

Impacts on fuel producers and customers of conflicting rules for LCA

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DIRECTIVES

DIRECTIVE (EU) 2018/2001 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

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on the promotion of the use of energy from renewable sources

(recast)

(Text with EEA relevance)

COUNCIL OF THE EUROPEAN UNION,

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in contact with the national parliaments,

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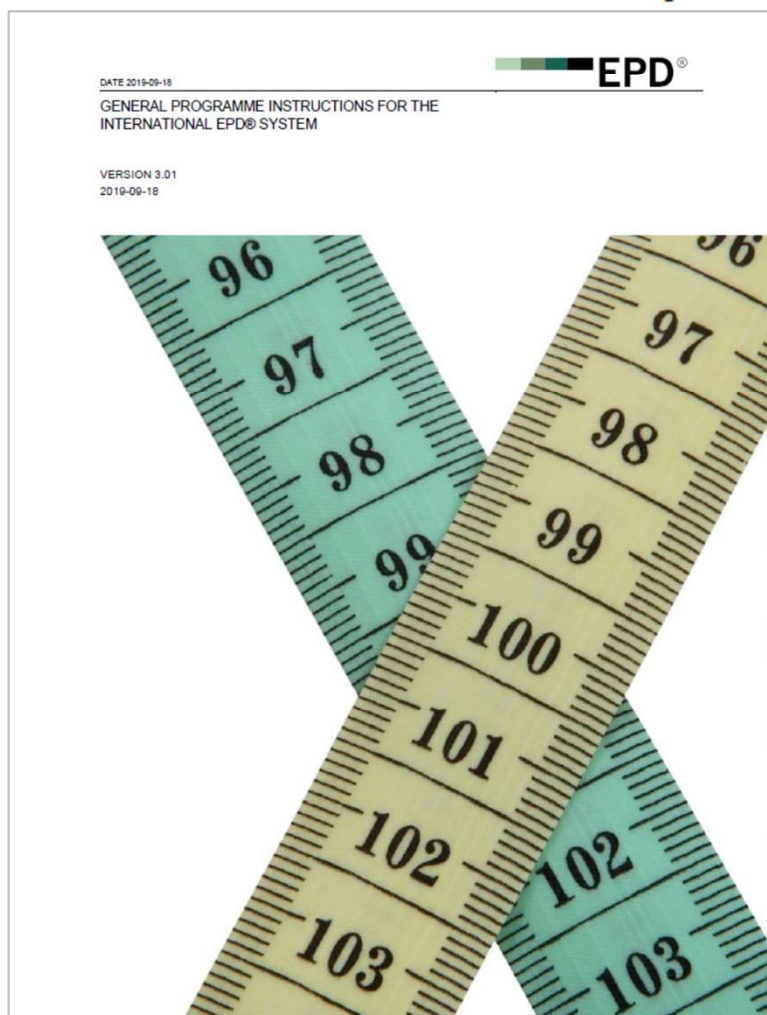
Committee of the Regions ⁽²⁾,legislative procedure ⁽³⁾,1 Product Environmental Footprint Category
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Version 6.3 – May 2018

6 Preface

7 This document (henceforward, the PEFCR Guidance) provides instructions on how to develop a
8 Product Environmental Footprint Category Rules (PEFCR). The content of this PEFCR Guidance will be
9 periodically revised by European Commission services. The PEFCRs developed during the
10 Environmental Footprint pilot phase (2013-2018) shall be fully in line with this version of the
11 guidance. Any derogation from this general rule is only possible with the agreement of the
12 Commission.13 Please cite this document as European Commission, *PEFCR Guidance document*, - Guidance for the
14 development of Product Environmental Footprint Category Rules (PEFCRs), version 6.3, December
15 2017.16 For any technical question related to the content of this guidance, please refer to the functional
17 mailbox env-environmental-footprint@ec.europa.eu

