Global Trends in Addressing Chemical Pollution

Dr Melissa Wang

GREENPEACE

Chemical Watch Global Business Summit
Brussels, 26 March 2019

Chemical pollution threatens biota and ecosystem functions

The burden of disease from chemicals is high, and vulnerable populations are particularly at risk

Death (total 1.6 million) attributed to selected chemicals in 2016

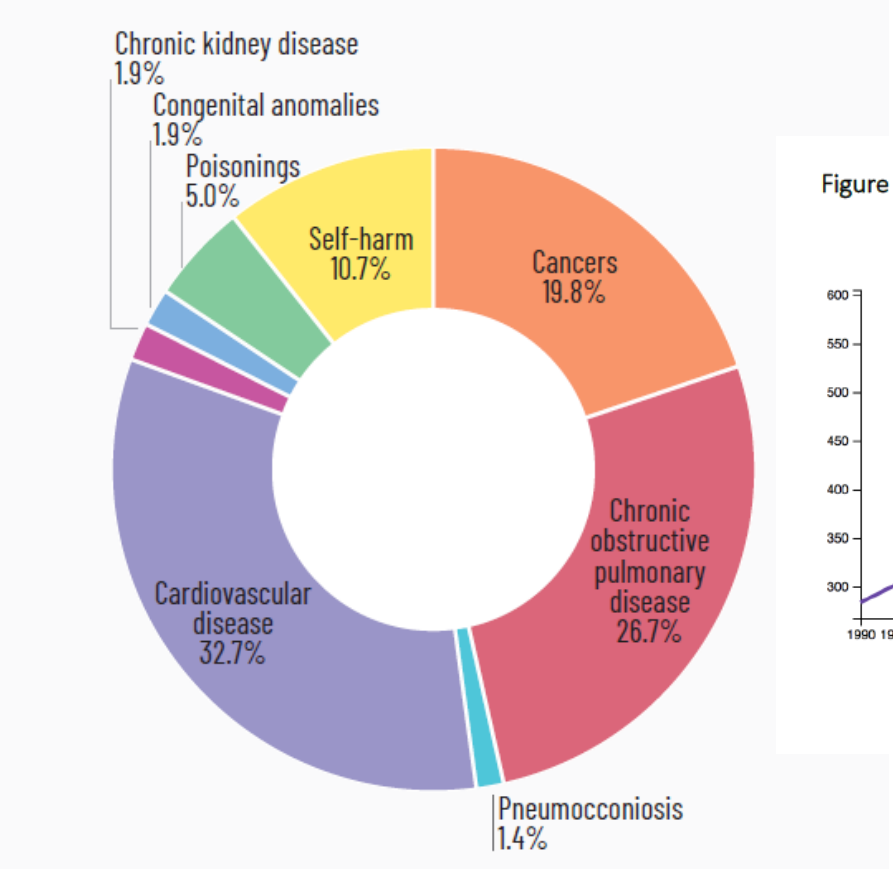
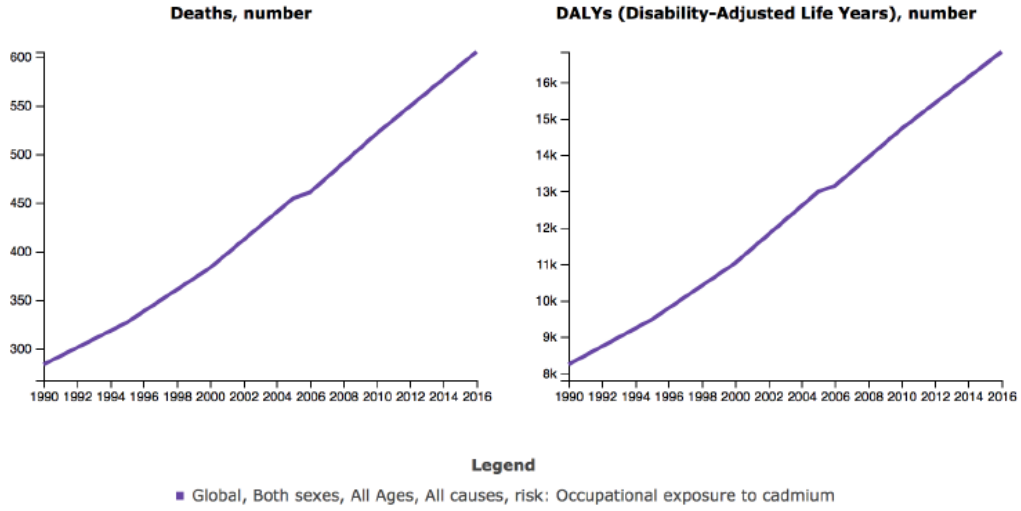


Figure 7.2: Deaths and DALYs from occupational exposure to cadmium, 1990-2016 (IHME 2018)



(44.8 million DALYs)

(DALYs: Disability adjusted life years)

(UN Environment 2019: GCO-II)

"Pollution is very costly; it is responsible for productivity losses, health care costs and costs resulting from damages to ecosystems. .....

the full costs of pollution are not appreciated [and] are often not counted..."

- Landrigan et *al*. 2018

The costs associated with unsound management of chemicals and waste include productivity losses, health care costs, damage to ecosystems, litigation costs, and reputational damage to businesses.

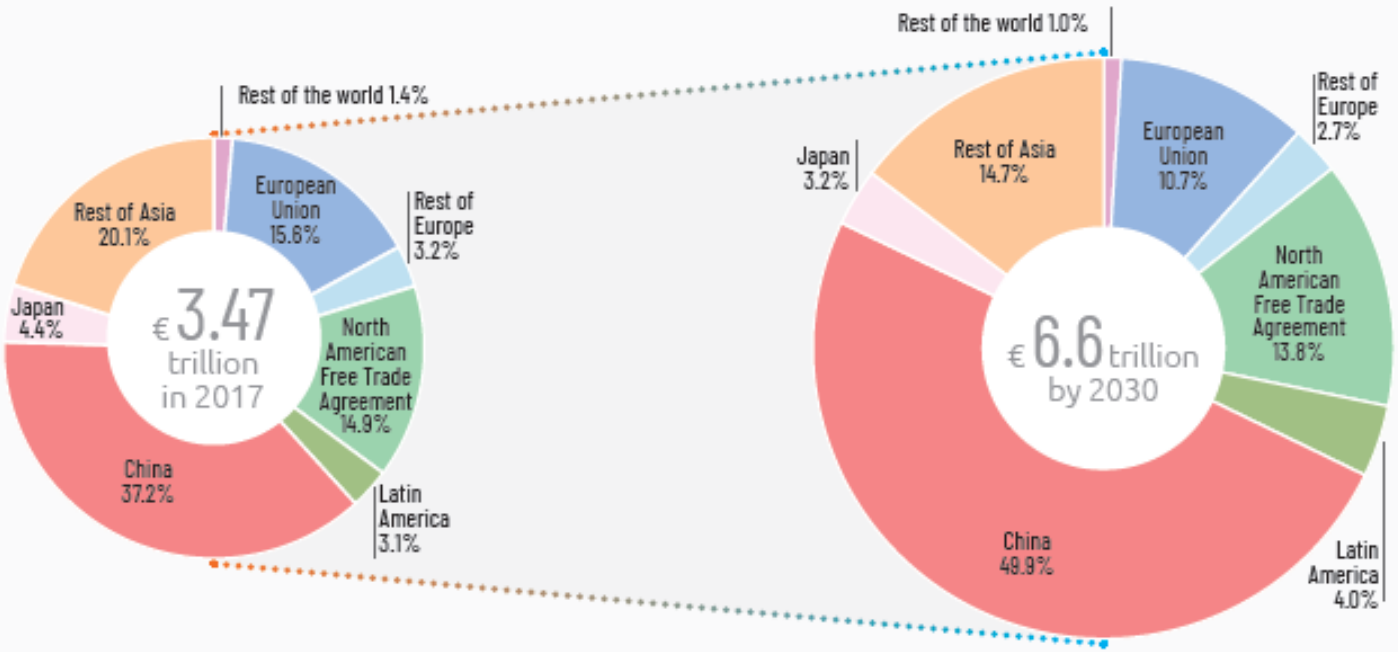
.....

