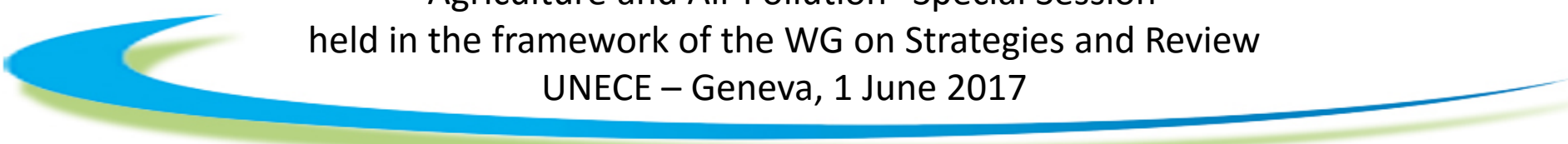


# The EU Nitrogen Expert Panel and its indicator for Nitrogen Use Efficiency (NUE)

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# Background

## EU Nitrogen Expert Panel



- 🌱 Nitrogen is essential for life
- 🌱 EU nitrogen experts have joined forces to promote efficient nitrogen use in food production
- 🌱 The ambition is to encourage best use of nitrogen to mitigate threats to our health and the environment



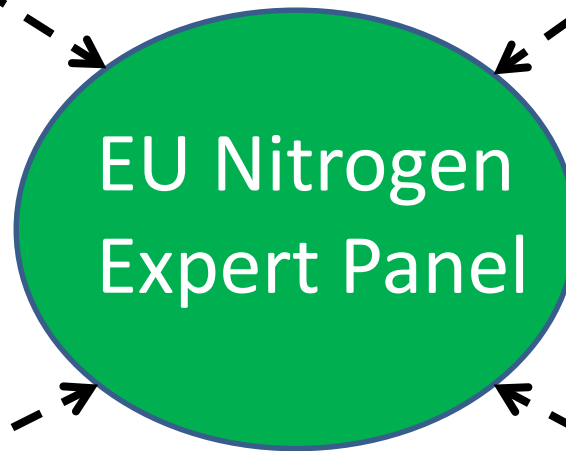
# EU Nitrogen Expert Panel



- To improve linkages
- To get things done

Science

Practice





Policy

Industry



# EU Nitrogen Expert Panel

-  Objective is to contribute to improving NUE in food systems, through
    - i. communicating a vision and strategies on how to improve nitrogen use efficiency (NUE) in food systems
    - ii. generating new ideas, and recommending effective proposals and solutions
    - iii. acting as referee in controversial issues and by communicating as authority
- 

# EU Nitrogen Expert Panel



- 🌱 Initiated by Fertilizers Europe
- 🌱 About 20 members
- 🌱 Joint meetings since 2014
- 🌱 Coordination with other fora (GPNM, CFA, SDG, INMS, European Commission, IFA, etc.)



# Why Nitrogen?



- 🌱 Nitrogen is a main crop yield limiting factor
- 🌱 Excess nitrogen has a range of unwanted effects to human health and the environment
- 🌱 Matching nitrogen demand and supply requires knowledge, tools and site-specific actions



# Why nitrogen use efficiency?



- 🌱 Key indicator for '*resource use efficiency*' and '*sustainable intensification*'
- 🌱 Currently, there is no such indicator in use in policy and practice
- 🌱 Easily understood by policy and practice

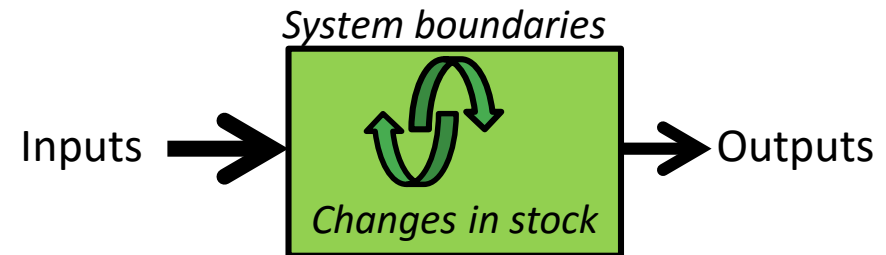


# A NUE indicator

- 🌱 A robust and easy-to-use NUE indicator, based on the mass balance.
- 🌱 NUE should be reported together with nitrogen output and nitrogen surplus.

