

### UNEP Manuals on Green and Sustainable Chemistry

Sandra Averous-Monnery, UNEP

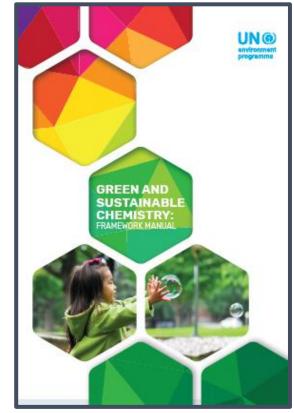
IOMC Webinar - Leveraging Green and Sustainable Chemistry for sound management of Chemicals and waste beyond 2020 - April 14<sup>th</sup>, 2021

### **UNEA-4** on green and sustainable chemistry

• UNEA-4 (2019) Resolution 4/8 on Sound Management of Chemicals and Waste among others:

Welcomes the analysis of best practices in sustainable chemistry and recognizes the value of developing a better understanding of sustainable chemistry opportunities

Synthetize UNEP's analysis of best practices in sustainable chemistry into manuals on green and sustainable chemistry, in consultation with relevant stakeholders, by UNEA5, and to continue the work on a holistic approach for the sound management of chemicals and waste in the long term, taking into account both the importance of the sound management of chemicals and the potential benefits of chemicals for sustainable development



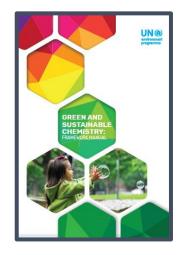
### 10 Green and Sustainable Chemistry Objectives and Guiding Considerations



UN@

#### 10 Green and Sustainable Chemistry **Objectives and Guiding Considerations**

**UNEP Green and Sustainable Chemistry: Framework Manual** 



Design of chemicals with minimized (or no) hazard properties for use in materials, products and production processes ("benign by design")

Use of sustainably sourced

negative trade-offs

resources, materials and

feedstocks without creating

Minimizing chemical hazards

Sustainable sourcing of resources and feedstocks

Advancing sustainability of products

**Avoiding** regrettable substitutions alternatives

Develop safe and sustainable alternatives for chemicals of concern through material and product innovations that do not create negative tradeoffs

Advancing sustainability of production processes

Use green and sustainable chemistry innovation to improve resource efficiency, pollution prevention, and waste minimization in industrial processes

to enable non-toxic circular material flows and sustainable supply and value chains throughout

workers, consumers and vulnerable groups in formal Minimizing chemical releases and pollution

**Enabling non-**

**Protecting** 

workers.

vulnerable

populations

consumers and

toxic circularity

Reduce chemical releases throughout the life cycle of chemicals and products

Maximizing social benefits Consider social factors, high standards of ethics, education and justice in chemistry innovation

Developing solutions for sustainability challenges

Focus chemistry innovation to help address societal and sustainability challenges

Use green and sustainable chemistry innovation to create sustainable products and consumption with minimized (or no) chemical hazard potential

Use of chemistry innovations the life cycle

> Safeguard the health of and informal sectors

## UNEP Green and Sustainable Chemistry: Framework Manual

Why and What

How

#### 2030 Sustainable Development Agenda

- ► Clean energy
- Sustainable consumption and production
- Good health and well being
- ▶ ....

Chapter

#### Green and sustainable chemistry objectives

- Minimizing chemical hazards
- Avoiding regrettable substitutions and alternatives
- Sustainable sourcing of resources and feedstocks

**....** 

Chapter 3

#### Chemistry and technology areas

- Sustainable feedstocks
- Non-toxic alternatives
- ▶ Process innovation
- **>**

Chapter

GREEN AND SUSTAINABLE CHEMISTRY:
FRAMEWORK MANUAL

Enabling instruments and policies

- Live cycle thinking and assessment
- Sustainable supply chain management
- Corporate sustainability strategies
- ٠...

