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The global sustainability of biofuels

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Structure

- Climate change and transport
- Are biofuels are part of the solution?
- Impacts of Biofuels
- Environmental & Social Assurance
- Next steps

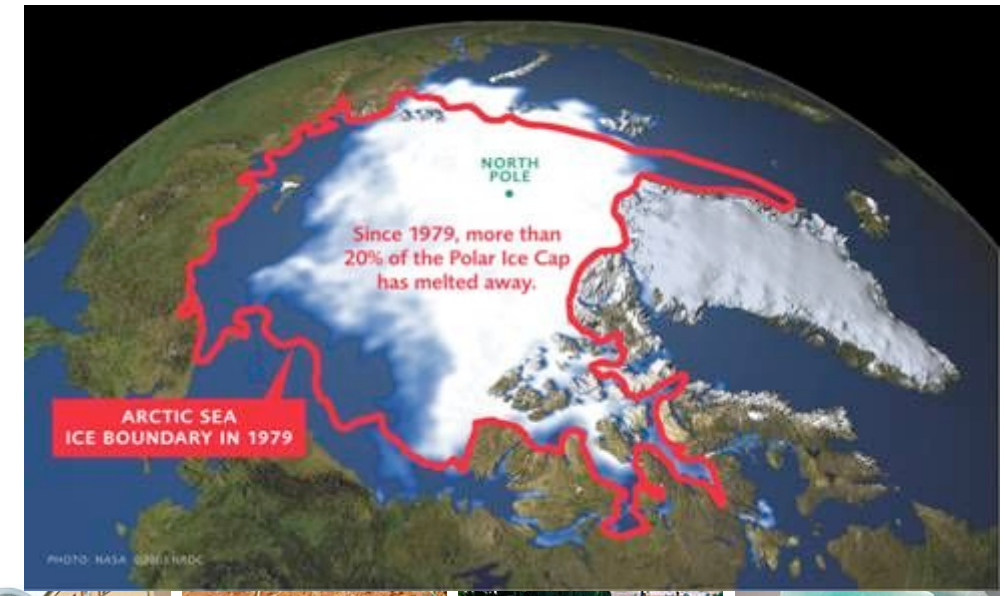
Climate Change

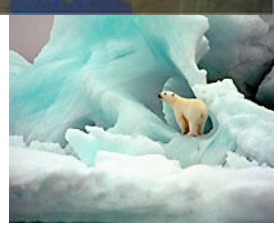
The global scientific community agrees on the:

Need to keep global temperature growth below 2º C above pre-industrial times to prevent disastrous climate change

This means that no later than 2020, ***global*** **emissions have to fall**

and **industrialised nations** have to **cut GHG by at least 80%** by 2050





Transport and climate change

- Transport emissions in the UK are 20% of the total – 36 MtC equivalent in 2004

- Expected to grow by 20% from 1990 levels by 2020 – all other sectors will shrink

