PEFCR for cut flowers and potted plants

Webinar: Preparing for public consultation

August 31st 2021

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- Motivation for developing FloriPEFCR (Albert Haasnoot)
- How we are developing FloriPEFCR (Roline Broekema)
- Public consultation: what to expect and what is expected (Roline Broekema)
- Representative product for potted plants (Tommie Ponsioen)
- Representative product for cut flowers (Tommie Ponsioen)
- FloriPEFCR – category rules for cut flowers and potted plants (Roline Broekema)
- Q&A session with TS representatives

Motivation for developing FloriPEFCR

Why work on methodology development?

- Demand for environmental information of horticulture products is rising

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Source: the Guardian, Eluxe magazine, VOX, Technology Networks

Why work on methodology development?

- In Europe new policies are being developed to tackle unreliable outcomes and false claims.
- One of these developments is Product Environmental Footprint (PEF).
- Reliable insight into the environmental footprint of horticultural product provides great opportunities
- As one of the frontrunning sectors, we aim to be prepared with the development of FloriPEFCR. (In coming years EU legislation is to be expected)

Why work on methodology development?

- The development of an environmental footprint methodology for horticultural products helps the sector to **materialise the current effort it puts in to sustainability**. It helps a grower to identify - within its supply chain - how **to improve its environmental impact** and, doing so, to learn more about its own impact.

Any questions...

...on the motivation for developing FloriPEFCR?

How we are developing FloriPEFCR

How we are developing FloriPEFCR (1)

2020: Hortifootprint category rules published:

- Dutch method for Horticultural sector
- 'Cookbook' for calculating an environmental footprint

2020 – 2022: Product Environmental Footprint Category Rules (PEFCR) for potted plants and cut flowers is a follow up of Hortifootprint.

Within framework:

European Commissions Product Environmental Footprint (PEF)

How we are developing FloriPEFCR (2)

- Calculating environmental impacts (through LCA) is complex and time consuming.
- There are many methodological considerations and decisions to take.
- Lack of reliability of results creates room for green washing.

PEFCR is a harmonised LCA methodology.

- ✓ The PEFCR ensures that the calculated environmental impacts from the sector are comparable, because they follow the same methodology. This creates reliable results and a level playing field.

How we are developing FloriPEFCR (3)

- Royal FloraHolland - Trade association cut flowers and potted plants TS-lead
- Wageningen Economic Research – Independent Research Institute Project coordinator
- UnionFleurs – International Flower Trade Association
- MPS Group – Developer of standards
- Natuur&Milieu – NGO
- Blonk Consultants – LCA consultancy
- PRé Sustainability – LCA consultancy and software developer
- FSI (Floriculture Sustainability Initiative)
- GroentenFruit Huis
- Florverde

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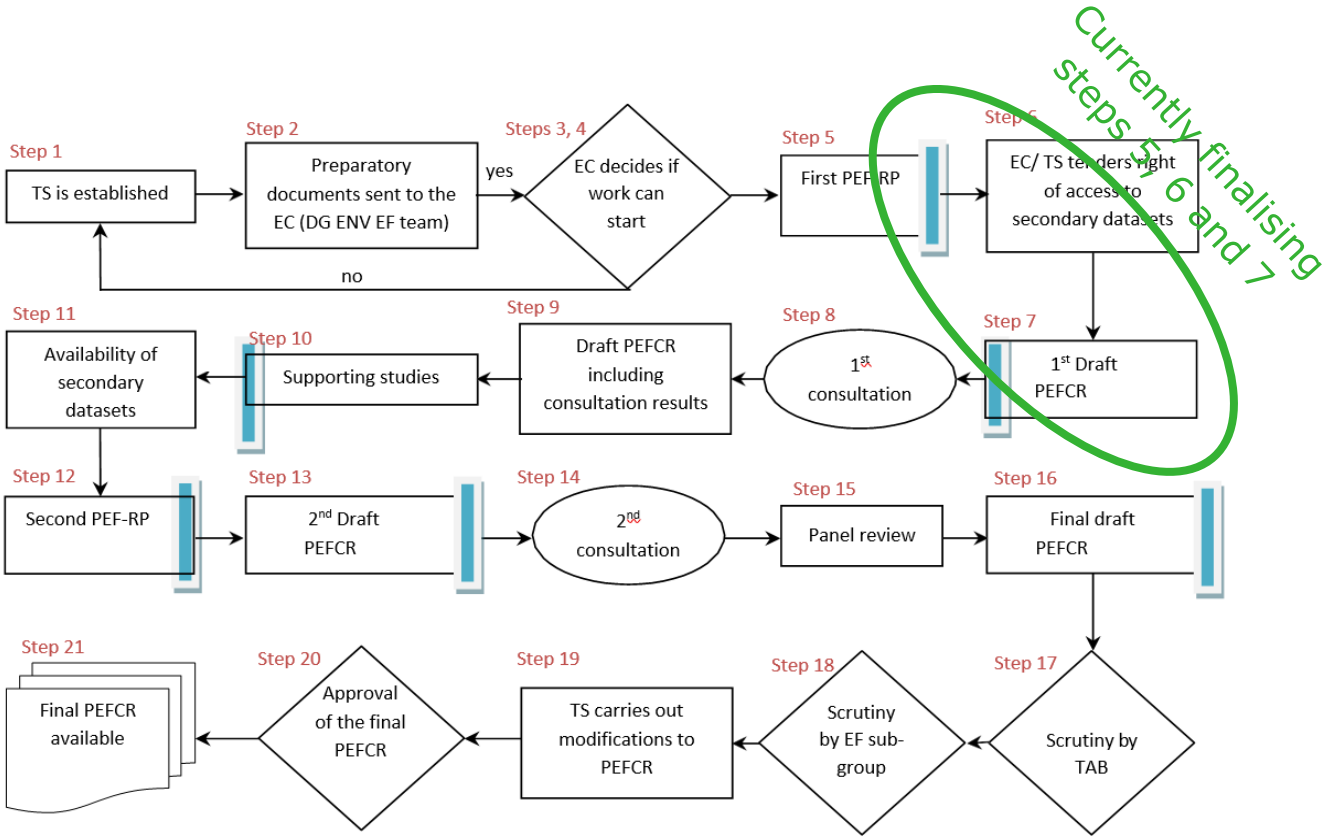
How we are developing FloriPEFCR (4)



How we are developing FloriPEFCR (5)

We have done two Representative Product (RP) studies:

1) Cut flowers

2) Potted plants

Goal: Identify the most relevant life cycle stages, processes impact categories and other major requirements needed for the definition of the benchmark for the product category in scope of the PEFCR.

How we are developing FloriPEFCR (6)

The RP studies have informed the first draft of the FloriPEFCR.

Goal: To provide product category specific, life cycle-based rules that complement general methodological guidance for PEF studies by providing further specification at the level of a specific product category:

- Cut flowers and Potted plants

How we are developing FloriPEFCR (7)

All deliverables of the project are reviewed by an review panel.

