Environmental target of the "Europe 2020" strategy : assessment for Europe

Arnaud Fougeyrollas and Pierre Le Mouël,
ERASME (Paris)

Federal Planning Bureau, 47-49 avenue des Arts, 1000 Brussels

Friday June 11, 2010

Introduction

Assessment for the EU Climate strategy adopted by European Council the 12th of December 2009 in Brussels.

Principal objective:

- Reduce 20% in 2020 EU GHG emissions, compared to 1990 level, if Europe engage alone in mitigation policy
- Reduce 30% emissions in case of an international agreement

Secondary objective:

- 20% share of renewable in final energy consumption in 2020

Outline

1. Methodology
2. The no recycling case
3. The recycling options
4. Concluding remarks

1- Methodology

The EU Climate and Renewable Energies:

- The EU-ETS directive and its four amendments;
- A decision on the effort of EU Member States to reduce their greenhouse gas emissions ('non ETS effort-sharing');
- A directive on the promotion of the use of renewable energy sources ('renewables directive');
- A directive on the geological storage of carbon dioxide ('CCS directive').

1- Methodology

Two types of sectors:

- The sectors participating to the EU Emissions trading Scheme, that are energy intensive sectors.

4	Gas distribution
5	Refined Oil
6	Electricity
8	Ferrous & Non ferrous metals
9	Non metallic mineral products
10	Chemicals
11	Metal products
18	Paper and printing
19	Rubber and Plastic
25	Air transport

I- Methodology

- The sectors that do not participate to the EU Emissions trading Scheme

1	Agriculture
2	Coal & Coke
3	Oil & Gas Extrac.
7	Water Supply
12	Agric. & Industrial Mach.
13	Office Machines
14	Electrical Goods
15	Transport Equipments
16	Food, Drink and Tob.
17	Textile, Clothes & Footwear
20	Other Manufactures
21	Construction
22	Distribution
23	Lodging & Catering
24	Inland Transports
26	Other Transports serv.
27	Communication
28	Bank, Finance & Insurance
29	Other Market Serv.
30	Non Market Serv.

I- Methodology

The GHG emissions reduction targets for 2020 are, compared to 2005 level:

Table 1: ETS and non-ETS GHG emissions reduction compared to 2005 level

	2015	2020	2025
ETS	-11%	-21%	-27.6%
Non-ETS	-4%	-10%	-10%
Total	-6.5%	-14%	-16.4%