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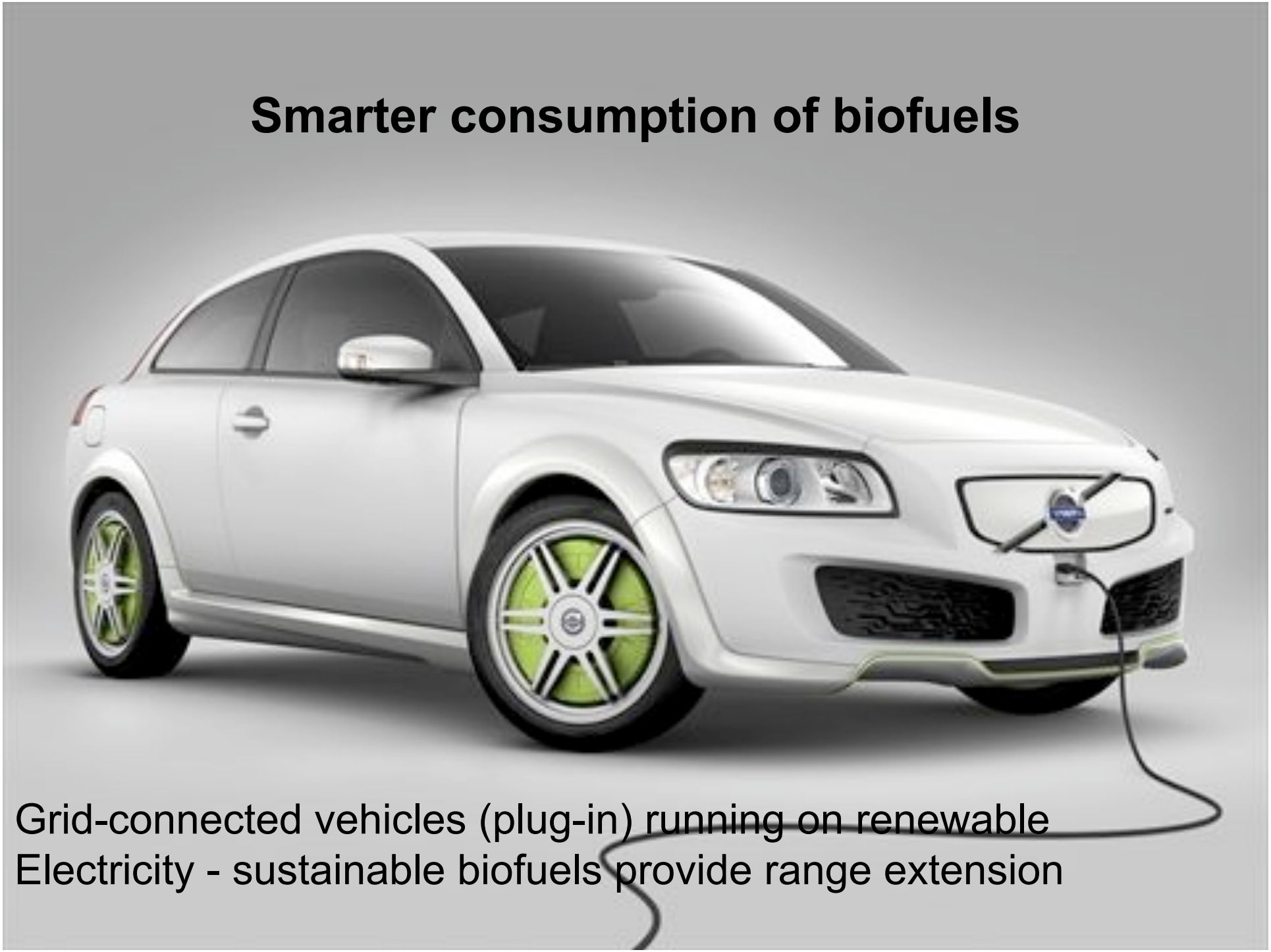
Can biofuels solve transport problems?

- Are transport biofuels the best use of bioenergy?
  - Heat – up to 85% efficiency
  - Half of global bioenergy is wood
  - 60% of EU renewables
- Will biofuels cut emissions enough?
  - 0.6-0.8 million tonnes is only 2% of 2010 transport emissions
- What else needs to be done?
  - Demand reduction
  - Alternatives

Smarter consumption of biofuels



Grid-connected vehicles (plug-in) running on renewable Electricity - sustainable biofuels provide range extension

Smarter consumption

- Current average EU car consumption – 6.5 liters/100km
- US average of car journeys - 16 km, 50% of all journeys less than 30 km; over 90% of all journeys < 100 km
- EU plans for 10% biofuels by 2020 means 20% of agricultural land is needed

- Current concept plug-in flex-fuel cars – 1.7 liters/100km
- Only needs 5% of agricultural land to provide 10% of transport fuel
- 20% of agricultural land would provide 40% of fuel

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Left
Land cleared for soy, around Brazilia
Right
Cerrado, Chapada dos Veadeiros
© WWF / László Máthé

