

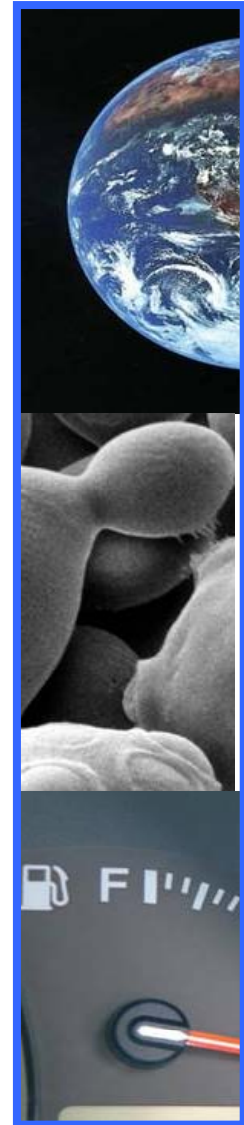


Sustainable Bioenergy Issues in Europe

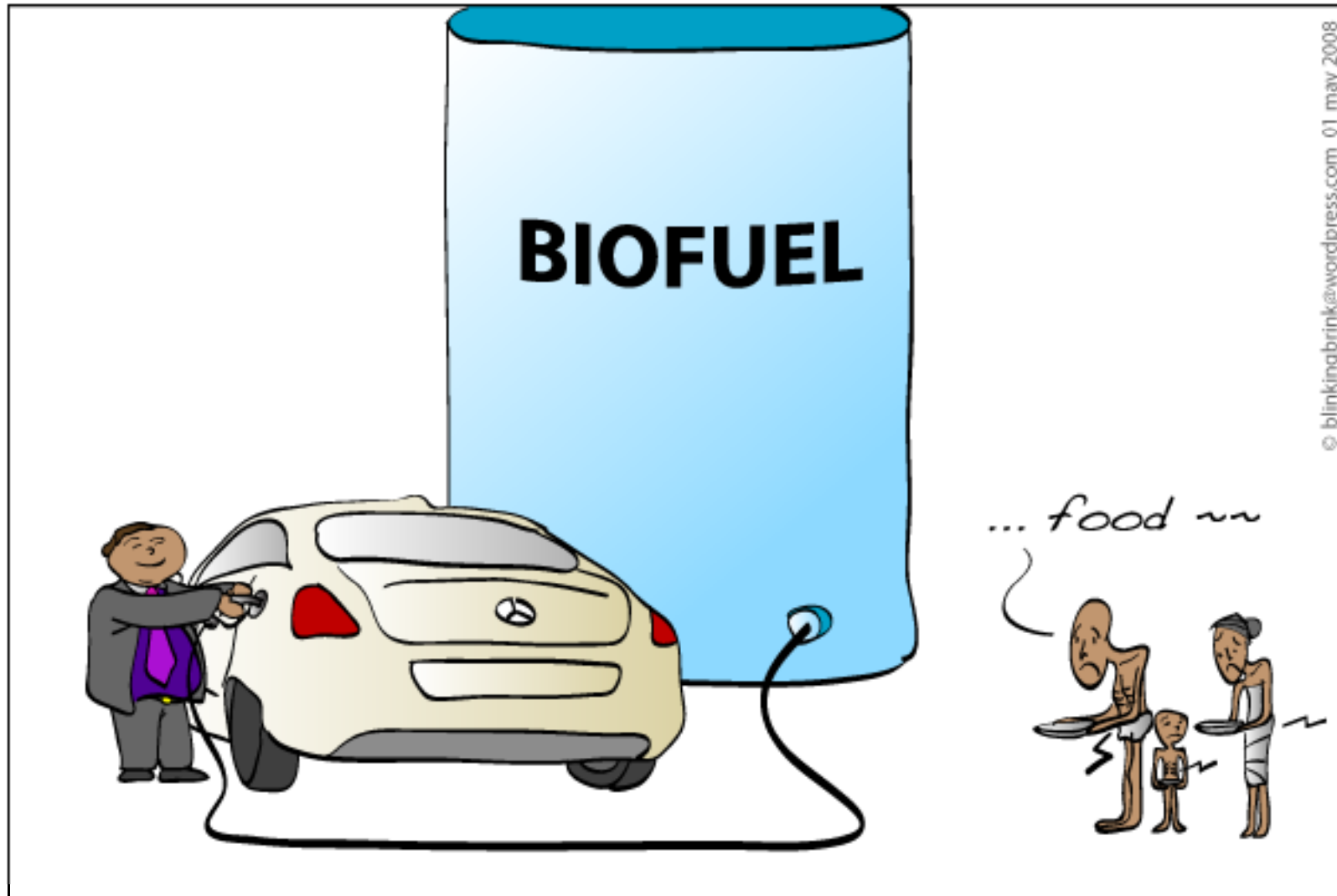
Patricia Osseweijer

Delft University of Technology &
Kluyver Centre for Genomics of
Industrial Fermentation

The Netherlands



Newspaper headlines



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Newspaper headlines

The Irish Times, Saturday 30 January 2010

Producers of biofuels want changes to carbon tax

The Guardian, Wednesday 10 February 2010

Scrap biofuels targets and focus on improved public transport

The Guardian, Monday 15 February 2010

EU biofuels significantly harming food production in developing countries

The Guardian, Thursday 18 February 2010

A surreal argument for biofuels



The Sun

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Monday, 22 February 2009

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Obamas happy to go green

Published: 27 Feb 2009
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PRESIDENT Obama outlined his recession-busting budget last night - including plans to cut greenhouse gases.