The independent review panel consists of:

- LCA expert – RIVM – Johannes Lijzen
- Sector expert – Delphy – René Corsten and Jeroen van Buren
- NGO – MilieuCentraal – Judith Brouwer

How we are developing FloriPEFCR (8)

13 Reports will be reviewed (including the data used):

- 2x Representative Product reports (incl. modelling) – version 1
- 1st Draft PEFCR "Cut Flowers and Potted Plants"
- 3x Supporting study cut flowers
- 3x Supporting study potted plants
- 2x Representative Product reports – version 2 (re
- 2nd Draft PEFCR "Cut Flowers and Potted Plants"
- Final Draft PEFCR "Cut Flowers and Potted Plants"

Finalised.

Supporting studies expected Feb. 2022

Version 2 of RP studies and PEFCR expected May 2022.

Final PEFCR expected summer 2022.

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How we are developing FloriPEFCR (9)

Next steps:

1) Public consultation will open early September

Register: https://www.wur.nl/nl/project/Developing-Product-Environmental-Footprint-Category-Rules-for-floriculture.htm

1) Update of the 1st draft FloriPEFCR using Review comments and comments from public consultation (October)
2) Supporting studies (#6) will be used to test the FloriPEFCR (starting in November)

We are currently identifying horticultural companies to take part in supporting studies. Are you interested? → email to floripefcr@wur.nl

Any questions...

...on the process of developing FloriPEFCR?

Public consultation: what to expect and what is expected

1st Public consultation in September (1)

Goal: To collect feedback from relevant stakeholders.

Public consultation starts on September 1st and will be open for one month.

The registration form will be open early September, via: https://www.wur.nl/nl/project/Developing-Product-Environmental-Footprint-Category-Rules-for-floriculture.htm

Please register if you are interested to provide your feedback!

1st Public consultation in September (2)

Documents to be delivered for 1st public consultation:

- First PEF-RP report, including characterised, normalised and weighted results
- Public review report on the first PEF-RP study, including all the comments raised by the review panel on the first PEF-RP and the answers provided by the TS;
- First draft PEFCR;
- Analysis of PEFCRs and PCRs already existing for the proposed product group/sector.
- Template to collect comments (in excel).

1st Public consultation in September (3)

	A	B	C	D	E	F	G	H	I	J
1	Technical Secretariat of the FloriPEFCR: 1st DRAFT PEFCR Cut flowers and Potted Plants					Please return the review form with your comments no later than August 9th 2021 to the following addresses: irene.gosselink@wur.nl, FloriPEFCR@wur.nl				
2	Name of commenter:									
3	Organisation:									
4	Date:									
5	Index of the comment (per person)	Reviewer name	choose Report	Page	Chapter, sub-chapter	Line number	Table number/ figure number	Comment, Including justification when needed	Type of the comment Ge. General Ed. Editorial Te. Technical	Suggestion of redaction, contribution
6	1		FloriPEFCR	e.g. p.3	e.g. 1.1.	e.g. line 80-82	e.g. figure 2.1			
7	2		RP report potted plants							
8	3		RP report cut flowers							

- Your comments are collected via the Excel template and we will provide an answer to every comment.
- Your comments are used to update the draft FloriPEFCR.
- The updated version of FloriPEFCR will be tested in the supporting studies.

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Any questions...

...on the public consultation?

Representative product for potted plants

Representative product for potted plants (1)

Reading guide:

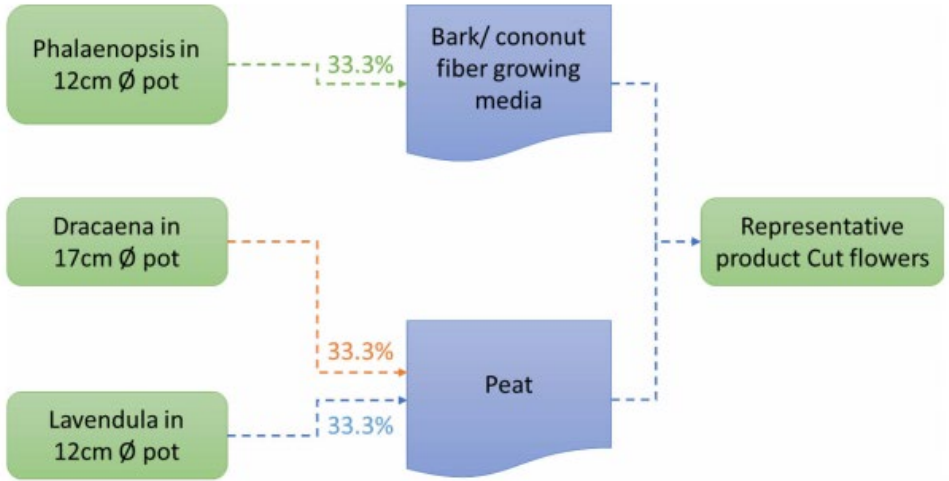
- General
- Goal
- Scope – RP, FU, system boundaries, impact categories, allocation
- Life Cycle Inventory – detailed data in Excel file
- Impact Assessment results – characterised, normalised and weighted
- Interpretation – hot spots
- Validation statement – will follow from review task

Most relevant elementary flows not required for this version!

Representative product for potted plants (2)

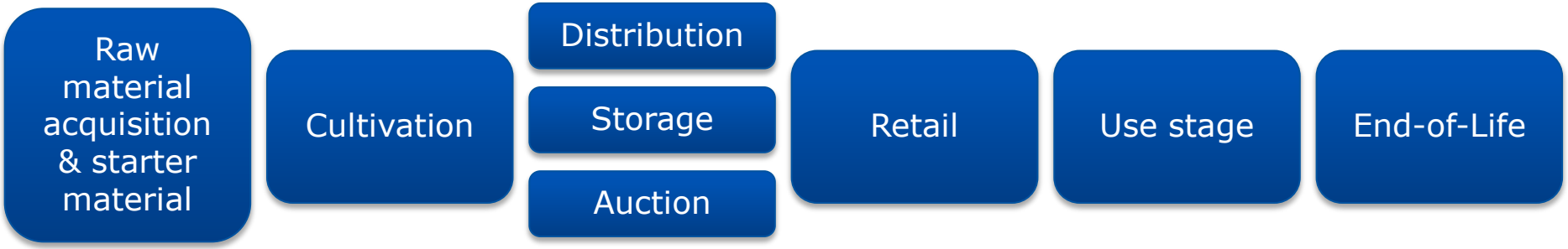
Representative virtual product for potted plants:

Functional unit: 1 pot (inner pot only)

