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**FABRIC Asia**

# 国际化学品管理形势与产业界绿色和可持续化学需求

## Perspectives of International Chemical Management and Trends toward Green & Sustainable Chemistry for Industries

**刘建国 博士**

北京大学新体制长聘副教授/研究员  
环境科学与工程学院

**Liu Jianguo Ph.D**

Associate professor(Tenure-track)

College of Environmental Sciences and Engineering, Peking University

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## 提纲/Outline

### □ SAICM及2020后行业面临的国际化学品管理政策趋势

SAICM and Megatrends in International CM for Industries Beyond-2020

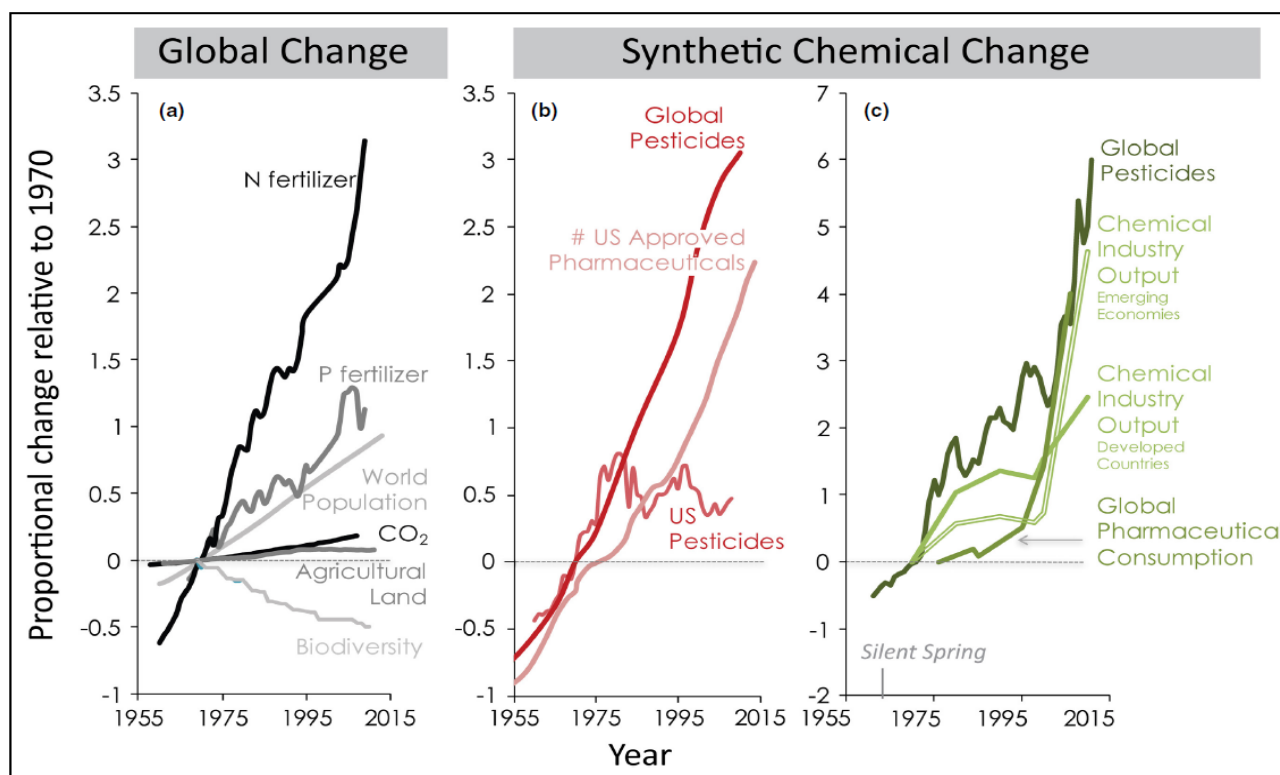
### □ 全球产品链化学品风险管控形势：新兴关注化学品

Situation of CRM in Global Value Chain: Emerging Chemicals of Concern

### □ 绿色和可持续化学：产业界的未来及供应链设计导向与实践案例

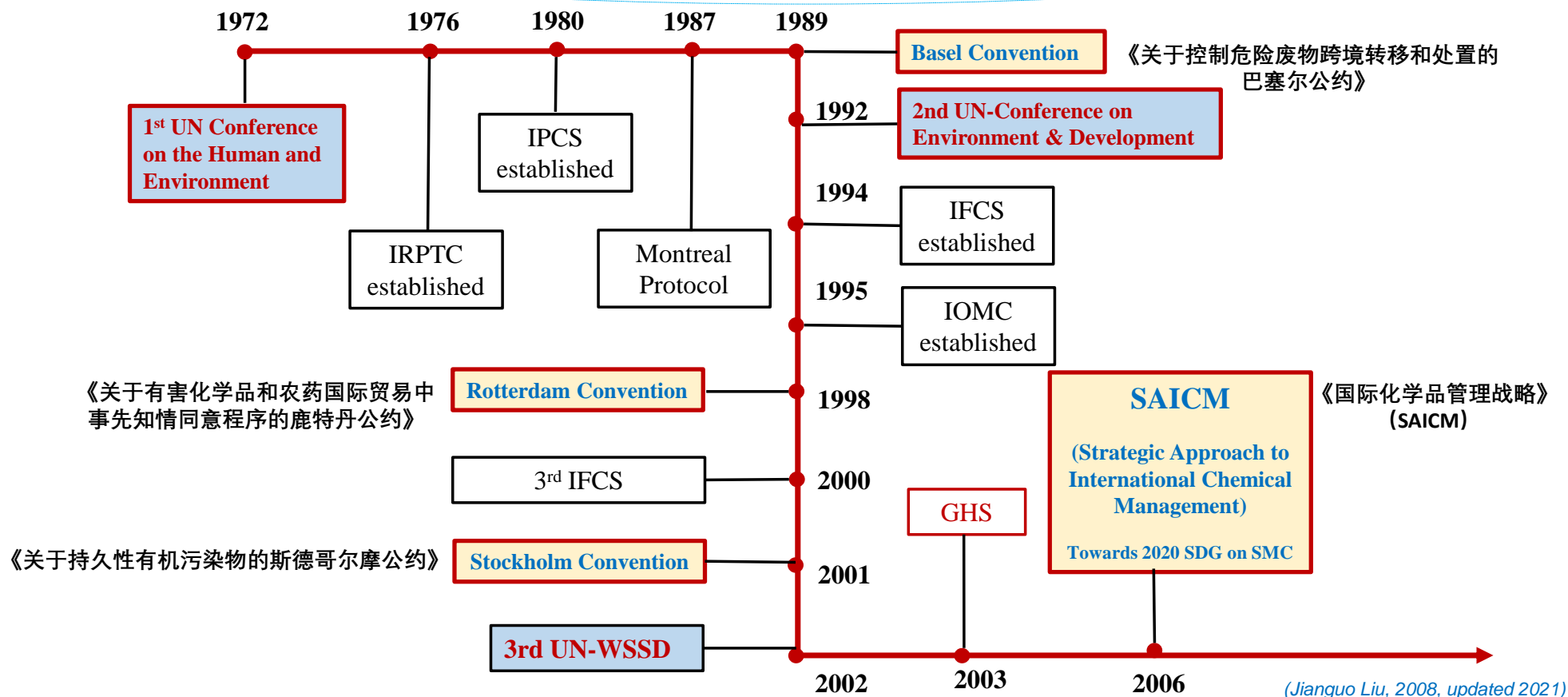
Green and Sustainable Chemistry: Future Industries and Guides & Good Practices for Supply Chain

