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Quantitative analysis of policy options for GHG abatement and biodiversity in agriculture

Preliminary results from the EU-STREP 'MEACAP', WP6

Workshop on MEACAP, 13 March 2006, Brussels

Structure

GHG abatement

Biodiversity

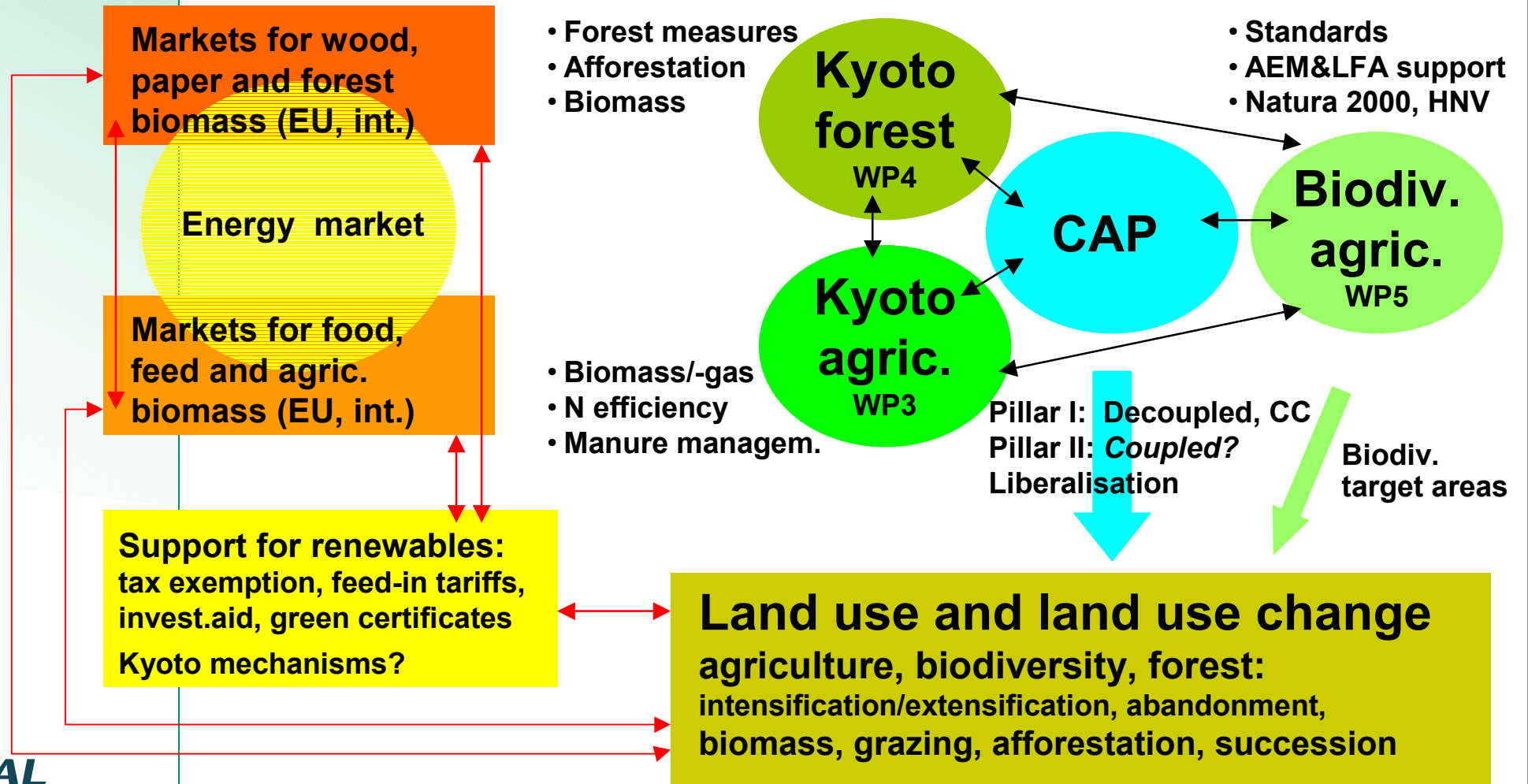
Data and methods

Scenarios

Structure

- 1. MEACAP WP6 – Integration of topics**
- 2. Assessment of technical abatement measures and related policy tools**
 - GHG abatement**
 - conserving and enhancing Biodiversity**
- 4. Data and methods**
- 5. Scenarios**

