

Stemming the Tide

Using Circular Economy Principles to Tackle Terrestrial & Marine Litter

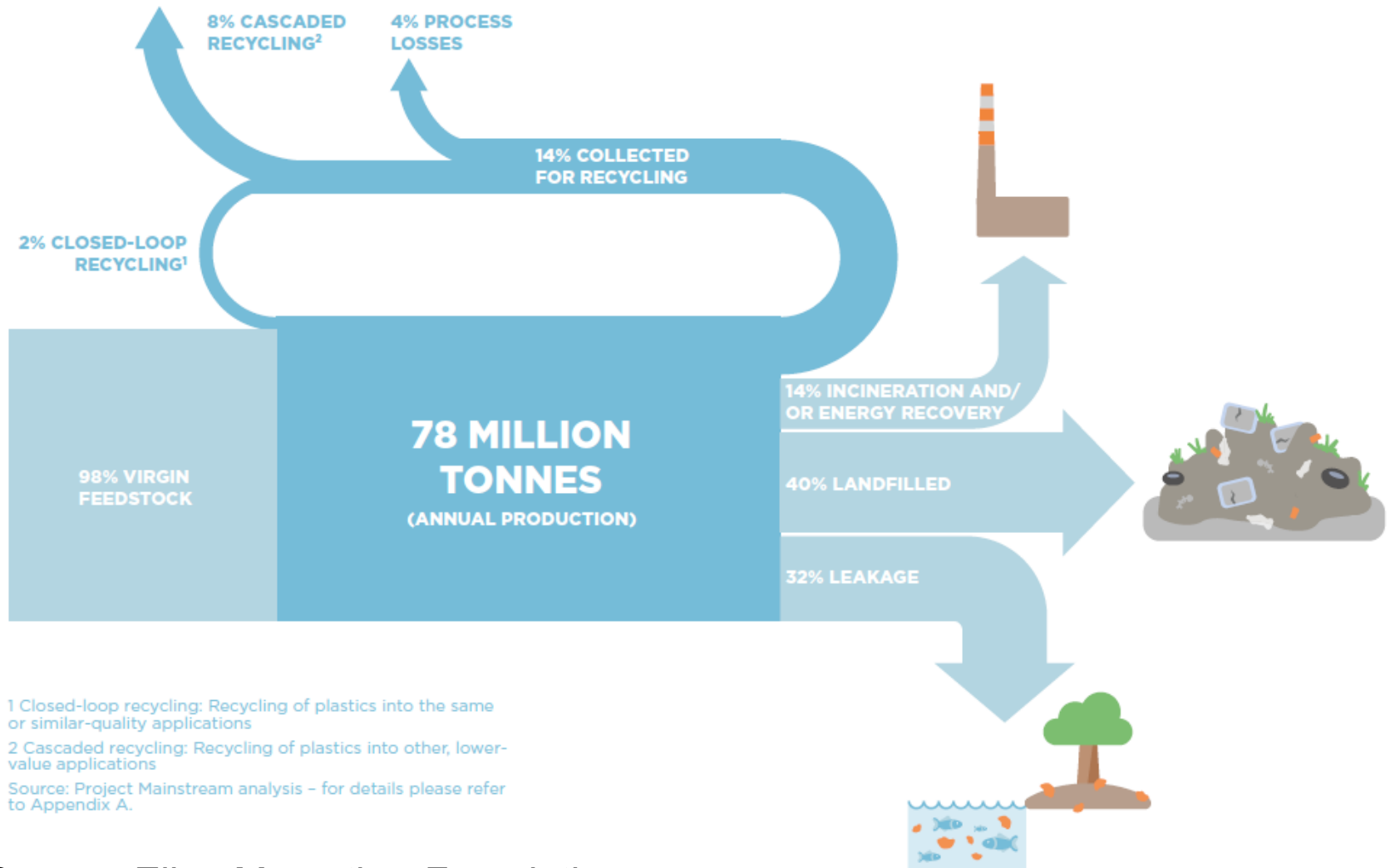
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A Global Problem



