

Environmental Certification of Biofuels

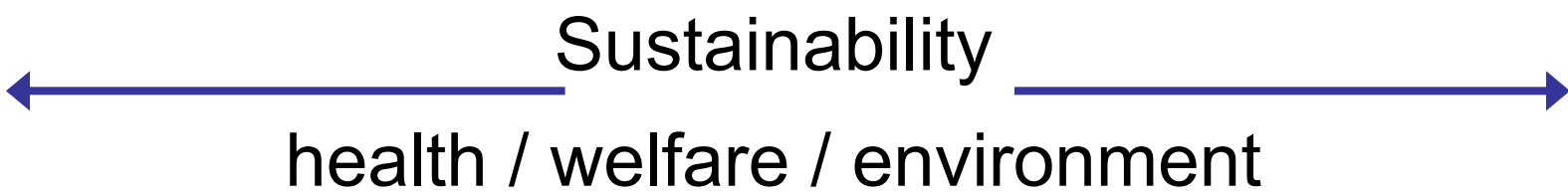
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OECD Roundtable on Biofuels
IEA, Paris
7th and 8th June 2007

Overview

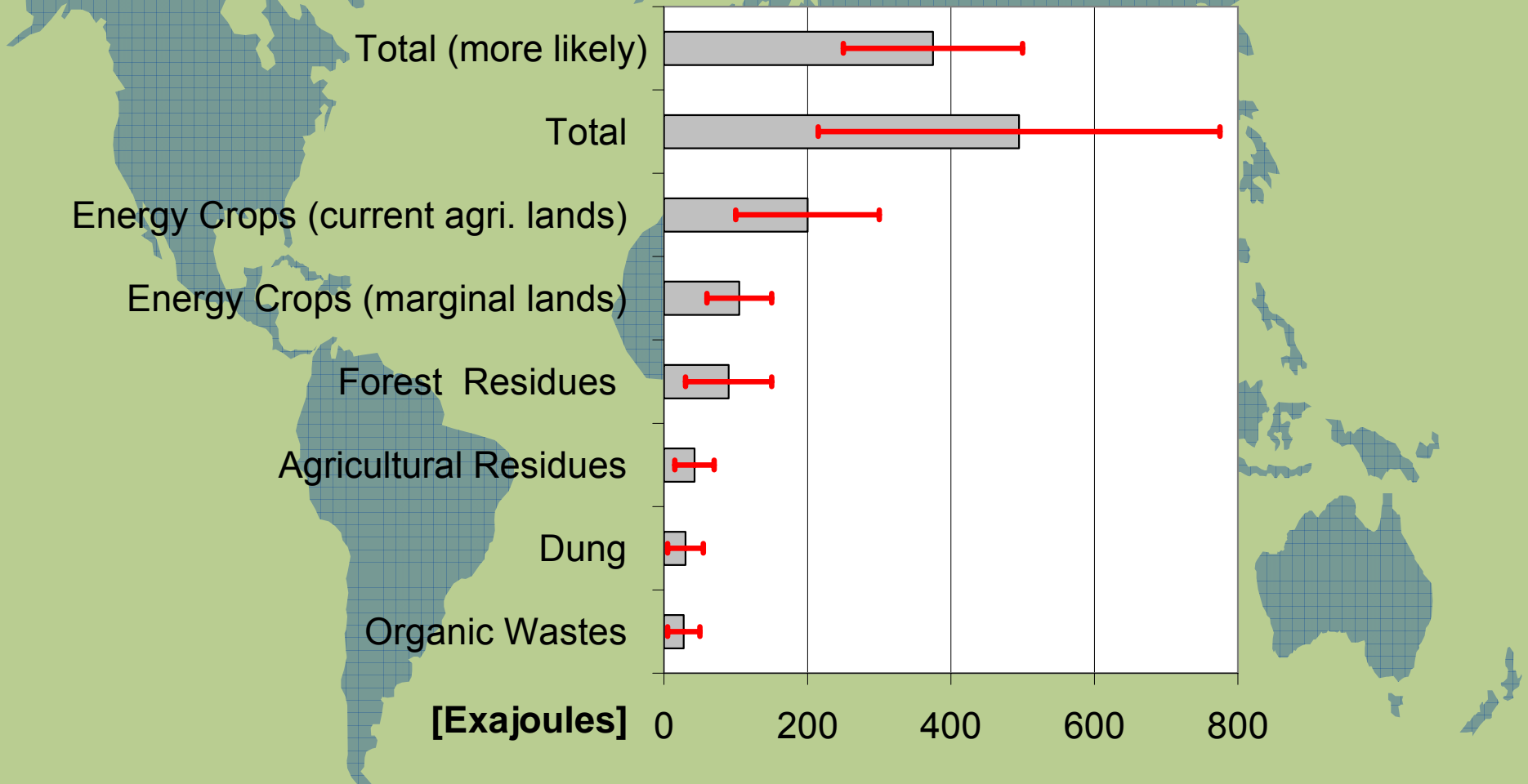
- Background: the drivers for biofuels and their environmental assurance
- Certification framework
 - Principles and standards
 - Environment as a sub-set of 'sustainability' assurance
- Data requirements
 - criteria/indicators
- Auditing of commercial production
- Use of certification
 - Access to markets and indexing of support
- International standards for international markets?

Drivers and Obstacles for Biofuels

National / Regional / Global	Local / End User
1. Climate Change 2. Energy Security 3. Rural Development (Macro-economic costs)	1. Usability 2. Cost 3. Environment e.g. air quality / health / welfare / biodiversity?
 <p>Sustainability</p> <p>health / welfare / environment</p>	