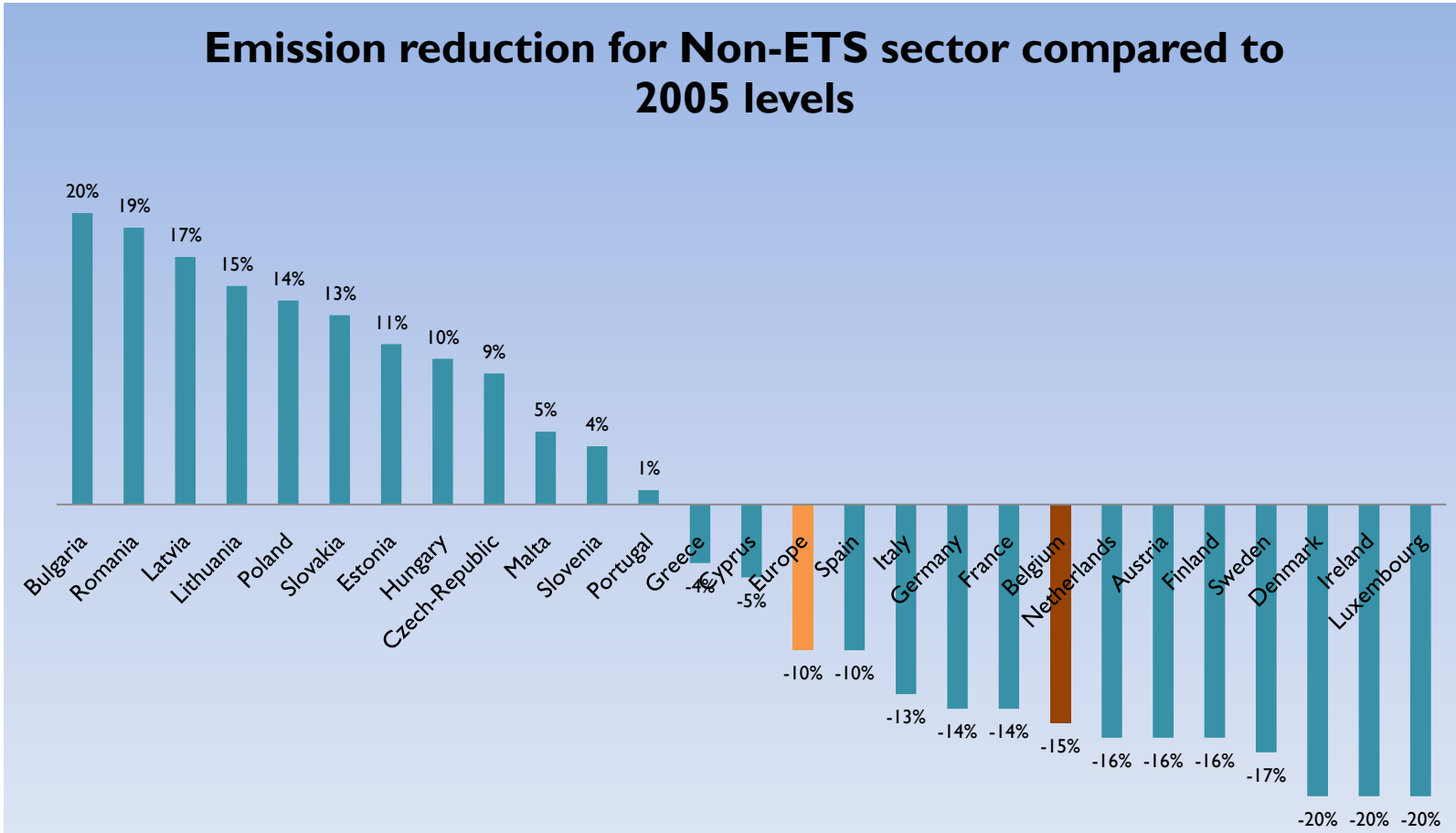
1- Methodology

- EU ETS:
  - ✓ -21% reduction in 2020
    - ✓ Initial quantity of allowances based on average 2008/2012 level. Allowances decrease linearly after 2013.
  - ✓ -27.6% reduction in 2025.
    - ✓ After 2020, allowances are reduce by a linear factor of 1.74%

Table 2: Emission allowances scheme, EU ETS

	2015	2020	2025
Power Sector	full auctioning	Full auctioning	full auctioning
Rest ETS sectors	80% free	30% free	10% free

1- Methodology
Non ETS sectors



1- Methodology

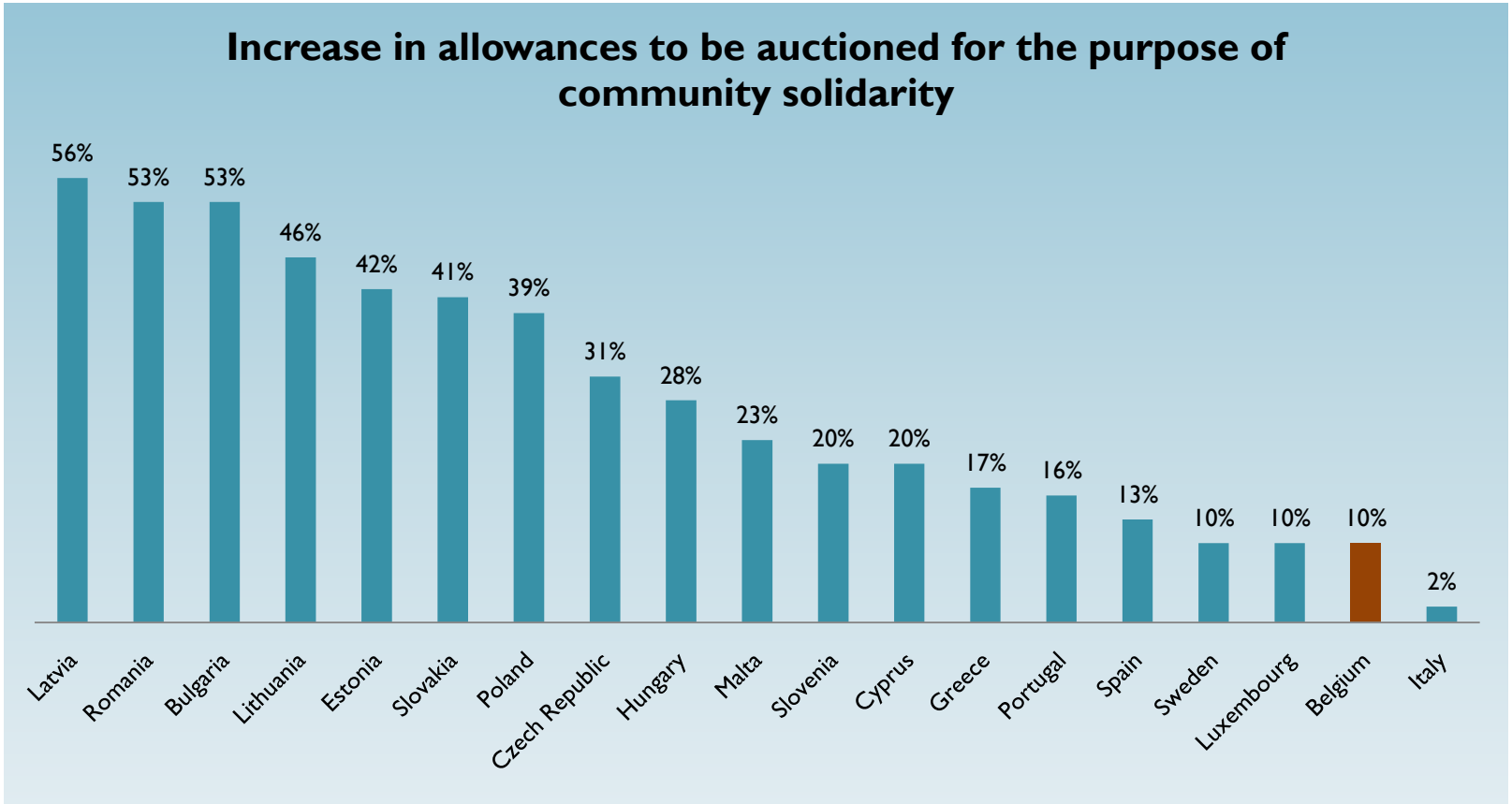
- EU ETS:
  - There is free trade of CO_2 allowances between sectors and countries. Equilibrium carbon price that ensure that the mitigation target is reached.

