



# Outlook for Material Resources and Implications for a Circular Economy

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# Key questions

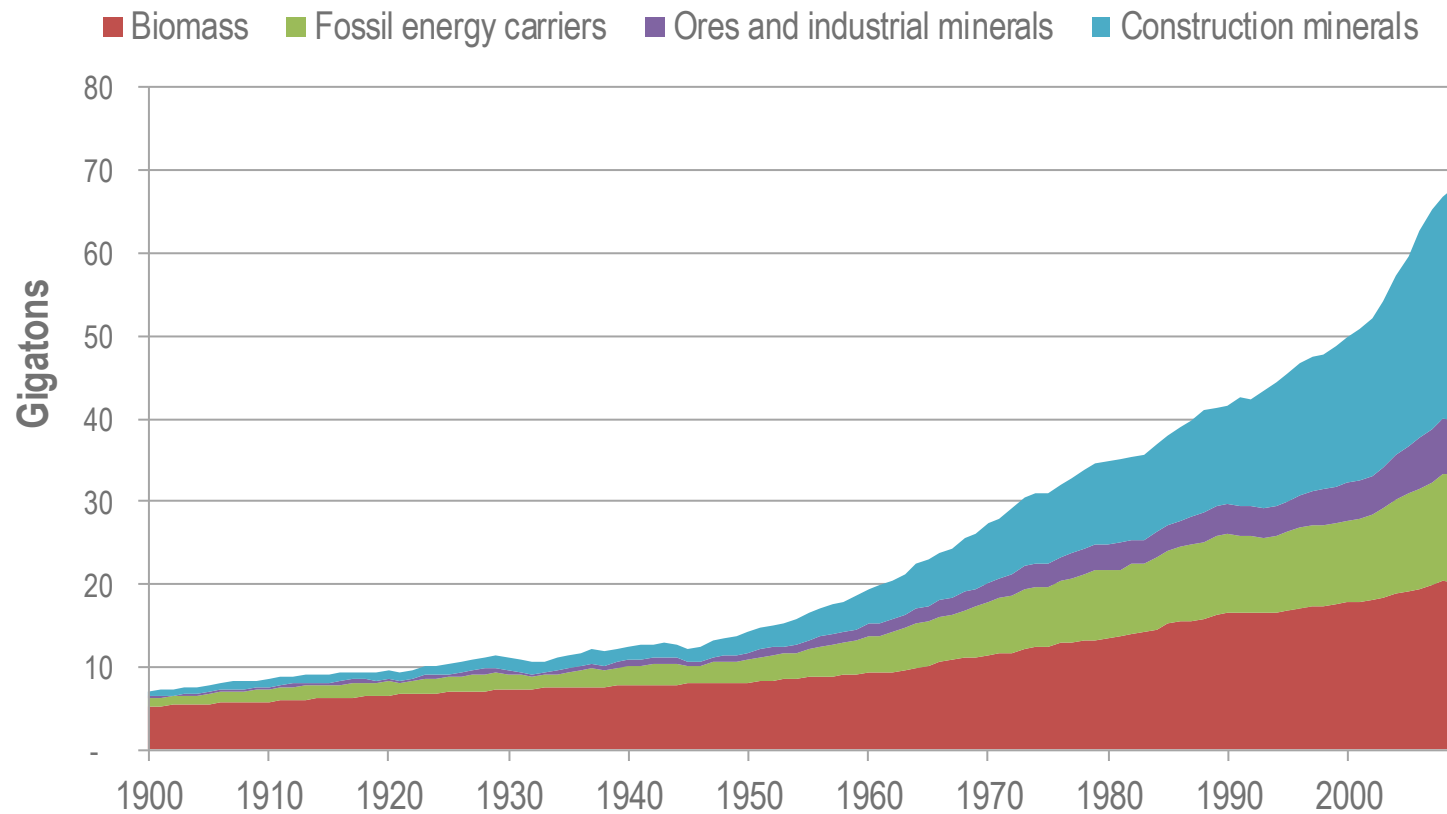
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- What is the environmental case for a circular economy?
- What are key business models for a circular economy?
- How much progress are governments making towards a circular economy?
- Some policy recommendations



