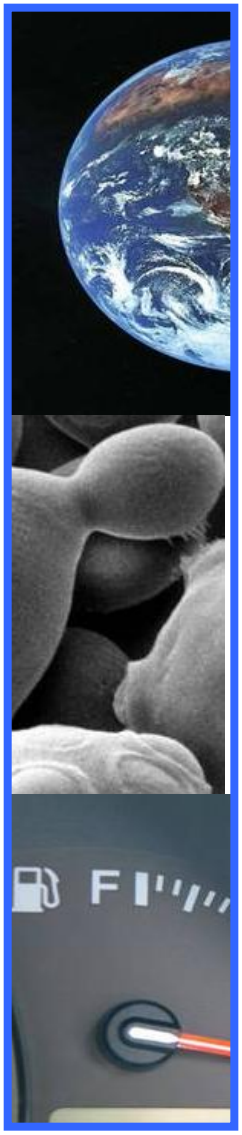
Sustainable Bioenergy Issues in Europe



Patricia Osseweijer

Delft University of Technology &

Kluyver Centre for Genomics of Industrial Fermentation

The Netherlands

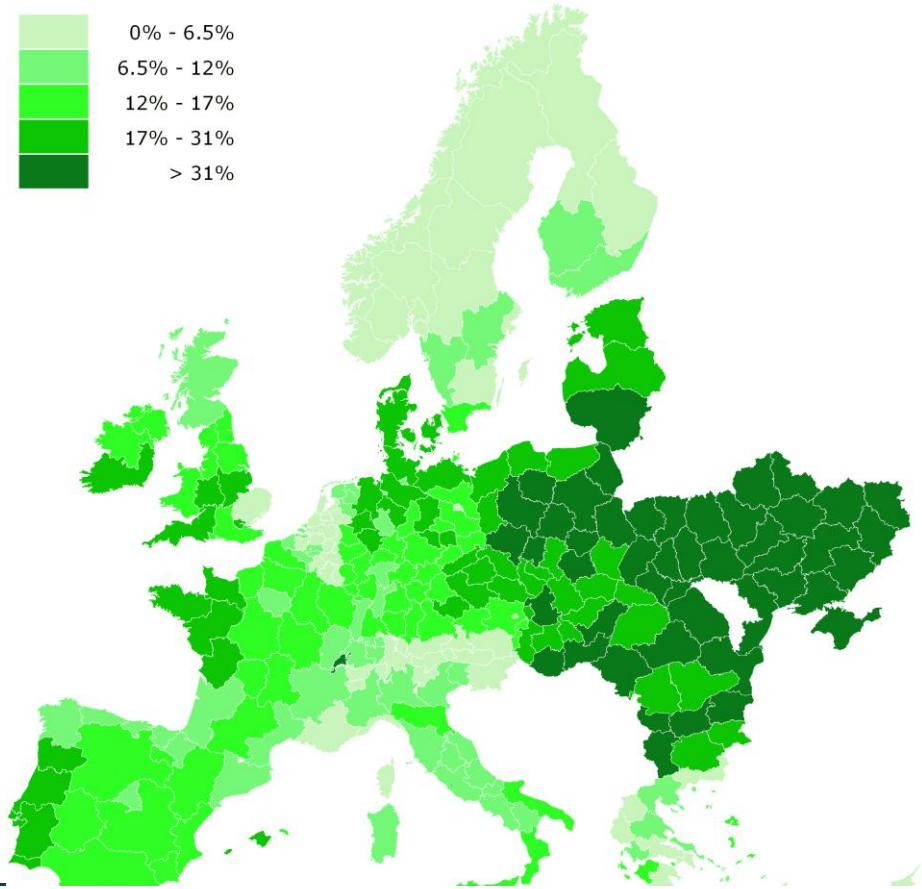
Europe

- 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 2nd 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



Wit & Faaij, Biomass & Bioenergy, 2010

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"