# 人工化学品已致全球变化 Synthetic chemicals as agents of global change



(ES Bernhardt et al., 2017)

# 国际化学品管理发展历程 Development of International Chemicals Management



## 国际化学品管理战略(SAICM)

### Strategic Approach to International Chemicals Management



- 到2020年，实现化学品可以在最大程度地降低人体健康和生态环境的显著不利影响的情况下生产和使用。  
**By 2020**, chemicals are produced and used in ways that lead to the minimization of significant adverse effects on human health and the environment

----- WSSD, 2002

### *“Non-toxic Environment”*

- 五个主题领域及一项全球行动计划（包含36个工作领域及273项行动）  
Five Themes with a Global Action Plan (36 Working Areas containing 273 Activities)

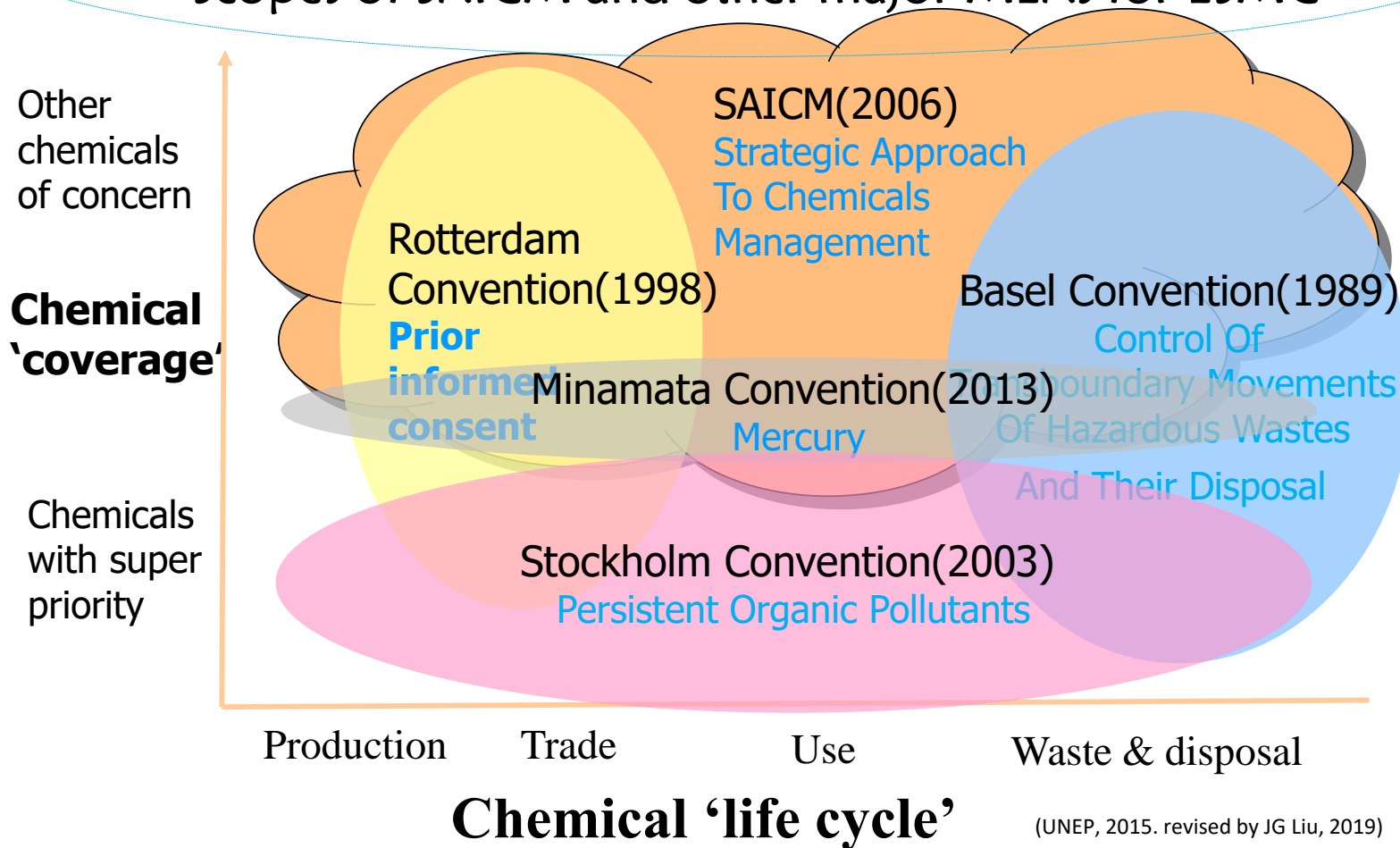
# SAICM基本主题

## Five Themes of SAICM

- **风险降低 (Risk Reduction) :**  
e.g., 数据申报登记、POPs, 高毒农药, 汞..., —— 《POPs公约》
- **知识与咨询 (Knowledge & Information) :**  
e.g., 风险认识, 分类与标识, 信息传递和共享..., —— 《全球》GHS
- **公共治理 (Governance)**  
e.g., 政府各部门合作, 企业责任, 政府、企业及社会共同参与——SAICM重心之一
- **能力建设与技术合作 (Capacity building and Technical cooperation)**  
e.g., 危害测试、风险评估与风险管理能力 (法制与监督实施) ..., ——SAICM重心之一
- **非法国际流通控制 (Illegal international traffic)**  
有害化学品和废物非法国际贸易和转移——《巴塞尔公约》