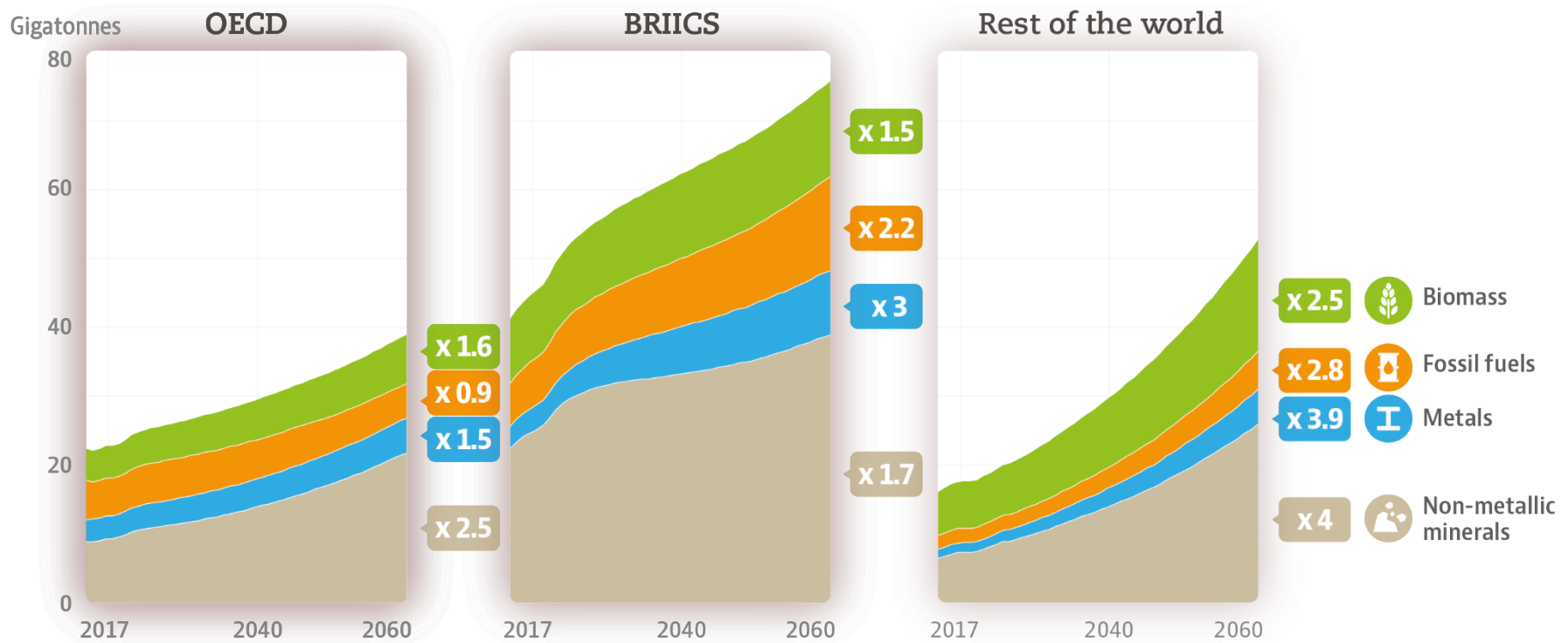
# Unprecedented growth in global material extraction