- Non EU ETS:
  - National target are reached in NEMESIS by the introduction of an endogenous tax on CO_2 emissions. There is one tax by country. Taxation is fully compensated by:
    - Equivalent lump-sums to households
    - Equivalent tax cuts for firms

1- Methodology

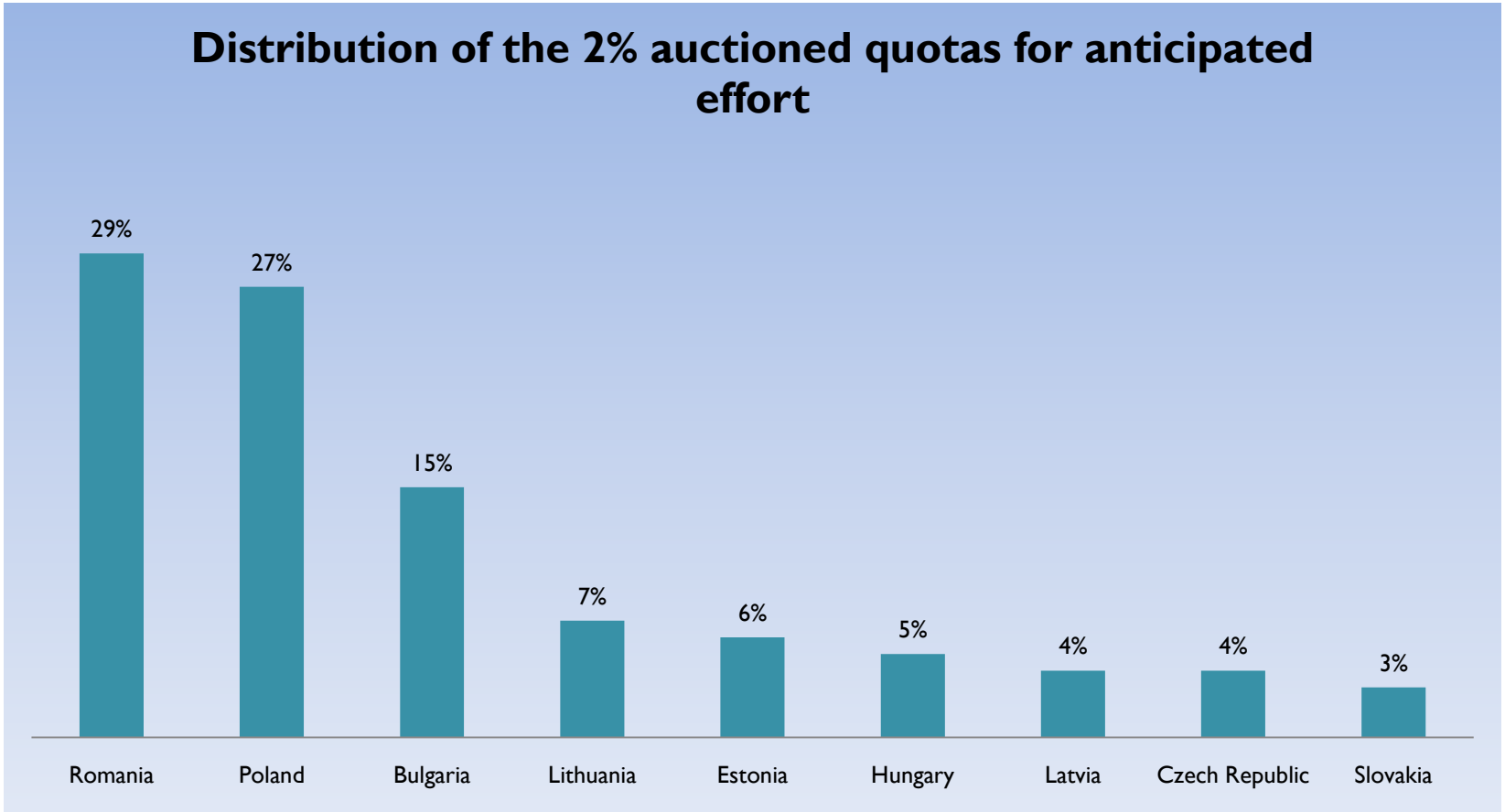
- 10% of the auctioned quotas in EU ETS are redistributed for the purpose of Community Solidarity principle.
- 2% are redistributed for the purpose of Anticipated Mitigation Effort.
- 88% are kept by National governments.

1- Methodology
The emission trading scheme



1- Methodology

The emission trading scheme



I- Methodology

- Joint Implementation/ Clean Development Mechanisms

Table 3: JI/CDM use for EU ETS and non EU ETS (in % of 2005 CO_2 emissions)

	2020	2025
ETS	4.6%	8.2%
Non-ETS	3%	3%
Total	3.7%	10.3%

- *After 2020, the amount of JI/CDM was increased to cover 50% of the additional mitigation efforts*

I- Methodology

- No application of the 'Renewable Directive' aiming at promoting the use of renewable energies

- No application of the 'CCS Directive' that aims at allowing and regulating the capture of CO_2 from industrial installations and its storage.