20 Disclaimer

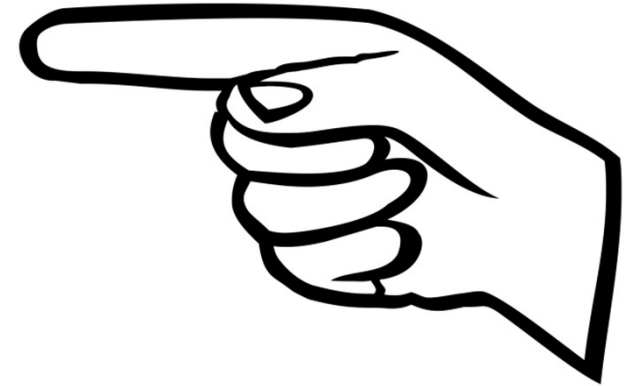
21 The European Commission accepts no responsibility whatsoever nature to third parties to whom this
22 Guidance, or any part thereof, is made known. Any such party relies on the Guidance at their own
23 risk.

Carbon footprint of renewable and/or waste-based fuels

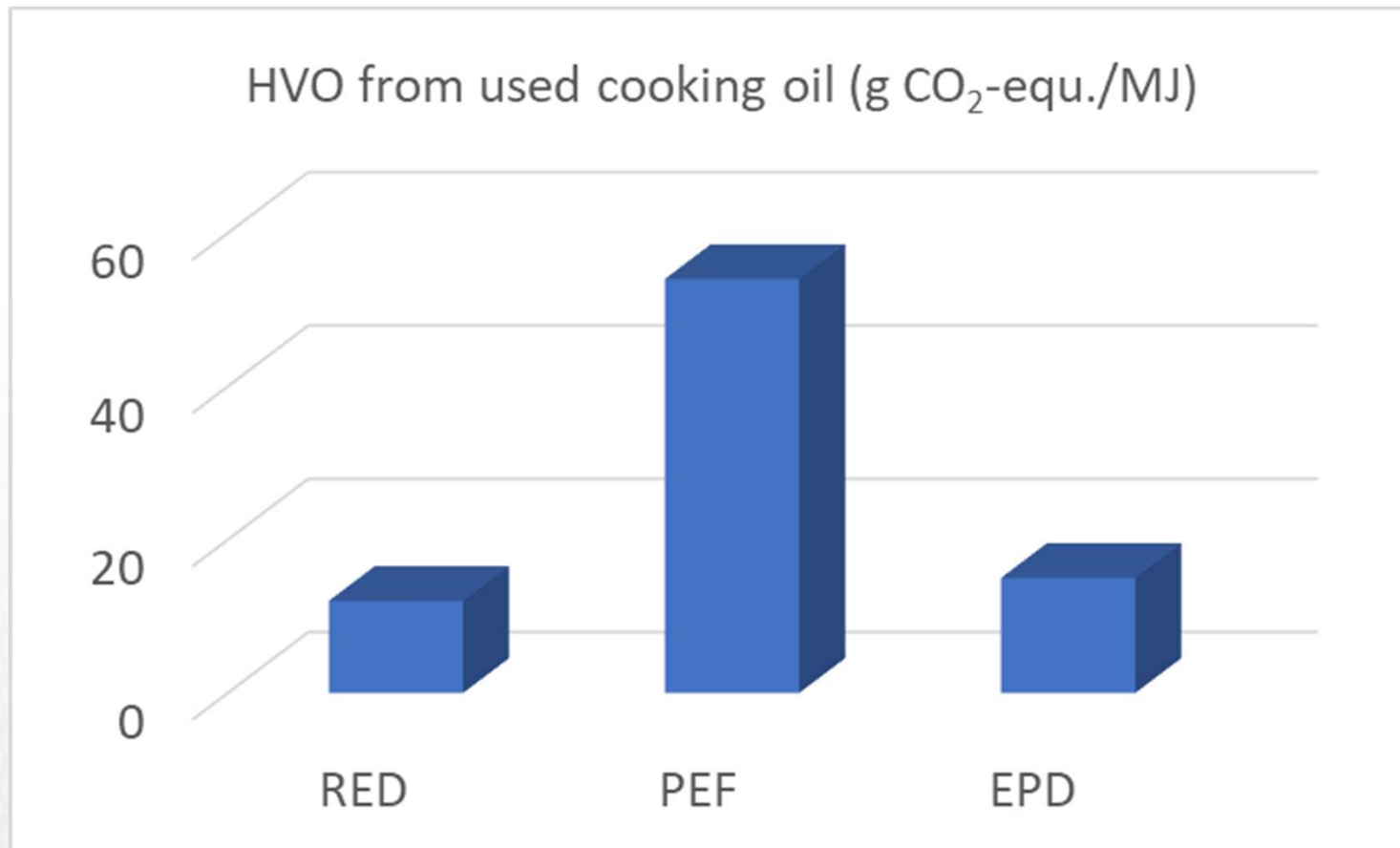
Fuel	Feedstock
Biogas	Municipal food waste
Hydrotreated vegetable oil (HVO)	Used cooking oil (UCO)
Hydrotreated vegetable oil (HVO)	Rapeseed oil (RSO)
Rapeseed methyl ester (RME)	Rapeseed oil (RSO)
Ethanol	Corn
Ethanol	Bread waste from bakeries
Ethanol	Sawdust from sawmills
Pyrolysis oil	Used vehicle tyres