🌱 Hence:

- $NUE = Output / Input$
- $N\ output = N\ yield$
- $N\ surplus = Input - output$





# Multi-scale applicable



- 🌱 Concept is multi-scale applicable
  - Field, Farm, Region, Country, World
  - Food systems
  - Sectors
  - ...
- 🌱 Systems and its boundaries have to be defined
- 🌱 Time span has to be defined
- 🌱 Changes in storage (e.g., soil) have to be reported



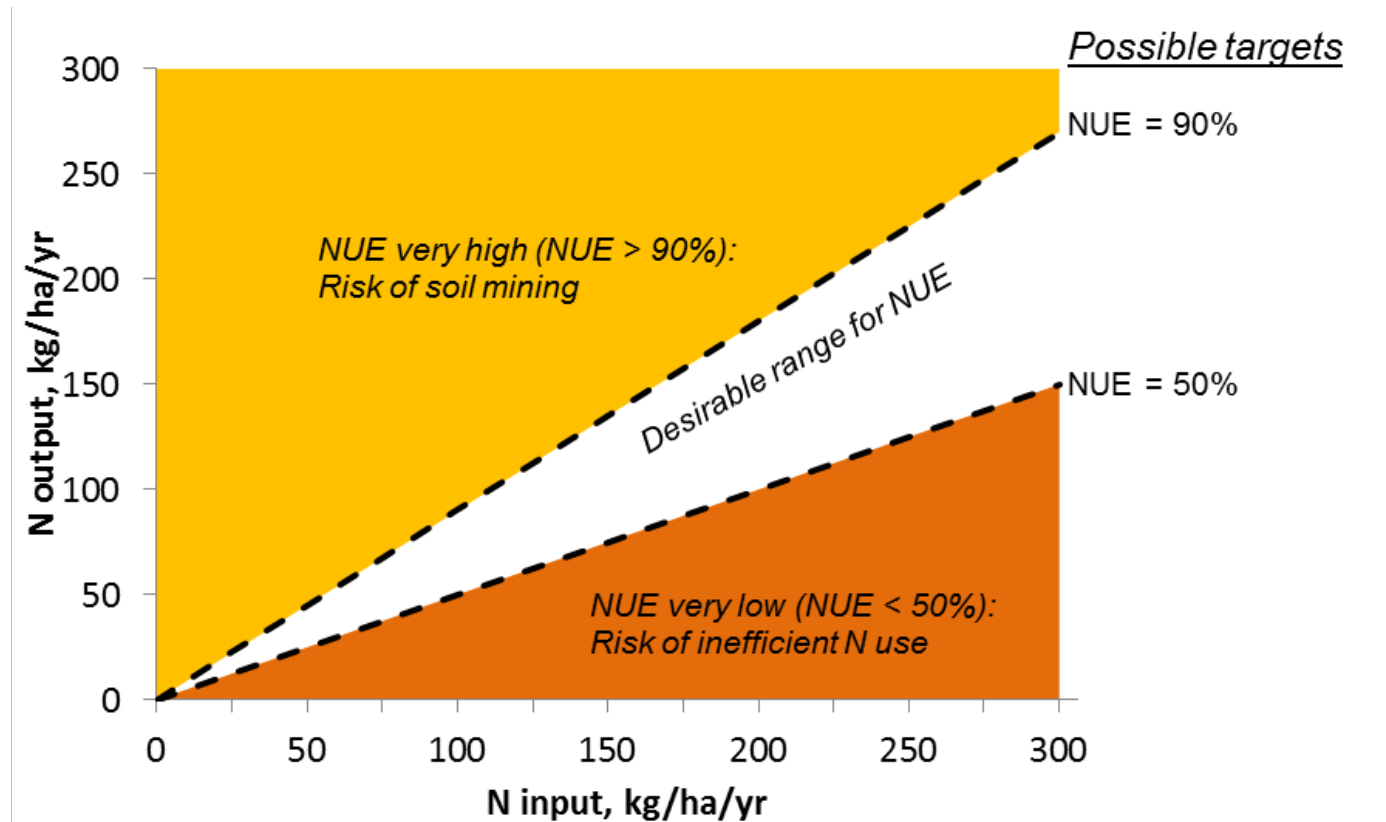
# Interpretation



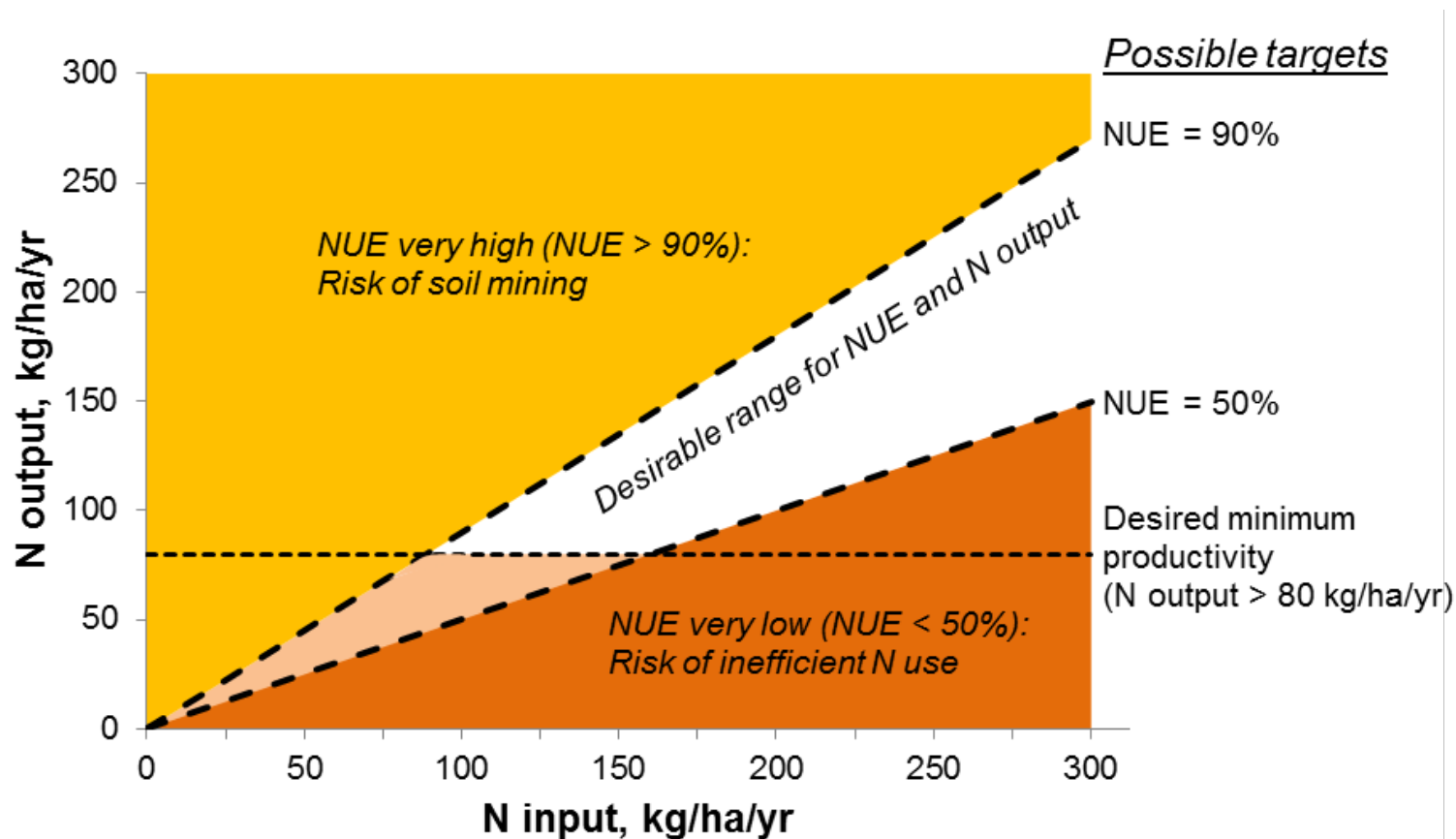
- 🌱 There are no absolute reference values for NUE, but possible target values can be derived.
  