⇒ *Consequently, the recommendation of investing at least 50% of the revenues derived from auctioning in strategic sectors for climate change (such as specific R&D, renewable energies, forestry and land-use, energy savings in buildings, etc.) was not retained in the recycling options for the ETS auctioning revenues.*

2- The 'no-recycling' case

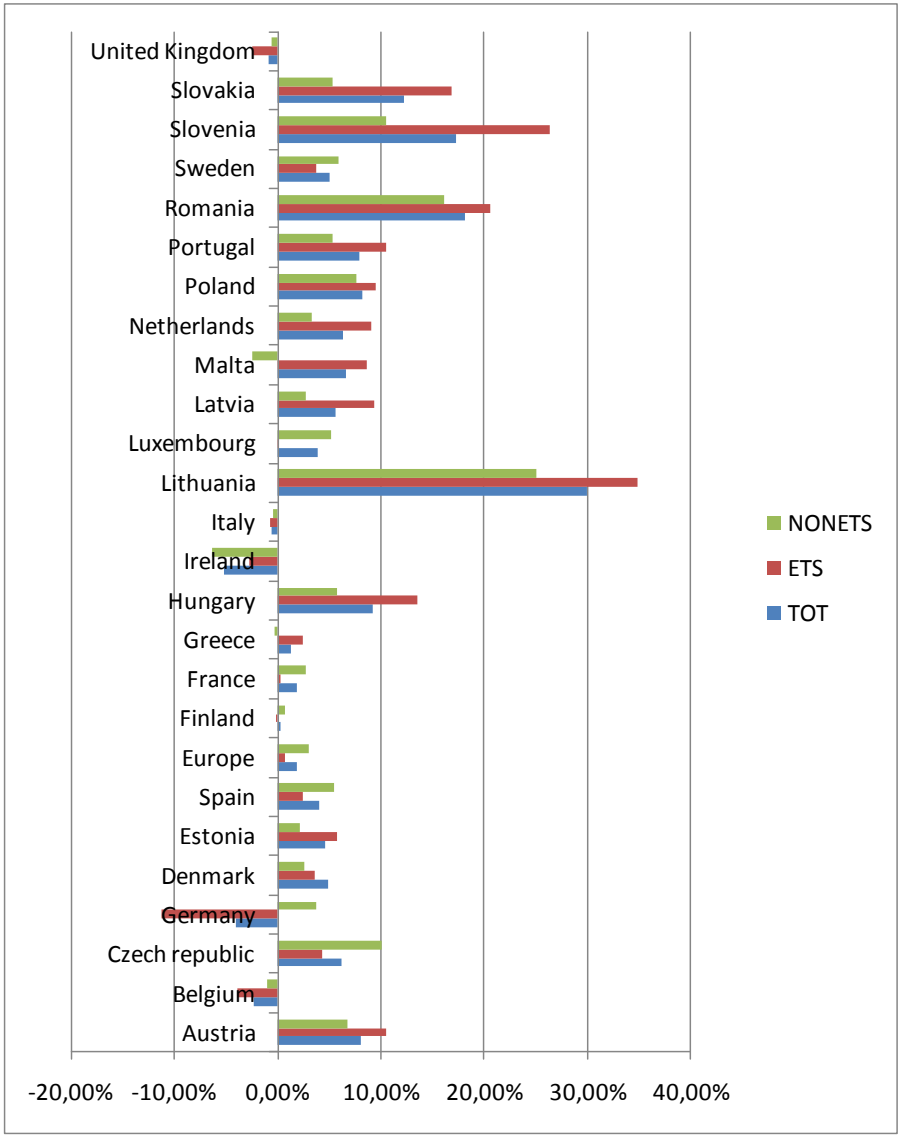
- In this first scenario, there is no recycling of auctioning revenues that are kept by National governments to reduce public deficits and debts.

- This simulation will allow assessing for the 'direct implementation costs' of the EU climate and Energy package from 2013. Costs of EU mitigation strategy arise from:

  - The carbon price that support companies belonging to the EU ETS sectors.
  - The adaptation costs that incur the non EU ETS sectors.

2- The 'no-recycling' case

GHG's emissions evolutions, 2005-2025 (baseline scenario)



