

Benchmark and performance classes in the European Environmental Footprint (EF)

Learnings from the Product EF Category Rules (PEFCR) on olive oil

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Technical Secretariat of the Olive oil pilot

14 producers from Italy, Greece, Portugal and Spain



5 industry associations



5 public research bodies



1 local government



1 third party body verifier



Tech. Supporting by:



RodaxAgro Ltd consulting company



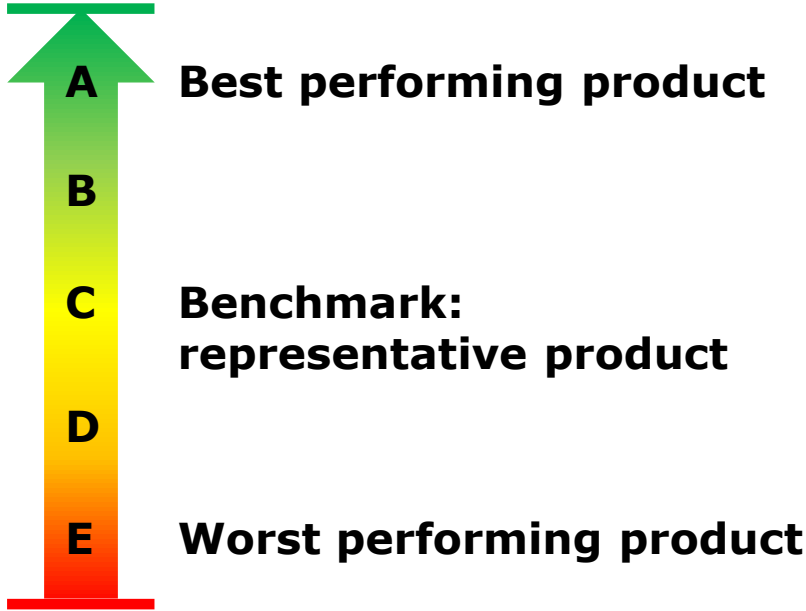
Benchmark

- The characterised results of the PEF profile of the representative (average) product(s)
- and
- Represents performance class C

Performance classes

- Range in which results could be seen as not being significantly different in comparisons or comparative assertions between products in the same category
- 5 classes: A to E
 - A the best performing class
 - C the benchmark

Benchmark and performance classes A - E



- Results might differ from impact category to impact category - or weighted

PEFCR Screening study on the average representative olive oil in Europe leading to the benchmark

Functional unit

“A litre of packed olive oil used by consumers as salad dressing or for cooking”

WHAT	Olive oil
HOW MUCH	1 litre packed
HOW LONG	Until best before-date
HOW WELL	Suitable for human consumption according to EU regulation 29/2012 ¹

¹ COMMISSION IMPLEMENTING REGULATION (EU) No 29/2012, of 13 January 2012 on marketing standards for olive oil (codification)

System diagram



I Olive fruit production (Agricultural phase)

- Plant nursery
- Land preparation and tree planting
- Pest and disease management
- Canopy and soil management
- Fertilizing and irrigation (if applied)
- Harvesting



Energy, seedlings, fertilizers, pesticides, water and auxiliaries



Pruned wood, dead leaves, trunk and root increase, weed debris

II Processing

- 2 or 3 phase extraction
- Refining (if applied)
- Pomace oil production (if applied)



Energy, water, hexane (for pomace oil) and auxiliaries



Wet (2-phase system) and dry pomace
Waste and waste water (from 3-phase mills)

Olive fruits

III Packaging & distribution to retail

- Packaging production and transport
- Packaging waste management



Packaging material, energy, auxiliaries



Emissions

IV Consumption & End of Life

- Use as salad dressing
- Cooking
- Deep frying

- Re-use & recycling
- Landfilling
- Incineration



Energy



Emissions

Packed olive oil

Olive oil

Legend:



Transport



Inputs



Output

- Included processes

- Excluded processes

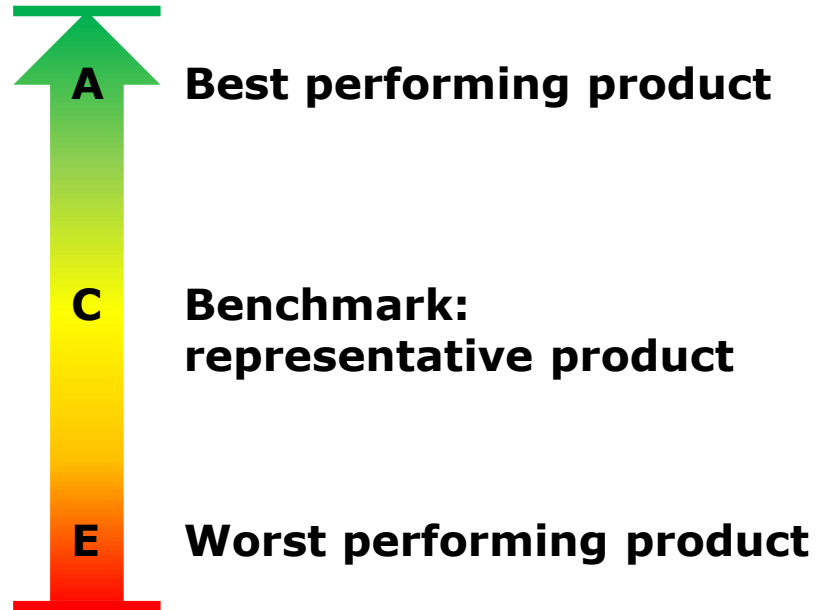
Realistic min.,max. and benchmark input values



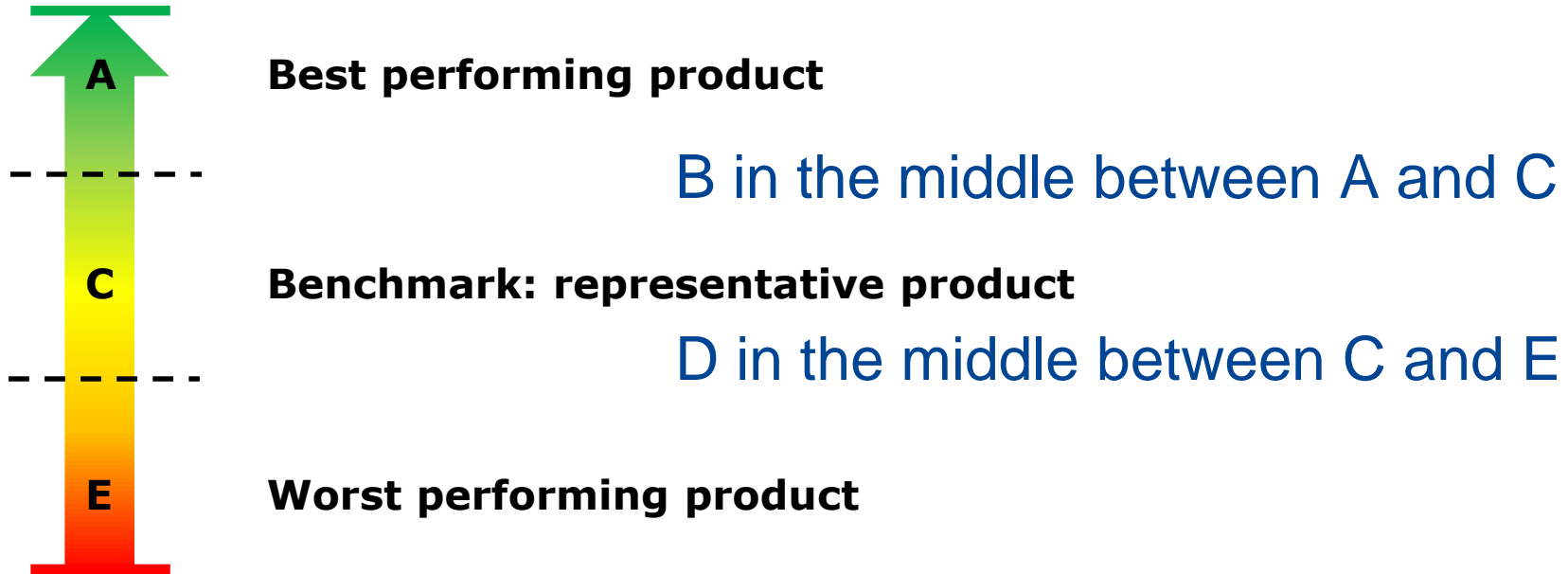
	Field Stage								
	N	P	Electricity	Water	Cu	Organo-Phosphorous	Pyre-throids	Glypho-sate	Dime-thoate
Unit:	kg/ha		kWh/ha	m ³ /ha	kg/ha				
Max (Worst case)	325	187	8667	14444	9.11	19.50	0.58	6.55	12.5
Min (Best case)	0	0	0	0	0	0	0	0	0
Benchmark	69	21	76	180	0.16	0.09	0.0...	0.40	0.0...