Global material extraction 1900-2009





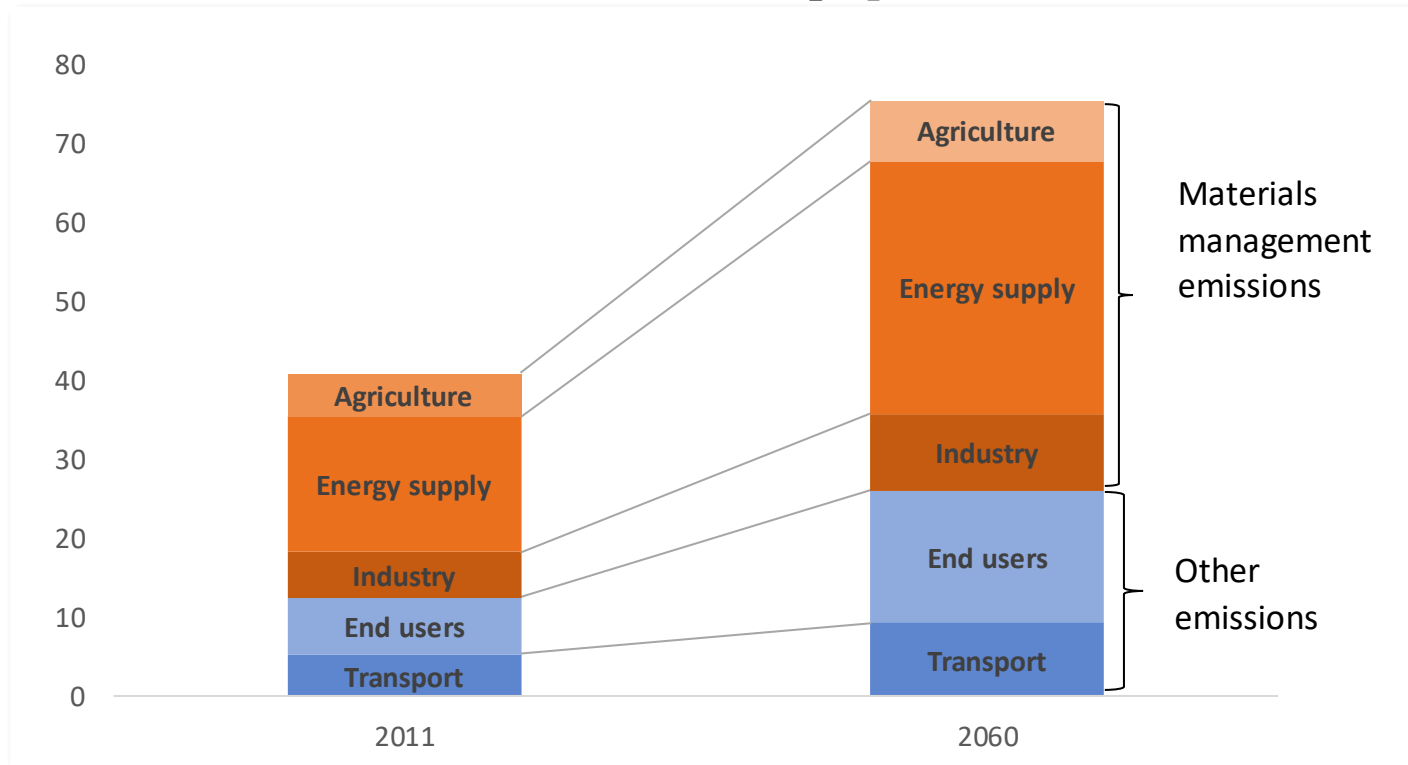
# Another doubling of materials use projected by 2060





# Greenhouse gas emissions related to materials