

**12**

ARGUMENTS FOR A

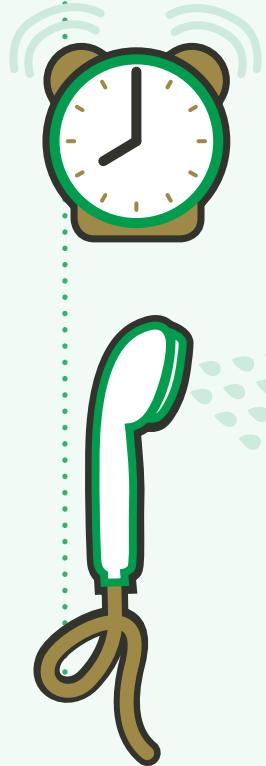
**RAW MATERIALS TRANSITION**

1

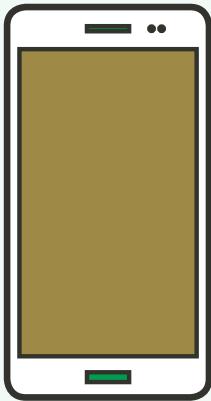
METALLIC RAW MATERIALS ARE

# DAILY COMPANIONS

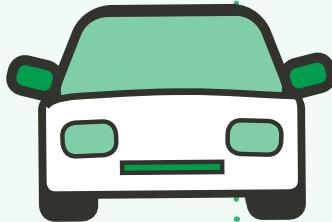
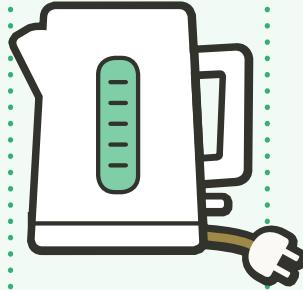
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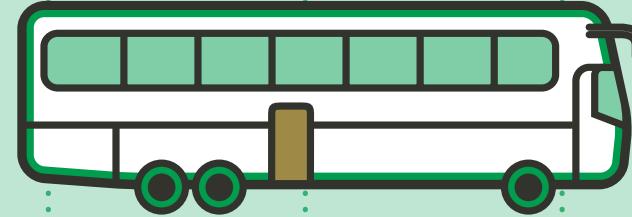
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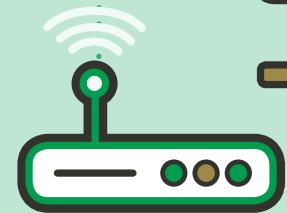
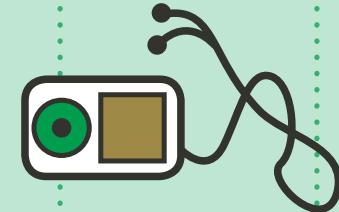
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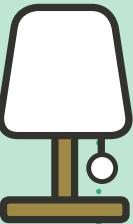
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16:00



18:00



19:00

Tin  
Copper  
Nickel  
Zinc

Lithium  
Chrome  
Cobalt  
Bauxite

Lead  
Gold  
Platinum  
Palladium  
Coltan

Iron  
Tungsten  
Magnesium  
Titanium



# 2

## METAL PRODUCTION CONSUMES LARGE VOLUMNES OF WATER, LAND AND AIR

### 5.

Germany is the **5<sup>th</sup> largest consumer of raw materials** worldwide.

More than

# 99%

of all metals are imported to Germany.

# 69

million tons of metals are consumed in Germany annually. Indirect\* raw material consumption amounts to 723 million tons.

\* indirect raw material consumption includes all resources that are used in the extraction and the transportation of the iron ores as well as all the equipment required.



→ German copper imports consume 115,4 Mio. cubic meters of water each year alone. That equals 577 million bathtubs of water.

For the extraction of the copper used in industrial production in Germany, 4.8 million tons of CO<sub>2</sub> are released annually. A car would produce the same amount of CO<sub>2</sub> over a distance of 25,4 billion kilometres, equalling 633,890 circumnavigations.



→ 220 million smartphones were sold in Germany over the last decade, containing over 6,58 tons of gold. Mining this amount of gold produced 8,3 million tons of tailings. That equals a convoy of 330,000 40-ton trucks with an average load of 25 tons each, starting at the North Cape and reaching as far as Tunisia. Gold is only one of 30 raw materials used in a smartphone.

# 3

OUR CONSUMPTION OF RAW MATERIALS

## ENDANGERS LIVES

### GOING ON STRIKE

CAN HAVE DEADLY CONSEQUENCES



In August 2012, **34 mining workers on strike were shot** in Marikana/South Africa.



### ENORMOUS WATER CONSUMPTION



In Galba-Uush Doloodin Gobiu Basin/Mongolia, **85% of the water available** is used in the mining sector, reducing directly the availability of water for the population.



