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Trends in Natural Resource Use and Management

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Who are we?

*The **International Resource Panel – IRP** was launched in 2007 with the idea of creating a science-policy interface on the sustainable use of natural resources and in particular their environmental impacts over the full life cycle*

Climate Change

IPCC
INTERGOVERNMENTAL PANEL ON climate change

Biodiversity Loss

ipbes

Resource Efficiency

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NATURAL RESOURCES FOR THE FUTURE WE WANT

Resources:

provide the foundation for the goods, services and infrastructure that make up our current socio-economic systems

Biomass (wood, crops, including food, fuel, feedstock and plant-based materials)

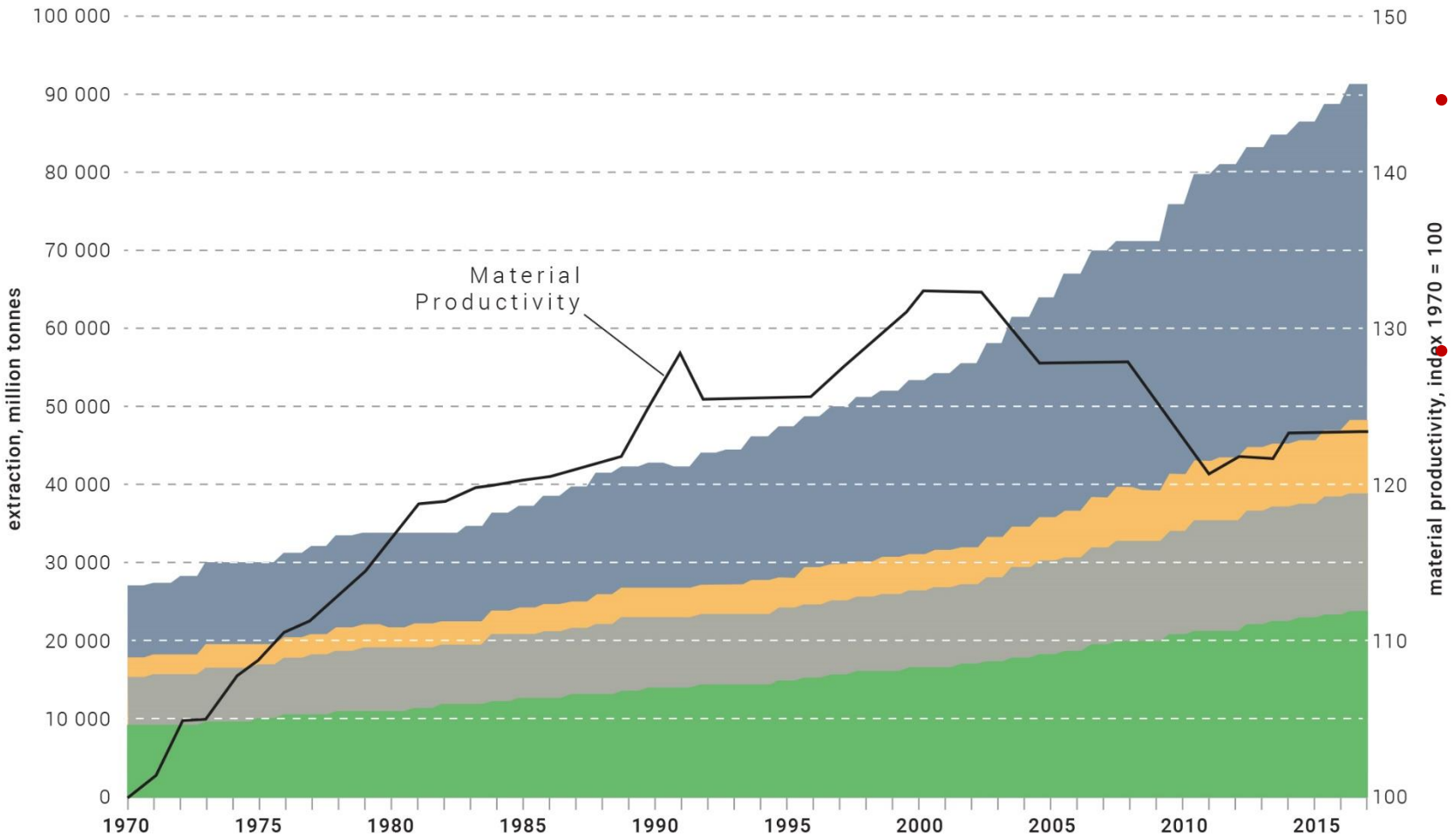
Fossil fuels (coal, gas and oil)