# SAICM与主要化学品环境公约的范畴

## Scopes of SAICM and other major MEAs for ESMC



## SAICM的实施效果 SAICM Performance 2006-2016

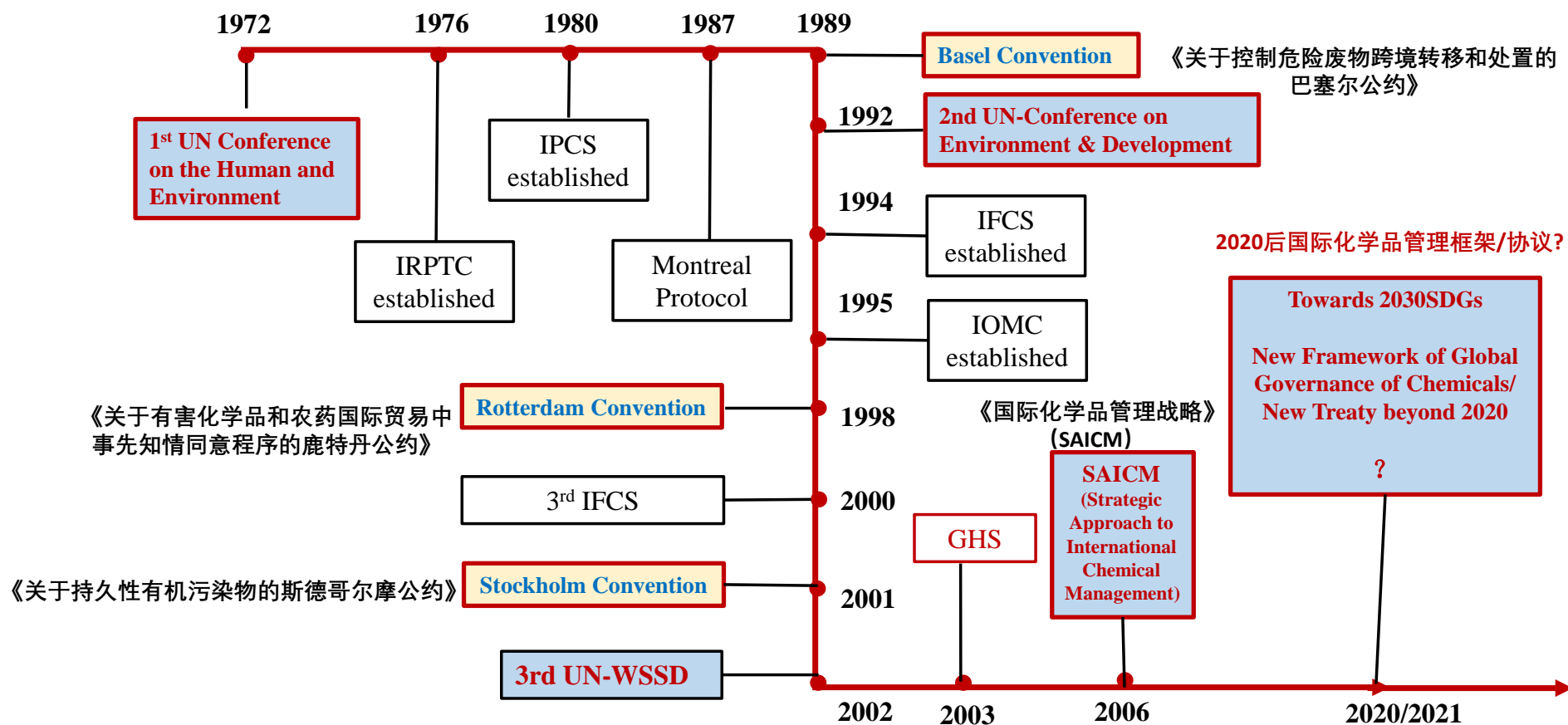
### ● 总体效果（问卷调查）

	very successful	some success	little success	unsuccessful	don't know
risk reduction	15%	56%	16%	3%	11%
knowledge & information sharing	22%	54%	14%	2%	7%
governance	16%	47%	20%	5%	12%
capacity-building & technical cooperation	20%	40%	25%	4%	11%
illegal international traffic	7%	27%	18%	18%	31%

(R. NURICK, 2018)



# 国际化学品管理发展历程 Development of International Chemicals Management



(Jianguo Liu, 2008, updated 2021)



## SAICM/2020后国际化学品管理:

### 一个具有进取性优先事项及明确指标的综合性和全球治理框架 (GCO-II, 2019)

A comprehensive global framework with ambitious priorities and coherent indicators

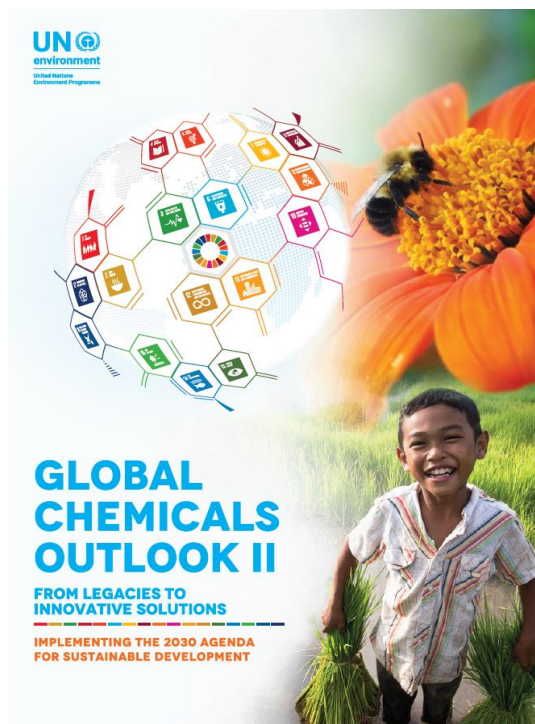


#### The Stockholm High-Level Dialogue on Sound Management of Chemicals and Waste beyond 2020, on 12 March 2018:

How to make an ambitious new chemicals and waste global framework



Upon invitation from the Swedish Environment Minister Karolina Skog, on 12 March a group of high-level officials from governments, Inter-governmental Organizations, civil society organizations and industry met for a discussion on how to promote an ambitious framework on sound management of chemicals and waste. The aim of the dialogue was to raise commitment and engagement on this crucial issue. The main questions addressed were related to the essential elements



<https://www.unenvironment.org/resources/report/global-chemicals-outlook-ii-legacies-innovative-solutions>

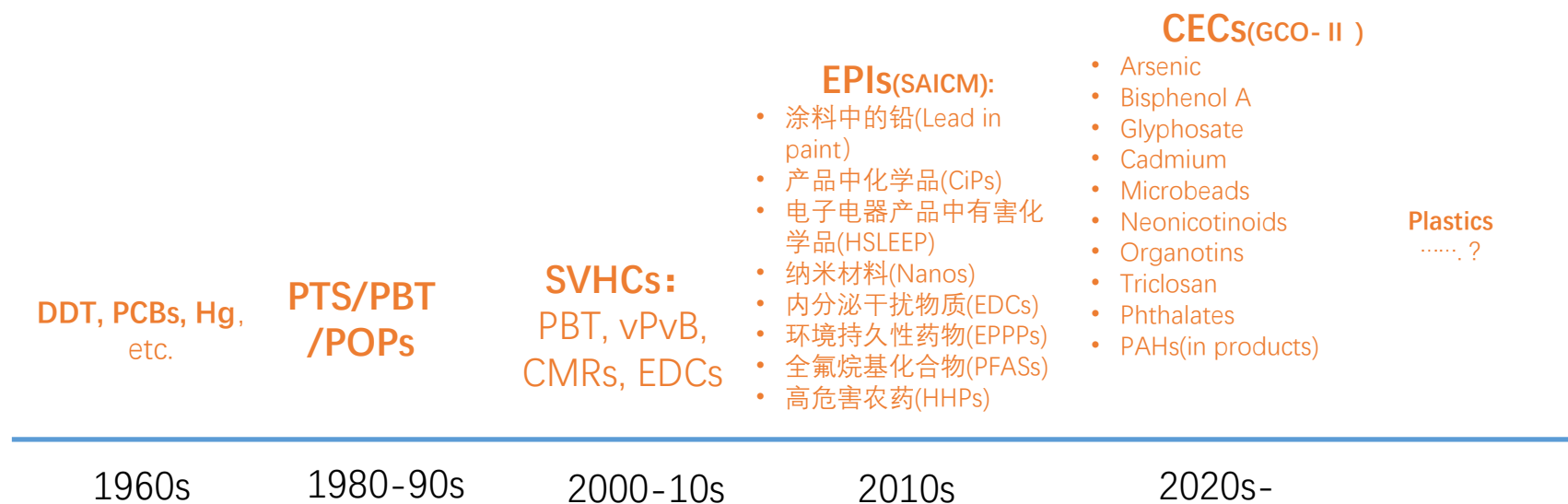
## SAICM/2020后国际化学品管理趋势(与行业密切相关的)

### Megatrends in International Chemicals Management regarding Industries beyond 2020

- 强化各利益相关方的责任(尤其是企业, 如危害/风险评估, 报告, 信息披露, 资助 等)/Enhance the responsibilities of stakeholders (especially for industries, eg., hazard/risk assessment, reporting, finance, )
- 加强产品及供应链中化学品的风险评估、交流和风险管理/Foster the assessment, communication and management of risk chemicals in products and supply chain
- 推行全生命周期的产品中化学品信息透明和可持续供应链管理: 全材料信息披露/透明/可持续产品设计/Advance widespread implementation of sustainable supply chain management in life cycle approaches: full material disclosure, transparency and sustainable product design
- 推行绿色和可持续化学研究与创新/Integrate green and sustainable chemistry in research and innovation

