Addressing Single-Use Plastic Products Pollution using a Life Cycle Approach

WEBINAR SERIES A – PART 1: ASIA-PACIFIC + EUROPE/AFRICA/WEST ASIA (08:00 GMT ONLINE)

Response to UNEA4 Resolution 9: Addressing single-use plastic products pollution

6 OCTOBER 2020

Economy division, UNEP
1 rue Miollis, Building VII
75015 Paris, France

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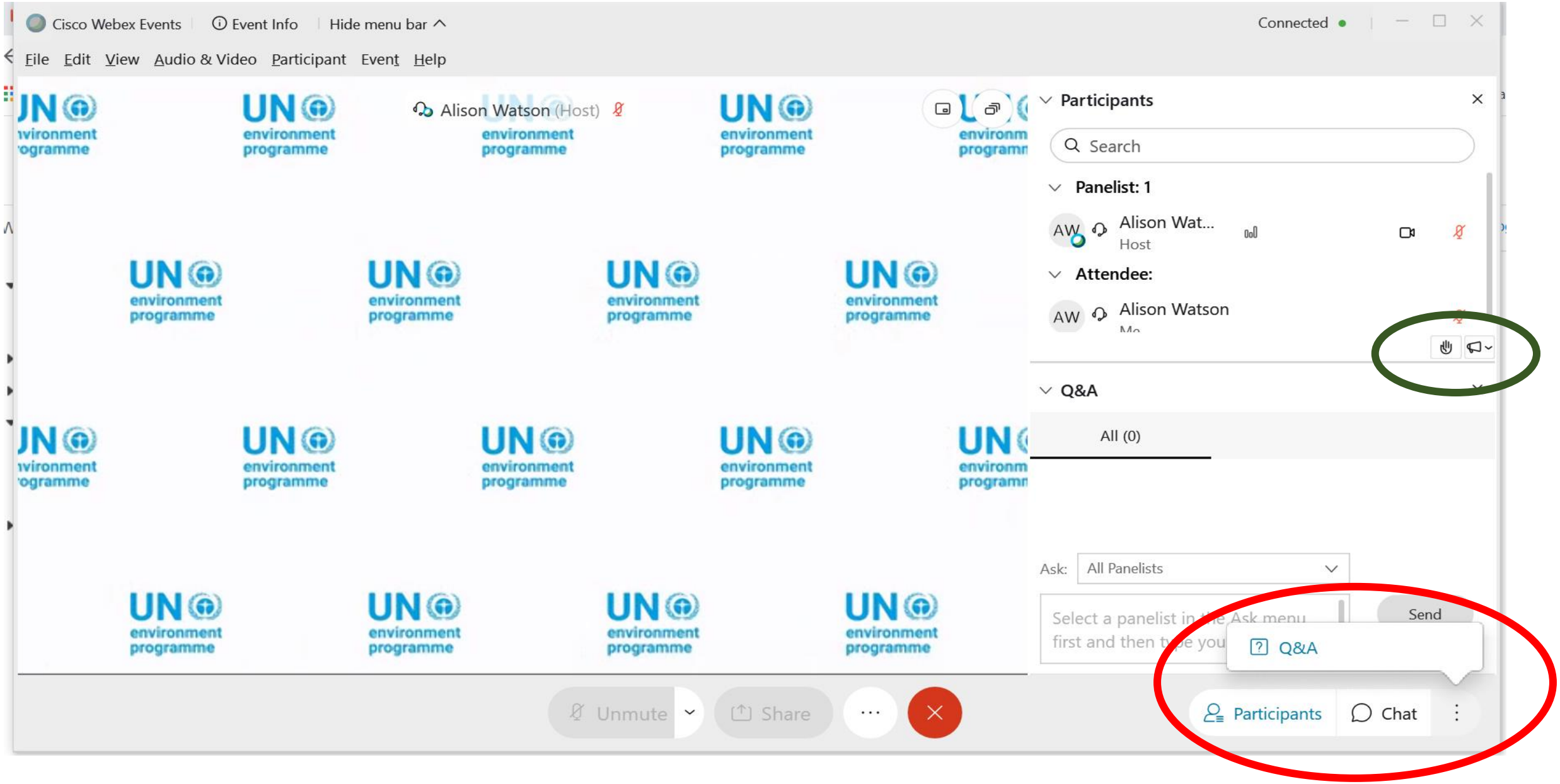

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POLL

Who are we?

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Agenda

Time	Presentation	Speaker
08:00	Onboarding	Alison Watson, UNEP
08:02	**Introduction**	**Llorenc Mila I Canals**, UNEP
08:07	**LCA meta-studies on tableware, beverage cups, nappies, feminine hygiene products**	**Dr Yvonne Lewis**, principle consultant at The Green House & **Dr Philippa Notten**, director at TGH Think Space
08:17	Q & A	
08:27	**20 Years of Government Responses to the Global Plastic Pollution Problem**	**Dr John Virdin** Director, Oceans & Coastal Policy Program Nicholas Institute for Environmental Policy Solutions Duke University
08:37	Q & A	
08:47	**New Zealand**	**Dr Rachel Chiaroni-Clarke** Senior Research and Policy Analyst, **Office of the Prime Minister's Chief Science Advisor, New Zealand**
08:57	**United Kingdom**	**Tom Pye** Team Leader- Resources, Waste and Plastics Strategy, DEFRA, United Kingdom
09:07	Q & A	
09:25	**Summary of session**	**Llorenc Mila I Canals**, UNEP
09:30	Close	Alison Watson, UNEP

Introduction

Why are we here?

Llorenç Milà i Canals
Life Cycle Assessment Team Leader, UNEP
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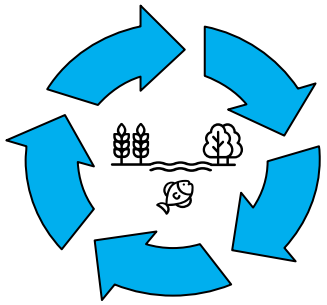
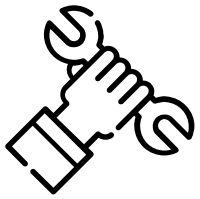
UNEP/EA.4/Res.9

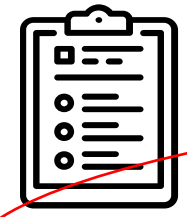
Addressing single-use plastic products (SUPP) pollution (adopted 15 March 2019)

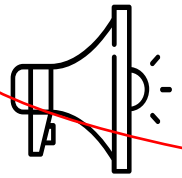
Encourages Member States to deal with the pollution generated by SUPP, considering all environmental impacts across their life cycle.
It requests UNEP to (Operative Paragraph 8, OP8):





- (OP8a) Support development and implementation of ***national or regional action plans***;
- (OP8b) ***Technical and policy support*** regarding the environmental impact of single-use plastic products and the promotion of solutions for their replacement;





- (OP8c) ***Make available existing information*** on ***actions taken*** to address plastic pollution and the ***full life cycle environmental impacts of plastic products and their alternatives*** in advance of UNEA 5.