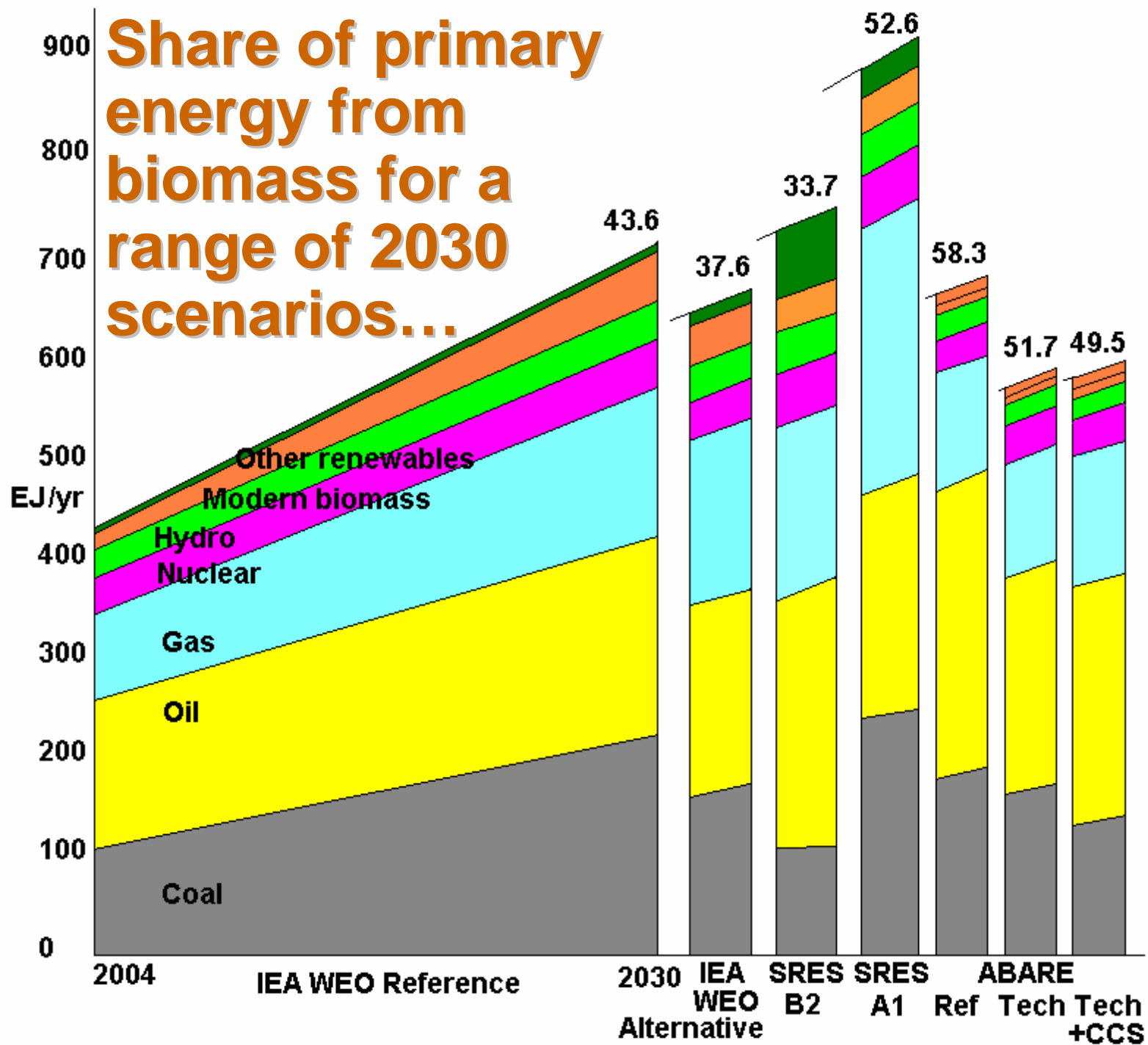


Bioenergy potential per type of biomass: different scenarios, year 2050 Exajoules/yr

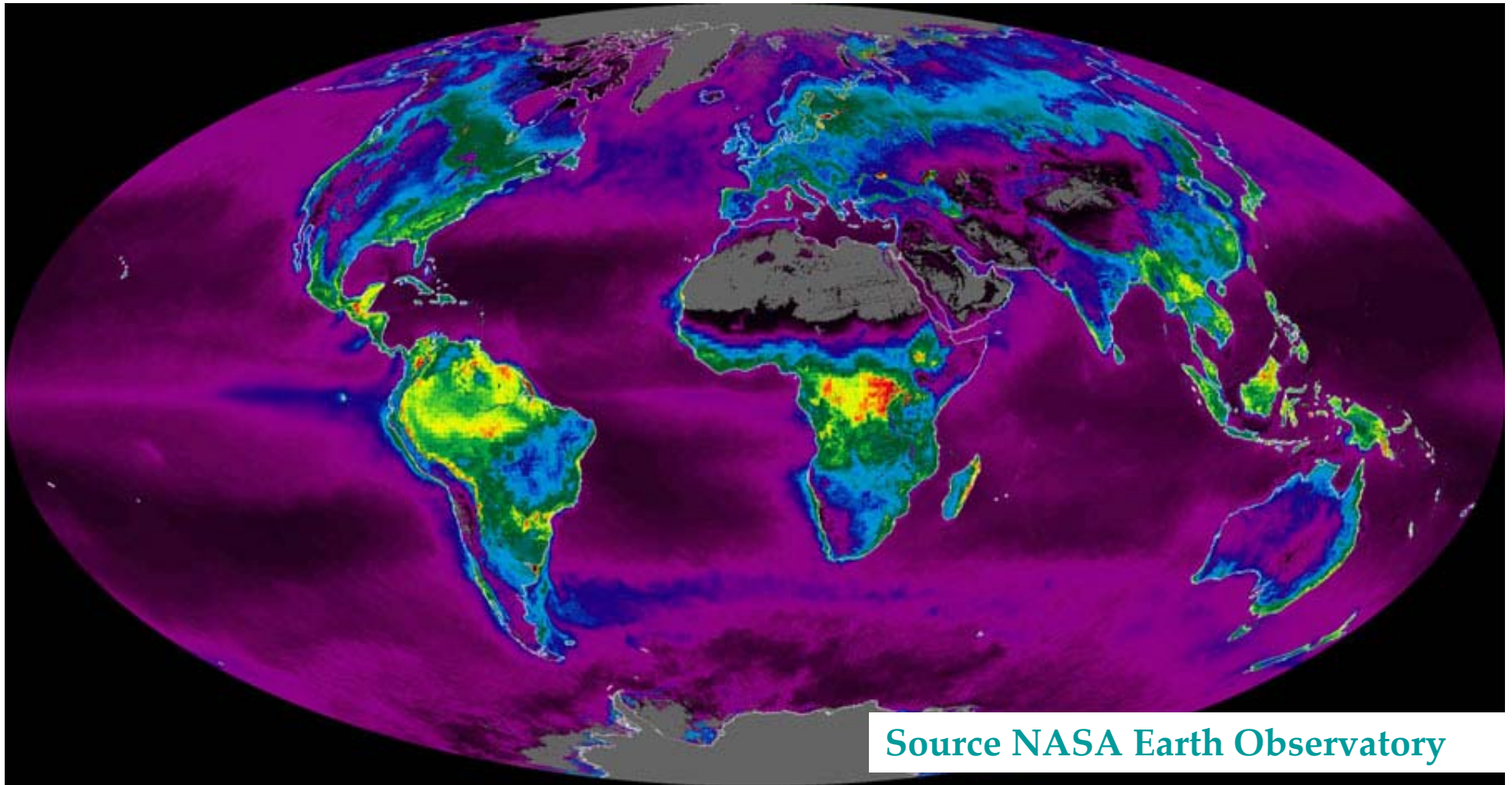


Source: Juergens and Mueller *forthcoming 2007*, based on data from Faaij 2006

'Biomass continually underachieves' (Sims, 2007)



The Earth's carbon "metabolism"- variability vs location



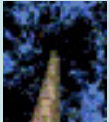
- Rate at which plants absorbed C out of the atmosphere during 2002
- Global annual average of net productivity of vegetation on land and in ocean.
- Yellow and red areas show the highest rates, (2 to 3 kg C taken in per m²/yr (~44t_{DM}/ha.yr)
- Green, blue, and purple shades show progressively lower productivity.

Land Availability – a view from Developing Countries



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What are the components of a credible [sustainability] scheme?