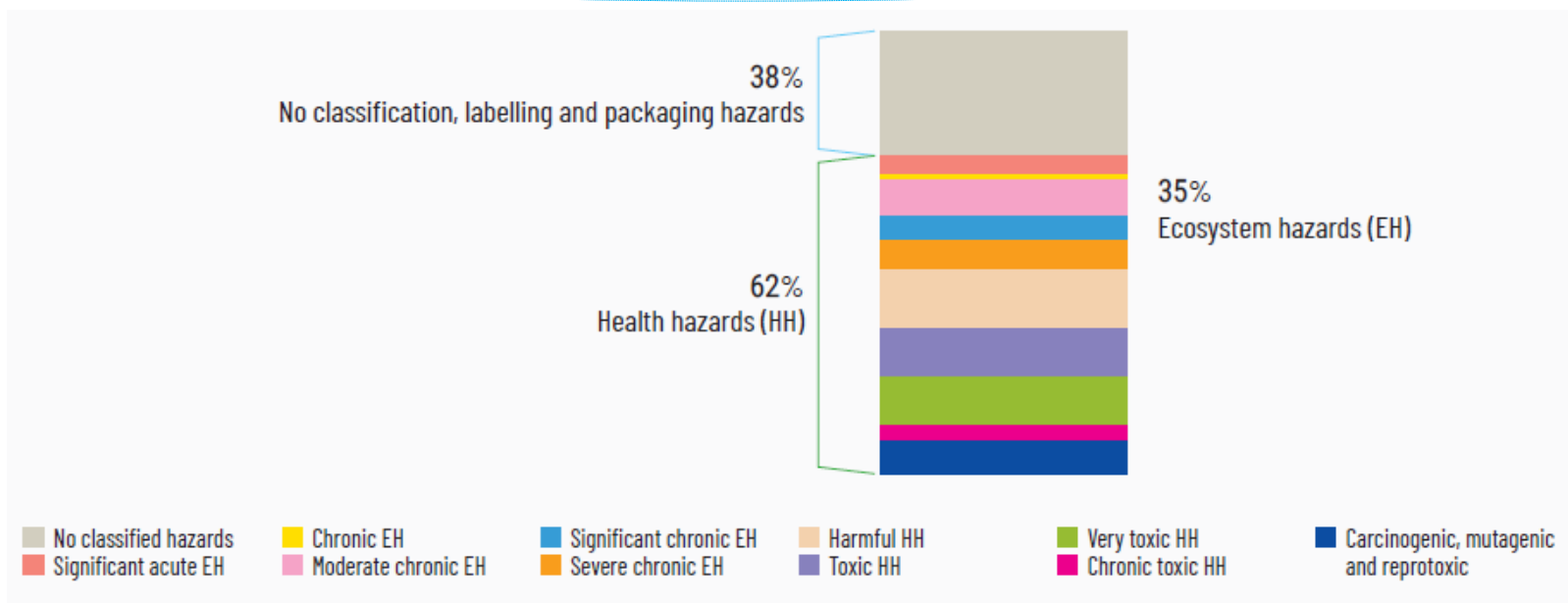
(SAICM-OOG, 2015; GCO-II, 2019 )

不断识别/涌现的高风险/关注化学品  
Continuously emerging chemicals of concern globally



(Jianguo Liu, 2019)

## 现状：市场在用化学品的危害性比重 Status of hazardous properties of chemicals in our market



## 欧洲环保局（EEA）：欧盟境内使用中的化学品的危害性比重 Share of the volume of chemicals consumed in the European Union in 2016 by hazard categories (EEA, 2018; GCO-II, 2019)

## 欧盟(EU)REACH评估: 2007-2018

### □ 登记产量/进口量>1000吨/年的化学品

**Chemicals registered above 1000tons/y:**

- 平均仅~39%充分符合毒理学数据要求（其中仅19%符合生殖发育毒性要求）

**Only 39% were compliant with the information requirements**

### □ 登记产量/进口量100-1000吨/年的化学品

**Chemicals registered 100-1000tons/y:**

- ~70%因缺乏充分毒理学数据或使用信息，无法确定进一步的优先测试~70% cannot be prioritized for in-depth evaluation due to lack of data

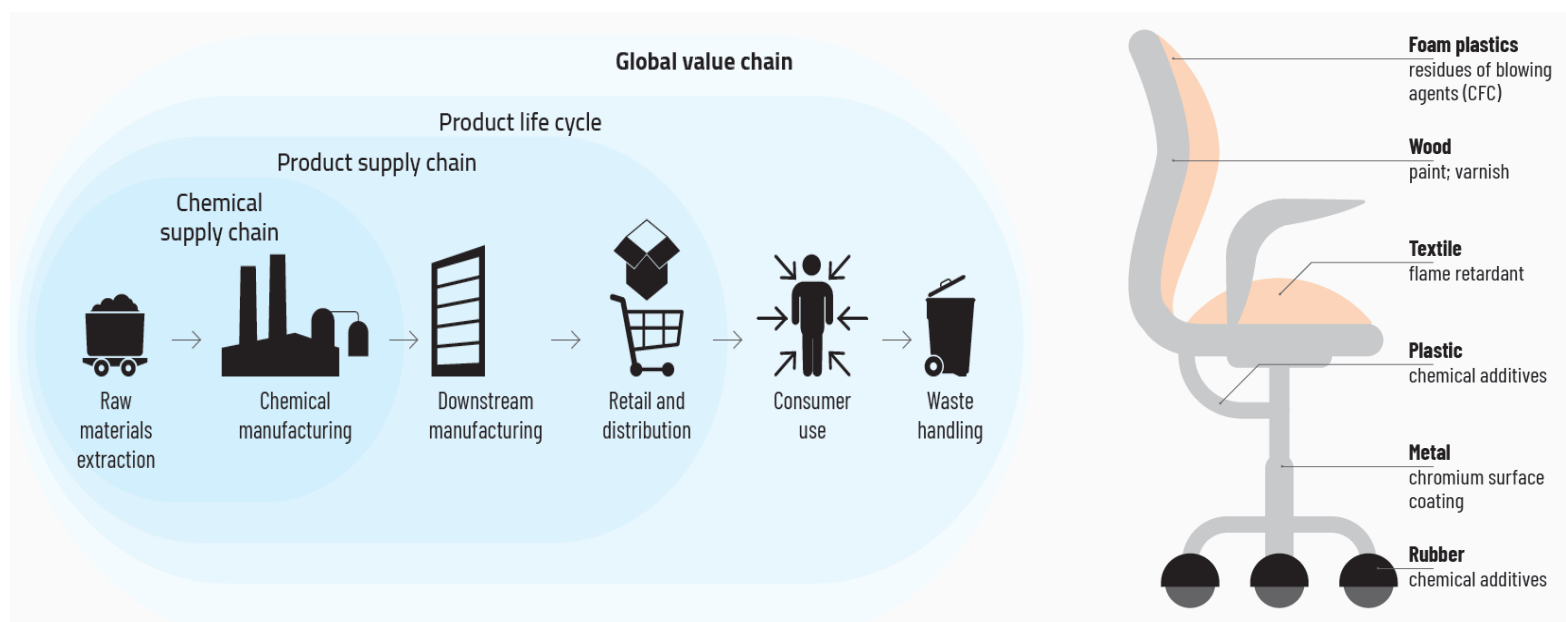
### □ 登记产量/进口量10-100和1-10吨/年的化学品： ?