Meanwhile, wife Michelle, looking stunning in a green dress, honoured soul legend Stevie Wonder at the White House.



Stunning ... Michelle Obama



Obama pledges to rebuild US
OBAMA issues stirring promise to the US, saying economy will 'be stronger'

Obama tells US: We will recover
Obama's Afghan troop surge
Obama signs stimulus bill
Obama's top photo award

NOT SPORTS

NEWS SPORT **BIZARR**

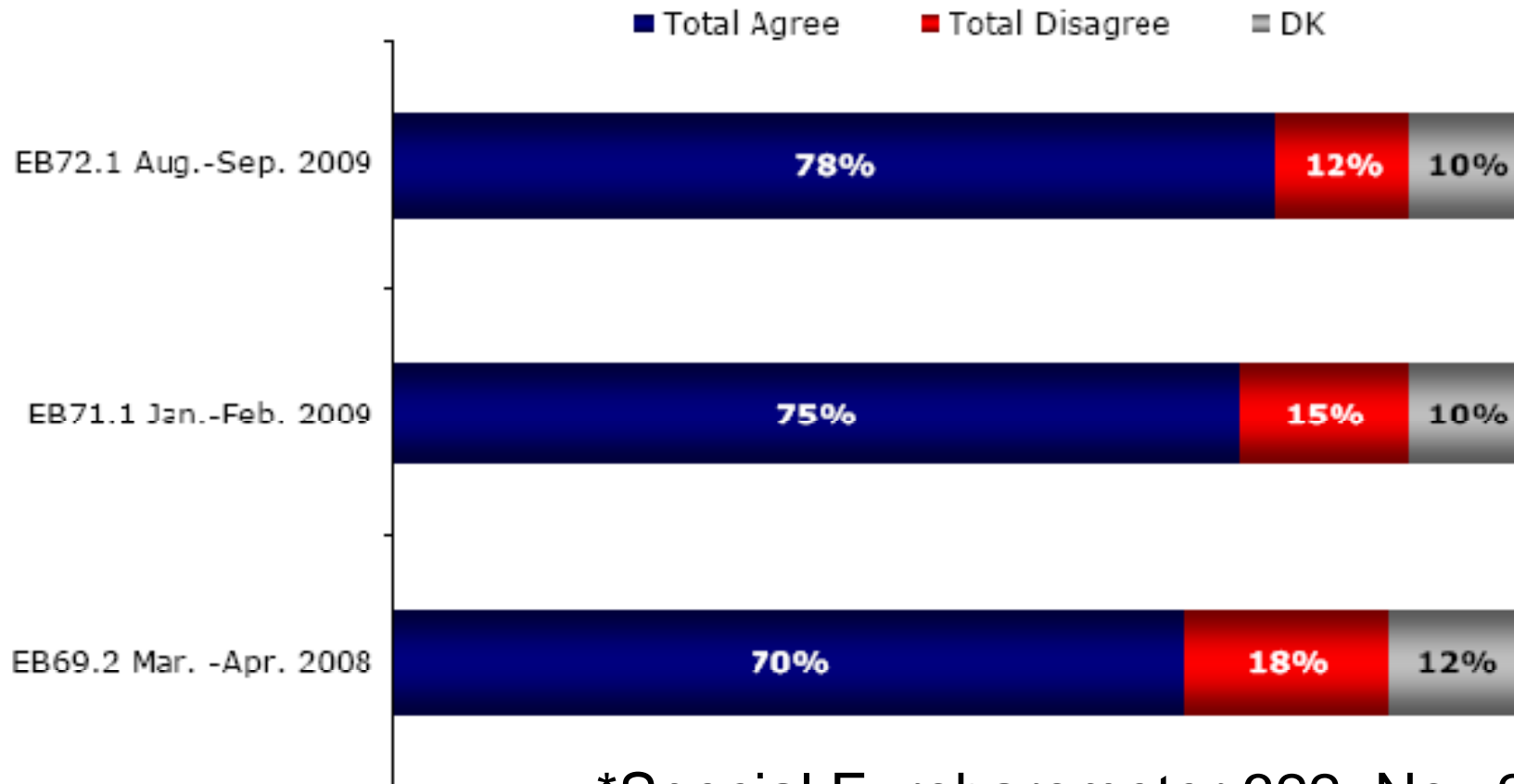
 Cheryl: Move



Public Opinion*

QB4.6 For each of the following statements, please tell me whether you totally agree, tend to agree, tend to disagree or totally disagree.