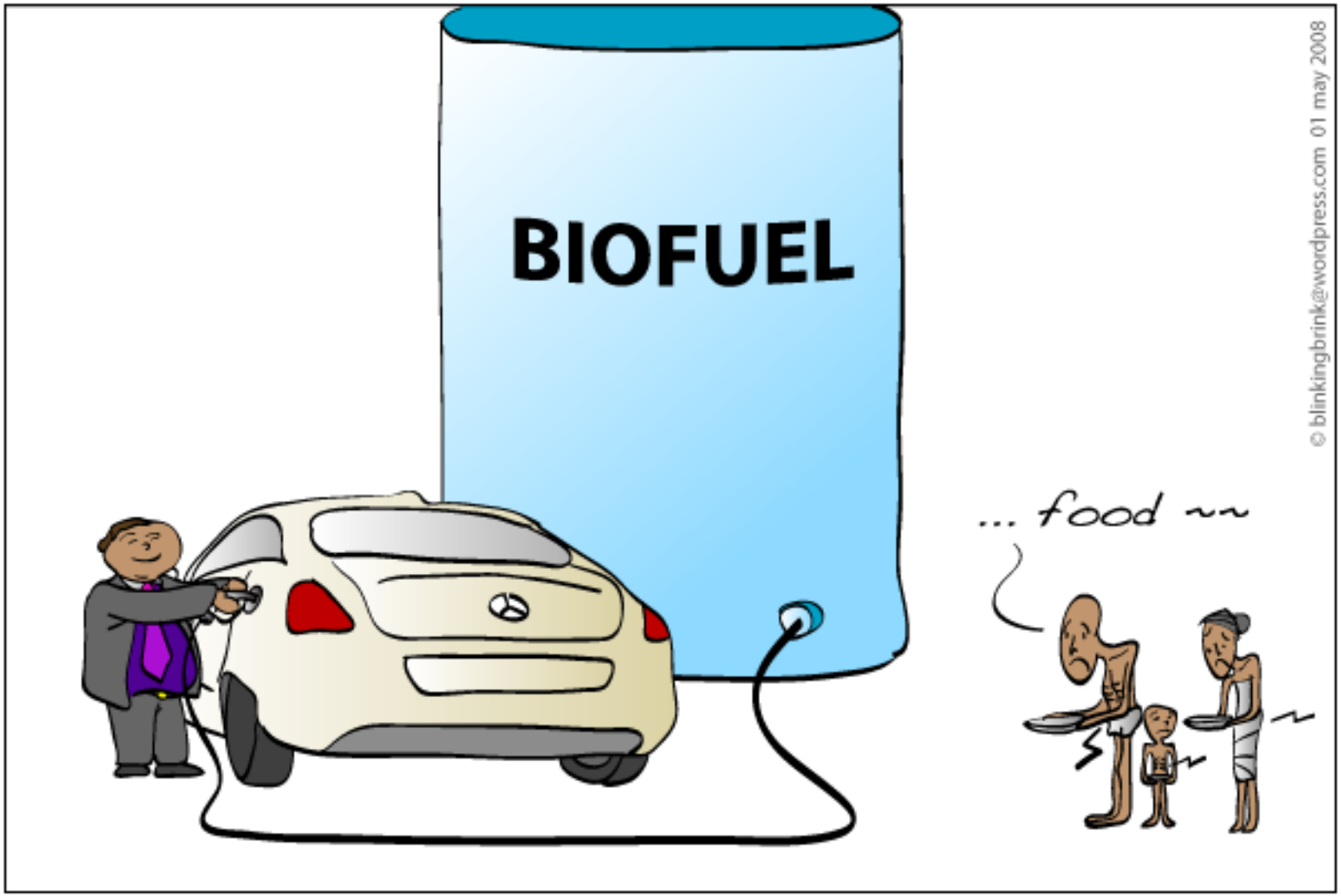
40 M hectares available for bioenergy production