Life Cycle Initiative

the "***full life cycle environmental impacts***" of products is assessed with Life Cycle Assessment (LCA)…

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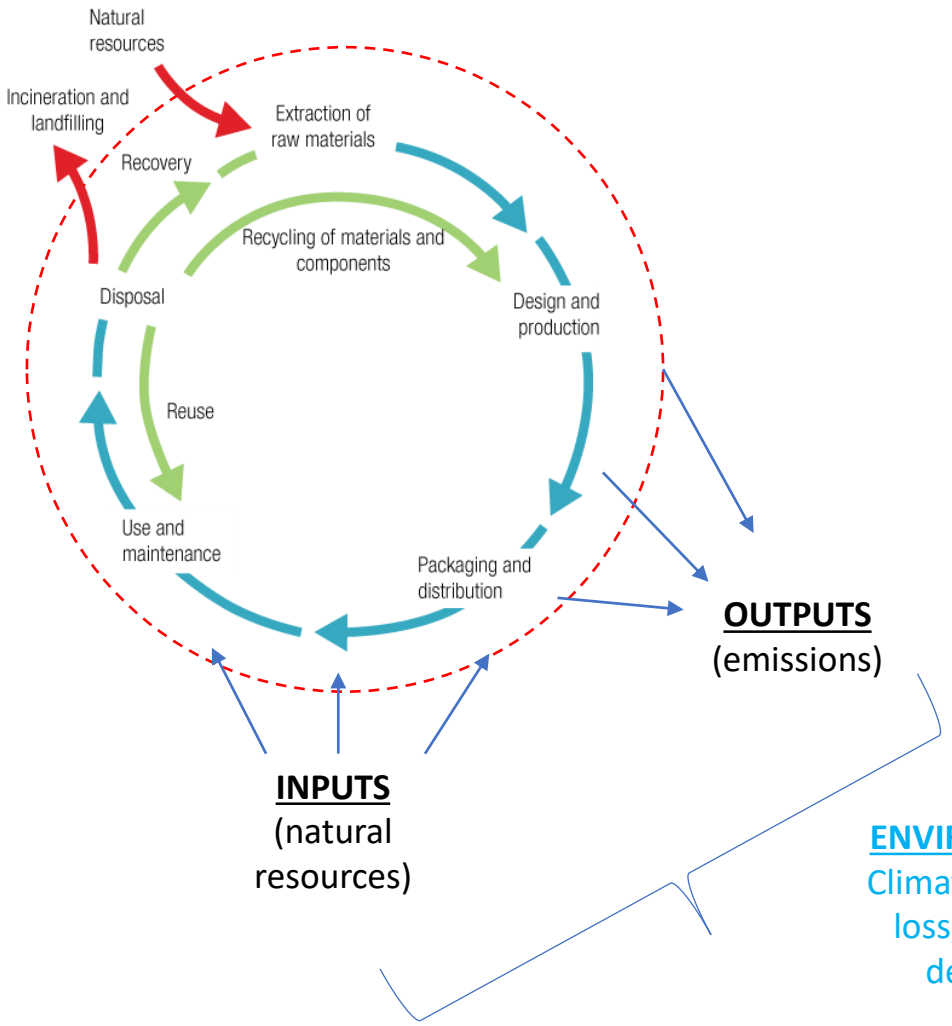
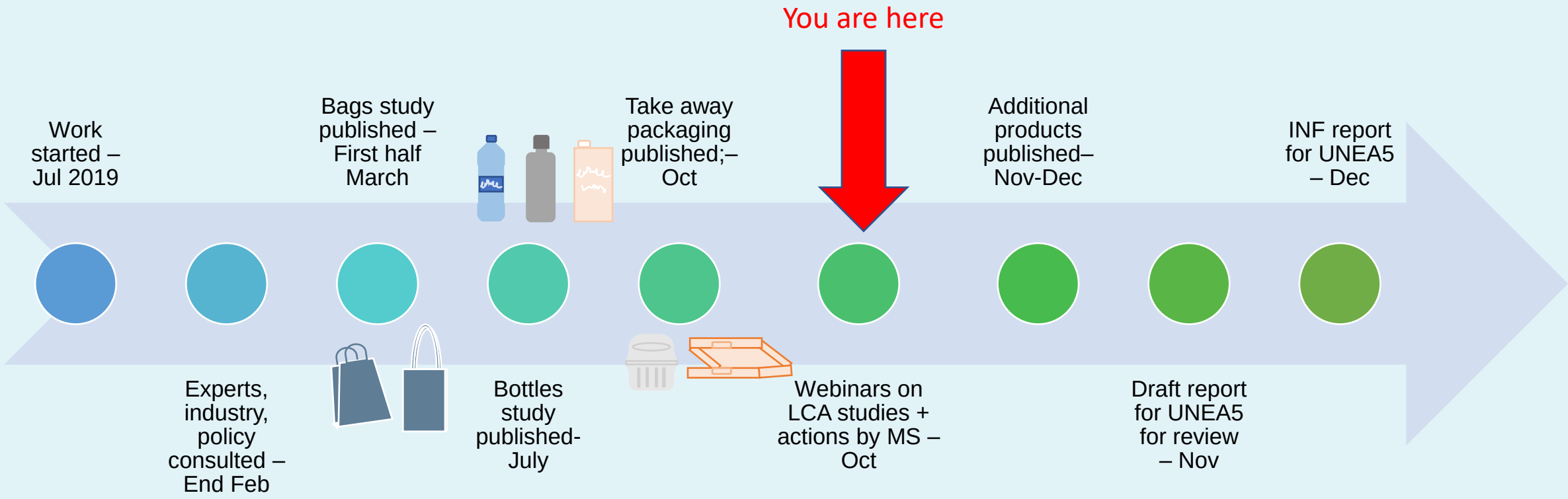
… so what is Life Cycle Assessment (LCA)?



Life Cycle Assessment (LCA) is the "***Compilation and evaluation of the inputs, outputs and the potential environmental impacts of a product system throughout its life cycle***" (ISO 2006)

Check the Life Cycle Initiative's e-Learning modules on Introduction to Life Cycle Thinking

Timeline for the follow-up of the SUPP resolution (OP8c)



LCA studies coordinated by and available through:

Life Cycle Initiative

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Context and goals for today

Reminder of key blocks today

1. Learnings from Life Cycle Assessment Studies
2. Government actions across the world
3. Examples from a sample of governments using LCA in single-use plastic products policy

These are linked to other on-going processes in UNEP:

- Ad Hoc Expert Group on Marine Litter and microplastics stock-taking exercise
- Legislative Guide on single-use plastic products
- One Planet Network-wide Plastics Initiative

- 2-way dialogue!
- Please post questions and comments in the chat
- We are taking today's feedback into the final report!

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LCA Meta-studies:

Tableware, beverage cups, nappies, feminine hygiene products

Dr Yvonne Lewis

& Dr Philippa Notten

LCA meta-studies on beverage cups; tableware; nappies and feminine hygiene products

Dr Yvonne Lewis
Dr Philippa Notten

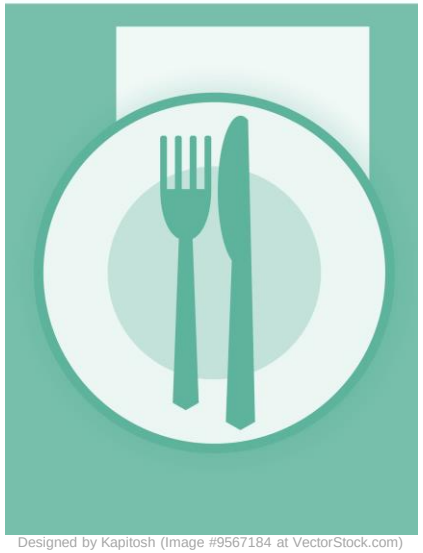
- Single-use plastic products present a significant environmental problem and global challenge
- Alternatives are needed
- Policy makers require information to compare alternatives on the basis of full life cycle environmental impacts

TGH THINK SPACE

Meta-analysis of existing LCA studies

Designed by Nandalal_Sarkar (Image #32016924 at VectorStock.com)

Beverage cups



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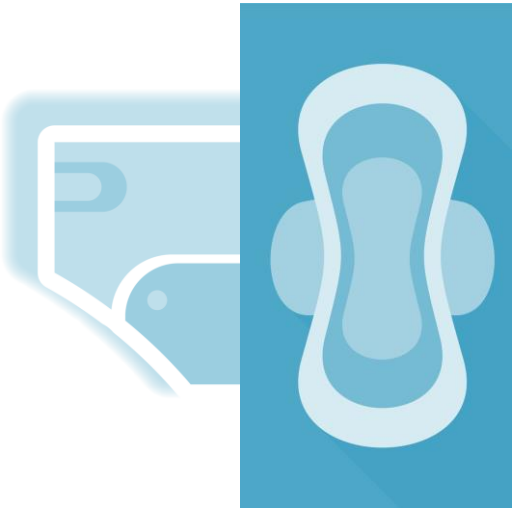
Tableware