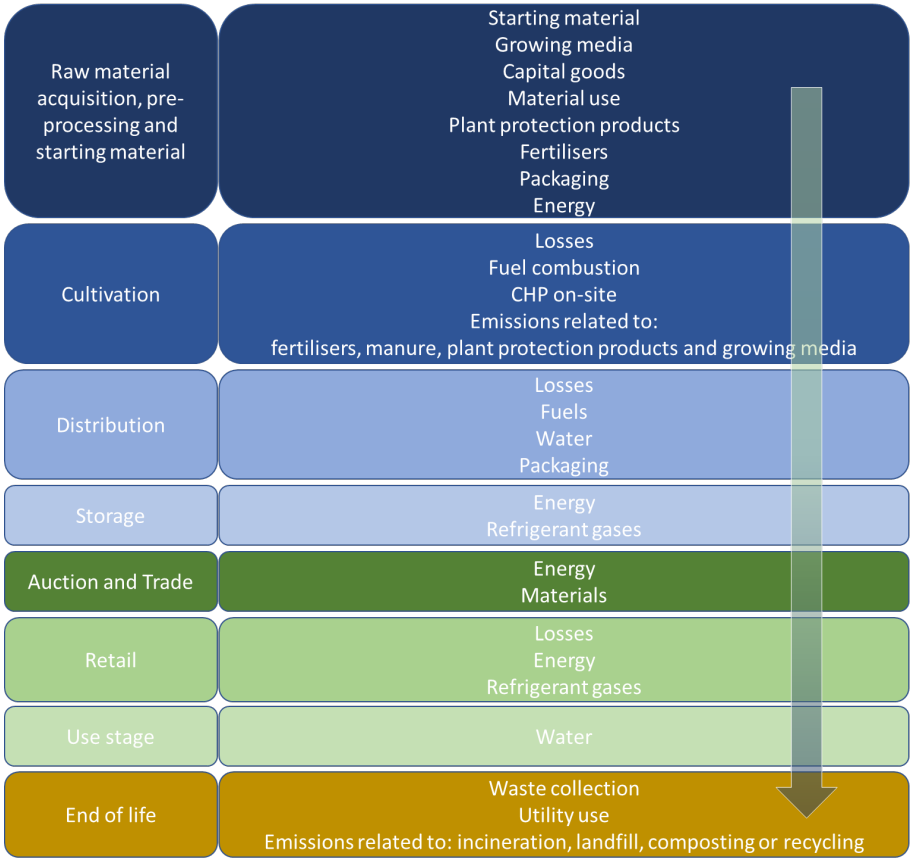


Representative product for potted plants (3)

System boundaries: full life cycle - cradle to grave



Representative product for potted plants (4)



Representative product for potted plants (5)

EF impact category	Impact category indicator	Unit
Climate change • Climate change-biogenic • Climate change – land use and land use change	Radiative forcing as Global Warming Potential (GWP100)	kg CO_2 eq
Ozone depletion	Ozone Depletion Potential (ODP)	kg CFC-11 eq
Human toxicity, cancer	Comparative Toxic Unit for humans (CTUh)	CTUh
Human toxicity, non-cancer	Comparative Toxic Unit for humans (CTUh)	CTUh
Particulate matter	Impact on human health	disease incidence
Ionising radiation, human health	Human exposure efficiency relative to ^{235}U	kBq ^{235}U eq
Photochemical ozone formation, human health	Tropospheric ozone concentration increase	kg NMVOC eq
Acidification	Accumulated Exceedance (AE)	mol H^+ eq
Eutrophication, terrestrial	Accumulated Exceedance (AE)	mol N eq
Eutrophication, freshwater	Fraction of nutrients reaching freshwater end compartment (P)	kg P eq
Eutrophication, marine	Fraction of nutrients reaching marine end compartment (N)	kg N eq
Ecotoxicity, freshwater	Comparative Toxic Unit for ecosystems (CTUe)	CTUe
Land use	• Soil quality index • Biotic production • Erosion resistance • Mechanical filtration • Groundwater replenishment	• Dimensionless (pt) • kg biotic production • kg soil • m^3 water • m^3 groundwater
Water use	User deprivation potential (deprivation-weighted water consumption)	m^3 world eq
Resource use, minerals and metals	Abiotic resource depletion (ADP ultimate reserves)	kg Sb eq
Resource use, fossils	Abiotic resource depletion – fossil fuels (ADP-fossil)	MJ

Representative product for potted plants (6)

Damage category	Unit	Total	Total
Total	µPt	135.2	100%
Climate change	µPt	57.7	43%
Resource use, fossils	µPt	47.8	35%
Particulate Matter	µPt	4.3	3%
Ecotoxicity, freshwater	µPt	4.0	3%
Acidification	µPt	3.8	3%
Photochemical ozone formation	µPt	3.7	3%
Resource use, minerals and metals	µPt	3.5	3%
Water use	µPt	2.9	2%
Eutrophication, terrestrial	µPt	2.5	2%
Eutrophication, marine	µPt	1.9	1%
Land use	µPt	1.1	1%
Ionising radiation	µPt	0.8	1%
Human toxicity, non-cancer	µPt	0.6	0%
Human toxicity, cancer	µPt	0.5	0%
Eutrophication, freshwater	µPt	0.2	0%
Ozone depletion	µPt	0.0	0%

Hot spot analysis:

The most important impact categories (>80%) are

1. climate change
2. resource use, fossil
3. particulate matter

Representative product for potted plants (7)

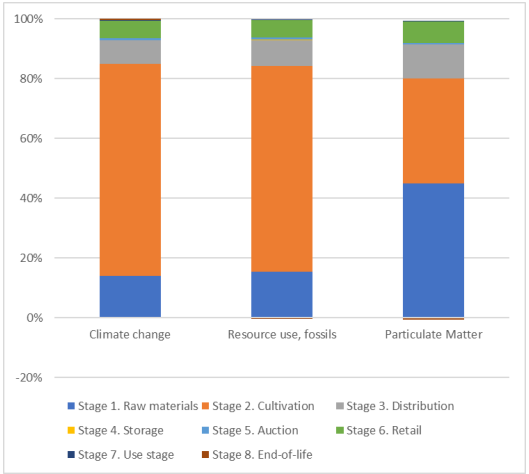
Impact category	Unit	Total	Stage 1. Raw materials	Stage 2. Cultivation	Stage 3. Distribution	Stage 4. Storage	Stage 5. Auction	Stage 6. Retail	Stage 7. Use stage	Stage 8. End-of-life
Climate change	kg CO2 eq	2.22	0.31	1.57	0.17	0.00	0.02	0.13	0.00	0.01
Climate change - Biogenic	kg CO2 eq	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00
Climate change - Fossil	kg CO2 eq	2.20	0.31	1.55	0.17	0.00	0.02	0.13	0.00	0.01
Climate change - Land Use and LU Change	kg CO2 eq	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Particulate Matter	disease inc.	2.87E-08	1.30E-08	1.02E-08	3.29E-09	2.90E-11	1.03E-10	2.10E-09	1.10E-10	-1.74E-10
Resource use, fossils	MJ	37.32	5.81	25.95	3.23	0.03	0.28	2.17	0.03	-0.18

Hot spot analysis:

The most relevant life cycle stages (>80%) are

A. Stage 1. Raw materials

B. Stage 2. Cultivation



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Representative product for potted plants (8)

