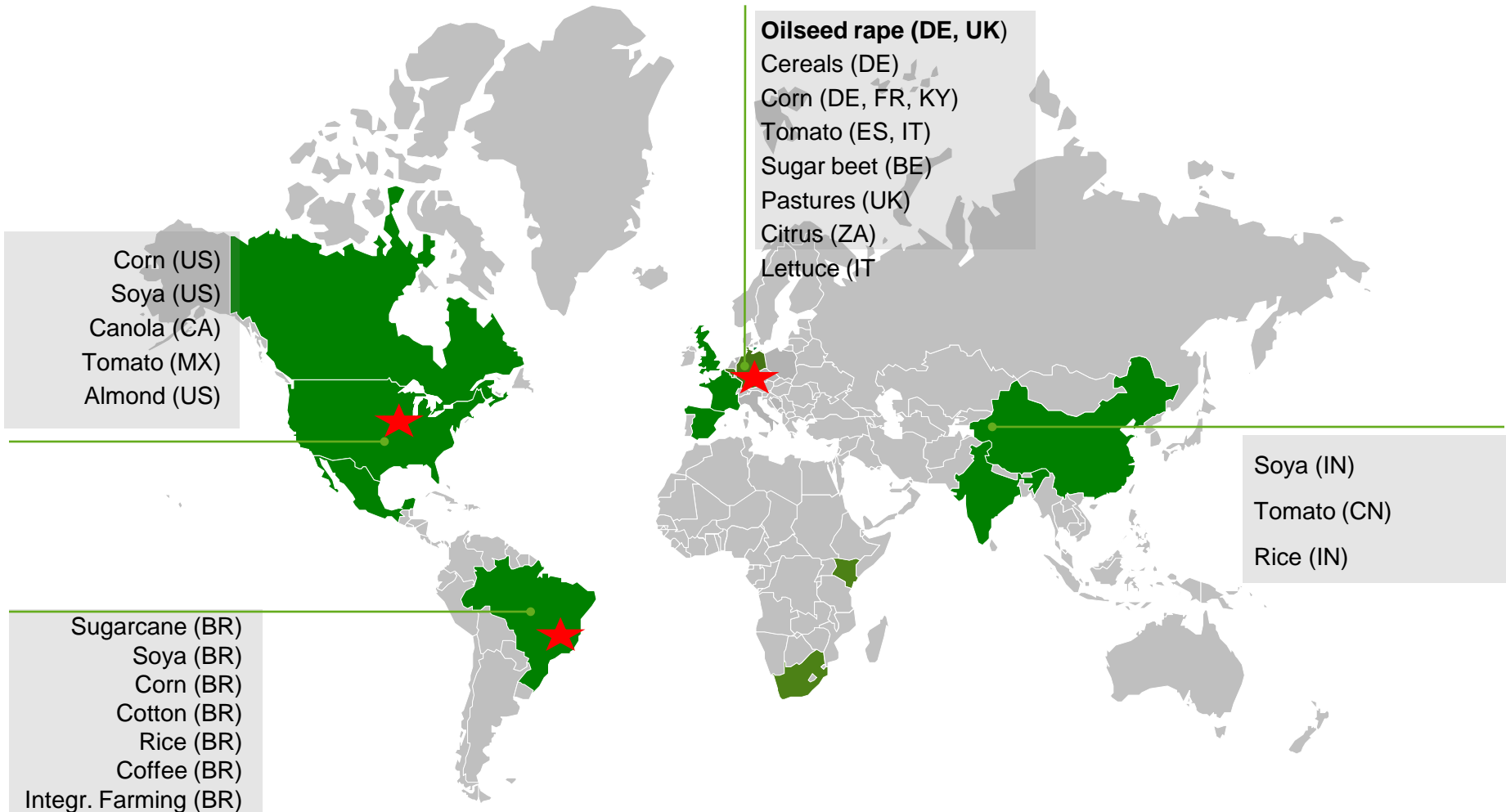
includes the categories **water use, land use, energy consumption, resource depletion, emissions, ecotoxicology potential**

as well as indicators related to

soil health and biodiversity.

AgBalance Case Studies

- Global Roll-Out (Denmark still missing)



AgBalance™ Farm

- Translating sustainability into crop management











- **Objective:** On-farm decision support in sustainable agriculture
- **Target audience:** agronomic advisors, progressive farmers, scientists, NGOs
- **Scope:** global



PROs & CONs of min/no till

- ...through the lens of sustainability

PROs:

- Soil health, fertility & quality 
- Erosion 
- Biodiversity (soil & more) 
- Resource use 
- Energy use 
- Emissions (CO₂, black C) 
- Variable & fixed costs 
- Labor intensity 

CONs:

- Weed control 
- Herbicide use 



Sustainability in Modern Agriculture

- Conclusions

- Sustainability in agriculture has become a key paradigm in the food chain
- AgBalance™ was designed to holistically assess sustainability in agriculture and to guide continuous improvement
- Minimum/no till are important sustainability drivers in agriculture – provided weed problems are under control



**Sustainability has become an imperative in modern agriculture -
Let's not miss the boat...!**