(SPLIT A) Alternative fuels, such as "bio fuels", should be used to reduce greenhouse gas emissions - % EU

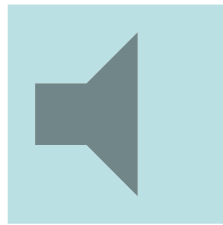


*Special Eurobarometer 322, Nov 2010

Europe vs world

Security of:

- **Food**
- **Energy**
- **sustainability**



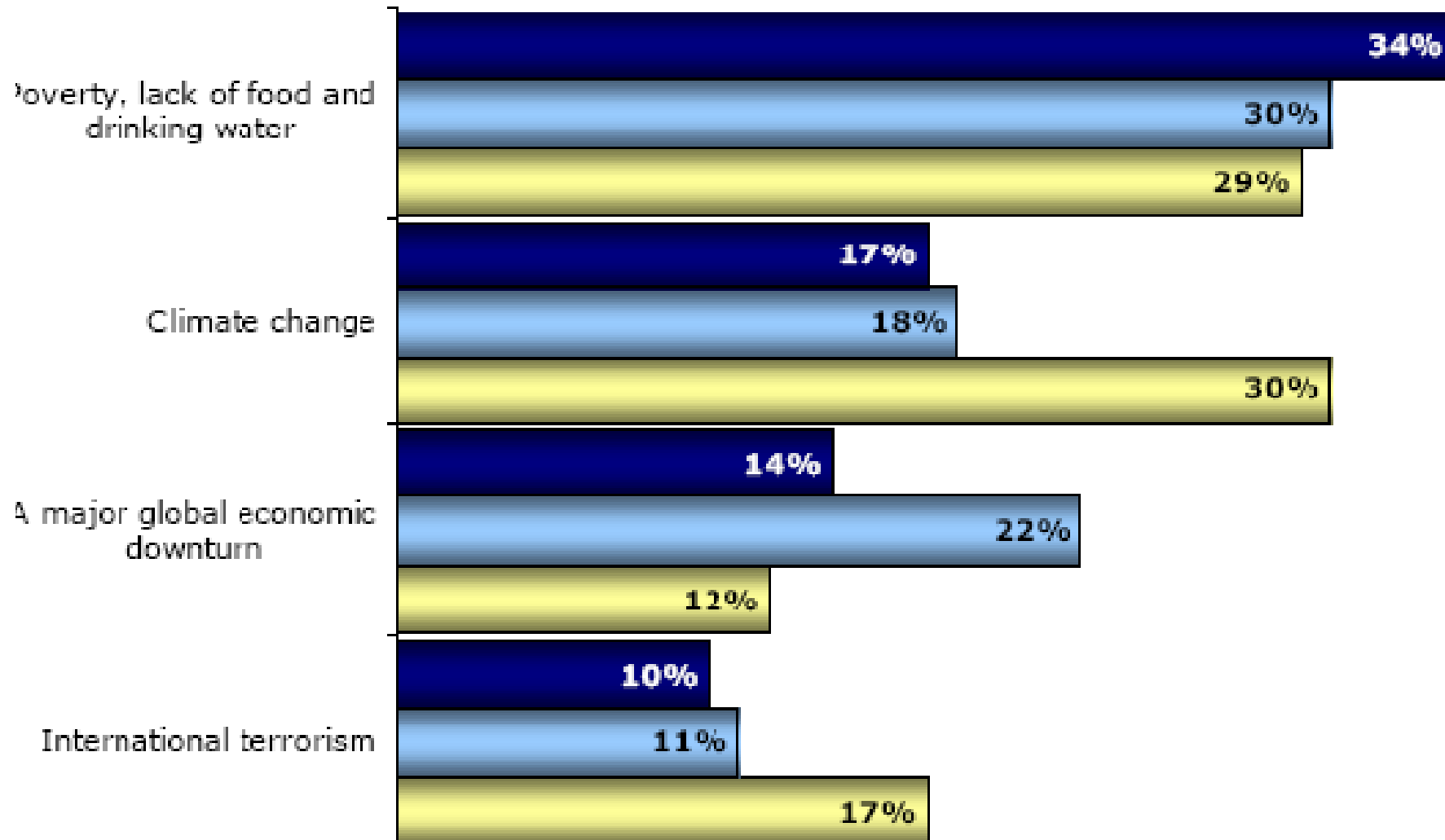
- **Climate change**
- **Trade issues**

**Change: Common Agricultural Policy &
Lisbon agenda for economic strategy**



QB1a In your opinion, which of the following do you consider to be the most serious problem currently facing the world as a whole? Firstly?
% EU

■ EB69.2 Mar. -Apr. 2008 ■ EB71.1 Jan.-Feb. 2009 ■ EB72.1 Aug.-Sep. 2009



Relevant opinions

European Group on Ethics report on
Sustainable Agriculture (December 2008)

Focus on:

- Human right to food
 - availability, access and quality
- Distributive justice
 - Global equity: protecting disadvantaged
 - Intergenerational: sustainability

http://ec.europa.eu/european_group_ethics/docs/opinion24_en.pdf

EGE report

- (1) planting of crops for biofuel production should not interfere with food production, such as in the case of set-aside or marginal land;
- (2) steps should be taken to recycle both crops and food waste in the production chain, using the biofuel derived from crop production in order significantly to improve the energy balance of biofuel production;



EGE report

- 3) research should be funded in order to obtain biofuel from waste materials, from non-edible parts of plants or from plant species that do not compete with food production or for resources such as water and land used for growing food;
- (4) reduction of use of fossil fuels, especially in transport, should be promoted;
- (5) infrastructure for second-generation biofuels should be promoted, financed and advanced in the European Union.