- 🌱 Interpretations can be made on the basis of:
  - Changes over time (direction and size of change)
  - Differences between
    - actual and target values (NUE gap)
    - different cropping systems
    - different management practices
    - different countries



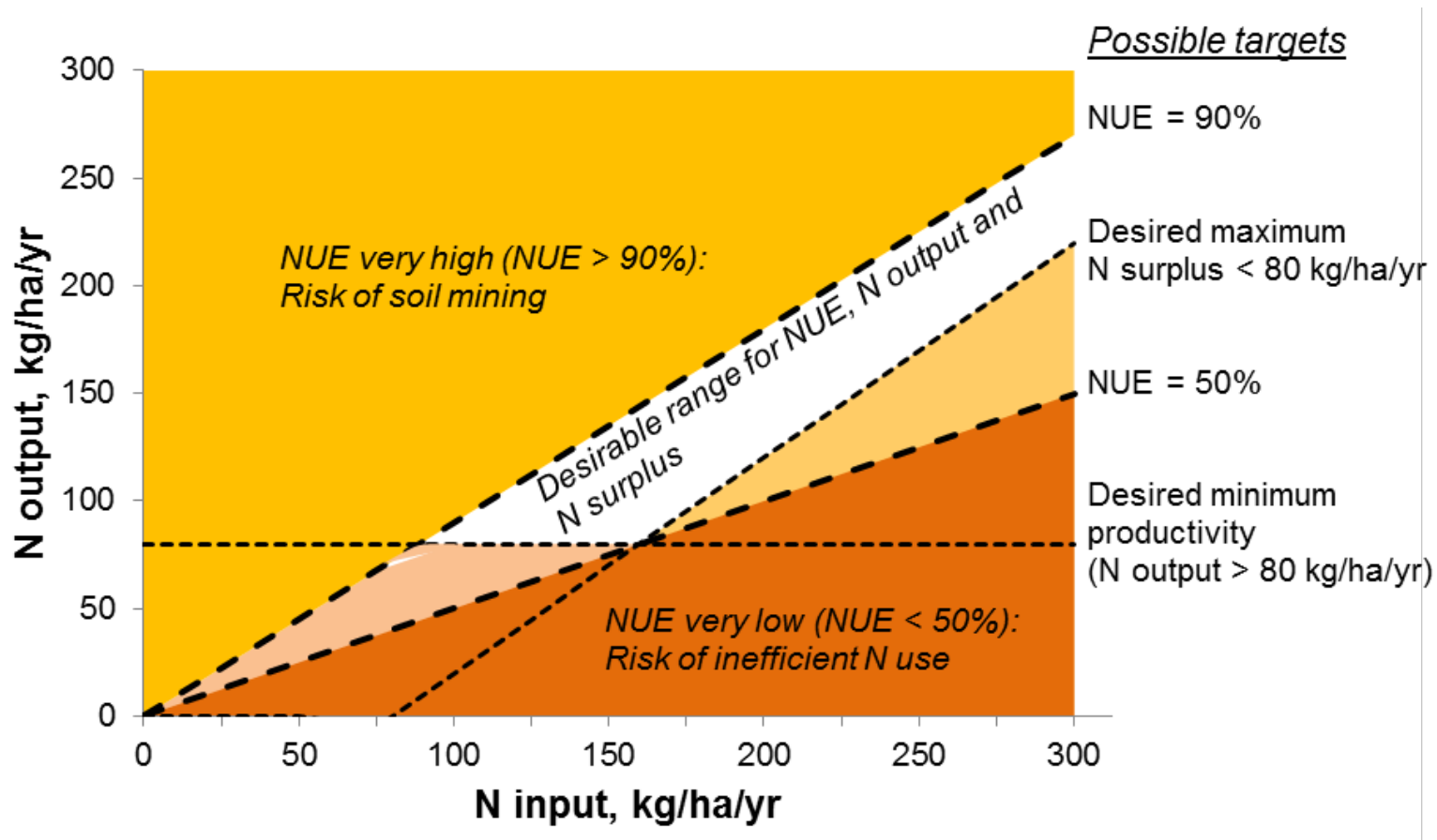
# A graphical presentation, in three steps: (i) NUE