> 1/3 of energy needs in Europe

http://kluyvercentre.nl/gsb

gsb@kluyvercentre.nl

Newspaper headlines



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

NEWS Got a story? We pay £££ Call: 0207 782 4100 - Email: talkback@the-sun.co.uk

Obamas happy to go green

Stunning ... Michelle Obama

Published: 27 Feb 2009

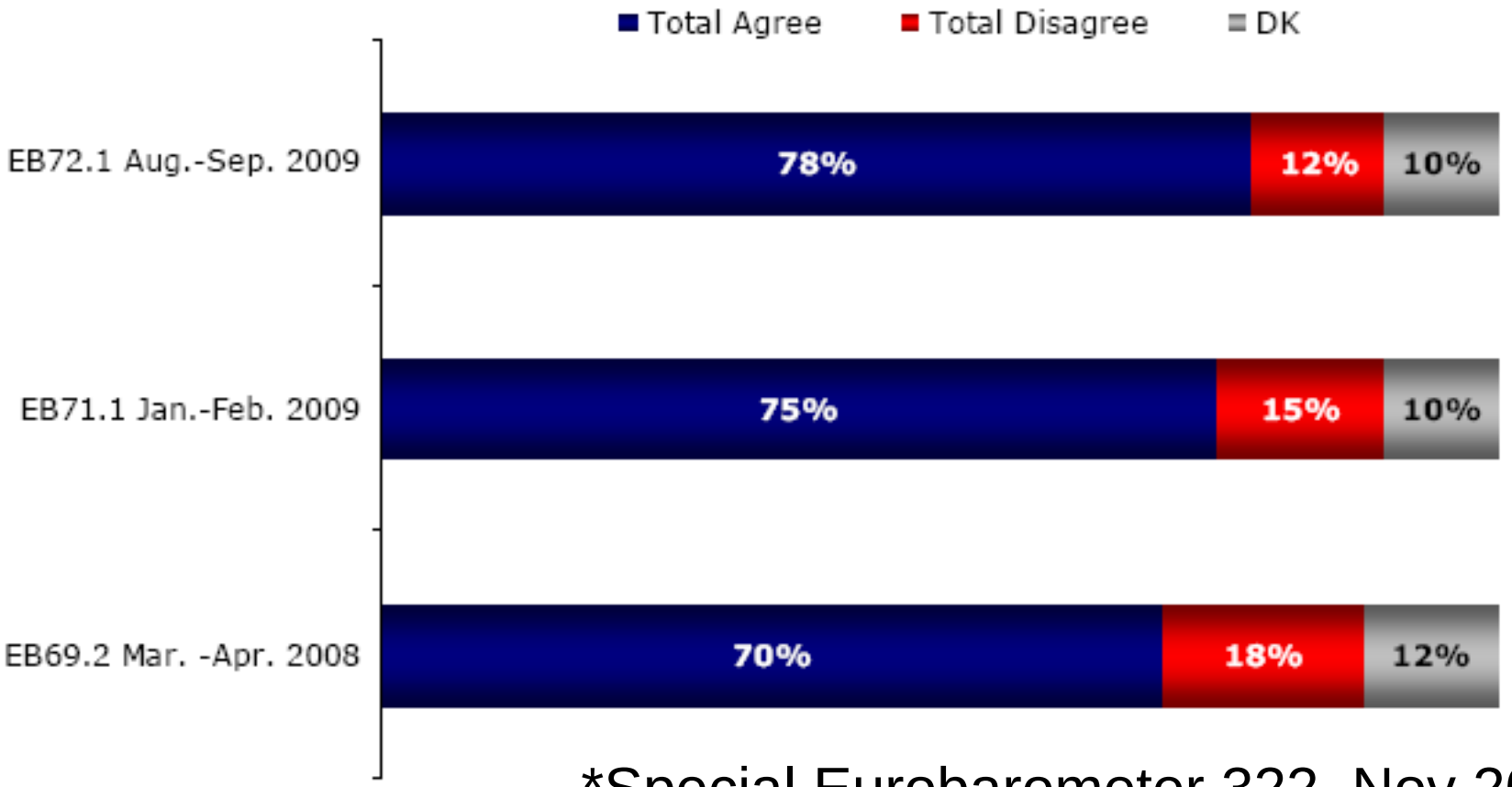
Add a comment (4)

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.