Some studies estimate costs from environmental chemical exposures to be as high as several percentage points of global gross domestic product, with developing countries and economies in transition bearing the highest costs.

(UN Environment 2019: GCO-II)

Conversely, both regulatory and voluntary action can deliver socio-economic benefits in the form of reduced or avoided damage to human health and the environment. A 2017 study conservatively estimated the cumulative benefits of chemicals legislation in the EU to be "in the high tens of billion Euro per year". [Part I, Ch. 8]

Figure 4 **Projected growth in world chemical sales (excluding pharmaceuticals), 2017-2030 (adapted from European Chemical Industry Council 2018, p. 34)**



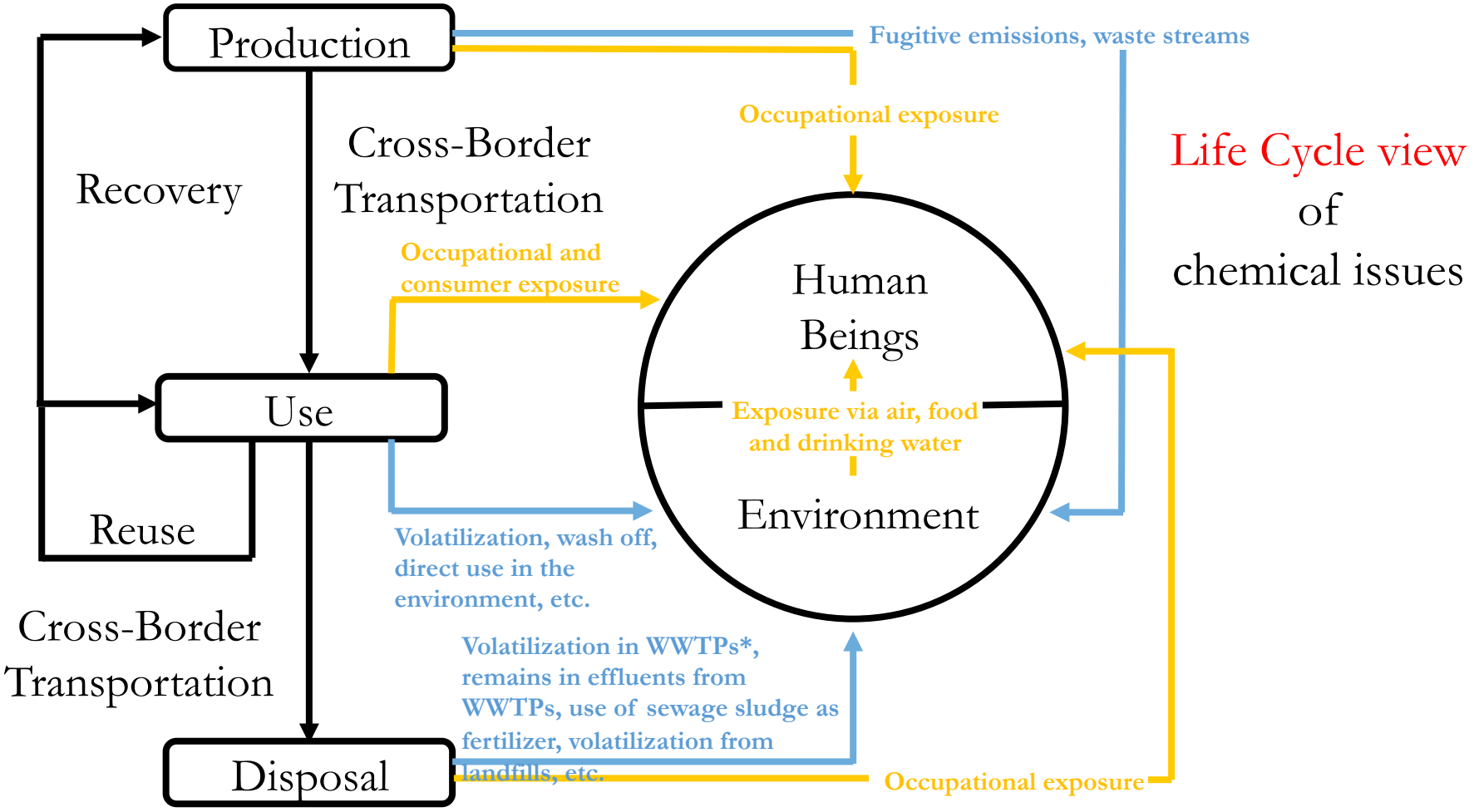
(UN Environment 2019: GCO-II)

Table 3.4: End markets of chemicals (adjusted, based on Global Manufacturing Industry group, 2011, p. 18)

End market	End market size and chemical revenue from end market	
*Global	Chemical revenue (US$ billion)	End market size (US$ billion)
Construction	695	8,016
Electronics	371	2,458
Household	159	800
Agriculture	142	1,772
Paper and packaging	130	702
Automotive	128	1,932
Health care	113	1,368
Energy	113	3,833
Transportation	61	1,023
Nutrition	29	4,022
Personal care	20	225
Machinery	15	457
Apparel and textiles	11	1,097
Mining and metals	4	1,333

