

## Supplementary Materials

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## B: Identified Stakeholders in the Dutch Plastic Sector

Organization	Actor	Type	# Mentioned in News	National Agreement on CE	Plastic Pact
4PET Recycling	Market	Business	3	yes	yes
ABN Amro	Market	Business	2	yes	yes
Aterro	Market	Business	3	yes	yes
Coöperatie Green Events Nederland	Market	Business		yes	yes
Friesland Campina Nederland B.V.	Market	Business		yes	yes
Ioniqa Technologies B.V.	Market	Business	2	yes	yes
Philips	Market	Business	4	yes	yes
Quality Circular Polymers (QCP)	Market	Business	2	yes	yes
SUEZ Recycling & Recovery Netherlands	Market	Business	2	yes	yes
Unilever	Market	Business	5	yes	yes
Veolia Polymers	Market	Business	2	yes	yes
Vereniging Afvalbedrijven	Market	Association	1	yes	yes
A New Zero	Market	Consultancy		yes	yes
TNO	Market	Consultancy	2	yes	yes
Foundation Natuur & Milieu (Nature & Environment Foundation)	Civil Society	Foundation		yes	yes
Foundation MVO Nederland	Civil Society	Foundation		yes	yes
Foundation Polymer Science Park	Civil Society	Foundation		yes	yes
Plastic Whale	Civil Society	NGO		yes	yes
National Government (Minister for the Environment and the Minister of Economic Affairs, also on behalf of the Minister for Housing and the Central Government Sector, and the Minister for Foreign Trade and Development Cooperation)	State	National	22	yes	yes
AEB Amsterdam	Market	Business	1	yes	
Afvalzorg	Market	Business		yes	
AkzoNobel	Market	Business		yes	
Boskalis	Market	Business	1	yes	
GreenWavePlastics	Market	Business		yes	

Interface	Market	Business	1	yes	
KplusV	Market	Business		yes	
MKB Nederland (representing small and medium-sized enterprises)	Market	Business	1	yes	
Natural Plastics	Market	Business		yes	
Packaging & Distribution Innovators BV	Market	Business		yes	
RoyalhaskoningDHV	Market	Business	1	yes	
Triodos Bank	Market	Business	1	yes	
UNIK (Unie Nederlandse Industriële Kunststofbewerders)	Market	Business		yes	
Van Gansewinkel Groep	Market	Business		yes	
Van Werven Plastic Recycling	Market	Business	1	yes	
Vita Plastics	Market	Business		yes	
Vereniging Circulair Friesland	Market	Association	2	yes	
Afvalfonds Verpakkingen	Market	Branch organisation	3	yes	
Commissie Toezicht Monitoring Verpakkingen (= Afvalfonds Verpakkingen)	Market	Branch organisation	1	yes	
CE Delft	Market	Consultancy	3	yes	
Kennisinstituut Duurzaam Verpakken	Market	Consultancy	5	yes	
Nationaal Duurzaamheid Instituut	Market	Consultancy	1	yes	
VNO-NCW (Confederation of Netherlands Industry and Employers)	Market	Employee organisation	1	yes	
Stichting Nedvang	Market	Foundation	1	yes	
IPO, Interprovinciaal Overleg (Association of Provincial Authorities)	State	Association		yes	
Unie van Waterschappen (Association of Dutch Regional Water Authorities)	State	Association		yes	
Vereniging van Nederlandse Gemeenten (Association of Netherlands Municipalities)	State	Association	2	yes	
Province Drenthe	State	Province		yes	
Province Flevoland	State	Province		yes	
Province Fryslân	State	Province		yes	

Province Gelderland	State	Province		yes	
Province Groningen	State	Province		yes	
Province Noord-Brabant	State	Province		yes	
Province Overijssel	State	Province	1	yes	
Province Utrecht	State	Province		yes	
Province Zeeland	State	Province		yes	
Province Zuid-Holland	State	Province		yes	
WasteFreeOceansFoundation	Civil Society	Association		yes	
Milieu Centraal	Civil Society	Foundation	1	yes	
Plastic Soup Foundation	Civil Society	Foundation	4	yes	
Technische Universiteit Delft	Civil Society	Knowledge/Education	3	yes	
Universiteit Utrecht	Civil Society	Knowledge/Education	2	yes	
Dutch Federation of Trade Unions	Civil Society	Trade Union		yes	
FNV	Civil Society	Trade Union		yes	
VCP, Vakcentrale voor Professionals (Trade Union Federation for highly educated professionals)	Civil Society	Trade Union		yes	
Afvalsturing Friesland N.V	Market	Business			yes
Air Events	Market	Business			yes
Albert Heijn	Market	Business	2		yes
Aldi	Market	Business	2		yes
ASN Bank	Market	Business			yes
BRBS Recycling	Market	Business			yes
C.I.V. Superunie B.V.	Market	Business			yes
CLICK-NL	Market	Business			yes
Coca Cola Nederland	Market	Business	8		yes
Coöperatie Royal FloraHolland U.A.	Market	Business			yes
Cumapol B.V.	Market	Business			yes
Ekoplaza Franchise B.V.	Market	Business			yes
Filigrade Sustainable Watermarks B.V.	Market	Business			yes
Gampet Plastics B.V.	Market	Business			yes

