

Reshaping global policies for circular economy

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Content



Introduction to Circular Economy

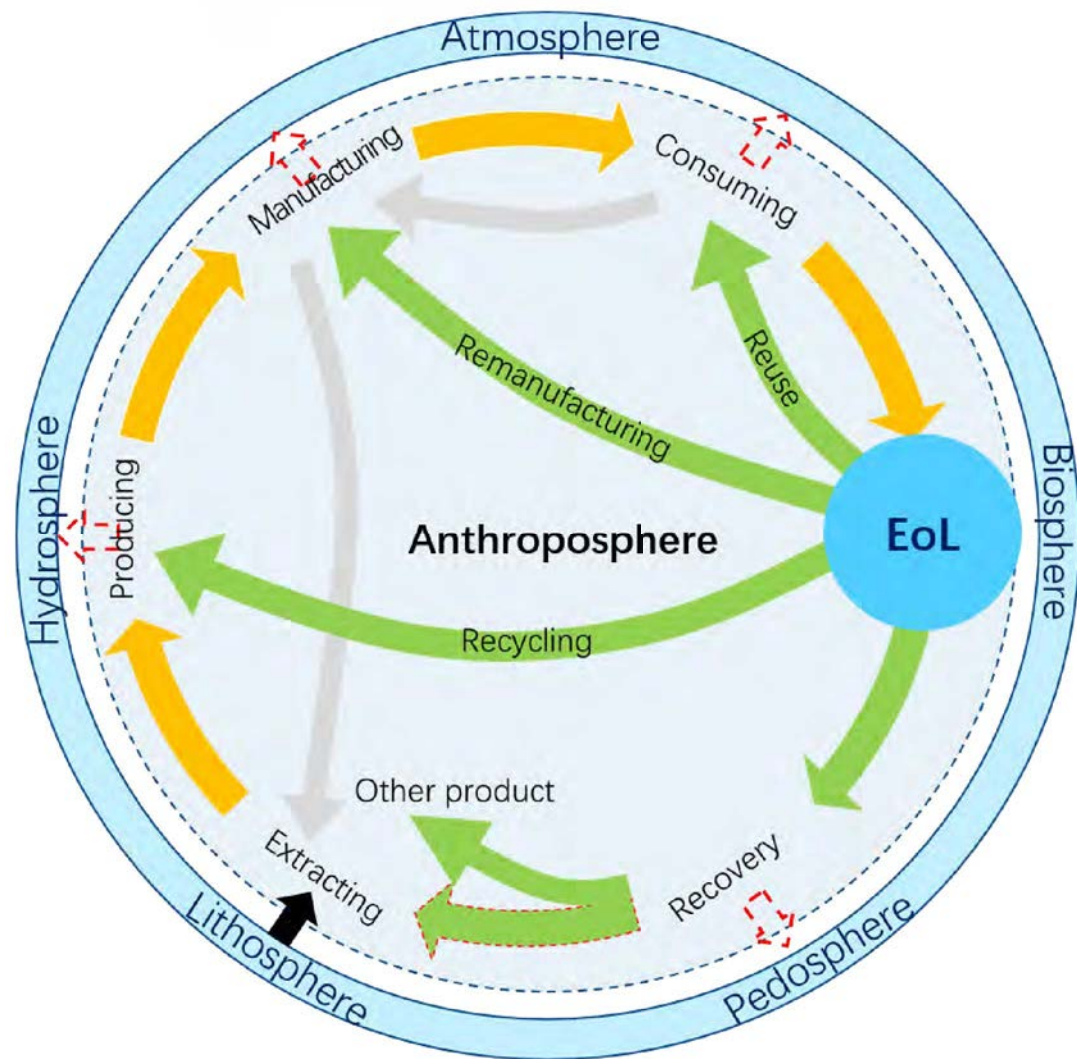