Increase public participation

- **in policy design for primary production of food of plant origin**

Linked to information campaigns on the consequences of dietary habits for food sustainability

- (1) preventing waste of food products,
- (2) promoting healthy lifestyle, and
- (3) raising public awareness of agricultural methods and technologies



Kluyver Centre



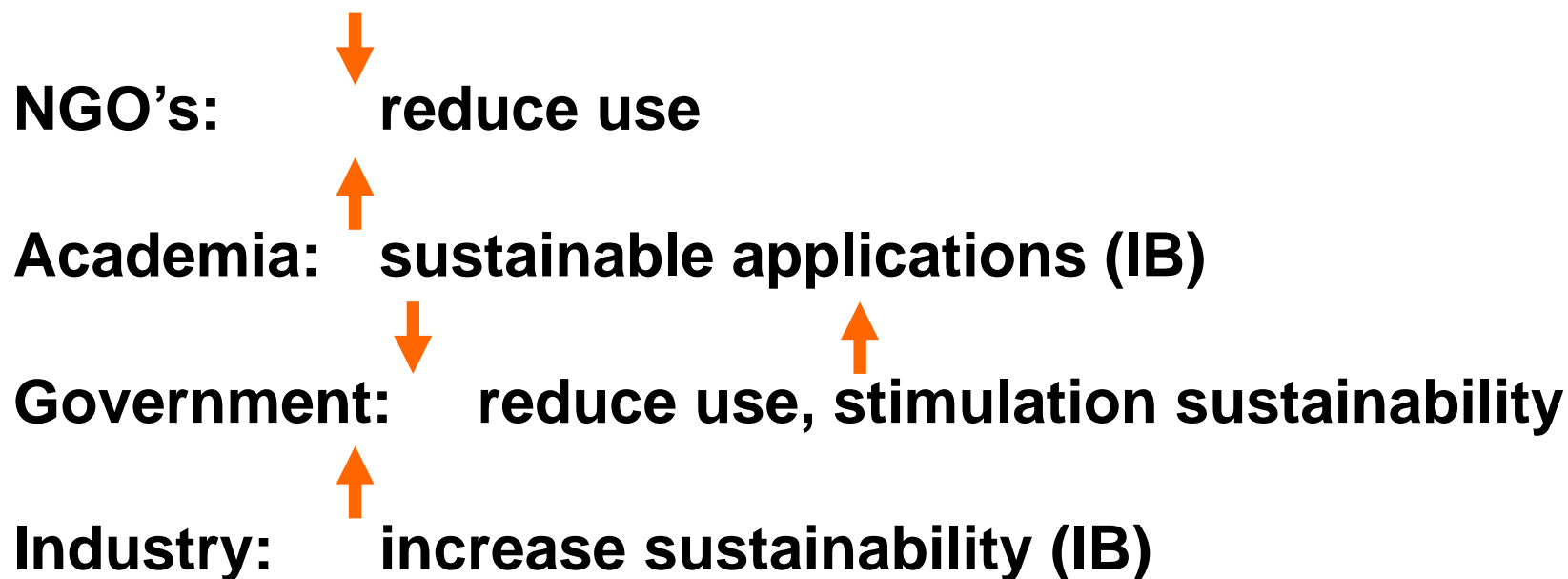
Genomics & Society

Aims to reveal and understand underlying public issues that influence implementation of industrial genomics results and suggests ways of improved communication



Recommendations KC 2002-2007

Sustainability as 'core value' & joint agenda
reduce use energy and fossil sources
increase use sustainable sources



Results

- **Agreed: 10 recommendations for sustainable biofuels**



Kluyver|CENTRE | Hooger Instituut voor Genetica
van Industriële Fermentatie

Summary Statement on sustainable development of biofuels *Vlaardingen, The Netherlands, 1 November 2008*

This statement describes the results of an expert meeting on the societal issues of biofuels organised by the Kluyver Centre for Genomics of Industrial Fermentation under "Chatham House Rule". The meeting was designed to discuss the societal issues that are likely to emerge when applications of industrial fermentation technologies for the production of biofuels and energy steadily increase. The workshop focused on the identification of policy 'control points'.

This document reflects the opinions of 25 international experts on the necessary measures that should be implemented to develop sustainable alternatives for fossil fuels. Although agreement is reached on the following statements each expert may hold different priorities for the recommendations given in this text.

25 prominent scientists, politicians, social scientists, environmental organisations and industrialists gathered in Vlaardingen on 30 October to 1 November 2008 to identify key issues and concerns about the implementation of biofuels.

Industrial technologies using microorganisms are contributing increasingly to the creation of a bio-based society. Industries are now turning renewable resources such as corn and sugar into biofuels and biodegradable plastics. Vitamins, antibiotics and food enzymes produced by industrial biotechnology are penetrating the market. Step by step biomass-based alternatives are replacing fossil fuel-based production processes. These technologies are much less well-known than biotechnological developments in the health and food areas and consequently have initially aroused less concern with the general public. But: recently public and political concerns were raised on these developments as they will have a major impact on society as a whole. The social implications of these developments therefore need to be addressed from the outset.

How will the public and the environment benefit? What about the needs of developing countries? How to deal with unknown risks? What regulations should be in place? How will these contribute to industrial innovation? What effects will these developments have on the global economy? And how is society going to address these issues? Insights into the societal issues should guide public-private research, technology development and regulations.

The main issues identified by the group during the lectures, discussions and break-out sessions are summarised below.

1. Development of sustainable and secure alternatives for energy need governance

We believe that *bioenergy* must be managed to contribute to a comprehensive sustainable



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van Industriële Fermentatie

Sustainability?