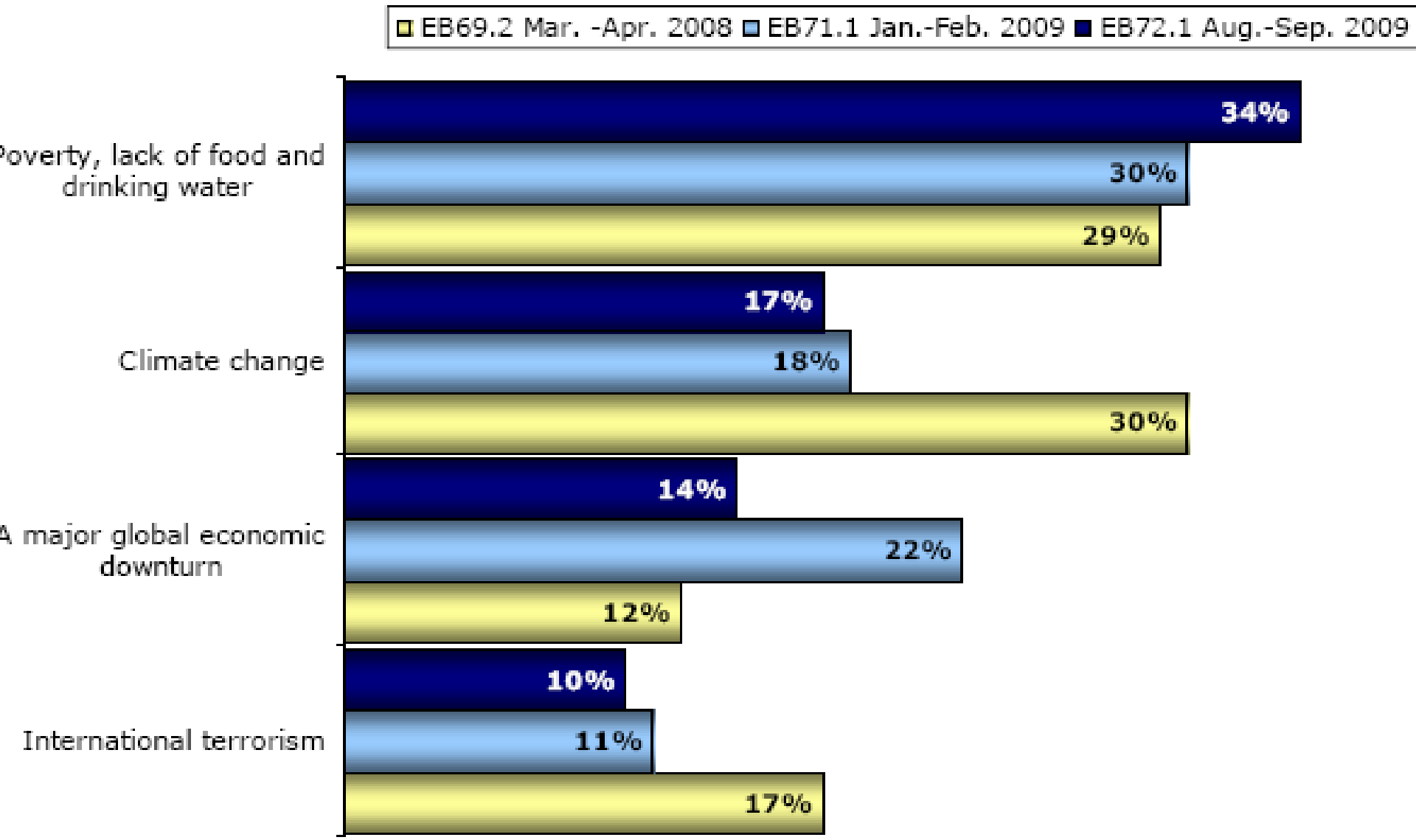
Public Opinion*

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 2009

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



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) crops for biofuel production on set-aside or marginal land

(2) recycle both crops and food waste to improve the energy balance of biofuel production

3) research for biofuel from waste, non-edible parts and species that do not compete for land and water

(4) promote reduction of use of fossil fuels

(5) promote & finance infrastructure for 2nd generation biofuels in EU

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 (2002-2012)

> 100 MEuro > 150 researchers from Universities in NL & international industry

Genomics & Society

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

DSM applikon HTC HITEXACOAT i.o. B.V. BIRD ENGINEERING Nestlé PURAC TATE & LYLE CONSISTENTLY FIRST IN RENEWABLE INGREDIENTS lifeWizz DYADIC Heineken Genedata GSK

Kluyver Centre Society programme

***Three sub-programmes*:**

- **Identification of future issues**
- **Quantification of impact of innovations**
- **Development of pro-active communication strategies**

Issues identified by KC 2004-2006*

1. **Safety** (*biopharma and co-existence: antibiotics in cornflakes?)*
2. **Land-use: Food-Energy conflicts** (*rain-forests, food prices?)*
3. **Energetics: Eco-efficiency** (*who do we trust?)*
4. **Environmental pressure: biodiversity; soil + water; mono-cultures**
5. **Economic feasibility** (*oil/sugar price; uncertainty for investments)*

*** Schuurbiers, Osseweijer & Kinderlerer: Future issues in industrial biotechnology, Biotech Journal, 2007**

New issues

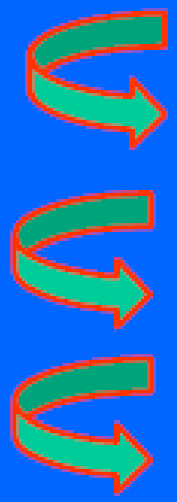
- Role of multinationals & IP
- North-South distribution
- Standards in measurement (LCA)
- Food-feed-fuels?
- Cultural values of nature

Trend to take socio-economic issues on board

Approach

Stakeholders: Round tables to coordinate agenda
organised with RCI, EuropaBio and locally

- **Stakeholder analysis on interests, values, sources of information and trust**