Main Problems to Circular Economy

The Goals of the Circular Economy Transformation

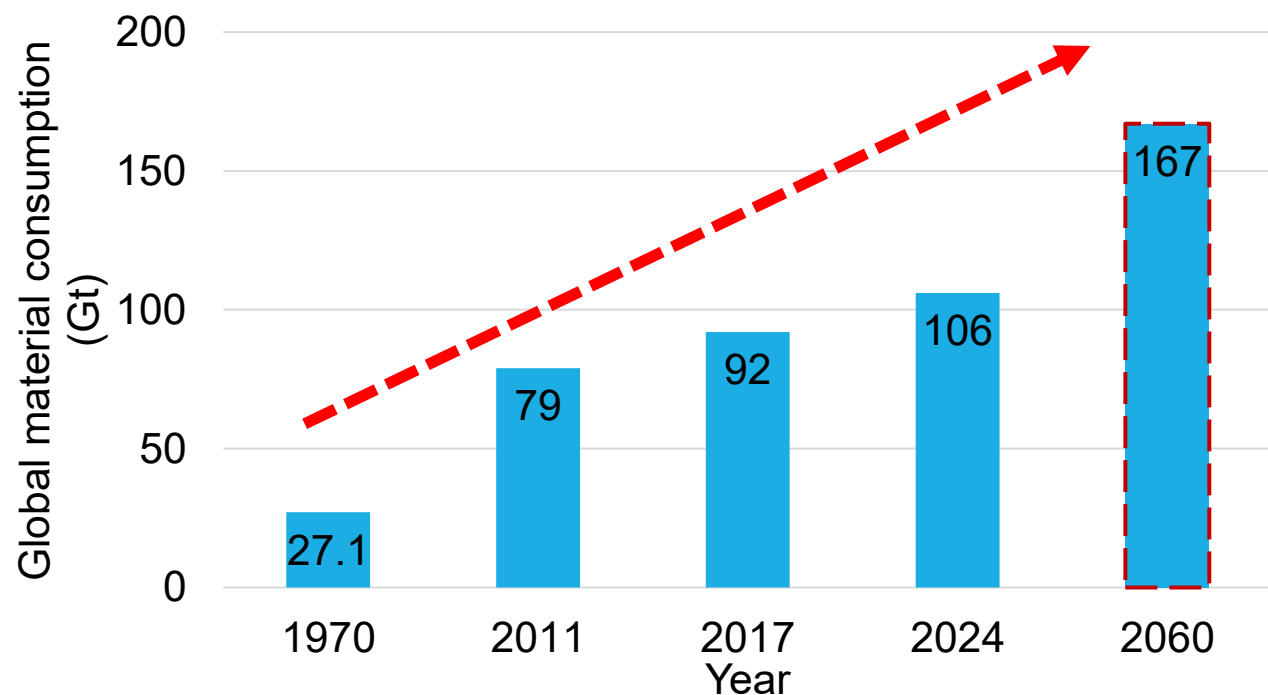
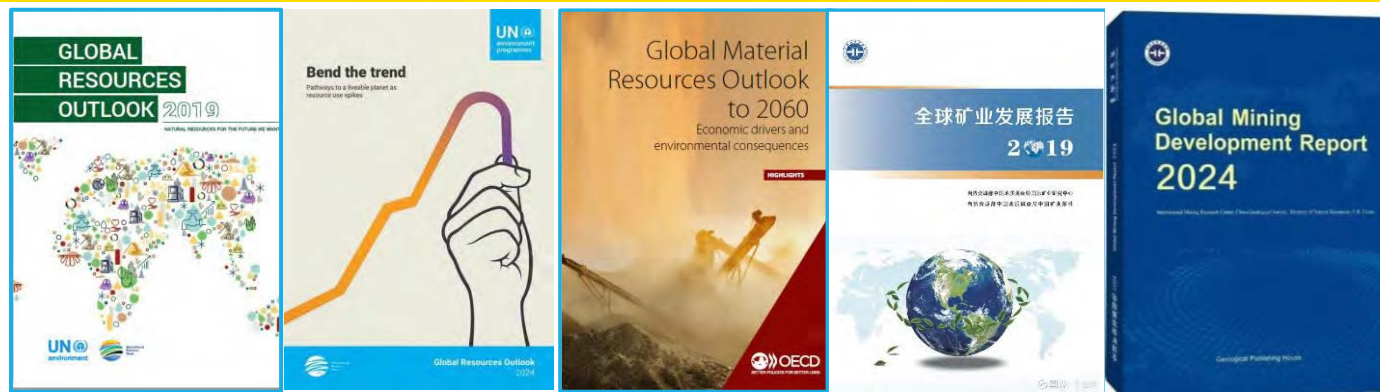
Solutions to achieve transformative change