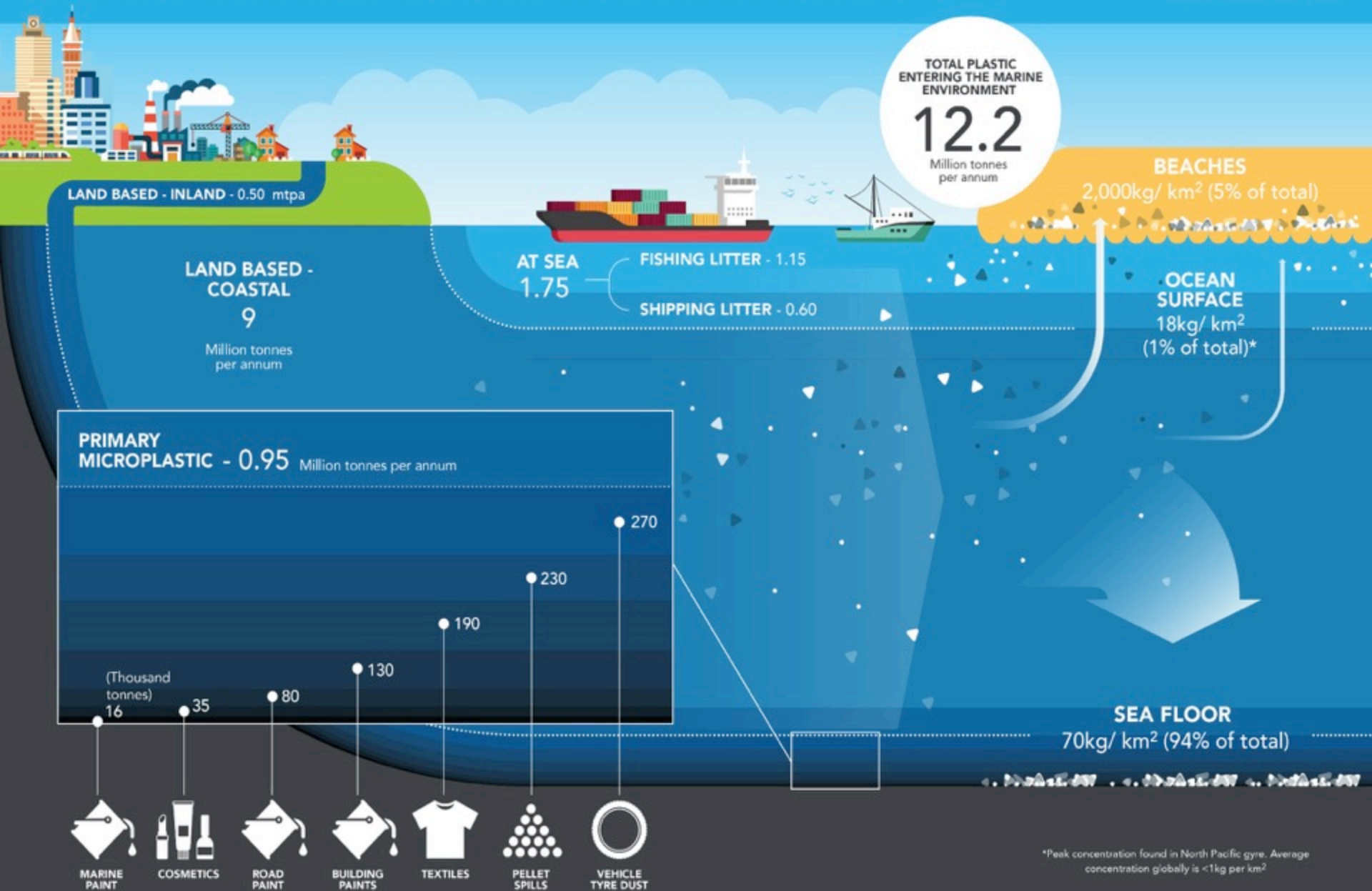
Global Flows of Plastic Packaging Materials 2013