### CONTAMINATION WITH HEAVY METALS



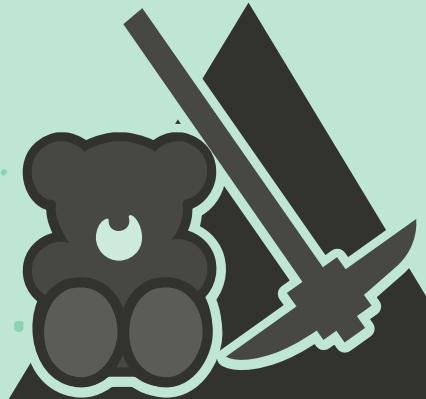
Blood and urine analysis show that **over 90% of the population in Cerro de Pasco/Peru are poisoned with heavy metals.**

The dam disaster in Brumadinho/Brazil in January 2019 caused a mud wave of **11 million cubic meters**. At least 246 people died.



### danger TO LIFE

for workers and the population



### CHILD LABOUR



**At least 1 million children** work globally in mines.



### CONTAMINATED GROUNDWATER



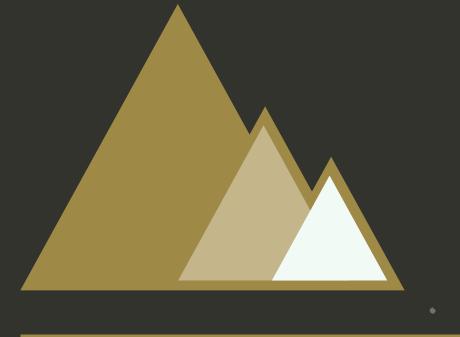
In 2014, **over 40,000 cubic meters of copper sulphate containing residues** were dispersed into the rivers Sonora and Bacanuchi in Sonora/Mexico after a dam burst. Heavy metals have been contaminating both rivers and the groundwater since then, rendering food production in the region merely impossible.



# 4 CONSUMPTION OF RAW MATERIALS IS GLOBALLY VERY UNFAIRLY DISTRIBUTED

## METAL STOCK CONSUMPTION PER CAPITA

Metal Stock is an equivalent of the amount of metals historically accumulated and currently used as resources in a society.



## COUNTRIES IN THE GLOBAL SOUTH

- ▲ Iron 2.000kg
- ▲ Aluminum 35kg
- ▲ Cooper 30-40kg



## → INDUSTRIALIZED COUNTRIES [e.g. Germany]

- ▲ Iron 7.000-14.000kg
- ▲ Aluminium 350-500kg
- ▲ Copper 140-300kg

## Amount of cars per 100 people

### Germany



### Guinea



0,3

Bauxite, a raw material used in the production of cars, comes mainly from Guinea.

# 5

## RESOURCE-RICH COUNTRIES

EXPECT TO BENEFIT FROM THE MINING SECTOR, BUT OFTEN DON'T

"Mining offers labour and income to the population."



Modern mining activities create **only few jobs**. Only one percent of the workforce works in the mining sector.

"Exporting raw materials will bring revenue to the country."



In Peru, mining amounted to more than **61% of all exports** in 2016, but only generated **6,7% of state revenue**. This number still excludes the costs.

"Countries in the Global South could benefit a lot from deep sea mining."



After a deep sea mining operation failed in the coastal zone of Papua-Neuginea, the government had to write off **100 million Dollars of its own contribution**. This sum equals a third of the annual expenditures in the health care sector of the country. The country now demands a 10-year moratorium for high-risk technologies like deep sea mining.

"Countries can generate high revenues."



In 2015 and 2016, the **tax refunds** the mining companies received from the state of Peru resulted to be higher than the taxes they actually paid.

"Mining is democratic, because society has a direct say."



If the population opposes a mining project, the country risks **lawsuits by the investors**. The Canadian corporation Gabriel Resource demands 5.7 billion Dollar from Romania in so-called compensation. After protests by civil society, the Romanian government put a ban on gold mining operations.

"The mining companies are subject to high risks, it is justified that they pay fewer taxes."



In Peru alone, there are 8,616 contaminated industrial sites. Mines have not been renatured or restored in a way that prevents toxic substances from polluting the environment. 4,281 sites therefore bear a high or even very high risk for the population. The Peruvian state bears the **costs of environmental damage, restoration and health impacts** because the mining companies do not compensate for partly historical damage.