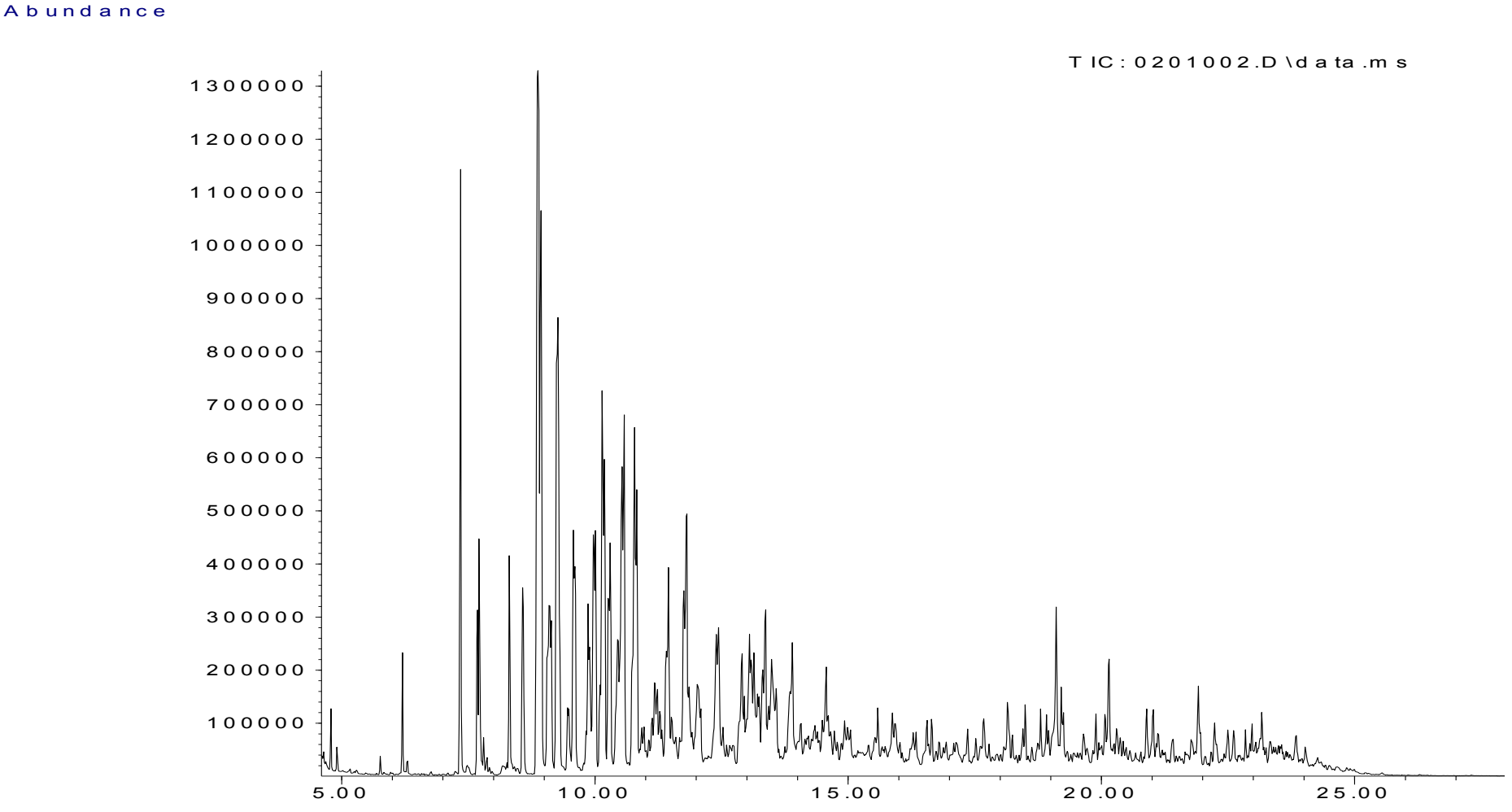
(UN Environment 2019: GCO-II)

How?

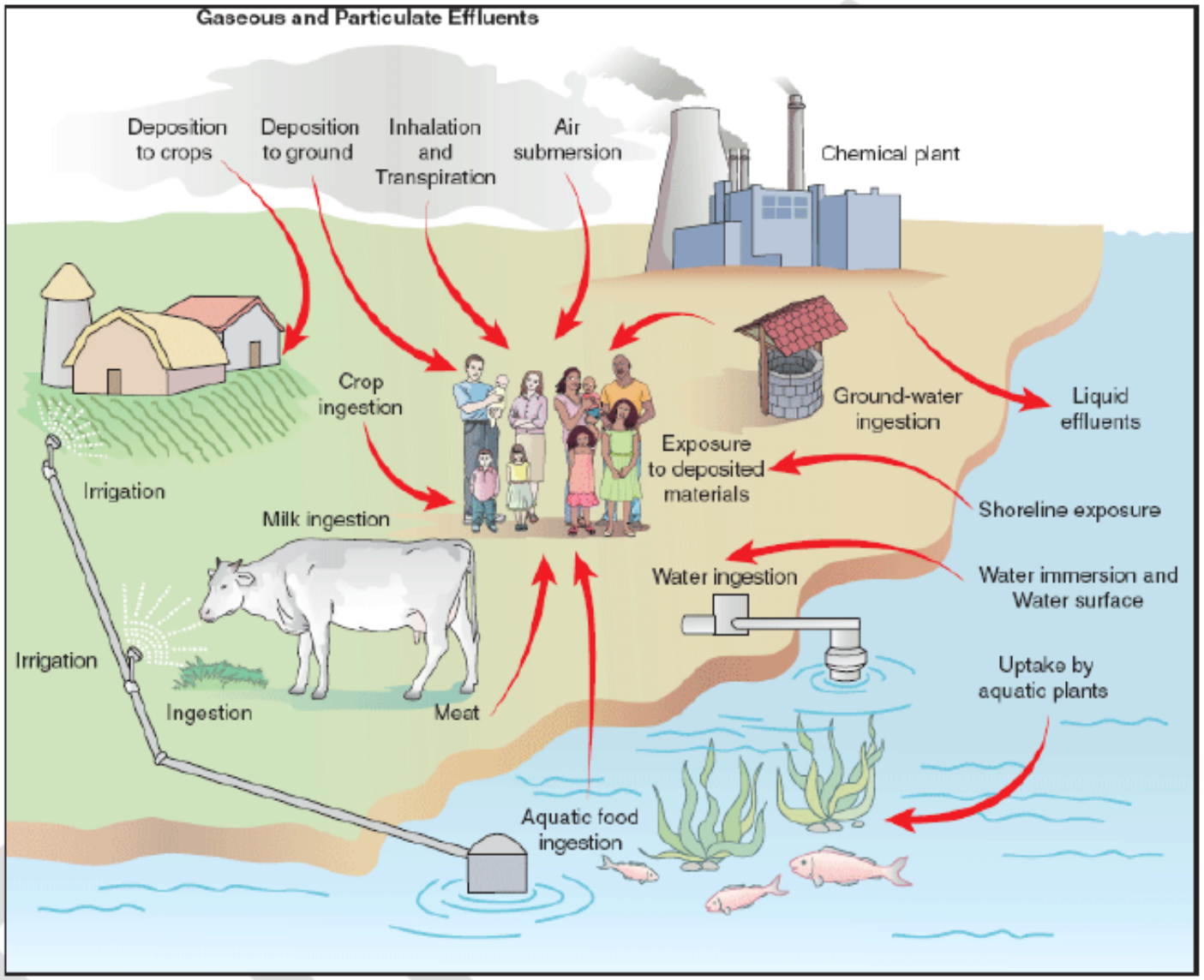


(Adjusted based on OECD 2013 Synthesis paper on per- and polyfluorinated chemicals (PFCs))