Grolsch	Market	Business	1		yes
Haval Disposables B.V.	Market	Business			yes
HEMA B.V.	Market	Business			yes
Hordijk Smitgietverpakkingen B.V.	Market	Business			yes
Hordijk Verpakkingenindustrie Zaandam B.V.	Market	Business			yes
HVC Group N.V.	Market	Business			yes
Inbev Nederland N.V.	Market	Business			yes
Indorama Ventures Europe B.V.	Market	Business	1		yes
ISS Catering Services	Market	Business			yes
Jumbo Supermarkten B.V.	Market	Business			yes
Kunststof Recycling Van Werven	Market	Business			yes
Kunststoffen Sorteer Installatie B.V.	Market	Business			yes
Lidl	Market	Business	1		yes
McDonald's	Market	Business	1		yes
Mojo Concerts B.V.	Market	Business			yes
Morssinkhof Plastics Heerenveen B.V.	Market	Business	1		yes
Nestlé	Market	Business	1		yes
NS Groep N.V.	Market	Business			yes
NS Stations B.V.	Market	Business			yes
Obbotec B.V.	Market	Business			yes
Oerlemans Packaging	Market	Business			yes
PaCombi Group B.V.	Market	Business			yes
Pathé Theatres B.V.	Market	Business			yes
Plus Retail B.V.	Market	Business			yes
PolyStyreneLoop B.V.	Market	Business			yes
Purac Biochem BV (Corbion)	Market	Business			yes
Renewi Nederland B.V.	Market	Business			yes
Sodexo B.V.	Market	Business			yes
Starbucks	Market	Business	1		yes
Total Corbion PLA B.V.	Market	Business	1		yes

Vomar Voordeelmarkt B.V.	Market	Business			yes
Vrumona B.V.	Market	Business	1		yes
Wellman International Ltd.	Market	Business			yes
Federatie Nederlandse Rubber- en Kunststofindustrie	Market	Association	3		yes
NRK Recycling	Market	Association			yes
NRK Verpakkingen	Market	Association			yes
Nationaal Testcentrum Circulaire Plastics (NTCP)	Civil Society	Foundation (research)			yes
Foundation Vierdaagsefeesten	Civil Society	Foundation			yes
Foundation Holland Circular Hotspot	Civil Society	Foundation			yes
Aegon	Market	Business	1		
Airbnb	Market	Business	1		
Alliander	Market	Business	1		
Allianz	Market	Business	1		
Avri (waste processor)	Market	Business	1		
Bayards	Market	Business	1		
Be-Start	Market	Business	1		
Beter Bed	Market	Business	1		
Better Future Company	Market	Business	1		
Broeckx Plastic Recycling	Market	Business	2		
Bureau SLA	Market	Business	1		
Capgemini	Market	Business	1		
Caroda	Market	Business	1		
CeDo	Market	Business	1		
Chevron	Market	Business	1		
De Paauw Plastic Recycling	Market	Business	1		
Deloitte	Market	Business	1		
Desso	Market	Business	2		
DowDuPont	Market	Business	1		
DSM	Market	Business	1		
E&Y	Market	Business	1		



Exxon Mobil	Market	Business	1		
Fairphone	Market	Business	1		
Groene Zaak	Market	Business	1		
G-Star	Market	Business	1		
Ikea	Market	Business	2		
ING	Market	Business	1		
Kraft Heinz	Market	Business	1		
Kras Recycling	Market	Business	2		
Lego	Market	Business	2		
L'Oreal	Market	Business	1		
Nespresso	Market	Business	1		
New Marble	Market	Business	1		
NIBC	Market	Business	1		
Nike	Market	Business	1		
Omrin	Market	Business	2		
Overtreders W	Market	Business	1		
Pepsi	Market	Business	1		
PGGM	Market	Business	1		
PostNL	Market	Business	1		
Rabobank	Market	Business	1		
Red Bull	Market	Business	1		
Renault	Market	Business	1		
RetourMatras	Market	Business	1		
Sabic	Market	Business	1		
Shell	Market	Business	1		
Sita	Market	Business	1		
Spadel Nederland	Market	Business	2		
Swapfiets	Market	Business	1		
Thuiswinkel.org	Market	Business	1		
Volksbank	Market	Business	1		

