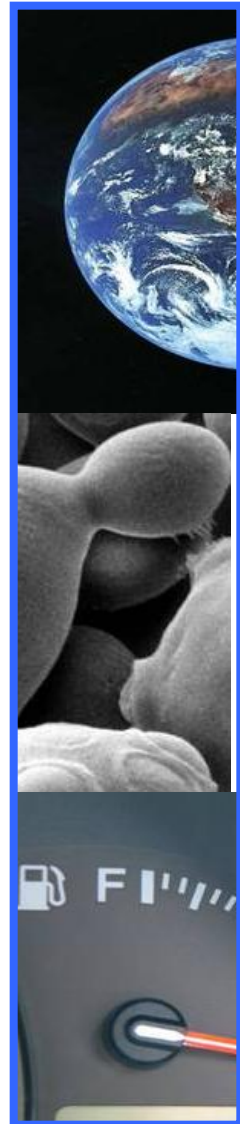




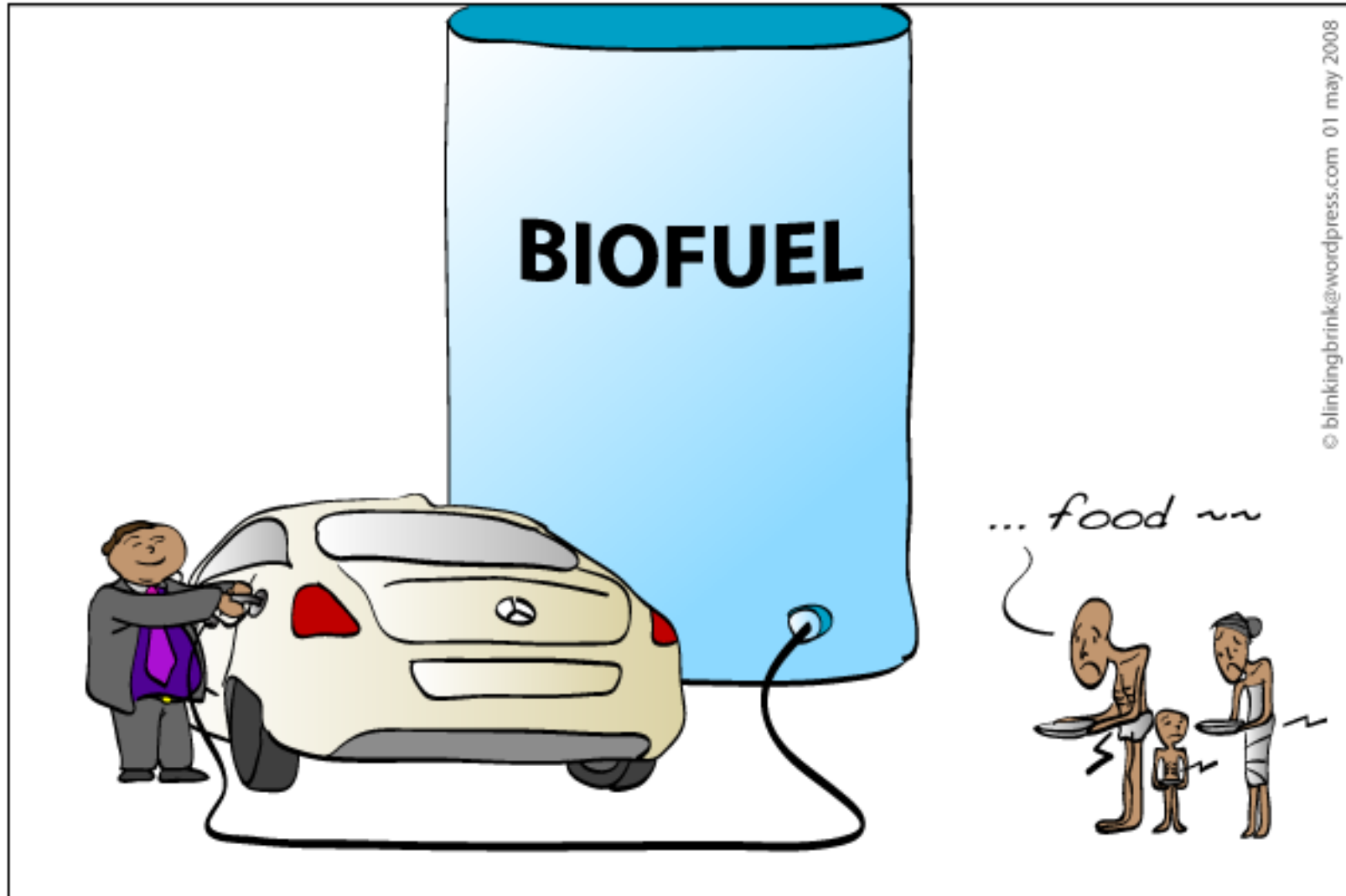
# Sustainable Bioenergy Issues in Europe