Cocktail Exposure

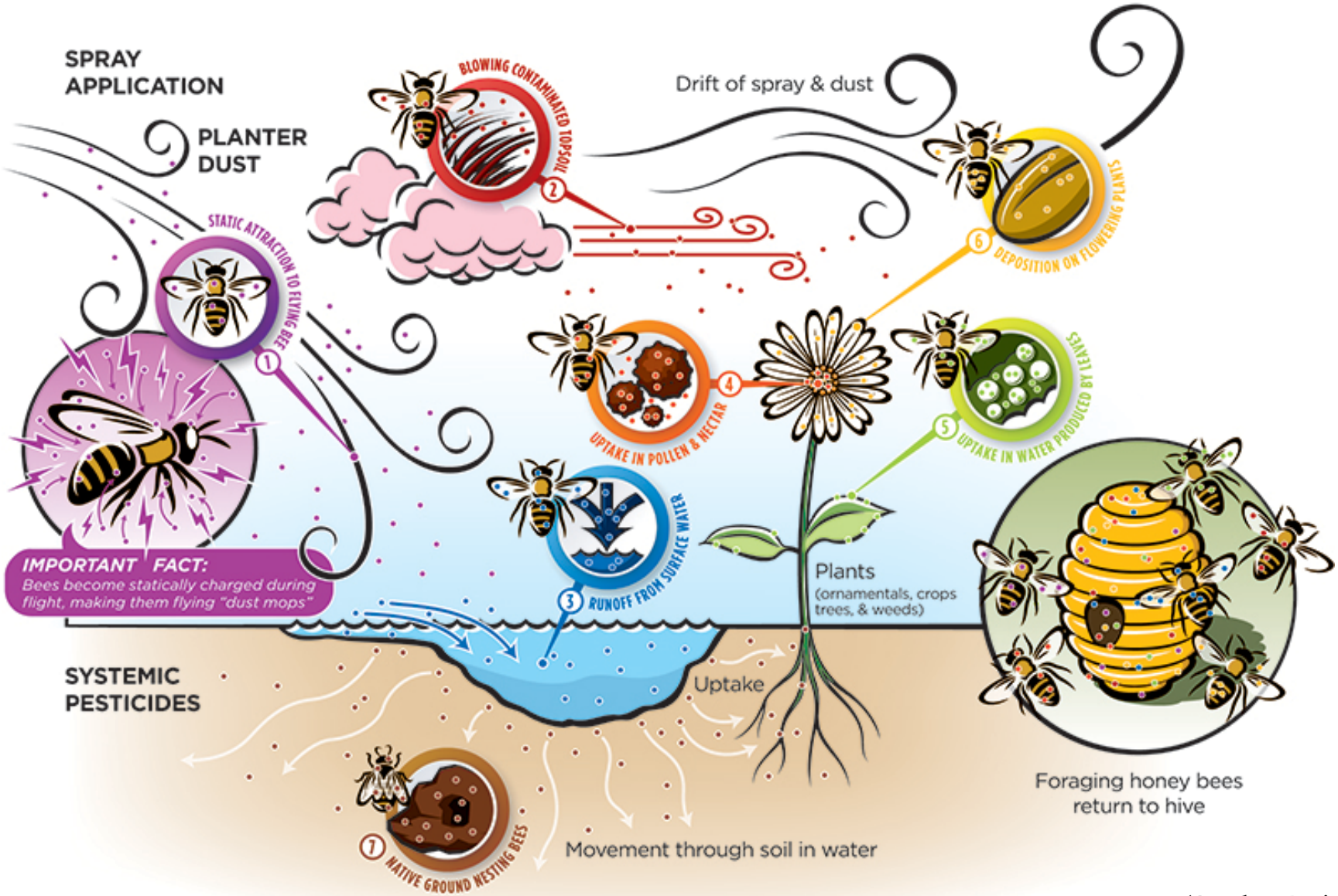


Box 2.1: Human exposure to chemicals – environmental pathways (Faustman and Omenn 2013, p. 138)



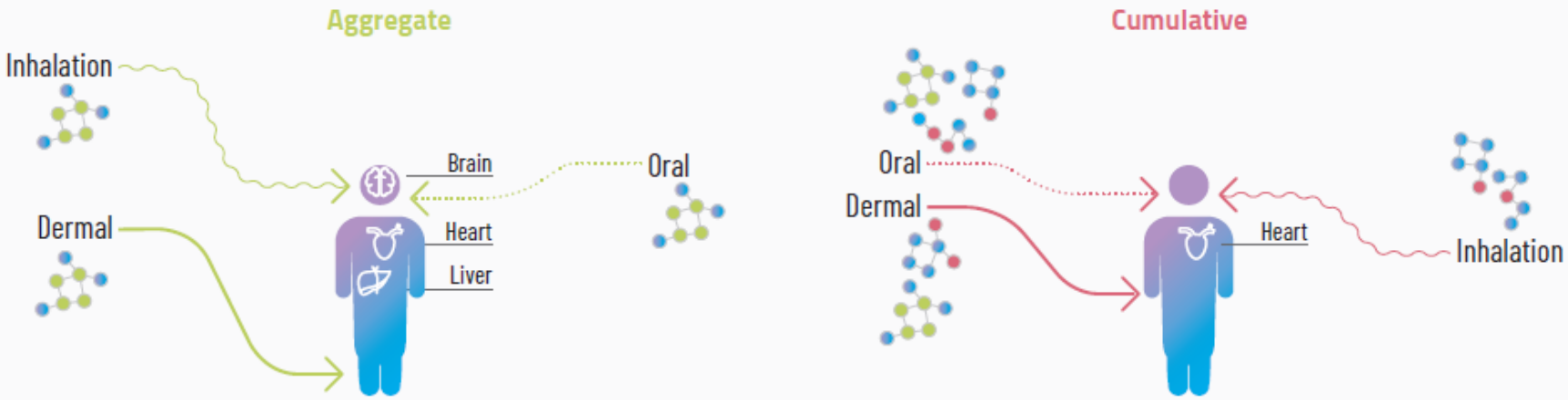
(UN Environment 2019: GCO-II)

Major Routes of Pesticide Exposure for Foraging Honey Bees and Their Transmission to the Hive



(Purdue University)

Figure 18 The concepts of aggregate and cumulative exposure (adapted from US Environmental Protection Agency 2017b)