**Chemicals registered 10-100 and 1-10tons/y: ?**

**( ECHA 2016, 2017 )**

## 全球产业链中的化学品风险管理形势：

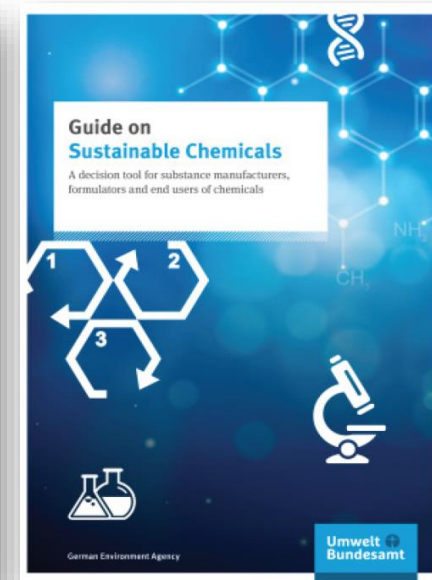
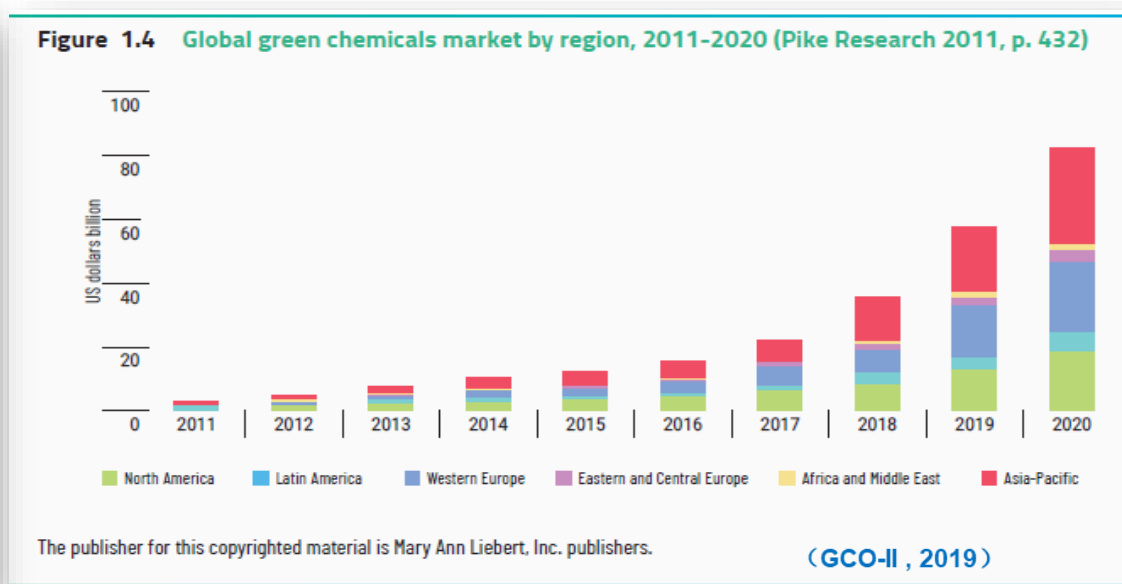
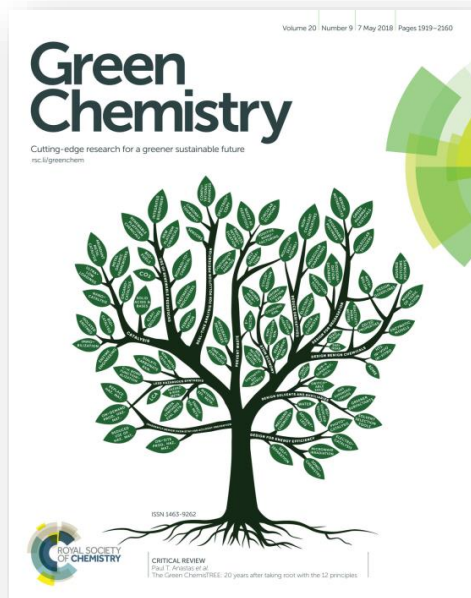
## Current situation of chemicals risk management in global value chain



## 绿色和可持续化学：产业界未来发展之路

Green and sustainable chemistry(GSC): Road ahead of industries for future

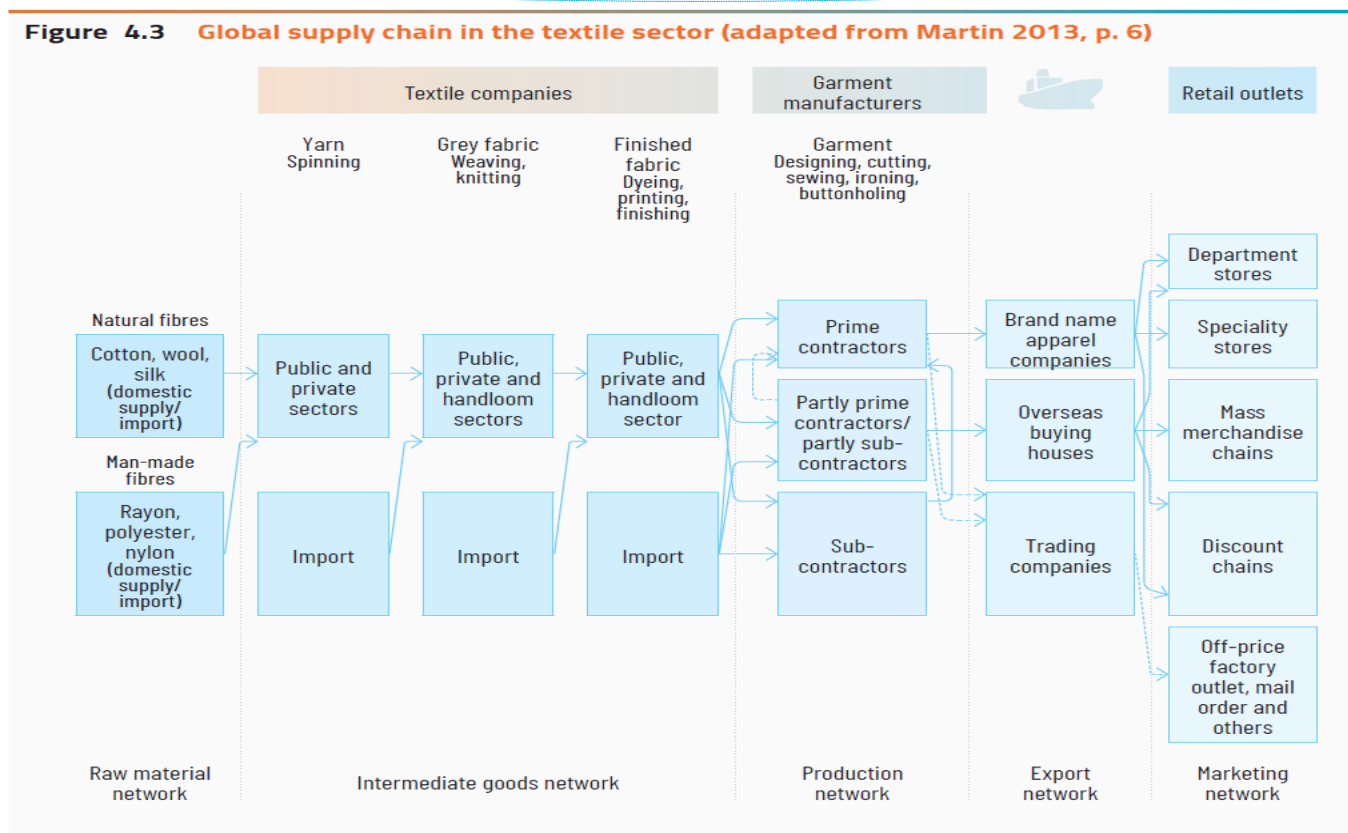
- ① **Knowledge & Assessment** of the Presence and Risk of Chemicals in Use(Products and Supply Chain)
- ② **Alternative Assessment** for Safer Chemicals
- ③ **GSC Innovations** for Nontoxicity, Recyclability, Recoverability and Greenhouse Gas Reduction





