



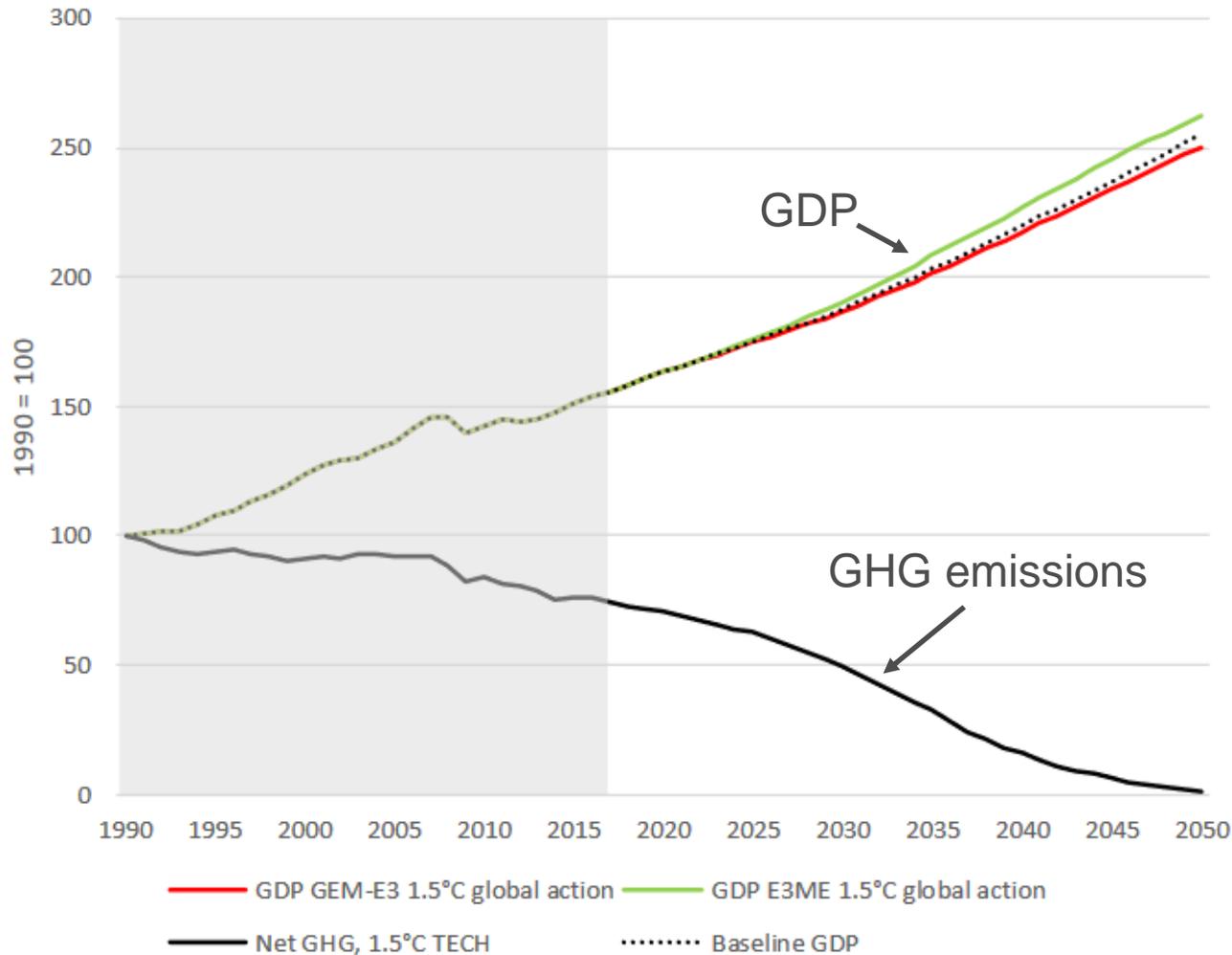
Modelling the economics of mitigation

Results from JRC-GEM-E3

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ECFIN Webinar on the Economics of Climate Change, 25 March 2021

Climate neutrality is affordable



EU can continue the path of further decoupling emissions and economic growth.