Further analysis MEACAP: Integration of topics



Indicators, targets, monitoring, cause-effect

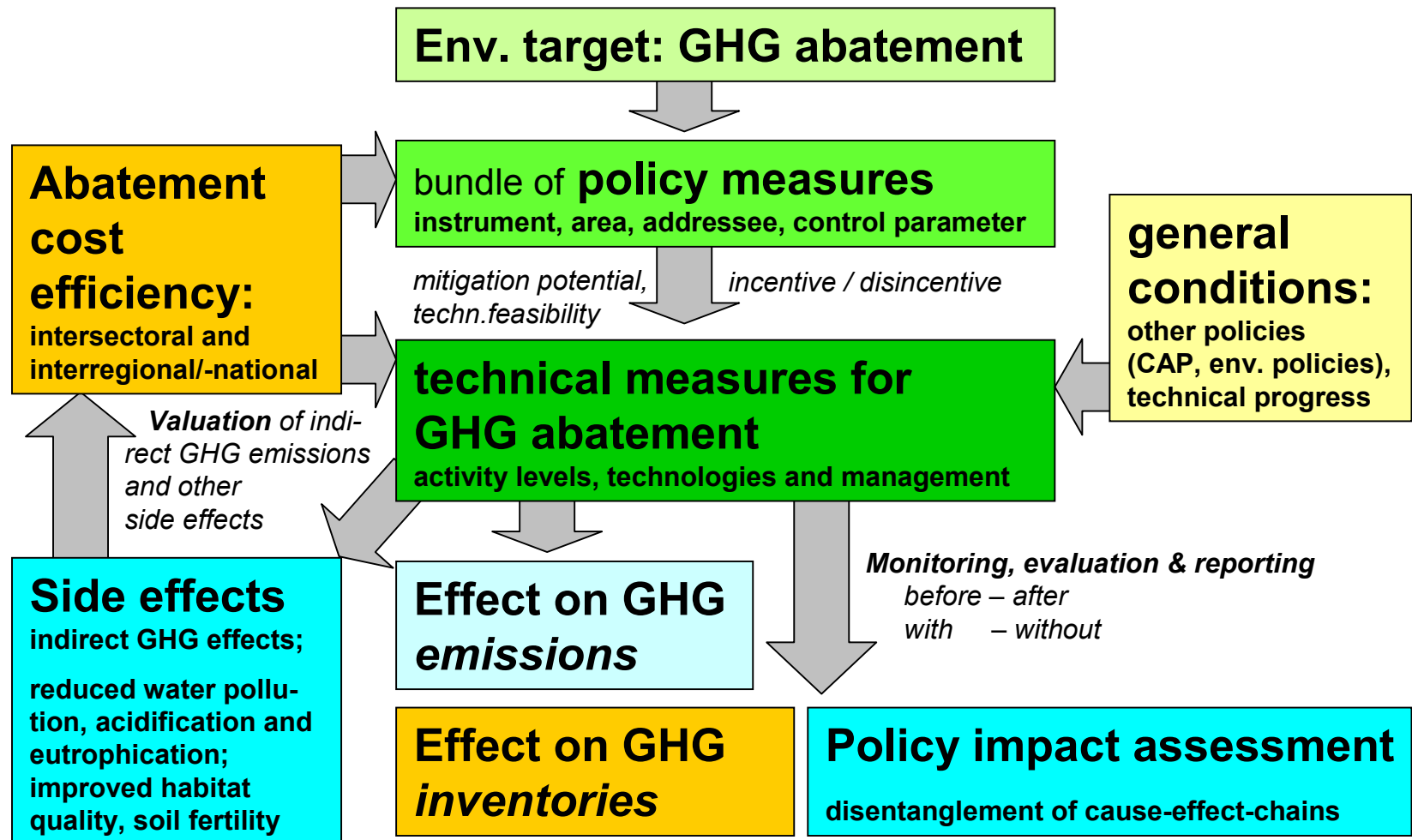
GHG emissions

- **Clear indicators (CO₂-equivalents, IPCC- guidelines)**
- **Clear Kyoto targets, chances in agric.&forestry**
- **Monitoring partially incomplete (LULUC)**
- **Cause-effect chain bound to energy and mass flows**

Biodiversity

- **Lack of accepted indicators (HNV land, farmland birds)**
- **CBD-target: ‚stop the loss until 2010‘**
- **Lack of systematic monitoring**
- **Multi-factorial/-dimensional cause-effect chain**

The policy frame (GHG) – from technical options to policy measures and reporting



“Duality” in GHG abatement strategies

Emission trade

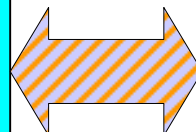
Directive 2003/87/EC
of 13 October 2003
establishing a scheme
for greenhouse gas
allowance trading, for
industrial installations

Market allocation of
reductions minimising
low abatement cost

Predictable reductions

Incentives for “best
performers”

Including monitoring



Other sectors

e.g. agriculture:

**Implementation of
different other measures**

No ‘efficiency motor’

