



# Risk and opportunities for barley growing in a changing climate

## Brewing and Beer Brands Forum

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# Global presence

## UK: Stowmarket & Bridlington

Stowmarket: Head Office - Maltings & Malted Ingredients plant

Bridlington: Maltings



# 200,000

tonnes of malt  
World number 19

# 50,000

tonnes of malted  
ingredients  
Largest sales producer  
in Europe and arguably  
the World



## Chicago

Sales Office

Time difference

-5 hours



## Bangkok

Dried Malt Extract plant  
NPD development facility



## Singapore

Sales Office

Time difference

+8 hours

# Climate Change Risk Assessment: Malting

*Extreme events may cause substantial decreases in barley yields worldwide.*

*Average yield losses range from 3% to 17%*

Decreases in global beer supply due to extreme drought and heat 2018: Xie et al (2018) *Nature Plants* vol 4, pp964–973



95% certainty that  
human activities  
affect climate



## SOIL

Organic matter decline  
affects nutrients and  
water penetration and  
retention

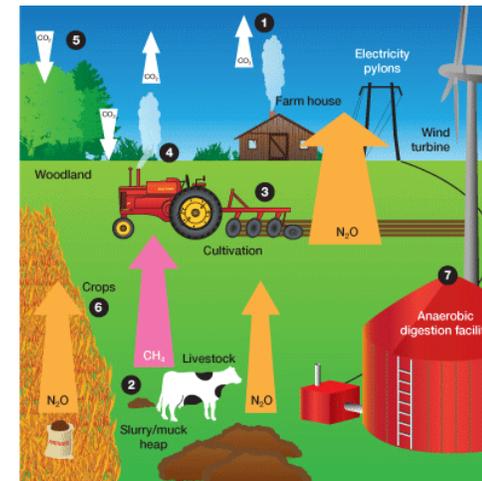


## EXTREME WEATHER

“Global Weirding”

Flood            Drought  
Gales            Erosion

Europe: last 100 yrs + 1°C  
50kha flood risk rising to 1%  
of agricultural land in 2080



## GHG EMISSIONS

Green taxation  
Carbon leakage  
ELMS  
Productivity

# Breeding programme changes?



**Drought  
resistance**

**Better starch-degrading  
capability (DP)**

**Spring/Winter  
genotypes merged**

**Different starch  
source??**



**Genomics**

**NOT GMO!**



**Is barley malt  
under threat?**

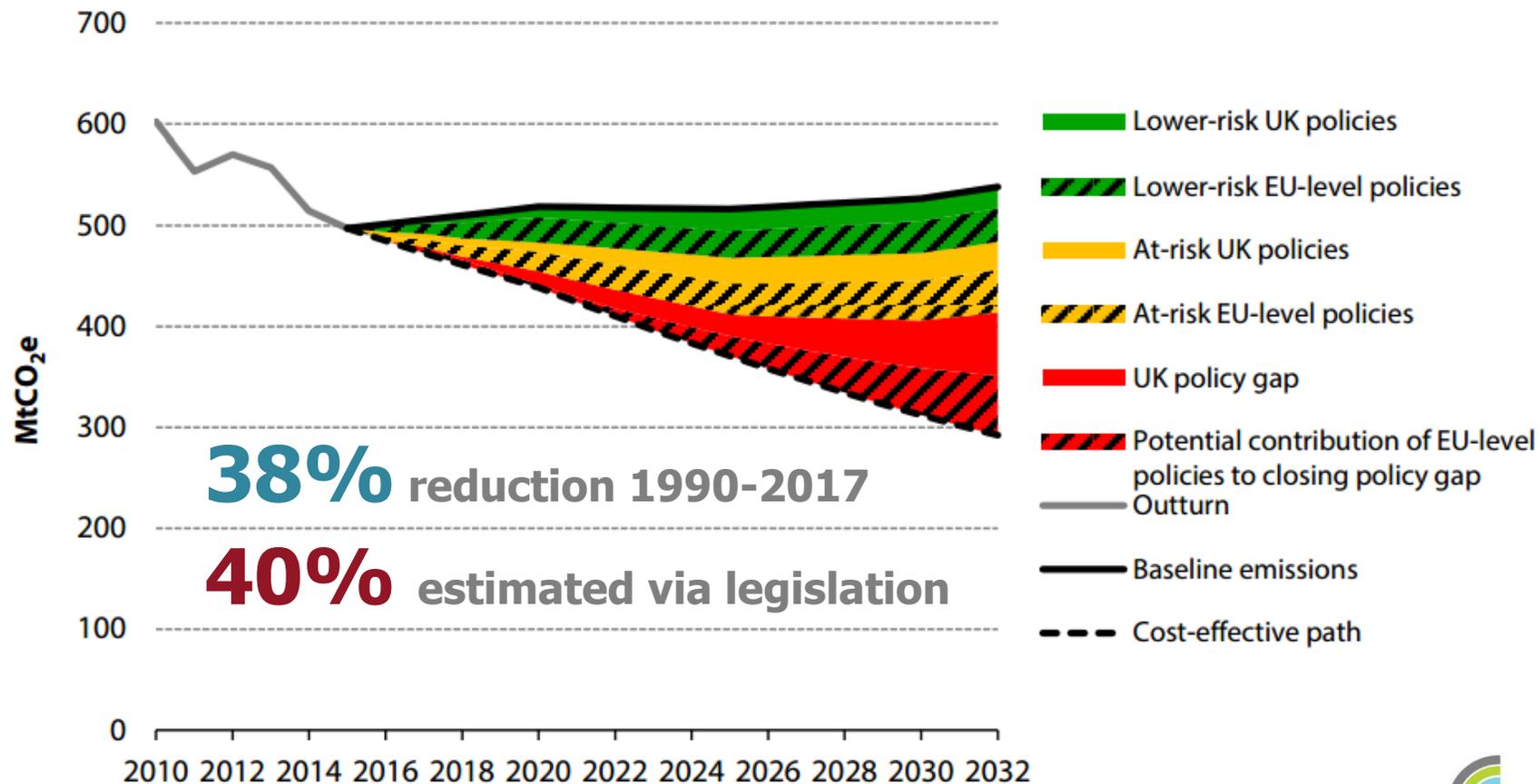
# Carbon Footprint of Malted Ingredients