GDP loss in the EU in 2050:

- 0.3 to 1.3% below baseline

(without incorporating co-benefits, reduced climate impacts)



Different sectors are affected differently

Change in output (2050)

	Fragmented action	Global action
Fossil-fuels industries¹	-54.5	-40.6
Electricity supply²	23.8	29.7
Ferrous metals	-10.1	5.5
Non-ferrous metals	-1.2	6.1
Chemical Products	-2.7	-1.1
Paper products	1.1	6.8
Non-metallic minerals	-3.5	1.7
Electric Goods	-2.7	-3.4
Transport equipment	0.0	-3.9
Construction	3.3	2.5
Transport	-5.6	-8.7
Market Services	-0.7	-2.9

Transition manifests in changes of output levels in different sectors in 2050:

- Fossil sectors most adversely affected.
- More demand for (clean) electricity
- Some sectors can gain (e.g. construction)
- Impact on industry depends on ambition on the rest of the world

Table adapted from:
In-depth analysis in support of
COM(2018) 773

Concentrated Impacts

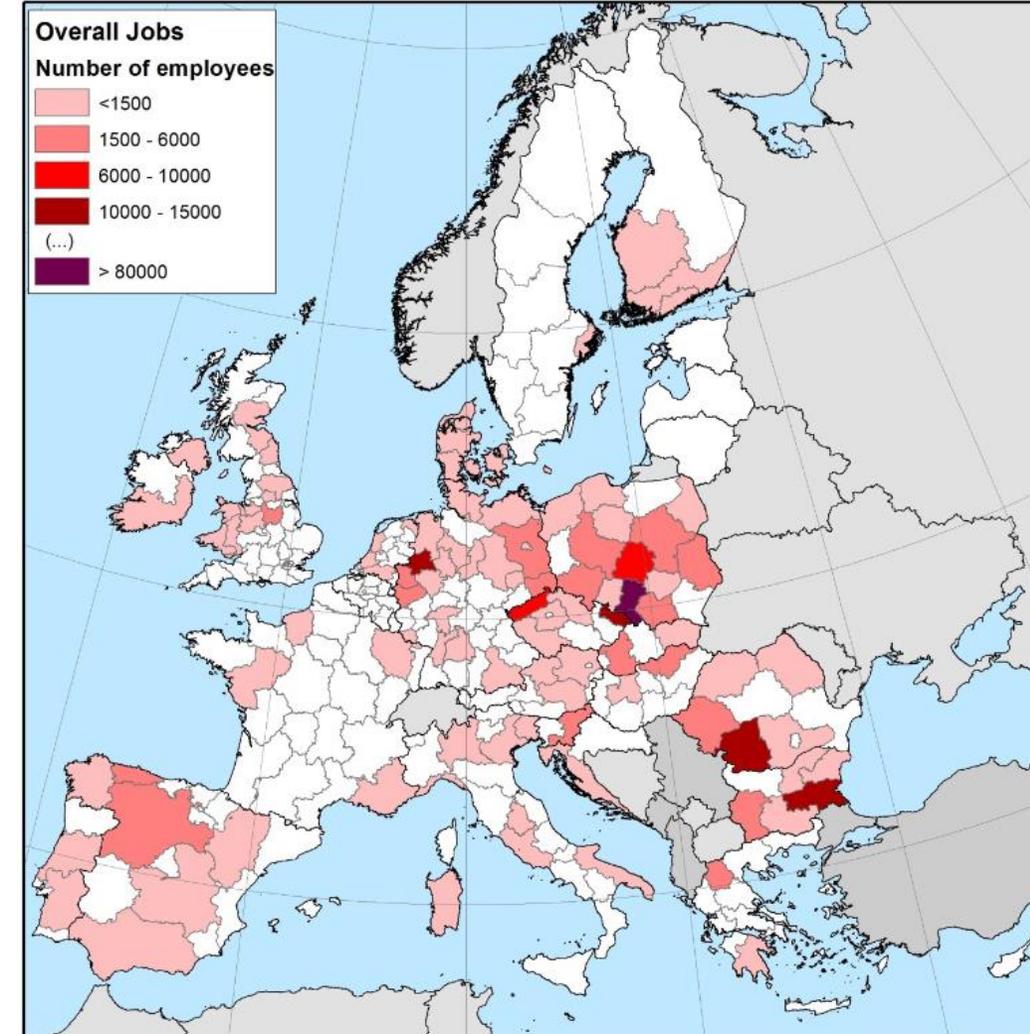
Sector	Share of total jobs in 2015	Range of change in jobs by 2050 compared to baseline
Construction		↗
Power generation		↗
Agriculture		↗
Services		⇒
Manufacturing (energy-int)		⇒
Other manufacturing		⇒
Mining & extraction		↘