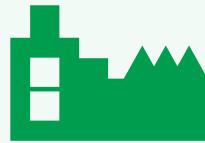


6

MINING BECOMES

MORE AND MORE RISKY

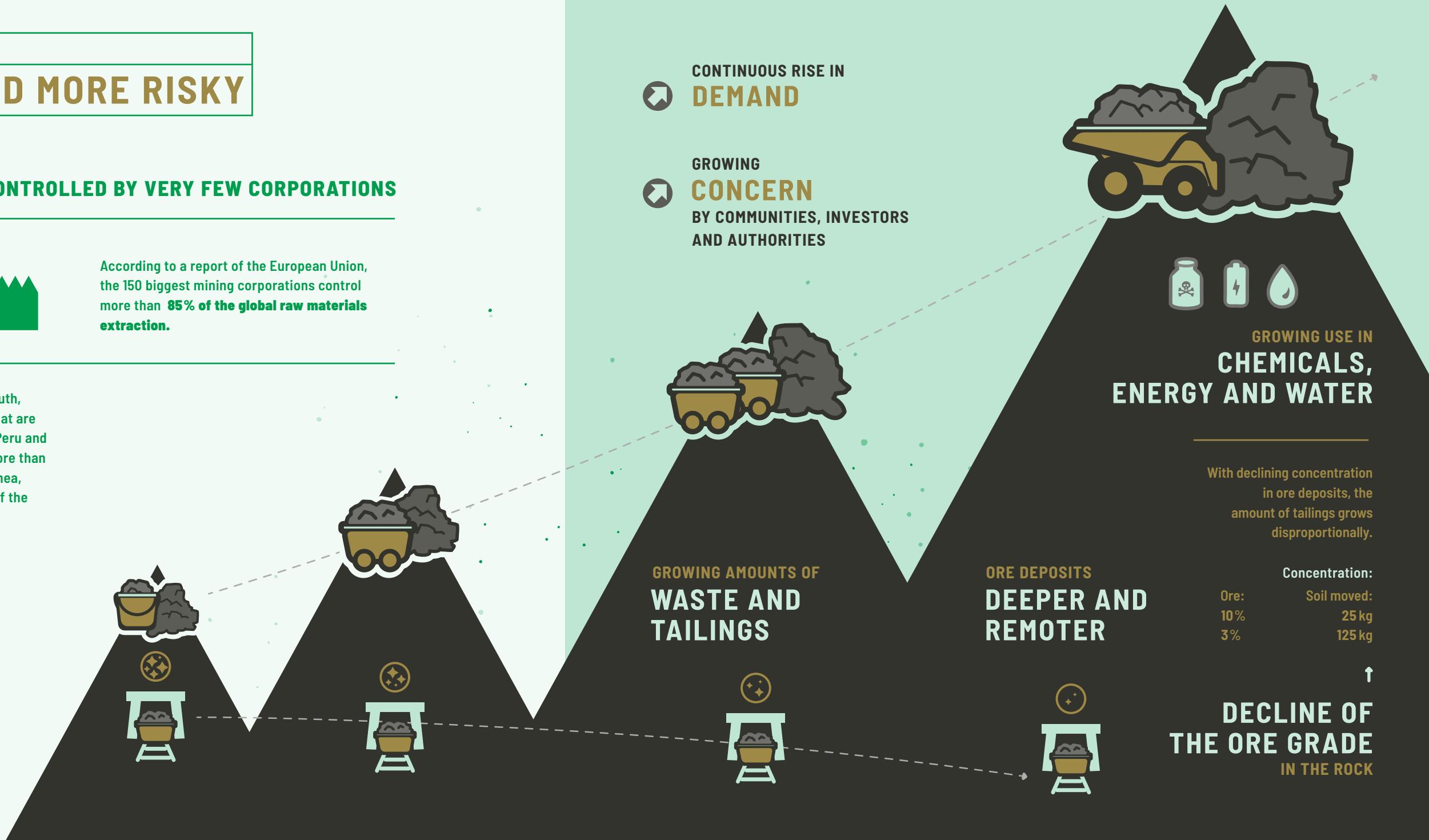
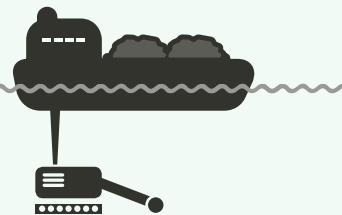
THE MINING SECTOR IS CONTROLLED BY VERY FEW CORPORATIONS



According to a report of the European Union, the 150 biggest mining corporations control more than **85% of the global raw materials extraction.**

Particularly in countries in the Global South, it's foreign transnational corporations that are responsible for extractive activities. In Peru and Colombia, those corporations extract more than **80% of the available resources**, in Guinea, Ghana and Tanzania they take up **100%** of the formal market.

HIGH-RISK DEEP-SEA MINING



CONTINUOUS RISE IN DEMAND

GROWING CONCERN BY COMMUNITIES, INVESTORS AND AUTHORITIES



GROWING AMOUNTS OF WASTE AND TAILINGS



GROWING USE IN CHEMICALS, ENERGY AND WATER

ORE DEPOSITS DEEPER AND REMOTER

With declining concentration in ore deposits, the amount of tailings grows disproportionately.

