# WORKSHOP ON SUSTAINABLE AND EFFECTIVE SUBSTITUTES AND ALTERNATIVES FOR PLASTICS

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## *Session 2: Minimum criteria for life cycle analysis*

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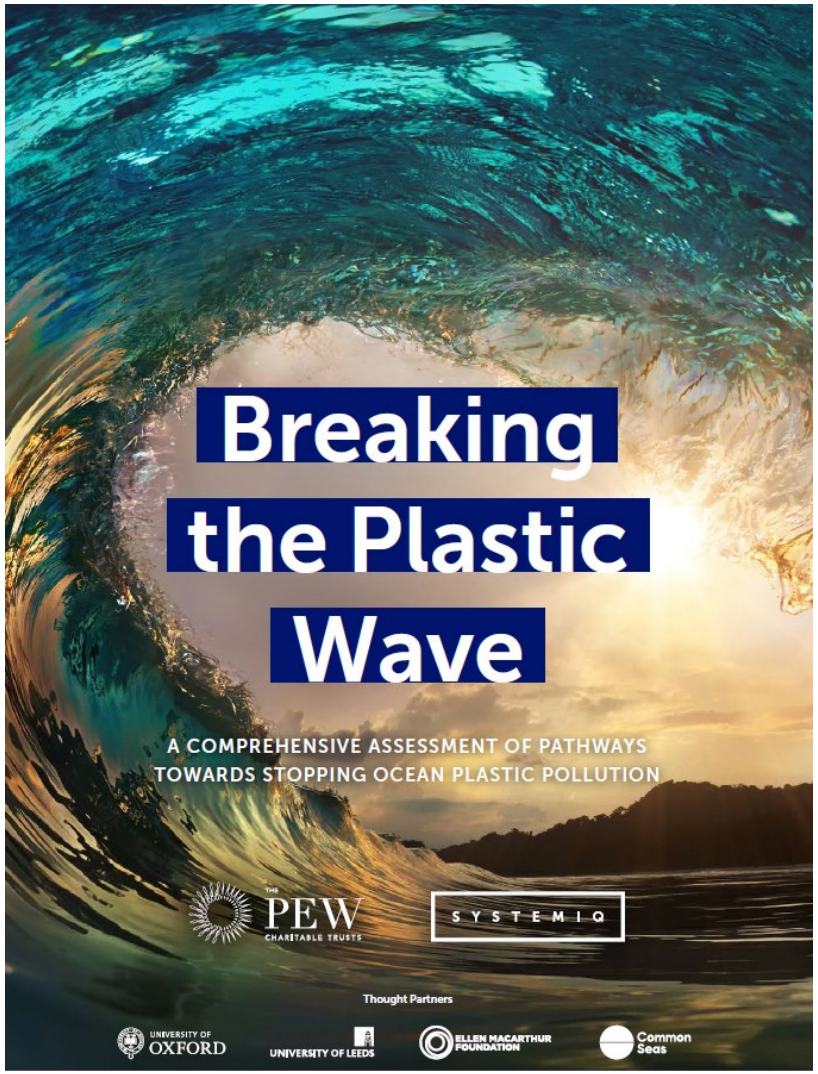
# BREAKING THE PLASTIC WAVE