Employment impacts concentrate

- in some sectors,
 - and geographically
- which has implications for a just transition.

Table adapted from:
In-depth analysis in support of
COM(2018) 773

Figure 16. Overall number of jobs in coal power plants and coal mines in NUTS2 regions



Alaves Dias et al. (2018), EU coal regions: opportunities and challenges ahead, JRC112593

Increased 2030 ambition towards climate neutrality

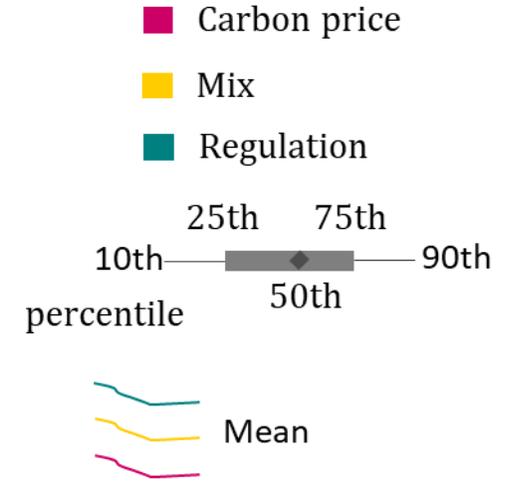
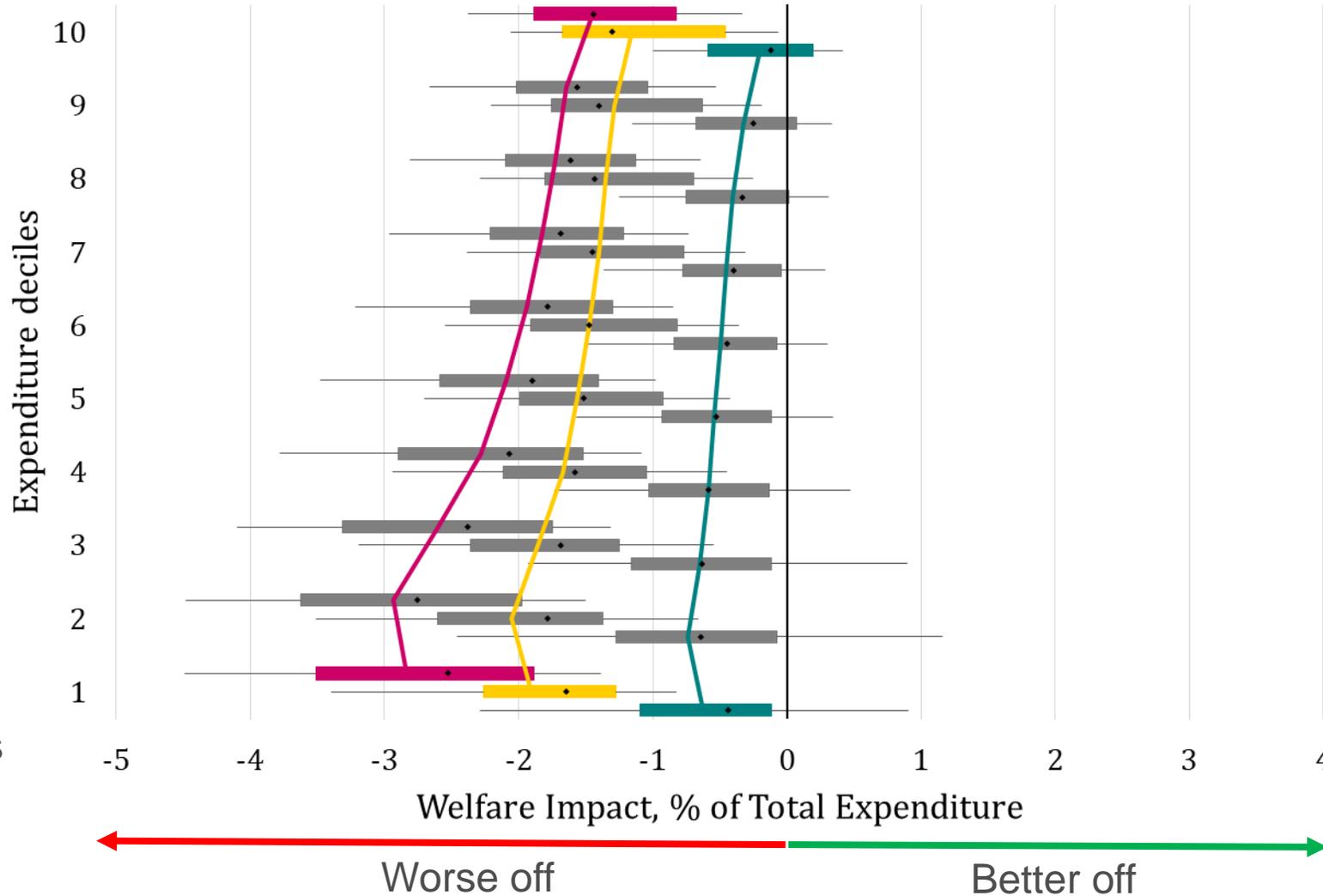
	- Tax recycling - Imperfect labour market - Free allocation ETS - Market share maximisation ETS			- Lump sum transfers - No labour market imperfections - Free allocation ETS - Profit maximisation ETS		
	REG	MIX	CPRICE	REG	MIX	CPRICE
Real GDP	-0.30	-0.27	-0.24	-0.23	-0.25	-0.25
Employment	-0.09	0.06	0.15	0.00	0.00	0.00
“Fuels and power” prices	-1.62	4.55	9.96	-1.92	3.47	8.07
“Housing and water charges” prices	2.67	1.77	0.14	2.68	1.82	0.19