Public meetings in Amsterdam and Rotterdam

International stakeholder meeting

Meeting at European Parliament

Recommendations KC 2002-2007

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

NGO's: reduce use

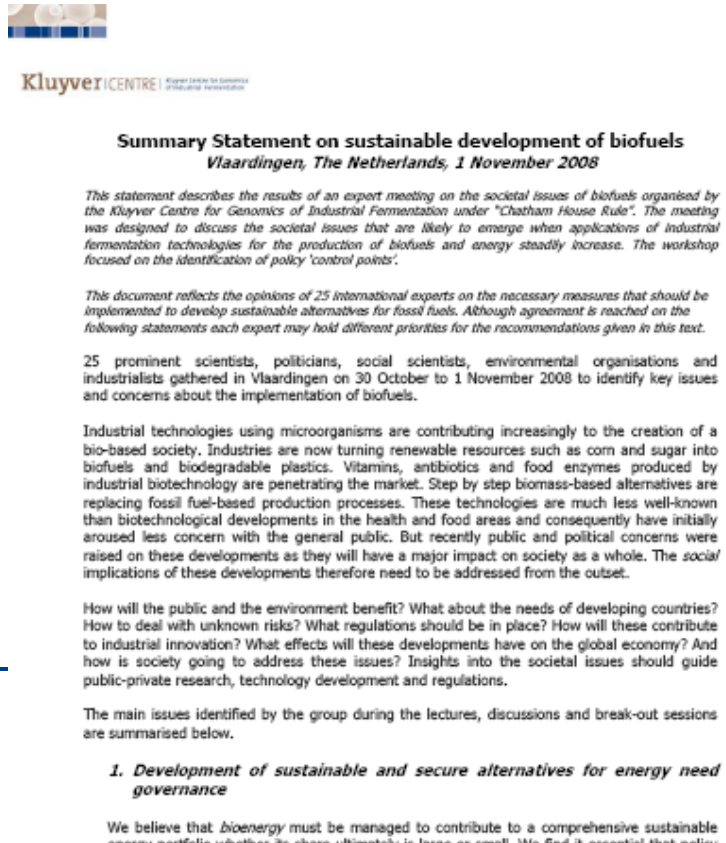
Academia: sustainable applications (IB)

Government: reduce use, stimulation sustainability

Industry: increase sustainability (IB)

Results

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



Kluyver CENTRE

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

*un*measurable 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

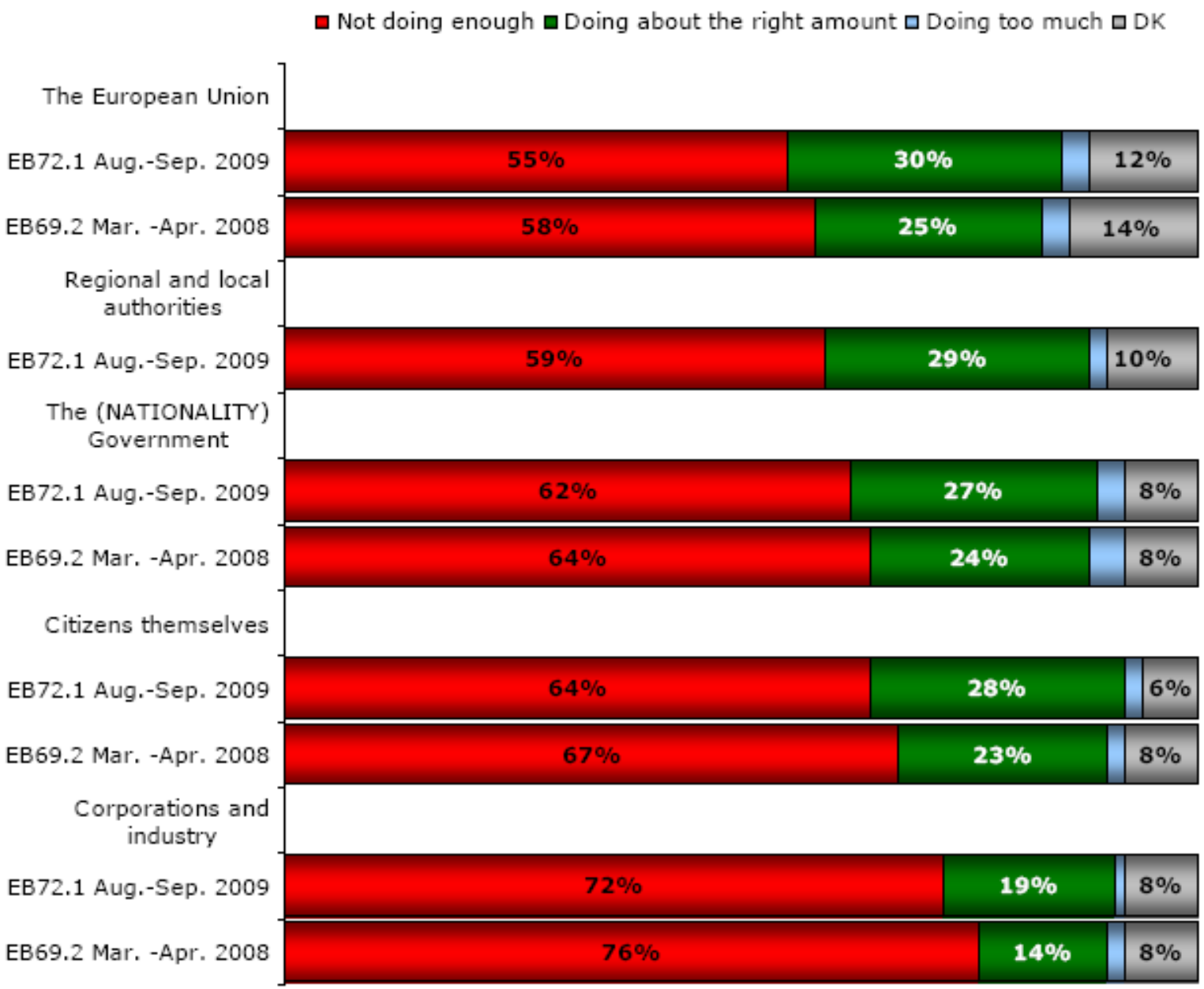
Implement globally → Agricultural policies