**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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Dream Team - Fantasy Football is back!

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## NEWS

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# Obamas happy to go green

Published: 27 Feb 2009

Add a comment (4)

**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

### NOT TO BE MISSED



#### 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 TO BE MISSED

NEWS SPORT BREAKING

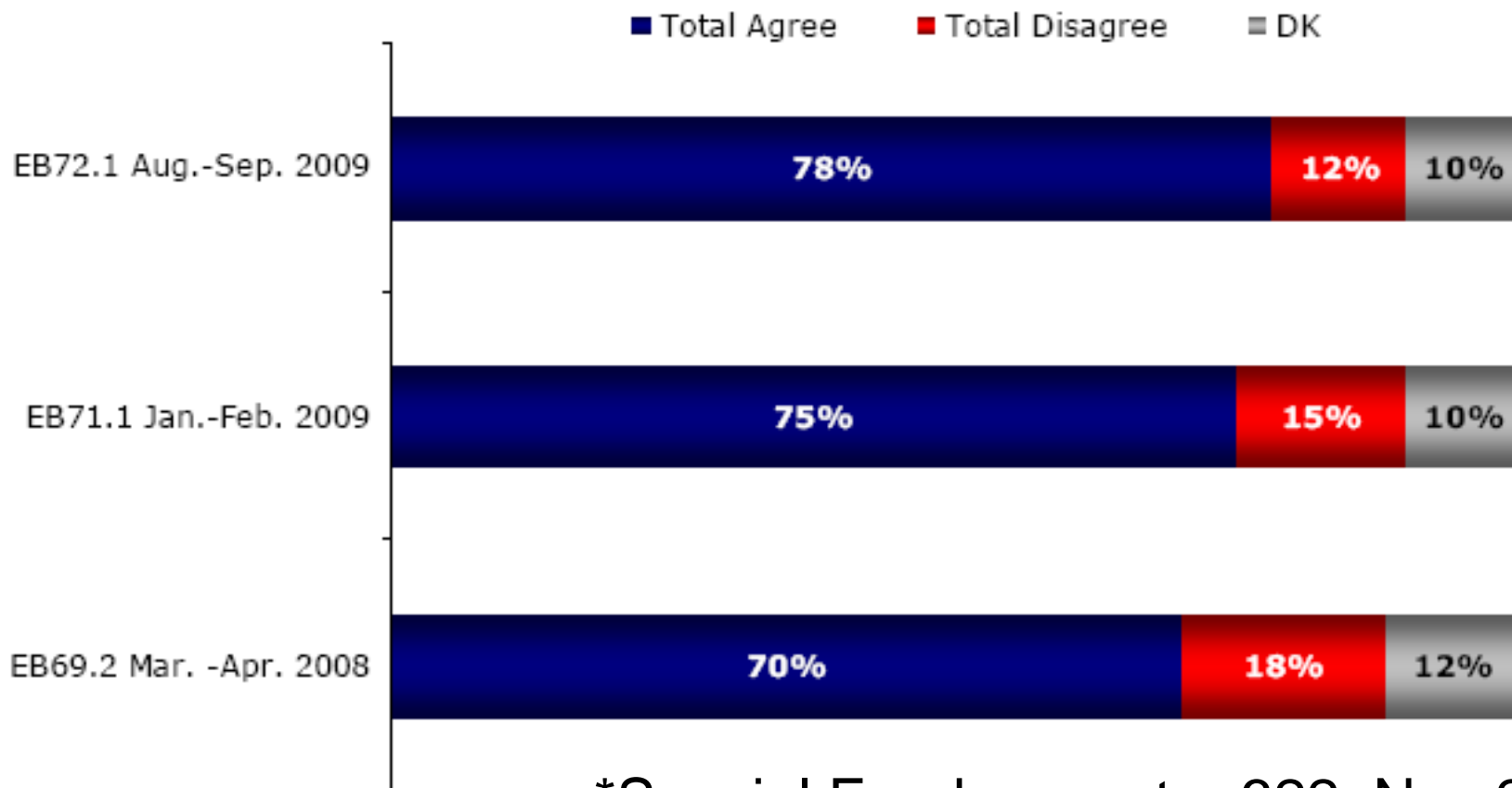
Cheryl: Move



# 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**

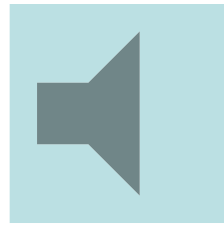


\*Special Eurobarometer 322, Nov 2010

# Europe vs world

## Security of:

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