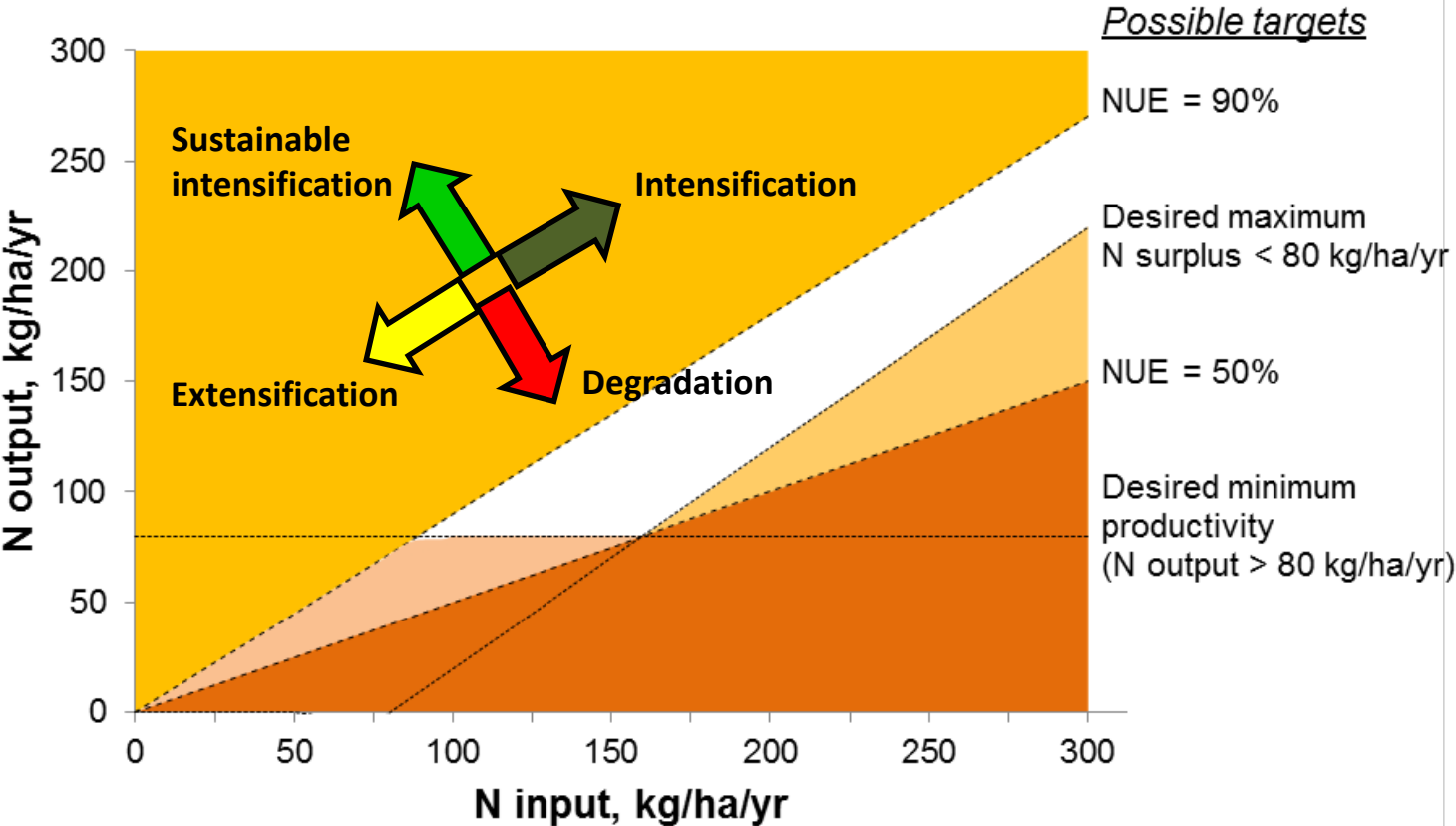
# A graphical presentation, in three steps: (ii) N output



# A graphical presentation, in three steps: (iii) N surplus



# Indicating the directions of change



# Applicability of concept:



- 🌱 Nitrogen fertilization experiments
  - 🌱 Farming systems
  - 🌱 Cropping systems at regional/national levels
  - 🌱 Food chain systems
- 
- 🌱 However, boundaries, inputs/outputs and target values change with change in systems!



# Current Work




- 🌱 Testing of the Guidance Document on how to derive NUEFM for different farm types, soil types, farming conditions...
- 🌱 ... via case studies in different EU regions – in cooperation with Panel members...
- 🌱 ... in order to open a dialogue with farmers to get them involved and to share results with them to enable the understanding of the indicator and develop benchmarks





# Concluding remarks

- ❧ In order to change practices, we need to be able to **measure** those
  - ❧ NUE is key indicator for **resource efficiency** and for **continuous improvement** of the environmental performance (as well the productivity) of farming
  - ❧ Matching with the need to implement the different **Sustainable Development Goals!**
- 
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# Now let's walk the talk!



EU Nitrogen Expert Panel

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