Key differences

- Modelling of recycling
- Modelling of energy recovery
- Modelling of multi-output processes

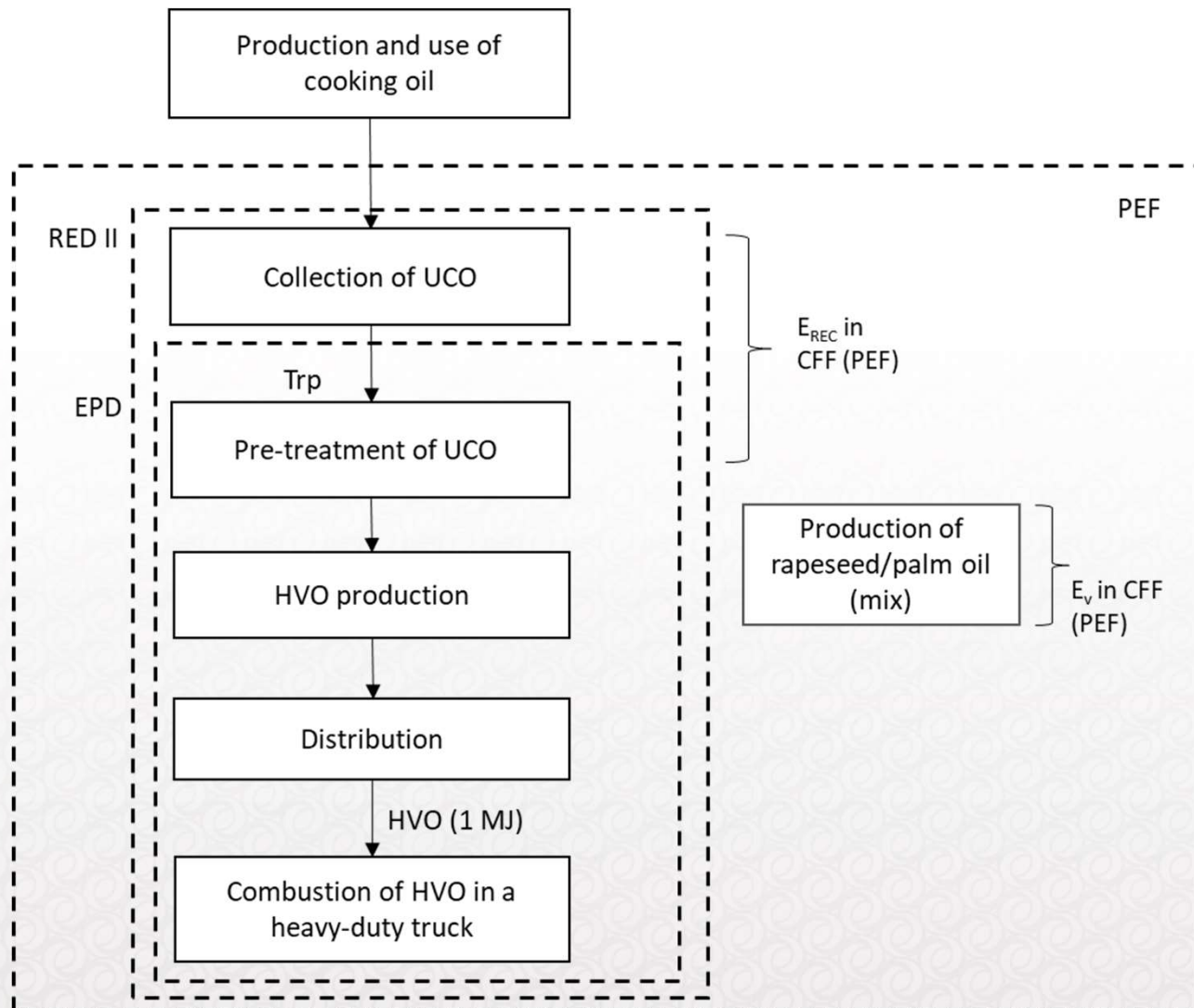


PEF can yield much higher results than RED and EPD if the fuel is produced from waste



Source: Poulíkidou et al. 2022

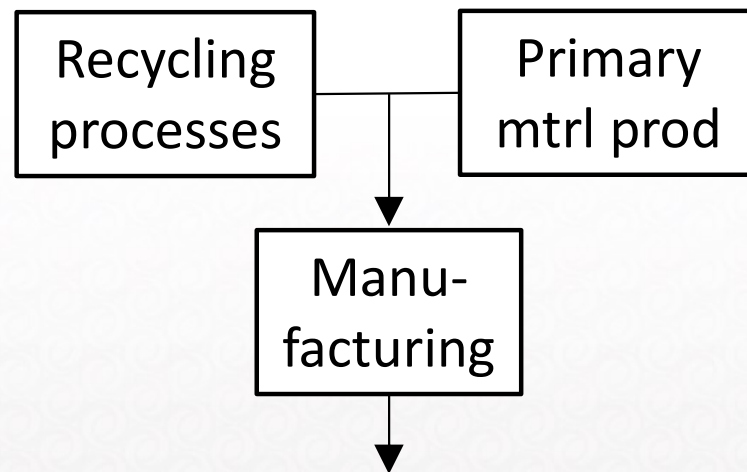
PEF calculations include (part of) replaced primary material or energy



Case: hydrotreated vegetable oil (HVO) produced from used cooking oil (UCO)

