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Strategic Programme

Agricultural GHG mitigation and climate policy in Scotland

Vera Eory, SRUC

4/3/2013

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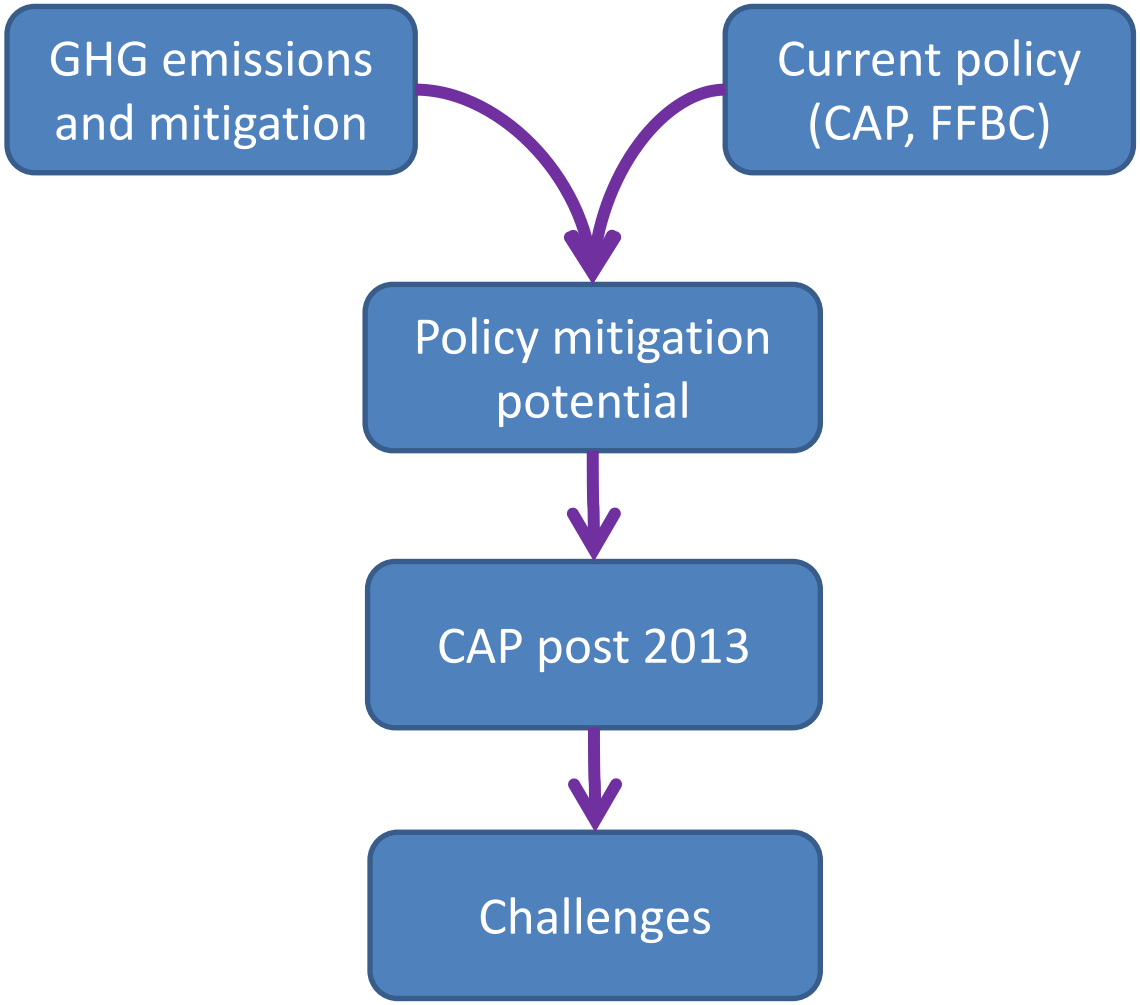
Outline



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Vision

"Scottish agriculture is multifunctional and performs several roles at once; it:

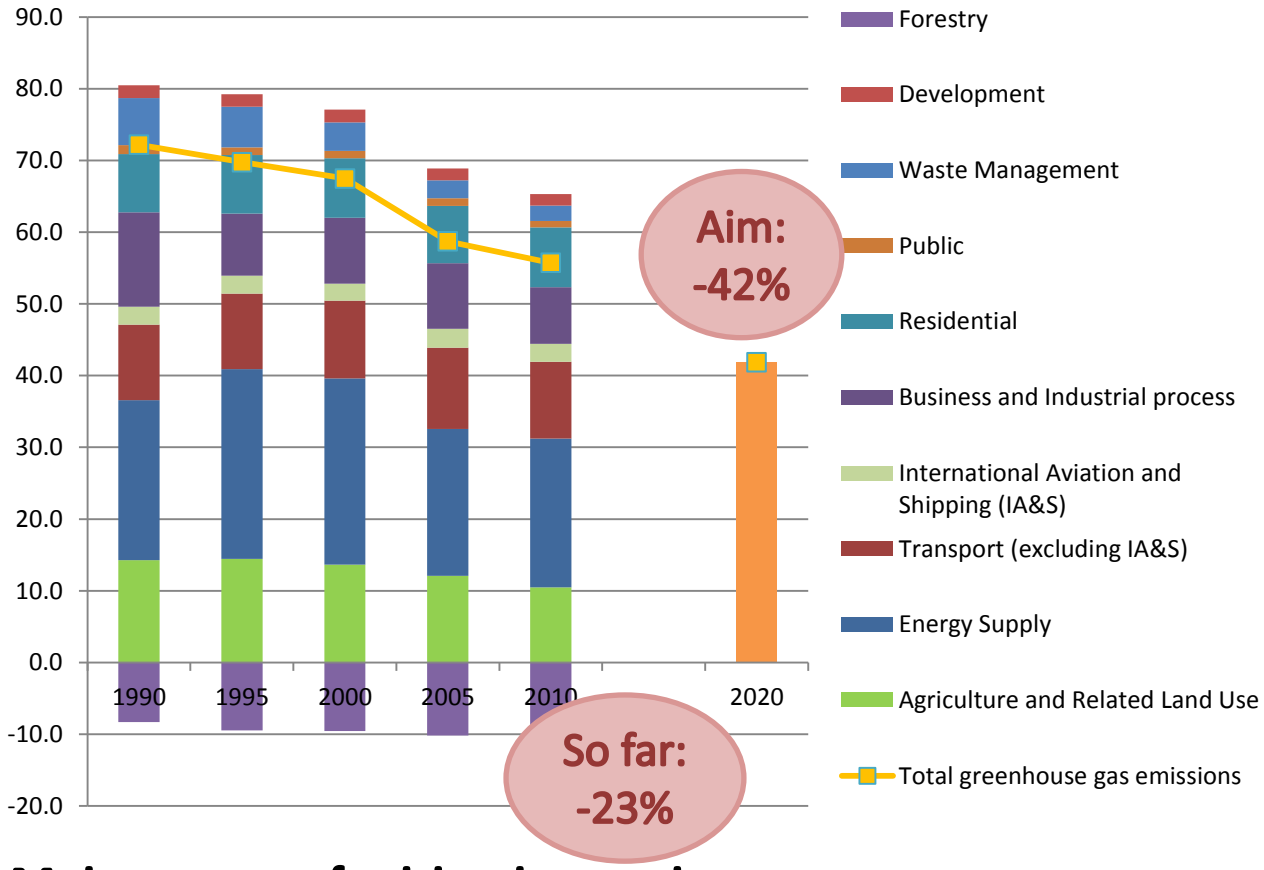
- Produces food
- Helps sustain rural communities
- Protects and sustains landscape and habitats
- ***Helps tackle climate change."***