# 《全球化学品展望》：全供应链考虑绿色和可持续化学设计

## GCO-II: Green and sustainable chemistry design considerations along the supply chain



(GCO-II, 2019)

# 企业绿色和可持续化学实践导则/标准(举例):

## Guides/Metrics to GSC for businesses, for example

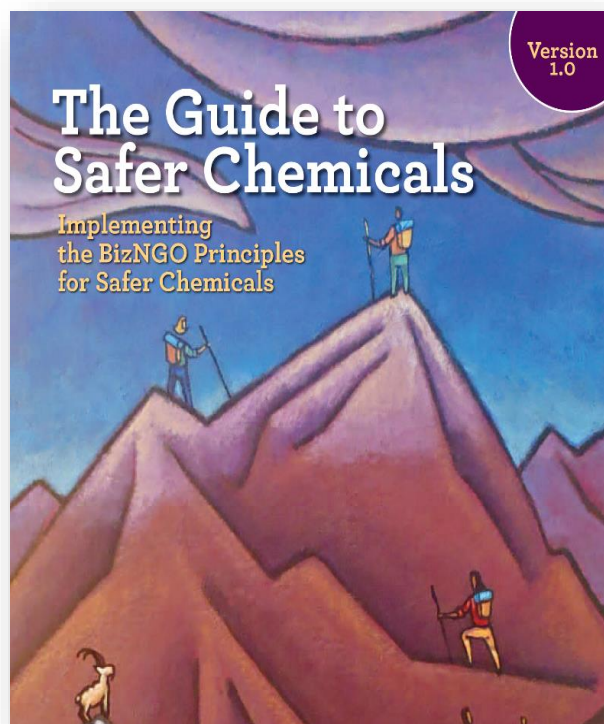
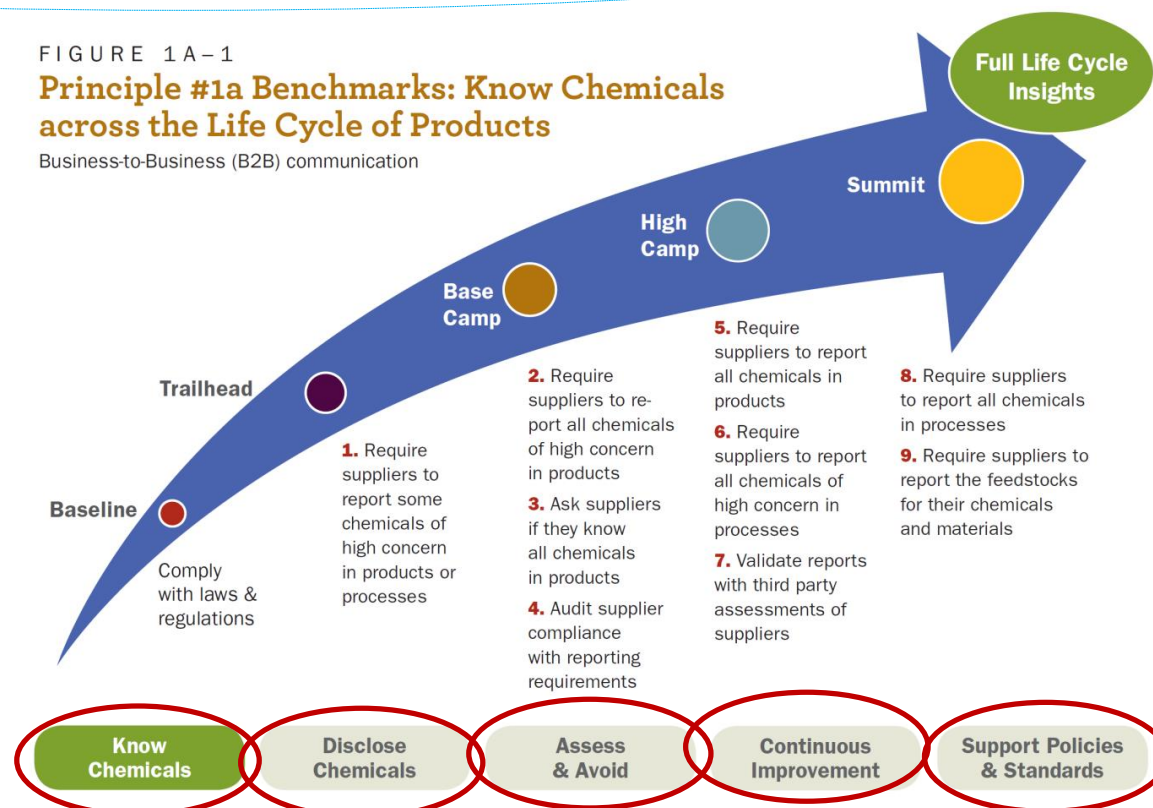


FIGURE 1A-1

### Principle #1a Benchmarks: Know Chemicals across the Life Cycle of Products

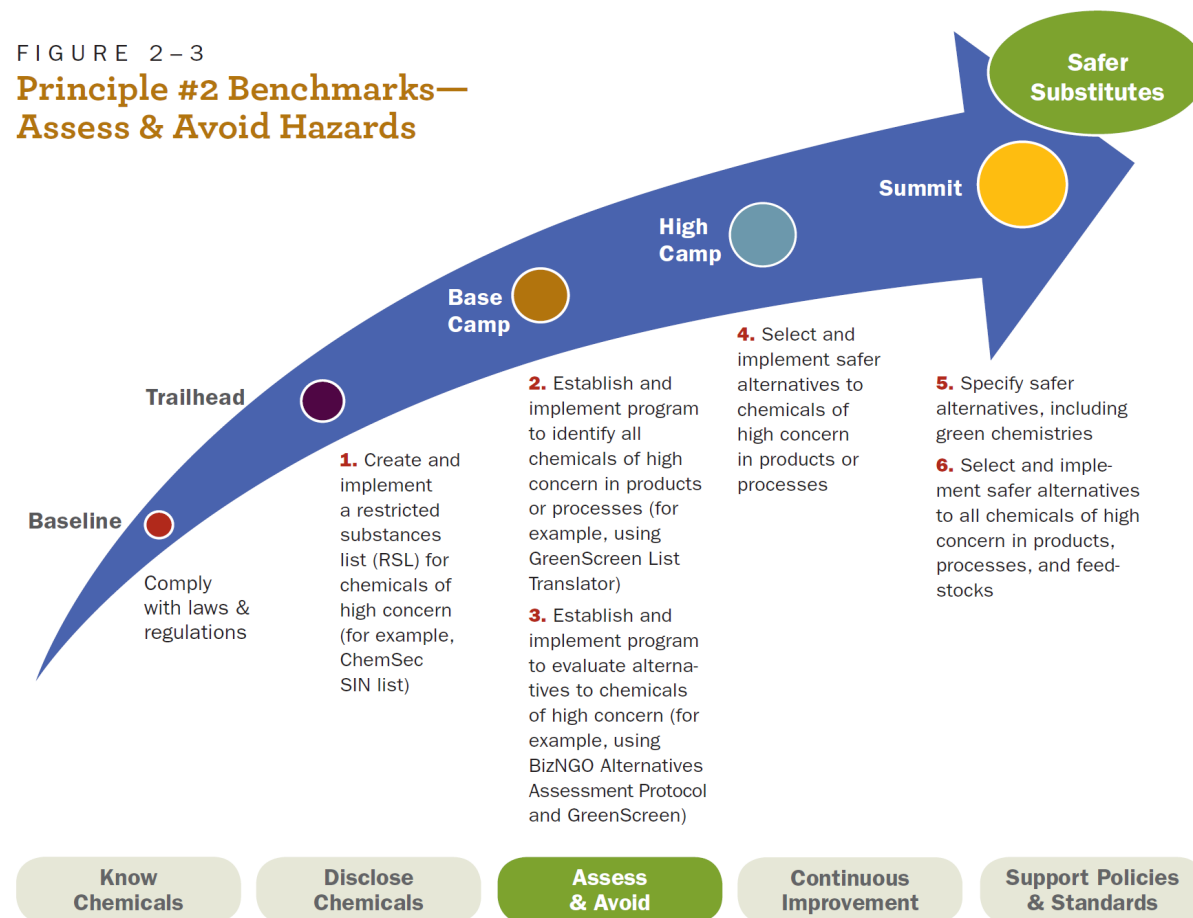
Business-to-Business (B2B) communication