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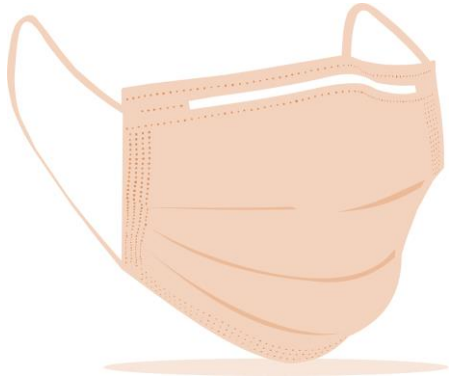
Nappies and feminine hygiene products



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Personal protective equipment (PPE) non-medical

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Beverage cups

Designed by Nandalal_Sarkar (Image #32016924 at VectorStock.com)

	Single-use			Reusable	
	PLA	Plastic	Paper	Plastic	Other
Hot beverages	-	PS	PE-lined, PLA-lined, wax-lined	PP	Glass, ceramic, melamine, bamboo
Cold beverages	PLA	PP, PET, rPET	PE-lined, PLA-lined	PC	Stainless steel

Nine studies included in the meta-analysis

5 x Europe; 4 x North America; 2 x Asia; 1 x Australasia; 1 x global

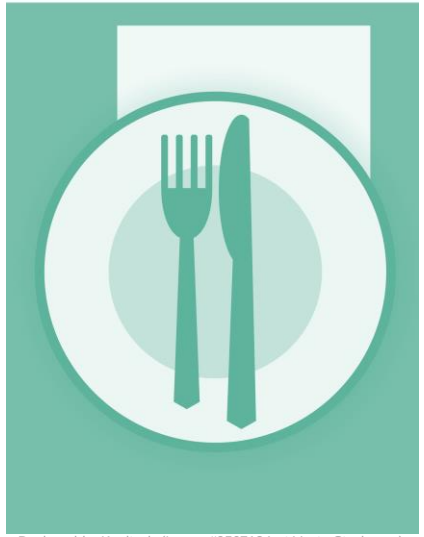
Findings

Beverage Cups

Designed by Nandalal_Sarkar (Image #32016924 at VectorStock.com)

- For **single-use cups** no material performs best or worst
  - **Manufacturing** largest contributor to life cycle emissions followed by end-of-life management
- **Reusable cups** outperform single-use cups regardless of material
- The number of re-uses to “break-even” varies between 10 and 140 uses
  - This depends on materials compared, end-of-life assumptions and washing assumptions
  - **Washing** contributes most to environmental impact, strongly influenced by water temperature and source of electricity

Tableware



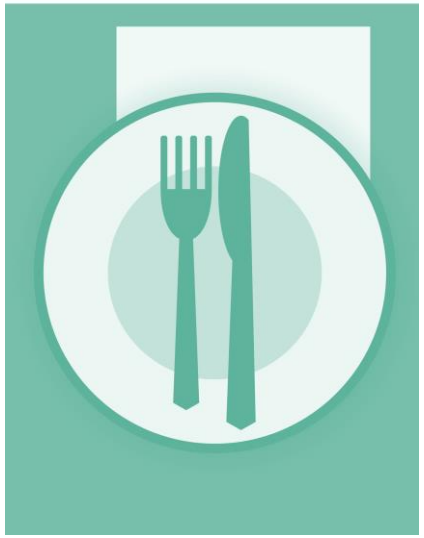
	Single-use			Reusable
	Bio-plastic	Fossil-plastic	Paper/ fibre	Various
Cutlery	Bio-plastic	PS		
Plates and bowls	PLA	rPET, PS, PP	CTMP, bagasse-pulp, LDPE-coated paper	Porcelain
Catering systems	E.g. Cardboard tray, PS plate, PS bowl, PLA cup, PS cutlery E.g. Melamine tray and bowl, porcelain plate, melamine bowl, reusable plastic bowl, stainless-steel cutlery			

Six studies included in the meta-analysis

4 x Europe; 2 x North America

Findings

Tableware



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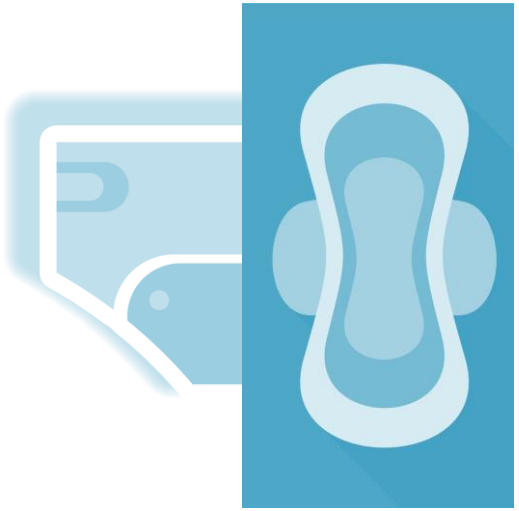
- For **single-use cutlery**
  - Compostable cutlery outperforms plastic cutlery when co-composted with food waste
- For **single-use plates and bowls** – no clear trends
  - The weight of the product and energy mix are key factors
  - Raw material production, manufacturing and end-of-life are the most important life cycle stages
- Comparing with **reusable options**
  - Reusable porcelain plates have significantly lower impacts than all disposable options, except with regards to water use due to washing
  - In all catering systems considered (hospital, school and hotel), the reusable tableware products have lower environmental impacts than the single-use options

Nappies and Feminine Hygiene Products



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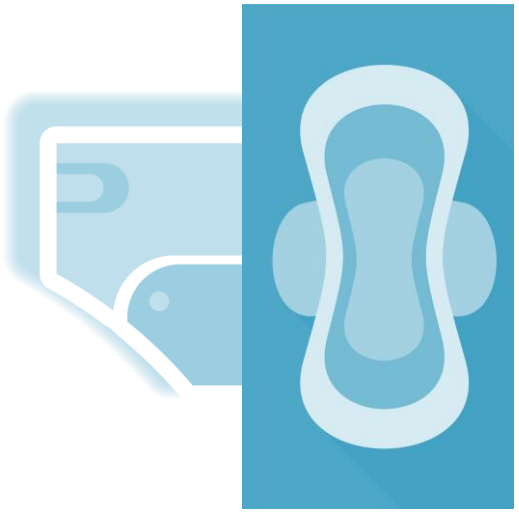
	Single-use	Reusable
Nappies	Disposable nappy, glueless nappy, bioplastic nappy	Terry cloth nappy, pre-folded, shaped nappy
Feminine Hygiene Products	Sanitary pads, tampon, tampon with applicator	Reusable pad, menstrual cup

Six nappy studies included in the meta-analysis
4 x Europe; 1 x South America; 1 x Australia

Three feminine hygiene studies
1 x Europe; 2 x North America; 1 x India; 1 x Africa

Findings

Nappies and Feminine Hygiene Products



- Single use vs. reusable nappies
  - Overall, **cloth nappies have lower environmental impacts** than disposable nappies across nearly all impact categories, with nappy-as-service (industrial laundry) having the best results
  - Glueless nappies outperform conventional plastic nappies and bio-based nappies show potential, especially if composted at end-of-life
- Feminine hygiene products
  - The **reusable menstrual cup** has substantially lower environmental impacts than single-use feminine hygiene products and reusable pads
  - For the menstrual cup, the production of raw materials as well as the use phase (washing) are the most significant life cycle stages
  - Single use tampons perform better than single use pads, particularly if there is no applicator

Considerations for policy makers

Geographic context can strongly influence results:

- Waste management infrastructure
- Energy mix
- Source and type of raw materials
- Recycling rates

Cultural context is equally important:

- Acceptability of reusable alternatives – social norms
- Use behaviour (washing, laundering, changing etc.)
- Access to waste management – likelihood of littering
- Cost

Other issues:

- Recognise and manage trade-offs between environmental impacts
- Understand the limitations of life cycle assessment studies

TGH THINK SPACE

Q & A Session with Dr Yvonne Lewis & Dr Philippa Notten

Please ask your questions in the Q & A Box (All Panellists)

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20 Years of Government Responses to the Global Plastic Pollution Problem

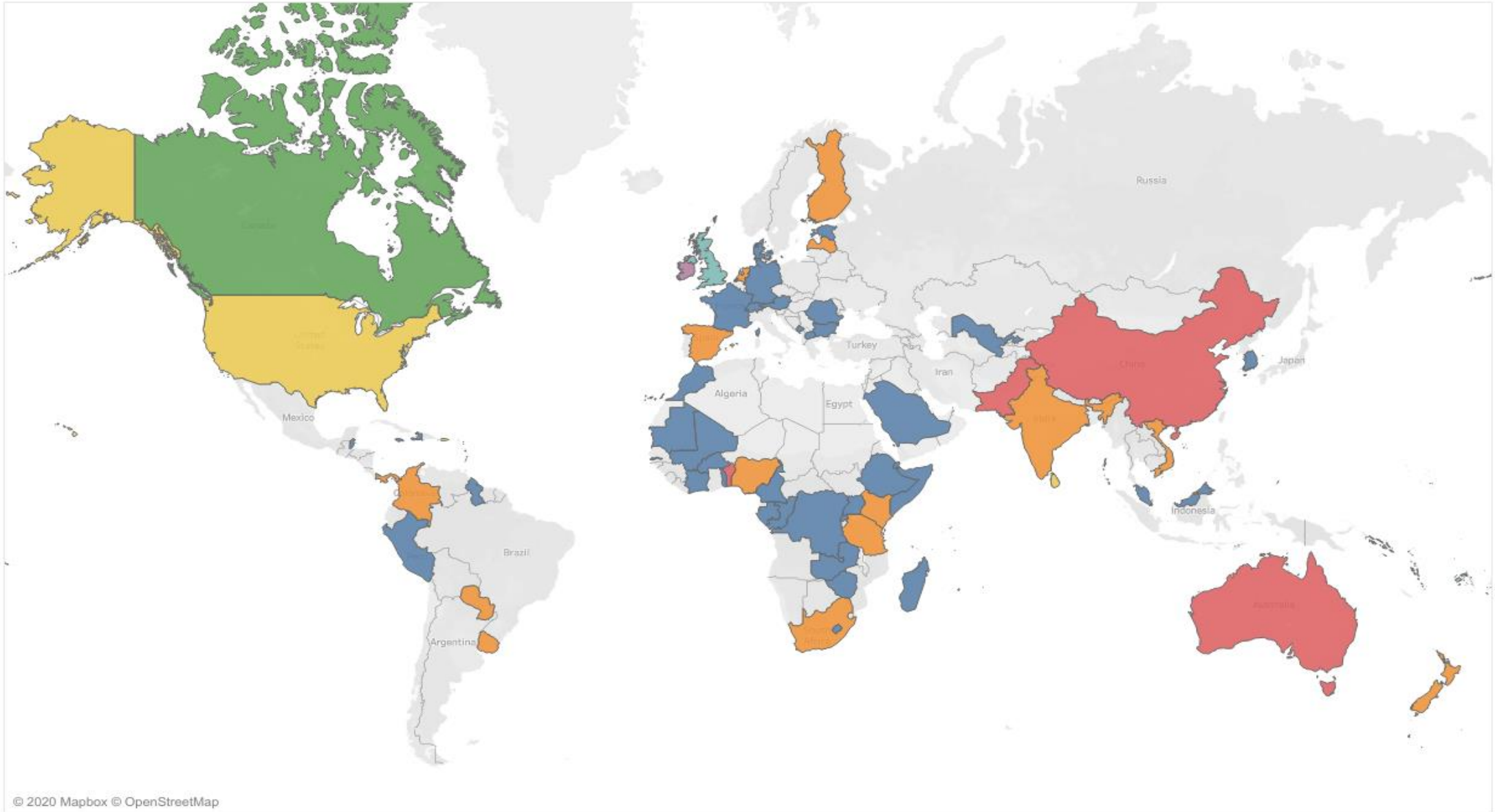
Dr John Virdin

How have governments around the world responded to the global plastic pollution problem (2000 to mid-2019)?

What do we know about what has worked and what didn't?

Rachel Karasik, Tibor Vegh, Zoie Diana, Janet Bering, Juan Caldas, Amy Pickle, Dan Rittschof and John Virdin

National Policies Included in Analysis

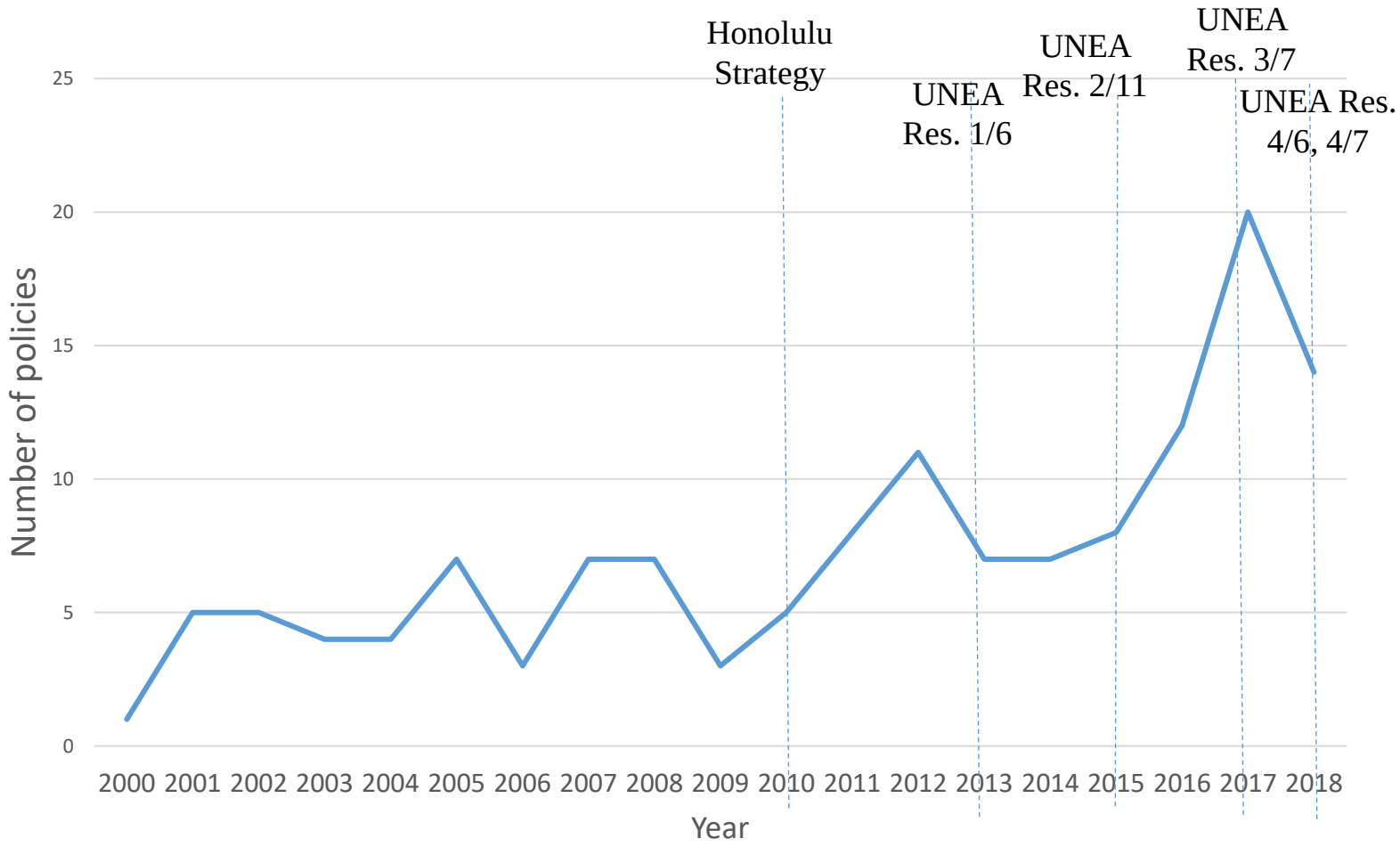


Number of Policies (n=147 total)