## A common currency

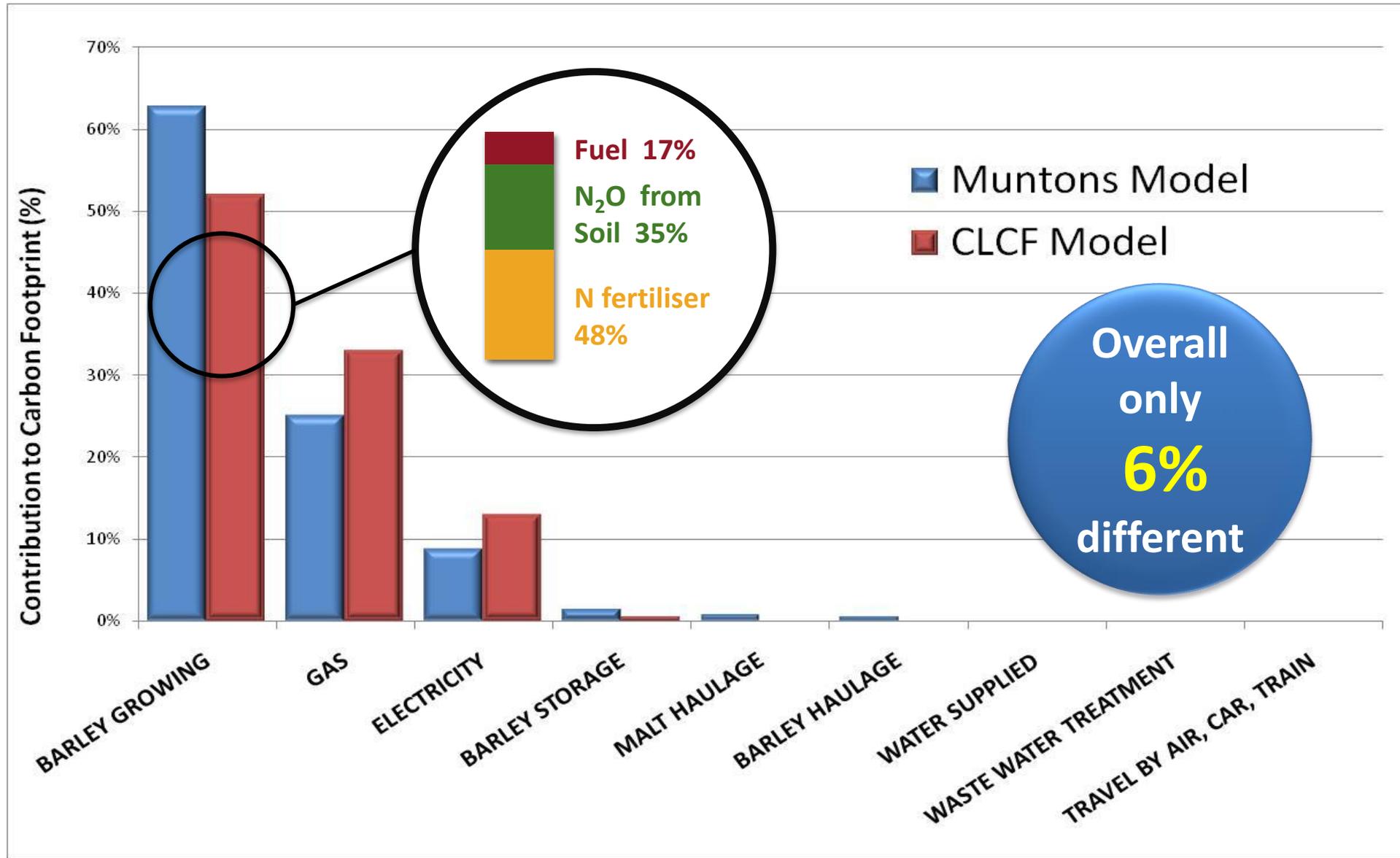


# Legislation: It will struggle to be effective to meet its agreed targets