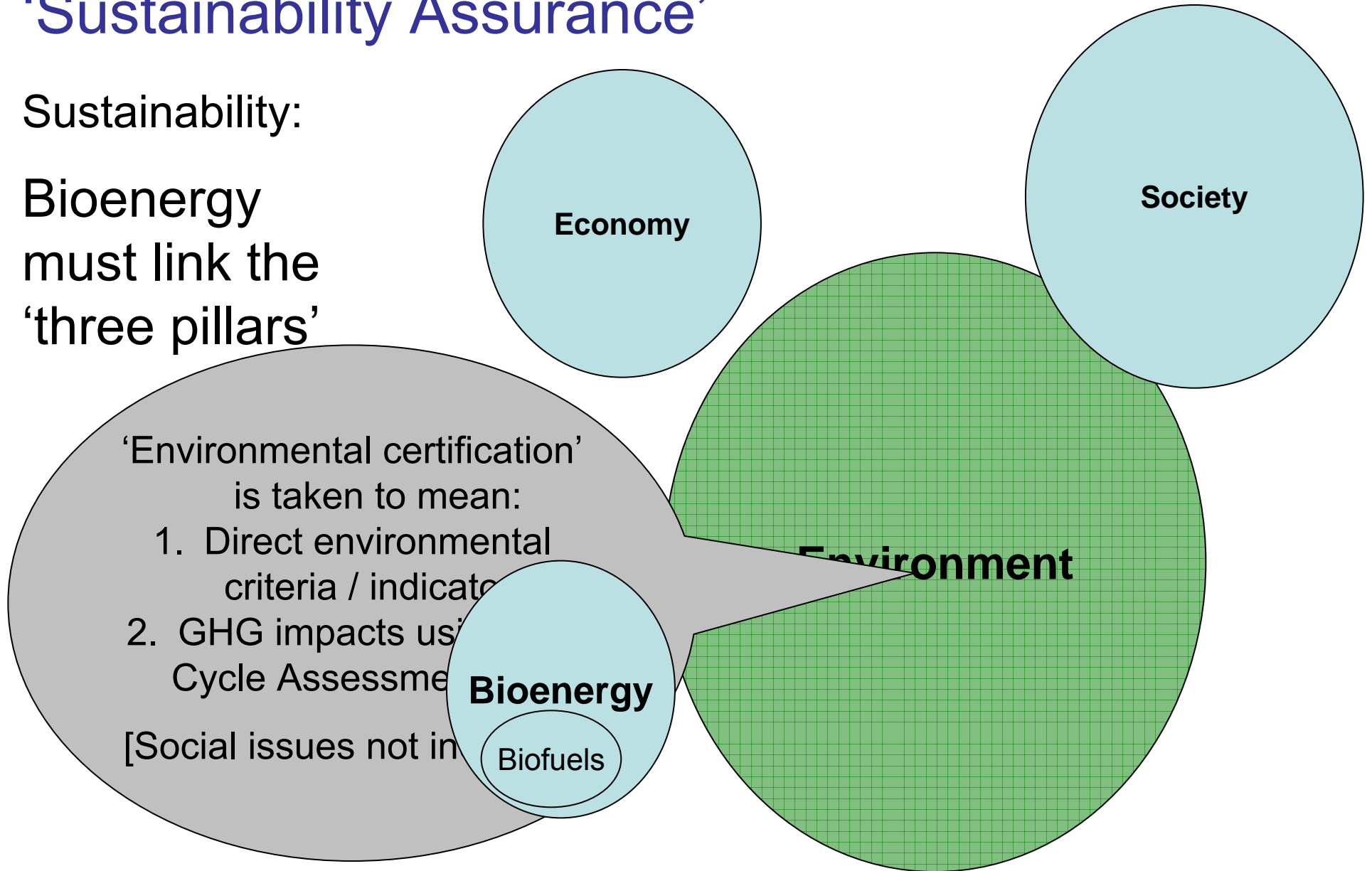
- **Standards** or set of criteria which defines 'sustainable'
- Independent **certification** or verification to confirm standard is implemented
- **Accreditation** to control certification bodies
- Product **traceability** / supply chain control

See Nusbaum, Pro-forests, 2007: www.ProForest.net

'Environmental Assurance' as a component of 'Sustainability Assurance'

Sustainability:

Bioenergy must link the 'three pillars'



Standards → Principles → Criteria → Indicators

- Principles

'general tenets of sustainable production'

- Criteria

'Conditions to be met to achieve these tenets'

- Indicators

How a farm, producer or company could prove that a particular criterion is met

Need to distinguish between '**direct**' and '**in-direct**' impacts

Certification Tools and Institutions

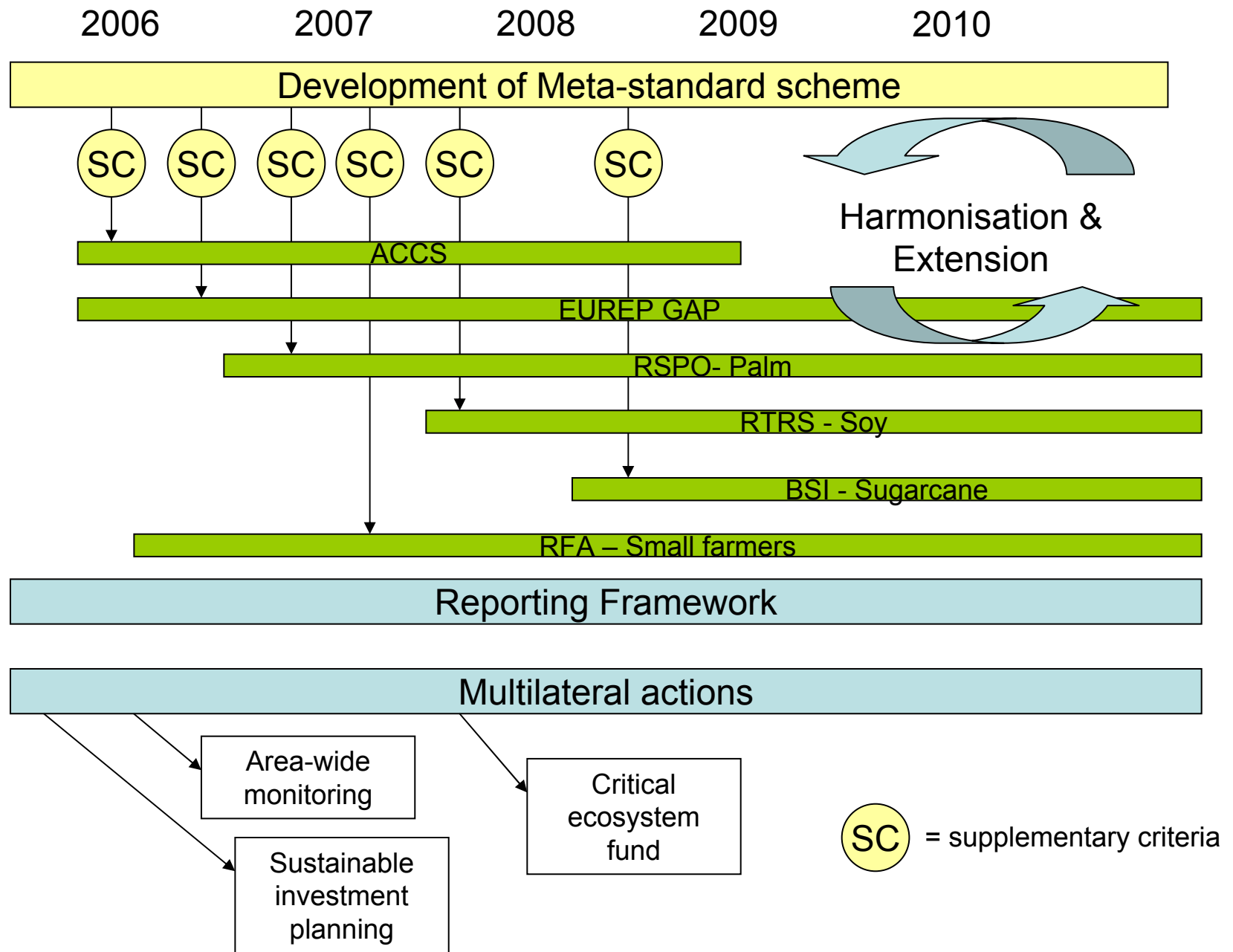
- ISEAL and existing institutions
- Life Cycle Assessment
 - Boundaries
 - Co-product allocation
 - Indicators / monitoring and reporting
- National and Regional Standards
 - CEN / ISO etc