Statement 2

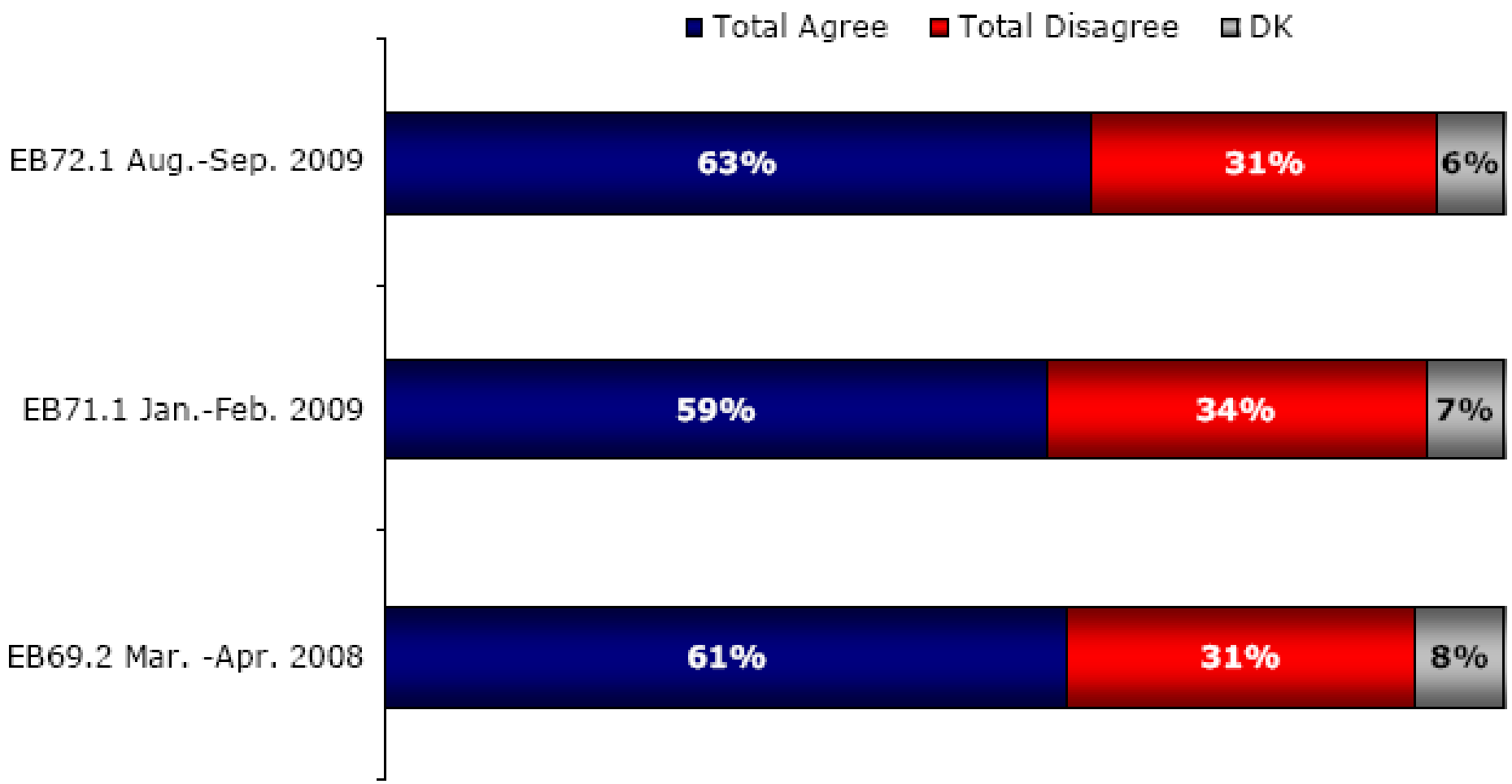
Sustainable biofuels =

Sustainable agriculture

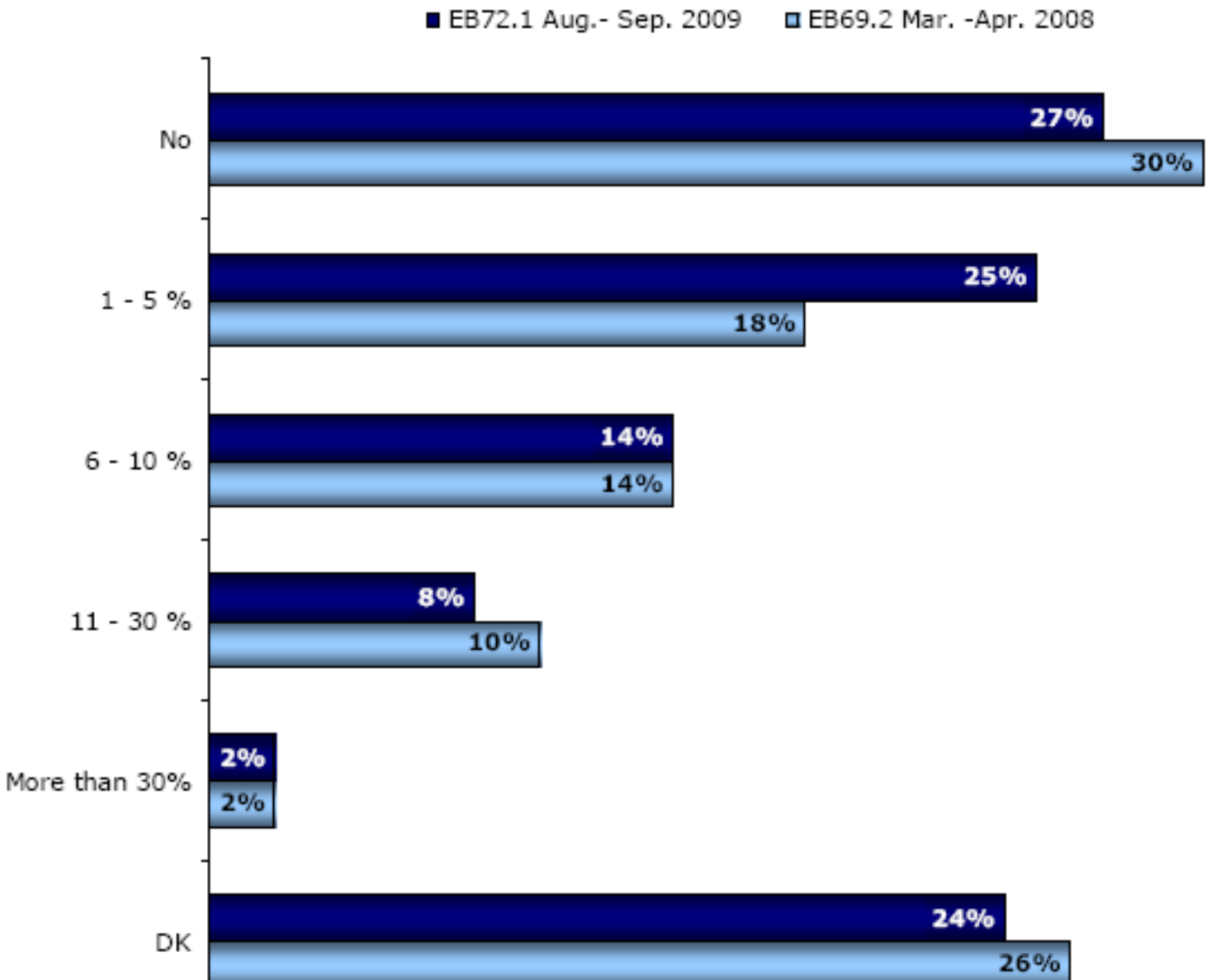
QB3 In your opinion, is each of the following currently doing too much, doing about the right amount, or not doing enough to fight climate change? - % EU