2- The 'no-recycling' case

The No-recycling case

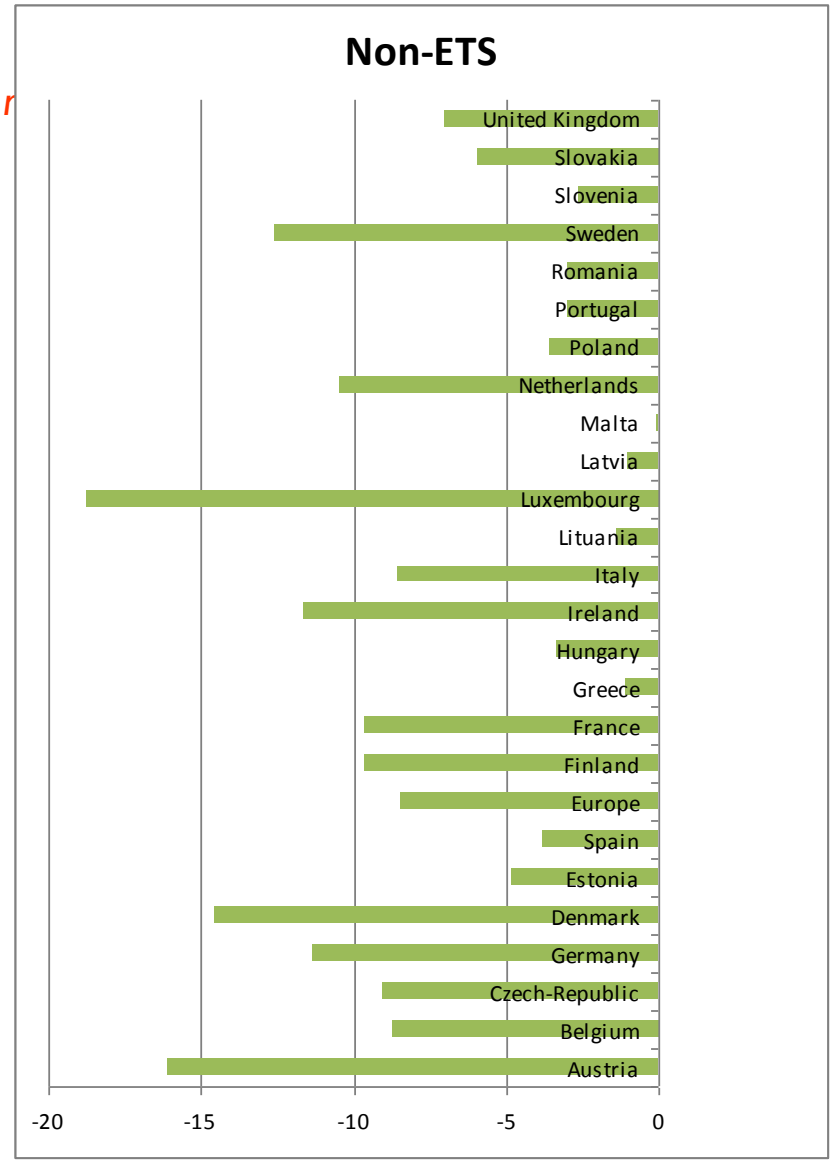
Quota price 37.08

taxation of NON ETS sectors per member state

Austria	28.12	**Italy**	18.23
Belgium	18.68	**Lithuania**	-
Czech-Republic	-	**Luxembourg**	53.62
Germany	24.88	**Latvia**	-
Denmark	37.52	**Matla**	-
Estonia	-	**Netherlands**	36.53
Spain	14.12	**Poland**	-
Finland	6.06	**Portugal**	-
France	24.38	**Romania**	-
Greece	-	**Sweden**	21.69
Hungary	-	**Slovenia**	-
Ireland	38.64	**Slovakia**	-
		United kingdom	44.43