Principles and Criteria for Biofuel Crops

Environmental standards for **biofuel crops** production comprise the following “Principles”, “Criteria.”:

- Conservation of carbon stocks
 - *Protection of above-ground carbon*
 - *Protection of soil carbon*
- Conservation of biodiversity
 - *Conservation of important ecosystems & species*
 - *Basic good biodiversity practices*
- Sustainable use of water resources
 - *Efficient water use in water critical areas*
 - *Avoidance of diffuse water pollution*
- Maintenance of soil fertility
 - *Protection of soil structure and avoidance of erosion*
 - *Maintain nutrient status*
 - *Good fertiliser practice*
- Good agricultural practice
 - *Use of inputs complies with relevant legislation*
 - *Use of inputs justified by documented problem*
 - *Safe handling of materials*
- Waste management
 - *Waste management complies with relevant legislation*
 - *Safe storage and segregation of wastes*

Draft(ing) A Meta-Standard

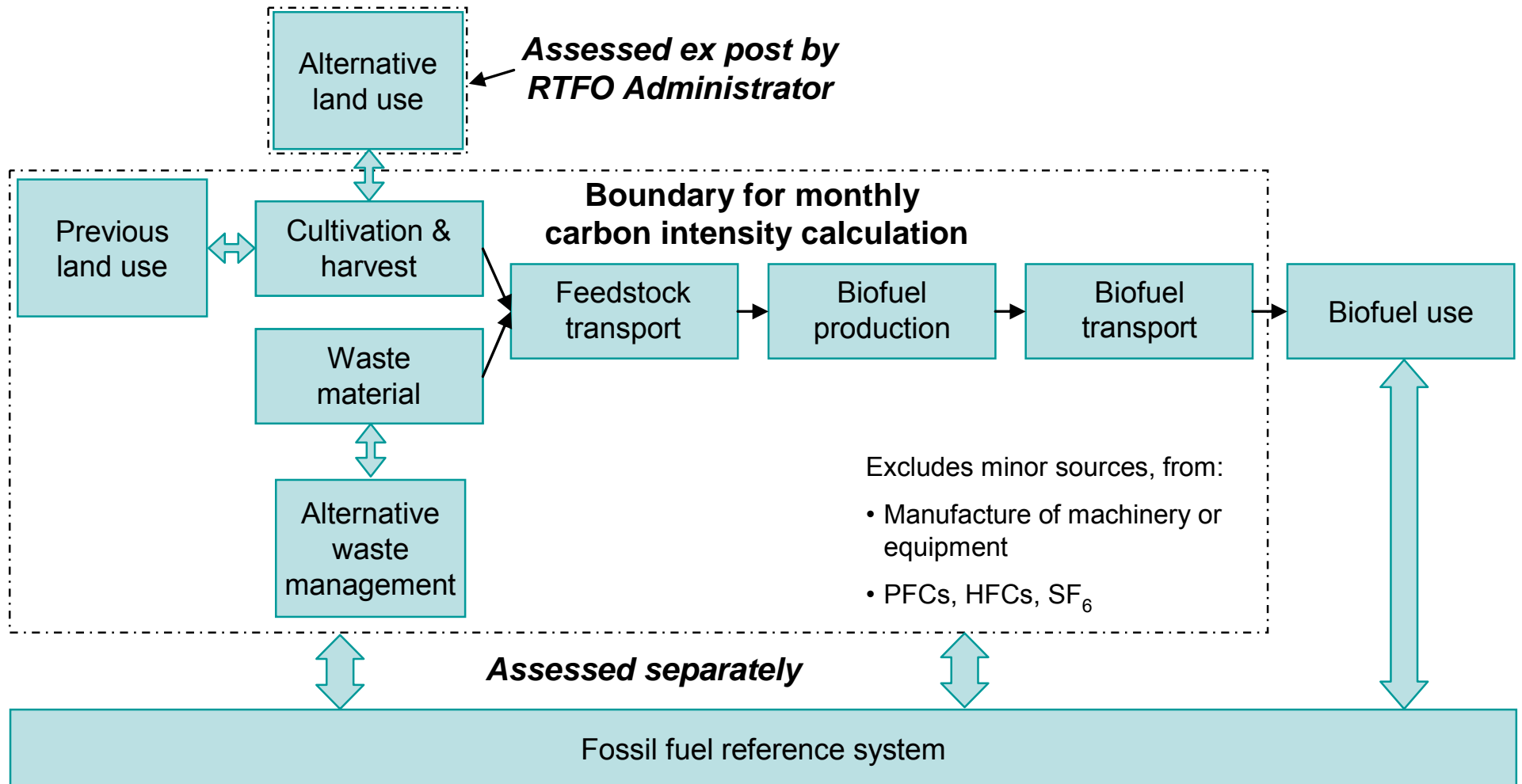


After Tipper et al, 2006

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Boundaries for carbon intensity calculation (E4TECH, 2007)