- Durable, biodegradable, environmentally friendly, fair, non-GM, organic, economically viable, natural, ...

Both: measurable specific standards AND
unmeasurable general concepts



Sustainability?



**Politicians have fear
no decisions are taken**



Statement 1

**Urgent need to clarify
concept of sustainability**

Sustainable biofuels ?

Sustainability criteria are needed
which need to be measured

Indirect land use changes
Level playing field



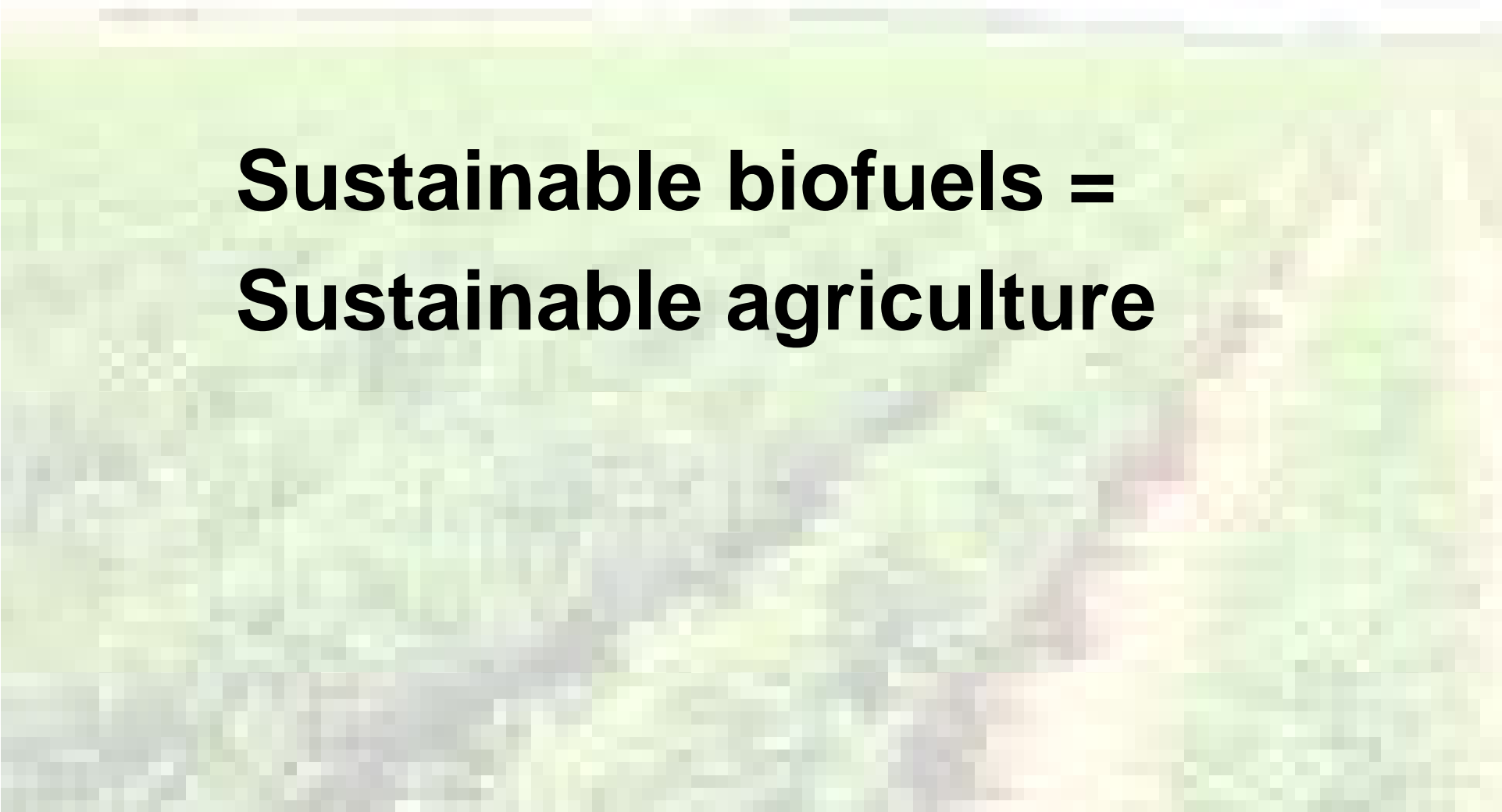
need to measure whole agricultural system