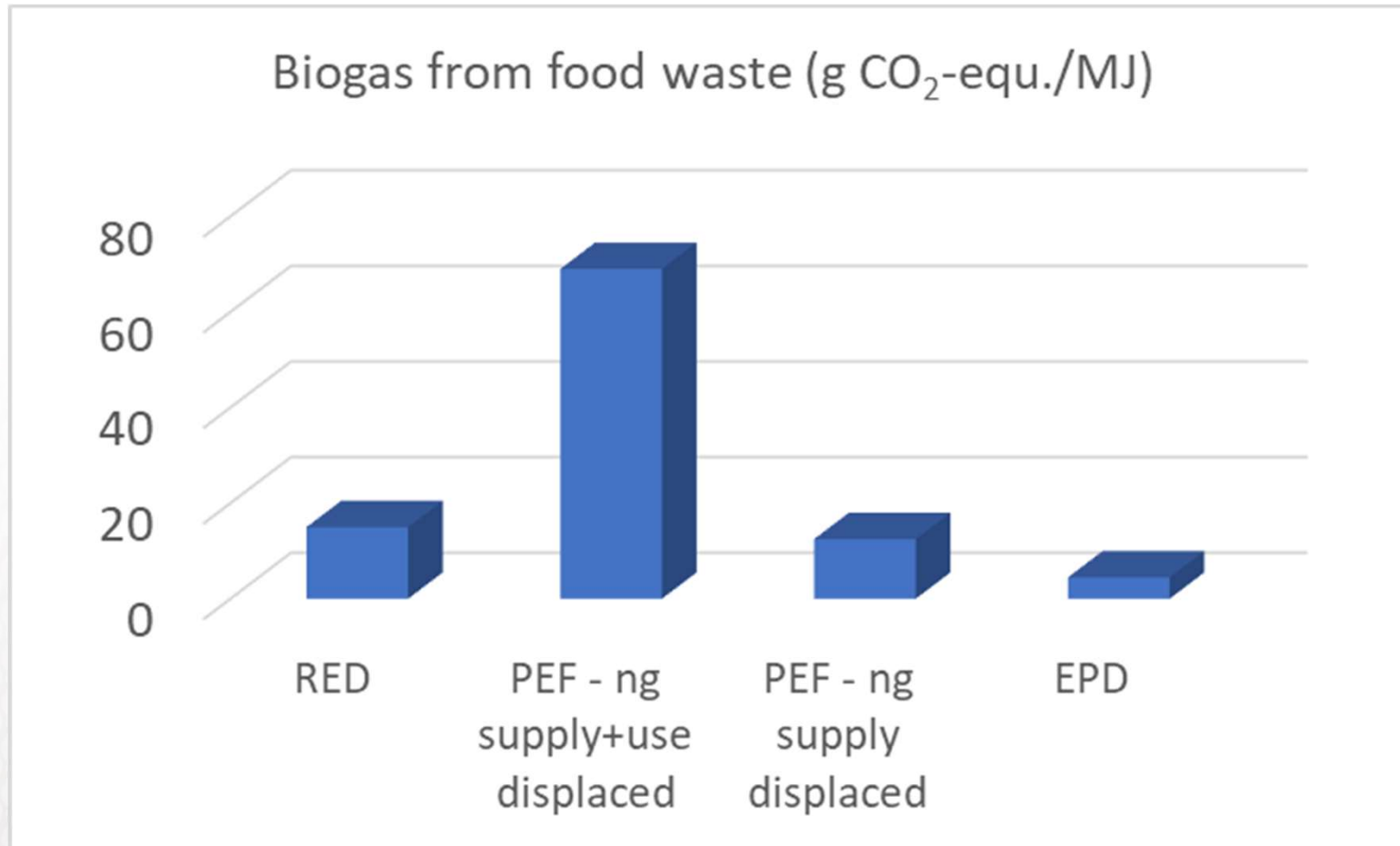
Source:
Poulikidou et al. 2022

The point of substitution is where recycled material is mixed with primary material