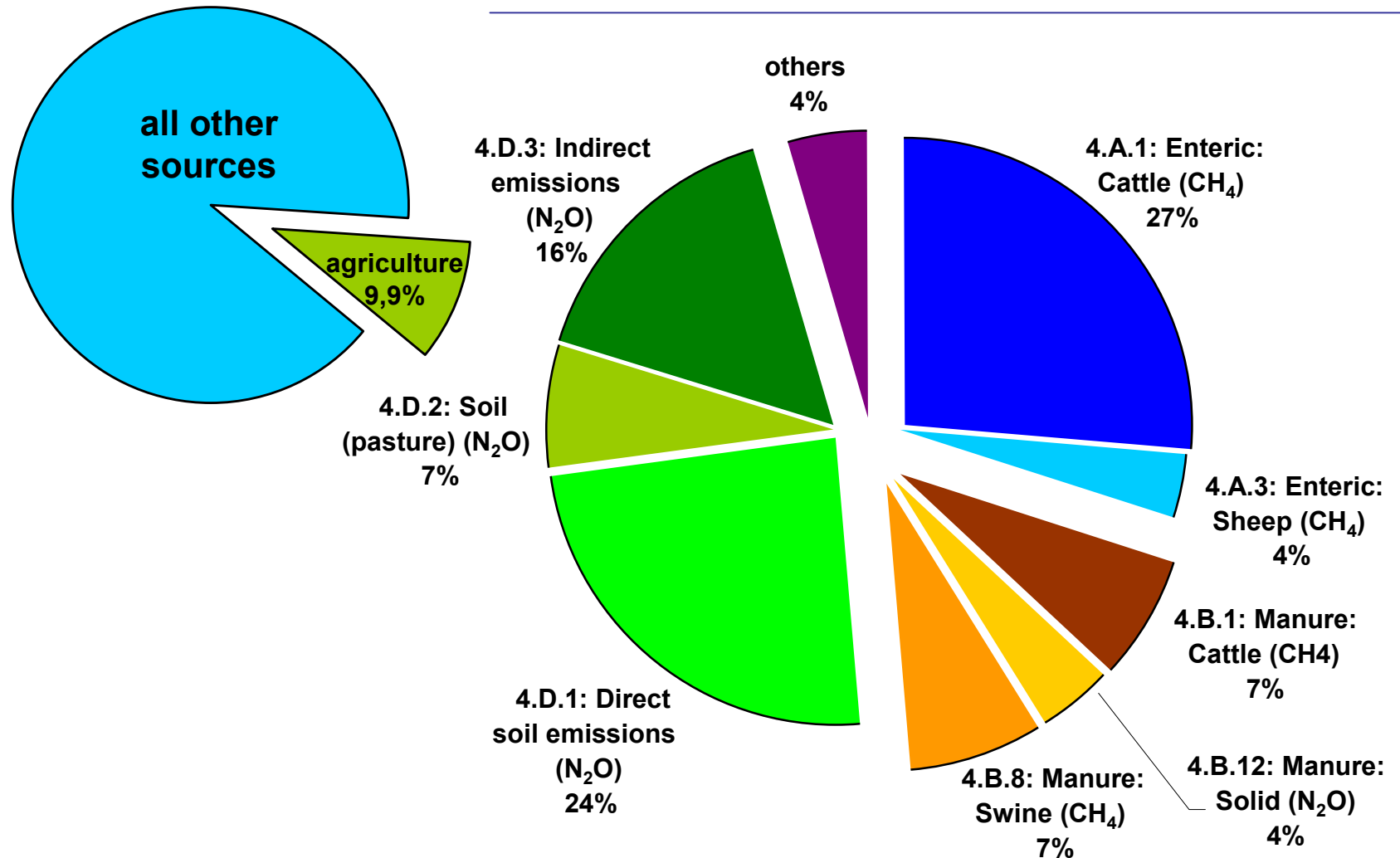
Problems of valuation and
predictability of measures

Often no incentives for “best
performers”

