

Securing our future with greener food and fuel

April 2011



 ensus

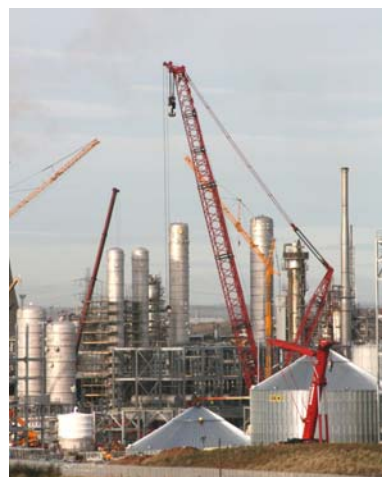
Ensus: Summary background

- Start up company formed in 2006 in response to challenges of climate change and energy security
- >£300m private investment by Ensus and partners supporting ~2000 UK jobs and economic growth
- First plant in UK is now operational, a world scale grain biorefinery

UK-sourced animal feed wheat input

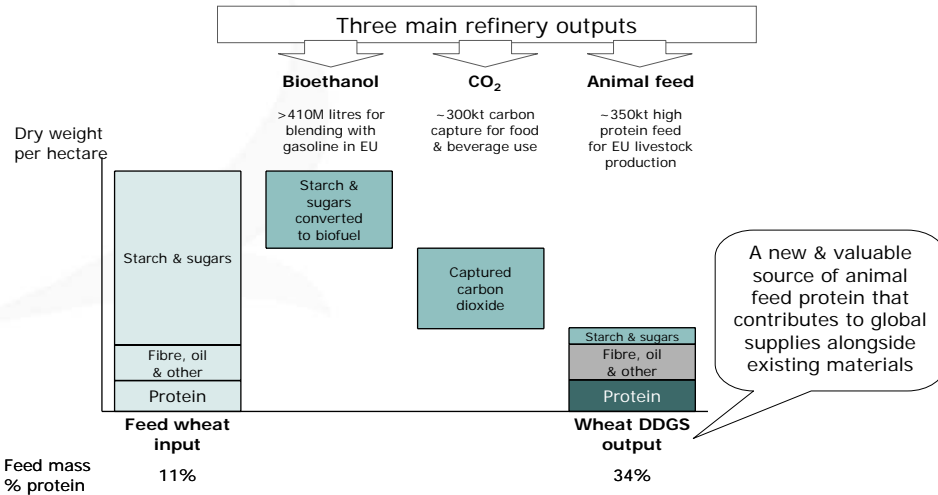
Produce enough bioethanol to meet over half of UK demand, >70% GHG saving vs. petrol

Ensus is also one of EU's largest producers of animal feed



 ensus

What is biorefining?



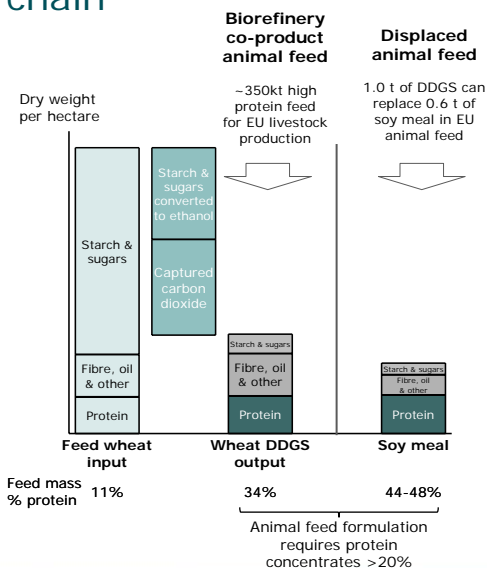
Source: Impact of protein concentrate coproducts on net land requirement for European biofuel production
GCB Bioenergy (2009) 1, 346–359, doi: 10.1111/j.1757-1707.2009.01026.x

ensus

3

Producing a greener food chain

- Meat production accounts for a fifth of global GHG emissions, linked to global land required for feed crops
- EU imports >35 mt of soy meal p.a., a high protein feed made from soy beans
 - Soy bean area for EU imports equivalent to >70% of EU wheat area**
 - 90% of this soy area is in South America, adding to deforestation pressures**
- Biorefining converts EU wheat into a high protein animal feed that can replace imported soy meal
- A more efficient land use that reduces global deforestation pressures