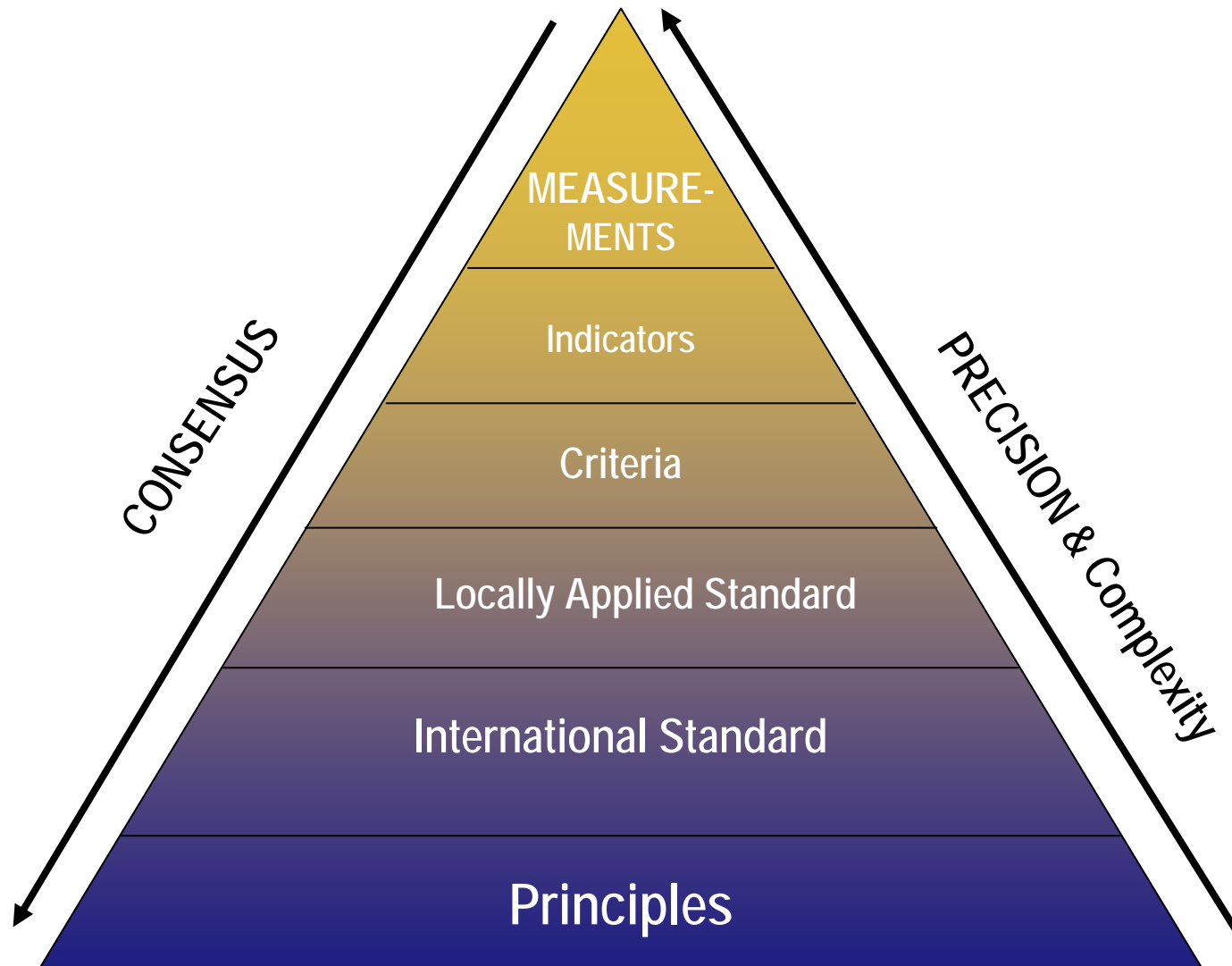
Measuring / Monitoring Direct & Indirect Impacts

Some Principles and criteria require BOTH direct and indirect indicators, for example:

- Conservation of carbon stocks (Principle)
 - Protection of above-ground carbon (Criteria)
 - *No exploitation of protected land (indicator)*
 - *Reference date is very important here!*
 - *Crop type/ residue retention / yield as proxy*
 - *Good land management or agricultural practice...*
 - Protection of soil carbon (Criterion)
 - *Crop type (indicator)*
 - *Harvesting of residues?*
 - *Soil type*
 - *Good land management or agricultural practice...*
 - *Previous land-use type*
 - *Reference date/system is very important here!*

Assurance Pyramid

– credibility and complexity -



Adapted from: Jim Smith, BSI Professional Standards Services (his presentation to LCVP on 18Feb05)

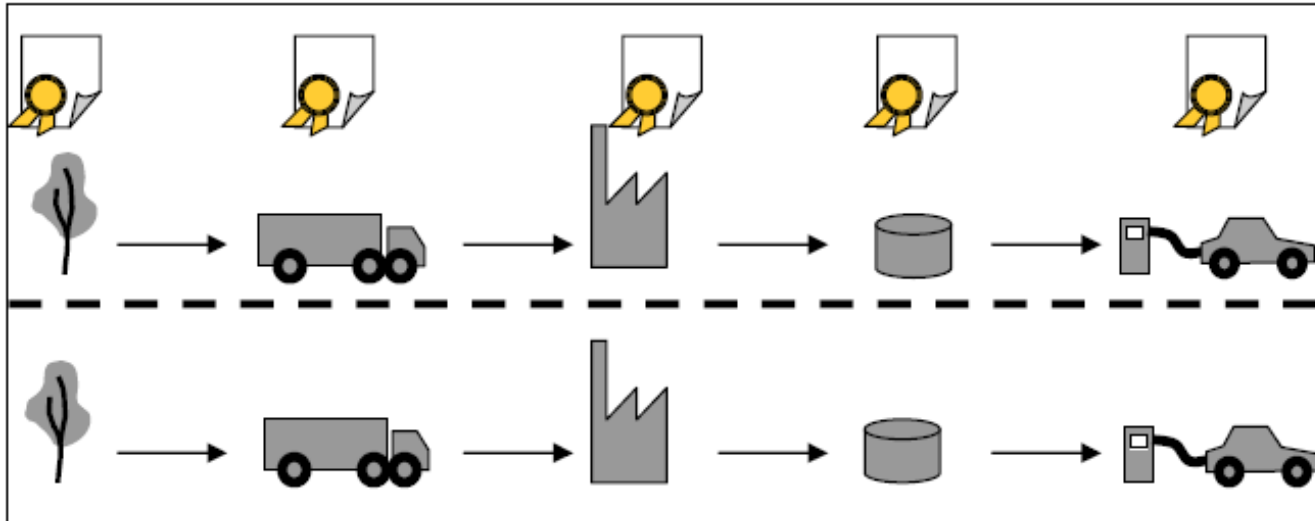
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Auditing, verification and accreditation