management will more than double

GHG emissions in CO<sub>2</sub> equivalent



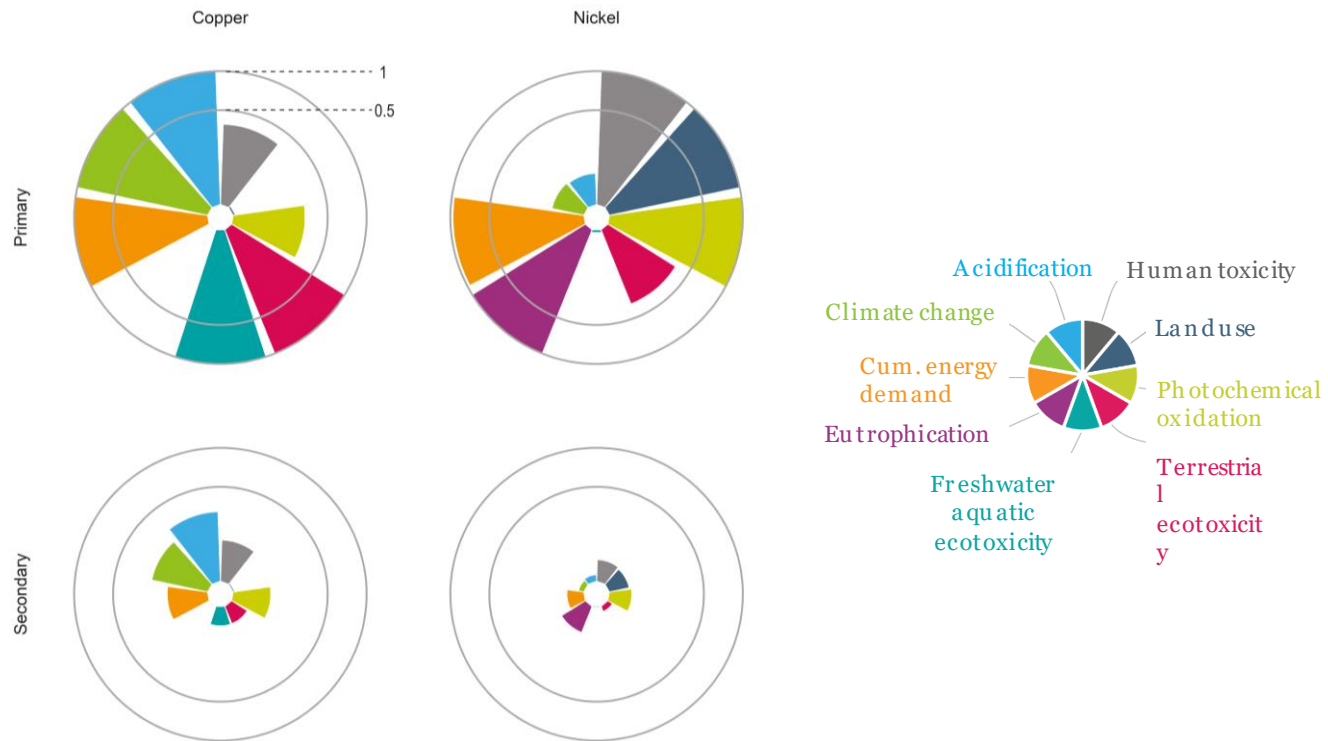
**9** % of total ghg emissions  
associated with 7 key metals