1 2 3 4 5 6 7

Key Findings: Policy design – how governments have responded

Clear upward trend in policy responses at every level: international, national and sub-national

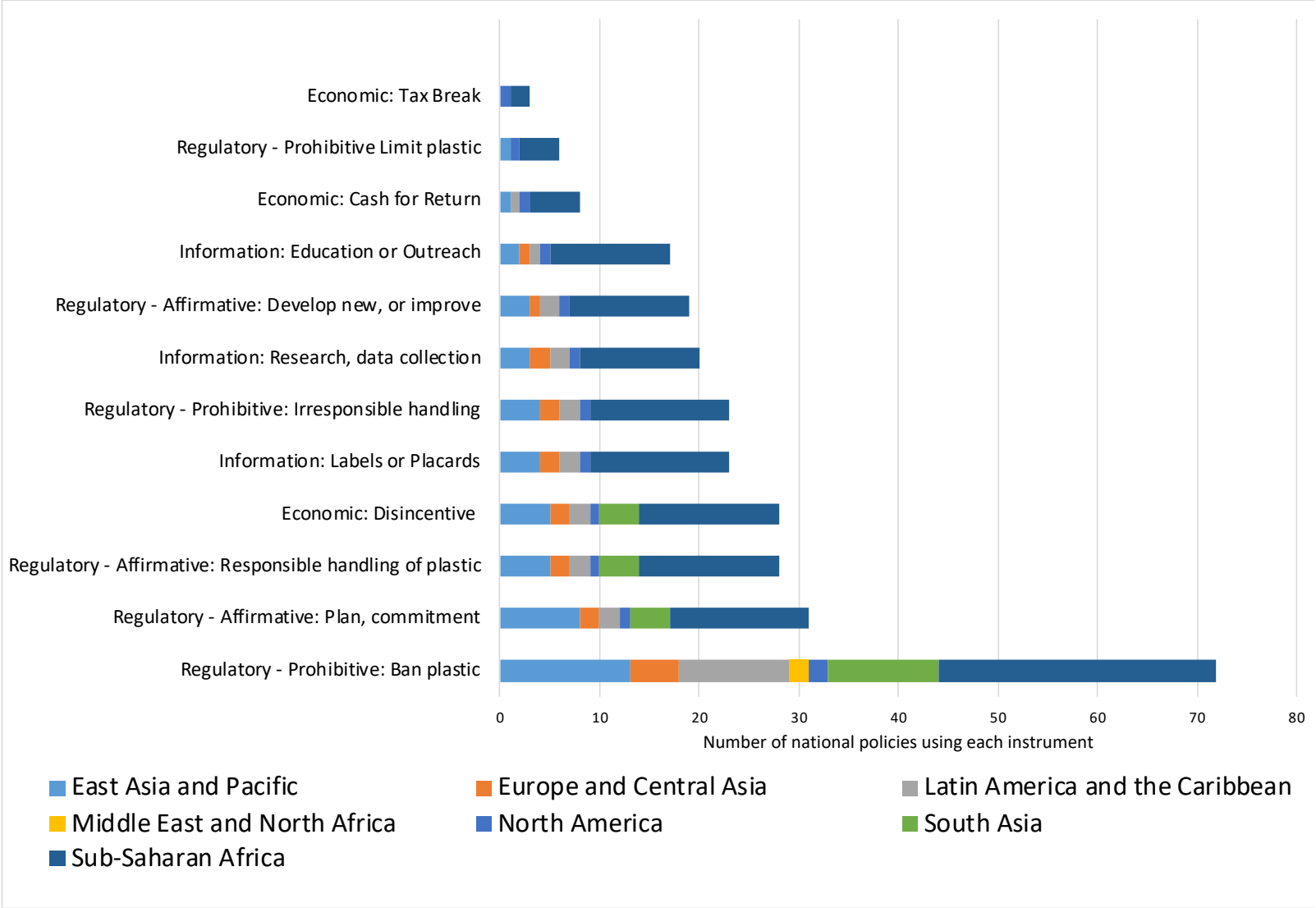


Number of National Plastics Policy Documents Analyzed, with Key Global Policies

Key Findings: Policy design – how national governments have responded

The upward trend in national policy responses largely reflects new policies introduced solely to address plastic bags.

As of mid-2019, governments had banned, taxed or levied fees on various forms of plastic bags in at least 43 countries, w a population of 952 million in 2018 – 3.7 billion if China and India policies included.



Instruments most frequently used by national governments to address the plastic pollution problem in the sample analyzed

Key Findings: Policy design – how governments have responded

Overall, of the top 20 countries producing mis-managed plastic waste from coastal land-based sources (Jambeck *et al.* 2015), 7 have no national policy document or reference in the inventory:

1. Philippines
2. Thailand
3. Egypt
4. Algeria
5. Brazil
6. Myanmar
7. North Korea

Another four have only national policies targeting plastic bags:

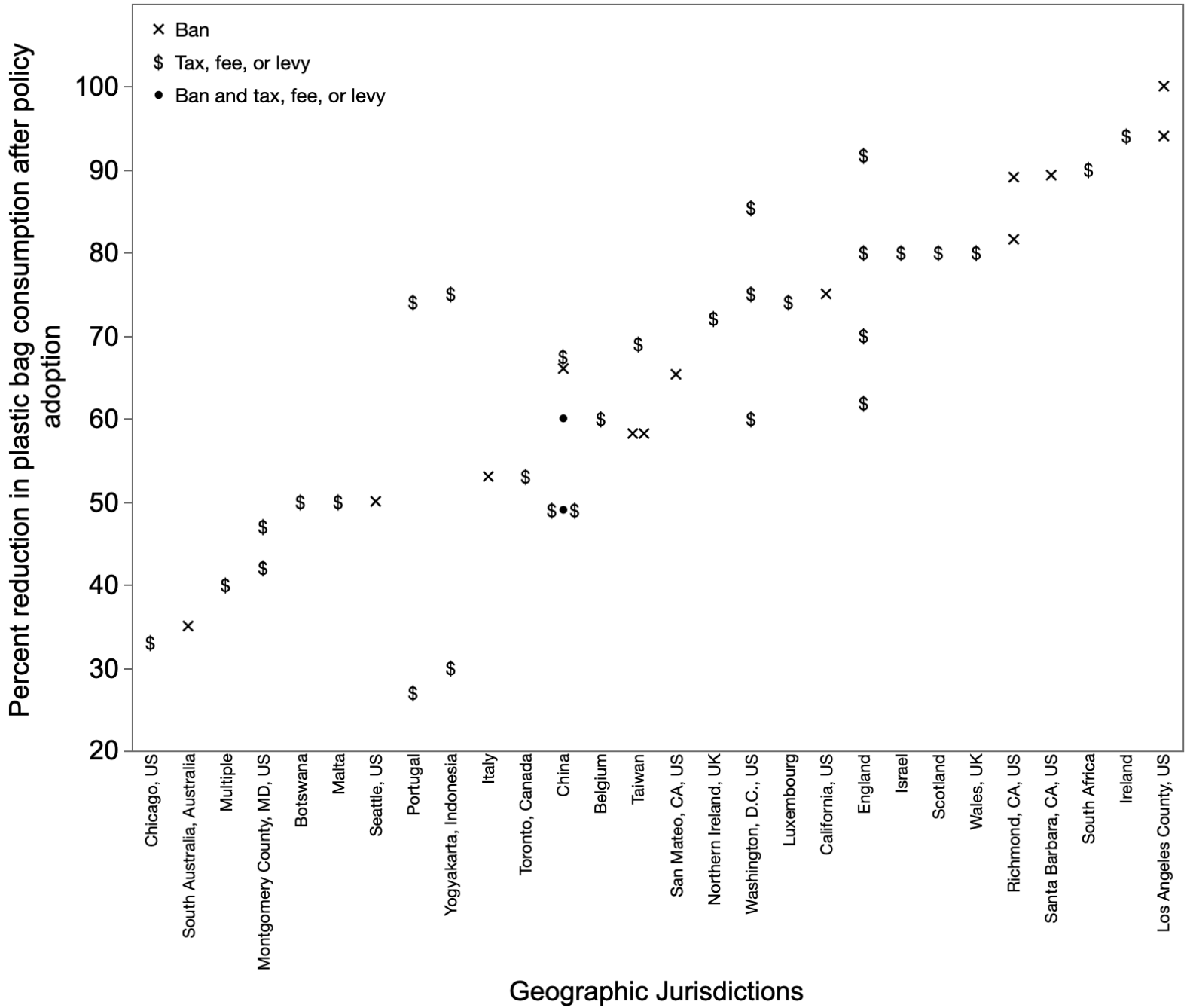
1. Nigeria
2. Bangladesh
3. South Africa
4. Morocco