Consider combined exposures to:

a single stressor multiple stressors

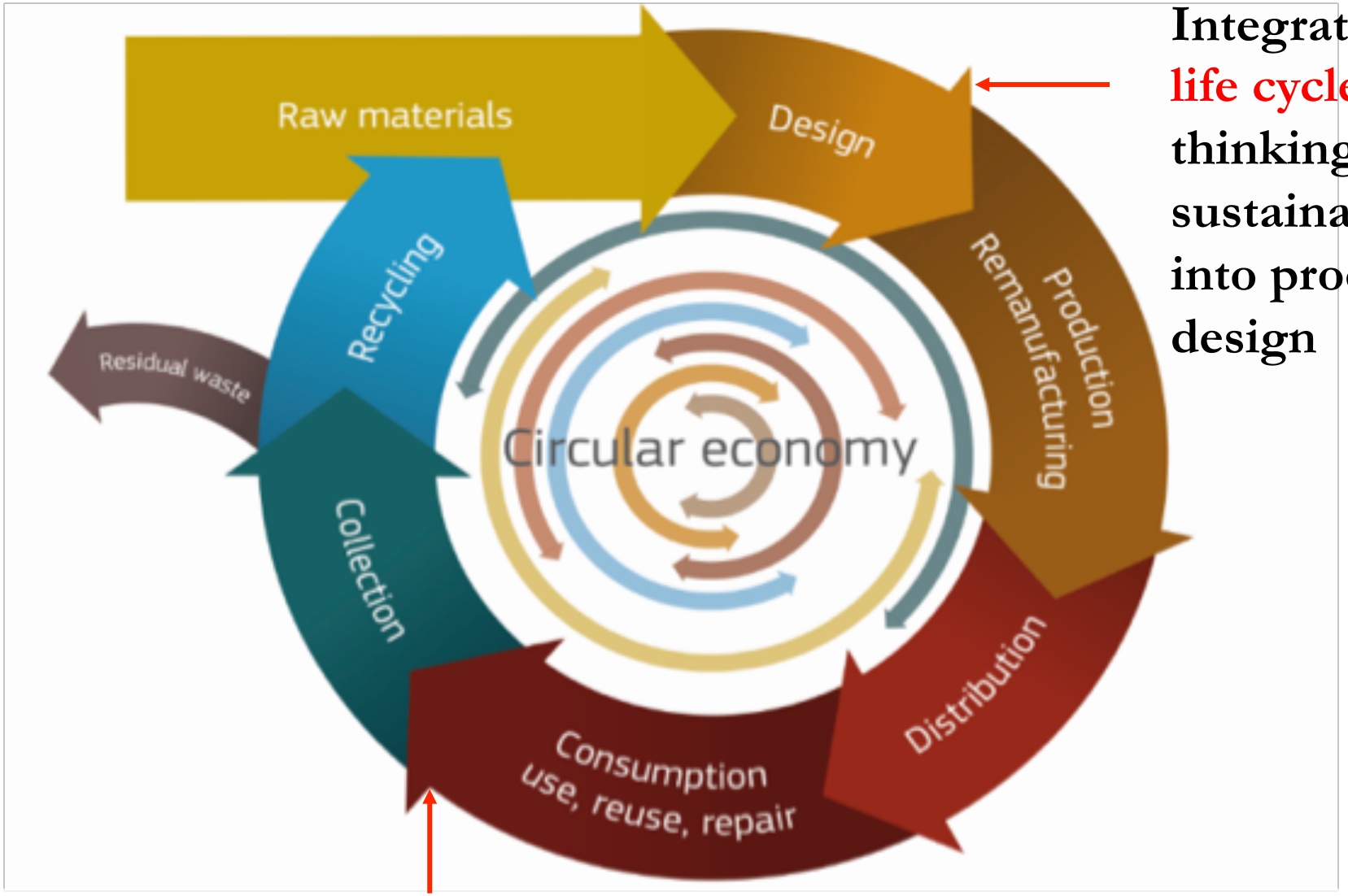
Via multiple exposure pathways

European Food Safety Authority

European Commission

World Health Organization

What?



Integrating life cycle thinking and sustainability into product design

The interface of chemicals, product and waste management

(Graph: European Commission)

SDG 12: Ensure sustainable consumption and production patterns

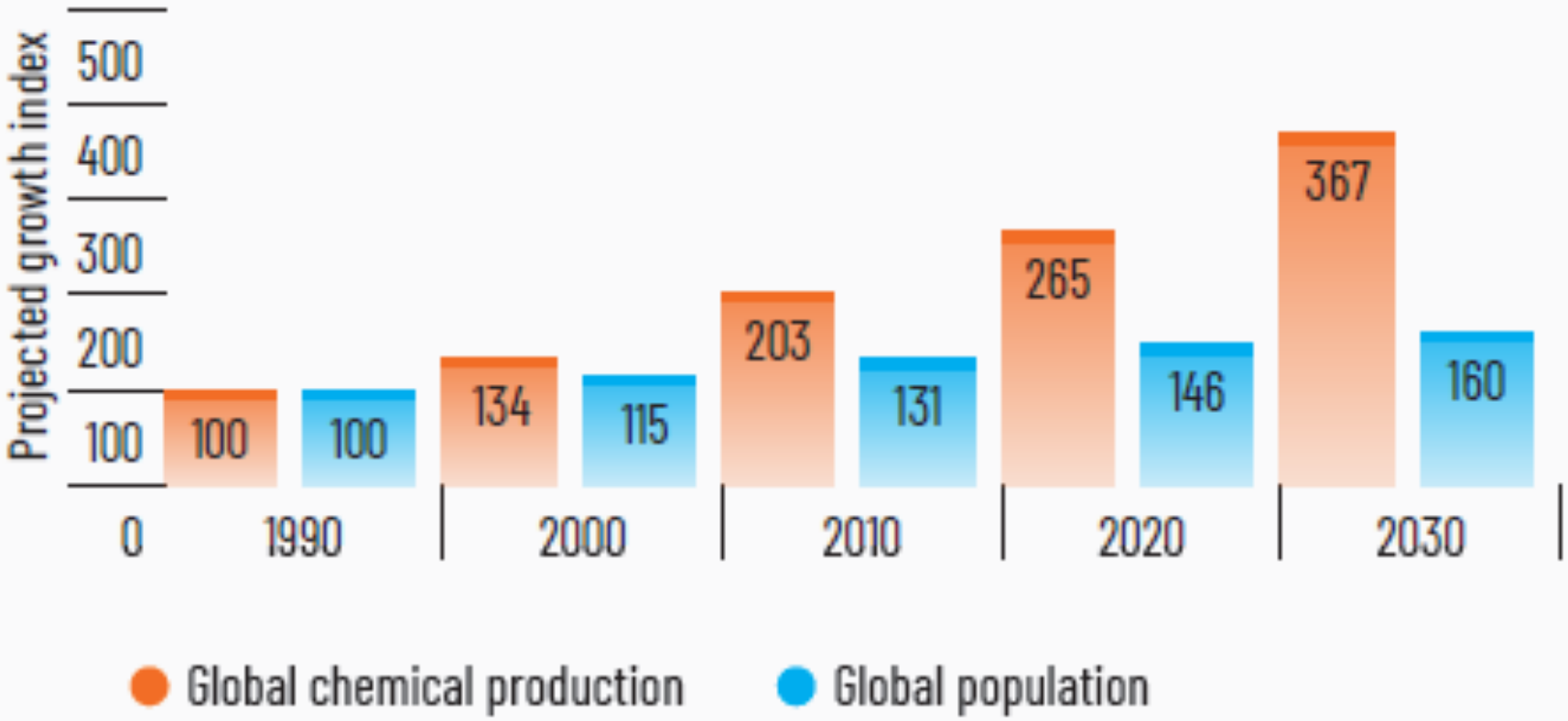
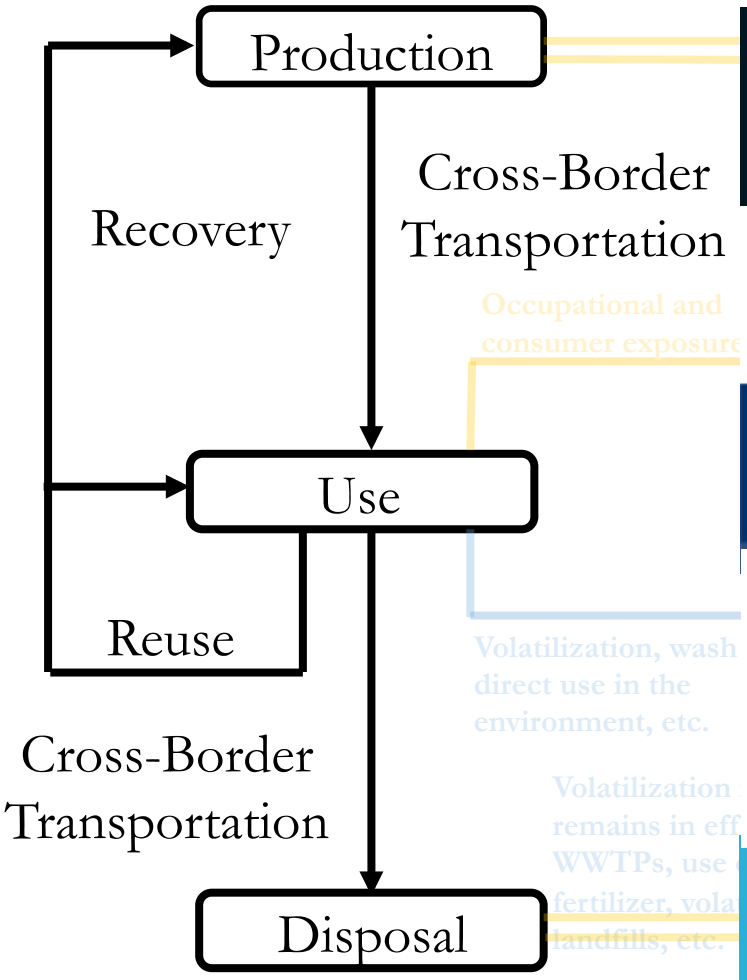