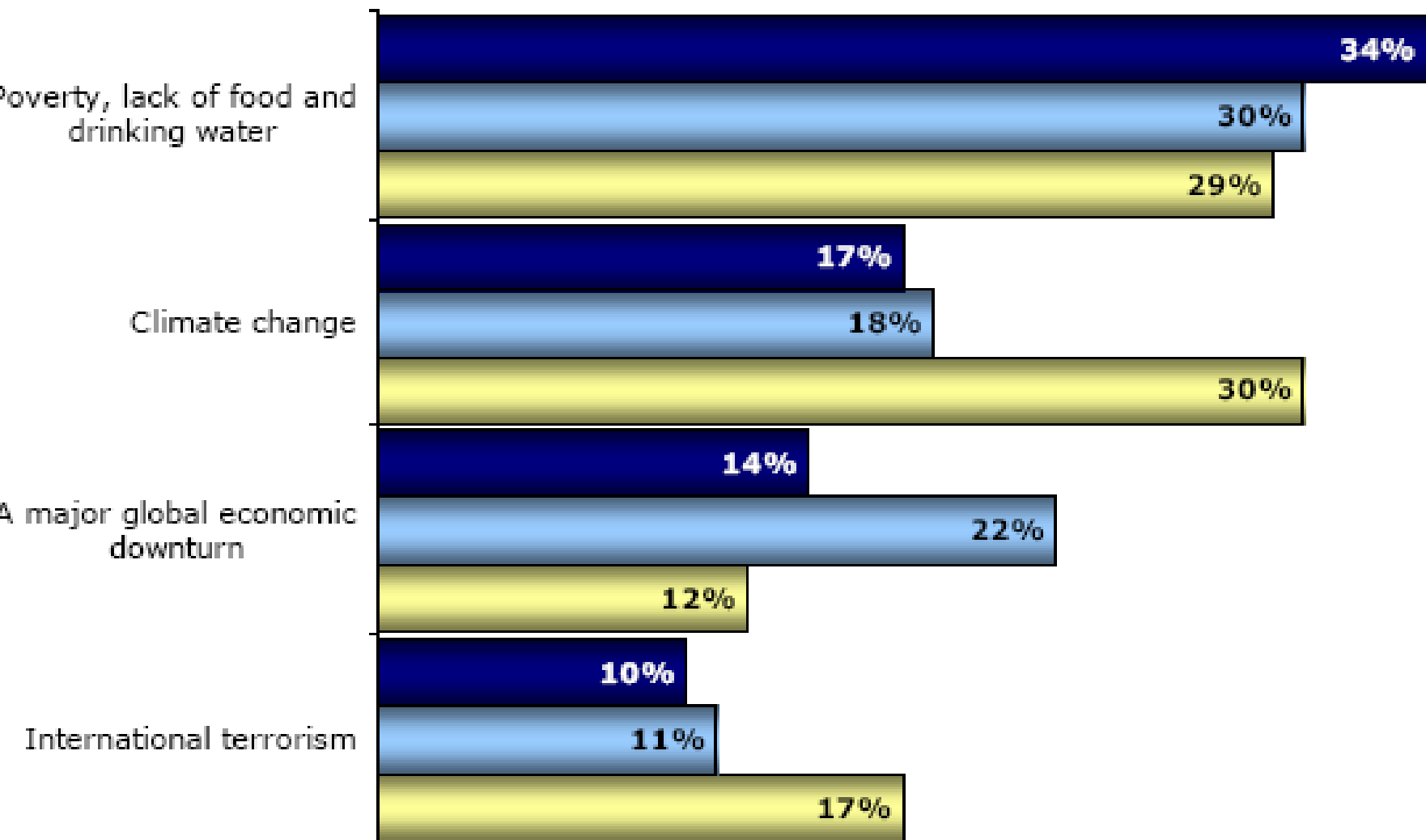
- **Climate change**
- **Trade issues**

**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



# 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



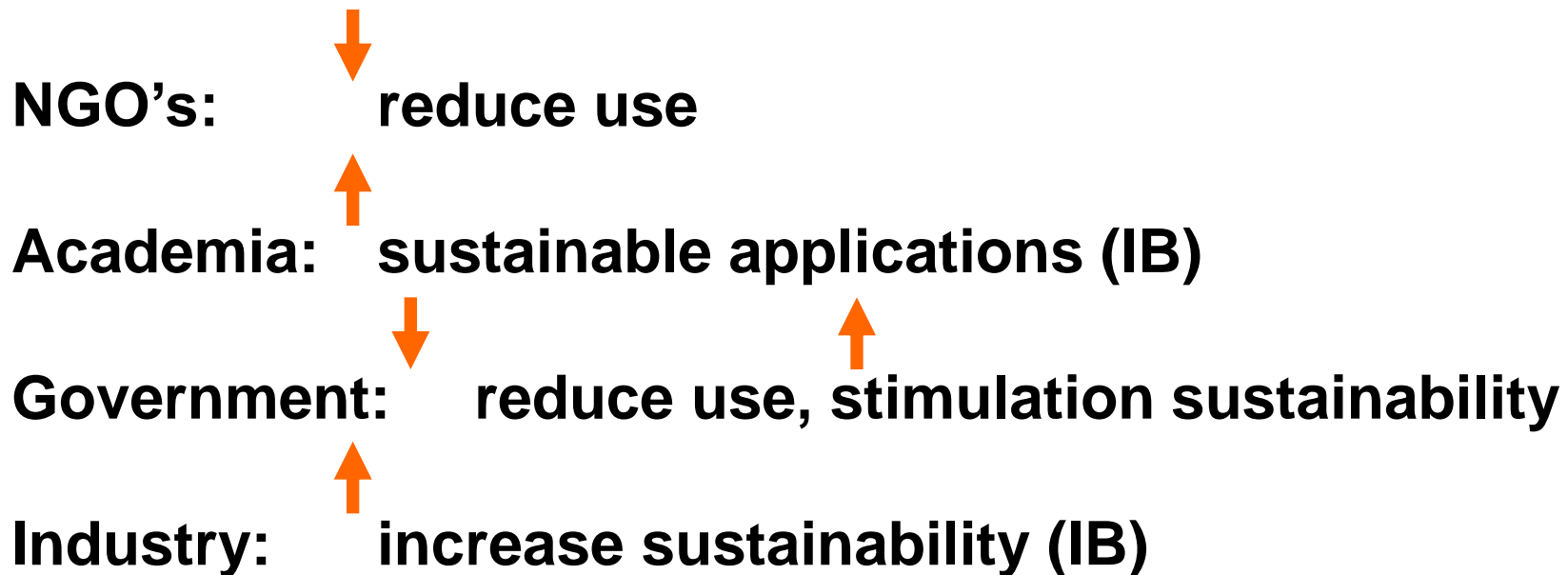
## *Genomics & Society*

*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**



KluyverCENTRE | Center for Genomics of Industrial Fermentation

