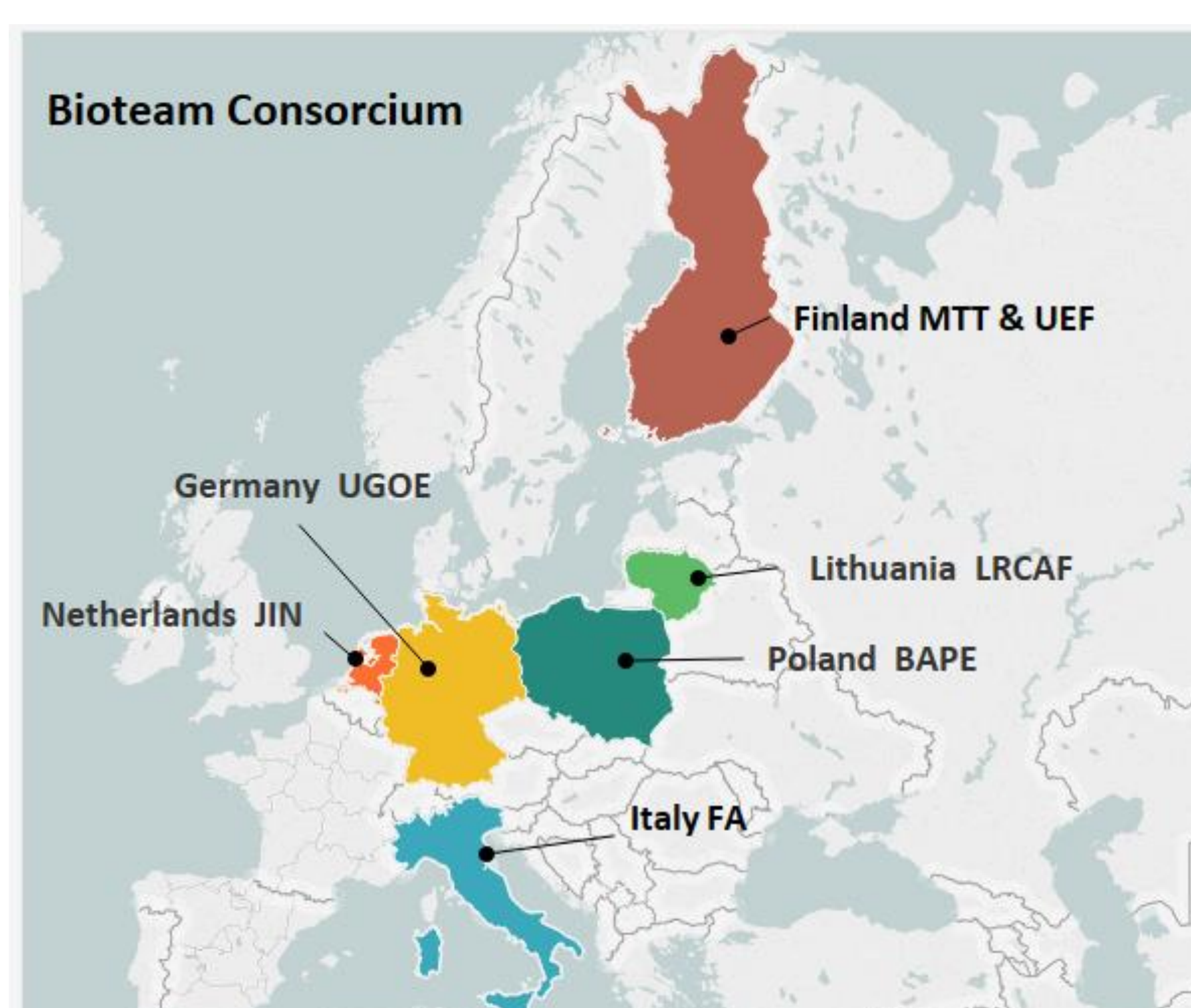


Role of national fossil fuel comparators in the nominal emission savings - Bioenergy under the RED I

Six EU Member States are involved in the EU funded IEE Bioteam project. Finland, Germany, Poland have abundant biomass resources, directly sourced from their forest, next to agricultural lands. Italy sources relatively more from agricultural lands. Lithuania is an efficient user even on agricultural residues. The Netherlands sources 'indirectly', as most residues are collected after processing in its agricultural product sector. The 'direct sourcing' potential from Dutch forests or farmer's lands is small.



Italy and Finland have already exceeded their 2020 plans for bioenergy. Germany is the leading country with 18.8 Mtoe in 2017. Bioenergy deployment in Bioteam countries is dominated by solid biomass with large shares (> 90%) in Lithuania and Finland.

Via the contribution of Germany, Italy, Lithuania, Netherlands, Poland and Finland (as reported in their biennial progress reports under RED I) 350 Mt CO₂-eq of GHG emission was saved in 2016 through the use of renewables, equal with nearly 50% of overall GHG emissions saved in EU using renewables.