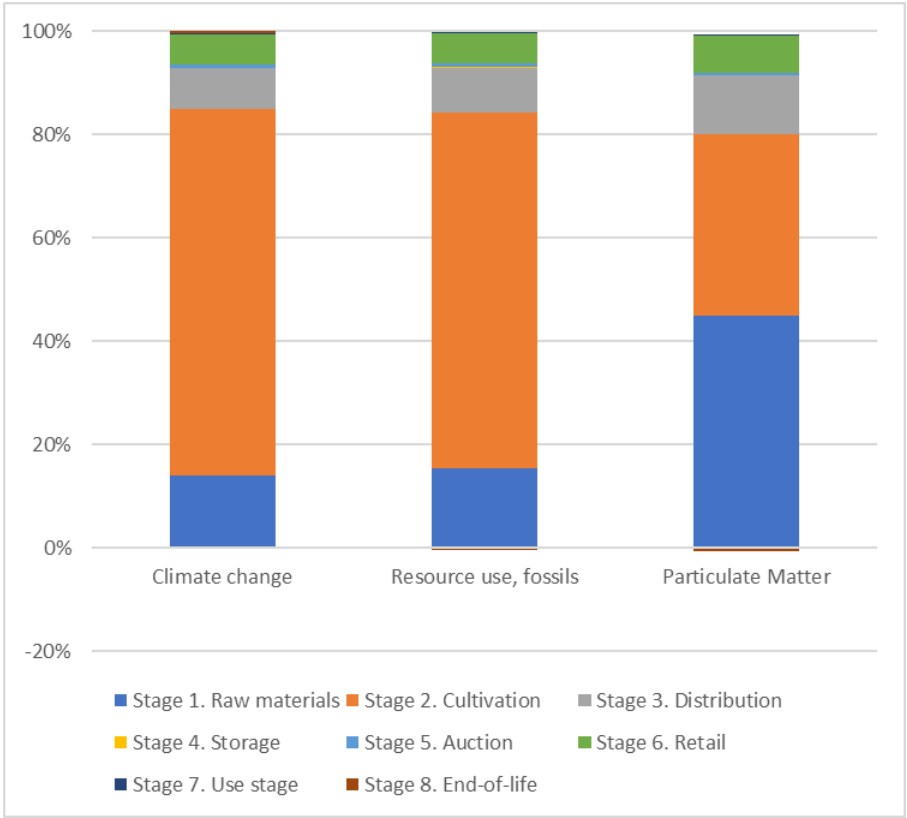
Characterised results of all EF impact categories as absolute values

Impact category	Unit	Total	Stage 1. Raw materials	Stage 2. Cultivation	Stage 3. Distribution	Stage 4. Storage	Stage 5. Auction	Stage 6. Retail	Stage 7. Use stage	Stage 8. End-of-life
Acidification	mol H+ eq	0.0034	0.0008	0.0018	0.0005	0.0000	0.0000	0.0002	0.0000	0.0000
Climate change	kg CO_2 eq	2.22	0.31	1.57	0.17	0.00	0.02	0.13	0.00	0.01
Climate change - Biogenic	kg CO_2 eq	0.0193	0.0007	0.0169	0.0007	0.0000	0.0000	0.0010	0.0000	0.0000
Climate change - Fossil	kg CO_2 eq	2.20	0.31	1.55	0.17	0.00	0.02	0.13	0.00	0.01
Climate change - Land Use and LU Change	kg CO_2 eq	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ecotoxicity, freshwater	CTUe	8.91	0.00	4.73	0.83	2.75	0.01	0.01	0.58	0.02
Particulate Matter	disease inc.	2.87E-08	1.30E-08	1.02E-08	3.29E-09	2.90E-11	1.03E-10	2.10E-09	1.10E-10	-1.74E-10
Eutrophication, marine	kg N eq	0.0012	0.0002	0.0007	0.0002	0.0000	0.0000	0.0001	0.0000	0.0000
Eutrophication, freshwater	kg P eq	1.26E-05	8.73E-06	2.17E-06	8.05E-07	1.45E-09	9.90E-09	6.30E-07	5.36E-08	2.34E-07
Eutrophication, terrestrial	mol N eq	0.0121	0.0024	0.0066	0.0022	0.0000	0.0000	0.0007	0.0000	0.0000
Human toxicity, cancer	CTUh	3.65E-10	1.76E-10	9.09E-11	6.92E-11	2.28E-13	3.50E-12	2.10E-11	4.78E-12	-5.60E-13
Human toxicity, cancer - inorganics	CTUh	1.49E-22	1.44E-22	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.08E-24	0.00E+00	0.00E+00
Human toxicity, cancer - metals	CTUh	1.02E-10	5.17E-11	1.01E-11	3.06E-11	2.88E-14	5.02E-13	5.54E-12	2.79E-12	3.89E-13
Human toxicity, cancer - organics	CTUh	2.64E-10	1.24E-10	8.08E-11	3.86E-11	1.99E-13	3.00E-12	1.55E-11	1.99E-12	-9.50E-13
Human toxicity, non-cancer	CTUh	6.88E-09	3.43E-09	1.46E-09	1.39E-09	4.64E-12	2.84E-11	4.45E-10	1.08E-10	1.85E-11
Human toxicity, non-cancer - inorganics	CTUh	2.46E-09	8.68E-10	8.74E-10	5.24E-10	2.44E-12	9.38E-12	1.77E-10	1.30E-11	-1.07E-11
Human toxicity, non-cancer - metals	CTUh	4.06E-09	2.27E-09	5.44E-10	8.57E-10	2.19E-12	1.88E-11	2.51E-10	9.49E-11	2.78E-11
Human toxicity, non-cancer - organics	CTUh	6.52E-10	3.26E-10	2.70E-10	2.22E-11	2.46E-13	1.45E-12	3.20E-11	3.12E-13	1.14E-13
Ionising radiation	kBq U-235 eq	0.0643	0.0247	0.0185	0.0096	0.0003	0.0002	0.0127	0.0005	-0.0021
Land use	Pt	11.74	7.72	2.65	0.70	0.00	0.00	0.66	0.00	0.00
Ozone depletion	kg CFC11 eq	5.78E-10	3.59E-10	1.53E-10	6.94E-12	2.46E-13	3.74E-12	3.43E-11	2.32E-11	-1.71E-12
Photochemical ozone formation	kg NMVOC eq	0.0031	0.0007	0.0018	0.0005	0.0000	0.0000	0.0002	0.0000	0.0000
Resource use, fossils	MJ	37.32	5.81	25.95	3.23	0.03	0.28	2.17	0.03	-0.18
Resource use, minerals and metals	kg Sb eq	2.91E-06	2.36E-06	1.29E-07	2.75E-07	2.21E-10	1.75E-09	1.42E-07	6.56E-09	2.40E-10
Water use	m^3 depriv.	0.392	0.060	0.014	0.020	0.000	0.039	0.014	0.243	0.002

Representative product for potted plants (9)

Raw materials (stage 1) and Cultivation (stage 2) are most relevant for all relevant impact categories.

Both stages together cover over 80% of the impact for all relevant impact categories.