Over half of the top 20 plastic polluting countries from Jambeck *et al.* (2015) do not have a policy in the inventory or have only a policy targeting plastic bags.

Note: Does not suggest with certainty no national policy exists, nor that presence of a policy indicates an effective response.

Key Findings: Policy effectiveness – what has worked and what hasn't

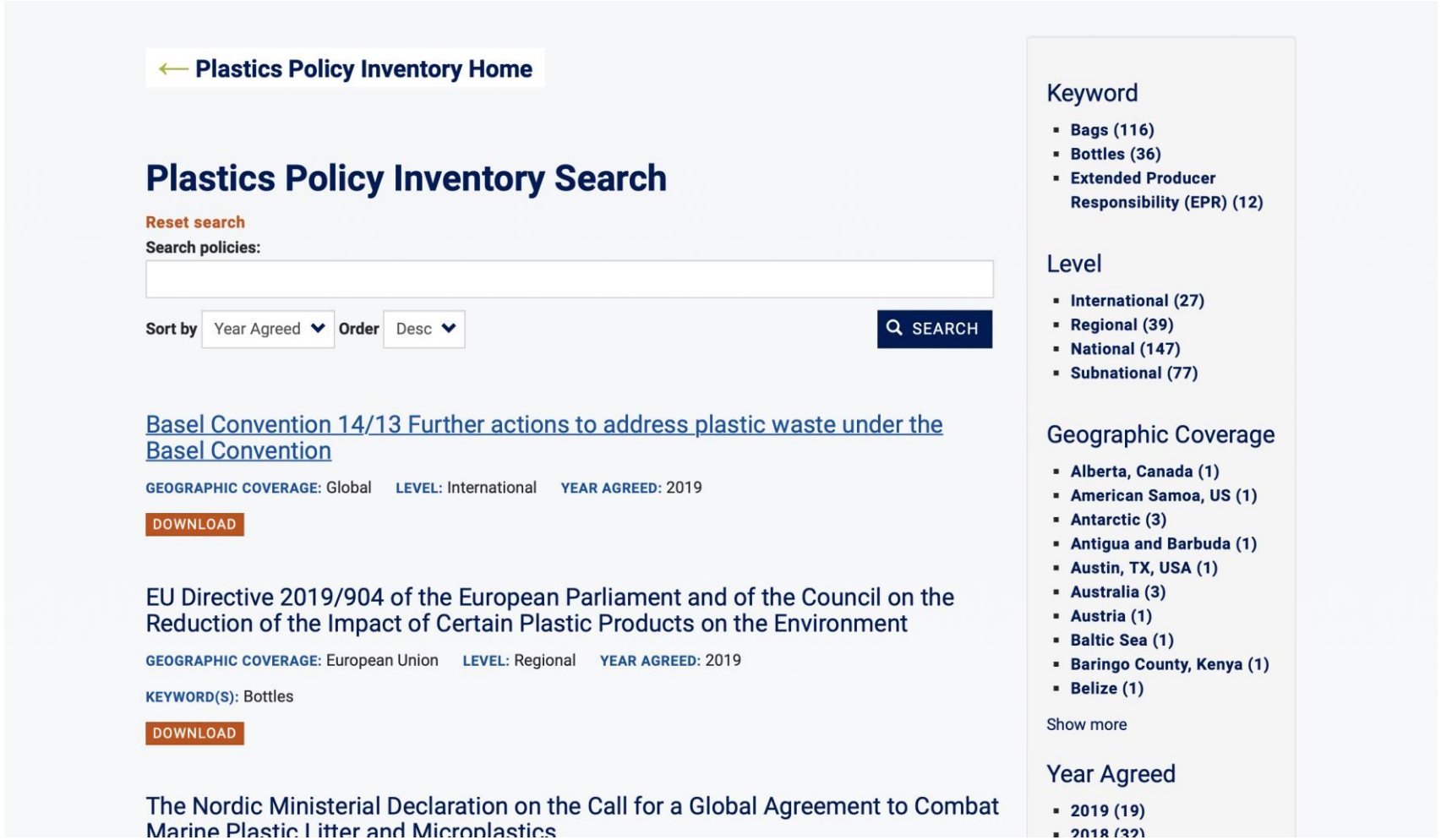
Regardless of the instrument used, significant reductions in plastic bag consumption were consistently measured in the short-term (within 24 months).



Summary of Policy Recommendations in the Scientific Literature

- For responses to all land-based sources, ***increased use of information instruments recommended*** – one of the more consistent recommendations
- For land-based sources of macro-plastic pollution, ***improved solid waste management*** is fundamental, particularly in lower and middle-income countries. Instruments that extend producer responsibility also consistently recommended.
- Larger body of recommendations and observations available for instruments to address plastic bags
- ***Regulatory bans for plastic bags, could be extended to other single-use plastic pollutants*** (e.g. bottles), at least in the short-term
- ***For plastic bottles, cash for return policies*** have been effective in increasing recycling rates and recommended for wider use (based largely on studies in Europe and N America)
- For micro-plastic pollutants, ***regulatory bans of plastic microbeads in all types of cosmetic and personal care products*** are recommended at all levels
- Across all land-based sources of plastic pollution, scientists have consistently called for ***a global treaty***, with global, binding and measurable targets for pollution reduction

Plastics Policy Inventory



https://nicholasinstitute.duke.edu/plastics-policy-inventory

Q & A Session with Dr John Virdin

- Please ask your questions in the Q & A Box (All Panelists)

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Case-Studies: New Zealand & United Kingdom