## 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



# 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

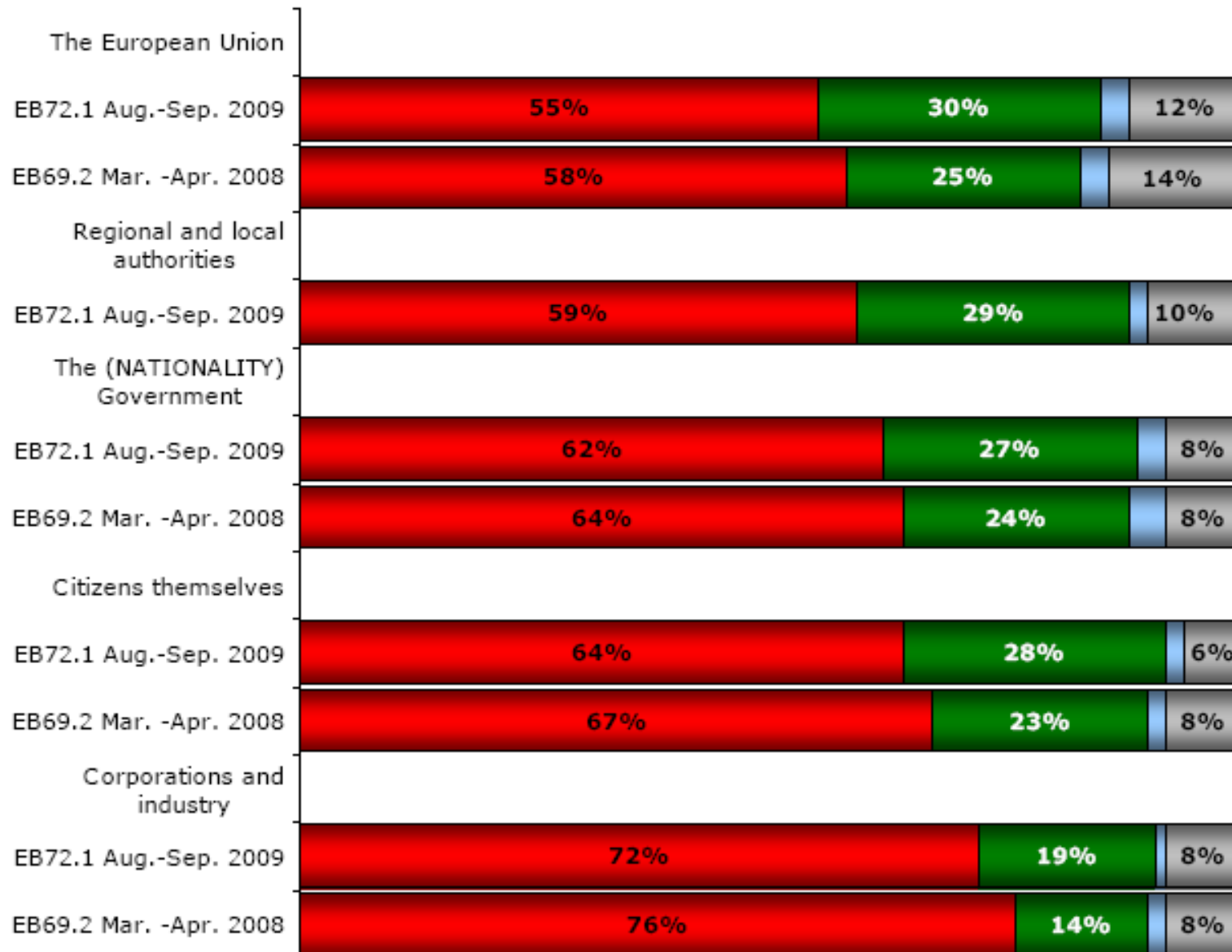


# Statement 2

**Sustainable biofuels =  
Sustainable agriculture**

**QB3 In your opinion, is each of the following currently doing too much, doing about the right amount, or not doing enough to fight climate change? - % EU**