Walmart	Market	Business	1		
Centraal Bureau Levensmiddelenhandel	Market	Business	1		
Dutch Sustainable Growth Coalition (= Philips, Shell, KLM, Unilever, Heineken, DSM, AkzoNobel, Friesland Campina)	Market	Business	1		
Federatie Nederlandse Levensmiddelen Industrie	Market	Association	1		
Nederlandse vereniging Frisdranken Waters en Sappen	Market	Association	1		
Vereniging Plastics Recyclers Europe	Market	Association	1		
European Commission	State	Supranational	11		
Verenigde Naties	State	Supranational	3		
WTO	State	Supranational	1		
City Amsterdam	State	Municipality	1		
City Groningen	State	Municipality	1		
City Rotterdam	State	Municipality	1		
Grondstoffen- en Afvaldienst	State	Municipality	1		
Noord-Oost Groningen	State	Municipality	1		
Noord-Veluwe	State	Municipality	1		
Algemene Rekenkamer	State	Agency	1		
Centraal Bureau voor Statistiek	State	Agency	1		
Centraal Planbureau	State	Agency	4		
Planbureau voor de Leefomgeving	State	Agency	2		
Rijkswaterstaat	State	Agency	1		
Sociaal- Cultureel Planbureau	State	Agency	1		
Citizen initiatives	Civil Society	Citizen	4		
Ellen MacArthur Foundation	Civil Society	Foundation	2		
Stichting Ideële Reclame	Civil Society	Foundation	1		
Stichting KLEAN	Civil Society	Foundation	1		
Erasmus Universiteit	Civil Society	Knowledge/Education	1		
Open Universiteit	Civil Society	Knowledge/Education	1		
Radboud Universiteit Nijmegen	Civil Society	Knowledge/Education	1		
Rijksuniversiteit Groningen	Civil Society	Knowledge/Education	2		

Universiteit Leiden	Civil Society	Knowledge/Education	1		
Universiteit Maastricht	Civil Society	Knowledge/Education	1		
Universiteit Twente	Civil Society	Knowledge/Education	1		
Universiteit van Amsterdam	Civil Society	Knowledge/Education	1		
Vrije Universiteit	Civil Society	Knowledge/Education	2		
Wageningen Universiteit	Civil Society	Knowledge/Education	7		
Eerlijke Bank- en Verzekeringswijzer (= cooperation between Amnesty International, FNV, Milieudefensie, Oxfam Novib, PAX and World Animal Protection)	Civil Society	NGO	1		
Greenpeace	Civil Society	NGO	2		
Recycling Netwerk (cooperation between environmental organizations, e.g., Greenpeace)	Civil Society	NGO	4		
Global Footprint Network	Civil Society	Think Tank	1		
GroenLinks	Civil Society	Political party	1		
PVDA	Civil Society	Political party	3		
VVD	Civil Society	Political party	1		
VVD councilor Gooise Meren	Civil Society	Political party	1		

### C: Interview questions

Date

Location

Name:

Organization:

Position:

### Introduction

- Presentations and explanation of CRESTING project.
- Explanation of interview's role in the research.

- Explanation of consent form, and permission for recording.

#### **Background:**

1. What is your position and role in the organization? For how long?

#### **General:**

2. From your experience working in sustainability, what do you see as the main social and ecological issues with regards to plastics?

#### **Circular economy**

3. What does the circular economy mean for you? Is it necessary? Why?
4. Many say that a circular economy can allow the decoupling of economic growth from environmental degradation, do you agree? If not, does this mean that circularity is incompatible with economic growth?

#### **From your organizational perspective**

5. What are your organization's goals for the achievement of the circular plastics economy?
6. What are your organization's activities and projects for the achievement of the circular plastics economy?
7. What obstacles and challenges does your organization face in the transition towards a 100% circular plastics economy? How to deal with them?

#### **Governance and society**

8. Do you have any role in the formulation of circular plastic economy policies at the local, national, and international level? What measures and policies do you promote? Would you like to have a stronger role?
9. Is the current plastic governance system in the Netherlands effective? Why? Why not? How can it be improved?
10. Do you think that the government should increase the involvement of civil society organizations in the construction of policies and practices for the plastic sector?
11. Are the current plastic policies of the EU effective? Why? How can they be improved?

#### **Technical issues with plastics**

12. From your experience, what specific plastics are most circular and sustainable? To what extent are these used? And which ones are the least? Why are these still used?
13. How difficult is it to use only recycled plastics? How much more expensive are they compared to virgin plastics? How to stimulate the demand for recycled plastics?

14. How difficult is it to use only recyclable plastics? How much more expensive are they compared to virgin plastics? How to stimulate the demand for recyclable plastics?
15. What are your perspectives on reusable packaging, including re-usable alternatives to plastic? How much more expensive are they compared to SUP? Are reusable options more or less sustainable than SUP?
16. What are your perspectives on bio-based plastics?
17. What are your perspectives on biodegradable plastics?
18. What are your perspectives on other alternatives to plastic (metal, cardboard, glass, etc.)?
19. What are your perspectives on chemical recycling?
20. What are your perspectives on mining for plastic waste in landfills (urban mining)?
21. What are your perspectives on CO2 plastics?
22. What are the health implications and concerns with recycled and re-usable plastic? How can they be overcome?
23. What are the main ecological and environmental impacts of recycling facilities? How can they be overcome?
24. The Netherlands is one of the largest plastic waste producers in the world. In this context, is recycling enough or should we reduce plastic consumption in general as well?
25. Can there be a future without plastics? Why?