SYSTEMIQ

UNIVERSITY OF OXFORD

UNIVERSITY OF LEEDS

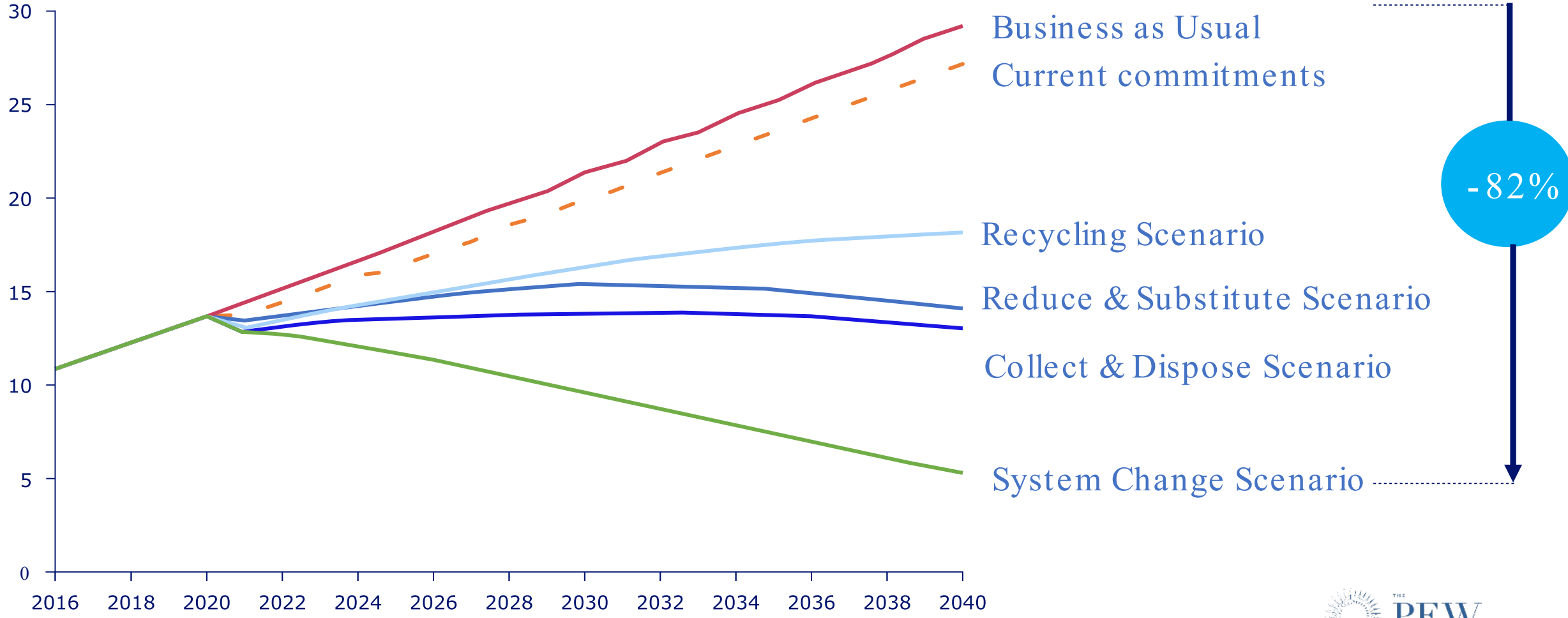
ELLEN MACARTHUR FOUNDATION

Common Seas

THE PEW CHARITABLE TRUSTS

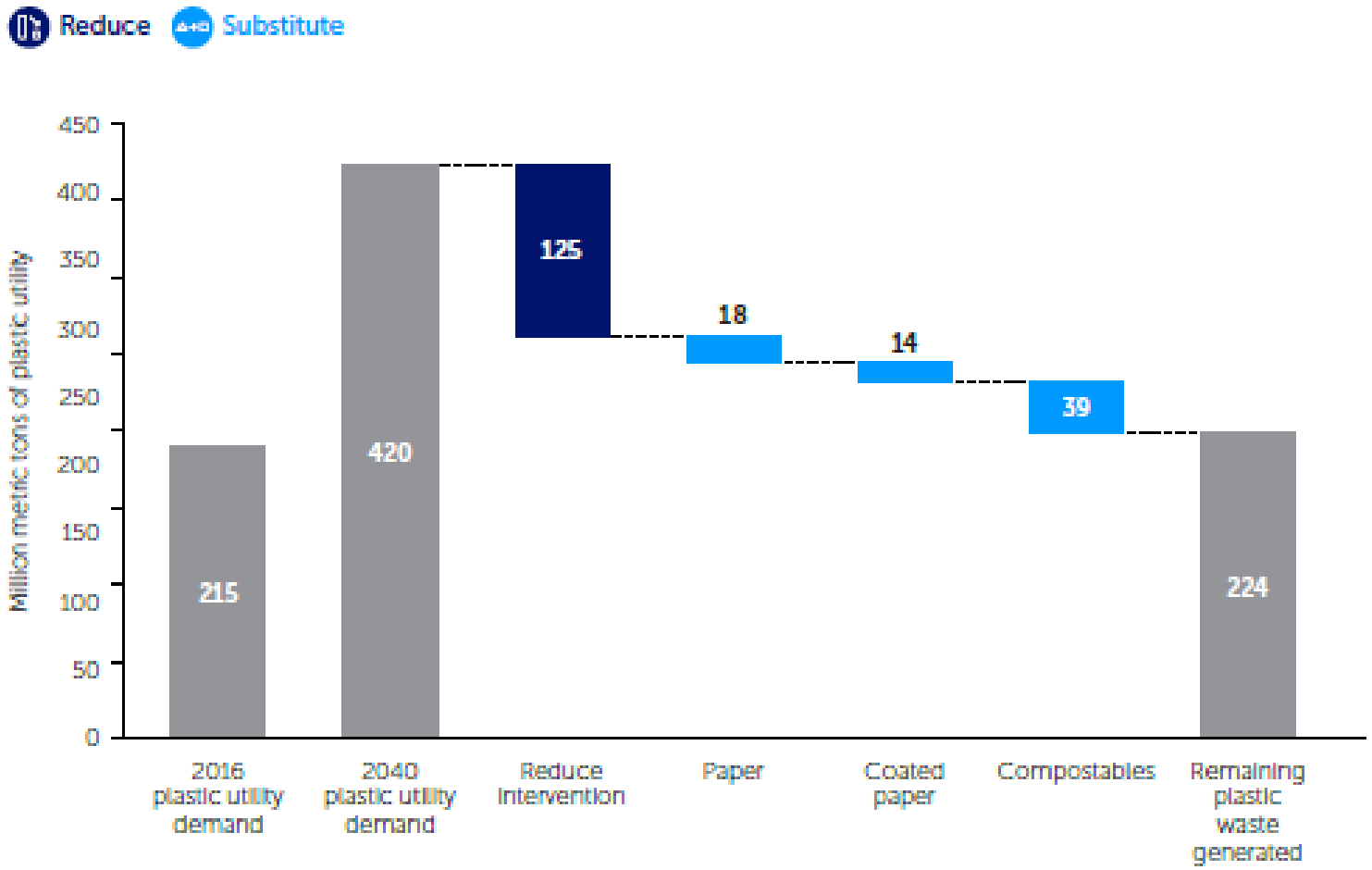
# SUITE OF SOLUTIONS TO THE PLASTIC POLLUTION PROBLEM

## Leakage to the ocean under different scenarios, Mt per year



## Figure 28: Utility demand in 2016 and 2040, and how it is met by the Substitute levers in the System Change Scenario

The System Change Scenario shows 17 per cent of plastic production substituted with alternatives by 2040




This figure shows plastic utility demand in 2016, 2040, and in 2040 after the Reduce and Substitute levers are applied.

# SUBSTITUTE INTERVENTION

Six plastic subcategories with the largest substitute potential by mass

| Plastics subcategories | Per cent & mass of plastic subcategory substituted in 2040 | Paper and compostable substitutes |
|---|---|---|
| **Monomaterial films** | **41%**<br>**45 million metric tons** | • **Paper/coated paper where water barrier properties not necessary**<br>• **compostable plastic, cellulosics, alginates transparency is essential** |
| Other rigid monomaterial packaging | 23%<br>9.5 million metric tons | • Paper and compostable substitutes available for expanded polystyrene and other protective packaging |
| Sachets and multilayer films | 7%<br>4 million metric tons | • Coated paper and compostable alternatives |
| Carrier bags | 13%<br>4 million metric tons | • Compostable bags water resistance required (for meat, fish, etc.)<br>• paper bags widespread today |
| Pots, tubs, and trays | 12%<br>3 million metric tons | • Paper punnets for fresh produce;<br>• coated paper for other |