1

Material Flow Subject to Resource and Environmental Problem



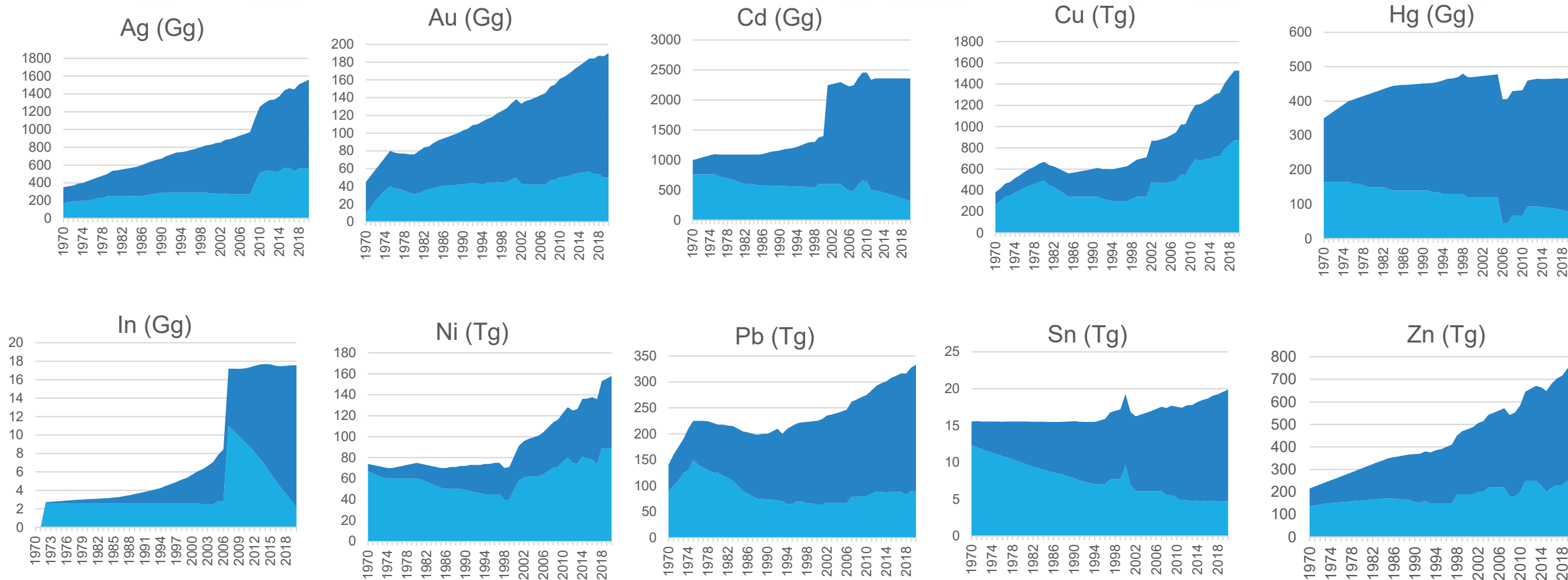
Zeng & Li, 2018 & 2021



IRP, 2019 & 2024; OECD, 2019 3

1

Natural Resource Reserve Is Depleting...