Source: Impact of protein concentrate coproducts on net land requirement for European biofuel production
GCB Bioenergy (2009) 1, 346–359, doi: 10.1111/j.1757-1707.2009.01026.x

ensus

4

Producing a greener transport fuel

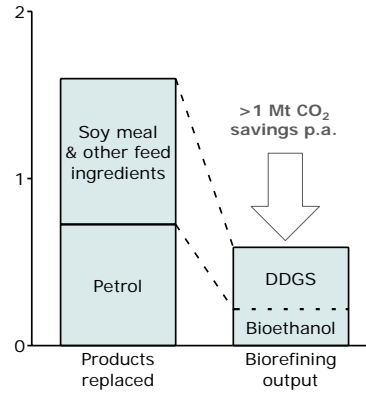
- There are good and bad biofuels

Ensus fully complies with demanding sustainability criteria and reporting requirements in RTFO and RED

Studies indicate that Indirect Land Use Change (ILUC) risks are lower for EU bioethanol than for many other biofuels

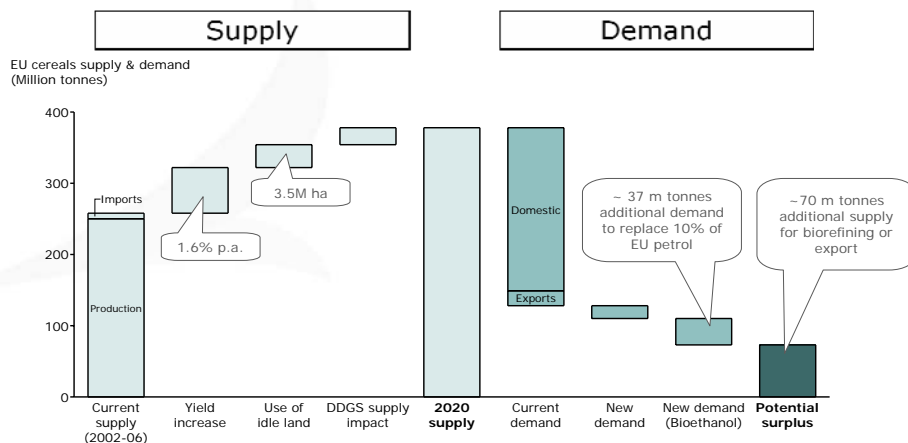
- Ensus process scale and technology delivers >70% biofuel CO₂ savings vs. petrol
- Overall GHG impact including animal feed and biofuel contributions > 1 million tonnes CO₂ savings p.a. - including ILUC impacts

GHG emissions
(Mt CO₂ p.a.)



Source: RED methodology; Department for Transport results for indirect land use change

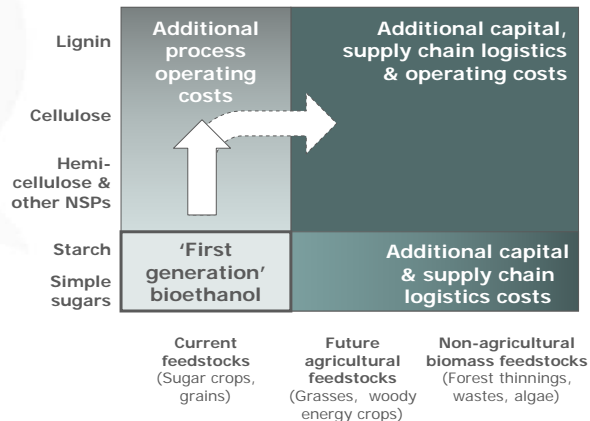
EU has potential to increase cereal grain output well in excess of 2020 bioethanol demand



Source: Renewable Energy Association - Biofuel supply and demand scenario modelling (2009)

'First generation' bioethanol industry is an enabler for second generation technologies