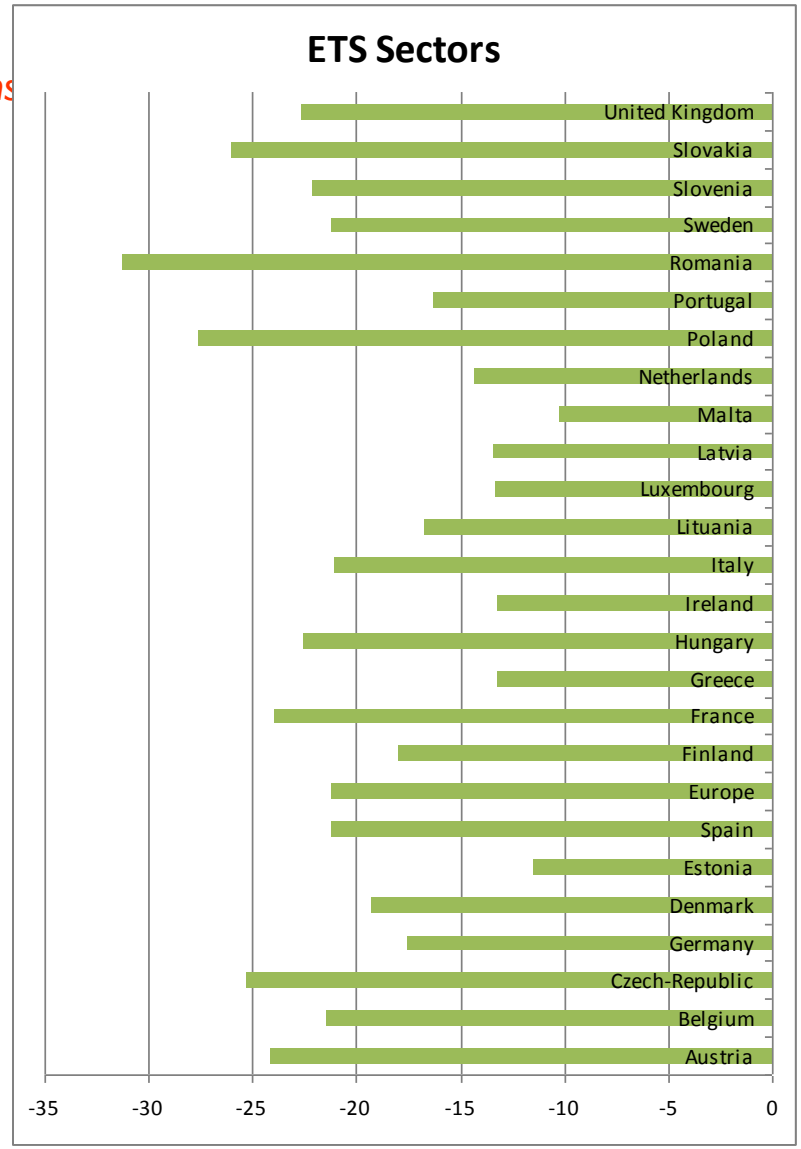
2- The 'no-recycling' case

Emissions r

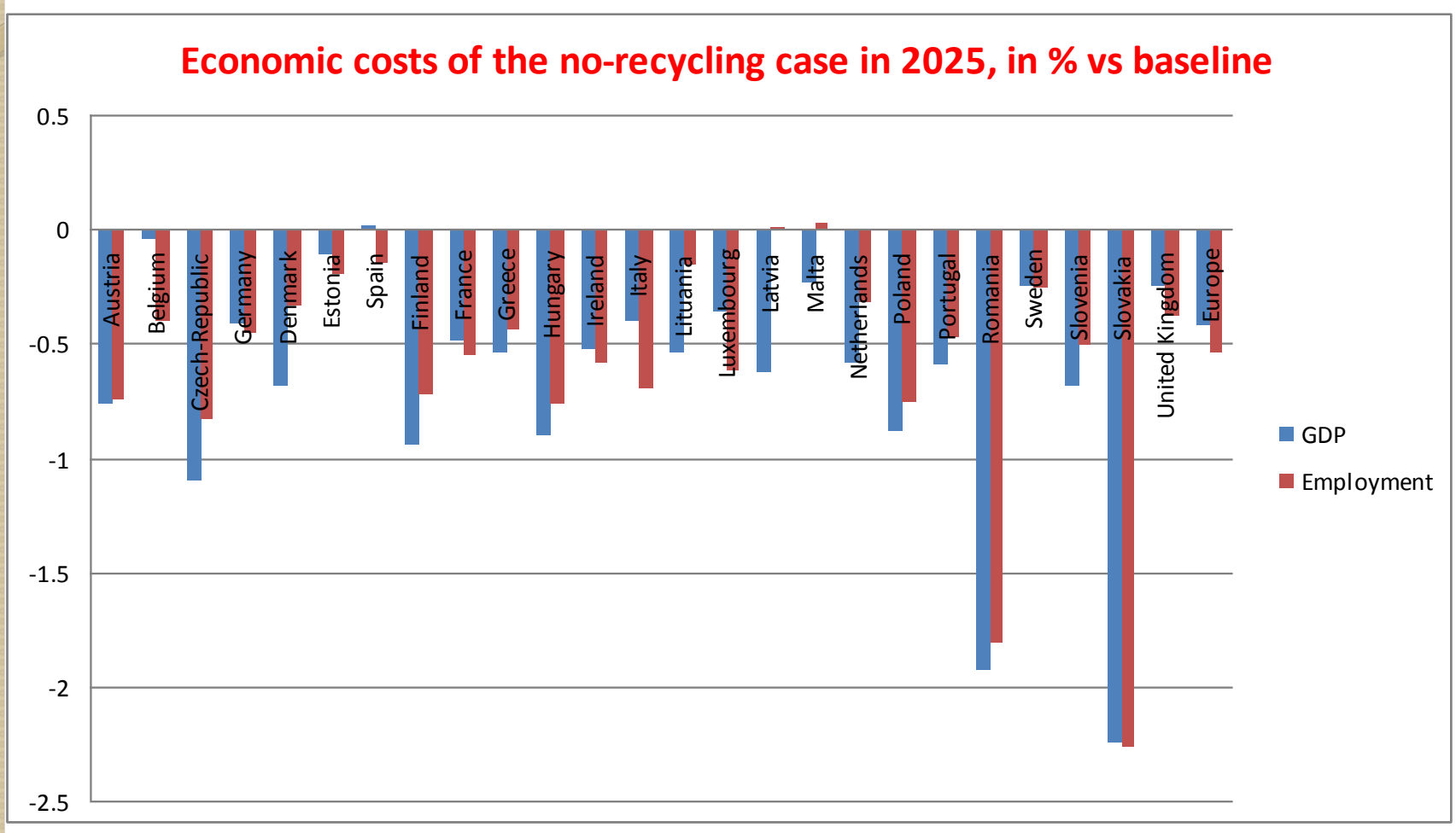


2- The 'no-recycling' case

Emissions



2- The 'no-recycling' case



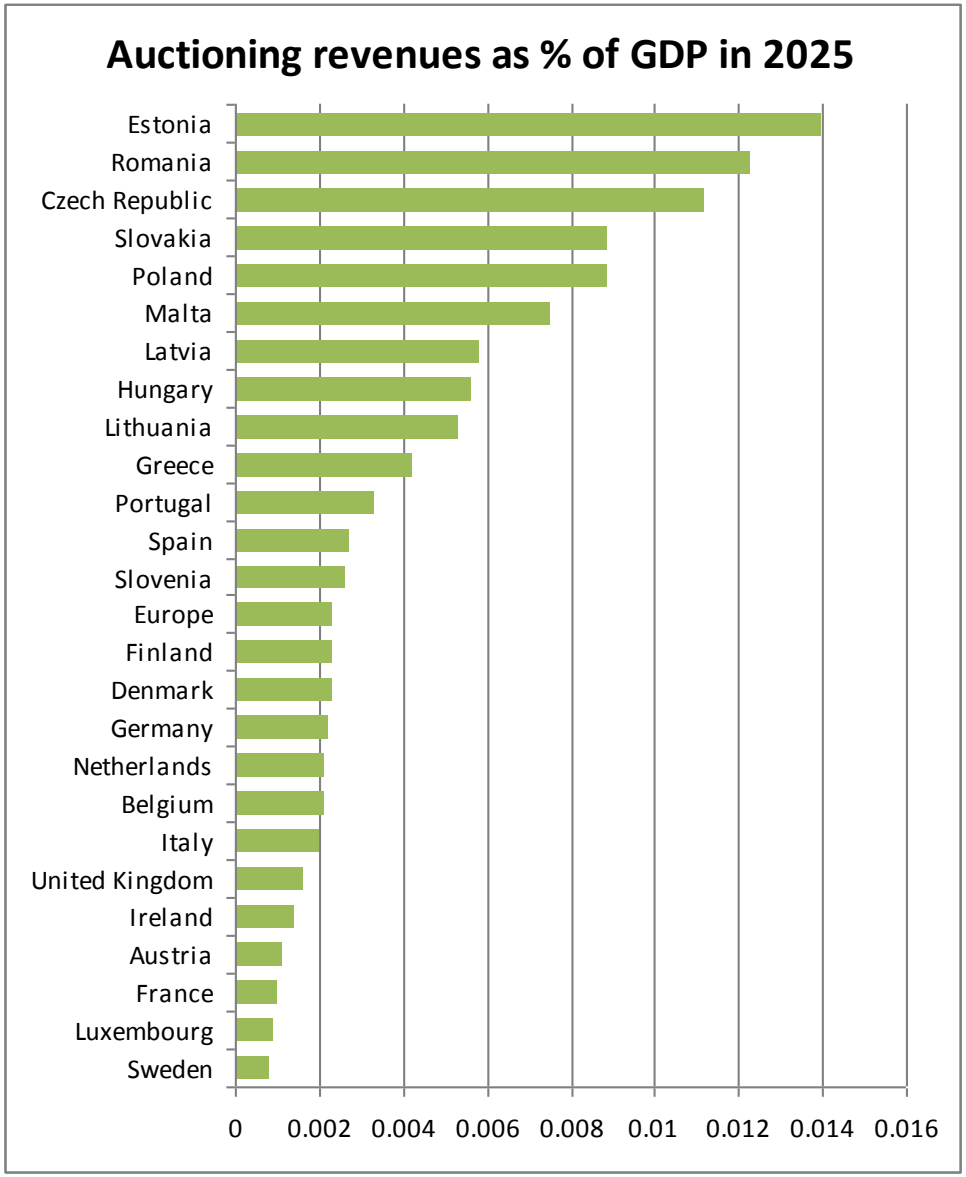
3- The recycling options

- **Auctioning revenues** are generally very important in NMS that:

  - Are the principal beneficiaries of the Solidarity Principal.
  - And that are more carbon intensive that EU-15 countries.

  $\Rightarrow$ *In the countries where recycling revenues are low in % of GDP, the different recycling options will not change much the situation in terms of economic costs, compared to the no-recycling case.*

3- The recycling options



3- The recycling options

- 6 recycling options were envisaged:

Use of auctioning revenues for:
ESC. Reduction of employers' social contributions
HDT. Reduction of Households' direct taxation
FDT. Reduction of Firms' direct taxation
VAT. Reduction of VAT rate on all products (except energy)
EESC: Combined reduction of employers' and of employees' social contributions
ESC+RD: Combined reduction of employers' social contributions and subsidies to R&D

- In RD+ESC, R&D subsidies are determined first and limited up to 33% of private R&D expenditures, the remaining of auctioning revenues is then used to reduce labour costs:
  - In most EU15 countries, with high levels of private R&D expenditures and low levels of revenues to recycle in % of GDP, all the subsidies go to R&D.
  - On the contrary, in most new member States, with generally very low R&D intensity of GDP, the major part of the subsidies goes reducing labour costs.

3- The recycling options

ESC+RD: Share of auctioned revenues allocated to R&D subsidies in 2025

Austria	100.0%	**Italy**	100.0%
Belgium	100.0%	**Lithuania**	5.1%
Czech-Republic	20.8%	**Luxembourg**	100.0%
Germany	100.0%	**Latvia**	4.9%
Denmark	100.0%	**Malta**	94.8%
Estonia	7.8%	**Netherlands**	100.0%
Spain	97.4%	**Poland**	4.2%
Finland	100.0%	**Portugal**	63.5%
France	100.0%	**Romania**	2.2%
Greece	8.3%	**Sweden**	100.0%
Hungary	34.3%	**Slovenia**	100.0%
Ireland	100.0%	**Slovakia**	5.4%
		United kingdom	100.0%

3- The recycling options

- Results for GDP and Employment, EU-27

Results for EU-27 in 2025, % dev. from baseline

	NR	ESC	HDT	FDT	VAT	EESC	RD+ESC
GDP	-0.42	-0.03	0.02	-0.13	-0.02	0.00	0.18
Employment	-0.54	0.15	-0.11	-0.28	-0.13	0.02	-0.09

- The recycling allows cancelling the GDP cost of 0.42% where there is no-recycling for most options. It remains a GDP loss of -0.13% for FDT, and we have on the contrary a gain of +0.18% for ESC+RD.

- ESC and EESC are the only two options that allow compensating fully the 0.53% jobs destructions that occur when there is no recycling (NR).