Chapter

#### Enabling sectors and programmes

- Green and sustainable chemistry education
- Collaborative research and innovation
- Sustainable business models

...

Chapter

Metrics, assessment and reporting

- Green and sustainable chemistry metrics
- Sustainability assessments and reporting
- M See

Chapter

7

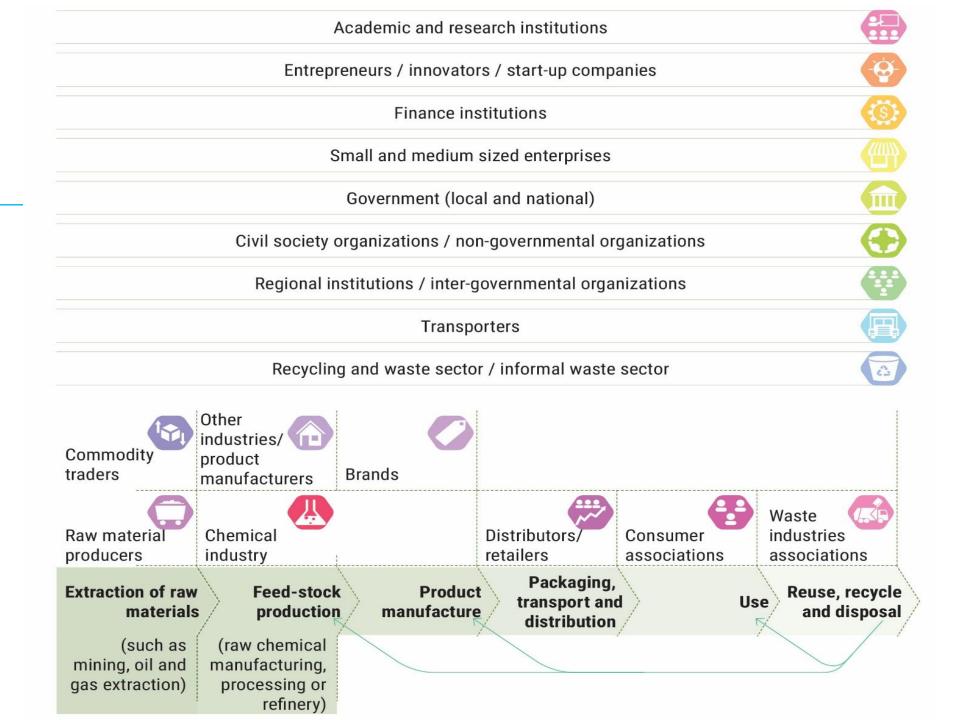
Roadmap development

> Chapter 8

# Key Stakeholders for green and sustainable chemistry action



Figure: Mapping of key green and sustainable chemistry stakeholders (Adapted from Ryberg, Laurent and Hauschild 2018, p.10)



### UNEP Specialized Manual on Green and Sustainable Chemistry Education

Green and sustainable chemistry education and innovation are drivers of change and can be scaled up through enabling policies to reap benefits of chemistry innovation. GCO II, 2019

## Provide practical guidance to advance green and sustainable chemistry education

 Outline key action steps, organize educational resources, feature illustrative examples, guide development of green and sustainable chemistry education roadmaps

## Promote learning throughout society for a wide range of stakeholders

- Formal education for all ages
- Non-formal and informal education for professional development and citizen awareness raising

## Facilitate and stimulate action to raise awareness, enhance knowledge and develop skills

 Empower target audience to advance the 10 objectives and guiding considerations for green and sustainable chemistry



#### Thank you for your attention!

Contact: science.chemicals@un.org

**Personal contact:** 

Sandra Averous-Monnery (sandra.averous@un.org)

Colin Hannahan (colin.hannahan@un.org)

IOMC Webinar - Leveraging Green and Sustainable Chemistry for sound management of Chemicals and waste beyond 2020 - April 14th, 2021