Representative product for potted plants (10)

Impact category	% imp. Cat.	Life cycle stage	% LC stage	Process	% process
Climate change	43%	Stage 1. Raw materials	14%	Thermal energy from natural gas {EU+EFTA+UK} | technology mix regarding firing and flue gas cleaning | production mix, at heat plant | MJ, 100% efficiency | LCI result	0.6%
Climate change		Stage 1. Raw materials		Natural gas mix {EU+EFTA+UK} | technology mix | consumption mix, to consumer | medium pressure level (< 1 bar) | LCI result	0.1%
Climate change		Stage 1. Raw materials		Electricity grid mix 1kV-60kV {NL} | technology mix | consumption mix, to consumer | 1kV - 60kV | LCI result	3.2%
Climate change		Stage 1. Raw materials		Corner foam, PS {EU+EFTA+UK} | polymerisation of styrene, foam production | production mix, at plant | 28 kg/m3, tensile strengh: 3 kg/cm2 | LCI result	0.4%
Climate change		Stage 1. Raw materials		Electricity, from CHP, natural gas {NL}	0.4%
Climate change		Stage 2. Cultivation	71%	Thermal energy from natural gas {EU+EFTA+UK} | technology mix regarding firing and flue gas cleaning | production mix, at heat plant | MJ, 100% efficiency | LCI result	35.9%
Climate change		Stage 2. Cultivation		Heat, from CHP, natural gas {NL}	23.0%
Climate change		Stage 2. Cultivation		Natural gas mix {EU+EFTA+UK} | technology mix | consumption mix, to consumer | medium pressure level (< 1 bar) | LCI result	6.8%
Climate change		Stage 2. Cultivation		Electricity grid mix 1kV-60kV {NL} | technology mix | consumption mix, to consumer | 1kV - 60kV | LCI result	1.5%
Climate change		Stage 2. Cultivation		Electricity, from CHP, natural gas {NL}	2.0%
Climate change		Stage 3. Distribution		Corner foam, PS {EU+EFTA+UK} | polymerisation of styrene, foam production | production mix, at plant | 28 kg/m3, tensile strengh: 3 kg/cm2 | LCI result	2.4%
Climate change		Stage 5. Auction	1%	Thermal energy from natural gas {EU+EFTA+UK} | technology mix regarding firing and flue gas cleaning | production mix, at heat plant | MJ, 100% efficiency | LCI result	0.3%
Climate change		Stage 6. Retail	6%	Thermal energy from natural gas {EU+EFTA+UK} | technology mix regarding firing and flue gas cleaning | production mix, at heat plant | MJ, 100% efficiency | LCI result	1.9%
Climate change		Stage 6. Retail		Heat, from CHP, natural gas {NL}	1.1%
Climate change		Stage 6. Retail		Natural gas mix {EU+EFTA+UK} | technology mix | consumption mix, to consumer | medium pressure level (< 1 bar) | LCI result	0.3%
Climate change		Stage 6. Retail		Electricity grid mix 1kV-60kV {NL} | technology mix | consumption mix, to consumer | 1kV - 60kV | LCI result	0.2%
Climate change		Stage 6. Retail		Corner foam, PS {EU+EFTA+UK} | polymerisation of styrene, foam production | production mix, at plant | 28 kg/m3, tensile strengh: 3 kg/cm2 | LCI result	0.1%
Climate change		Stage 6. Retail		Electricity, from CHP, natural gas {NL}	0.1%

Representative product for potted plants (11)

Remember: for FloriPEFCR 2 RP studies have been done.

Both RP studies have informed the drafting of the FloriPEFCR.

The most relevant impact categories, life cycle stages and processes as well as the benchmark results for potted plants and cut flowers are copied into the PEFCR.

Any questions...

...on the RP-study for potted plants?

Representative product for cut flowers

Representative product for cut flowers (1)

Reading guide:

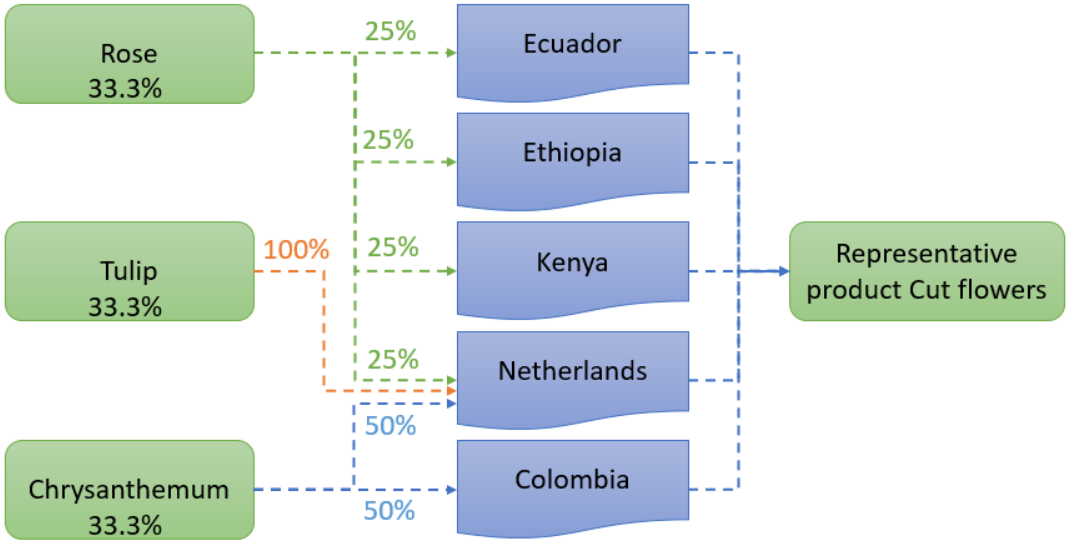
- General
- Goal
- Scope – RP, FU, system boundaries, impact categories, allocation
- Life Cycle Inventory – detailed data in Excel file
- Impact Assessment results – characterised, normalised and weighted
- Interpretation – hot spots
- Validation statement – will follow from review task

Most relevant elementary flows not required for this version!

Representative product for cut flowers (2)

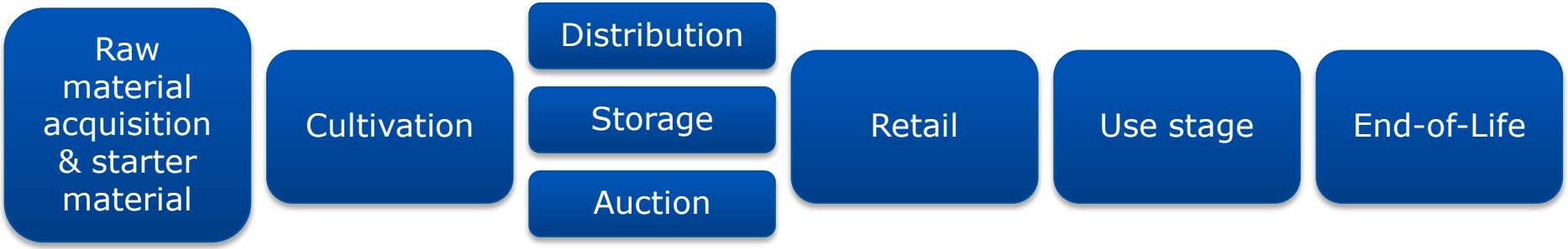
Representative virtual product for cut flowers:

Functional unit: 1 stem

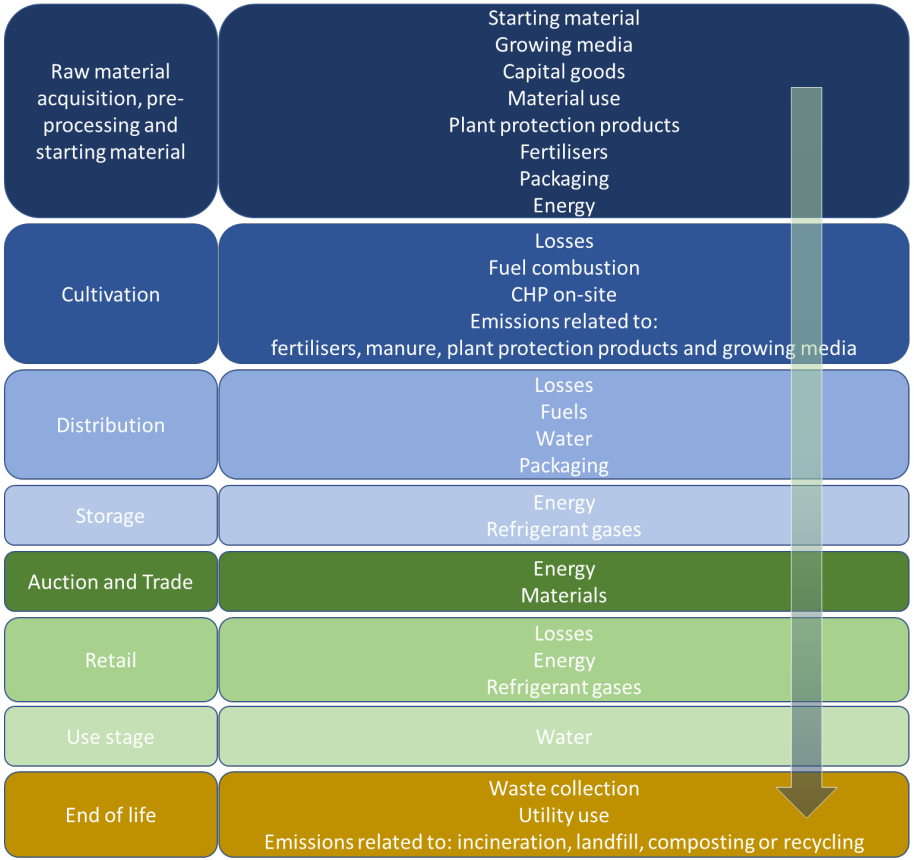


Representative product for cut flowers (3)

System boundaries: full life cycle - cradle to grave



Representative product for cut flowers (4)



Representative product for cut flowers (5)

EF impact category	Impact category indicator	Unit
Climate change • Climate change-biogenic • Climate change – land use and land use change	Radiative forcing as Global Warming Potential (GWP100)	kg CO_2 eq
Ozone depletion	Ozone Depletion Potential (ODP)	kg CFC-11 eq
Human toxicity, cancer	Comparative Toxic Unit for humans (CTUh)	CTUh
Human toxicity, non-cancer	Comparative Toxic Unit for humans (CTUh)	CTUh
Particulate matter	Impact on human health	disease incidence
Ionising radiation, human health	Human exposure efficiency relative to ^{235}U	kBq ^{235}U eq
Photochemical ozone formation, human health	Tropospheric ozone concentration increase	kg NMVOC eq
Acidification	Accumulated Exceedance (AE)	mol H^+ eq
Eutrophication, terrestrial	Accumulated Exceedance (AE)	mol N eq
Eutrophication, freshwater	Fraction of nutrients reaching freshwater end compartment (P)	kg P eq
Eutrophication, marine	Fraction of nutrients reaching marine end compartment (N)	kg N eq
Ecotoxicity, freshwater	Comparative Toxic Unit for ecosystems (CTUe)	CTUe
Land use	• Soil quality index • Biotic production • Erosion resistance • Mechanical filtration • Groundwater replenishment	• Dimensionless (pt) • kg biotic production • kg soil • m^3 water • m^3 groundwater
Water use	User deprivation potential (deprivation-weighted water consumption)	m^3 world eq
Resource use, minerals and metals	Abiotic resource depletion (ADP ultimate reserves)	kg Sb eq
Resource use, fossils	Abiotic resource depletion – fossil fuels (ADP-fossil)	MJ

Representative product for cut flowers (6)

Damage category	Unit	Total	Total
Total	µPt	32.9	100%
Climate change	µPt	12.0	36%
Resource use, fossils	µPt	7.7	23%
Ecotoxicity, freshwater	µPt	2.3	7%
Acidification	µPt	1.9	6%
Photochemical ozone formation	µPt	1.7	5%
Particulate Matter	µPt	1.7	5%
Resource use, minerals and metals	µPt	1.5	5%
Eutrophication, terrestrial	µPt	1.4	4%
Eutrophication, marine	µPt	1.2	4%
Water use	µPt	0.4	1%
Land use	µPt	0.3	1%
Human toxicity, non-cancer	µPt	0.3	1%
Eutrophication, freshwater	µPt	0.2	1%
Human toxicity, cancer	µPt	0.2	1%
Ionising radiation	µPt	0.1	0%
Ozone depletion	µPt	0.0	0%

Hot spot analysis:

The most important impact categories (total 83%):

1) climate change,

2) resource use, fossil,

3) ecotoxicity, freshwater,

4) acidification,

5) photochemical ozone formation and

6) particulate matter

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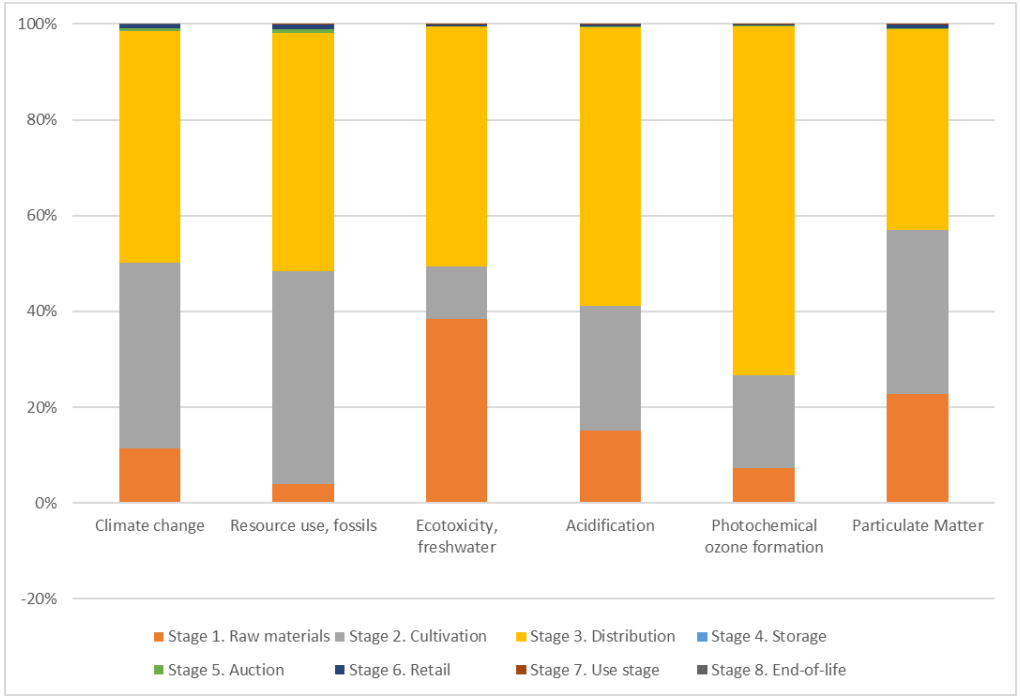
Representative product for cut flowers (7)

The most relevant life cycle stages are:

- Stage 1. Raw materials
- Stage 2. Cultivation
- Stage 3. Distribution

Various combinations of stages cover 80% of the impact depending on the impact category.