Metals (such as iron, aluminum and cooper…)

Non-metallic minerals (including sand, gravel and limestone)

Relentless demand: Global resource use, Material demand per capita and Material productivity

Global material extraction and material productivity, 1970 - 2017



- *Global resource use has more than tripled since 1970*
- *Global material demand per capita grew from 7.4 tons in 1970 to 12.2 tons per capita in 2017*
- *Material productivity started to decline around 2000 and has stagnated in the recent years*

Non-metallic minerals

Metals

Fossil fuels

Biomass

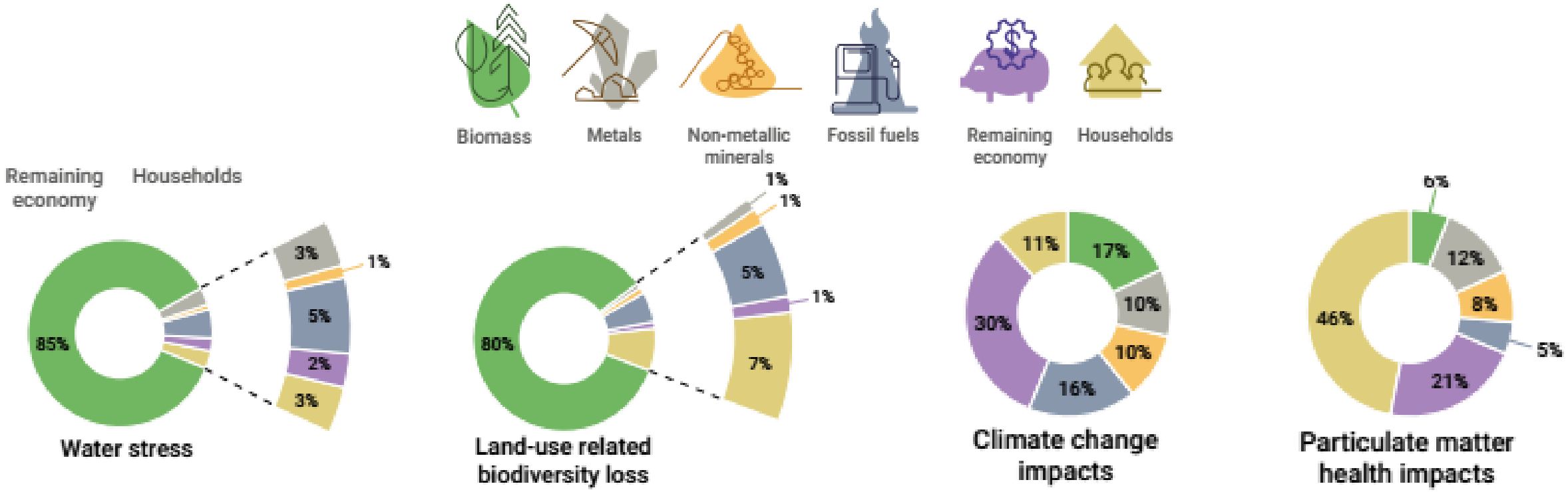
Environmental impacts in the value chain