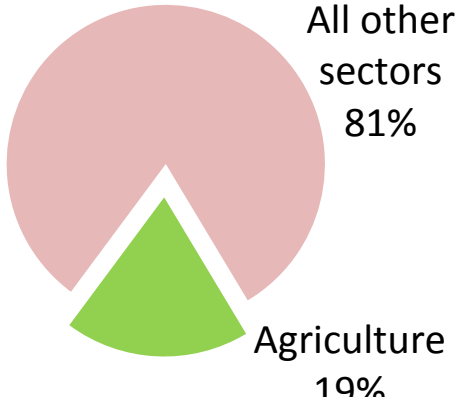
(Pack Inquiry)

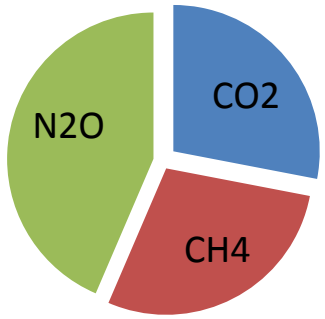
"Therein lies the EU added value of a truly ***common policy*** that makes the most efficient use of limited budgetary resources in maintaining a sustainable agriculture throughout the EU, ***addressing important cross-border issues such as climate change*** and reinforcing solidarity among Member States, while also allowing flexibility in implementation to cater for local needs."

(European Commission proposal on the CAP, 2011)

Emissions







Main groups of mitigation options:

Higher production and N-use efficiency, reducing rumen CH_4 emissions, locking more C into cultivated soils

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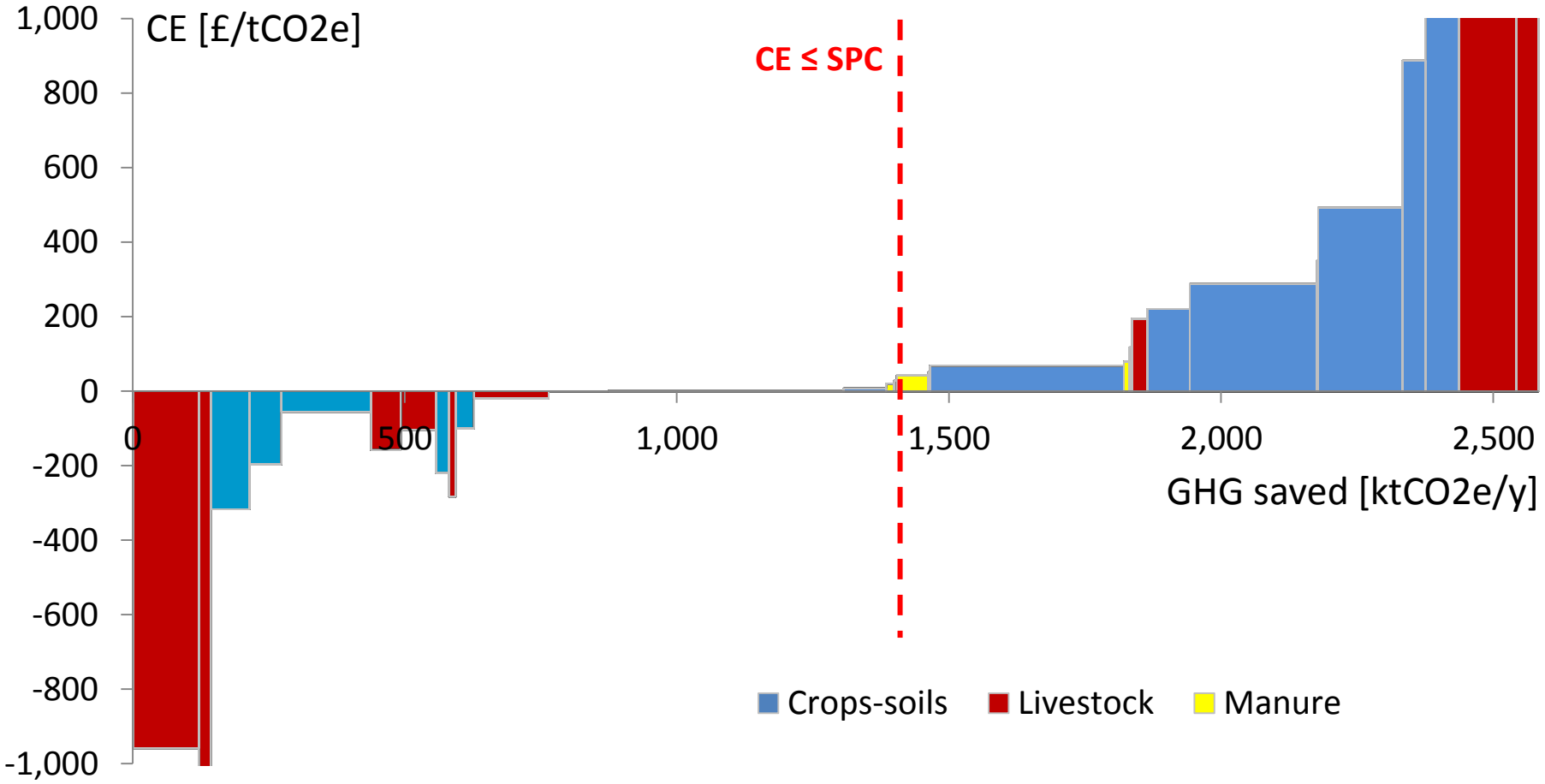
Mitigation