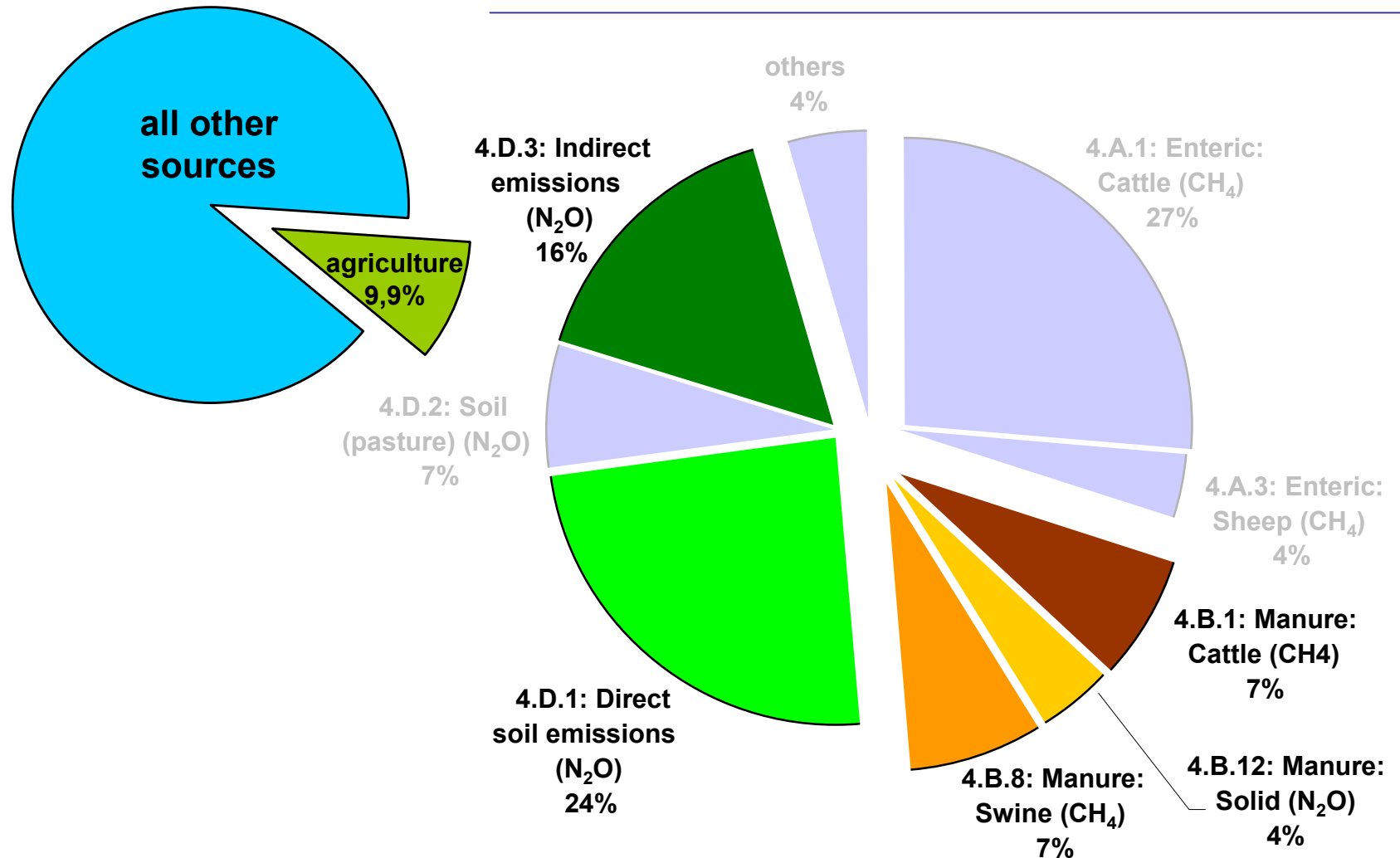
Problems with measure-
specific monitoring

Interaction with trade system

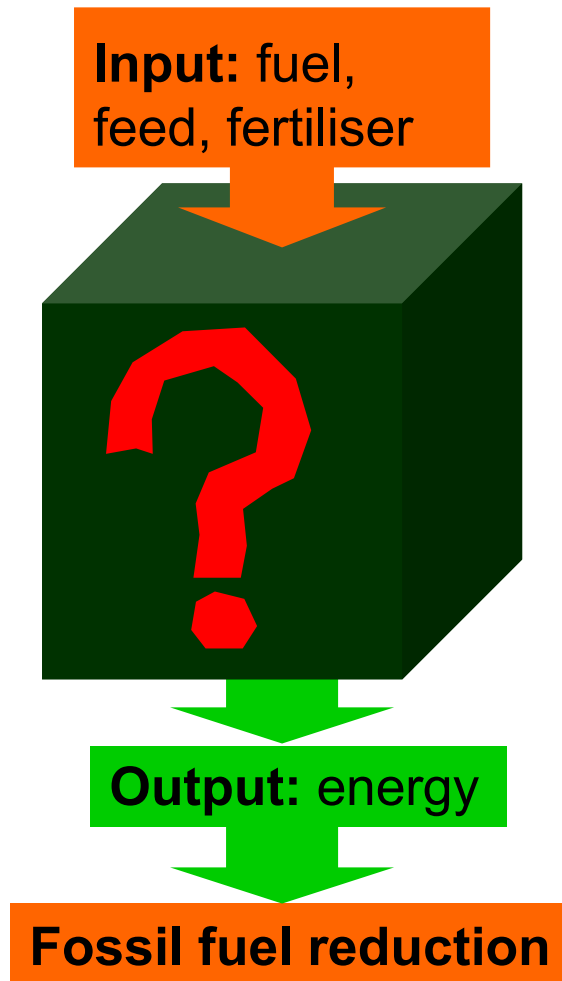
GHG key sources in agriculture (EU15, 2003, in CO₂-eq. without CO₂ from LUCF)