Implement globally → Agricultural policies

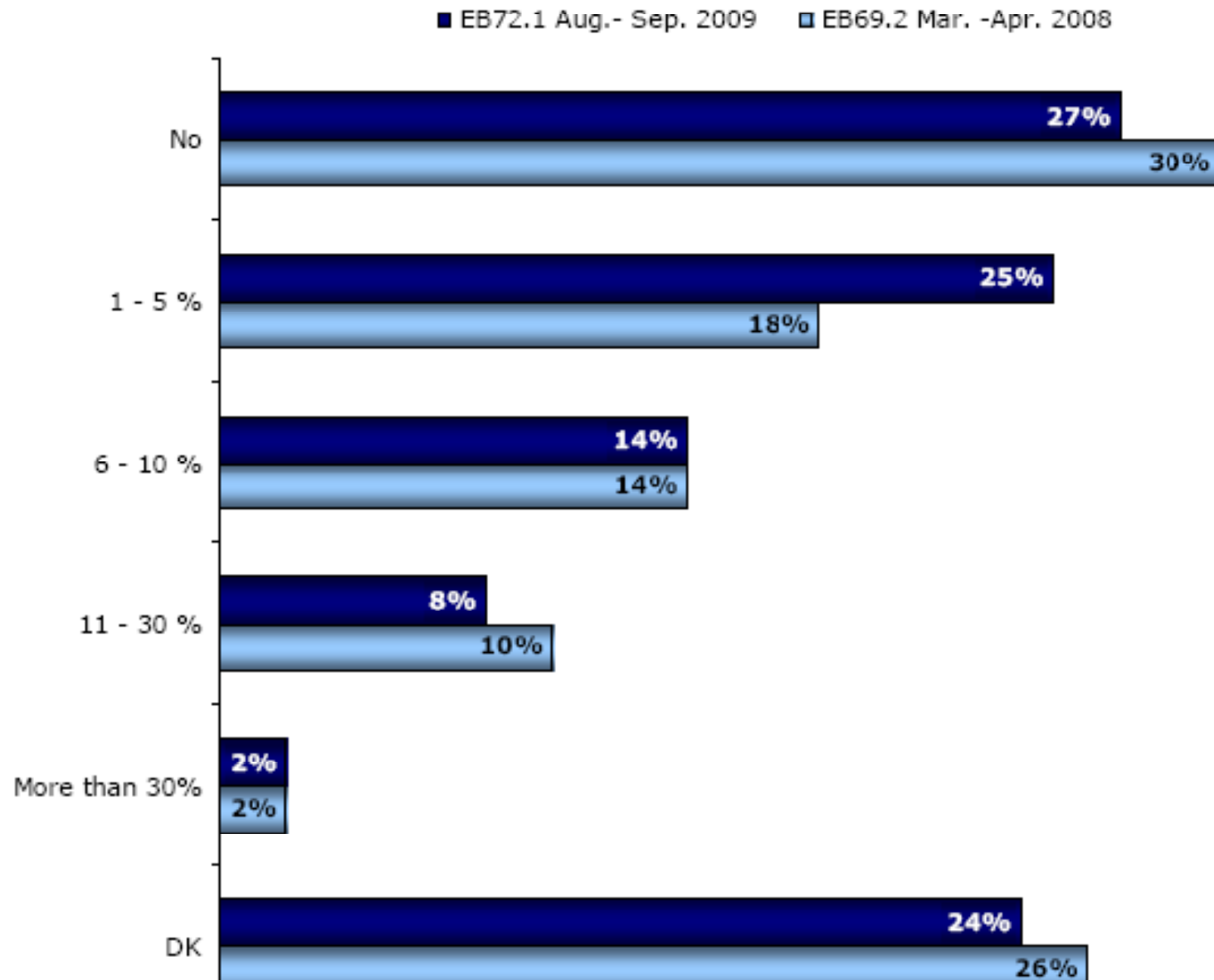


Statement 2

**Sustainable biofuels =
Sustainable agriculture**



QB7 Personally, how much would you be prepared to pay more for energy produced from sources that emit less greenhouse gases in order to fight the climate change? In average, how much, in percent, would you be ready to pay more? - % EU



Responsibility ?

Debates have not led to clarity but presented one-sided pictures on selections of data
Resulting in lack of public trust on promises
Which leads to lack of motivation (denial?)
and hence little responsibility and change

To avoid techno-fix we need shared responsibility



Responsibility?

To create shared responsibility
we need awareness leading to
behavioural changes

→ We need better
communication for more people





Statement 3

**Personal responsibility is crucial
to help our planet survive**



ASPIRATIONS – IDEAL WORLD

- Climate and environment improvement
- Food security and Food safety
- Energy security
- Sustainability
 - responsible use of resources (environment, water, air, biodiversity)
- Economic stability



EUROPEAN VIEW

- Stable population
 - Stable energy demand, but regional differences
- Likely net importer of bioenergy
 - Criteria: security, logistics, trade issues, sustainability, certification
- Advanced 2nd gen. biofuels is relevant

22/3/2010



EUROPEAN CHALLENGES

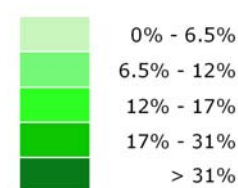
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- Sources for bioenergy imports
- Scale and Infrastructure (supply chain)
- Cost
- Energy efficiency/Consumption and behavior
- policies