Positive impacts include

- GHG savings - for WWF, emissions reduction is the primary reason for using bioenergy
- Security of supply
- Potential contribution to renewable energy strategies in developing countries
- Rural development opportunities

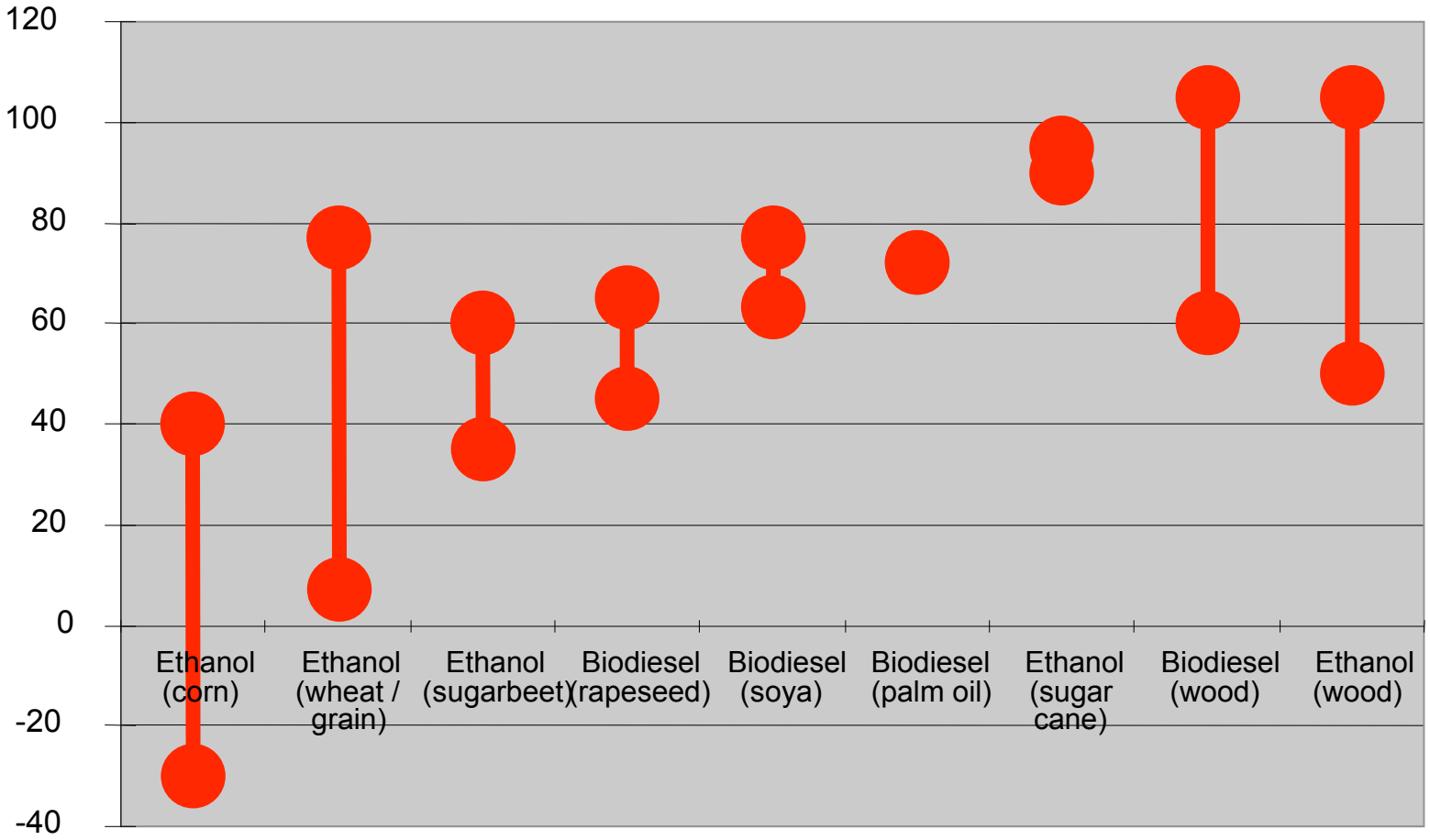
Crushing sugar cane, India
© WWF-Canon / Jamie PITTOCK