#### **Global Perspectives**

26. How can we deal with leakage of waste plastic to the Global South? Who should be responsible?
27. How can we deal with Ocean plastics and global clean-up activities? Who should be responsible? Considering that most of the pollution comes from river deltas in the Global South, should large corporations or wealthy countries give financial help and technology transfers to help countries in the Global South?
28. What are your perspectives on open-source technologies and community-based plastics recovery and transformation structures?
29. The transition often involves heavy costs through EPR systems, etc., how can we prevent this does not disproportionately fall on the most vulnerable people?
30. Overall, do you think that the transition to a 100% circular plastics economy can be achieved by 2050 as the Dutch Government aims? Why?
31. What policy measures and mechanisms do you find important to foster this transition to Circular Plastic Economy?

#### **Take-aways**

32. What would you like to learn from this research? Do you have further questions, comments, or hints about it?
33. Who else would you recommend we interview in the context of this research? Could you please introduce us to them?

**D: Overview of Interviewees**

#	Sector	Role	Organization	Country
1	State	Senior Policy Advisor	Local governments	NL
2	State	Secretary of Plastic Pact NL	National government	NL
3	Academia	Professor in high-tech recycling	University	NL
4	Academia	Professor in plastic packaging	University	NL
5	Academia	Postdoctoral researcher in plastic packaging design	University	NL
6	Civil Society	Senior Program Leader CE	Environmental organization	NL
7	Civil Society	Director	Environmental organization (international)	NL
8	Civil Society	Chemical engineer	Non-governmental organization specializing in the Global South	NL
9	Civil Society	Innovation & Solution Manager	Environmental organization	NL
10	Business	1) Technical Engineer 2) Plastic Manager	Large recycling firm	NL
11	Business	Business Development Manager	Large recycling firm	NL
12	Business	Director	Large recycling firm	NL
13	Business	1) Innovation Consultant 2) Director of Policy, Advice, and Public Affairs	Branch association for plastic producers	NL
14	Business	Director	Plastic producers (International branch association)	NL
15	Business	Director	Plastic producer (Bio-based)	NL
16	Business	Managing Director	Plastic producer (Trade association)	NL
17	Business	Sustainability Director Benelux	Plastic applier (Multinational product-consumer brand)	NL

18	Business	Sustainability Manager	Plastic applier (Multinational brand owner)	NL
19	Business	Corporate Sustainability	Plastic applier (Multinational retail firm)	NL
20	Business	Director	Consultancy in biotechnology	NL
21	Business	Director	Consultancy in packaging	NL
22	Business	Associate Director	Consultancy in circular economy	NL
23	Business	Consultant household waste	Consultancy in circular economy	NL
24	Business	Director	Consultancy in circular economy, chemical recycling, and bioplastic	NL

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## E: Q-survey process

### Consent text



Thank you for your participation in this research conducted by Martin Calisto Friant and Dirkjan Lakerveld from Utrecht University's Copernicus Institute of Sustainable Development.

Your anonymity in this study will be assured and participation in this research is voluntary. You can decide to leave the study at any time of your choosing. The results may be reported in scientific journals, at academic conferences and policy events but will exclude any information that could reveal the identity of the participant. The results from this study will be stored in a secure password-protected domain and only the principal observer and trained researchers will have access to the material. Your personal data will not be shared with any third party outside the research team.

This research is part of the CRESTING project (<http://cresting.hull.ac.uk/>), which aims to develop cutting edge systematic analysis of circular economy-related activity and initiatives in a range of geographic and economic settings. The CRESTING project is funded by the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 765198.

If you have any questions or concerns about the research, please feel to contact:

Martin Calisto Friant  
Phone: +31 636 08 7300  
E-mail: [p.m.calisto@uu.nl](mailto:p.m.calisto@uu.nl)

I DO NOT AGREE

I AGREE

### Instruction text (1)



Welcome to the Utrecht University **CRESTING** project survey on the circular plastic economy.

The questionnaire consists of four steps and takes 25 to 40 minutes in total. This part of the research aims to gain insight in which action statements **you consider most and least important** for a more circular and sustainable future for plastics in the Netherlands.

Please always keep the following question in mind when ranking the statements:

**“How important do you consider the following action statements in the transition to a sustainable circular plastics economy in the Netherlands?”**

Below is a brief explanation of the steps to help you through the process.

**1. Pre-sort the statements** (+/- 5-10 minutes)

The first stage of the sorting tasks is **pre-sorting**. Read all the 42 statements first. Then, go back to the first statement, and click the icon that corresponds with your feeling, belief, or attitude about the statement. There are three choices: 'not important' (thumb-down icon), 'neutral' (question mark) and 'important' (thumb-up icon). Don't worry about making mistakes at this stage. You can change the sorting and ranking of each statement in the next step. When all the statements have been pre-sorted, you will be directed to the final sorting page.