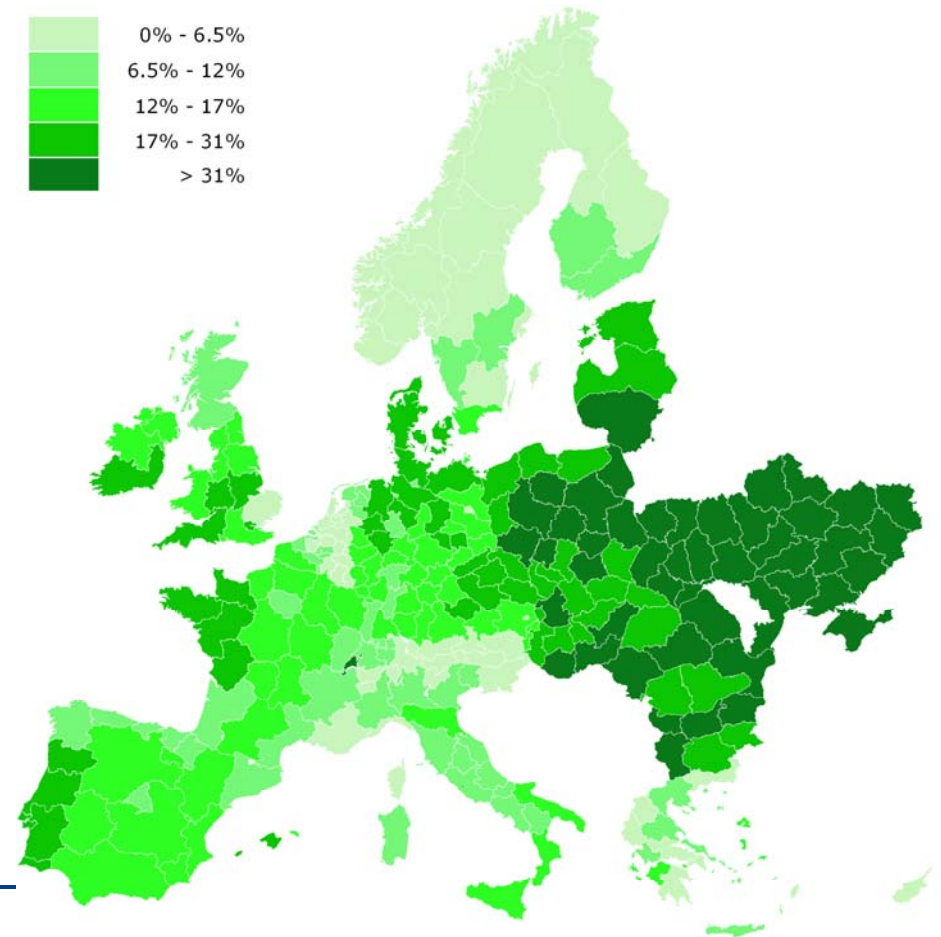


spatial production potential

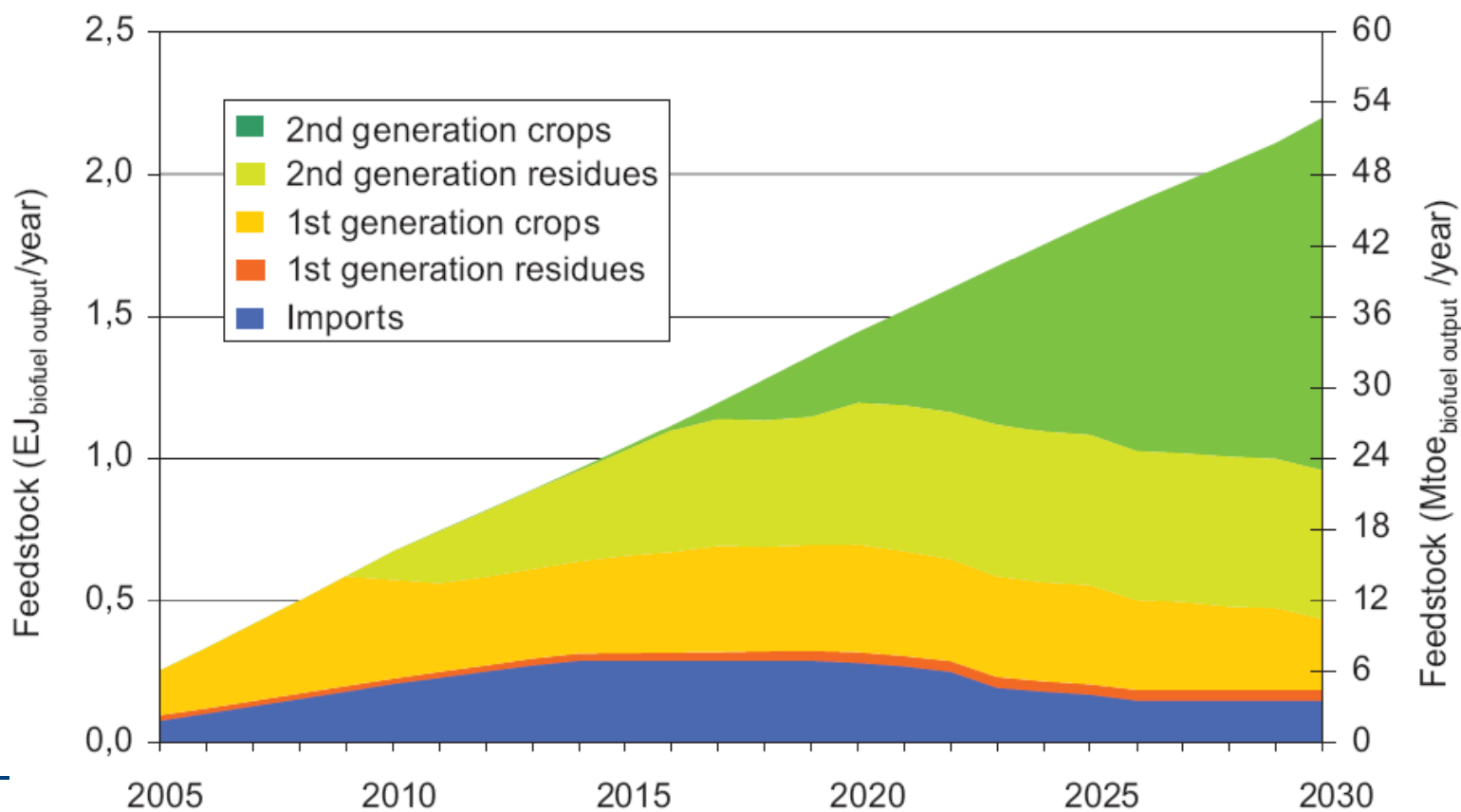
Arable land available for dedicated bio-energy crops divided by the total land