Representative product for cut flowers (8)

Most relevant impact category	[%]	Most relevant life stages	[%]2	Most relevant processes	[%]3
Climate change	36.5	Stage 3 Distribution RP cut flowers	48.4	Cargo plane {GLO} | technology mix, kerosene driven, cargo | consumption mix, to consumer | 65 t payload | LCI result	35.6
				Articulated lorry transport, Euro 4, Total weight >32 t {EU+EFTA+UK} | diesel driven, Euro 4, cargo | consumption mix, to consumer | more than 32t gross weight / 24,7t payload capacity | LCI result	7.8
				Carton box {EU+EFTA+UK} | Kraft Pulping Process, pulp pressing and drying, box manufacturing | production mix, at plant | 280 g/m2, R1=47% | LCI result	2.2
		Stage 2 Cultivation RP cut flowers	38.7	Electricity grid mix 1kV-60kV {NL} | technology mix | consumption mix, to consumer | 1kV - 60kV | LCI result	11.6
				Heat, from CHP, natural gas {NL}	8.2
				Electricity, from CHP, natural gas {NL}	6.3
				Natural gas mix {EU+EFTA+UK} | technology mix | consumption mix, to consumer | medium pressure level (< 1 bar) | LCI result	4.0
				Thermal energy from natural gas {RoW} | technology mix regarding firing and flue gas cleaning | production mix, at heat plant | MJ, 100% efficiency | LCI result	2.7

Representative product for cut flowers (9)

Characterised results of all EF impact categories as absolute values

Impact category	Unit	Total	Stage 1. Raw materials	Stage 2. Cultivation	Stage 3. Distribution	Stage 4. Storage	Stage 5. Auction	Stage 6. Retail	Stage 7. Use stage	Stage 8. End-of-life
Acidification	mol H+ eq	0.0017	0.0003	0.0004	0.0010	0.0000	0.0000	0.0000	0.0000	0.0000
Climate change	kg CO_2 eq	0.46	0.05	0.18	0.22	0.00	0.00	0.00	0.00	0.00
Climate change - Biogenic	kg CO_2 eq	0.0009	0.0001	0.0002	0.0007	0.0000	0.0000	0.0000	0.0000	0.0000
Climate change - Fossil	kg CO_2 eq	0.46	0.05	0.18	0.22	0.00	0.00	0.00	0.00	0.00
Climate change - Land Use and LU Change	kg CO_2 eq	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ecotoxicity, freshwater - part 1	CTUe	3.79	0.84	0.44	2.48	0.00	0.00	0.02	0.00	0.00
Ecotoxicity, freshwater - part 2	CTUe	1.39	1.15	0.13	0.11	0.00	0.00	0.00	0.00	0.00
Ecotoxicity, freshwater - inorganics	CTUe	2.84	0.27	0.20	2.36	0.00	0.00	0.01	0.00	0.00
Ecotoxicity, freshwater - metals	CTUe	1.03	0.76	0.08	0.17	0.00	0.00	0.01	0.00	0.00
Ecotoxicity, freshwater - organics	CTUe	1.21E-10	9.13E-11	2.90E-11	1.09E-12	2.10E-23	2.74E-22	7.55E-22	1.30E-14	1.50E-21
Particulate Matter	disease inc.	1.10E-08	2.51E-09	3.76E-09	4.60E-09	2.29E-12	1.58E-11	9.38E-11	3.92E-12	-9.16E-12
Eutrophication, marine	kg N eq	0.0008	0.0001	0.0003	0.0004	0.0000	0.0000	0.0000	0.0000	0.0000
Eutrophication, freshwater	kg P eq	1.16E-05	6.01E-06	4.65E-06	9.39E-07	2.86E-10	2.41E-10	5.99E-09	1.90E-09	1.43E-08
Eutrophication, terrestrial	mol N eq	0.0069	0.0007	0.0016	0.0045	0.0000	0.0000	0.0000	0.0000	0.0000
Human toxicity, cancer	CTUh	1.23E-10	2.05E-11	4.66E-11	5.42E-11	2.00E-14	5.43E-13	4.88E-13	1.70E-13	-2.18E-14
Human toxicity, cancer - inorganics	CTUh	1.57E-22	1.56E-22	0.00E+00	1.56E-24	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Human toxicity, cancer - metals	CTUh	8.10E-11	1.02E-11	3.17E-11	3.89E-11	3.04E-15	9.81E-15	1.06E-13	9.91E-14	3.19E-14
Human toxicity, cancer - organics	CTUh	4.15E-11	1.04E-11	1.49E-11	1.53E-11	1.69E-14	5.33E-13	3.82E-13	7.06E-14	-5.37E-14
Human toxicity, non-cancer	CTUh	3.22E-09	1.02E-09	6.31E-10	1.54E-09	4.51E-13	2.06E-12	1.61E-11	3.84E-12	1.55E-12
Human toxicity, non-cancer - inorganics	CTUh	9.93E-10	1.96E-10	1.45E-10	6.42E-10	1.92E-13	1.37E-12	7.88E-12	4.61E-13	-5.14E-13
Human toxicity, non-cancer - metals	CTUh	1.60E-09	5.01E-10	1.99E-10	8.83E-10	2.57E-13	6.64E-13	8.20E-12	3.37E-12	1.99E-12
Human toxicity, non-cancer - organics	CTUh	6.69E-10	3.33E-10	3.08E-10	2.62E-11	1.39E-14	2.50E-13	2.78E-13	1.11E-14	1.10E-14
Ionising radiation	kBq U-235 eq	0.0113	0.0008	0.0060	0.0033	0.0000	0.0000	0.0012	0.0000	-0.0001
Land use	Pt	3.42	0.79	0.81	1.81	0.00	0.00	0.01	0.00	0.00
Ozone depletion	kg CFC11 eq	1.68E-09	1.65E-09	2.17E-11	8.12E-12	1.75E-14	1.76E-16	1.09E-12	8.25E-13	-1.02E-13
Photochemical ozone formation	kg NMVOC eq	0.0015	0.0001	0.0003	0.0011	0.0000	0.0000	0.0000	0.0000	0.0000
Resource use, fossils	MJ	6.01	0.24	2.68	2.99	0.00	0.05	0.05	0.00	-0.01
Resource use, minerals and metals	kg Sb eq	1.27E-06	1.17E-06	2.66E-08	7.15E-08	2.05E-11	1.32E-10	7.49E-10	2.33E-10	3.47E-11
Water use	m^3 depriv.	0.057	0.009	0.013	0.024	0.000	0.000	0.001	0.009	0.000

Representative product for cut flowers (10)

Remember: for FloriPEFCR 2 RP studies have been done.