Scotland, 2022, 100% uptake, baseline year 2008



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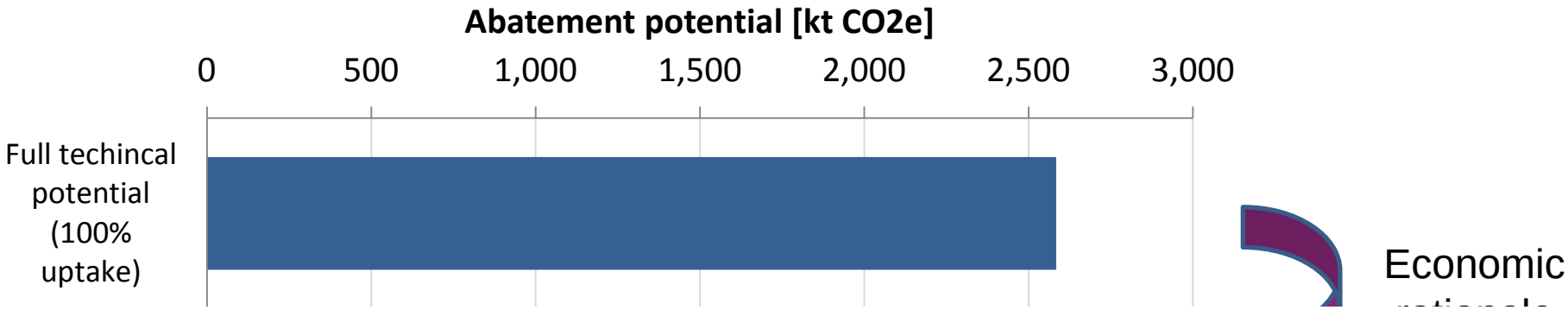
What can we achieve?