Figure 6. Growth of basic chemical production capacity vs. population growth

(UN Environment 2019: GCO-II)



UNEP

BASEL CONVENTION
ON THE CONTROL OF TRANSBOUNDARY MOVEMENTS OF HAZARDOUS WASTES AND THEIR DISPOSAL

1989

ROTTERDAM CONVENTION

ROTTERDAM CONVENTION
ON THE PRIOR INFORMED CONSENT PROCEDURE FOR CERTAIN HAZARDOUS CHEMICALS AND PESTICIDES IN INTERNATIONAL TRADE

1998

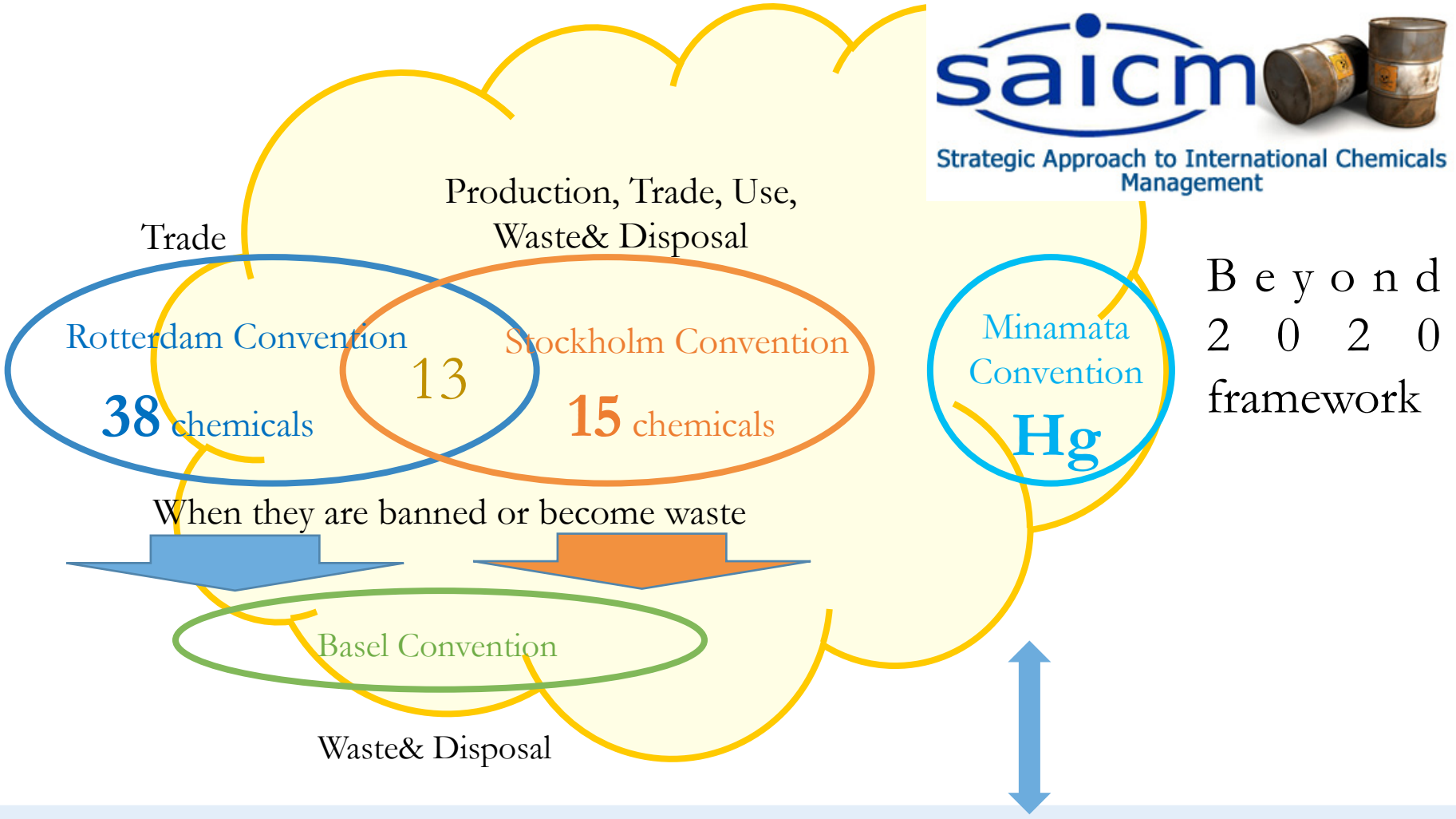
Stockholm Convention on persistent organic pollutants (POPs)