Concentration:	
Ore:	Soil moved:
10%	25 kg
3%	125 kg

DECLINE OF THE ORE GRADE IN THE ROCK



# 7

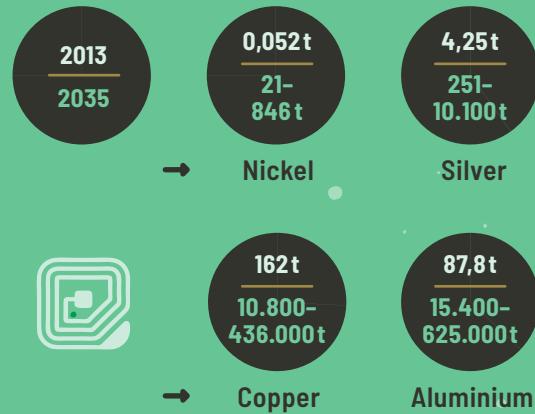
## EMERGING TECHNOLOGIES

LEAD TO A RAPID INCREASE IN THE CONSUMPTION OF RAW MATERIALS

### EXAMPLE RFID-TAGS

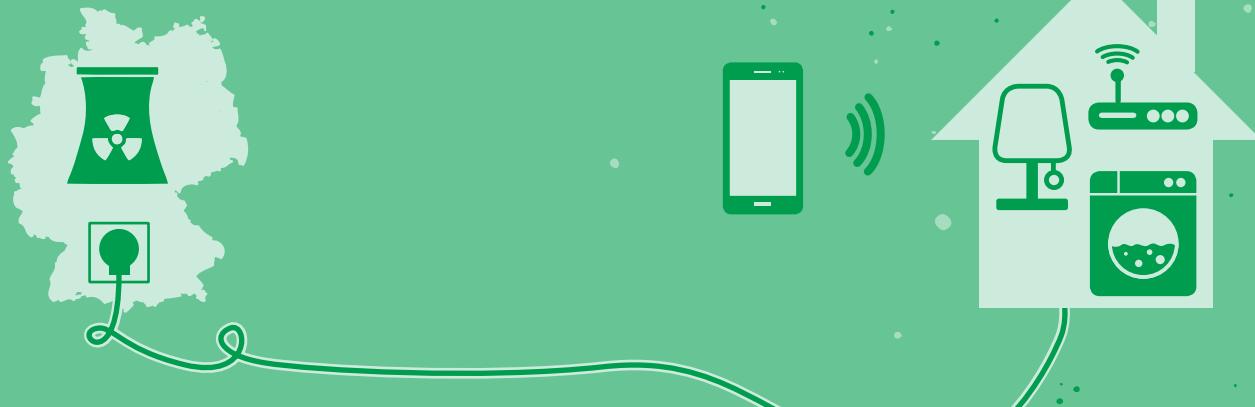
RFID-Tags are a form of technological barcode that improves the traceability of products. In order to function, they need a system of transmitters and receivers. We are already familiar with RFID-Tags in consumer goods like DVD cases, clothes or other electronic devices.

### DEMAND IN RAW MATERIALS RFID-TAGS



### NETWORKS OF DOMESTIC APPLIANCES

In Europe, the growing number of home automation systems may cause an additional energy demand of 70 TWh, which equals the amount of electricity produced by all nuclear power plants in Germany (2017). In Germany, home automation alone will cause an additional demand of 15 TWh.



### SCENARIO FOR THE INCREASE IN RAW MATERIALS USE FOR EMERGING TECHNOLOGIES

[Metall Consumption By 42 Emerging technologies in 2013 and SCENARIO for 2035]