**2. Sort and rank the statements onto the grid** (+/- 15-20 minutes)

Please drag and drop each card at the top onto the distribution grid ranging on importance from -5 (least important) to 0 (neutral) and +5 (most important). You may find all the statements important, however, please make a choice based on *your* knowledge, opinion, and belief.

Use the zoom in (+) button on the left side of the screen to enlarge the Q-grid and make the statements easier to read. Click the zoom out (-) button to view the entire grid.

You can also:

- Click the help button (the question mark on the right) to view Q Method Software's help page.
- Click the reset button to return all the statements to the three piles and start over. If you click reset, a confirmation dialogue opens. Click Yes to confirm.

## Instruction text (2)

**3. Review your Q-sort** (+/- 5-10 minutes)

When you're done placing the statements onto the distribution grid, please review your Q-sort. Drag and drop the statements to reorder them as you wish.

**4. Submit your Q-sort**

When you're happy with the Q-sort, click the Submit icon.

**5. Final Questions**

Please complete a few final questions.

Do not hesitate in sending us any questions or doubts regarding the questionnaire directly by phone or email.

Martin Calisto Friant

Phone: +31 636 08 7300

E-mail: [p.m.calisto@uu.nl](mailto:p.m.calisto@uu.nl)

START SURVEY

**Pre-sort process**



## Pre-Sort Your Responses

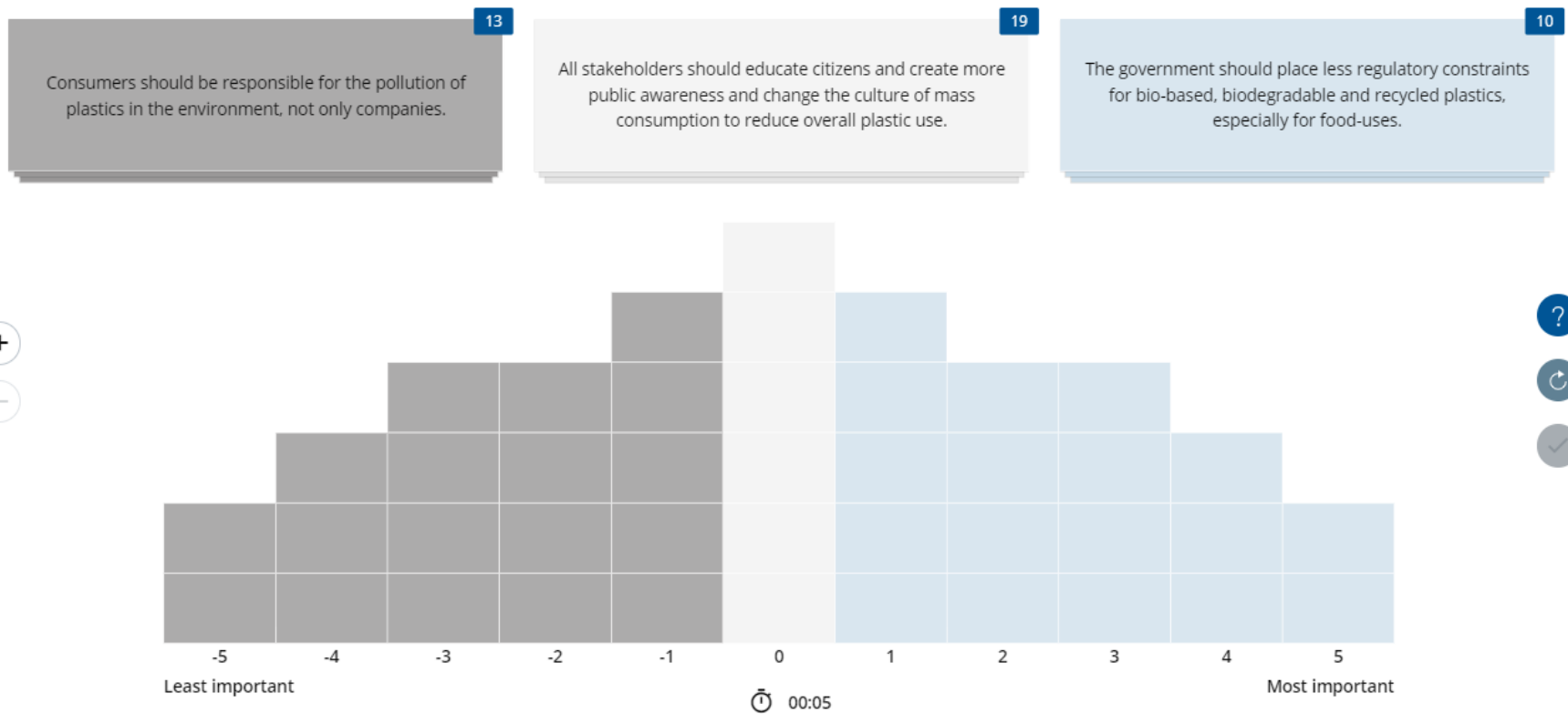
The first stage of the sorting tasks is **pre-sorting**. Read all the 42 statements first. Then, go back to the first statement, and click the icon that corresponds with your feeling, belief, or attitude about the statement. There are three choices: 'not important' (thumb-down icon), 'neutral' (question mark) and 'important' (thumb-up icon). Don't worry about making mistakes at this stage. You can change the sorting and ranking of each statement in the next step. When all the statements have been pre-sorted, you will be directed to the final sorting page.