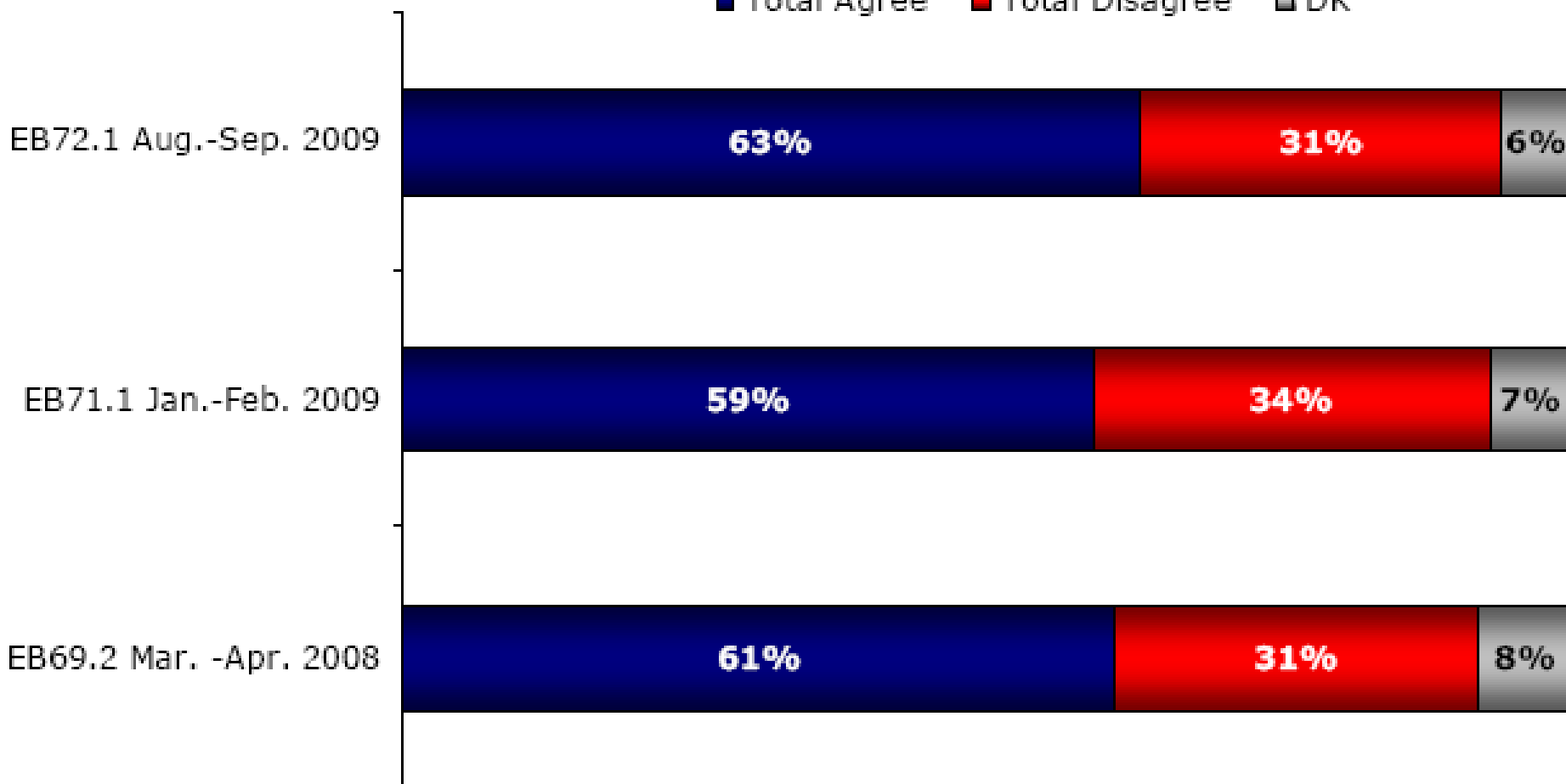
■ Not doing enough ■ Doing about the right amount ■ Doing too much ■ DK