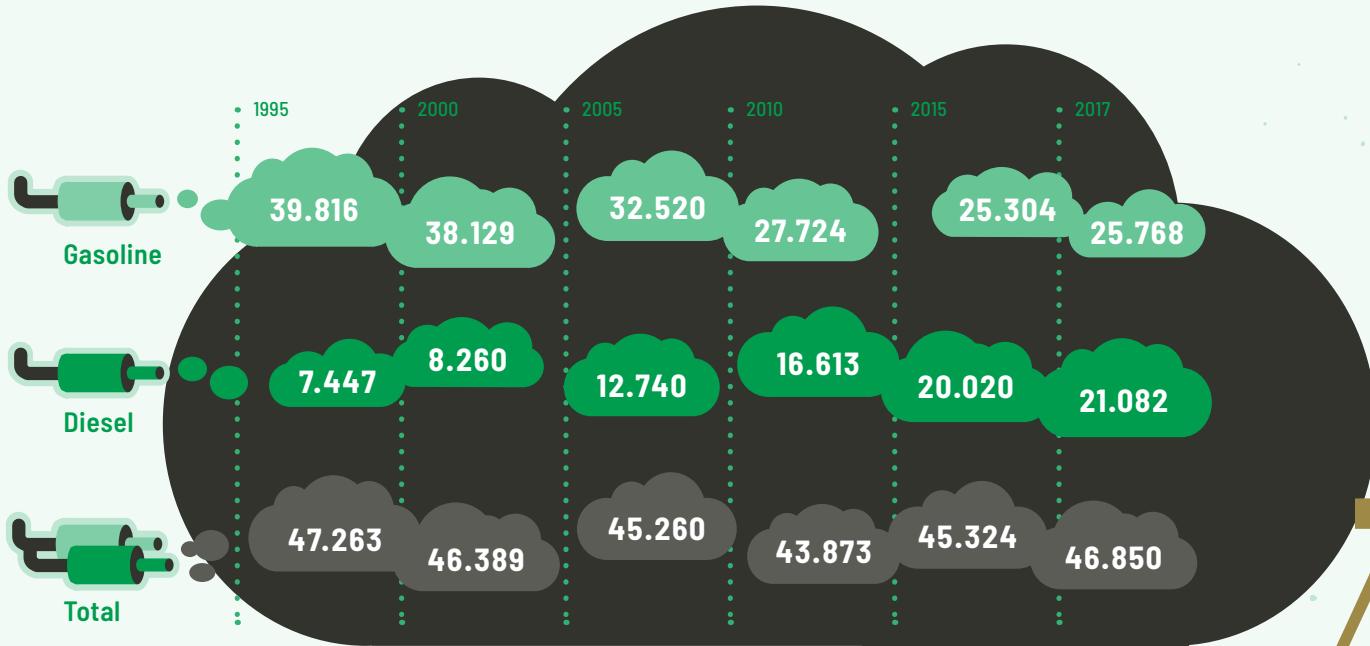
# 8

METALIC RAW MATERIALS ARE

## THE BLIND SPOT OF SUSTAINABLE POLICIES

### FUEL CONSUMPTION

of cars and wagons in million liters



Fuel consumption of cars in Germany in 2017 was more than 46 billion liters of gasoline and diesel. **A simple shift to electric drives would reduce that level of consumption but at the cost of increased consumption in metals and minerals.** Instead, the total amount of registered cars (47 million in Germany) should be reduced. Rather than a shift in drive technology we need a mobility transition.

### SHARE OF GERMAN AUTOMOTIVE INDUSTRY IN RAW MATERIALS USE

[selected raw materials]:



Lead



Platinum



Zinc



Steel



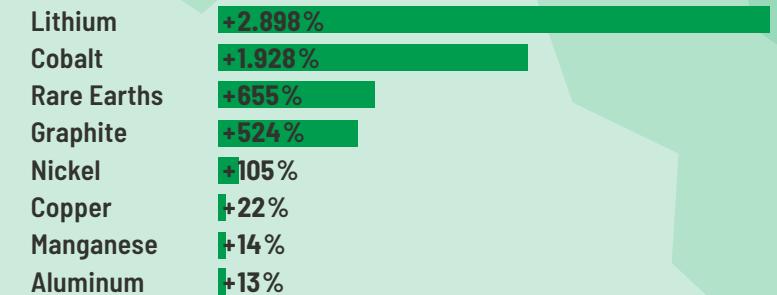
Stainless Steel  
[Chrom, Nickel, Molybdenum & Manganese]



Copper



### INCREASE OF RAW MATERIAL CONSUMPTION THROUGH SHIFT TO ELECTRIC DRIVES



9

# POLITICAL DISINCENTIVES

PREVENT THE SUSTAINABLE USE OF RESOURCES

1991

**-34%**

### PURCHASE PRICE

The level of prices at purchase has declined by 34% between 1991 and 2016.

2016

**+40%**

### REPAIR COSTS

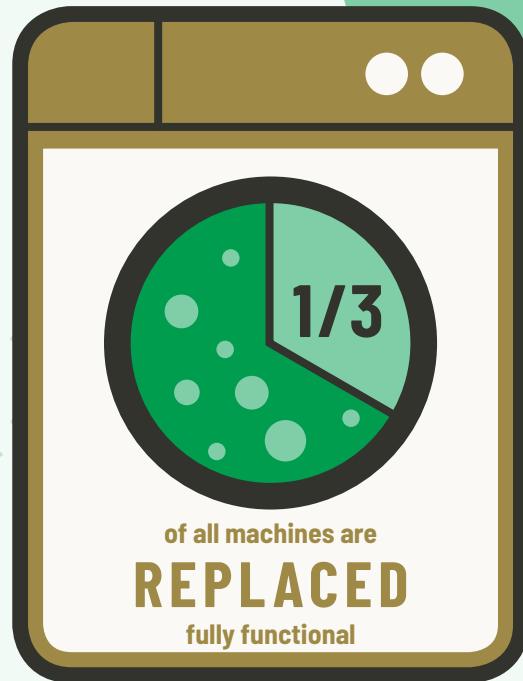
At the same time, costs for repair work have increased by 40%.



11,6

## YEARS

is the average lifespan of a washing machine.