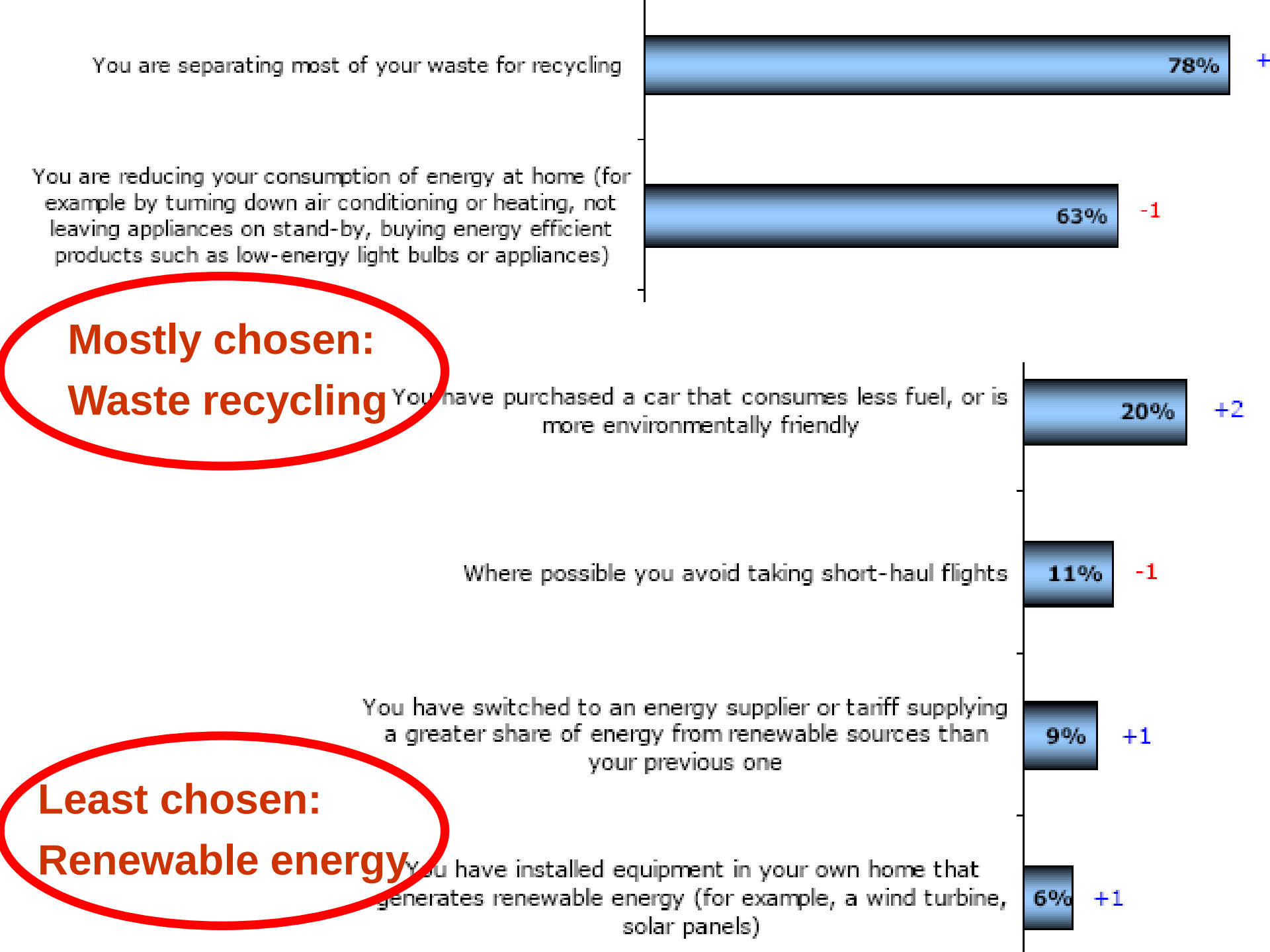


QB4.8 For each of the following statements, please tell me whether you totally agree, tend to agree, tend to disagree or totally disagree.
You personally have taken actions aimed at helping to fight climate change - % EU



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

Approach?

Make it fun

Make it matter

Make it last

Myths from the past

- *more knowledge = more support*
- *risk is most important*
- *Europe does not want GM*
- *rational approach = best*
- *public perception = public behaviour!*

Quality communication starts with knowing the issues