START Q-SORT

<p>The government should establish a single system for waste management in all municipalities to generate efficient economies of scale for plastic recovery operations.</p> <p>👎 ? 👍</p>	<p>The media should communicate the health and environmental benefits of plastics better, especially compared to alternatives, which can have a higher environmental footprint.</p> <p>👎 ? 👍</p> <p>Most important</p>	<p>The government should establish a fund focused on innovation and R&amp;D of circular solutions (such as new sorting and recycling technologies) financed by fees on virgin materials.</p> <p>👎 ? 👍</p>	<p>The government should place less regulatory constraints for bio-based, biodegradable and recycled plastics, especially for food-uses.</p> <p>👎 ? 👍</p>
<p>The government should place targets to reduce overall plastic consumption per capita.</p> <p>👎 ? 👍</p> <p>Least important</p>	<p>The government and companies from the Global North should establish a fund to finance clean-up activities of plastics in the oceans and other natural ecosystems.</p> <p>👎 ? 👍</p>	<p>The government should establish a fair and just societal system to make sure that all the fees and costs of a circular economy transition for plastics do not fall on the poorest and most vulnerable people.</p> <p>👎 ? 👍</p>	<p>Municipalities should have more autonomy in the management of their recycling systems so that small-scale plastic recovery initiatives can be created and develop disruptive innovations.</p> <p>👎 ? 👍</p>

Etc.

Start of final Q-sort



**Submit final Q-sort**  
 This Q-sort is randomly filled in and was not submitted.





Final Questions

Please complete a few final questions.

What sector is your organisation in? \*

What organisation do you work for? \*

Do you have further comments about the research?

SUBMIT

VIEW Q-SORT

F: Full data recycling percentages Afvalfonds Verpakkingen 2014 – 2019

Year	Brought on the market in Kton	Recycled (R7) in Kton	% Recycled (R7)	% Energy recovery (R8)	Target % recycling (R7) (EU Directive 2018/852)	Target % recycling (R7) (NL: Packaging Management Decree 2014)
2013	468	268	47%	53%	22.5%	43%
2014	474	240	51%	49%	22.5%	44%
2015	492	245	50%	50%	22.5%	45%
2016	505	264	52%	48%	22.5%	46%
2017	519	263	51%	49%	22.5%	47%
2018	526	284	54%	46%	22.5%	48%
2019	523	299	57%	43%	22.5%	49%
2025					55%	55%
2030					60%	60%

Source: Monitoring reports Afvalfonds Verpakkingen 2014, 2015, 2016, 2017, 2018, and 2019.

#### G: Output from PQ Method Software

##### Significant loadings

Significant loadings were calculated, by fulfilling two conditions: 1) EVs<sup>1</sup> > 1, and 2) at least two participants that load significantly on a certain perspective. Significance was determined by using Brown's formula (1980) (multiplying 1.96 with the standard error (which is:  $1 / \sqrt{n}$ )).

where 'n' is equal to the number of statements (i.e., 42). Therefore,  $1.96 * (1 / \sqrt{42}) = 0.302$ . therefore, participants who loaded  $\pm 0.302$  are statistically significant at  $p < 0.05$ . Significant participant loadings on a perspective are marked with an asterisk (\*) in Table A.

The grey boxes in Table A indicate perspectives to which participants belong mostly. Most participants attributed significantly to one of the perspectives. Perspective 1 consists of four people (and three confounders from perspective 3, and one negative loading), perspective 2 has four people (and one negative loading), perspective 3 includes twelve people (and one confounder from perspective 4), and perspective 4 includes four people.

- **Confounders:** In total four confounders loaded significantly on two perspectives. These are participants 4, 16, 17, and 26. Those people are considered to have hybrid views. They are appointed to the perspective where they scored the highest because this gives more meaning to the perspective. During the interpretation, it will be kept in mind that they scored also high on other perspectives.

<sup>1</sup> Eigenvalue or the sum of its squared factor loadings



- **Non-loaders:** People who did not load significantly to one of the perspectives. Only participant 23 did not load significantly, meaning that this person holds a unique point of view, which is inconsistent with other participants, and is therefore excluded from the analysis.
- **Negative loading:** Participants 6 and 21 loaded significantly in the opposite (-) direction on one of the perspectives. This means that they have a significant opposite view compared to the participants who belong to that perspective. In case of participant 21, they were not appointed to any of the perspectives and were therefore excluded from the analysis.

Table 0. (Marked with ‘\*’).