■ Anthropogenic stock

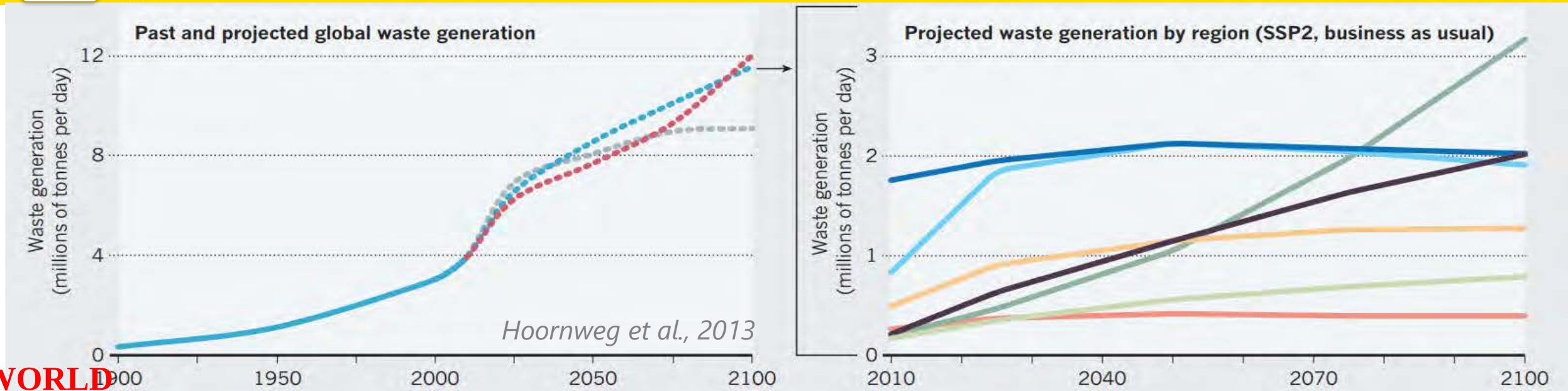
■ Geological reserve

Data source: USGS

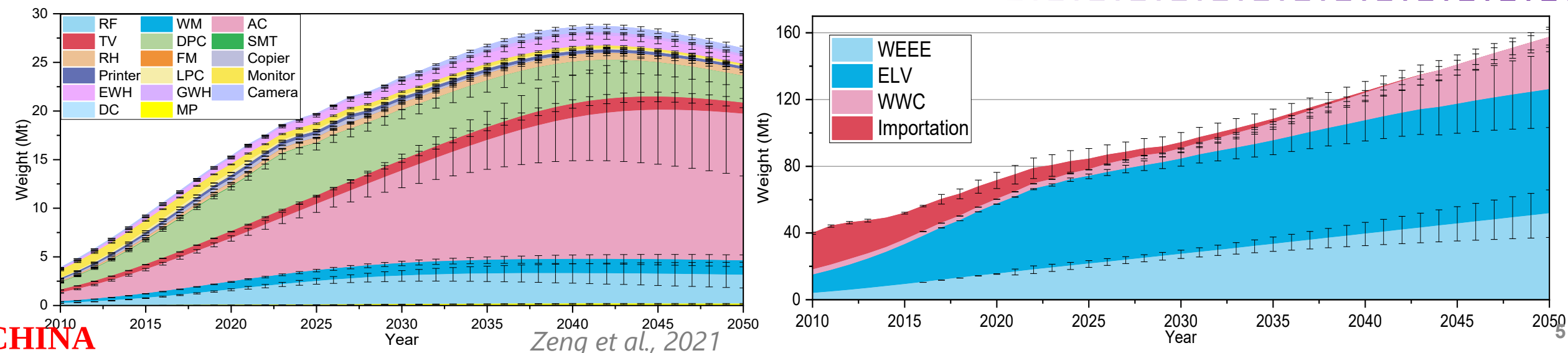
1

Waste production is increasing and must peak this century

WORLD



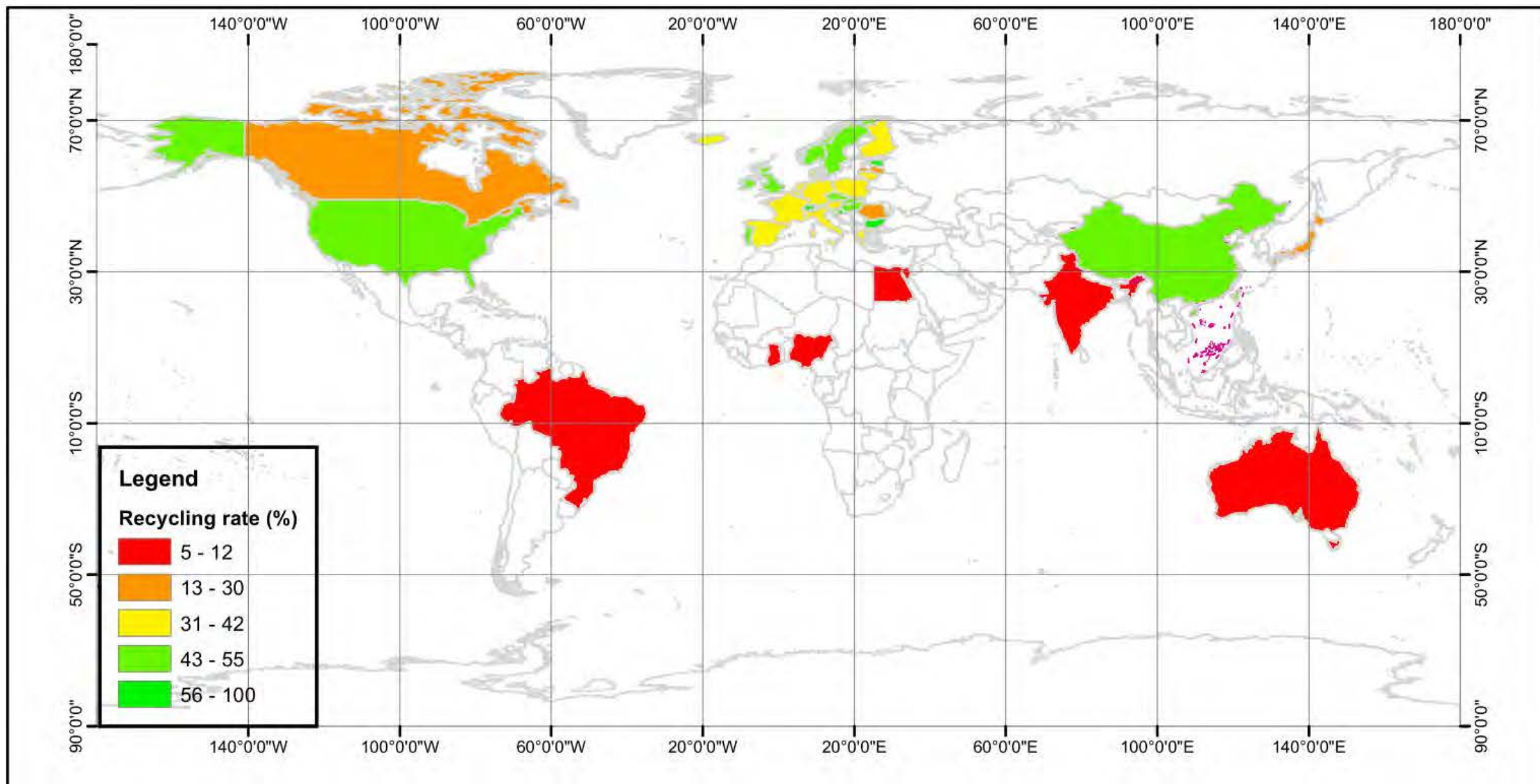
CHINA





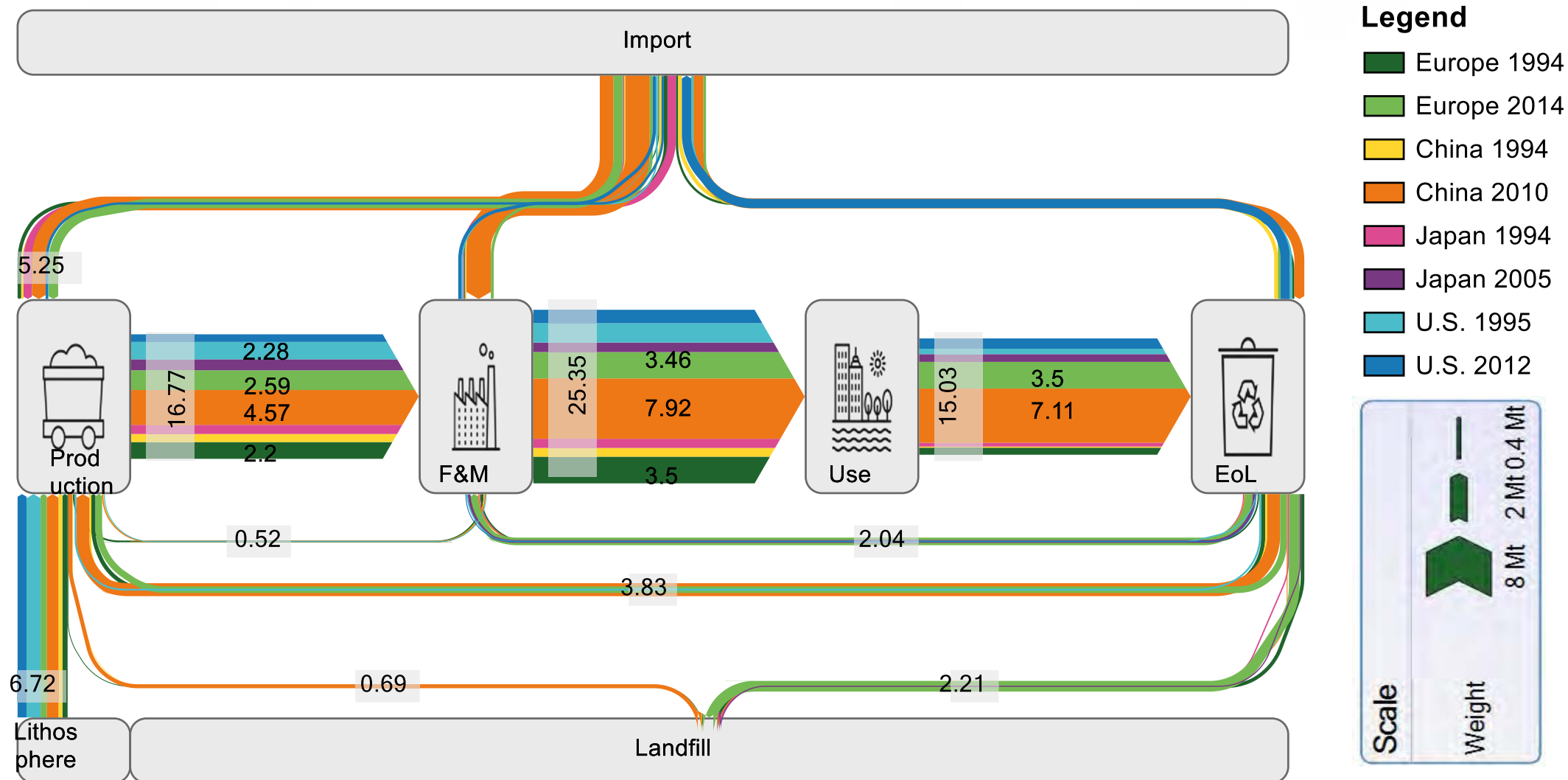
- ✓ Circular economy is charged not only with improving the efficiency of **resource** conservation, but also with reducing **waste** through anthropogenic circularity, characterizing reuse, remanufacturing, recycling, and recovery.
- ✓ It is enabled by two approaches, namely a **closed loop** for material circularity in the same function or an **open loop** for material used for other functions.
- ✓ **Digital** circular economy will be visualized in a high resolution...

E-waste recycling rate in the world



2

Metal recycling rate: Copper



The goals of the circular economy transformation

- Goal 1: Achieve climate stabilization through industrial decarbonization and near-zero lifecycle emissions from materials extraction, processing, use and end-of-life.
- Goal 2: Net-positive contributions to biodiversity, eco-system health and soils through recovery, restoration and regeneration.
- Goal 3: Near-zero waste and pollution across the lifecycle from materials extraction, processing, use and end-of-life.
- Goal 4: Equitable socio-economic development, and security of resource and supply chain through creation of safe and decent jobs and elimination of health impacts from mismanaged waste and pollution.