GHG key sources in agriculture (EU15, 2003, in CO₂-eq. without CO₂ from LUCF)



Transaction cost and GHG abatement strategies: monitoring options



Supply industry and trade
(„bottle neck“ for inventory, tax)

Agricultural enterprises
(high number of actors):
Fuel, feed and fertiliser use,
manure and soil management

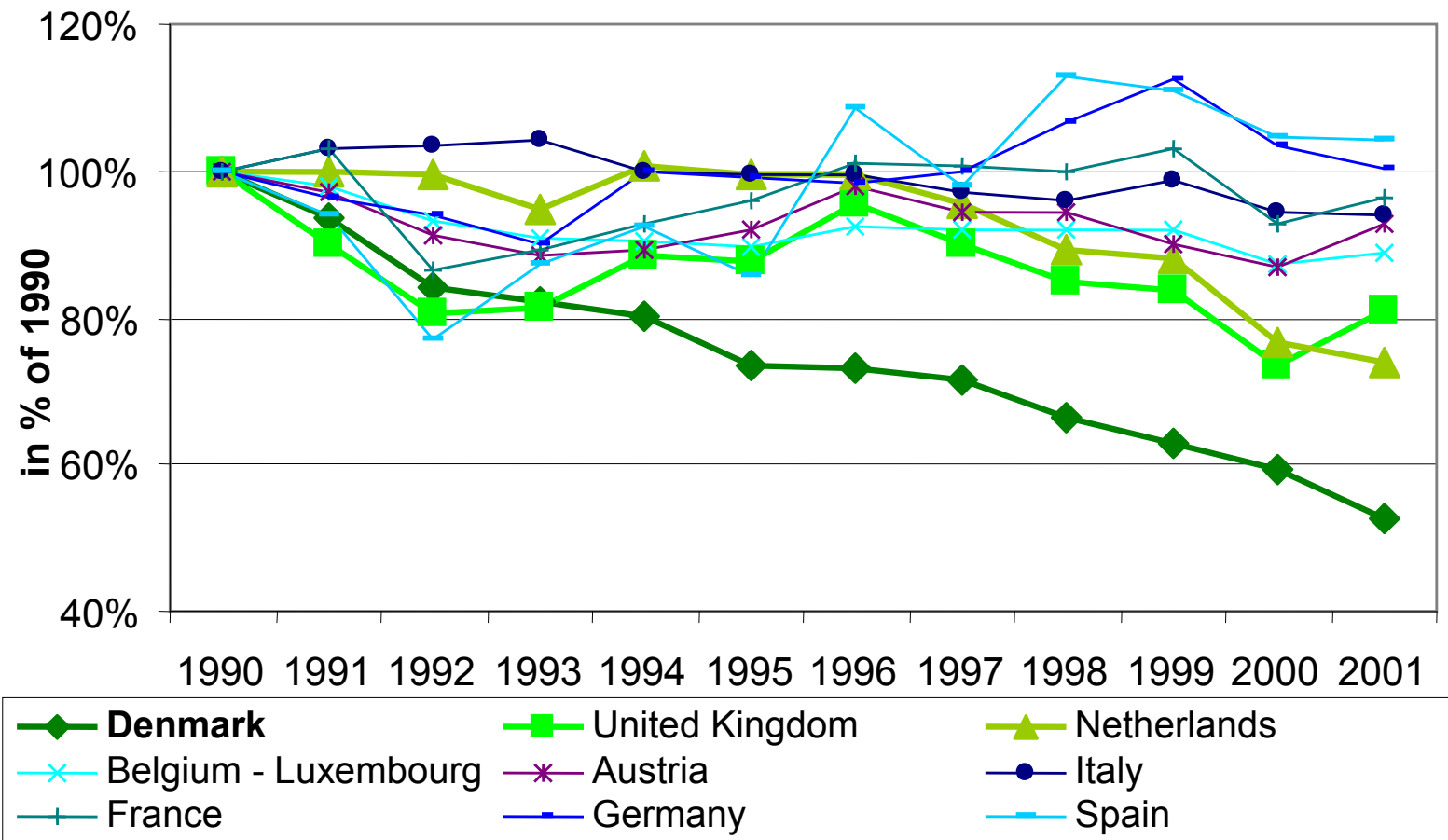
(Energy plants: biomass and bioenergy production)

Supply industry, trade

Technical options for GHG abatement: instruments, addressees and monitoring

	Instruments	Addressee	Monitoring
Enteric fermentation (CH₄)			
Feeding	? (technical progress)	farm	difficult
Animal number	dis? (techn.progress)	farm	easy (CAP reform)
Manure management (CH₄, N₂O)			
Biogas	inc (co-ordination?)	farm/enterprise	+/- easy
Direct and indirect soil emissions (N₂O)			
Increase of N-Efficiency			
- sectoral	dis? / GfP	industry/farm	easy
- farm/site-specific	inc/dis (high TC)	farm / site	difficult
Bioenergy options (substitution of fossils – CO₂)			
Biofuel, -mass, -gas	inc (co-ordination?)	p.plant/farm	easy (sectoral)
Carbon sequestration (CO₂)			
reduced tillage	inc / GfP	farm / site	diff./non-perm.
organo-soils	projects / GfP,CC	farm / site	+/-easy
afforestation/succession	inc. / -	site	easy