**+40%**

a machine used for only 5 years consumes 40 percent more energy in relation to a machine used for 20 years because of the energy intense production phase

219.300.000



smartphones sold

over a period of 10 years in Germany



30-40%

of the devices are being replaced, because hardware and software are no longer compatible

**MONTHS**

is the average lifespan



124.000.000

unused smartphones

are not recycled (Germany) =

2,9 t gold | 30 t silver | 1,100 t copper

10

GERMANY PRODUCES

TOO MUCH ELECTRONIC WASTE

Only

35-40%

of all electric waste in Germany is recycled at all



AMOUNT PER CAPITA OF ELECTRONIC WASTE IN KILOGRAMS PER YEAR



Germany



EU



Global



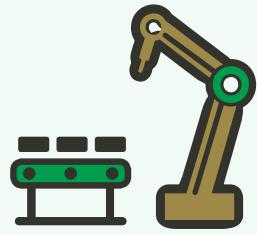
In Germany, 1.03 million tons of electronic devices are not collected thrown away with residual waste or exported illegally. That equals the weight of 100 Eiffel towers.

# 11

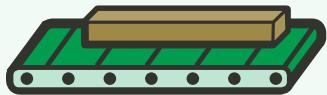
## RECYCLING

CAN ONLY BE ONE PART OF THE SOLUTION

### SYSTEMIC LOSSES IN THE COPPER CYCLE



**200.000 t**  
during the production of end products



**150.000 t**  
during the production of semi-finished products



**350.000 t**  
during the melting process



**3,85 Mio. t**  
during scrap collection



**2,1 Mio. t**  
during waste separation

**TOTAL LOSS IN THE COPPER CYCLE:**

# 60-70%

including material remaining in the lifecycle

**9,25 million tons remain in use**

[such as in buildings, cabling or other electronic devices]

# 12 EFFICIENCY

ALONE IS NOT ENOUGH

"The right course is already set!"



No, unfortunately not. The use of mined raw materials even **increased slightly** between 2000 and 2015 in Germany.

"We simply need a little more recycling and then it will be fine!"



**140,000 tons of small electronic devices are being burnt each year**, because they are disposed in domestic waste. These devices contain some of the most critical and rarest metals. Less than 1% of these materials are being recycled.



"Globally seen, Germany is an **insignificant player!**"



**We externalise our material footprint to other countries:** The material footprint for aluminium and iron ore increased significantly in Germany during the past years. Iron ore increased by 120% between 1990 and 2010, bauxite as raw material for aluminium by 80%.



"So we need to become **more efficient!**"



In the past 18 years, efficiency increased by 50%. While **raw material savings only amounted to 17%**.





## PROTESTS

### PROTESTS AGAINST TITANIUM SAND MINING IN SOUTH AFRICA.

The South African province of Eastern Cape witnessed successful protests. For 10 years, the Amadiba Crisis Committee has been opposing plans to extract titanium sand near the coast. For this purpose, a highway will be built through protected areas and farmland. First, the protests led to a moratorium and the Australian mining company partly withdrew its plans. However, in march 2016, the chairman of the Amadiba Crisis Committee, Sikhosiphi Rhadebe, was killed, activists keep receiving threats.

### LAW FOR GLACIER PROTECTION IN ARGENTINA.

On November 10<sup>th</sup> 2008, the law was discussed for the first time, but it was not adopted until 2010, following massive pressure from Argentina's civil society. The law protects 8,484 square kilometres and prevents many mining projects. In 2019, the company Barrick Gold took legal action against it, but the case was dismissed. The law was even anchored in the Constitution. As a consequence, the legitimacy of mining projects by Barrick Gold as well as 44 other projects are subject to examination.

### LAW FOR THE RESTRICTION OF MINING ACTIVITIES IN THE PHILIPPINES.

In many Philippine regions, local activists, indigenous people and others affected by the mining sector use conflicting legislation. Many municipalities restrict mining projects, usually open cast mines, by issuing orders. This is the only way to limit mining activity locally, because national authorities award the licences. In some areas, the restrictions equal bans because of geological conditions.

### PROTESTS AGAINST DEEP SEA MINING.

The manifold protests against deep sea mining begin to show effect in the Pacific region. After the first deep sea mining project in Papua New Guinea failed, opposition against high-risk mining procedures is growing. Countries like Fiji, Vanuatu or Papua New Guinea now demand a 10-year moratorium for deep sea mining for the first time.

### LONGSTANDING PROTEST LEADS TO WITHDRAWAL OF TWO COMPANIES IN ECUADOR.

In the Intag region, many communities and local initiatives oppose mining projects to preserve biodiversity, the habitat of the cloud forest and their environment. With their protests, they already expelled two international companies from their territory and established many economic alternatives instead. They plan to collectively build two hydroelectric power plants, grow fair trade coffee and founded women' cooperatives to promote local products.

### IN ROMANIA, MASS PROTESTS LEAD TO THE WITHDRAWAL OF THE COMPANY.

In all Romanian cities, tens of thousands of people protested between September 2013 and February 2014 against a gold mine in Rosia Montana. In Bukarest alone, 25,000 protesters were in the streets, it was the biggest mass protest after the fall of the Iron Curtain.