Methodology

Fossil fuels comparators: (i) EU default comparator; (ii) National comparator; (ii) Project specific comparator

$$\text{Net GHG impact} = \text{Pathway GHG emissions} - \text{GHG emissions of avoided fossil energy (comparator)}$$

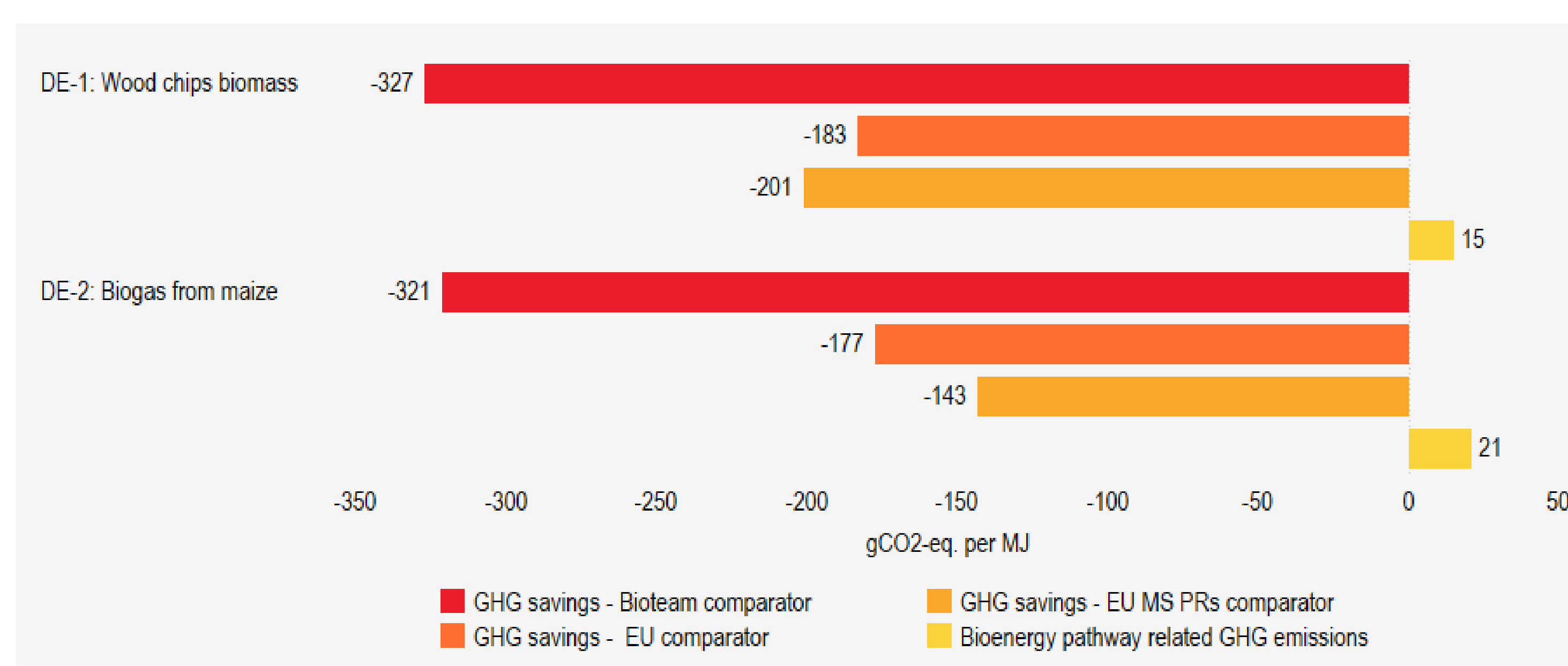
	Electricity		Heating/Cooling		Transport	
	COM (2010) 11	MS Method	COM (2010) 11	MS Method	Annex V RED	MS Method
DE		X		X		X
IT		X		X	X	
LT						
NL		X		X		X
PL	X		X		X	
FI		X		X	X	

	Fossil comparator Annex V RED I & COM (2010) 11 (Mt CO ₂ eq. per MJ)	
	Liquids biomass	Solid and gaseous biomass
Transport	83.8	-
Electricity	91	198
Heating	77	87
Cogeneration	85	-
Cooling	-	57