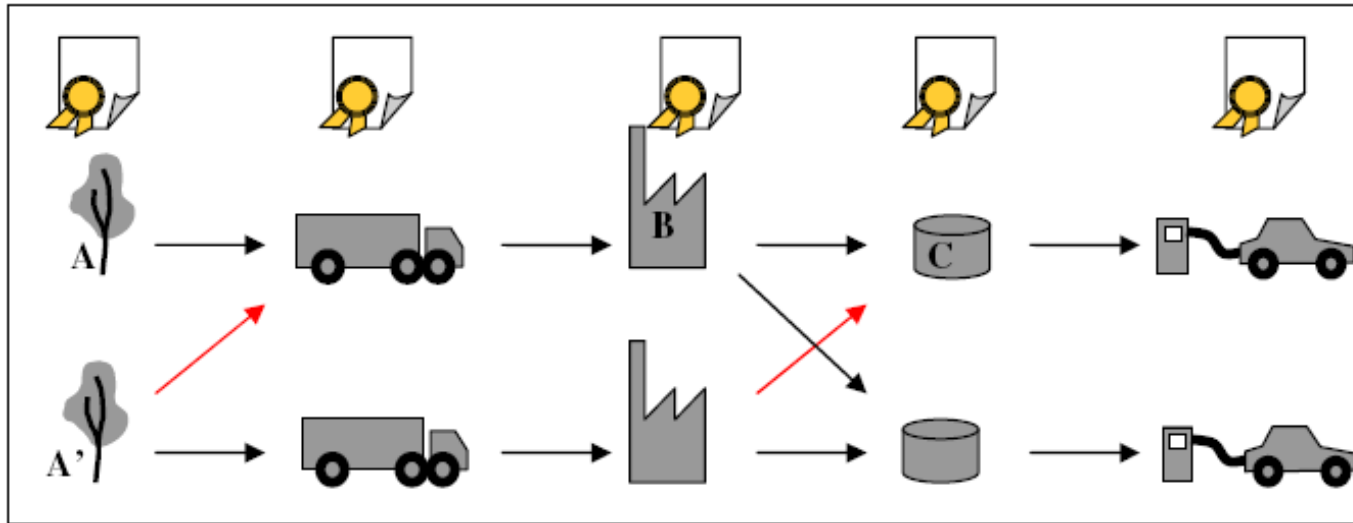
- Tracking chain-of-custody:
 - Track and Trace
 - Book and Claim
 - Mass Balance (equivalence)
- Accreditation of certifiers
- Acceptability of the relationship between indicators / criteria and principles...

Track and Trace (Ecofys, 2006)

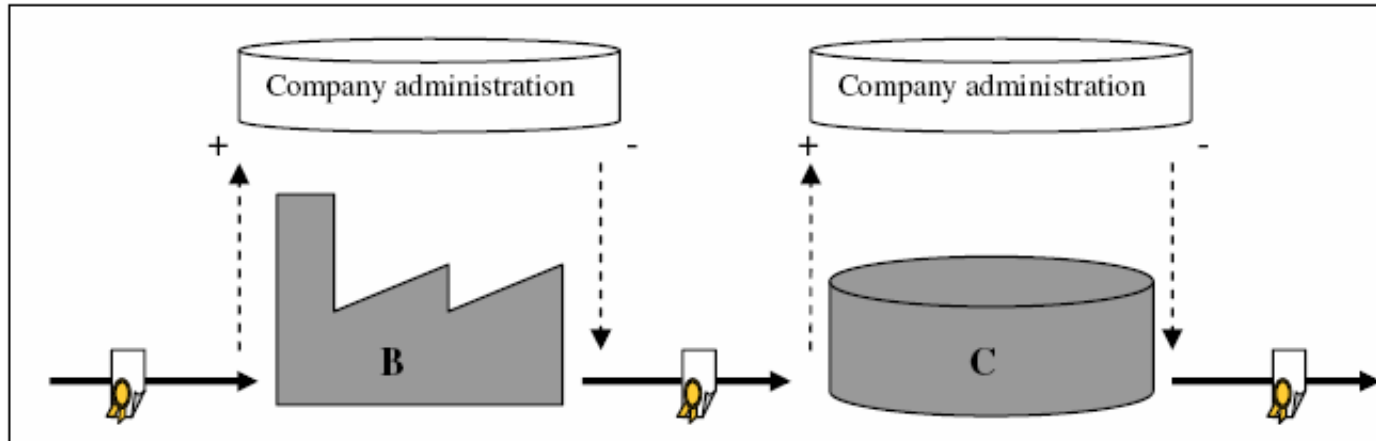


- Physical separation of certified from non-certified produce: no decoupling of information and product
- Used in food industry (organic food, non-GMO soy)
- Permitted for RTFO (but expensive at lower volumes)

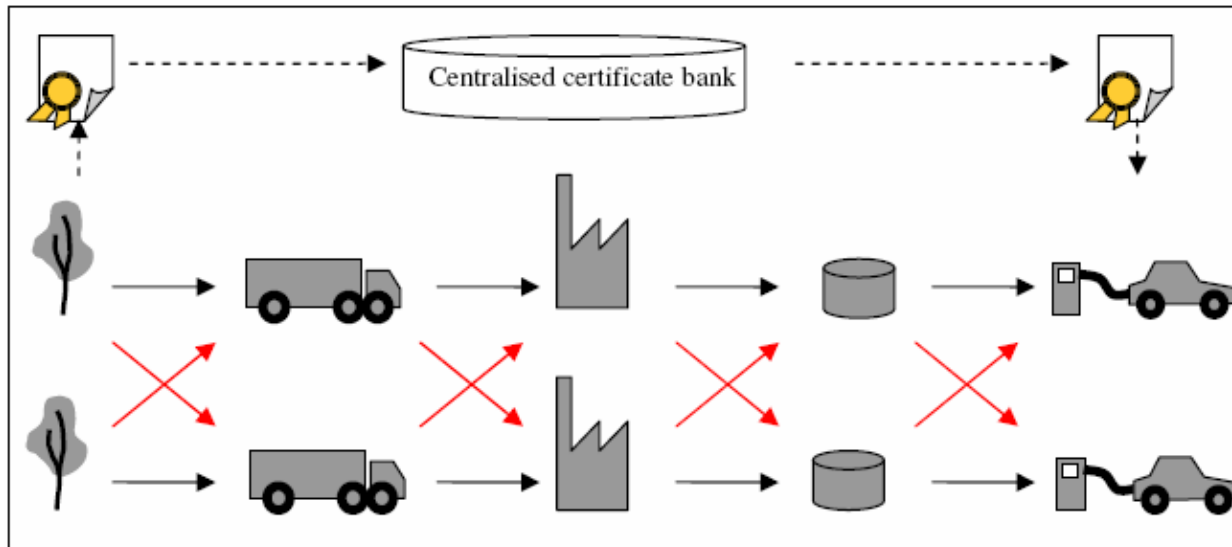
Mass Balance: units in = units out (Ecofys, 2006)