[https://www.bizngo.org/static/ee\\_images/uploads/resources/BizNGO-Guide-Principle-1a-v1\\_0.pdf](https://www.bizngo.org/static/ee_images/uploads/resources/BizNGO-Guide-Principle-1a-v1_0.pdf)

FIGURE 2-3

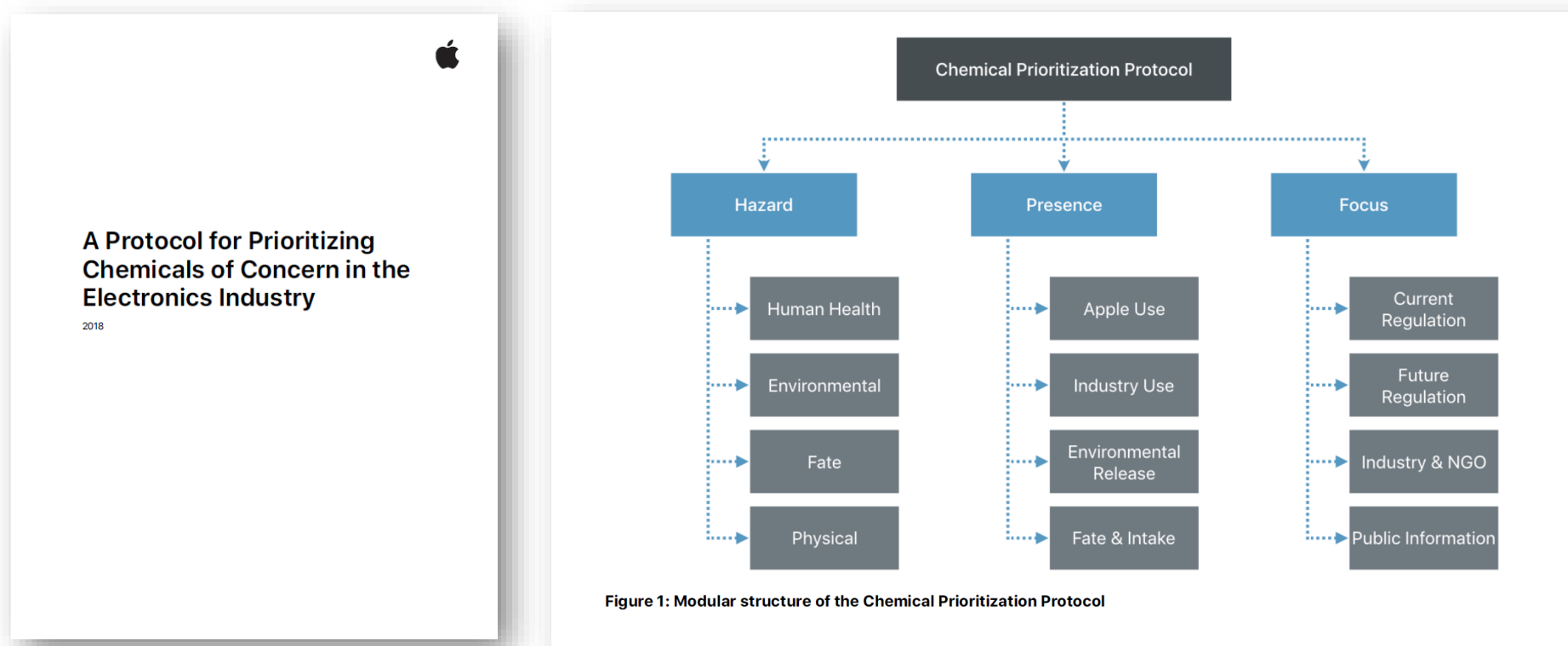
## Principle #2 Benchmarks— Assess & Avoid Hazards



[https://www.bizngo.org/static/ee\\_images/uploads/resources/BizNGO-Guide-Principle-1a-v1\\_0.pdf](https://www.bizngo.org/static/ee_images/uploads/resources/BizNGO-Guide-Principle-1a-v1_0.pdf)

# 企业绿色和可持续化学良好实践 (Apple 案例):

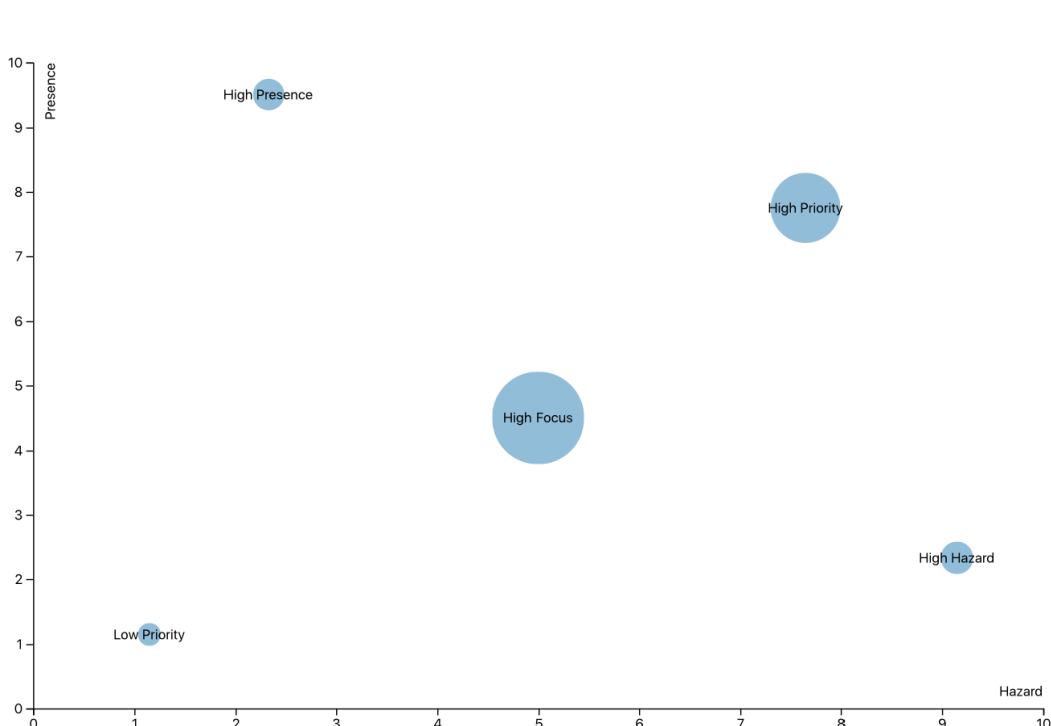
## Good Practices of GSC for businesses--Apple as a case