There were local, regional, national and international protests and other activities such as music and cultural festivals and an application to become a UNESCO world heritage site. Celebrities spoke out against the mining project. In the end, the Romanian parliament did not give permission for mining activities in Rosia Montana. For the moment, the project remains withdrawn.

### ENVIRONMENTAL AND HUMAN RIGHTS ACTIVISTS KILLED GLOBALLY



2015:

185

2016:

200

2017:

207

2018:

164

← With 43 activists killed, the mining sector is the deadliest sector.



# CONCEPTS

FOR HOW RAW MATERIALS CAN BE GOVERNED FAIRLY IN RESOURCE-RICH COUNTRIES

## BANS ON MINING

The El Salvadorian Parliament adopted 2017 a nationwide ban on mining in order to settle conflicts between affected communities and mining companies and to protect the health of its citizens.



## INCLUSION OF SMALL AND INDEPENDENT PROSPECTORS [DR KONGO]

The Democratic Republic of Congo adopted a new mining legislation in 2018, increasing export taxes and special charges on critical raw materials almost fivefold. At the same time, part of the generated profits benefits social projects in affected communities. Furthermore, the law obliges mining companies to fulfil their social responsibilities, hence actively abandons the principle of voluntary self-commitment.

## EXPORT TARIFFS ON RAW MATERIALS [INDONESIA]

In its new mining legislation, Indonesia introduced higher export tariffs on unprocessed ores in 2014. In 2019, even an export ban on unprocessed nickel followed. With these legislations, Indonesia successfully extended its value chains according to first estimates.

## SELF-ORGANISED CITIZENS' CONSULTATIONS IN VARIOUS LATIN AMERICAN COUNTRIES [COLOMBIA]

The citizens of Cajamarca, Tolima [Colombia] have, together with civil society organisations, achieved a ban on mining in their territory through a citizens' consultation. Many municipalities in Colombia followed this example and organised similar consultations. As a response, the Colombian state has restricted the scope of these consultations.

## ALTERNATIVE MINERALS MANAGEMENT BILL [PHILIPPINES]

Opposition members of Parliament, affected communities and NGOs introduced a legislation bill [Alternative Minerals Management Bill] that requires elements of grassroots democracy in licensing, the designation of no-go areas, fees for the use of water and logging as well as comprehensive environmental and social assessments.

## RIGHT TO SAY NO CAMPAIGN

In the Right to Say No Campaign, NGOs and activists fight in favour of the right to give prior and adequately informed consent to mining project on their territories. Other than the right to say no, the need and ideas of community as well as the active participation of the affected groups are crucial.

## COMMUNITY PROTOCOLS [ARGENTINA]

Affected Communities developed tools such as Community Protocols. Those ensure that their territories and raw materials be used consistently with their customs and traditions. National and international laws must respect sustainable principles according to the Protocols. The National Ombudsman, for instance, who is mandated by the Argentinian Constitution to protect human rights and monitor public authorities, officially recognised the Community Protocol "Kachi Yupi - Huellas de la Sal" [Traces in the Salt] in a resolution.

## ESTABLISHING ALTERNATIVE ECONOMIES

Local communities in the Intaq Region have opposed to mining projects while at the same time establishing cooperative structures in order to create economic alternatives to mining. They cultivate coffee, pursue ecotourism projects and have collectively developed plans for hydroelectric power plants with as minimal invasive effects as possible. Also, the community produces goods like soap and bags from local plants.

## LOCAL AND REGIONAL DEVELOPMENT [PERU]

In the Peruvian region of Cajamarca, the regional government carried out a comprehensive and inclusive process of regional development. Their goal was to determine the needs of local communities and to redesignate areas already intended for mining activities in the interest of the residents. The state government, however, does not accept the results.

## CAMPAIGN ON DIVESTMENT

Latin American organisations initiated a divestment campaign to influence, hence reduce or even prevent investment decisions made by religious and non-religious institutions when it comes to investments in huge mining projects. Investments in projects that violate human rights and destroy livelihoods and the environment, should be withdrawn.



## WHY DO WE NEED A TRANSITION IN RAW MATERIALS?

This booklet demonstrates the various issues connected to human rights, development and the environment caused by the extraction, the processing and the consumption of raw materials.

Those problems cannot be tackled by more efficiency, better systems of recycling, new technologies or a better governance alone. Until now, the issues of availability, finiteness and the sustainable use of metals hardly seem to emerge in the debates on transitions in the fields of energy, mobility, agriculture and digitalisation.

The different crises that surround us – related to climate, biodiversity and resources – must be addressed jointly. The escalation of both climate and social crisis we are currently facing is reaching enormous dimensions, while these crises unfold on various levels. Tackling these crisis requires a systemic rethinking as well as a paradigm shift in how we handle our planet's natural resources. From our point of view, this publication is a contribution to the debate.