Table adapted from: 2030 Climate Target Plan Impact Assessment, SWD(2020) 176

Effects on different social groups

Rich households

Poor households

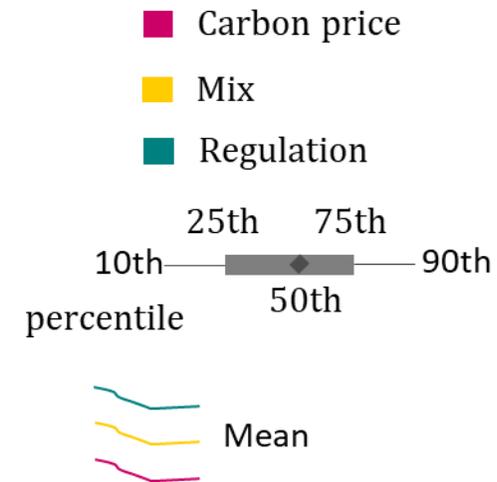
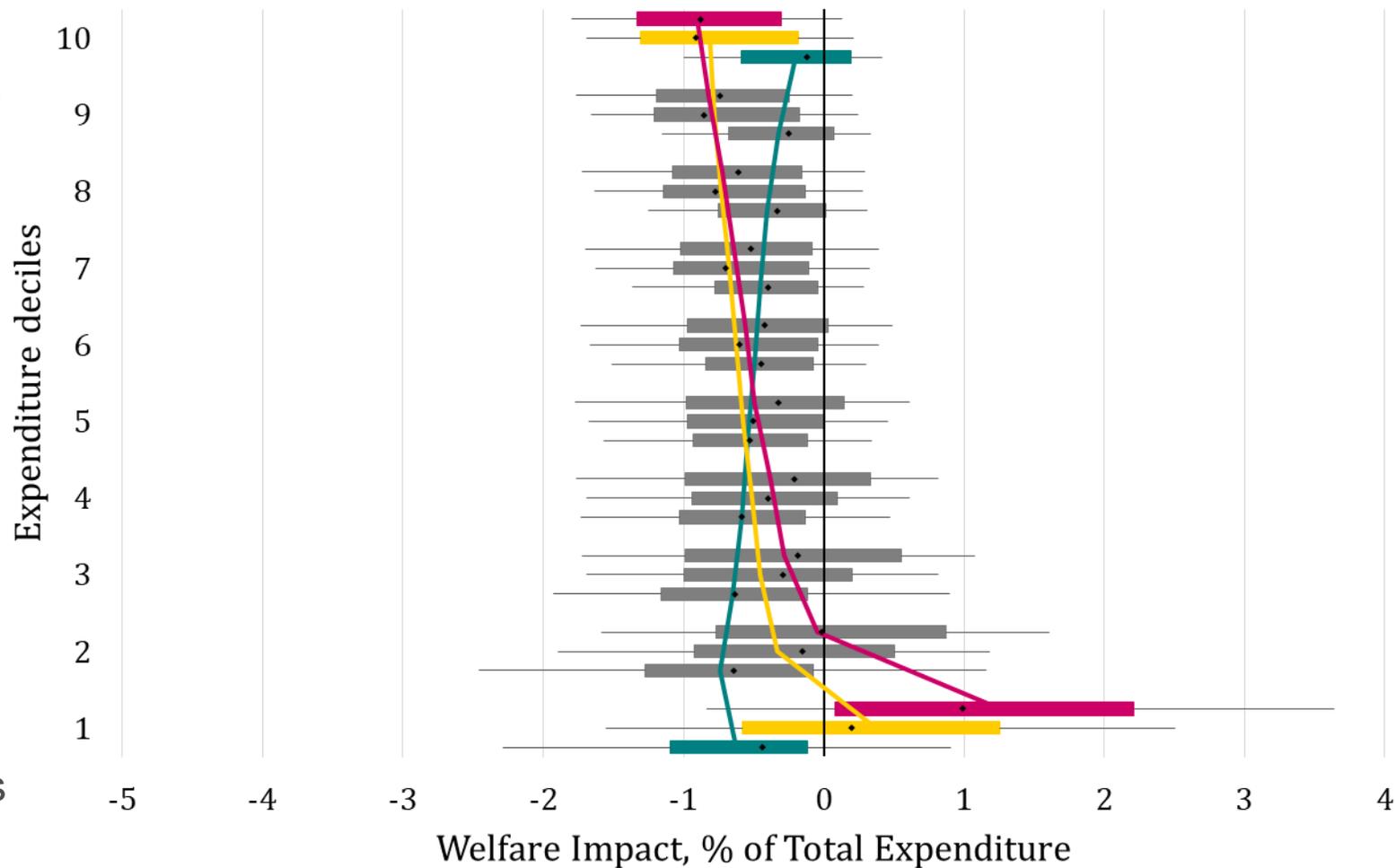


Carbon pricing is regressive in the EU and leads to wider variations within income groups.

Effects on different social groups

Rich households

Poor households



Carbon pricing is regressive in the EU and leads to wider variations within income groups. Carbon revenues can offset regressive outcome.

Conclusions

Climate neutrality will require substantial changes in all sectors, but this will not impede economic growth.

However, consequences of transition are concentrated in certain sectors, geographically, and for groups of the population which needs to be addressed for a fair transition.

Carbon pricing can lead to regressive outcomes and widens the range of impacts within income groups relative to regulatory measures.

Revenue from carbon pricing can help to reduce labour taxes to foster employment and/or reverse regressive effects.

Thank you



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