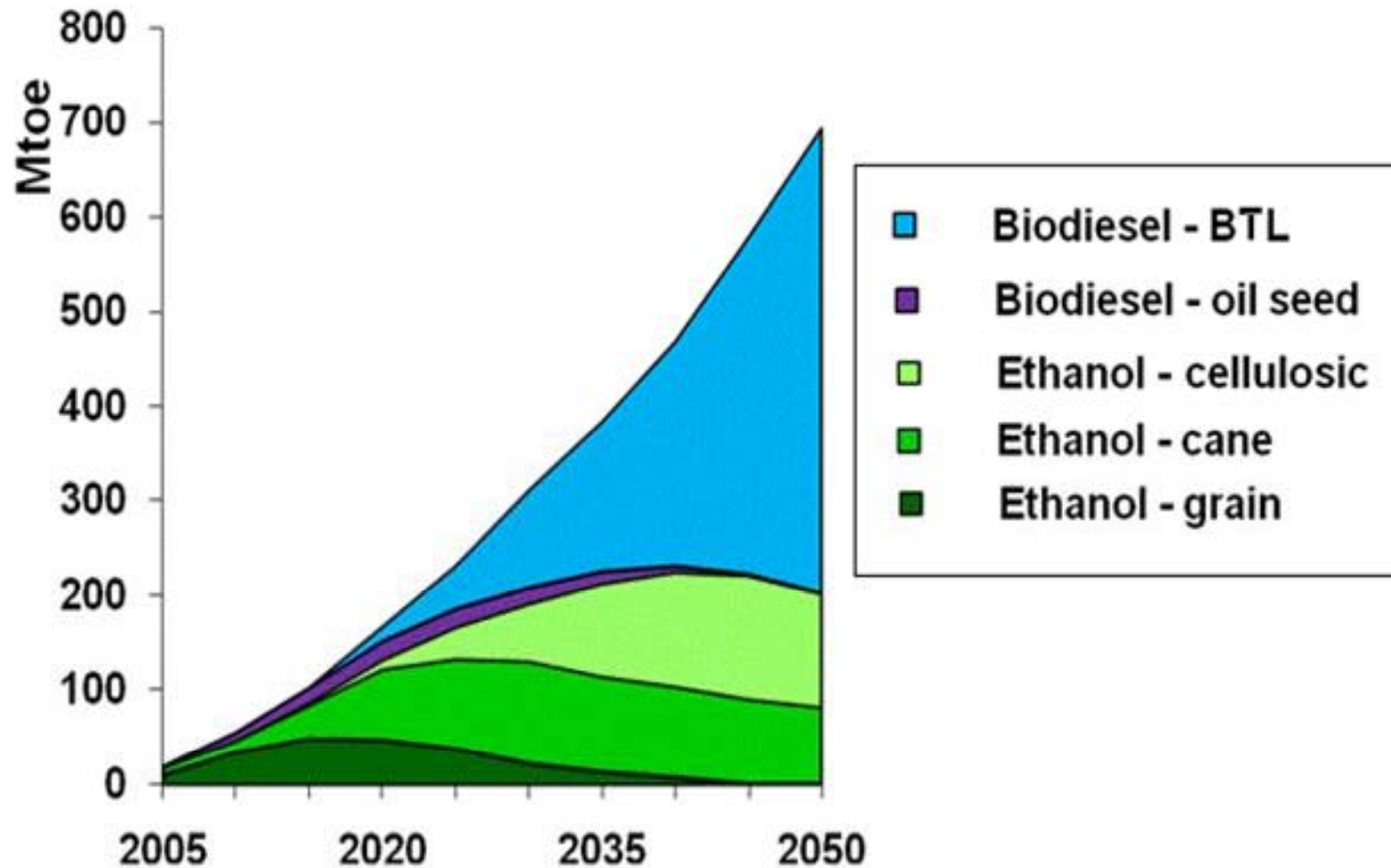
Potential		Countries
Low potential	< 6,5%	NL, BE, LU, AT, CH, NO, SE and FI
Moderate potential	6,5% - 17%	FR, ES, PT, GE, UK, DK, IE, IT and GR
High potential	> 17%	PL, LT, LV, HU, SL, SK, CZ, EST, RO, BU and UKR



Development in net feedstock use for biofuels (REFUEL project)



The IEA on biofuels...



Biofuels potential is highly uncertain but in any case must move to 2nd generation fuels. After 2020 most growth in BLUE is for biodiesel to decarbonize aviation, shipping, and trucking.

EUROPEAN opportunities

22/3/2010

- Different country's ag policies allow support for bioenergy
- Optimal feedstock use
 - Waste as a source of feedstock
- 40 M hectares available for bioenergy
 - > 1/3 of energy needs in Europe