| **Food service disposables** | **17%**<br>**2 million metric tons** | • **Widely available alternatives, e.g., bamboo cutlery, paper/coated paper clamshells and cups, banana leaf wraps** |

# CAVEAT ON COMPOSTABLES AND BIOPLASTICS

BPI ®

**COMPOSTABLE**
IN INDUSTRIAL FACILITIES

Check locally, as these do not exist in many communities. **Not suitable for backyard composting.** CERT # 2122186


## Bioplastics/ bio-based plastics

# FEASIBILITY FRAMEWORK CRITERIA

**a Technology test**

What is the technology readiness level (TRL)?

**b Performance test**

Does the intervention satisfy performance & health requirements?

**c Affordability test**

What is cost impact on consumers?

**d Convenience test**

Is it acceptable for lifestyle and convenience?

# LCA CONSIDERATIONS

- Sustainability of sourcing raw materials
- Presence of waste infrastructure to collect and process substitutes
- Overall GHG emissions
- Likelihood of being litter or ending up in the environment
- Impacts to people and nature after entering the environment
- Health concerns

# SUMMARY

Changing the plastic system – many single-use plastic products would be eliminated or replaced by reusable items and new delivery models.

Nonrecyclable and hard-to-recycle plastics could be substituted to paper or compostable materials.

The remaining plastic waste being recycled at much higher rates, resulting in much less plastic polluting the environment.

# THANK YOU

pewtrusts.org/plastics

Any questions? - mjungwi@pewtrusts.org

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