#	Participant	Persp. 1	Persp. 2	Persp. 3	Persp. 4	Extra information
1	CSO1	0.5727*	-0.0712	0.2363	0.0543	
2	GOV1	0.0332	-0.1995	0.6170*	0.1478	
3	PAO1	0.1050	0.2982	0.3433*	0.3018	
4	WMC1	0.1736	0.2940	0.3769*	0.4877*	Confounder 4 and 3
5	PAO2	-0.2419	0.6376*	0.3003	0.0476	
6	CSO2	0.3695*	-0.3871*	0.1746	-0.0826	Negatively significant persp. 2
7	RIN1	0.2864	-0.0270	0.2912	0.3539*	
8	COO1	0.2331	0.0778	0.3672*	0.2290	
9	PPO1	-0.0441	0.6217*	0.1139	0.0582	
10	ANO1	0.0551	0.1380	0.5368*	0.0398	
11	CSO3	0.2269	0.2983	0.4939*	-0.0278	
12	WMC2	0.0932	0.5270*	-0.0418	0.1706	
13	GOV2	0.6160*	0.1815	0.0381	-0.0935	
14	PPO2	0.1698	0.7494*	0.2214	-0.0509	
15	RIN2	0.6906*	0.0152	0.1073	0.1022	
16	WMC3	0.3214*	0.0646	0.5219*	0.2174	Confounder 3 and 1
17	PAO3	0.3144*	0.0757	0.5413*	-0.1169	Confounder 3 and 1
18	COO2	0.1430	0.0181	0.4494*	0.1854	
19	WMC4	0.1855	0.2519	0.4939*	-0.0254	
20	WMC5	-0.0725	0.1275	0.5117*	0.0892	
21	RIN3	-0.3649*	0.2264	0.1497	0.2437	Negatively significant
22	RIN4	0.0183	0.2719	0.1548	0.5020*	
23	PPO3	-0.1207	-0.0203	-0.0267	0.2691	Non-loader
24	PPO4	0.0360	0.0162	0.0298	0.5696*	
25	GOV3	-0.1213	0.0472	0.5158*	0.0182	
26	GOV4	0.3294*	0.2496	0.3434*	0.2190	Confounder 3 and 1

## Z-Scores per Perspective

#	Themes	Q action statements	Z-Scores per perspective			
			Persp. 1	Persp. 2	Persp. 3	Persp. 4
1.	Alternatives to plastic	The government and companies should investigate and promote sustainable alternative materials to plastic.	-0.411	-0.371	-0.091	0.949
2.	Ban export outside the EU	The EU should ban the export of plastic waste outside Europe so plastic waste is recycled and processed within European borders.	1.334	0.454	0.81	0.715
3.	Benefits of plastics	The media should communicate the health and environmental benefits of plastics better, especially compared to alternatives, which can have a higher environmental footprint.	-1.531	1.382	0.947	-0.19
4.	Promote bio-based plastics	The government and companies should encourage and highly increase the use of bio-based plastics.	-0.589	-0.81	-1.257	1.572
5.	Regulate bio-based plastics	The government should highly regulate bio-based plastic to prevent that they compete with food production and biodiversity conservation.	-0.43	0.594	0.787	-1.761
6.	Clean-up fund	The government and companies from the Global North should establish a fund to finance clean-up activities of plastics in the oceans and other natural ecosystems.	0.834	0.499	-1.032	-0.856
7.	Promote compostable plastics	The government and companies should promote the use of compostable plastics for applications where it is suitable (e.g., tea bags, coffee capsules, cups, cutlery, etc.)	-1.47	-0.661	-0.017	1.951
8.	Consumer responsibility	Consumers should be responsible for the pollution of plastics in the environment, not only companies.	-1.833	0.849	0.923	-0.097
9.	Ban controversial fossil plastics	The government should ban plastics made from controversial sources such as tar sands and shale gas.	-0.088	-1.744	-0.596	-0.282
10.	Deposit return system	The government should mandate the establishment of a deposit return systems for all relevant plastics (not just large PET bottles).	1.566	-0.654	0.48	-1.187

11.	Design for sustainability	Companies should always design for recyclability and lower overall environmental impacts throughout a product's lifecycle (including resource use and hazardous substances).	1.272	1.487	1.84	0.905
12.	Discourage incineration	The government should establish financial and legal incentives to discourage the incineration of lower grade plastics (with or without energy recovery) and promote their recycling.	1.157	1.834	0.76	0.569
13.	Education and awareness	All stakeholders should educate citizens and create more public awareness and change the culture of mass consumption to reduce overall plastic use.	0.136	-0.495	-0.21	0.238
14.	Enforcement and control	The government and companies should enforce stronger control policies to prevent mismanaged plastics (illegal dumping and exports to the Global South).	0.59	1.002	0.182	-0.238
15.	Expand EPR to other plastics	The government should expand EPR systems to other plastics currently not covered by EPR schemes.	0.678	1.133	1.099	-0.764
16.	Fair and just societal system	The government should establish a fair and just societal system to make sure that all the fees and costs of a circular economy transition for plastics do not fall on the poorest and most vulnerable people.	0.171	0.691	-1.698	0.667
17.	Global solidarity	Government and companies from the Global North should provide financial assistance and technology transfers to countries in the Global South so they can better manage plastic waste, as that is where most ocean plastics come from.	0.849	-0.599	-1.038	-0.715
18.	Health, safety, and toxicity	Regulatory agencies should strengthen and improve the enforcement of health, safety, and hazardous substances standards (OHS and REACH) on plastic products, as well as their production process.	-1.169	-0.89	-0.29	0.049
19.	EPR inclusiveness and participation	Afvalfonds Verpakkingen should include civil society organizations and local and national government representatives in a participatory and inclusive manner so that its decisions regarding plastics are more democratic and collaborative.	-0.355	0.242	-1.271	-0.049