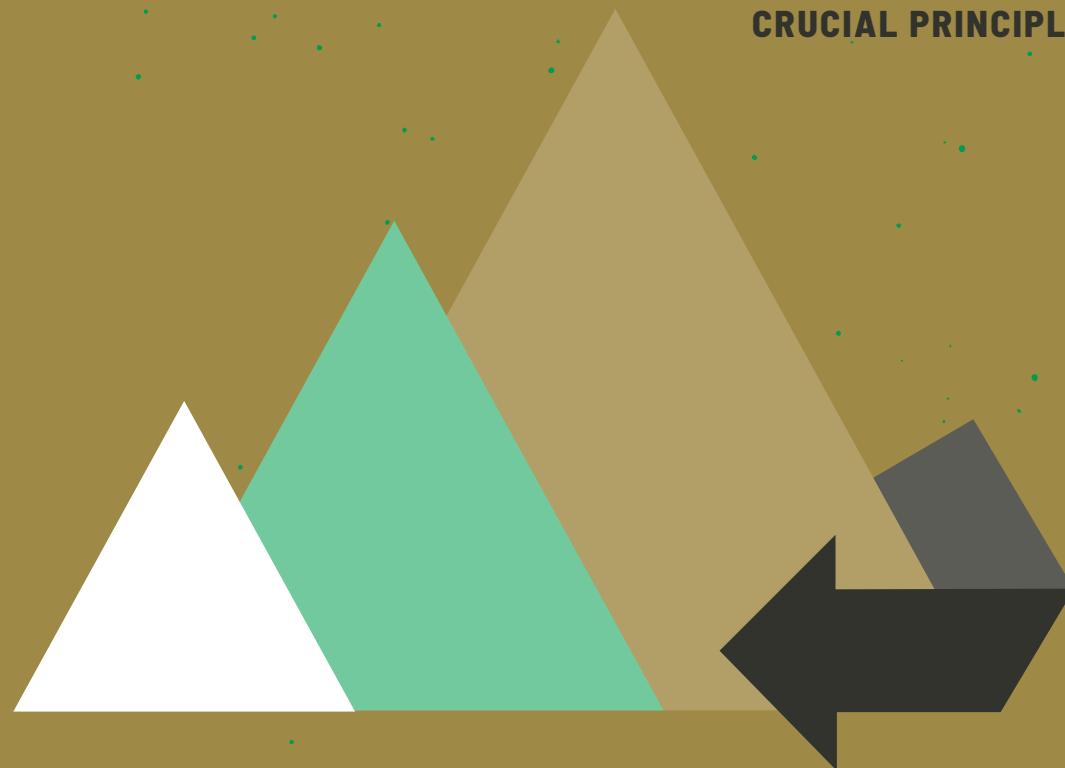
## IN OUR UNDERSTANDING, A SHIFT IN THE WAY WE HANDLE RAW MATERIAL REQUIRES TWO CRUCIAL PRINCIPLES:



As many metal ores as possible need to stay in the ground. To ensure this, all metals and minerals need to be circulated in loss-less cycles preferably. Countries like Germany need to reduce their primary raw material consumption in absolute terms. That means that recycled raw materials should be preferred over raw materials gained through mining.



All raw materials, end products and up-stream products must be mined, extracted, used and processed under highest environmental and social standards. Promoting human rights violations and environmental destruction in third countries by buying a product in Europe must be made impossible.





# CONCRETE FIRST STEPS

FOR HOW WE ACHIEVE THESE GOALS

**IN ORDER TO ACHIEVE THESE GOALS WE PROPOSE  
CONCRETE FIRST STEPS FOR POLICIES IN GERMANY:**

1 →

## REDUCE THE RAW MATERIAL CONSUMPTION IN ABSOLUTE TERMS



Industrial and consumption sectors that require large amounts of raw materials need to be restructured comprehensively. The transition in the mobility sector involves much more than a simple but necessary shift to electric mobility. To do so, the share of public transport as well as cycling and pedestrian mobility need to be increased substantially.



Reduce waste of resources by extending the lifespan of products, for example through the right to repair, long-lasting software architecture and modular design.



Enhance the recycling potential: Through ambitious and efficient collection as well as further development of recycling technologies and the establishment of a secondary resources market. Incentivize products made of secondary raw materials.



Sustainable production can be encouraged through fiscal incentives. Governments must remove subsidies for production and consumption that require large amounts of raw materials.

2 →

## ENFORCE THE PROTECTION OF HUMAN RIGHTS AND ENVIRONMENTAL STANDARDS



Human rights and environmental due diligence must be legally anchored along global supply chains and include all companies [supply chain legislation].



Judicial instruments like corporate liability should be available and effective as well as complaints procedures for affected individuals and communities. We demand the abolition of systems of corporate justice like investor-state dispute settlement in order to penalize environmental violations and violations of human rights in the extraction, processing and industrial processing of raw materials.



Enshrine environmental and social standards in trade agreements.



Strengthen the participation of communities affected by mining and their right to veto mining projects. This, of course, includes transparency in the procedure of awarding concessions, ownership structure, value chains and financial flows.

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