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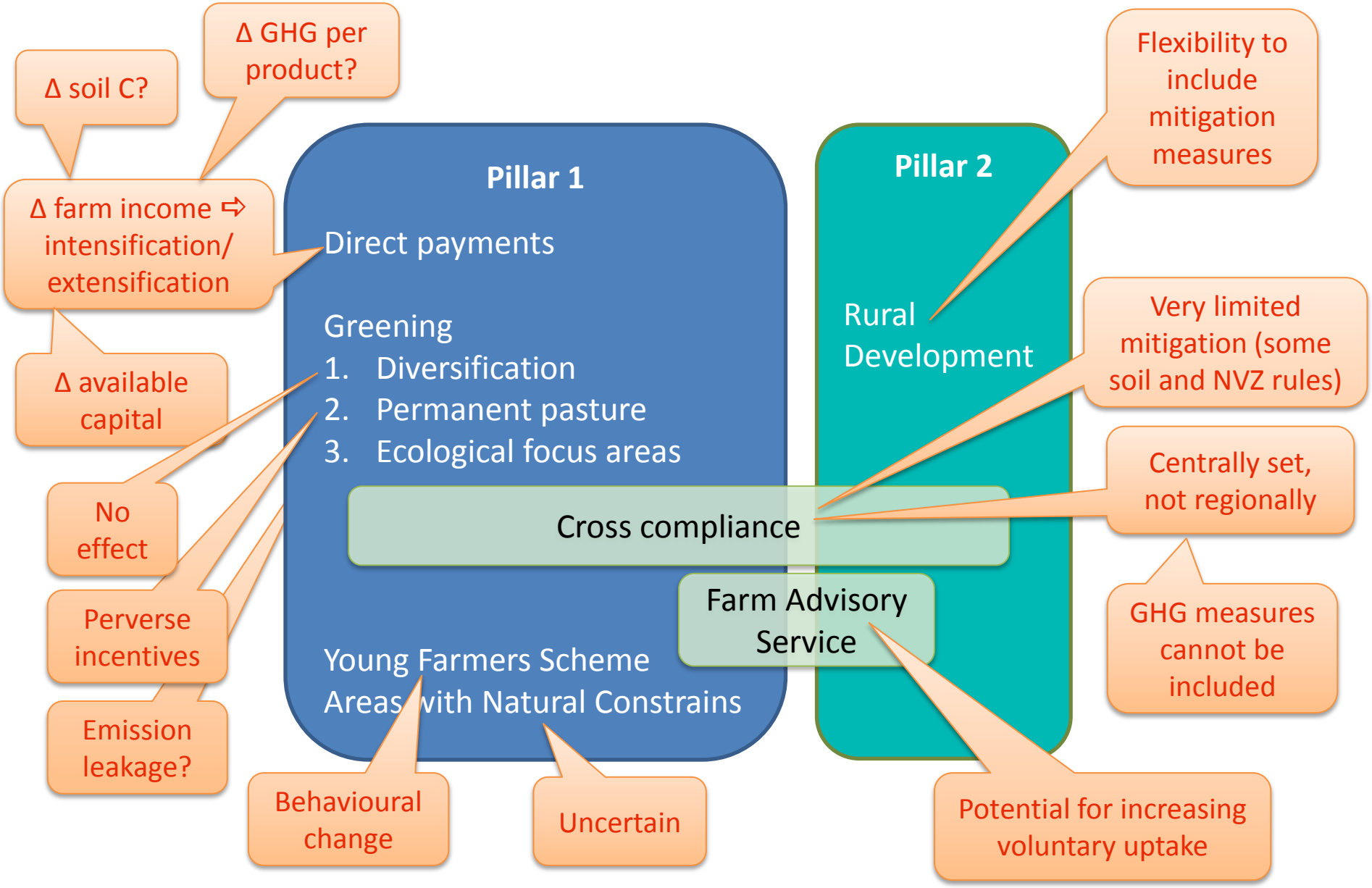
Policy constraints

- Robustness of estimates (incl. negative co-effects)
- Public and farmer acceptability
- Legal status of the measure
- Transaction costs

Available policy instruments

Currently	RPP1	RPP2
FFBC: farm efficiency	FFBC: farm efficiency	FFBC: farm efficiency
Cross Compliance: NVZ – GHG co-benefits	Cross Compliance: **NEW GHG measures**	**High uptake of N-efficiency measures**
SRDP: manure stores and renewables (AD)	SRDP: manure stores and renewables AD	**SRDP: new measures?**