3- The recycling options

- Results for EU-15 countries: GDP

Results for EU-15 in 2025, % dev. from baseline

	NR	ESC	HDT	FDT	VAT	EESC	RD+ESC
Austria	-0.76	-0.60	-0.57	-0.65	-0.54	-0.58	-0.37
Belgium	-0.04	0.22	0.27	0.14	0.31	0.25	0.37
Germany	-0.41	-0.13	-0.13	-0.22	-0.07	-0.13	0.10
Denmark	-0.69	-0.34	-0.41	-0.55	-0.24	-0.37	-0.51
Spain	0.01	0.48	0.58	0.29	0.59	0.53	0.75
Finland	-0.95	-0.55	-0.60	-0.68	-0.57	-0.58	-0.39
France	-0.49	-0.33	-0.28	-0.38	-0.26	-0.30	-0.37
Greece	-0.54	-0.06	0.08	-0.28	-0.11	0.01	0.32
Ireland	-0.52	-0.29	-0.38	-0.37	-0.33	-0.34	-0.10
Italy	-0.41	-0.02	-0.11	-0.15	-0.08	-0.06	0.39
Luxembourg	-0.36	-0.30	-0.14	-0.38	-0.21	-0.21	-0.27
Netherlands	-0.58	-0.41	-0.38	-0.40	-0.31	-0.39	-0.12
Portugal	-0.59	-0.27	0.00	-0.29	-0.01	-0.13	-0.27
Sweden	-0.25	-0.11	-0.05	-0.17	-0.04	-0.08	-0.15
United Kingdom	-0.25	0.08	0.06	0.07	0.18	0.07	0.48

3- The recycling options

- Results for EU-15 countries: Employment

Results for EU-15 in 2025, % dev. from baseline

	NR	ESC	HDT	FDT	VAT	EESC	RD+ESC
Austria	-0.74	-0.58	-0.64	-0.69	-0.58	-0.61	-0.66
Belgium	-0.40	-0.12	-0.22	-0.32	-0.12	-0.17	-0.38
Germany	-0.46	-0.19	-0.31	-0.35	-0.20	-0.25	-0.33
Denmark	-0.33	-0.12	-0.21	-0.28	-0.02	-0.17	-0.38
Spain	-0.15	0.32	0.23	-0.02	0.32	0.27	-0.12
Finland	-0.72	-0.36	-0.53	-0.61	-0.43	-0.45	-0.64
France	-0.55	-0.39	-0.42	-0.49	-0.37	-0.40	-0.58
Greece	-0.44	0.60	0.02	-0.25	-0.02	0.30	0.68
Ireland	-0.59	-0.35	-0.51	-0.50	-0.43	-0.43	-0.50
Italy	-0.69	-0.25	-0.49	-0.53	-0.40	-0.37	-0.49
Luxembourg	-0.62	-0.55	-0.53	-0.65	-0.51	-0.54	-0.93
Netherlands	-0.31	-0.11	-0.20	-0.22	-0.09	-0.16	-0.19
Portugal	-0.47	-0.02	-0.14	-0.33	-0.04	-0.08	-0.56
Sweden	-0.25	-0.13	-0.15	-0.22	-0.10	-0.14	-0.32
United Kingdom	-0.37	0.01	-0.20	-0.19	-0.01	-0.10	-0.20

3- The recycling options

- Results for NMS: GDP

Results for NMS in 2025, % dev. from baseline

	NR	ESC	HDT	FDT	VAT	EESC	RD+ESC
Czech-Republic	-1.10	1.18	0.44	0.50	0.53	0.82	1.46
Estonia	-0.11	1.63	0.12	0.98	1.50	0.88	1.40
Hungary	-0.90	-0.13	-0.47	-0.39	-0.32	-0.30	-0.01
Lituania	-0.54	0.75	-0.24	0.30	0.61	0.25	0.84
Latvia	-0.63	-0.22	-0.55	-0.36	-0.20	-0.38	-0.32
Malta	-0.23	0.46	-0.15	0.23	0.47	0.15	0.04
Poland	-0.88	0.51	2.97	0.18	0.41	1.78	0.50
Romania	-1.93	1.91	0.84	0.87	-0.60	1.35	1.81
Slovenia	-0.69	-0.22	-0.48	-0.37	-0.26	-0.35	-0.16
Slovakia	-2.25	-0.88	-1.75	-1.31	-0.97	-1.31	-0.93

3- The recycling options

- Results for NMS: Employment

Results for NMS in 2025, % dev. from baseline

	NR	ESC	HDT	FDT	VAT	EESC	RD+ESC
Czech-Republic	-0.83	1.29	-0.04	0.01	0.51	0.62	0.84
Estonia	-0.19	1.84	-0.04	0.53	1.53	0.90	1.28
Hungary	-0.77	0.14	-0.43	-0.44	-0.18	-0.14	-0.12
Lituania	-0.15	0.86	-0.04	0.16	0.63	0.40	0.75
Latvia	0.01	0.39	0.04	0.12	0.37	0.22	0.15
Malta	0.03	0.34	0.03	0.05	0.29	0.19	0.23
Poland	-0.76	0.60	1.41	-0.25	0.39	1.04	0.25
Romania	-1.82	2.47	0.61	0.34	-0.52	1.52	2.25
Slovenia	-0.51	-0.08	-0.38	-0.34	-0.15	-0.23	-0.44
Slovakia	-2.27	-0.89	-1.98	-1.77	-1.09	-1.43	-1.27

4- Concluding remarks

- The economic costs of reaching the -20% target if Europe engages alone to reduce its GHG emissions could be considerably reduced if auctioning revenues from EU-ETS are recycled in the economy.
- For NMS, highly carbon intensive, the application of the Solidarity Principal and the increased auctioning allowances for anticipated reduction effort may actually help compensating importantly the economic costs, with also net economic gains in countries like Estonia, Romania and Poland, that beneficiate the more from these financial compensations.

4- Concluding remarks

- But there are still net losers as Hungary, Slovenia, Slovakia, and, to a lesser extent, Latvia.

  ⇒ Additional financial compensations may be necessary for countries with adaptation costs

  ⇒ Belgium stays close from EU average in most scenarios