2001

UN environment

MINAMATA CONVENTION ON MERCURY

2013



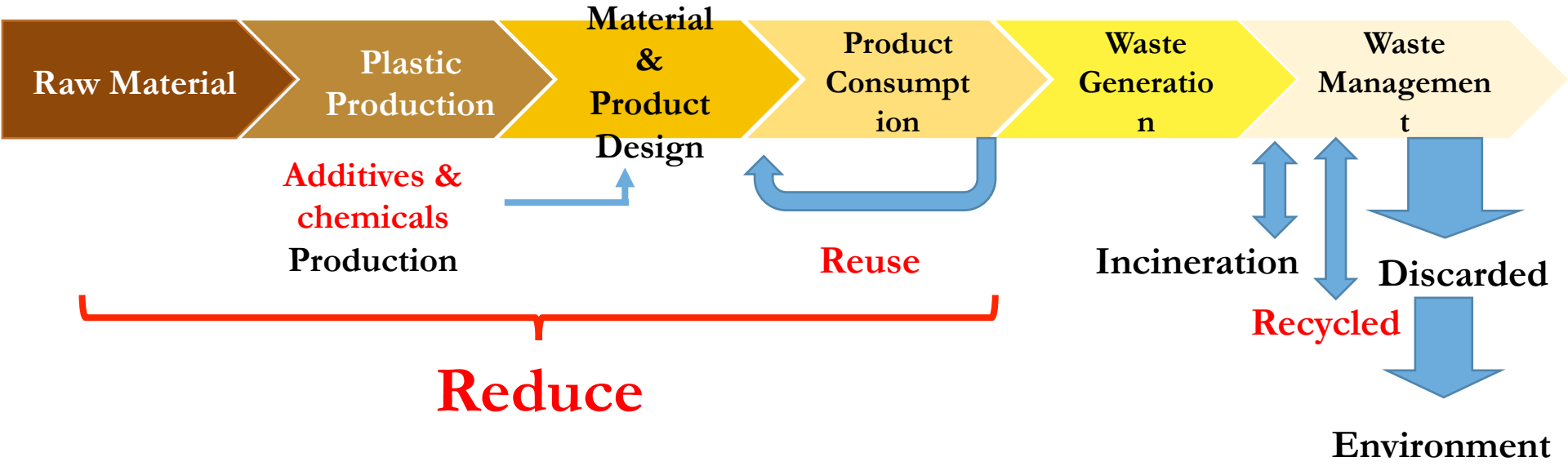
Private sector initiatives, e.g. :

- Chemical manufacturing industry
- Downstream industry
- Financial sector e.g. Dow Jones Sustainability Index…

Example: Plastics

Another typical symptom rising from non-sustainable production and the consumption of chemicals and resources.

Value Chain & Life Cycle



Holistic, Systematic & Transformative Approaches

(Modified from Jambeck et.al. (2018) *Marine Policy)*

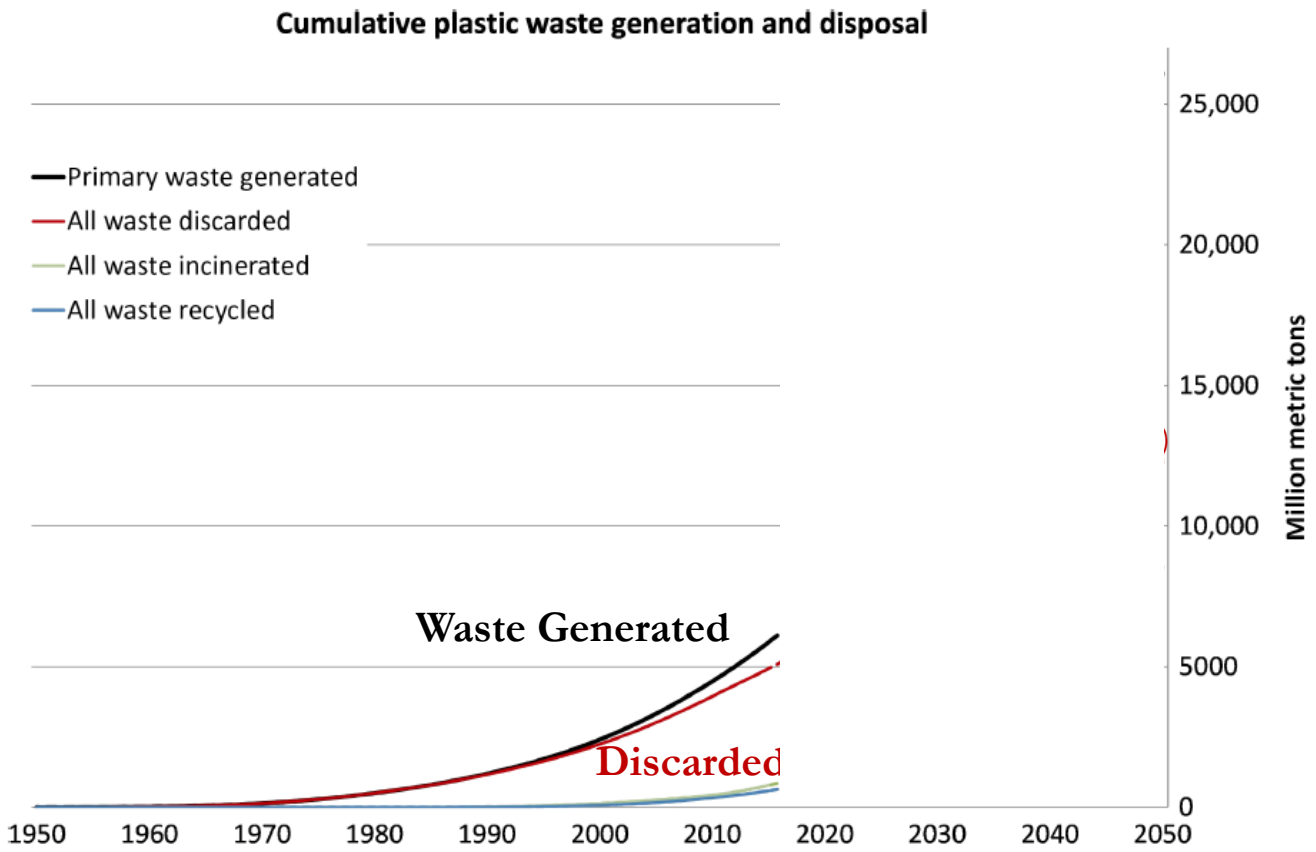


Fig. 3. Cumulative plastic waste generation and disposal (in million metric tons). Solid lines show historical data from 1950 to 2015; dashed lines show projections of historical trends to 2050.

(Geyer et.al. (2017))

CANNOT recycle our way out!