	Industrial stage	
	Electricity	Water
Unit:	kwh / 100 kg olives	kg / 100 kg olives
Max (Worst case)	5.24	124.6
Min (Best case)	0.36	10
Benchmark	3	30

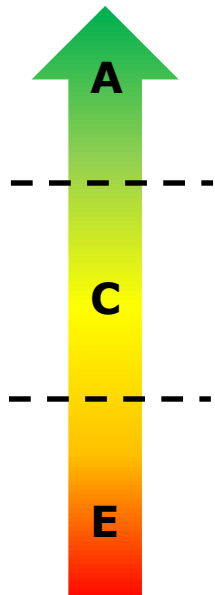
The steps to come to the performance classes A - E



Step 1: Introducing B and D



Step 2a: Define width (range) for A, B, C, D & E



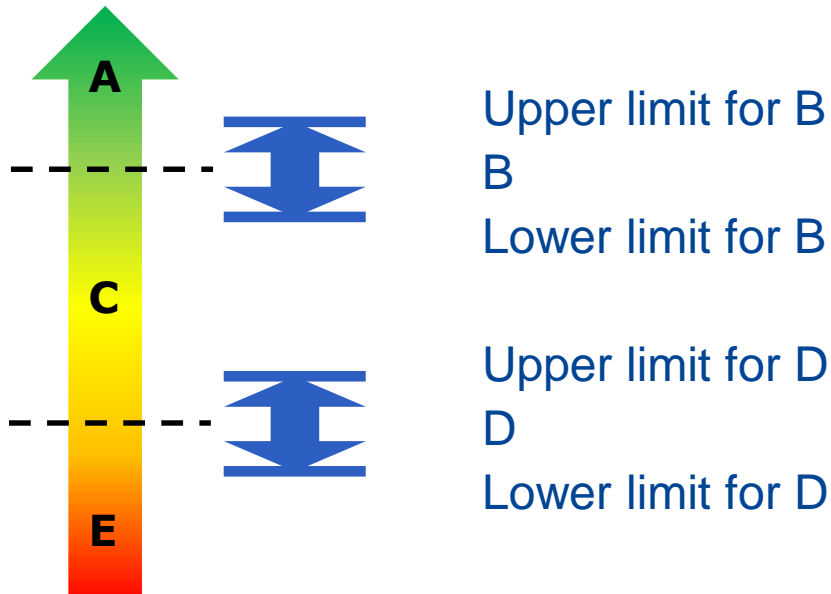
Every products performing better belong to the A class
Best performing product

Benchmark: representative product

Worst performing product

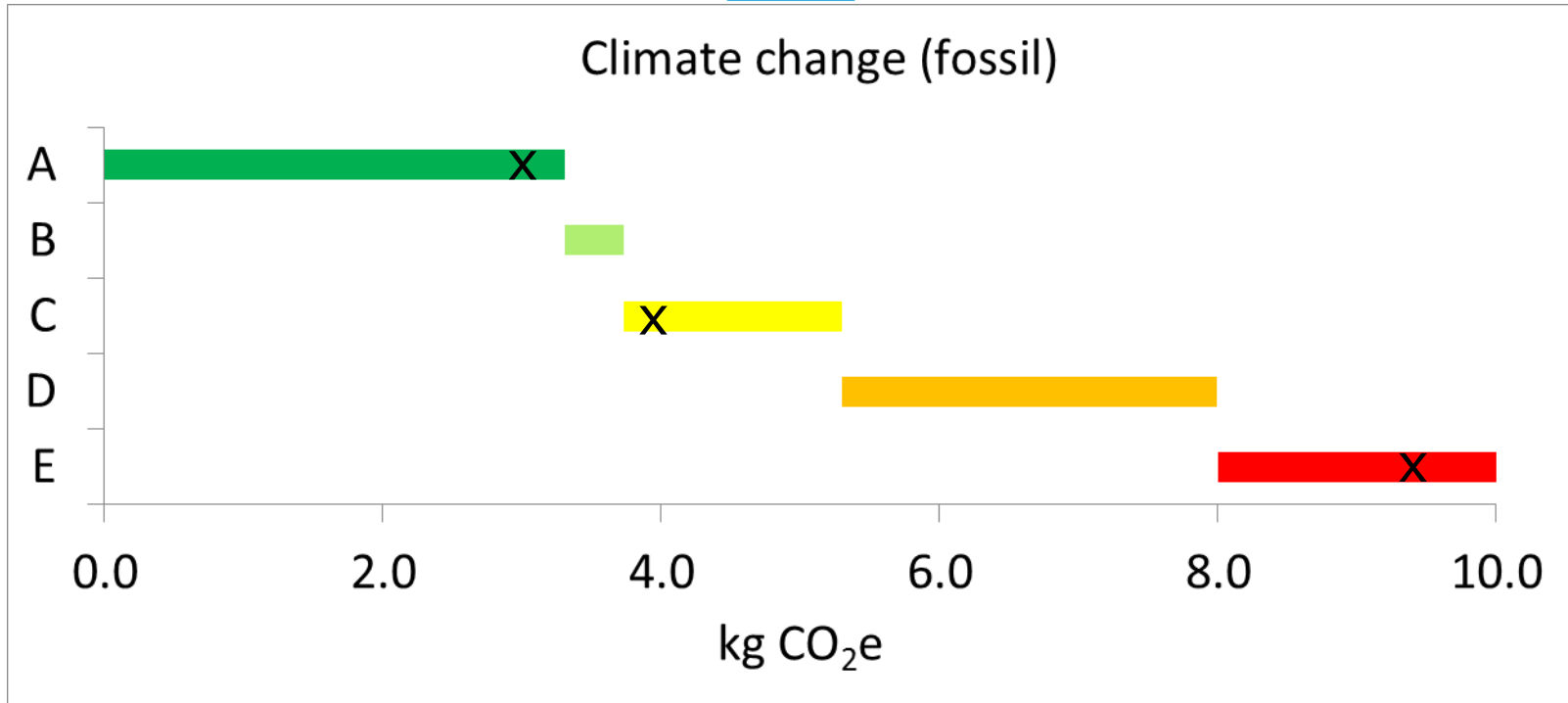
Every products performing worse belong to the E class