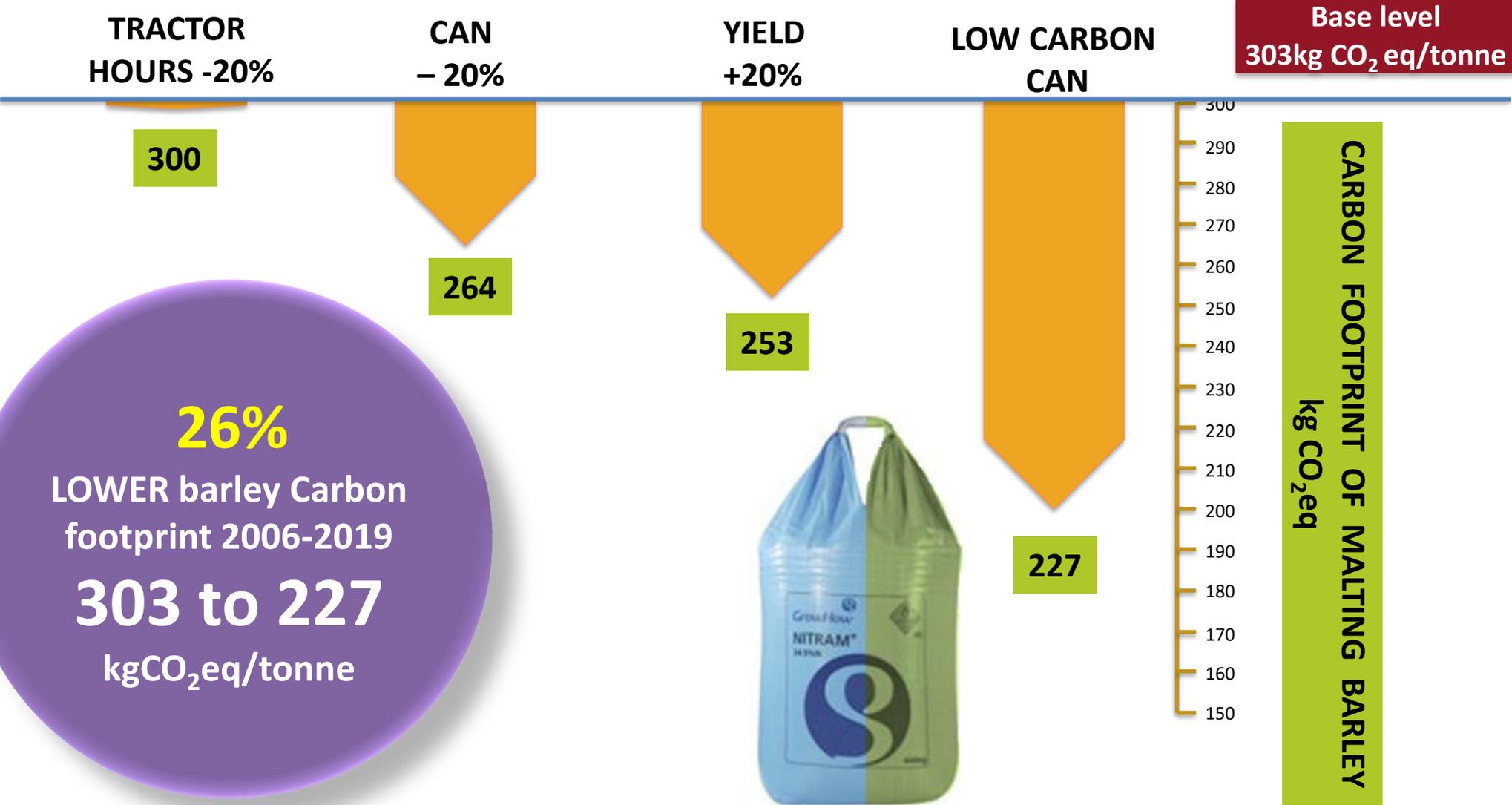
Contribution of EU policies to the cost-effective patch for meeting carbon budgets and the 2050 target