Both RP studies have informed the drafting of the FloriPEFCR.

The most relevant impact categories, life cycle stages and processes as well as the benchmark results for potted plants and cut flowers are copied into the PEFCR.

Any questions...

...on the RP-study for cut flowers?

FloriPEFCR – category rules for cut flowers and potted plants

1st draft FloriPEFCR (1)

Reading guide:

- Introduction and general information
- PEFCR scope – RPs, FU, system boundaries, limitations
- Most relevant impact categories, LCS and processes
- Life Cycle inventory – mandatory company specific data, DQR, secondary data, allocation
- Life Cycle Stages – instruction on how to develop the inventory
- PEF results – benchmark results cut flowers and potted plants

1st draft FloriPEFCR (2)

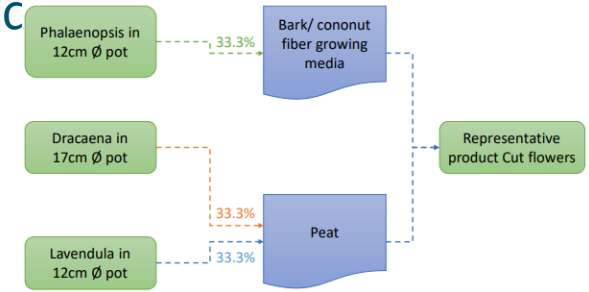
Report still contains marked text, it is a draft:

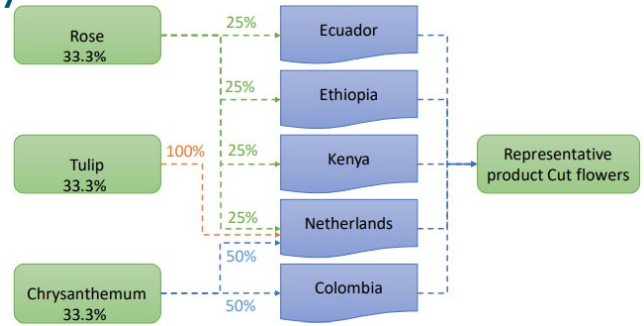
- Grey: guidance for text from PEFCR template – will be deleted in final
- Green: compulsory text from PEFCR template
- Yellow: remaining discussions, future work

1st draft FloriPEFCR (3)

The chapter on Scope (chapter 3) starts with a list of categories and codes from the Classification of Products by Activity (CPA) that are covered by this PEFCR.They are all products covering pot plants and cut flowers.

Then the Representative Products underlying the benchmark results are explained:





1st draft FloriPEFCR (4)

In chapter 4 the most relevant impact categories, life cycle stages, processes (and elementary flows, not in this version) are given.

These are taken from the RP studies.

1st draft FloriPEFCR (5)

Life Cycle Inventory (chapter 5):

1) processes for which company-specific data shall be collected.

2) rules for additional company-specific data.

3) data quality requirements (DQR) and calculation of DQR are explained

4) which secondary datasets to use

5) modelling rules for allocation in case of multifunctional processes,

electricity modelling, climate change modelling and modelling of end-of-life and recycling.

1st draft FloriPEFCR (6)

Mandatory company-specific data shall be collected for:

1) Raw material acquisition, pre-processing and starting material:
    - Starting material use
    - Growing media use
    - Fertilizer and manure use
    - Use of plant protection products
    - Packaging
    - Other material use
2) Cultivation emissions and resources
3) Combined Heat and Power unit (CHP)
4) Distribution

1st draft FloriPEFCR (7)

- Data Quality rating
- Data Needs Matrix
- Which secondary data to use
- Proxies and data gaps

1st draft FloriPEFCR (8)

Allocation challenges:

a) Combined heat and power (CHP) at the farm

→Energy allocation between electricity and heat

b) Use of carbon dioxide from third parties

→ Only purification and logistics of the CO2

c) Growing media

→ 100% of the carbon in peat is attributed to the grower

→ 100% of the composting process is attributed to the next lifecycle

d) End-of-life: Circular Footprint Formula

1st draft FloriPEFCR (9)

Life Cycle Stages (chapter 6):

Phase 1 – Raw material acquisition, pre-processing and starting material – Growing media

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data shall be collected on:

- quantity of growing media in volume/weight,
- sourcing country,
- packaging material, and
- share of carbon in the growing media that is considered as fossil shall be collected (peat constituent carbon content)

1st draft FloriPEFCR (10)

Phase 2 – Cultivation – Emissions from fertiliser application

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1) Direct measurement
2) Preferred modelling
3) Default PEFCR modelling

Parameters, emissions factors and formulas to be used are provided in this chapter.

1st draft FloriPEFCR (11)

Phase 3 – Distribution – Transport from farm to client

- Outbound transport is a mandatory company-specific process. Primary data shall be collected for distribution operations to final client.
- The default loss rate for distribution is based on expert judgement and considered to be 1%.
- The use of packaging material for products being distributed to the customer shall be quantified for secondary and tertiary packaging materials.

1st draft FloriPEFCR (12)

Phase 5 – Auction and trade – energy use and materials

- The user shall indicate the fraction of product being sold via the auction facilities. The default data for the auction documented in this section can be used.

Resource	Unit	Per kg of product	Per average flower stem*
Electricity from Natural Gas	kWh	4.31E-02	4.65E-03
Electricity from Solar Panels	kWh	3.04E-03	3.28E-04
Diesel consumed for fork lift trucks	L	4.71E-05	5.08E-06
Natural gas consumed for heat	m^3	6.02E-03	6.49E-04
Water	m^3	1.75E-06	1.89E-07
*including all packaging (flower + pack = 108 gr)			

- Losses during storage are modelled in the distribution stage.

1st draft FloriPEFCR (13)

Chapter 7 – PEF results:
1) Cut Flowers
2) Potted Plants

Characterised, Normalised and Weighted results

This chapter also indicates

- that the user of the PEFCR shall calculate the PEF profile of its product in compliance with all requirements included in this PEFCR
- which information should be in the PEF report.

1st draft FloriPEFCR (14)

Chapter 8 – Verification:

PEF studies conducted according to FloriPEFCR should be verified.

→ General requirements for verification given in PEF method.

→ Verifiers shall verify that the PEF study is conducted in compliance with this PEFCR.

Specific elements which shall be part of the verification process are given in this chapter.

1st draft FloriPEFCR (15)

This was an introduction and reading guide to the 1st draft of the FloriPEFCR.

This webinar is meant as a preparation for your contribution to the public consultation.

Please dive into the files and

we look forward to your feedback!

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Any questions...

...on the PEFCR for cut flowers and potted plants?

Q&A session with members of the TS

Thanks for your interest!

Register for public consultation via project website:
https://www.wur.nl/nl/project/Developing-Product-Environmental-Footprint-Category-Rules-for-floriculture.htm

Interest to join our support studies: email to floripefcr@wur.nl