**12** % of total ghg emissions  
associated with concrete

**50** Gt CO<sub>2</sub> eq emissions  
associated with materials cycle



# Primary materials cause more environmental damage

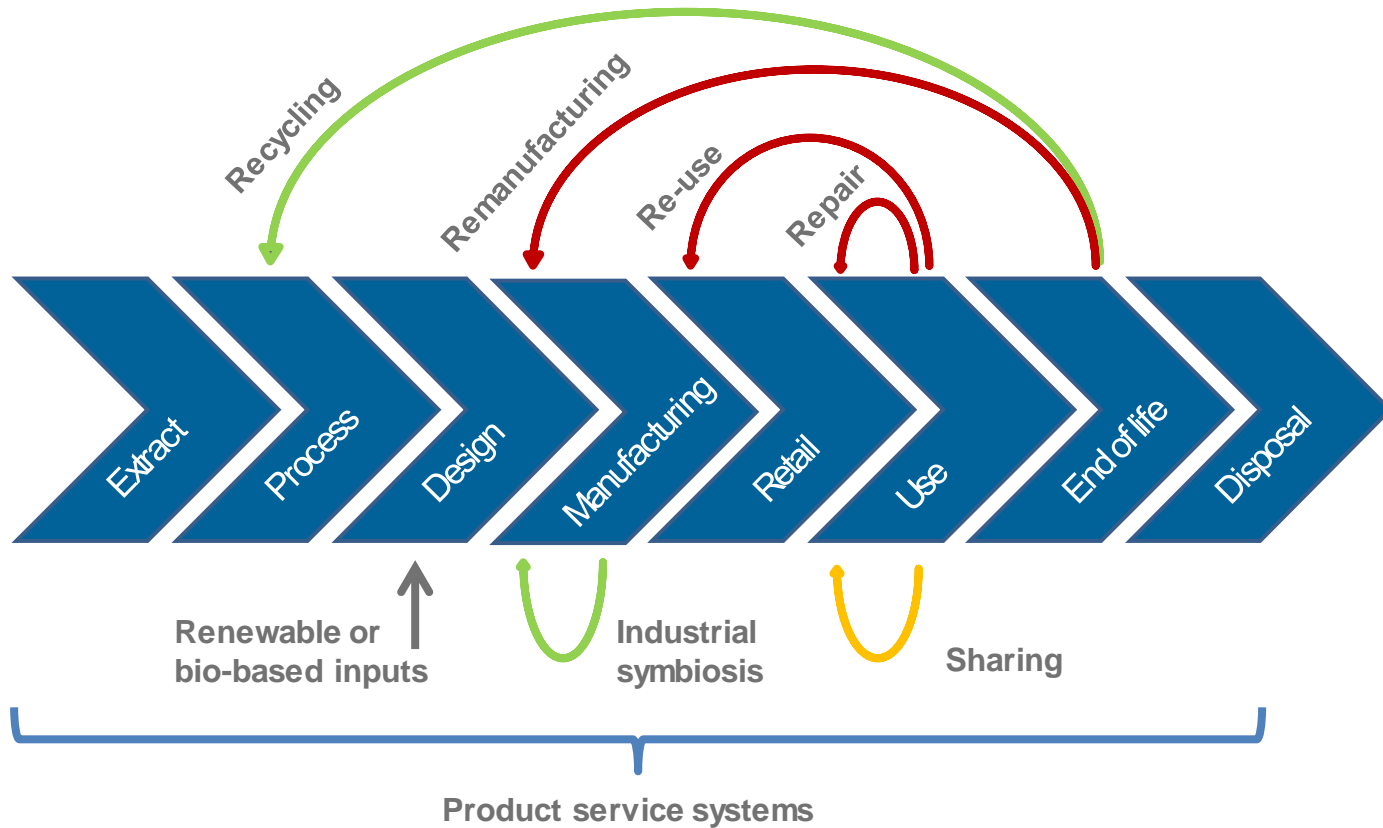


Per kg environmental impacts (highest impact normalised to 1) for 2015

Source: OECD *Global Material Resources Outlook to 2060* (2018)

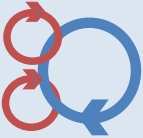



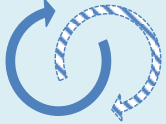























# Circular business models reduce material throughput





# Five main circular business models

 Circular input models	 Waste value models	 Life span models	 Platform models	 Product as service models
    	   	   	   	   





# Most circular business models are restricted to economic niches

Business model	Sector	Market penetration
PSS: result-oriented (chemicals)	Automotive	50 - 80%
PSS: result oriented (digital content)	Music	50%
Waste as value: recycling	Pulp and paper	38%
PSS: result oriented (digital content)	Books	25 - 35%
Waste as value: recycling	Steel	25%
PSS: result-oriented (chemicals)	Aerospace	5 - 15%
Waste as value: recycling	Plastics	13%
Product life extension: refurbishment	Smartphones	4 - 8%
PSS: result-oriented (lighting & heating)	Various	4 - 7.5%
Product life extension: remanufacturing	Machinery	3 - 4%
Product life extension: refurbishment	Various	2 - 3%
Product life extension: remanufacturing	Aerospace	2 - 12%
Idle Capacity: co-access	Lodging	1% - 6%
Product life extension: remanufacturing	Automotive	1%
Product life extension: remanufacturing	Consumer and EEE	0 - 1%
Was as value: recycling	REE metals	<1%
PSS: user-oriented (car sharing)	Transport	<1%



>50 %



15 - 50 %



<15 %



## Taking stock of Public Policies for advancing Resource Efficiency and Circular Economy

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- RE-CE roadmaps and policies increasingly part of national strategies in many developed and emerging economies
- Greater use of economic instruments to tackle waste management and resource efficiency

### But ...

- Fragmented policy landscape to address specific materials, products, lifecycle stages, market players.
- Challenge of integration and coherence between policies.
- Risk of shifting environmental burden from one location, country, medium or phase of the lifecycle to another.

***Need cross-sectoral policies as well as international co-ordination.***



## Some Key policy recommendations

Apply policy mixes along the product value chain

Adopt a life-cycle approach in policy making

- Extended producer responsibility
- Green public procurement
- Partnerships with business

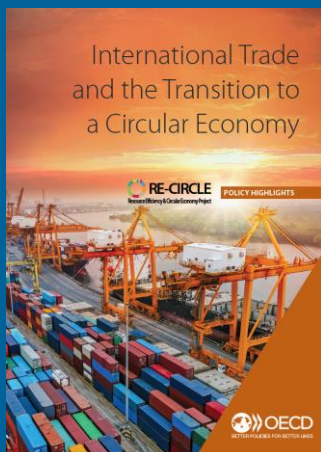
Correct policy misalignments

- Remove support for primary resource extraction
- Integrate low carbon and RE objectives
- Mainstream RE across policy silos
- Address trade obstacles

Strengthen indicators and infrastructure to collect data



# Thank you for your attention



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