# Carbon Footprint: Barley to Brewery/Distillery (Scope 1, 2, 3)



# Which areas have the greatest impact on farm?



**26%**  
 LOWER barley Carbon footprint 2006-2019  
**303 to 227**  
 kgCO<sub>2</sub>eq/tonne

# Muntons Sustainability Journey

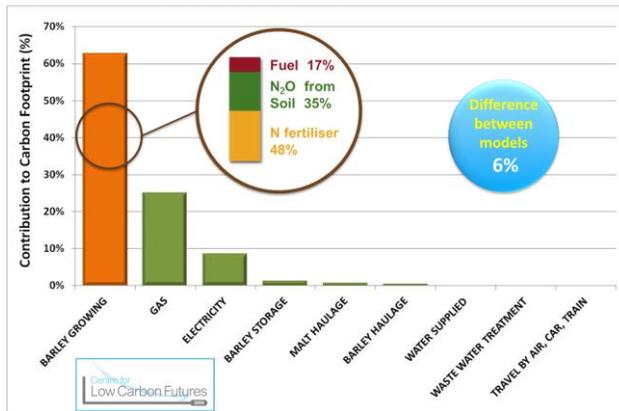


2006

LOCAL TO GLOBAL SUSTAINABILITY VIEW AND INFLUENCE

2019

## Carbon Footprint: Scopes 1-3



Arable working group member



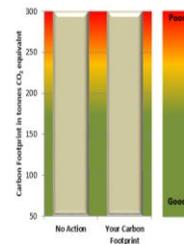
Arable working group Chairman



Executive committee

## Muntons Farming CARBON FOOTPRINT Calculator

- |   |     |                           |
|---|-----|---------------------------|
| What is your yield of barley?   | 5   | tonnes per hectare        |
| How many tractor hours did you travel on farm in your tractor?                  | 9   | hours per hectare         |
| How much barley seed did you use?   | 500 | kg per hectare per annum  |
| How much biofertiliser or compost did you use?                                  | 0   | kg per hectare            |
| How much Ammonium Nitrate (as N) was applied?                                   | 94  | kg per hectare            |
| How much Triple Superphosphate (as P <sub>2</sub> O <sub>5</sub> ) was applied? | 30  | kg per hectare            |
| How much Potassium Chloride (as K <sub>2</sub> O) was applied?                  | 1   | kg per hectare            |
| How much Pesticide was applied?   | 3   | kg per hectare            |
| Is your fertiliser sourced from a carbon efficient producer*?                   | n   | insert Y or N (Yes or No) |



\* This means one where carbon footprint is at least 40% less than the past 5 years average e.g. from GrowHow or Yara - refer to manufacturer if unsure

Your Carbon Footprint is **301** kg CO<sub>2</sub>e per tonne barley produced

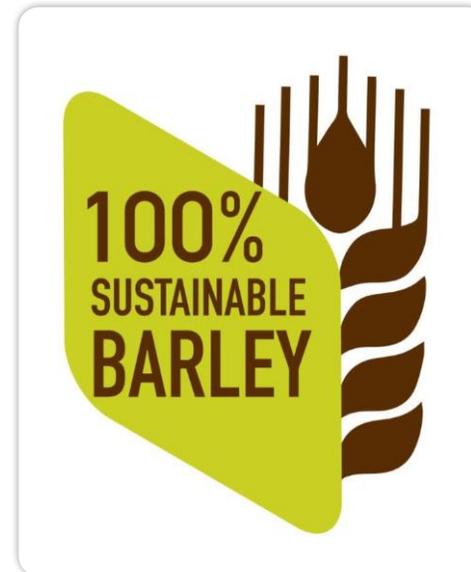


## FSA : Defines and benchmarks sustainable credentials

- Benchmarking to FSA validates existing schemes –allows global definition
- Made sustainability quantifiable & competitive

## DE-RISKS THE SUPPLY CHAIN

- Muntons: the first maltster globally to be audited as providing 100% sustainable malt and barley