resource extraction and processing phase

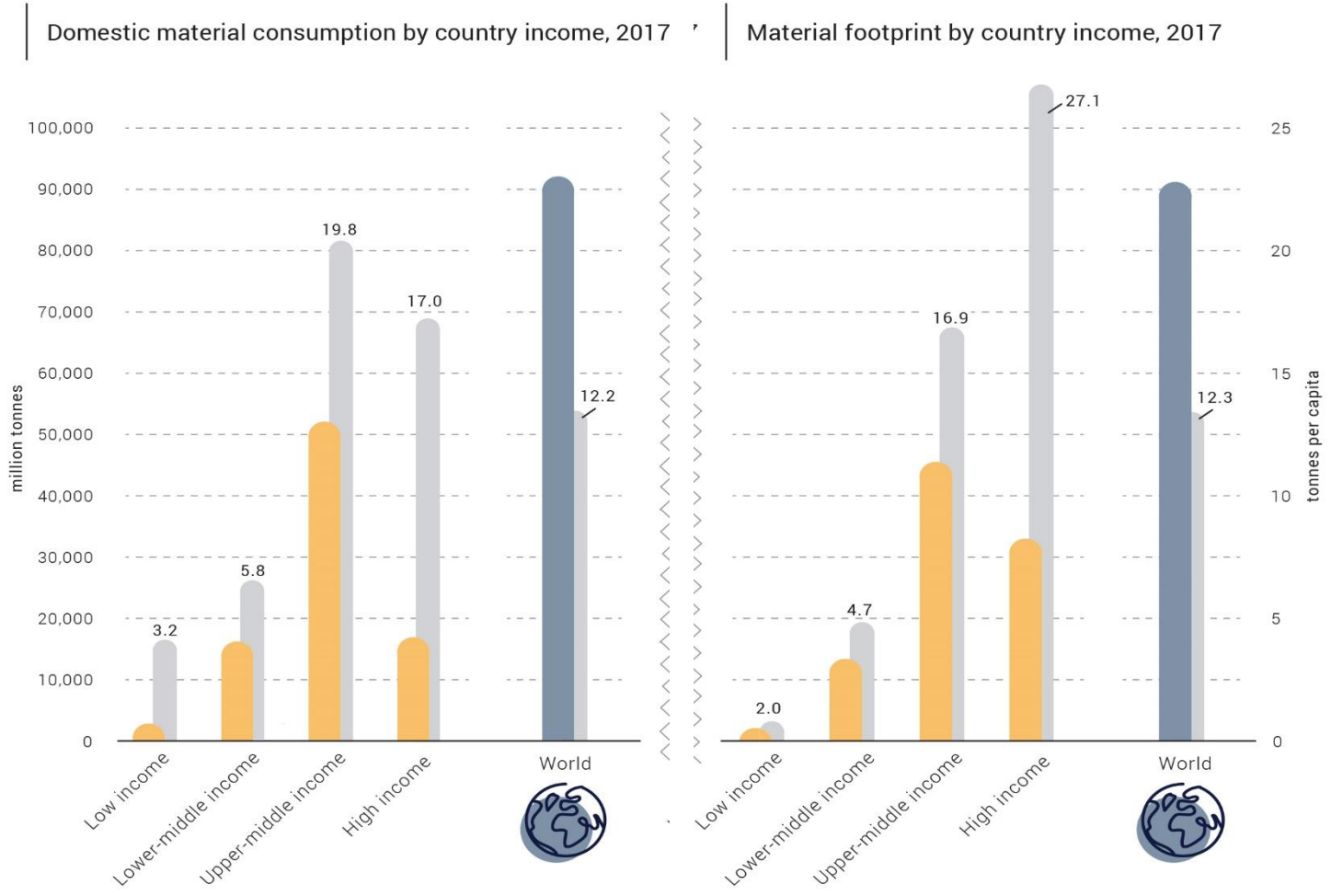
***90%** of global biodiversity loss and water stress*

***50%** of global climate change impacts*

1/3 of air pollution health impacts



Unequal consumption: per capita material footprint from high-income countries is 60% higher than the upper-middle-income group, 13x the level of the low-income groups.



- *Measured in Domestic Material Consumption (DMC), upper-middle income countries are the largest per-capita material consumers. Key driver: new infrastructure and cities buildup in developing countries*
- *Measured in Material Footprints (MF), high-income countries are by far the largest consumers per capita and are increasing their resource import dependence by 1.6 % per year. Key driver: outsourcing of material & resource intensive production from high-income countries*

million tonnes per income group
million tonnes world
tonnes per capita

*measured in Material Footprints

Achieve the SDGs through concerted SCP measures: Boost the economy by 8%, converge incomes, and reduce environmental impacts

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The GRO provides new scenarios