CAP reform and GHG



The challenge: matching policy to aspiration

- FFBC to continue, but increase voluntary uptake
  - Explore attitudes and behavioural change
  - Studies on uptake and 'framing' of messages
  - Studies on different mechanisms of advice (e.g. one-to-one vs. one-to-many advisory approaches)
- Develop other compulsory and voluntary policy instruments
  - Research to understand responses to regulation
- Explore mitigation measures currently not in the policy package
  - Biological fixation, nitrification inhibitors, land drainage

Thank you for your attention!

vera.eory@sruc.ac.uk

Funded by the Scottish Government Rural and Environmental Science and Analytical Services division (RESAS) funding to SRUC and to ClimatexChange.

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Appendix I: Water regulation policy instruments

BUDGES		MIXTURES				NUDGES			
Eliminate Choice	**Restrict Choice**	**Fiscal Incentives**	**Fiscal Disincentives**	**Non-fiscal incentives and disincentives**	**Persuasion**	**Provision of Information**	**Changes to the Physical Environment**	**Changes to Default Policy**	**Use of Socia Norms and Salience**
Non-choice architecture						Choice architecture			
Ban application of chemical fertiliser	Ban over-application of fertilisers	Grants for extra storage capacity	Relate levels of intensity to subsidy payment	Emphasise cost-saving of nitrogen storage	Emphasise human health needs	Include fertiliser application within decision-support systems	Nitrate application levels included in food labelling	Extend NVZ to whole country	Provide advice a catchment leve
	Ban application on land at certain times of the year	Incentives for prescribed changes in machinery	Artificial increase in prices for chemical fertiliser	Emphasise cost-saving from limiting nitrogen application	Emphasise family health needs and access to clean	Provide manuals/Best practice guidance	Change demands of supply chain on quality of product	Increase monitoring of on-farm practices	Establish monit and best-practi farms
	Set quotas for sale of fertiliser to individuals	Grants for housing of cattle			Emphasise impact on livestock health of dirty water	Free advisory visits	Investment in 'Green' technology methods		Include fertilise application rate within annual census data collection
	Set quotas on stocking numbers *(for organic manure)*	Incentives for livestock management (buffer strips, etc.)			Emphasise impact on crop quality of dirty water	Emphasise the cost-saving elements within private consultancy	Modify law to allow other technologies (e.g. nitrification inhibitors)		Report averag fertiliser applicat rates at a catchment leve
	Set quotas farm trading of organic manure	Encourage alternative markets *(anaerobic manure digesters)*							
	Restrictions on spreading technology (wide nozzles)								

1. Barnes, A.P., Willock, J., Toma, L. (2012). Comparing a 'budge' to a 'nudge': farmer responses to voluntary and compulsory compliance in water quality management regimes. *Journal of Rural Studies (forthcoming)*