Rethinking Plastics

in Aotearoa New Zealand

Dr Rachel Chiaroni-Clarke and Professor Juliet Gerrard

Office of the Prime Minister's Chief Science Advisor

Kaitohutohu Mātanga Pūtaiao Matua ki te Pirimia

The state of play when we started Rethinking Plastics

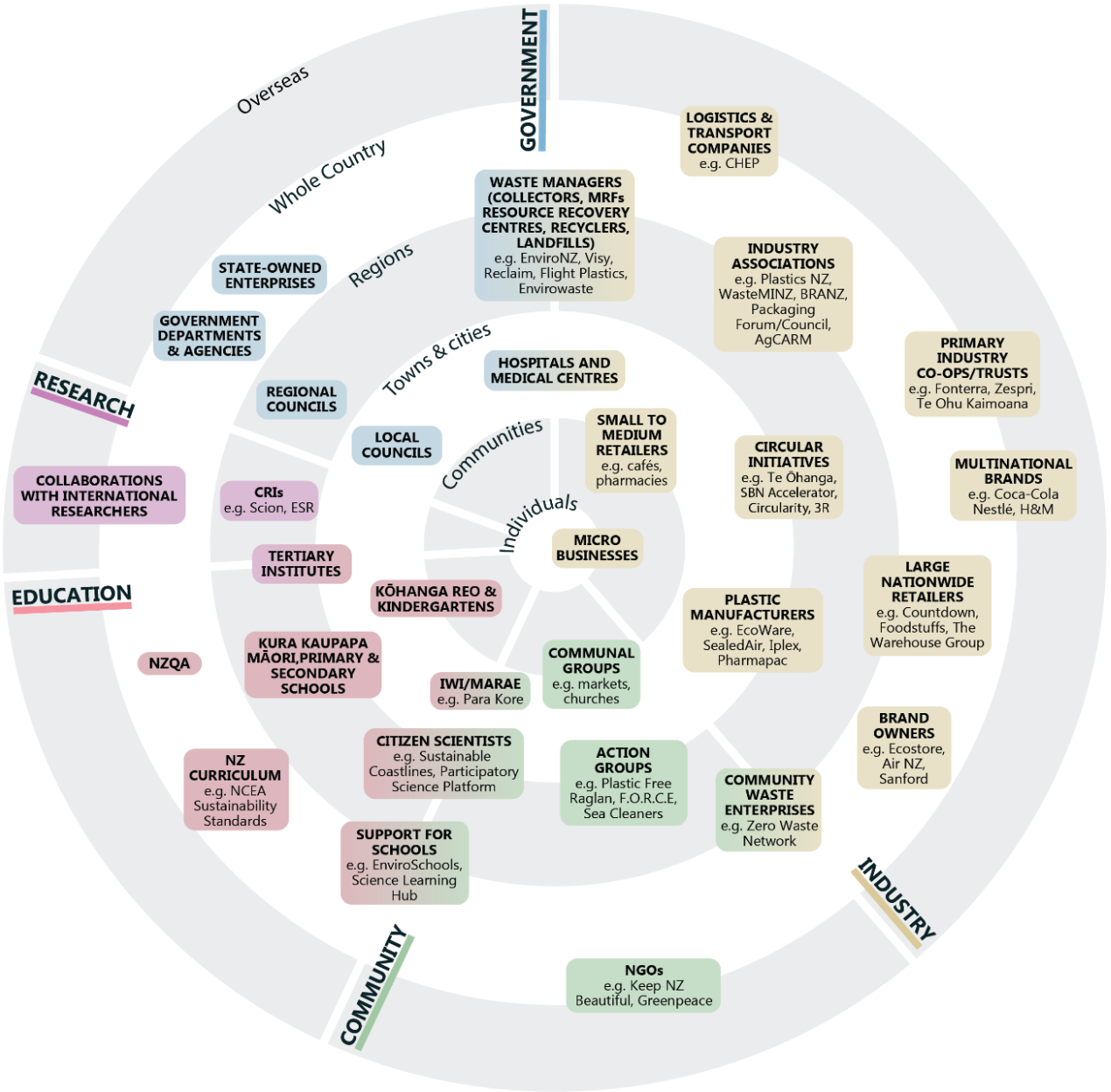
- Plastic microbeads banned
- Single-use plastic shopping bags banned
- Programme on waste underway
- Growing public concern in response to global issue
- The evidence to guide change was lacking…

Rethinking plastics – overview

- Assembled an expert panel – 11 people
- Talked to many, many more!
- Decided on a very broad scope
- Looking at evidence across the whole system and from a range of sources
- Report published in December 2019

Changing our relationship with plastics

- Issue isn't plastic, it's how we use it
- Need a systems change
- Many possible actions
- Coordination between groups and clear direction of travel important



Ideas for a more sustainable future – embracing innovation

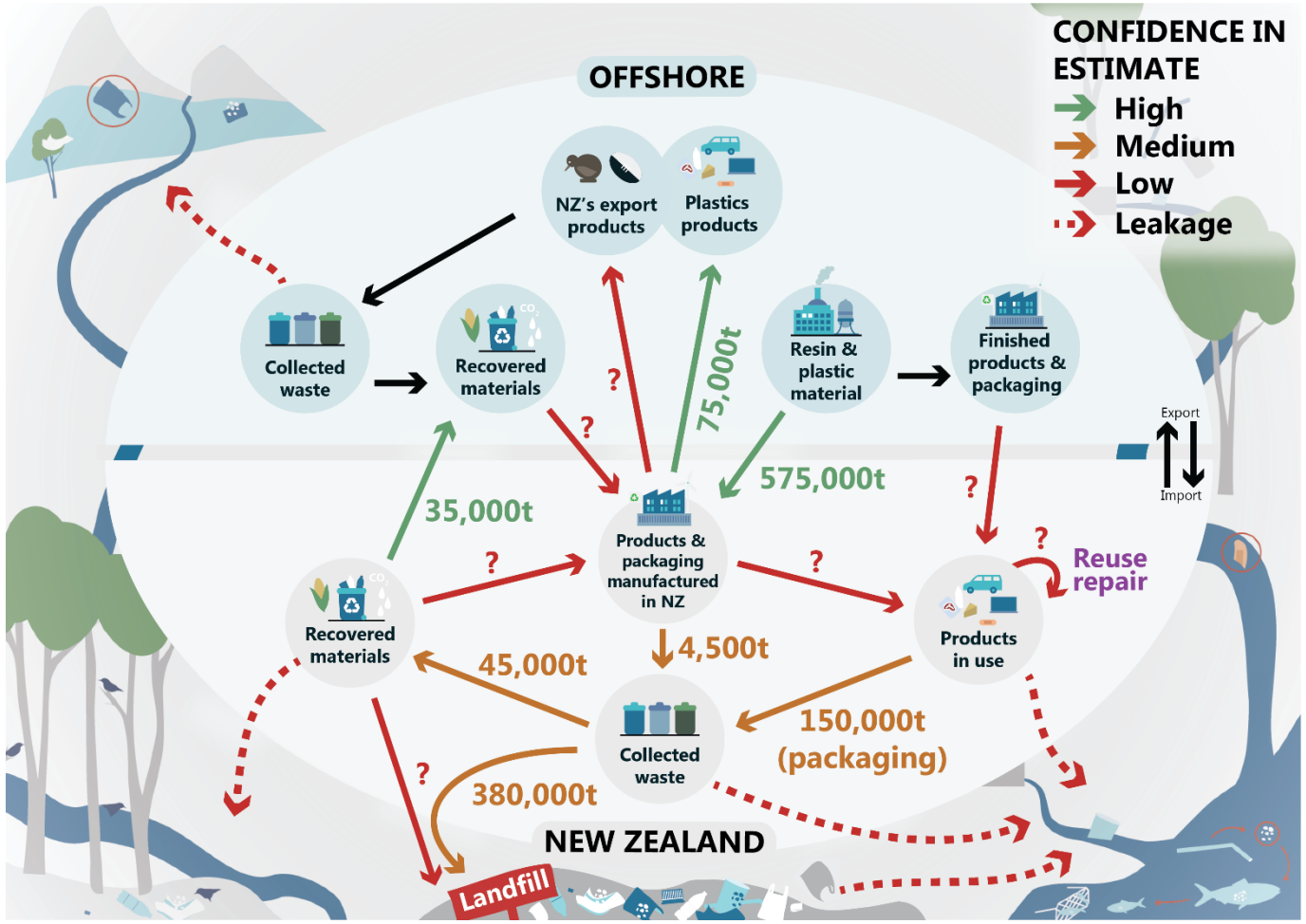
- Many solutions already out there
- Make best practice, standard practice
- Need a long-term vision to guide investment and innovation

Plastics and the environment – life-cycle assessment and beyond

- Evidence about negative impacts of plastic in the environment
- All materials have a cost
- Need to take a full life-cycle approach
- LCA can be used as a tool to inform decisions, e.g.
  - Are **reusable** products always better than **single-use** alternatives?
  - Should we switch to **bio-based plastics**?
  - Should we use an **alternative** material to plastic?