Sectoral visibility of N efficiency policies: Mineral fertiliser purchase (1990 = 100)



Source :FAO Statistics Division. Domain: Means of Production; Collection: Fertilizers (part 0). FAO's last update available: 21/08/2003.

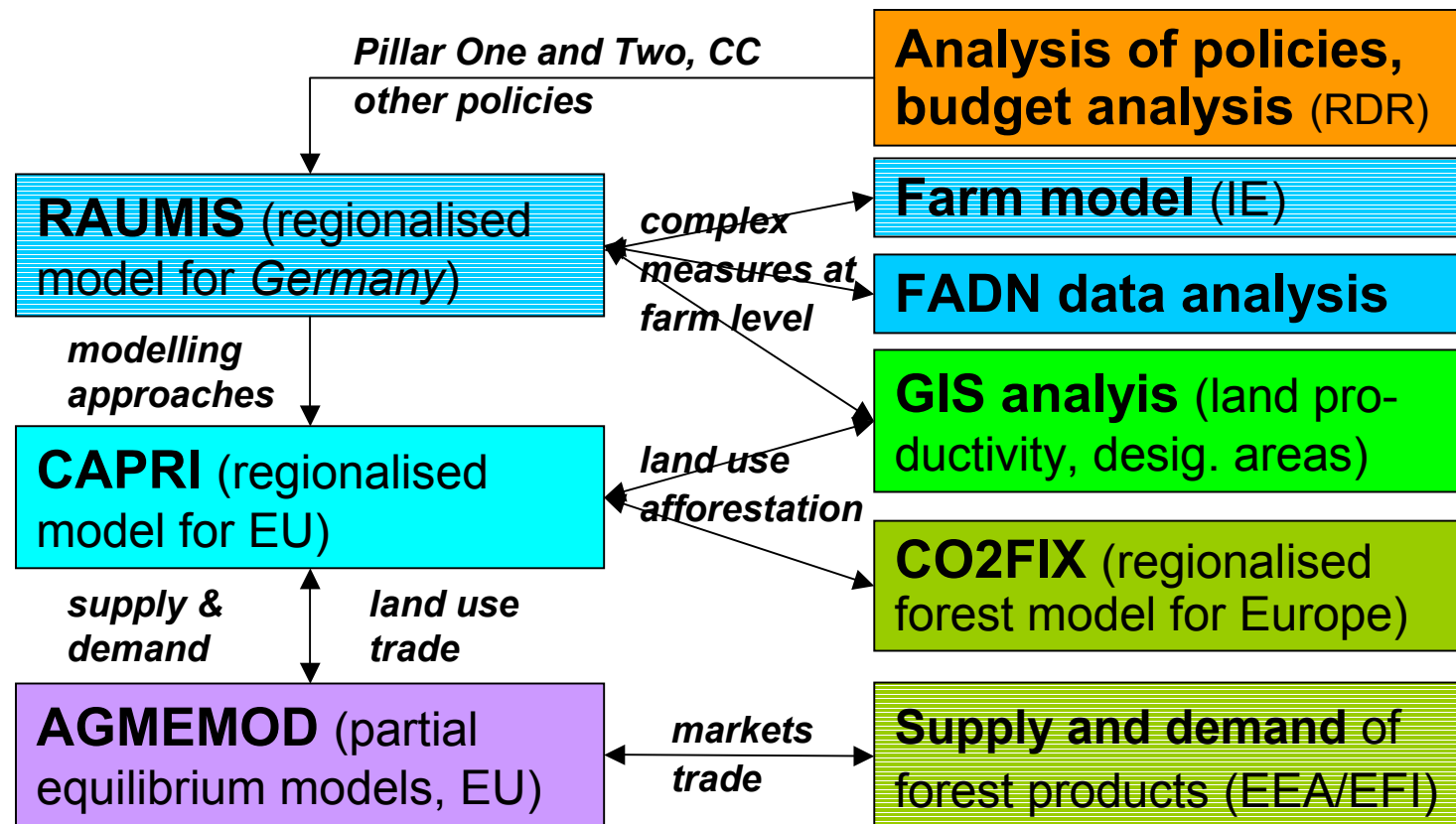
Technical options and appropriate political measures for biodiversity