20.	Increase EPR fees	Afvalfonds Verpakkingen should increase the waste management contribution fee paid to the EPR system because the current price is too low to foster the best recovery practices.	-0.37	-0.668	0.56	-0.38
21.	Innovation fund	The government should establish a fund focused on innovation and R&D of circular solutions (such as new sorting and recycling technologies) financed by fees on virgin materials.	0.355	1.126	-0.019	0.569
22.	Marketing on recyclability	The government and companies should ensure that claims about recyclability and composability are not misleading and deceptive.	0.11	1.345	0.84	0.38
23.	Municipal autonomy	Municipalities should have more autonomy in the management of their recycling systems so that small-scale plastic recovery initiatives can be created and develop disruptive innovations.	-0.896	-0.766	-2.019	-1.523
24.	Ban non-recyclable plastics	The government should ban non-recyclable single-use plastic applications until an effective collecting, sorting, and recycling infrastructure is implemented.	0.896	-1.097	-0.027	-0.808
25.	Open-source innovations	The government, companies, and civil society organizations should promote open-source technologies for plastic collection, sorting, and recycling to expand innovations throughout society.	-0.438	0.868	-0.269	-0.146
26.	Multi-stakeholder participation and collaboration	The government should increase civil society participation and multi-stakeholder cooperation along the entire value chain to improve plastic policies and practices including eco-design, reuse, and recyclability.	0.24	0.724	-0.301	-0.238
27.	Material passport	The government and companies should ensure that all plastic products and packaging have a material passport with the full list of materials and their origin (including all the different polymers and additives) so recyclers know how to process them.	0.391	-2.029	0.387	0.049
28.	Restrict polymer types	The government should restrict the types of polymers and additives allowed in the market so there are only a handful of plastic streams that can be easily sorted and recycled.	-0.574	-1.243	0.876	-1.903
29.	Product ecological footprint	The government and companies should ensure that all products contain a health, environment, and social footprint label (which	-1.163	-0.616	0.485	-1.046

		includes information about the packaging), so consumers have full information to make sustainable choices.					
30.	Recycled content requirements	The government should set high minimum requirements for recycled plastic content in new plastic products.	1.093	-0.943	1.455	1.474	
31.	Recycling bins	The government should provide more recycling bins and containers to people living in large cities, so they do not have to walk large distances to be able to recycle.	-0.678	0.126	-1.013	0.808	
32.	Recycling targets	The government should increase plastic recycling targets.	0.636	0.39	1.48	1.426	
33.	Less regulatory constraints	The government should place less regulatory constraints for bio-based, biodegradable, and recycled plastics, especially for food uses.	-1.669	-0.787	-1.024	1.333	
34.	Renewable energy sources	Companies should strive to use less energy as well as use only renewable energy sources to produce, transport, and recycle plastics.	-0.555	0.192	0.06	-1.236	
35.	Restrict sales in Global South	Companies should not sell non-biodegradable single-use plastic products in countries where the waste system cannot deal with plastic waste (such as in many countries in the Global South).	0.814	-0.647	-1.268	0.954	
36.	Promote reusable packaging	The government and companies should highly increase the use of reusable packaging.	2.101	-0.967	0.538	-0.905	
37.	Short loops	Companies should keep plastic loops short and minimize transport costs by using local products and materials as well as local sorting, recycling, and production facilities.	-2.101	-0.545	-0.651	-1.095	
38.	Employment and social inclusion	The government should help people working in unsustainable sectors of the plastic industry to relocate to the circular plastic economy and especially help the employment of people with poor job prospects.	-0.717	0.42	-1.259	-0.521	
39.	Taxes on plastic	The government should tax virgin fossil-based plastics and non-recyclable plastics and reduce the taxes on recycled plastics.	1.326	0.492	2.275	1.713	

40.	Transparenc y on pledged commitment s	Companies should publicly disclose data on their use of plastics including information on plastic recycling and bioplastics, as well as data regarding the progress on the achievement of pledged commitments such as the Plastic Pact.	-0.362	0.241	-0.25	0.667
41.	Unified municipal system	The government should establish a single system for waste management in all municipalities to generate efficient economies of scale for plastic recovery operations.	0.203	2.002	0.174	0.336
42.	Reduce virgin-plastic consumption	The government should place targets to reduce overall plastic consumption per capita.	0.648	-1.583	-1.362	-1.382

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