To what extent can we quantify Aotearoa's plastic? New Zealand's data challenge

- Many knowledge gaps
- Very high level data
- Need to address imported finished goods and packaged products
- Data important for informing policy decisions
- Baseline measures needed to see if policy is working



WHAT SUCCESS LOOKS LIKE

Best practice is standard practice

Decreasing plastics in our environment

Reuse is the new norm

Our recycling system works

Robust data on plastics

Improve plastics data collection

Embedding rethinking plastics in the government agenda

Create and enable consistency in design, use and disposal

Innovate and amplify

Mitigate environmental and health impacts of plastic

NATIONAL PLASTICS ACTION PLAN

Government's response to Rethinking Plastics

- Regulated product stewardship (including plastic packaging)
- Expanding and increasing waste levy
- Container return scheme design
- Kerbside standardisation and labelling
- Investment in onshore recycling facilities
- Phasing out some problematic plastic packaging and single-use plastic products – consulting on this now

- National Plastics Action Plan, including:
  - sustainable plastic procurement in Government
  - improve data on plastics
  - support action on plastics through education
  - standards and guidelines for industry
  - support for innovative business
  - better co-ordinate and leverage international connections to support our plastics agenda
  - + more

Rethinking Plastics in Aotearoa New Zealand
www.pmcsa.ac.nz/topics/rethinking-plastics/

Ministry for the Environment policy details and response to Rethinking Plastics
www.mfe.govt.nz/waste

Thank you

Department for Environment Food & Rural Affairs

Single-use plastics policy

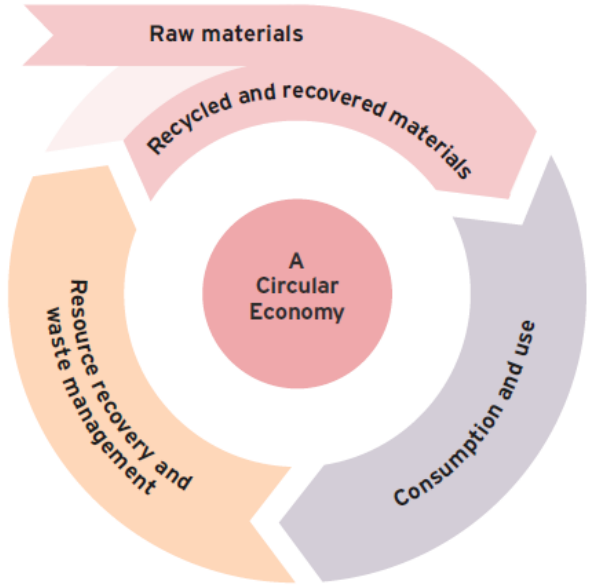
Tom Pye, UK government, department for environment, food and rural affairs

Forestry Commission England | NATURAL ENGLAND | Environment Agency

SUP policy is part of our broader **Resources and Waste Strategy**

In the 25 Year Environment Plan, the government pledged to leave the environment in a better condition for the next generation.

We want to prolong the lives of the materials and goods that we use. Our plan is to move society away from the inefficient ‘linear’ economic model of ‘take, make, use, throw’.



A more circular economy will see us keeping resources in use for as long as possible. It will allow us to extract maximum value from them, then recover and regenerate products and materials at the end of their lifespan.

Tackling plastic pollution

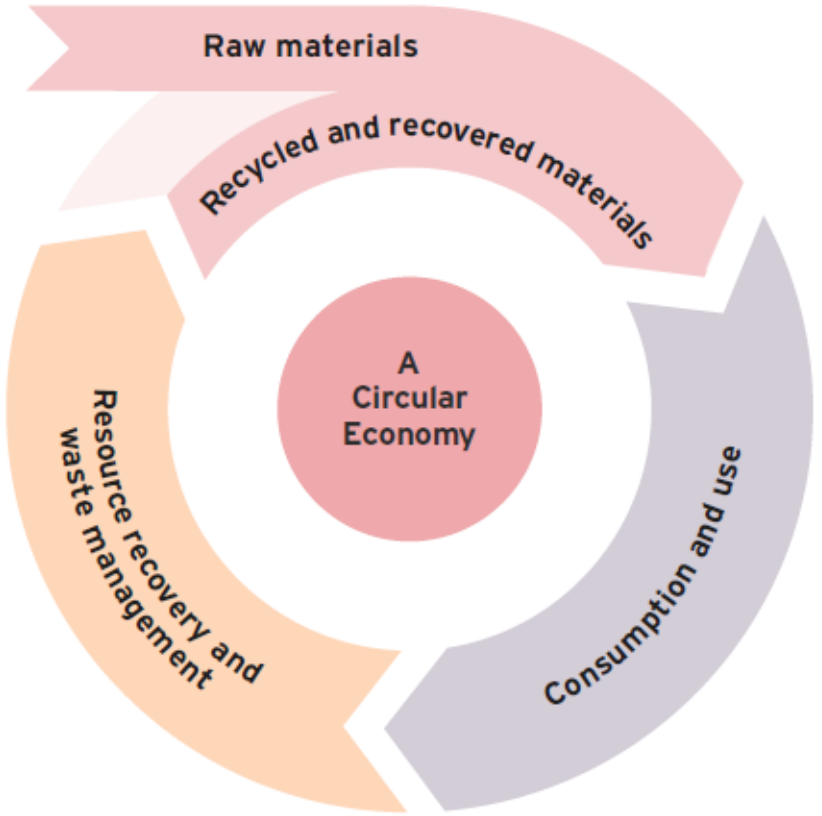
Key soft targets are:

- eliminate all avoidable plastic waste over the lifetime of the plan.

- work towards all plastic packaging placed on the market being reusable, recyclable or compostable by 2025.

Key SUP policies:

- **Packaging EPR**
- **Packaging tax**
- **Future EPR (e.g. fishing gear)**
- **Ecodesign**



- **Consistency in recycling system**
- **Innovation in waste treatment**

- **DRS**
- **Procurement e.g. removing SUPs from central gov estate**
- **Charges e.g. carrier bags**
- **Bans where appropriate e.g. microbeads, straws**

International action

- 20 countries responsible for 80% plastic debris in the sea
- 90% marine plastics originate from land-based sources
- Estimated 2 billion people living without waste disposal

Various initiatives to tackle this – use of UK ODA to support developing nations (e.g. **Blue Planet Fund**), driving political commitments through Commonwealth Clean Ocean Alliance (**CCOA**).

SUP case study – **ban on straws, stirrers and cotton-buds**

Ban on *supply* of these items to *end-users* entered into force on 1st October 2020. Several exemptions in place for medical, scientific and forensic purposes. **Challenges** in developing the legislation included:

- Balancing need for exemptions with overall policy objectives;
- Defining scope of exemptions, ensuring legislation will work in practise;
- Whether or not to include bio-based/biodegradable plastics.

LCA was important in making the case for the ban – for example by comparing carbon emission from using these items compared to projected alternatives.

Department for Environment Food & Rural Affairs

Thank you!

tom.pye@defra.gov.uk

Forestry Commission England | NATURAL ENGLAND | Environment Agency

Q & A Session with Tom Pye & Dr Rachel Chiaroni-Clarke

Please ask your questions in the Q & A Box (All Panellists)

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Summary of Key Points

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Addressing Single-Use Plastic Products Pollution using a Life Cycle Approach

Part 2: 20 October 08:00 GMT

You will receive an email with the recording link for this session and registration link for Part Two within 7 days.
http://bit.ly/SUPP2

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Addressing Single-Use Plastic Products Pollution using a Life Cycle Approach

Thank you for attending: WEBINAR SERIES A – PART 1: ASIA-PACIFIC + EUROPE/AFRICA/WEST ASIA (08:00 GMT):

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