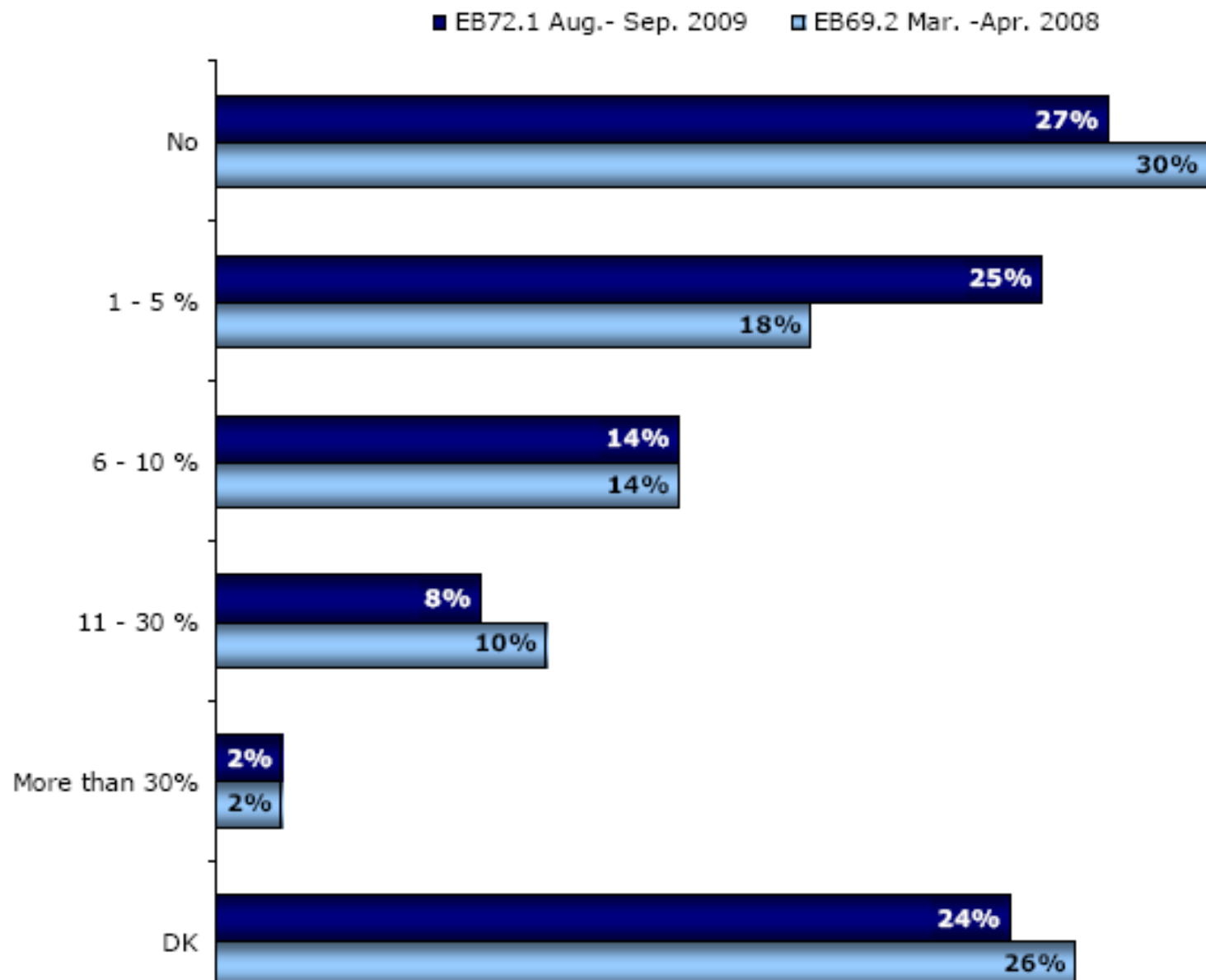
**QB4.8 For each of the following statements, please tell me whether you totally agree, tend to agree, tend to disagree or totally disagree.**

**You personally have taken actions aimed at helping to fight climate change - % EU**

■ Total Agree ■ Total Disagree ■ DK



**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**



You are separating most of your waste for recycling

78%

+

You are reducing your consumption of energy at home (for example by turning down air conditioning or heating, not leaving appliances on stand-by, buying energy efficient products such as low-energy light bulbs or appliances)

63%

-1

**Mostly chosen:  
Waste recycling**

You have purchased a car that consumes less fuel, or is more environmentally friendly

20%

+2

Where possible you avoid taking short-haul flights

11%

-1

You have switched to an energy supplier or tariff supplying a greater share of energy from renewable sources than your previous one

9%

+1

**Least chosen:  
Renewable energy**

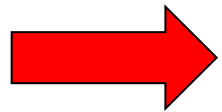
You have installed equipment in your own home that generates renewable energy (for example, a wind turbine, solar panels)

6%

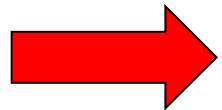
+1

# Responsibility ?

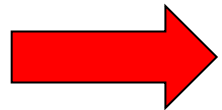
Debates: no clarity but one-sided pictures on selections of data



lack of public trust on promises



lack of motivation (denial?)