Step 2b: Define width (range) for A, B, C, D & E

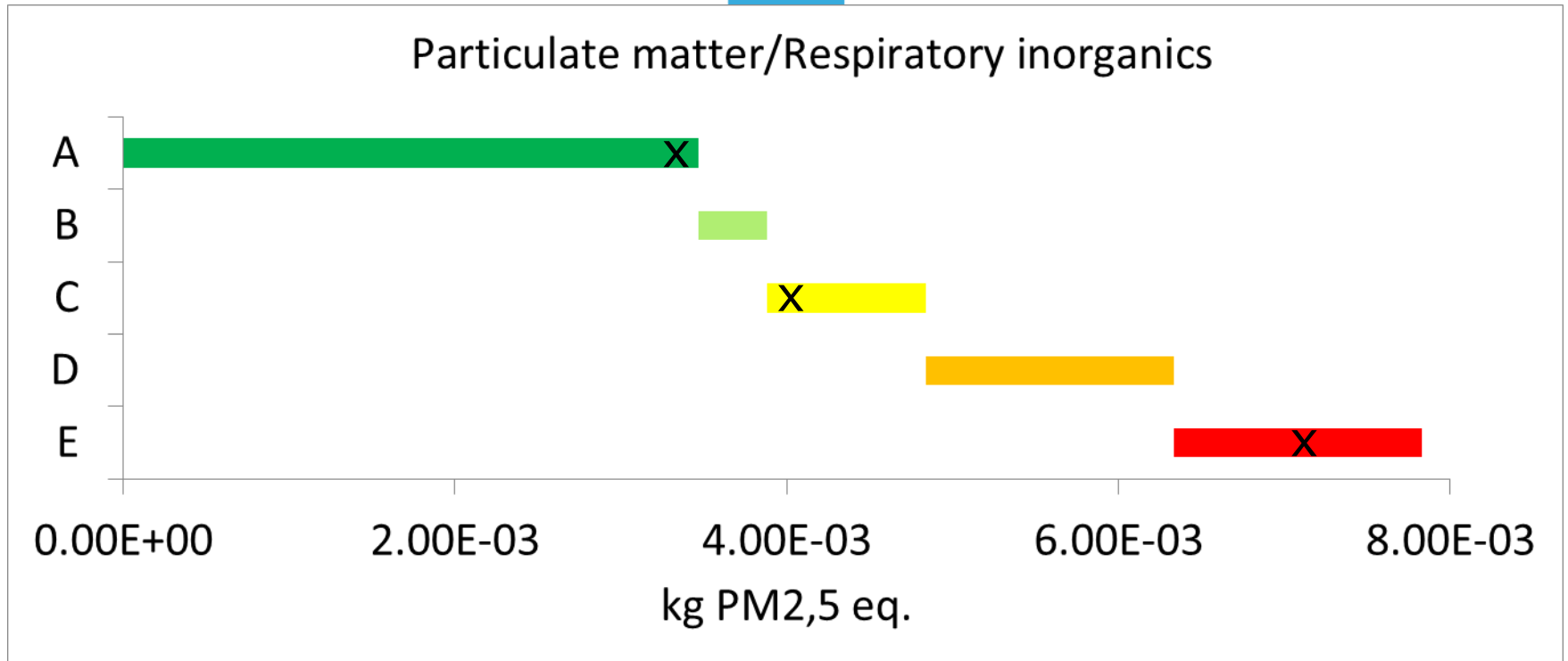


Examples of resulting classes

Impact categories	Unit	Class A	Class B	Class C	Class D	Class E
Climate change (fossil)	kg CO ₂ -eq.	≤ 3.31	3.32 - 3.74	3.75 - 5.30	5.31 - 8.00	> 8.00
Acidification	Mole of H ⁺ eq.	≤ 0.026	0.027 - 0.030	0.031 - 0.040	0.041 - 0.057	> 0.057
Particulate matter /Respiratory inorganics	kg PM _{2,5} -eq.	≤ 3.46 x 10 ⁻³	3.47 x 10 ⁻³ - 3.88 x 10 ⁻³	3.89 x 10 ⁻³ - 4.84 x 10 ⁻³	4.85 x 10 ⁻³ - 6.33 x 10 ⁻³	> 6.33 x 10 ⁻³
Photochemical ozone formation	kg NMVOC-eq.	≤ 0.029	0.030 - 0.032	0.033 - 0.037	0.038 - 0.045	> 0.045
Terrestrial eutrophication	Mole of N-eq.	≤ 0.097	0.098 - 0.106	0.107 - 0.136	0.137 - 0.187	> 0.187
Freshwater eutrophication	kg P-eq	≤ 5.00 x 10 ⁻⁴	5.01 x 10 ⁻⁴ - 6.61 x 10 ⁻⁴	6.62 x 10 ⁻⁴ - 1.49 x 10 ⁻³	1.50 x 10 ⁻³ - 2.99 x 10 ⁻³	> 2.99 x 10 ⁻³
Marine eutrophication	kg N-eq.	≤ 6.89 x 10 ⁻³	6.90 x 10 ⁻³ - 7.38 x 10 ⁻³	7.39 x 10 ⁻³ - 1.01 x 10 ⁻²	1.02 x 10 ⁻² - 1.49 x 10 ⁻²	> 1.49 x 10 ⁻²



x indicates the best product (in A class; 3), the average (in C class; 4) and the worst (in E class; 9.3 kg CO₂e)



x indicates the best product (in A class; 3.3×10^{-3}), the average (in C class; 4.1×10^{-3}) and the worst (in E class; 7.1×10^{-3} kg PM_{2,5}-eq.)

- Not expected to see many D and E class results in the public, but important for internal interpretation of results
- The benchmark is the critical point. Therefore, to get this right is of utmost importance
- Narrow B class with this data, method and impact categories
- Might need to have a look at other input, like yield
- Performance classes vs weighted (single score) scheme

Conclusion (Part I)