Electricity sector

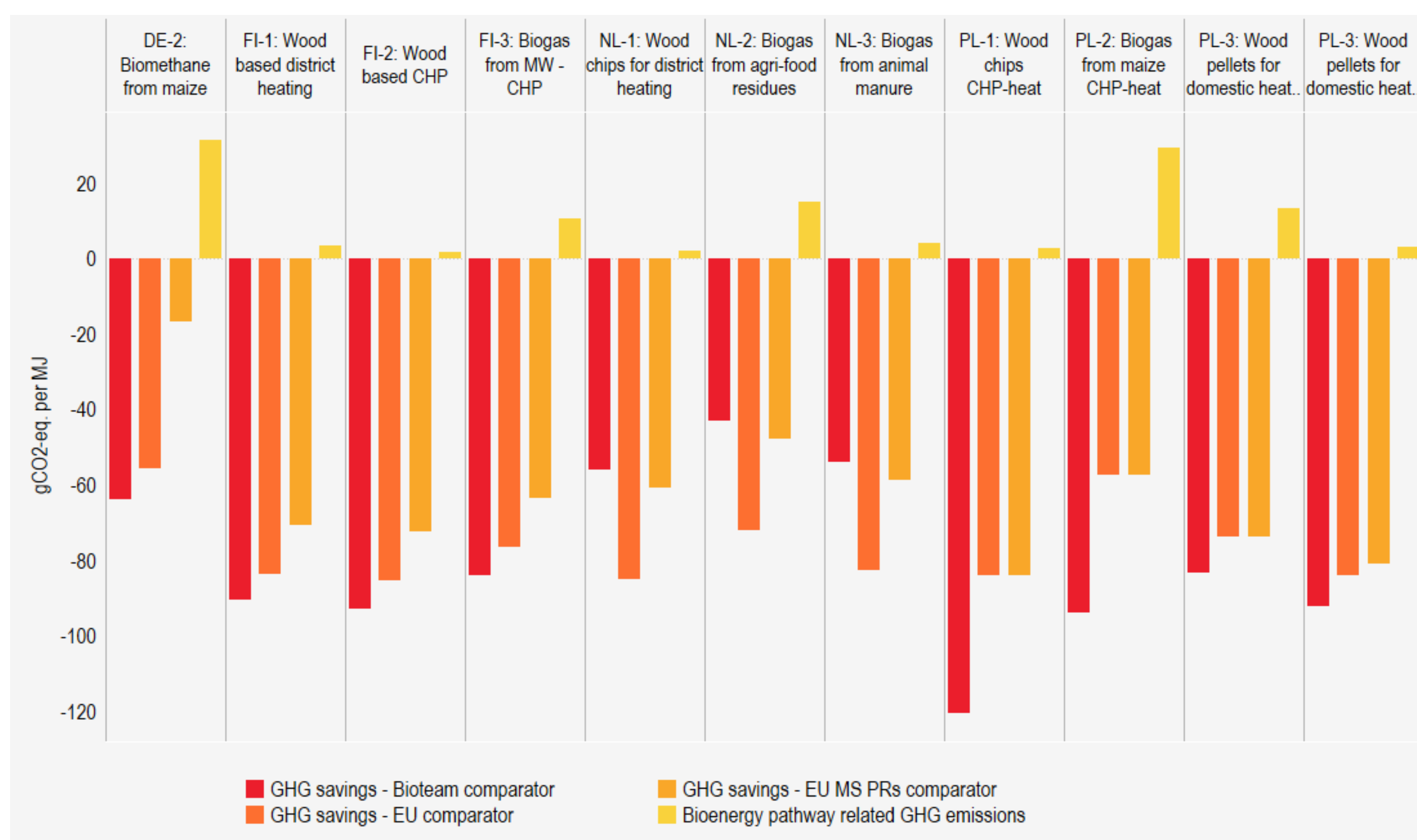
The project-specific (Bioteam) fossil fuel comparator assumes that less lignite will be used for electricity production in Germany resulting in higher net GHG emission savings using this comparator. The use of the other two fossil fuel comparators is based on avoiding the use of respectively a EU mix and national mix of fossil fuels for electricity production, resulting so in a lower calculated net GHG impact.

Pathway	EU comparator	EU MS PRs comparator	BIOTEAM comparator
DE-1: Wood chips biomass	198	216	342
DE-2: Biogas from maize	198	164	342



Heating/Cooling sector

The large variation in net GHG savings for heating shows the potential to enhance the climate-effectiveness of biomass for heating. The largest net GHG savings are typically achieved when bioenergy substitutes coal or fuel oil for heating (Poland; Finland). The project-specific comparator (Bioteam) for the Netherlands is only slightly lower than the EU (default) or the EU MS PRs comparator, while natural gas is substituted.



Key observations:

- ❖ Using dedicated national fossil fuel use or project-specific comparators can enhance the climate-effectiveness of EU energy and climate policy, relative to using rather generic European Union (EU) comparators.
- ❖ GHG emission reduction is more accurately estimated by those comparators, making the outcome dependent to country conditions.
- ❖ It is recommended to select more appropriate indicators for covering other sustainability indicators like water and nutrient balances.

Manjola Banja*, Richard Sikkema**, Eise Spijker***, Krisztina Szendrei***

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