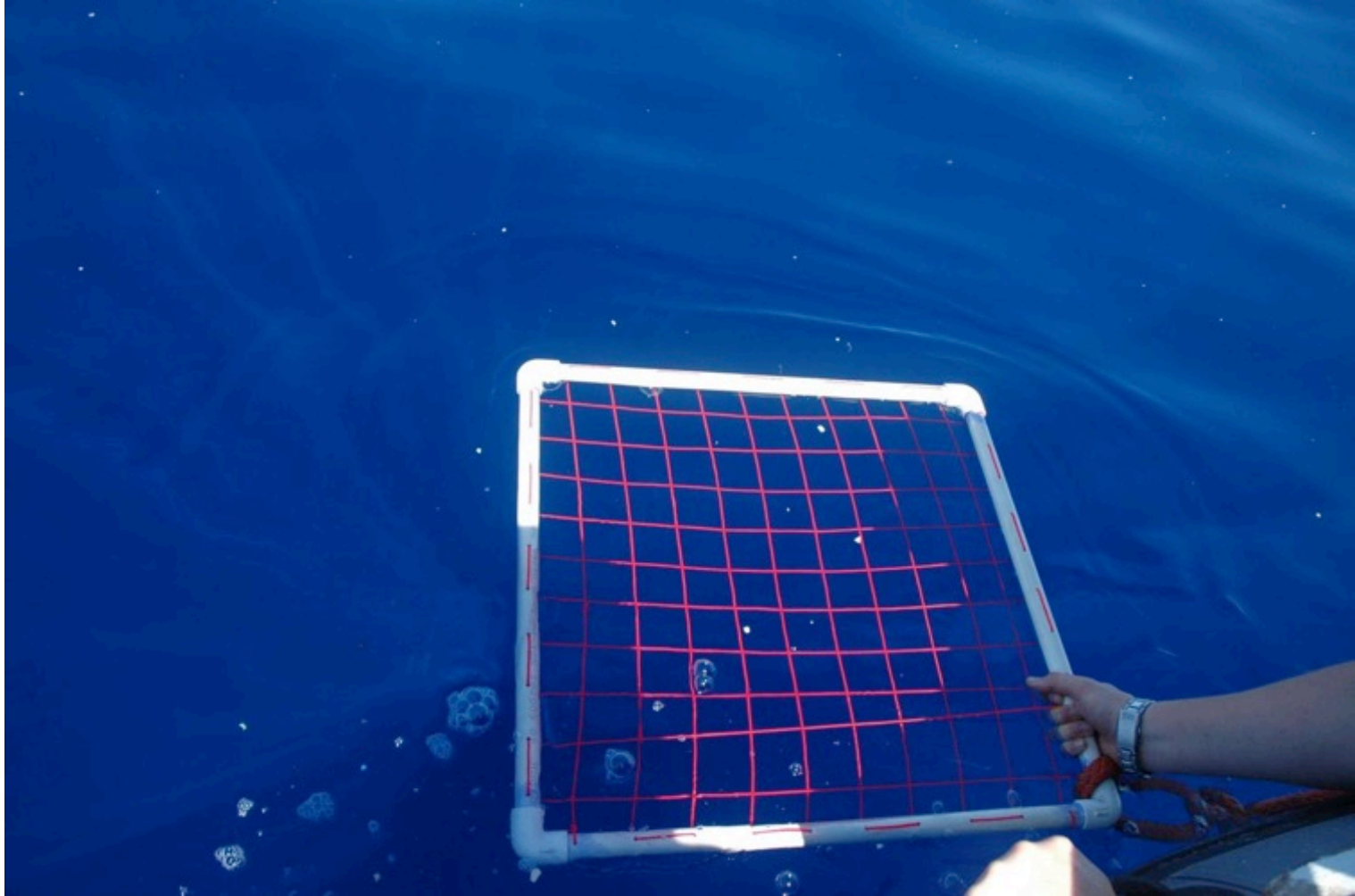
Source: Ellen Macarthur Foundation

PLASTICS IN THE MARINE ENVIRONMENT: WHERE DO THEY COME FROM? WHERE DO THEY GO?