- Temporarily decoupling
- Used by FSC
- Permitted in RTFO

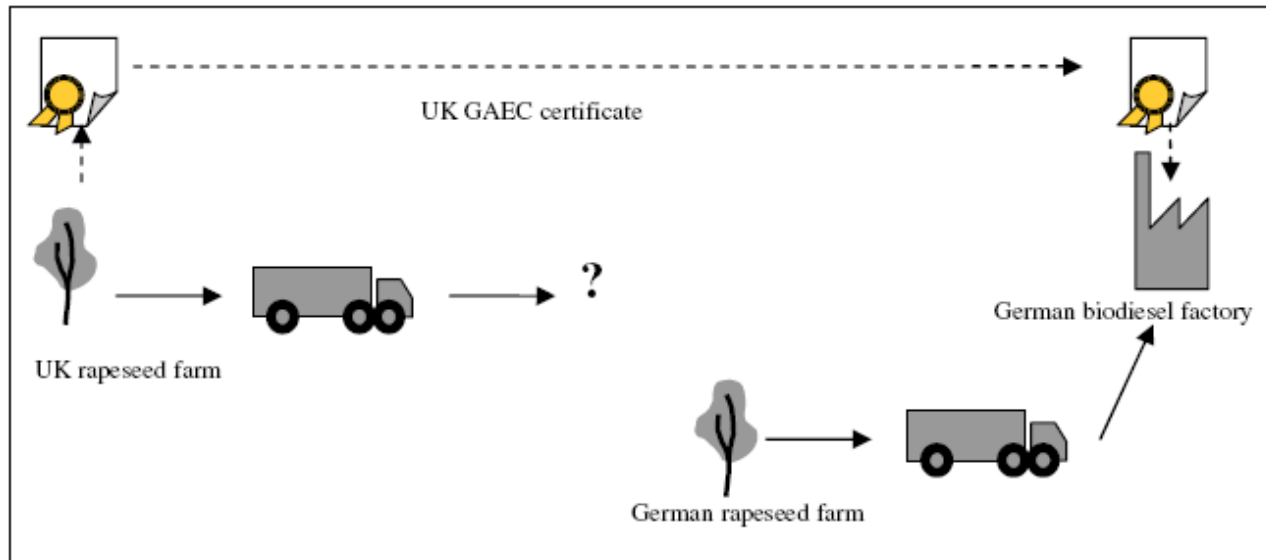


Book and Claim (Ecofys, 2006)



- Complete decoupling information from product
- Used in trade for green electricity
- Permitted in RTFO but problems expected:
 - Acceptance by Existing Standards + NGO's
 - All or Nothing: No Shopping
 - No carbon data -> fuel default value

Equivalence trading (Ecofys, 2006)



- Equivalence trading = book and claim
- Permitted under condition:
 - System in place to prevent double counting
 - C&S data from same farm: no shopping
- GAEC not (yet) benchmarked: under consideration

Chain of Custody in existing Standards (Ecofys, 2006)

	Track-and-trace	Mass-balance	Book-and-claim
FSC	Yes	Yes	-
SAN/RA	Yes	-	-
IFOAM	Yes	-	-
LEAF	Under development	-	-
RSPO	Under development: all COC options still open: operational in 2007		
RTRS	Under development		
SA8000	-	-	-
ACCS	-	-	-
EurepGAP, Combinable Crops	-	-	-

- Not all standards have chain-of-custody
- Need to keep track of own chain-of-custody -> included in verification

Chain of Custody (Ecofys, 2006)

- Track and trace
 - 100% separation
 - Common in food sector (non-GM soy)
- Mass Balance
 - Mixing allowed: % in is % out.
 - Partial decoupling: product partly linked to farm / plantation
 - Used in wood sector (FSC)
- Book and claim
 - Trade in certificates
 - Completely decoupled: product not linked to farm / plant
 - Used in electricity market

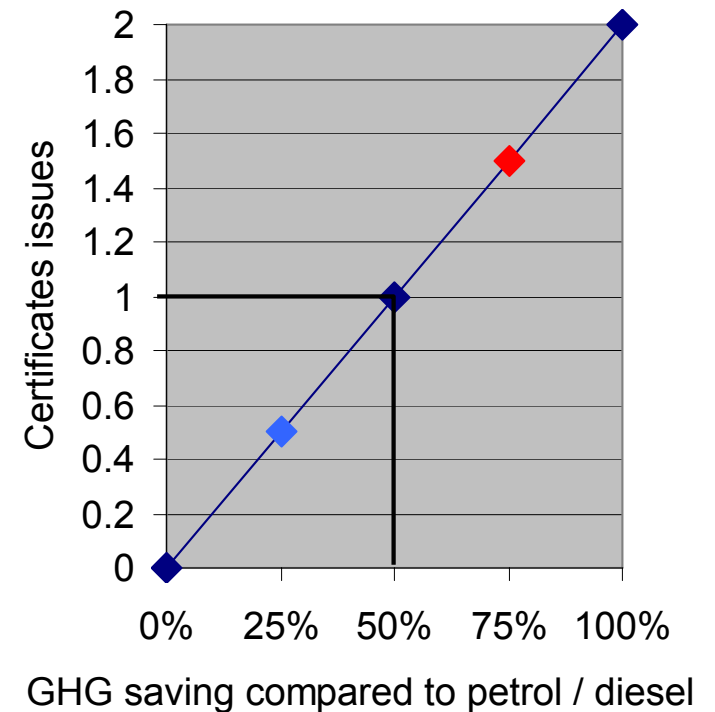
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How could C-certification & sustainability assurance be included in the UK's RTFO?

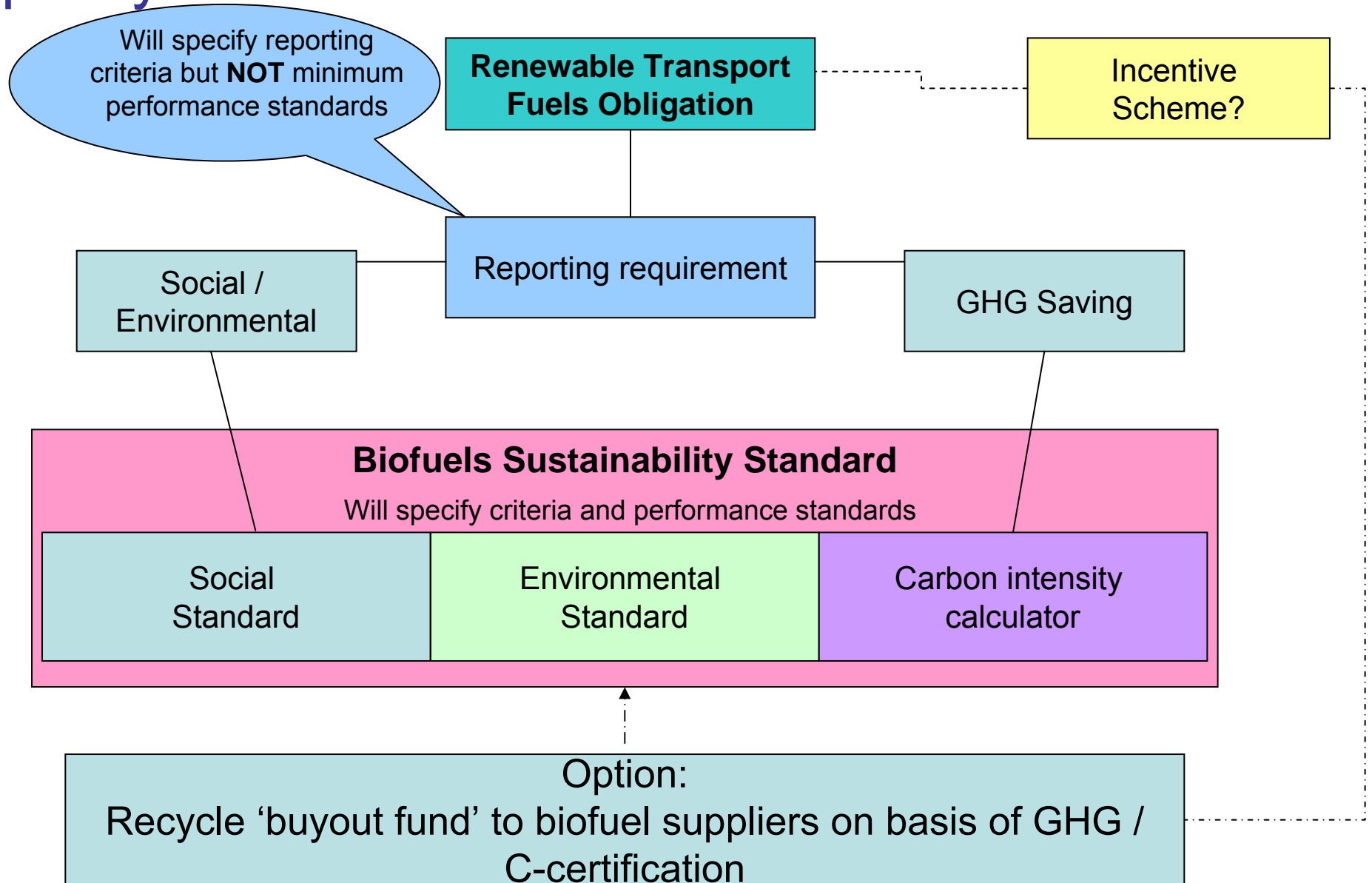
- Initial reporting requirement will assess the scale of sustainability issues and quantify GHG saving
 - Reporting will encourage corporate social & environmental responsibility from fuel suppliers
- Robust sustainability reporting & assurance systems are needed to manage adverse social / environmental impacts
 - Mandatory requirements may breach trade rules
- A future incentive scheme would link award of RTFO certificates to the biofuels C-intensity
- Reporting of GHG saving is appropriate for *testing* new systems, but without incentives:
 - The market will source predominately low cost fuels - with a low GHG balance
 - £ / t C saved will be higher
 - Higher GHG saving processes are not encouraged
 - No incentives for new (including 2nd Generation) technology