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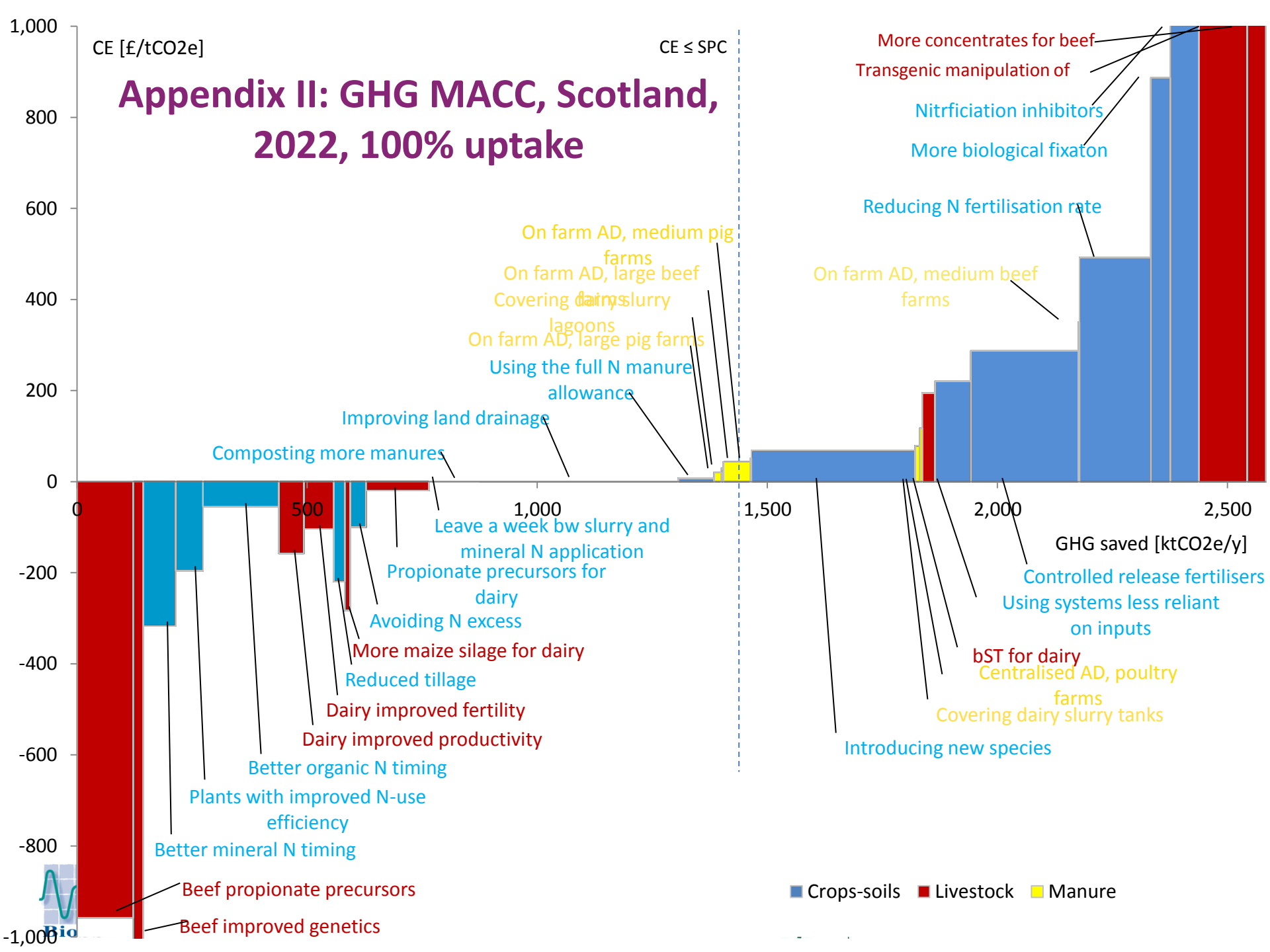
Appendix II: GHG MACC, Scotland, 2022, 100% uptake
CE [£/tCO2e]
CE ≤ SPC
GHG saved [ktCO2e/y]
1,000
800
600
400
200
0
-200
-400
-600
-800
-1,000
0
500
1,000
1,500
2,000
2,500
Beef propionate precursors
Beef improved genetics
Better mineral N timing
Plants with improved N-use efficiency
Better organic N timing
Dairy improved productivity
Dairy improved fertility
Reduced tillage
More maize silage for dairy
Avoiding N excess
Propionate precursors for dairy
Leave a week bw slurry and mineral N application
Composting more manures
Improving land drainage
Using the full N manure allowance
On farm AD, large pig farms
Covering dairy slurry lagoons
On farm AD, large beef farms
On farm AD, medium pig farms
Introducing new species
Covering dairy slurry tanks
Centralised AD, poultry farms
bST for dairy
Using systems less reliant on inputs
Controlled release fertilisers
On farm AD, medium beef farms
Reducing N fertilisation rate
More biological fixaton
Nitrficiation inhibitors
Transgenic manipulation of
More concentrates for beef
Crops-soils
Livestock
Manure