economia 

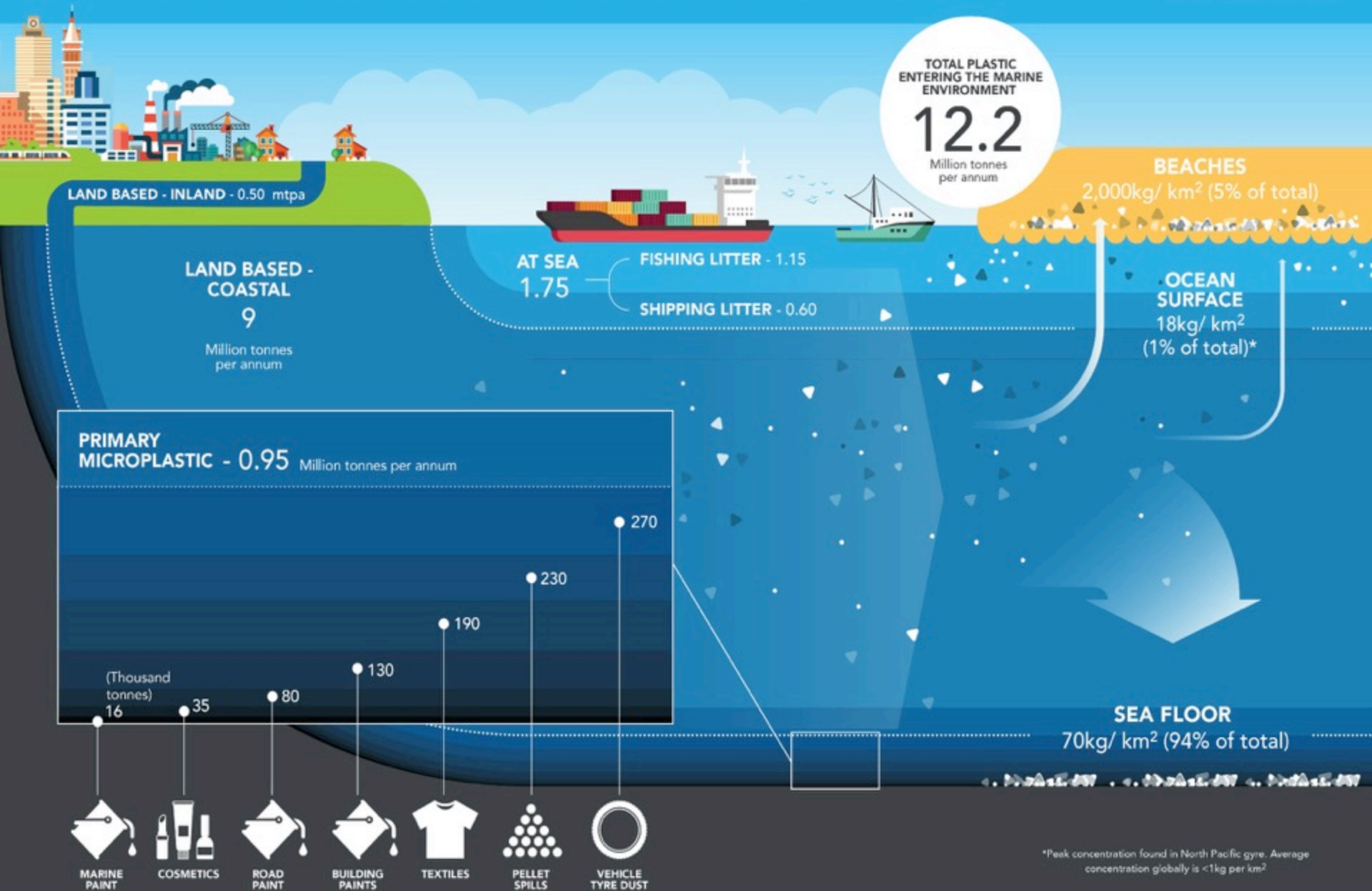


The real garbage patch



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Ingestion



Toxicological Impacts of Marine Plastics

- **Plastics may contain chemicals with toxicological effects on fish, mammals and molluscs**
 - **Phthalates, brominated fire retardants, BPA**
- **Plastic debris can adsorb persistent organic pollutants (POPs)**
 - **Concentrations far above background levels**