Negative Impacts include

Not all renewable biofuels are carbon neutral:

- **Energy used in manufacturing inputs, growing, processing and transporting biofuels**
- **Emissions associated with the use of fertilisers and soil managment**
- **Emissions associated with their use**
- **Emissons from land-use changes**

% GHG savings relative to fossil fuels



Negative Impacts also include

Intensification of agriculture AND direct and displaced expansion on to new land

- Habitat loss - 55% and counting
- Water take - 70% of human use, >60% wasted
- Loss of soil - half of topsoil lost globally
- 70-90% of farmers loose more carbon/year than put back
- Agro-chemicals - more used in agriculture than any other industry
- Pollution - more than any other human activity
- Climate change - 25-40% of man-made greenhouse gases

Each crop has key impacts

- **Sugarcane**
  - Burning fields
  - Displacement of food production
- **Corn/Maize**
  - Energy in/out and source of energy for processing
- **Palm oil**
  - Deforestation
  - No sulphur, less N20
- **Soy**
  - Soil erosion
  - Habitat loss
- **Second generation cellulosic**
  - Direct and indirect habitat loss

Palm oil

- Biodiesel from palm oil can save c. 70% of the emissions when replacing fossil fuels
- But clearing rainforest to produce biodiesel can lead to a 50+ year payback
- Palm oil demand for food is growing (US, China, India ...)
- Added pressure from biodiesel demand will double this
- 18 million hectares of degraded land is available but companies prefer to develop oil palm in forested land
- Increased efficiency in plantations is possible (currently ~4 tonnes oil/ha)

Ideally...

We need the right crops, in the right places, with the right techniques, used in the right ways and with measured performance improvements

- whole life cycle GHG balances
- protection of high conservation forests, permanent grasslands, wetlands, floodplains, peat soils etc.
- sustainable water management
- soil erosion, biodiversity, toxicity
- equitable access to land and benefits

Displacement

- Demand for energy may push the agricultural frontier outwards
- Habitat loss and food competition

- Avoid by producing more on existing land, use by-products or expand only on unused land

- Cannot be tackled by business certification alone
- Only monitored not controlled by policies

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Current situation

- Commodity Initiatives such as FSC, RSPO, RTRS, BSI... are established or under development
  - environmental and social measures and standards
  - do not include GHG balances since the initiatives were not developed for bioenergy
- Must make sure that they measure key impacts and deliver improvements
- Only part of the solution to ensure the sustainable development of bioenergy

http://www.rspo.org
http://www.fsc.org
http://www.responsiblesoy.org
http://www.panda.org/about_wwf/what_we_do/policy/agriculture_environment/index/our_solutions/better_sugarcane_initiative/index.cfm

What kind of system?

- Should not reinvent the wheel – base on existing relevant initiatives – commodities and IPCC
- Multi-stakeholder and international process - preferably global, at least European
- Identify important impacts and measure performance at field and cumulative levels:
  - Life-cycle GHG balance
  - Biodiversity impacts
  - Water use and pollution
  - Soil erosion
  - Toxic loading
- For all bioenergy, not just transport biofuels

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What does this mean for policies?

- UK and NI are developing relatively robust schemes based on this approach at least for reporting
- Germany and maybe others following
- EU has proposed weak and incomplete standards – need to be toughened up
- Roundtable on Sustainable Biofuels is developing a global framework for standards
- Effort and support from all stakeholders for developing the sustainability initiatives

What does this mean in Europe?

- Make the voluntary standards mandatory
- Ensure that there are policies and mechanisms in place to deal with indirect impacts

- Invest in land use planning in producer regions
- Monitor and adjust targets

- Promote demand reduction across the board

Thank you

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WWF EU biofuels position paper
http://assets.panda.org/downloads/wwf_position_eu_biofuels.pdf