# Which tape measure do you prefer?



SCIENCE  
BASED  
TARGETS

DRIVING AMBITIOUS CORPORATE CLIMATE ACTION



WORLD  
RESOURCES  
INSTITUTE



Muntons  
45%  
less GHG  
2010-2025

*Decarbonisation required to keep global temperature **increase below 2°C (now 1.5°C)** compared to pre-industrial temperatures*

*Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC AR5)*

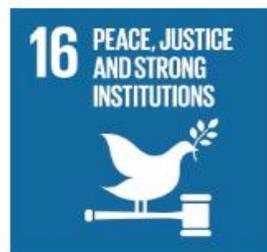
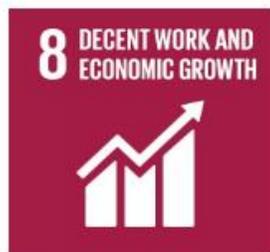
Reduce barriers to the adoption of science-based targets

Institutionalise the adoption of science-based targets

Create a critical mass



# SUSTAINABLE DEVELOPMENT GOALS



## Brexit – CAP reform impact

### Rural jobs at risk if CAP payments end

“Loss of CAP support payments with no replacement would have a significant effect on farm purchasing power”

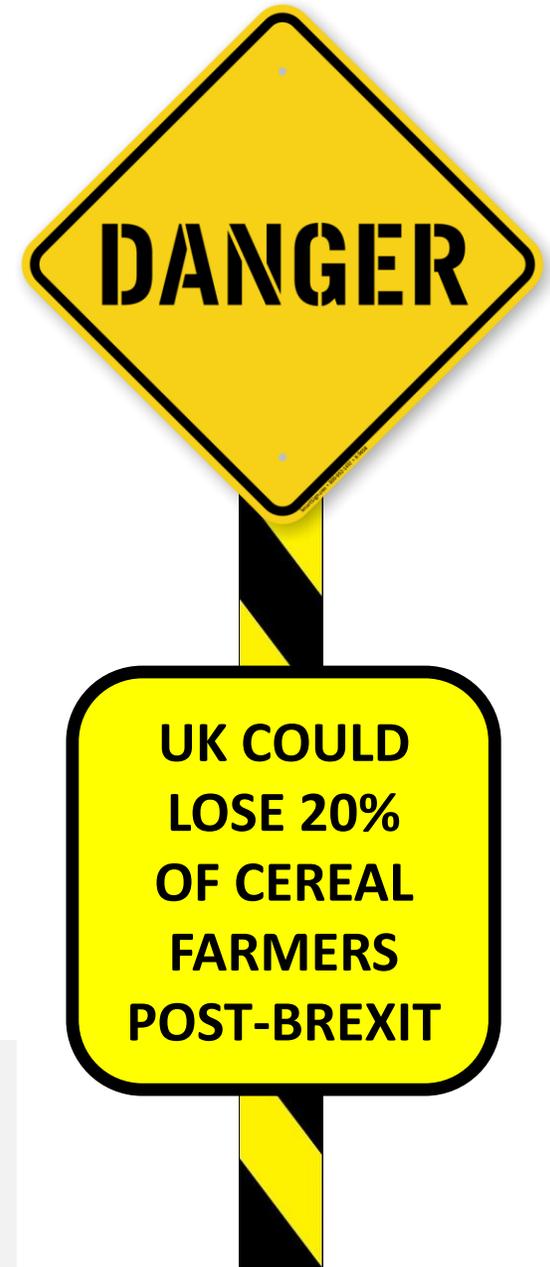
University of Kent’s National Institute of Economic and Social Research (NIESR) June 2017

“Removal of the CAP without a replacement could lead to the loss of about 250,000 jobs in non-farm small and medium-sized enterprises ..... Some 80% of these job losses would be in rural areas, with a “significant negative impact on rural job markets and economies”

### Two types of subsidy available:

**Basic Payment Scheme (BPS)** - in 2015 this was worth €3bn

**Rural Economy Subsidy** - UK Farmers have access to a €5.2bn pot of subsidy for rural development projects over 2014-2022



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open sharing of knowledge

- Case studies demonstrating **PS: Practical Sustainability**
- Proof of our progress



Case Studies & Projects

All Carbon Reducing Energy Saving Food Health & Wellbeing Supply Chain Wider Supply Chain



Reed Bed



Live energy usage



PV Cells



Malt in Your Mouth



1 million kilowatts



Health Benefits of Malt



SAI Platform



Sustainable Barley



Pedal Power