Impacts of Microplastics

- **Ingestion by Zooplankton**



A Local Problem



Direct Costs of Litter

- **Costs to Municipalities**
 - Clearance



Photo by Si Griffiths, via Wikimedia Commons

- **England-wide estimate**
 - £1 billion for litter clearance per annum
 - Keep Britain Tidy

Indirect Costs of Litter

- **Internalised**
 - Already experienced through market transactions
 - E.g. Punctures



Indirect Costs of Litter

- **Externalities**
 - Costs not 'internalised' in market transactions
 - E.g. the sense of 'welfare loss' associated with the visual disamenity of a park being strewn with litter



Internalised Costs

- **Crime**
 - Urban Disorder and vandalism can have a 'signalling' effect
 - Links between litter and crime
 - England – up to c. £350 million per year
- **Mental Health & Wellbeing**
 - Clear linkages between local environmental quality and wellbeing
 - England – costs of c. £500 million per year

Internalised Costs

- **Property Values**
 - Presence of litter can reduce property value by 2.7%
 - England – if only 1% of housing stock devalued by 2.7% this would be a loss of just under £1 billion
- **Other**
 - Road traffic accidents
 - Punctures
 - Vermin

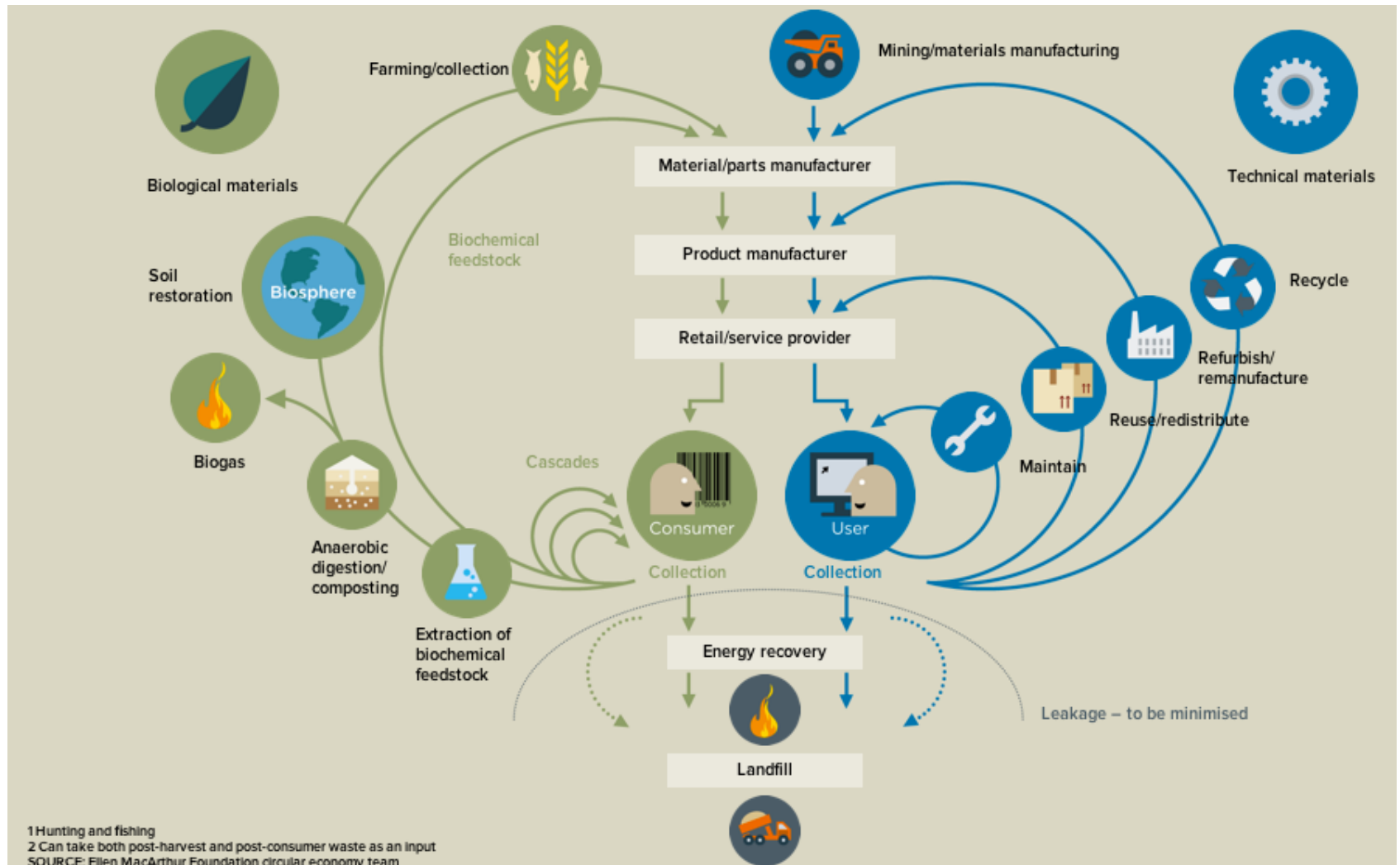
External Costs – Neighbourhood Litter

- **Factors Affecting Local Environmental Quality** (Wardman et al., 2011)
 - Chewing gum, litter, graffiti, noise, dog fouling
- **Highest ‘Willingness to Pay’ to move from ‘current situation’ to ‘best’**
 - Litter - £150- £190 per adult per annum
- **For England in total**
 - Circa £5 billion per annum

Should we spend more on clean up?

- **We could.....**
- **But:**
 - **Cost-effectiveness**
 - **Fairness**
 - **‘Citizens’ vs ‘consumers’**

Circular Economy Priorities



Litter Prevention?



Image courtesy of Tim Smith (My Poor Brain)

Levy on Cigarettes