Source: European Commission 2018b

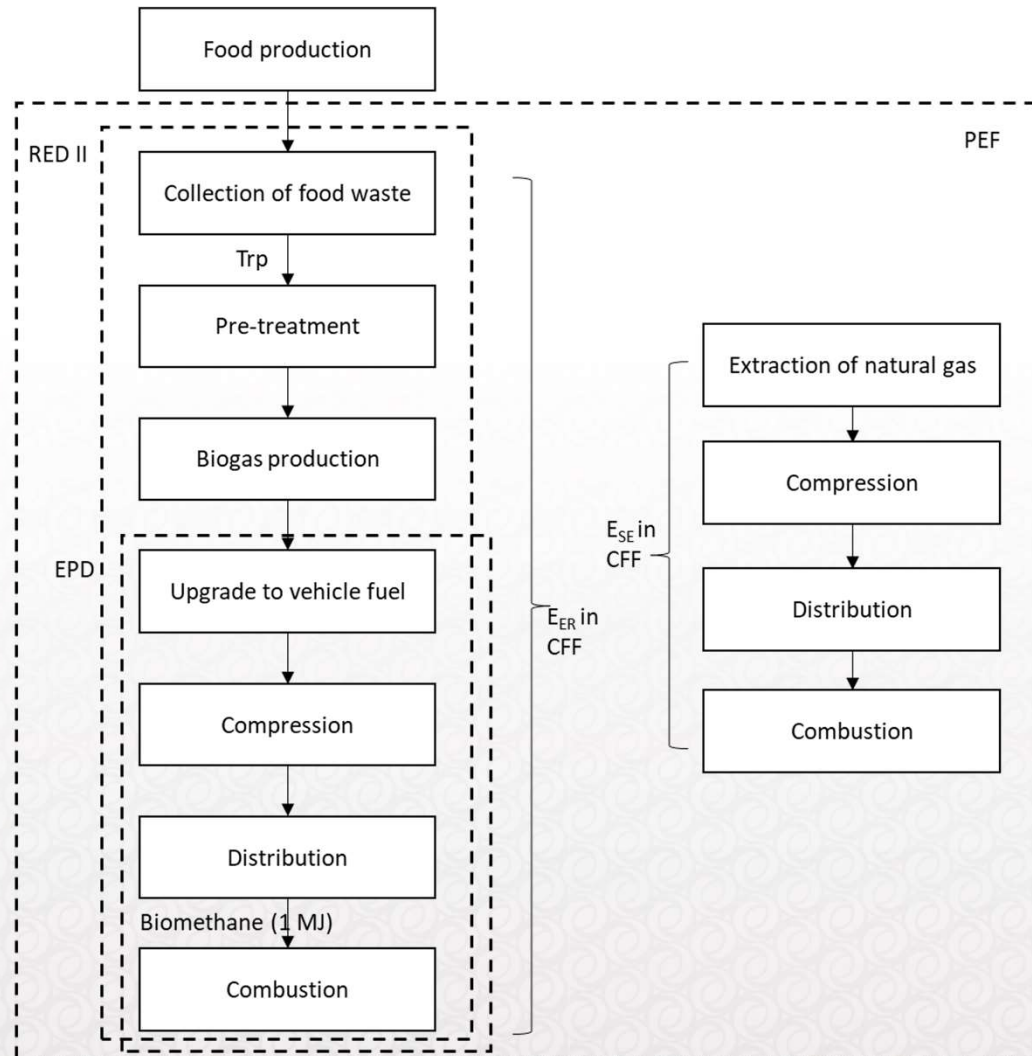
Point of substitution vital for biogas



Source: Poulíkidou et al. 2022

Biogas:

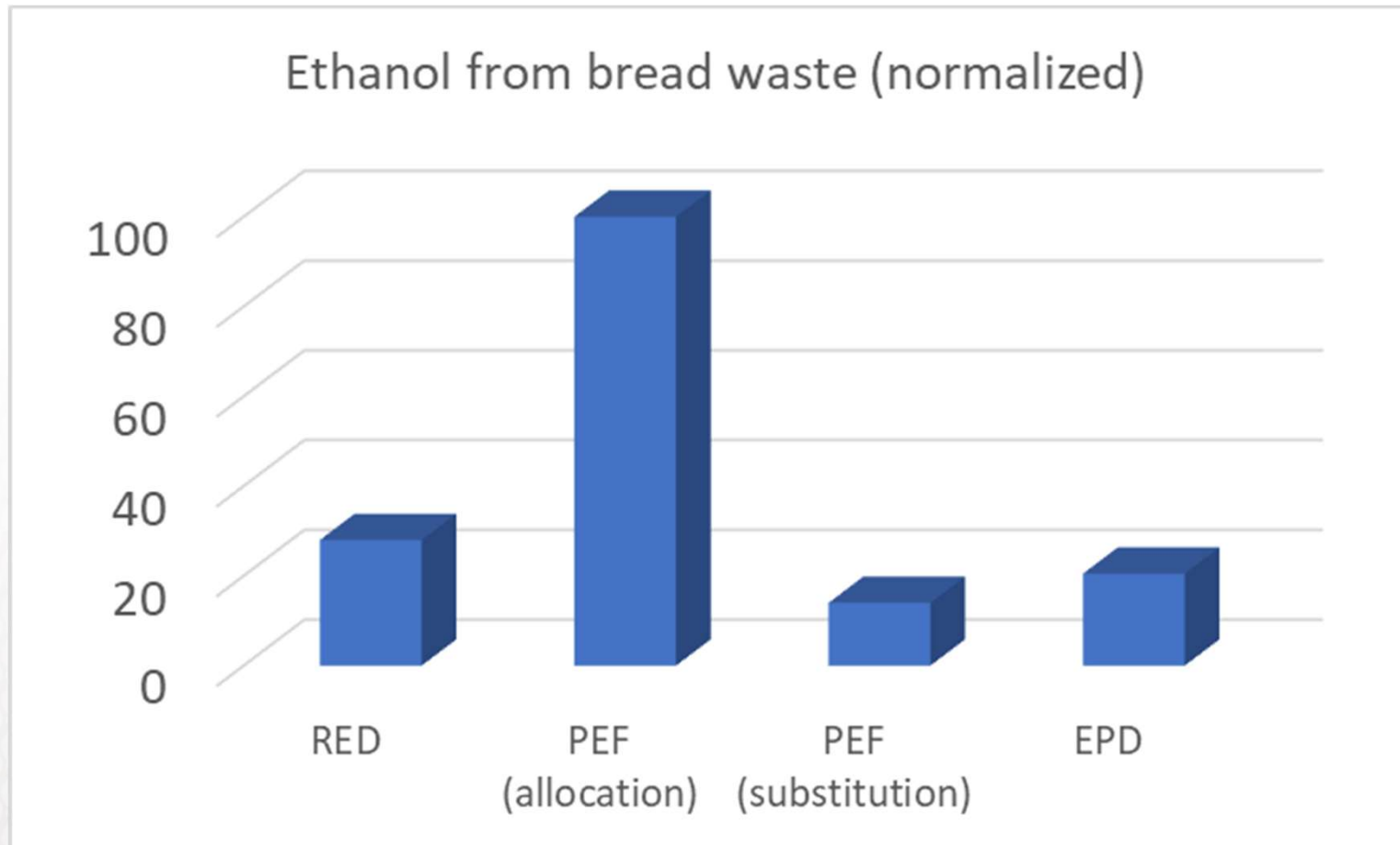
- PEF includes displaced primary energy
- EPD excludes digestion



Case: biogas
produced from
food waste
substitutes production
and use of natural gas