1. Pathway 1: Designing out waste / Designing in circularity into the full lifecycle of products
2. Pathway 2: Changing market signals and pricing structures
3. Pathway 3: Reform financial and monetary systems towards circularity of resource and capital flows
4. Pathway 4: Reform of the international trade system
5. Pathway 5: Circular society pathway

(1) Designing in circularity into the full lifecycle of products

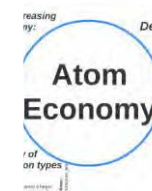
Action



Ensure transparency about what is contained in products, components and materials



Make products fit for cyclic use of products, components and materials



Make industrial production waste-free and resource-circular

Creating economic opportunity through materials innovation

Creating economic opportunity through business model innovation

Encourage solutions which satisfy customer needs rather than selling products

Closing the liabilities loop

Provide leadership in public contracting including local procurement

Build decentralised infrastructure for circular economy production, consumption and exchange

Adopt a multi-level approach (micro, meso, macro) to circular economy implementation

Promote eco-innovation for environmental effectiveness

Education and training in contemporary science, design and circular economy opportunities and challenges

(2) Changing market signals and pricing structures

Action

Taxation reform (taxing non-renewable resources instead of labour)

Formalization of informal sector collectors and informal workers in processing and recycling

Improve data and market transparency

Support adoption of existing technologies to enhance resource recovery across industrial sectors

Promotion of reverse logistics by improving the infrastructure and professionalization of collectors' cooperatives

Develop technology to increase de percentage of recycled material by replacing virgin material

Address to the companies the responsibility for the waste

Implement inclusion initiatives and encourage social participation with plans of education and communication

Development of intelligent logistics to map the points of greatest waste generation

Develop technologies for tracking waste materials

Reward the consumer by the material returned

(3) Reform financial and monetary systems towards circularity of resource and capital flows

Action

Financial institutions need to increase their understanding of circularity and develop expertise

Financial institutions offer new circular financial products

Non-financial reporting and disclosure by companies and investors

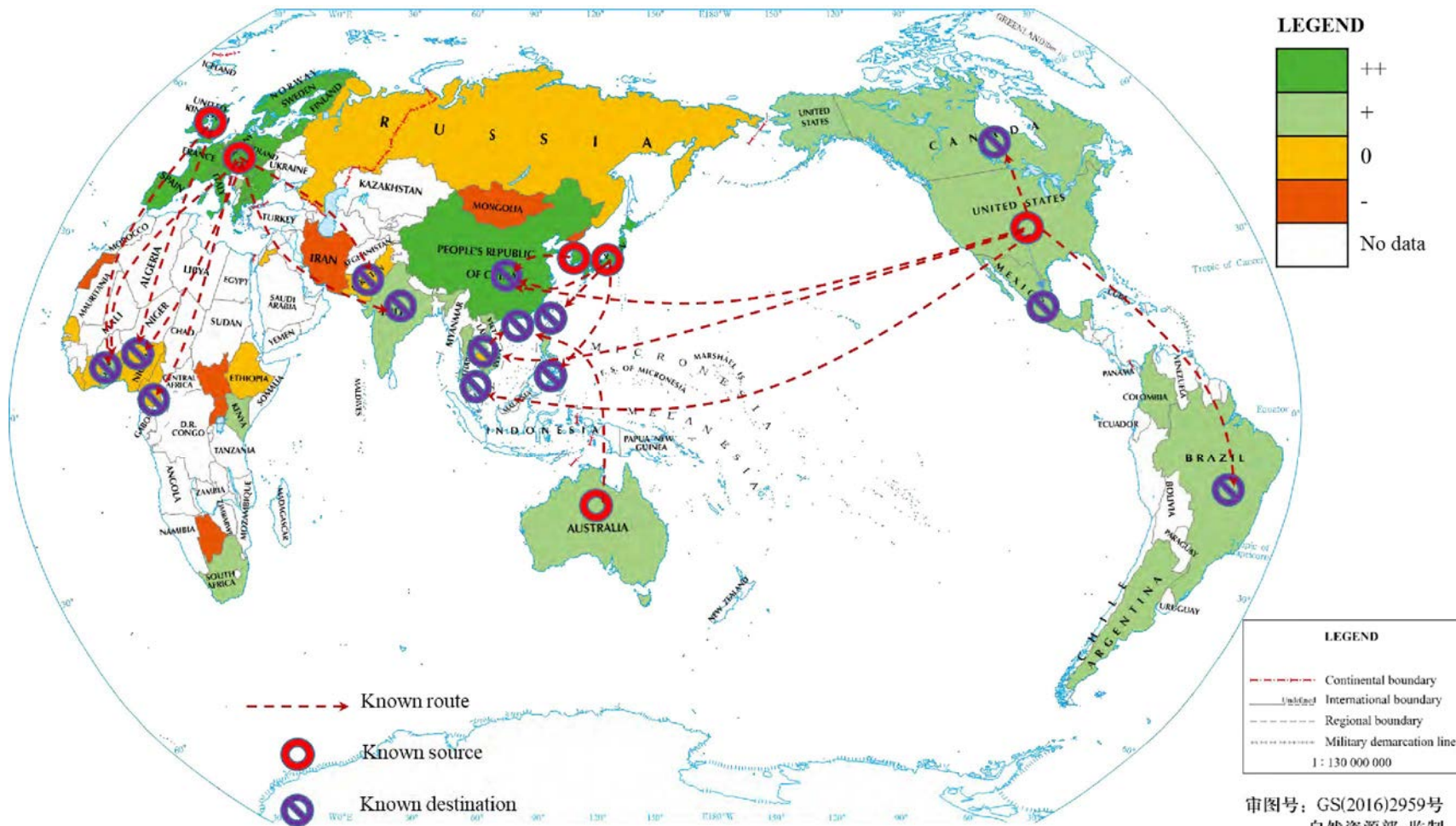
International adoption of sustainable finance taxonomies