Incentive scheme would link award of certificates to GHG saving



◆ 1 certificate for 1l fuel with 50% GHG saving

Rewarding innovation & performance through policy linked to certification



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Benchmark of criteria

	SAN/RA	RSPO	Basel	LEAF	ACCS	EurepGAP	FSC	SAI	IFOAM
P1. Conserve Carbon	P	P	P	P	P	N	P	N	P
P2. Conserve Biodiversity	P	Y	Y	P	N	N	Y	N	P
P3. Soil conservation	Y	Y	Y	Y	Y	Y	P	N	Y
P4. Sustainable Water Use	Y	Y	Y	Y	Y	Y	P	N	P
P5. Air quality	Y	Y	Y	Y	Y	P	P	N	Y
P6. Compliance with applicable law (social issues)	Y	Y	Y	Y	N	Y	Y	Y	P
P7. Contracts and subcontractors	Y	N	N	P	P	N	N	P	P
P8. Freedom of association and right to collective bargaining	Y	Y	Y	N	N	N	Y	Y	Y
P9. Working hours	Y	N	N	N	N	N	N	N	N
P10. Child labour	Y	Y	Y	N	N	N	N	Y	Y
P11. Health and safety	Y	Y	Y	N	P	Y	Y	Y	P
P12. Wages/compensation	Y	Y	Y	N	N	N	N	Y	P
P13. Discrimination	Y	Y	Y	N	N	N	N	Y	Y
P14. Forced labour	Y	N	Y	N	N	N	N	Y	Y
P15. Land right issues	Y	Y	Y	P	N	N	Y	N	P

- Short term solution for crops without operational standard
 - Soy: Meet Basel criteria + Membership of RTRS
 - Sugar Cane: Meet RTFO Base Standard + Membership of BSI
- Additional benchmarks by RTFO administrator

Coverage of current standards

Certified area (1000 ha) in 2006

	Eurep-GAP, IFA	ACCS	LEAF	SAN/RA, farm	RSPO	RTRS	IFOAM	FSC	SA8000
Soy	+	0	0	0	-	+	?	0	0
Palm oil	+	0	0	0	3,800	-	?	0	0
Sugar cane	+	0	0	0	-	-	?	0	0
Rapeseed	+	600	11	0	-	-	?	0	0
Sugar beet	+	25	0	0	-	-	?	0	0
Wheat	+	2,600	40	0	-	-	?	0	0
Corn/maize	+	0	0	0	-	-	?	0	0

- Current coverage limited
- Expansion can be realised quick: certification follows demand
- Limited availability of accepted standards in EU?
 - Other Standards / GAEC?

Could Cross-Compliance be sufficient in the EU? – Social factors are not included

	Standards	Cross Compliance GAECs	Cross Compliance SMRs	LEAF	ACCS	Eurepgap
P6	Compliance with applicable law (social issues)	NA	NA	Y	N	Y
P7	Contracts and subcontractors	NA	NA	P	P	N
P8	Freedom of association and right to collective bargaining	NA	NA	N	N	N
P9	Working hours	NA	NA	N	N	N
P10	Child labour	NA	NA	N	N	N
P11	Health and safety	NA	NA	N	P	Y
P12	Wages/compensation	NA	NA	N	N	N
P13	Discrimination	NA	NA	N	N	N
P14	Forced labour	NA	NA	N	N	N
P15	Land right issues	NA	NA	P	N	N

Main National / Global Programmes

- UK
 - Renewable Transport Fuels Obligation (May07)
<http://www.dft.gov.uk/pgr/roads/environment/rtfo/>
- Netherlands
 - Cramer Commission (May07)
http://www.mvo.nl/biobrandstoffen/download/070427-Cramer-FinalReport_EN.pdf
- Global Round Table on Sustainable Biofuels
 - Steering Board request for feedback and comments on draft principles from stakeholders around the world (05jun07)
http://www.bioenergywiki.net/index.php/Roundtable_on_Sustainable_Biofuels

Other international activities of relevance

- UN-FAO's Global Bioenergy Platform
 - http://www.fao.org/sd/en2_en.htm
 - **Key input into the widely miss-quoted UN-Energy (2007) report**
- G8+5 Global Bioenergy Partnership
 - GBEP-Secretariat@fao.org and coming soon:
 - www.globalbioenergy.org

Conclusions

- Site- and technology- specific variance in a range of key indicators (including GHG and energy balances) will dominate the actual performance of biofuels
- Existing assurance and certification schemes could be modified to provide verifiable performance indicators for biofuel supply chains
 - None yet exists that has sufficient geographic coverage or depth to act as the basis sustainability (or environmental) assurance
 - No single assurance scheme is likely to do so in the immediate future but some are more comprehensive than others – international standardisation is already occurring
- Un-balanced policy development may lead to perverse or sub-optimal outcomes
- Major reductions in inputs and improvements in efficiencies (including energy and GHG requirements) are possible but innovation in these areas can not be taken for granted
- Significant uncertainty remains in methodologies (and factors) used to calculate GHG and energy balances. Also true for other environmental impacts.
 - Development of life-cycle assessment tools is essential
- Emergence of multiple (and fragmented) assurance and certification schemes for biofuels would be detrimental for the development of sustainable biofuels
- Complexity is a major barrier to industry participation and to policy development
- New institutions are likely to be required to account for indirect impacts
 - These should not unduly penalise one sector in favour of another
- Equally, doing nothing should not be considered as an option as this is likely to lead to a 'race to the bottom'