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 education and communication for more people





# Statement 3

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




# European Convention

- 70 delegates
- 10 European countries
- Plus 4 other continents

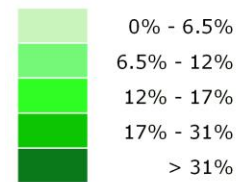


# European view

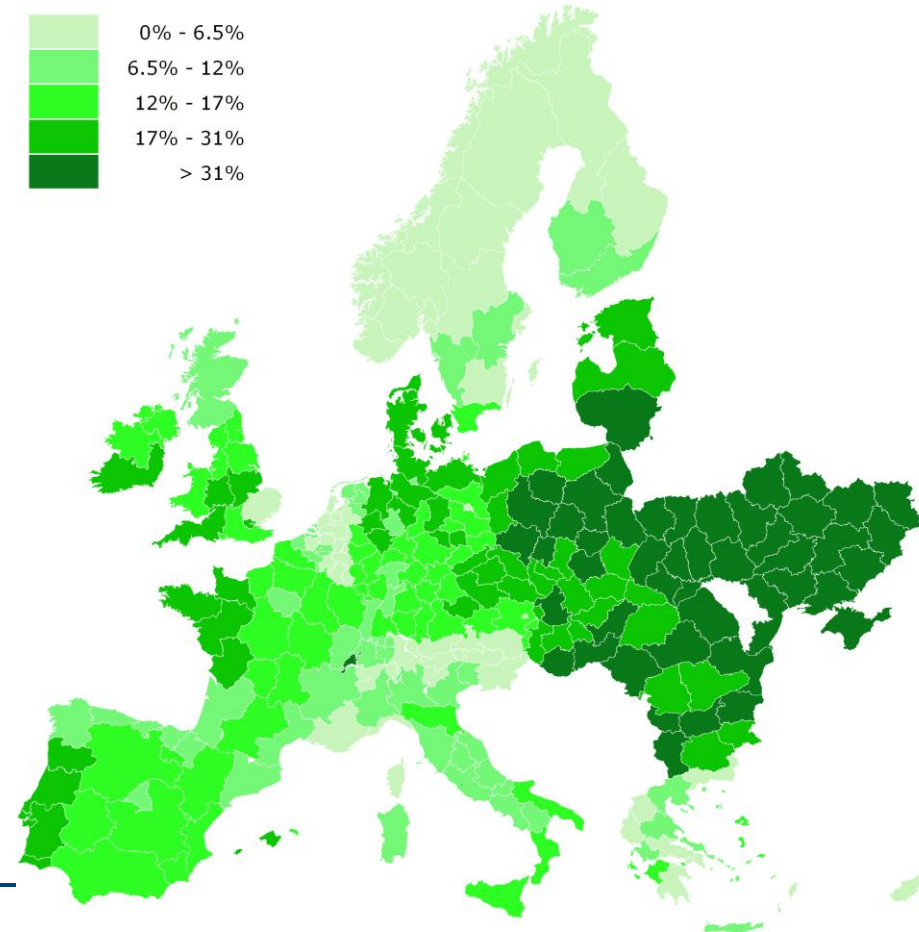
- Stable population
  - Stable energy demand, but regional differences
- Present energy portfolio is NOT secure nor sustainable
- Likely net importer of bioenergy
  - security, logistics, trade issues, sustainability, certification
-  Advanced 2<sup>nd</sup> gen. biofuels is seen as relevant

# Large 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



# European challenges

- Sources for bioenergy imports
- Scale and Infrastructure (supply chain)
- Cost
- Energy efficiency/Consumption and behavior
- Alignment of policies
- Public perception versus technical potential?



# European opportunities

- Different country's ag policies allow support for bioenergy
- Optimal feedstock use (waste as a source of feedstock)
- Abandoned land availability for bioenergy
- Large mature chemical and energy industry (+ and -)



# European Resolution

*“ Europe has the ability to provide substantial shares of its future energy demands from sustainable bioenergy. It has a unique set of opportunities....to aggressively develop bioenergy solutions”*

- **Respecting food security and increasing sustainability**
- **Recognizing regional opportunities**
- **Involving stakeholders**



# European Resolution

*“ Europe has the ability to provide substantial shares of its future energy demands from sustainable bioenergy. It has a unique set of opportunities....to aggressively develop bioenergy solutions”*

**40 M hectares available for bioenergy production**

**> 1/3 of energy needs in Europe**

<http://kluyvercentre.nl/gsb>

 gsb@kluyvercentre.nl