- Replacing more than 10-20% of global transport fuel energy will require second generation (cellulosic) biofuels
- 1G industry provides a platform for 2G process development, enhancing ethanol yield from current feedstocks
 - Brazil (Bagasse)**
 - US (Corn cobs & stover)**
 - EU (DDGS, beet pulp)**



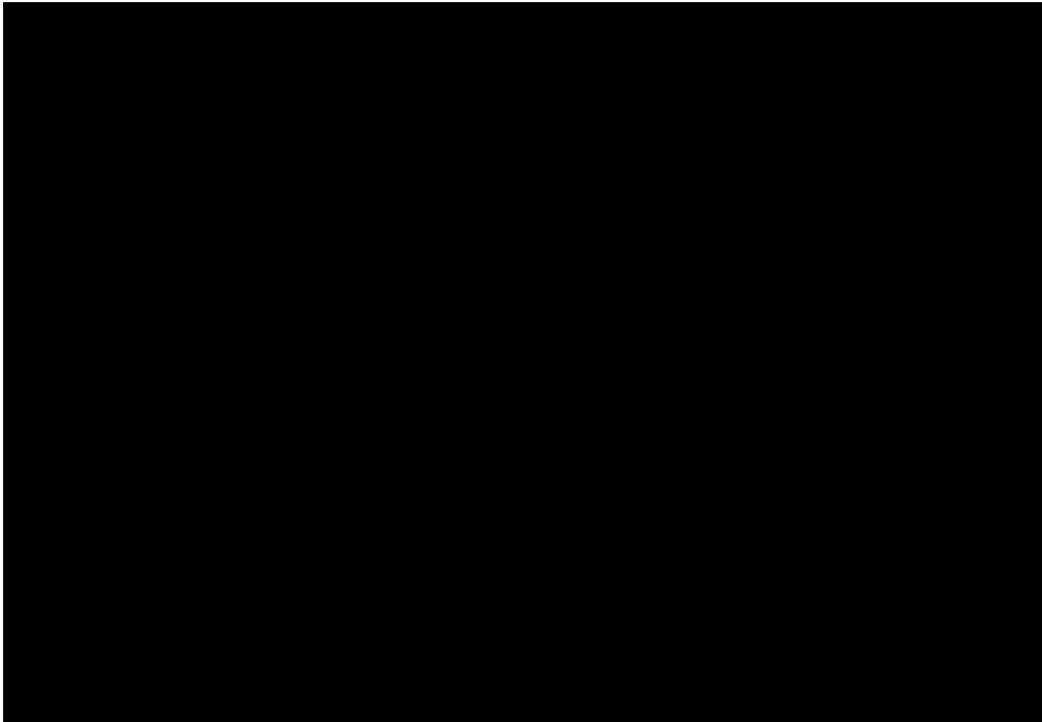
EU grain biorefining provides

- An immediate, highly sustainable contribution to UK & EU climate change targets *and* a greener food supply chain
- Improved food and energy security, adding to global supplies of high protein animal feed and transport fuel
- A platform for second generation biofuel process development and commercialisation



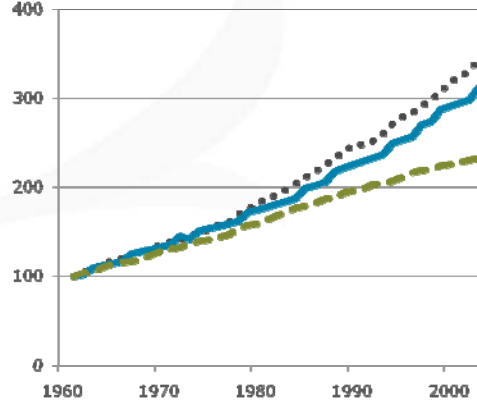
Thank you

sam.cockerill@ensusgroup.com



Global consumption of animal protein in food has been rising at nearly 3% p.a. since the 1960's

Global consumption
1961 = 100



Food consumption
growth rates
1961-1980 1980-2003

	1961-1980	1980-2003
Fats & oils	3.0%	2.8%
Animal protein	2.9%	2.6%
Energy (exc. protein & fat)	2.4%	1.6%

Corresponding rise in demand for high protein feed ingredients such as soy meal



Source: UNFAO