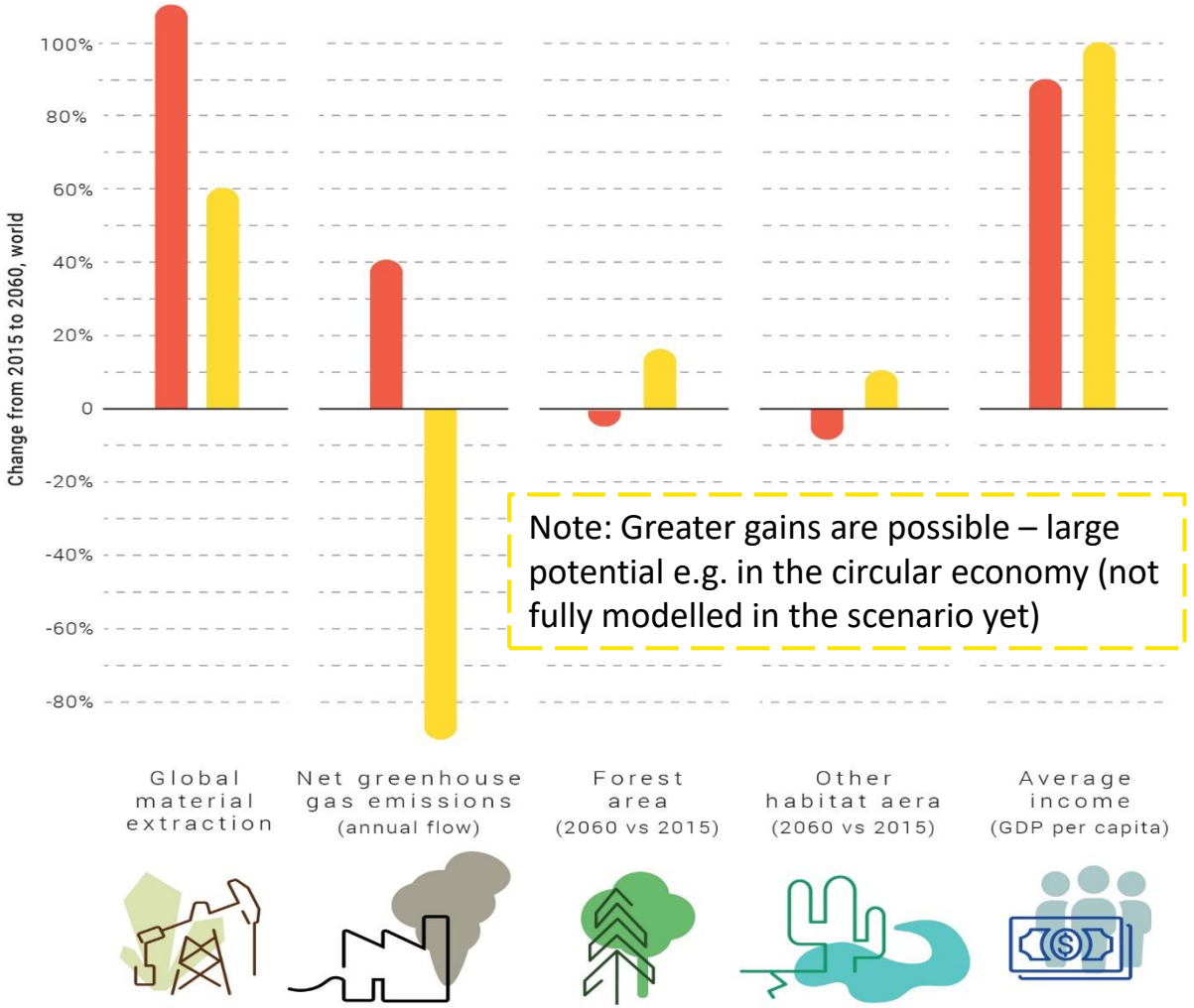
Historical Trends

- *Continuing past economic trends would more than double global material use to 190 billion tonnes by 2060*
- *This would quickly exceed the planetary boundaries and prevent achieving the SDGs*

Towards Sustainability

- ***Resource efficiency and innovation are key tools** to achieve economic development while reducing climate change, biodiversity and health dangers*

Summary of selected benefits of concerted resource efficiency and sustainable consumption and production (SCP) measures modelled in the 'Towards Sustainability' scenario vs environmental pressures if 'Historical Trends' scenario continues