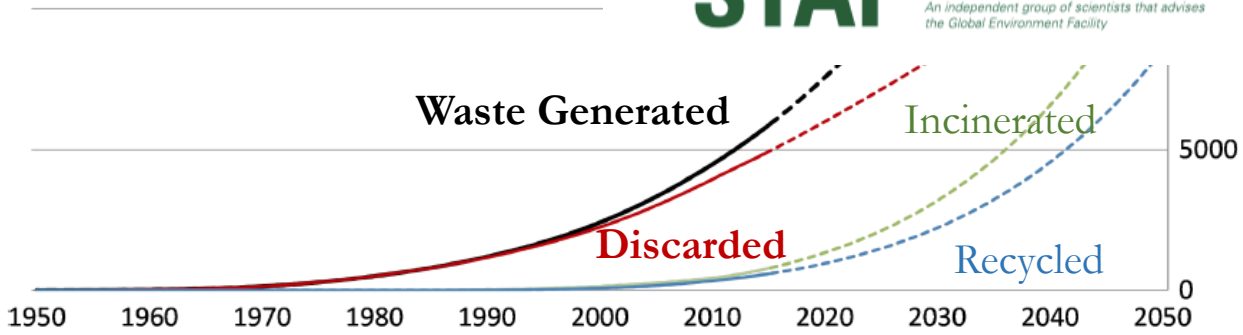
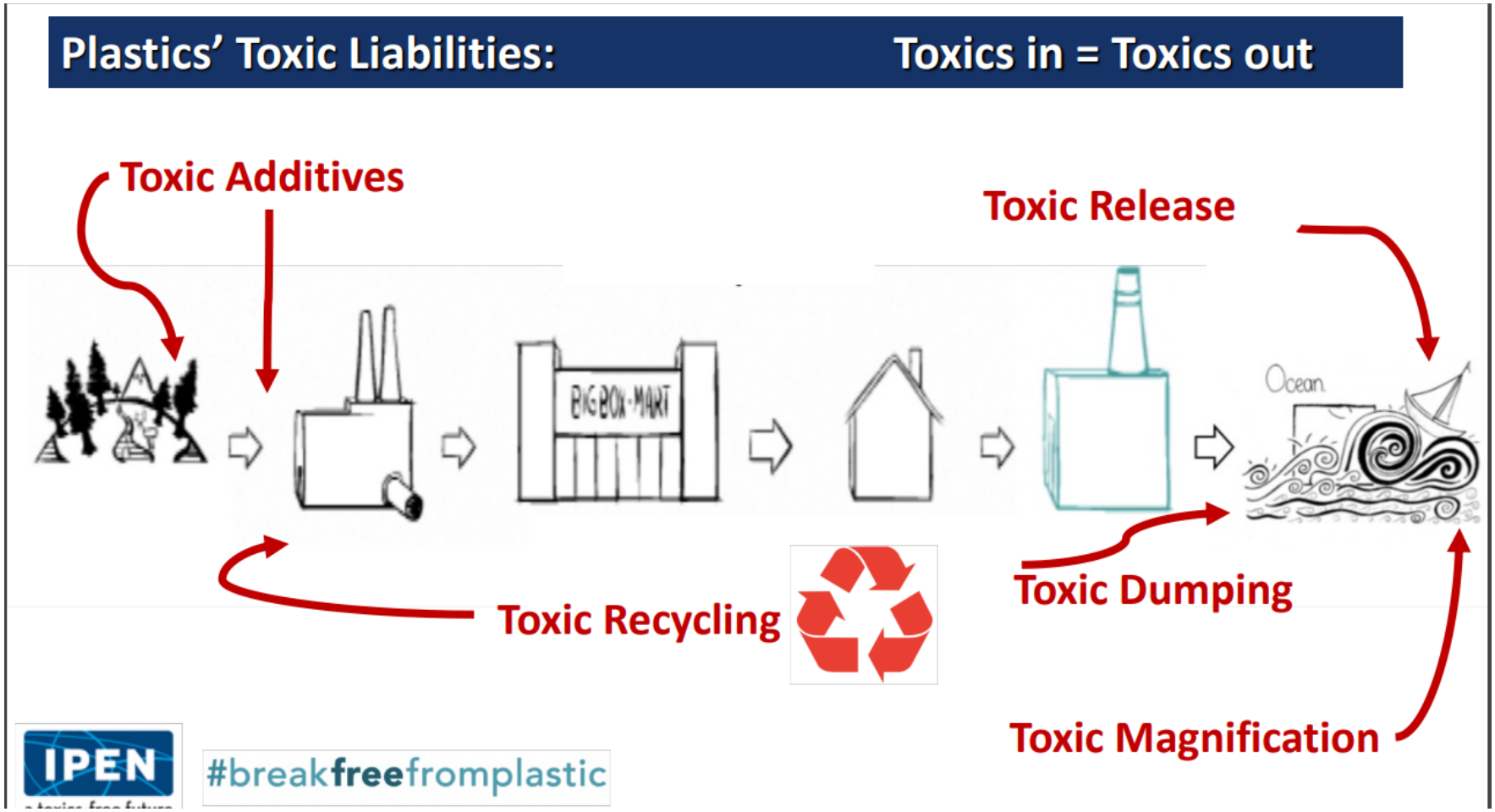


Fig. 3. Cumulative plastic waste generation and disposal (in million metric tons). Solid lines show historical data from 1950 to 2015; dashed lines show projections of historical trends to 2050.

(Geyer et.al. (2017))

Circular Economy: hazardous chemicals



"Current governance strategies and approaches provide a fragmented approach that does not adequately address marine plastic litter and microplastics…

These efforts will provide some degree of progress, but combined may NOT reach the desired outcomes at a global level of protecting the environment, human health and food security."

(UN Environment 2018)

UNITED NATIONS

UNEP/EA.

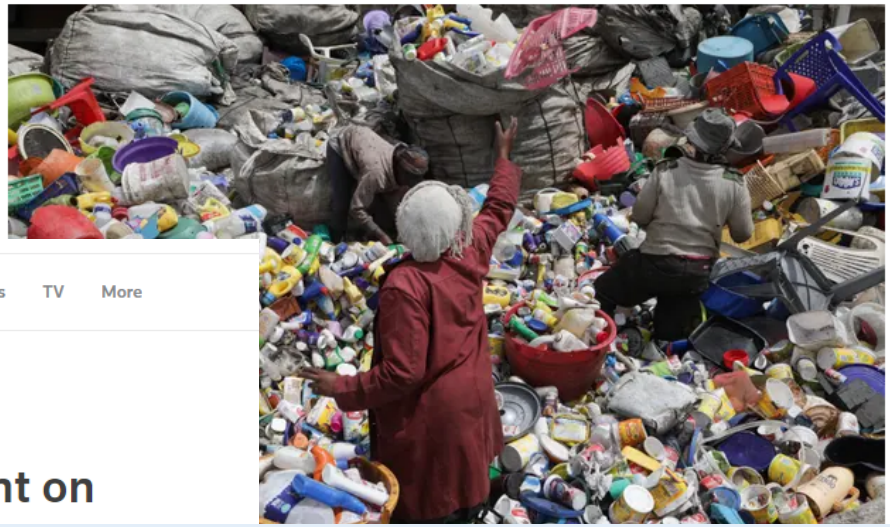
Distr.: Limited
14 March 201

Original: Engl

United Nations
Environment Assembly of the
United Nations Environment
Programme

US accused of blocking ambitious global action against plastic pollution

Commitments agreed at UN conference in Kenya do not go far enough, say green groups



REUTERS

Business Markets World Politics TV More

BIG STORY 10 MARCH 15, 2019 / 6:26 PM / 7 DAYS AGO

U.S. weakens first global commitment on

The global vision has emerged, both in terms of the need to phase out SUP and the need for global governance of plastic pollution

Phasing Out Single Use Plastic Products

Summary

- Sustainability case, Business case
- Science guide policy and action: cocktail exposure and effects; away from chemical-by-chemical approach
- Circular economy by design: chemical-product-waste interface, life cycle approach
- Sustainable production & consumption
- Governance and private sector initiatives