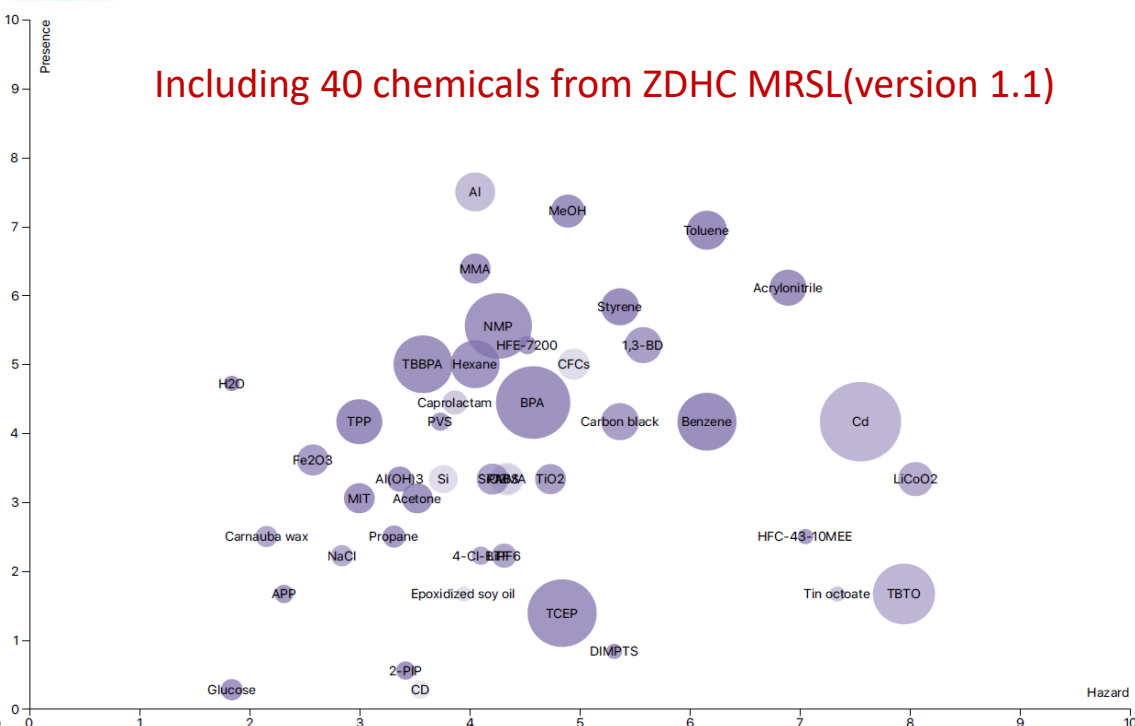
[https://www.apple.com/in/environment/pdf/Apple\\_Prioritizing\\_Chemicals\\_2018.pdf](https://www.apple.com/in/environment/pdf/Apple_Prioritizing_Chemicals_2018.pdf)

# 企业绿色和可持续化学良好实践 (Apple 案例):

## Good Practices of GSC for businesses--Apple as a case



Example plot showing prioritized substances.

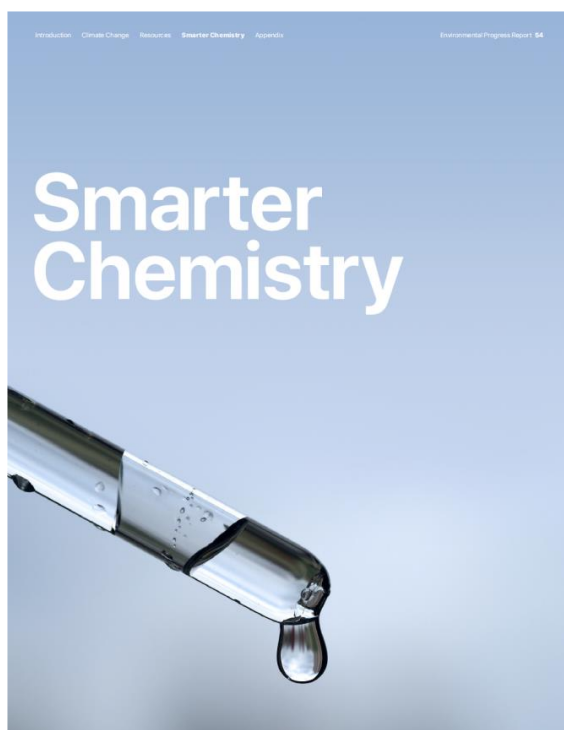


Including 40 chemicals from ZDHC MRSL(version 1.1)

Prioritization of test substances.

[https://www.apple.com/in/environment/pdf/Apple\\_Prioritizing\\_Chemicals\\_2018.pdf](https://www.apple.com/in/environment/pdf/Apple_Prioritizing_Chemicals_2018.pdf)

## 企业绿色和可持续化学良好实践 (Apple 案例): Good Practices of GSC for businesses--Apple as a case



Apple Smarter Chemistry 2020

The pillars of our smarter chemistry strategy:



### Mapping and engagement:

Engage our supply chain partners to build a comprehensive inventory of chemicals used to make our products and go beyond regulatory compliance.



### Assessment:

Assess the potential human health and environmental risks of chemicals to evaluate compliance with our requirements and inform product design.



### Innovation:

Exceed regional requirements by innovating safer alternatives and improving how we and our suppliers manage potential risks of chemicals.

- ✓ 建立供应链全面的化学品清单
- ✓ 评估化学品潜在健康和环境风险
- ✓ 超越现行标准，创新应用安全化学品并持续提升供应商化学品风险管理水平

### Apple 智慧化学战略三个支柱

[https://www.apple.com/environment/pdf/Apple\\_Environmental\\_Progress\\_Report\\_2021.pdf](https://www.apple.com/environment/pdf/Apple_Environmental_Progress_Report_2021.pdf)



## Apple 2020 环境保护进展报告

### Goals and highlights

The well-being of our suppliers, employees, customers, and the planet is a priority for Apple, which is why we're committed to using safer materials to create safer products. This requires diligent work—to build a comprehensive picture of chemicals across our supply chain, to promote the use of better chemical management processes and safer chemical alternatives, and to innovate through design for smarter approaches to making our products.

#### Goals

<p><b>Drive</b> comprehensive reporting of chemicals used in our supply chain to make our products</p>	<p><b>Integrate</b> Smarter Chemistry innovation into the way we design and build our products</p>	<p><b>Avoid</b> exposure to chemicals that could be harmful to human health or the environment</p>
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#### Highlights

<p><b>700+</b> parts and material suppliers share chemical ingredients with Apple</p>	<p><b>40,000</b> materials included in our comprehensive material library</p>	<p><b>100%</b> of supplier final assembly sites use safer cleaners</p>
<p><b>A+ rating</b> received from the Mind the Store campaign</p>	<p><b>1400+</b> new materials evaluated for safety</p>	
<p><b>Safer Choice Partner of the Year</b> award from the EPA</p>	<p><b>600+</b> manufacturing partner facilities shared how chemicals are used and safely managed</p>	

[https://www.apple.com/environment/pdf/Apple\\_Environmental\\_Progress\\_Report\\_2021.pdf](https://www.apple.com/environment/pdf/Apple_Environmental_Progress_Report_2021.pdf)

刘建国：国际化学品管理形势与产业界绿色和可持续化学需求，GIZ Conference on Chemical Management in the Chinese textile and footwear production, 5.27, 2021. 广州



谢谢

Thanks for your attention