New finance mechanisms to de-risk investments into circular solutions

Adopt revised accounting frameworks to measure impacts of investment on natural and social capital

(4) Reform of the international trade system

Action 1: 2025- 2030 Expand existing mechanisms and support long-term initiatives to tackle illegal waste trade



To hopefully change the landscape of international transboundary movements of solid waste from industrialized nations to developing countries

(4) Reform of the international trade system

Action 2: 2025 – 2030 Improve processes and procedures of the Basel Convention such as the prior informed consent (PIC) procedure

Action 3: 2025-2030 Work towards internationally shared definitions for trade of circular goods and services

Action 4: 2025- Ongoing Ensure circular economy-relevant information is captured in cross-border trade flows in a way that is globally interoperable

Action 5: 2025-2035 Embed circularity and inclusivity within trade and economic cooperation agreements

Action 6: Improve trade facilitation measures

Action 7: Build capacity of border agencies to conduct necessary conformity assessment procedures

Action 8: Enhance transparency and traceability across global supply chains through digital technologies

Action 9: Align national standards and policies for product circularity

Action 10: 2030- 2035 Incentivize mining and metals companies to direct traded materials into circular products and infrastructure by focusing on building up stocks - instead of a focus on flows

Action 11: 2030-2040 Shift to resource leasing models and ‘materials-as-a-service’ models that encourage circularity across commodity value chains

(5) Circular society pathway

Action

Encourage active participation and engagement by individuals

Public support for bottom-up social innovation at the community level

Promote traditional practices and indigenous knowledge on lifestyles for well-being and sustainability

Capacity building and skills development for workers and citizens to create, use, maintain and repair circular products

Education and awareness raising on the circular economy

Put in place enabling infrastructures for circular behavior including product take back schemes and sharing models

Facilitate societal wide dialogues on alternative social practices, lifestyles and culture

Include human wellbeing indicators into social-economic planning and decision-making

Restrict advertising for high-impact and harmful linear product categories

User charges for single-use products and items

Use digital technologies to provide lifecycle product information to consumers in easy-to-understand ways

Provide nudges, information, guidelines, communication strategies for social norms and individual behavior change



Thanks for your attention.

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<https://www.tsinghua.edu.cn/enven/info/1052/1964.htm>₁₇