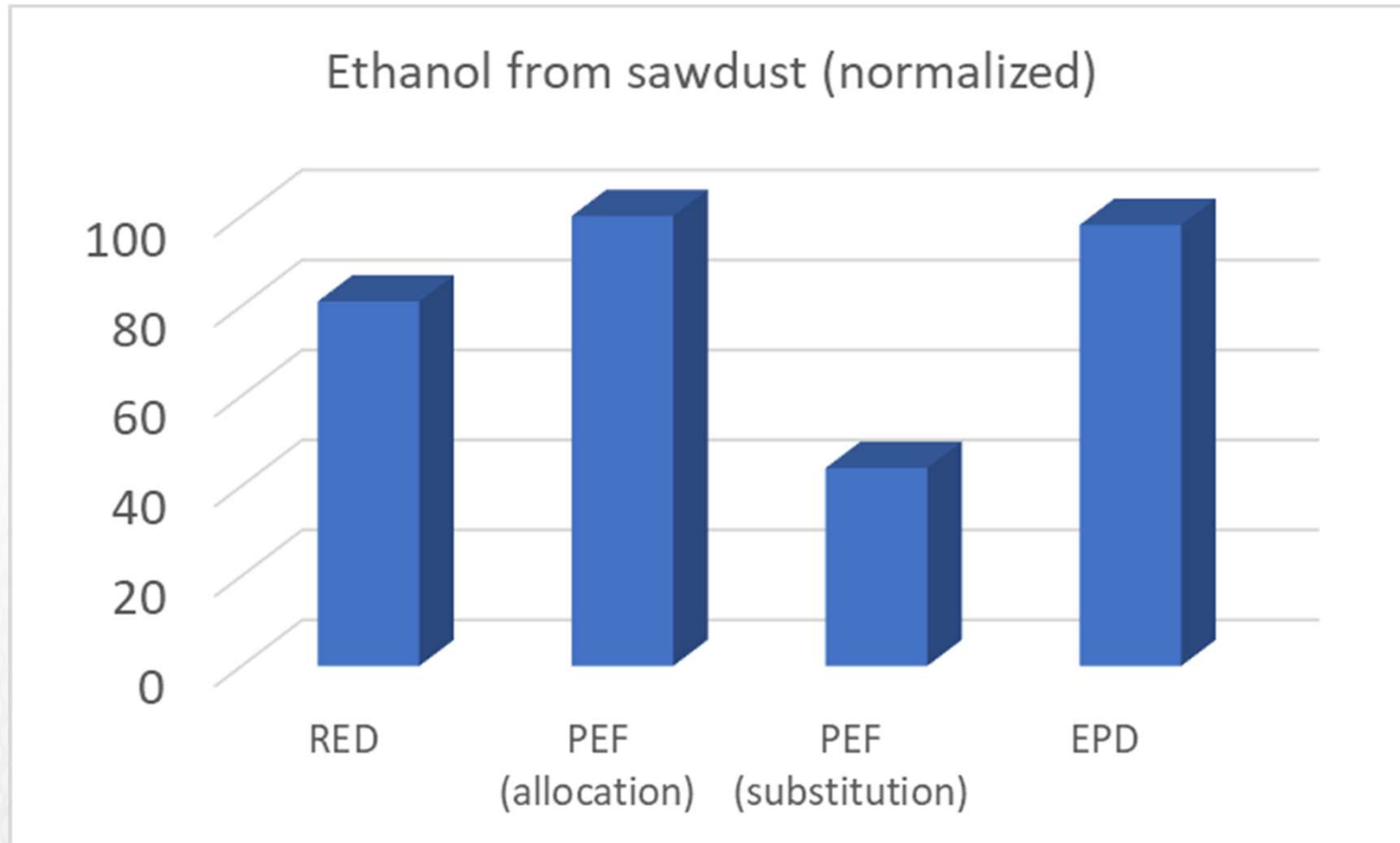
Source: Poulíkidou et al. 2022

Substitution can make PEF results lower than RED and EPD results



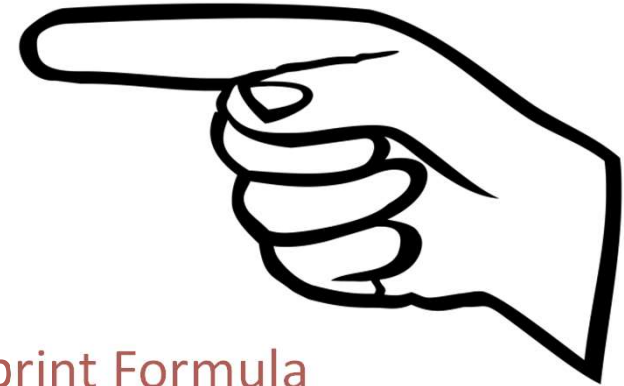
Source: Poulíkidou et al. 2022

Substitution can make PEF results much lower than RED and EPD results



Source: Poulidikou et al. 2022

Conclusions



1. PEF results stand out due to the Circular Footprint Formula
2. Point of substitution: important and unclear
3. RED and EPD give very different results for biogas
4. Need for PEFCR and PCR for (bio)fuel

Thanks for the attention!

Literature:

EPD International (2019). General Programme Instructions for the International EPD® System. Version 3.01. EPD International.

European Commission (2018a). DIRECTIVE (EU) 2018/2001 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 December 2018 on the promotion of the use of energy from renewable sources. Official Journal of the European Union. L 328/82.

European Commission (2018b). PEFCR Guidance document - Guidance for the development of Product Environmental Footprint Category Rules (PEFCRs). version 6.3.

Poulikidou, S. et al. (2022). Impacts on fuel producers and customers of conflicting rules for Life Cycle Assessment. Publ. No FDOS 30:2022. Available at: <https://f3centre.se/en/renewable-transportation-fuels-and-systems/>

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