- **Cross-compliance standards:** minimum land maintenance, landscape elements, permanent pasture, Natura 2000 - standards at MS level, soil organic content and biomass extraction?
- **RDR support measures:** Agri-environmental measures, LFA, *re-coupling*?
- **Designated areas:** Natura 2000, role of agric.& forest, need for specific management, pressure from CAP and land use change
- **Special focus on abandonment:** relevance especially in NMS (case study), importance for biodiversity issues, potential effects of decoupling and CC, afforestation and succession

Data and methods

Models

Other methods



Baseline

- **For the year 2015 – right after the end of the actual CAP planning period (both first and second pillar)**
- **New CAP (decoupling, cross compliance)**
- **WTO:**
 - **status quo = results of Uruguay Round (a)**
 - **assumptions on results of Doha Round (b)
= actual EU position (incl. further liberalisation)**
- **How to depict second pillar? Monetary ,coupled‘ incentives from investment aid, LFA, AEM (partially)**
- **Inclusion of bioenergy options, status quo**

Scenarios on GHG emission abatement

- **Integration of energy and food markets - price transmission between energy and food markets, depending on:**
 - Technological substitutability („grains instead of fossils“)
 - Different subsidies
 - Tradability of renewables
- **GHG biofuels:** how to reach the 5.75 % biofuel target: from domestic production / including imports (*tariffs?*)
- **GHG biomass:** biomass/gas combustion for reaching the 12 % / 22 % target (*share of biomass? Afforestation?*)
- **GHG manure management:** biogas
- **GHG nitrogen efficiency:** time series analysis, cost?

Scenarios on biodiversity

- **Targets for biodiversity scenarios**
 - Designated areas (land use and management requirements)
 - HNV land (*definition, extension*, managem. requirements)
 - *x% habitats / landscape elements on other UAA*
 - other measures (RDR: biodiversity-oriented AEM)
- **GIS and budget analysis (no EU-wide Natura2000 data!)**
- **Case studies**
- **Analysis of potential pressures from baseline and GHG scenarios (biomass)**
- **Focus on abandonment, extensive grazing, CC, afforestation**

Thank you for attention



Technical options and appropriate political GHG measures: RDR incentive payments

- **Investment aid** („green investments“): for animal housing, manure storage, application techniques and biogas → N efficiency, manure CH₄
- **Agri-environmental measures**: Organic farming, extensive grassland, reduced N input, nutrient management, application techniques
→ N efficiency; effect on grazing? effect on livestock numbers (= coupled payments)?
- very diverse measures including „maintenance“
- **Afforestation of agricultural and other land**
- **Multifunctional objectives** → problem of valuation

Technical options and appropriate political GHG measures: Biofuel, biomass, biogas

- **Increasing technological substitutability between food, feed and energy markets**
- **Main drivers: renewable energy policies and energy/food price relation**
 - **Biofuel:** tax exemptions, indicative targets, investment aid
 - **Biomass/-gas:** feed-in tariffs, green certificates, investment aid (heating & cooling?)
- **CAP:** decoupling, energy crop support, set-aside, CC, rural development measures, tariffs (ethanol)
- **Co-ordination of incentives?**
- **Tradability, plant scales and transport cost**
(fuel>electricity>cereals/oilseeds>wood>straw>biogas substr.)