- Performance classes can be developed in different ways
- This presentation demonstrates how we developed the performance classes for a very skewed distribution (where the A and B class is much closer to the benchmark than the D and E class).

Conclusion (Part II)

The performance classes and more specifically the range of the C class, can be used to help identify the range in which results could be seen as not being significantly different in comparisons or comparative assertions

However, need to have a look at the input again, e.g. add yield.

Next steps

- Develop performance classes A-E for the sub-categories:
 - 1) extra virgin and virgin olive oil
 - 2) olive oil (refined/blend) and
 - 3) pomace olive oil
- Update of the benchmarks based on the remodelling with newest environmental footprint data and Product EF Category Rules.
- Revisit the input factors for additional or other min & max values.

Sources:

European Commission (2016). Product Environmental Footprint Pilot Guidance - Guidance for the implementation of the EU Product Environmental Footprint (PEF) during the Environmental Footprint (EF) pilot phase - version 5.2, February 2016. Brussels, European Commission, DG Environment, pp. 95: http://ec.europa.eu/environment/eussd/smgp/pdf/Guidance_products.pdf

Galatola, M., A. Kerkhof and K. Wouters (2016). Determining the EF benchmark and performance classes - Version 3 (March 2016). Issue paper. Brussels, EF Technical Helpdesk, European Commission, DG ENV: pp. 7. Accessible for registered stakeholders: <https://webgate.ec.europa.eu/fpfis/wikis/download/attachments/80613270/Issue%20paper%20performance%20classes%20March%202016.docx?api=v2>

Thank you for your attention!