Note: Greater gains are possible – large potential e.g. in the circular economy (not fully modelled in the scenario yet)

Recent IRP research quantifies benefits of circular models in key manufacturing sectors in the USA, Germany, China and Brazil

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Circular 'Value Retention Processes' (VRPs) assessed

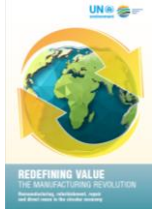
- *Remanufacturing*
- *Comprehensive Refurbishment*

} *Full service-life VRPs*

- *Repair*
- *Arranging Direct Reuse*

} *Partial service-life VRPs*

*Report finds that production of same quality products can save up to 40% of cost and up to 90% of emissions through circular VRPs**



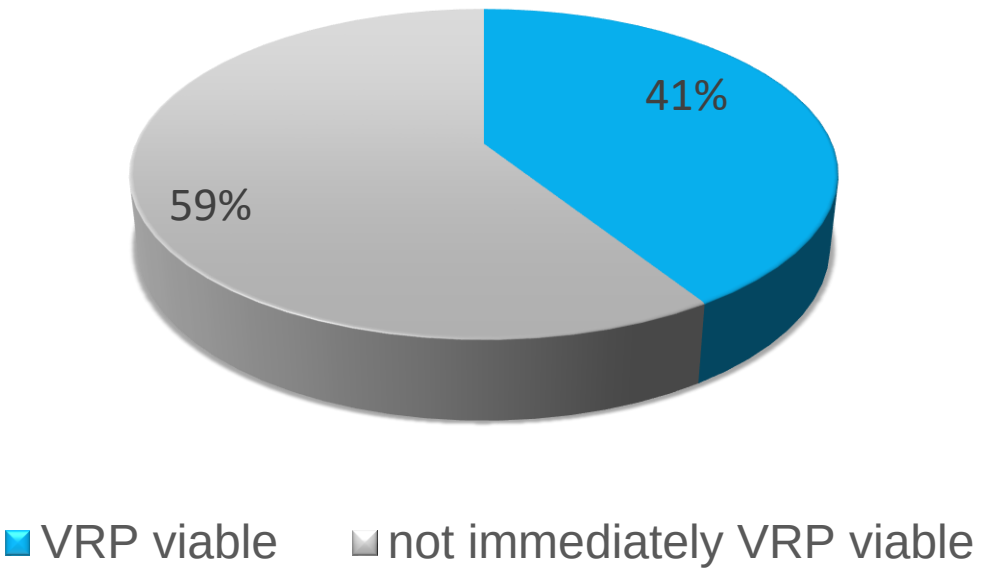
Benefits of full service-life VRPs*	***Remanufacturing***	***Comprehensive Refurbishment***
Saving in new material input	*80% - 98%*	*82% - 99%*
Reduction in embodied energy & material emissions	*79% - 99%*	*80% - 99%*
Reduction in process energy needs and emissions	*57% - 87%*	*69% - 85%*
Reduction in production waste	*90%*	*80% - 95%*
Job creation at offset labor costs	*Increased requirements for skilled labor*	
Reduction in product cost	***Up to 23%***	***Up to 44%***

** Compared to same product manufactured from new material inputs*

VRPs are commercially available to 41% of the manufacturing sector already today and could reduce 11% of global industrial energy use

- *VRPs viable sectors include automotive, marine, locomotive, heavy-duty, aerospace, furniture, mobile phones*
- *Globally, VRPs have potential to reduce 6 – 11% of global industrial energy use*
- *Only ~2% of US and EU production use remanufacturing today*

VRP viability of the manufacturing sector in sample economies today



**41% of manufacturing GDP (Mfg. GDP)*

IMPORTANT MESSAGES TO REMEMBER

- *The existing global resource use trends and their environmental and health impact are extremely worrying and can/should not continue.*

- *Resource efficiency/circular economy policies based on the concept of decoupling are essential ingredients of an economy, which would be SDG compliant.*

- *If appropriate policies, including resource efficiency, are applied, we can reduce social differences, efficiently fight against climate change, biodiversity loss and pollution, while economic growth would be even higher than in the case that the current trends would continue.*

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THANK YOU

For more information

Contact IRP Secretariat at resourcepanel@un.org

Visit our website at http://resourcepanel.org/