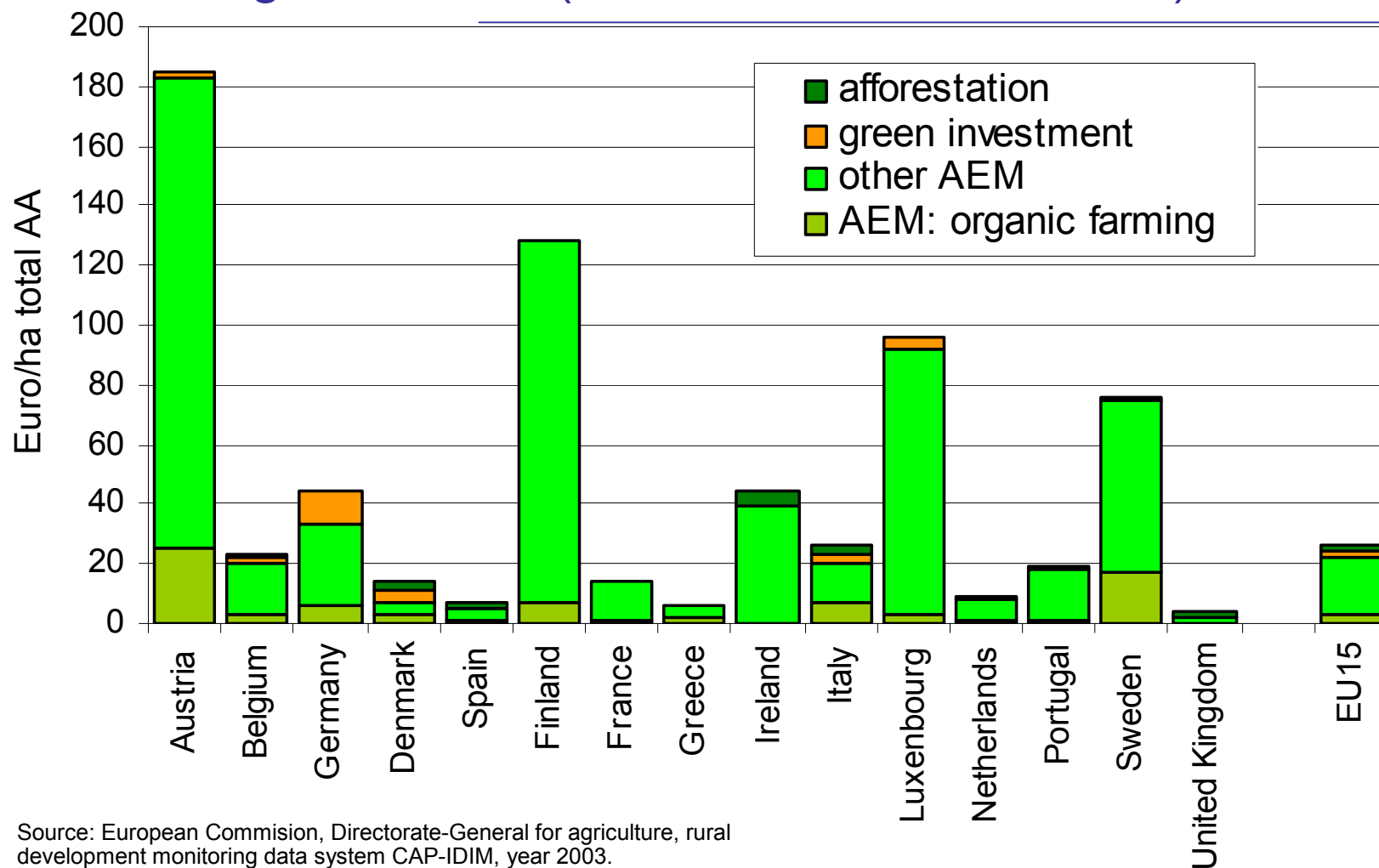
Implementation of the 2003 CAP reform: extent of ‚partial decoupling‘

	Start year	Regions	Type of SFP	National envelope	Partial or full coupling of premia for ...						
					Suckler cows	Slaughter: beef	Slaughter: calf	Special beef	Sheep & goat	Arable crops	other ¹⁾
Austria	2005	1	historic	-	100%	40%	100%	-	-	-	hops
Belgium	2005	2	historic	-	100%	-	100% ²⁾	-	-	-	seed
Denmark	2005	1	static hybrid	-	-	-	-	75%	50%	-	-
Finland	2006	3	dyn. hybrid	Yes	-	-	-	75%	50%?	10%?	seed
France	2006	1	historic	-	100%	40%	100%	-	50%	25%	outermost
Germany	2005	13	trans. hybrid	-	-	-	-	-	-	-	hops, tobacco
Greece	2006	1	historic	-	-	40%?	100%?	-	50%?	40% ³⁾	tob., cott., oli.
Ireland	2005	1	historic	-	-	-	-	-	-	-	-
Italy	2005	1	historic	Yes	-	-	-	-	-	-	seed
Luxembourg	2005	1	static hybrid	-	-	-	-	-	-	-	-
Netherlands	2006	1	historic	-	-	40%	100%	-	-	-	seed
Portugal	2005	1	historic	Yes	100%	40%	100%	-	50%	-	seed, outerm.
Spain	2006	1	historic	-	100%	40%	100%	-	50%	25%	seed, outerm.
Sweden	2005	5	static hybrid	Yes	-	-	-	74,6%	-	-	-
UK- England	2005	3	trans. hybrid	-	-	-	-	-	-	-	-
UK- N. Ireland	2005	1	static hybrid	-	-	-	-	-	-	-	-
UK- Scotland	2005	1	historic	Yes	-	-	-	-	-	-	-
UK- Wales	2005	1	historic	-	-	-	-	-	-	-	-
Share of partially or fully coupled production (animal head, cereal production) ⁴⁾					‘other cows’	cattle	slaughter calves	bulls	sheep & goat	cereals	
in % of EU-15					61%	41%	84%	7%	56%	43%	

1) seed aid, outermost regions, tobacco, hops, cotton, olive oil. 2) only in Flanders. 3) durum wheat 4) data on production capacities for 2003, situation of decoupling in 2013. ? indicates uncertainty.

Source: Gay et al. (2005); EUROSTAT databank.

RDR support payments (EAGFF-guarantee) monitoring data 2003 (without old commitments)



Source: European Commission, Directorate-General for agriculture, rural development monitoring data system CAP-IDIM, year 2003.