- **To fund the cost of clean-up**
 - Circa AUD 0.012 per cigarette
 - Incentivising producers to prioritise prevention
 - Behaviour change campaigns



Levy on Cigarettes

- **‘Polluter pays’ principle**
 - An argument that placing a ‘clean-up’ levy unfairly penalises those that dispose of their cigarette butts responsibly
 - But:
 - Only one-fifth of UK adult population now smoke, so 80% of those who fund the clean up can’t possibly be responsible

Charge on Single-use Takeaway Cups

- **Waste prevention and litter prevention**
- **Cups not generally recyclable**
- **High volume item**
 - **Indirect littering**
- **A charge could also be applied to:**
 - **Disposable cutlery**
 - **Single-use carrier bags**



Deposit-return Schemes

- **Small financial incentive not to litter**
 - **Effective – >80% reduction in beverage container litter**
 - **Syrek - reported in a peer review on deposits for Defra (2005)**



Beverage Containers - Cans

- **‘Every Can Counts’ Research on UK Consumption of Cans**
 - the UK public drink an average of 6.5 cans a week each, rising to 9.3 in the warmer months
 - nearly 80% of the country’s population purchase at least one canned drink a week
 - 24-44 year olds the ‘most voracious consumers of cans’

Source <http://www.letsrecycle.com/news/latest-news/study-highlights-need-for-more-can-recycling-points/>

Effects of DRS on Marine Litter

- **CSIRO's 2011 Marine Debris Survey**



Phasing Out Plastic Straws & Stirrers

- **Not essential**
- **Alternatives are available**
 - Paper
 - Metal



Full EPR for Packaging Waste

- Those placing packaging on the market to bear full end-of-life cost
 - Including preventing and managing litter



Photo by Si Griffiths, via
Wikimedia Commons

Network of Public Drinking Water Fountains



Free Tap Water





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