FAIRPHONE

Fair Materials Roadmap 2030

Executive Summary

A fair transition to an inclusive circular economy is the starting point of our Fair Materials Roadmap. But circularity is still out of reach, because the electronics industry's business model still relies on selling more products faster. Our industry should act urgently to address this challenge.

- In a first step, this means reducing demand for materials by designing for longevity, repair, reuse and recycling, in order to prevent negative social and environmental impacts related to the materials' production and processing.
- In a second step, the sourcing and use of materials should ensure it benefits the people and communities linked to their production, processing and manufacturing; and that it aims to protect and regenerate nature and the environment.

Fairphone therefore calls on the industry to join the journey towards Fair Circularity until 2030 and to act on:

1. Including and supporting the most marginalized small producers such as artisanal- and small-scale miners (ASM).
2. Demanding better practices from the mining industry.
3. Extending fairness to all workers and communities, including in the recycling value chains.
4. Prioritizing materials based on impacts to people and the environment - and applying supply chain models that deliver impact.
5. Reducing material use, being truly circular and reporting comprehensively on it.

Fairphone's vision of Fair Circularity means being accountable for our materials and caring for people and planet in the entire product life cycle, across all levels of circularity. We are proposing a template to report on the Fair Circularity of Materials, to transparently tell the full story of our material footprint.

Out of all the materials used in the electronics sector, we prioritize 23, because these have the biggest impacts on people and planet and the highest need for improvements. We prioritized these 23 materials and their supply chains based on a methodology and assessment in line with the UN Guiding Principles on Business and Human Rights and the OECD Due Diligence Guidelines for Responsible Business Conduct. We then developed individual impact strategies for these materials, taking into account the key risks, impacts and opportunities for thought leadership.

In summary, for our material sourcing and use, we will be focussing on the following thought leadership areas for recycled and mined sources:

Mined materials and sources

- Investing in and sourcing from ASM
- Living income and living wages in mining
- Worker and community voice
- Nature protection and regeneration

Recycled materials and sources

- Fair sourcing of recycled materials in our products - with a particular focus on batteries
- Recycled plastics innovation and upcycling
- Fair small-scale recycling (waste collectors)

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FAIR MATERIALS ROADMAP 2030

The challenge and opportunity we face

Circularity is still out of reach.

The electronics sector is one of the world's largest and fastest growing industries, with the consumer electronics market alone expected to grow by over 5% by 2030. With a business model that relies on selling more products faster, this growth means that the demand for virgin mined materials increases and achieving a circular economy becomes difficult. As it stands, the global economy, including the ICT and electronics sector, already uses a huge amount of extracted resources such as ores and minerals. Only 8.6% of this is recycled back into the global economy at the moment.

As the demand for minerals increases, so might negative social and environmental impacts.

The technologies needed for the energy transition are increasing the demand for minerals and materials. The consumer electronics industry, with its consumption of many materials and short product lifespans, contributes to this demand increase.

This hinders the move towards a more circular economy: The supply of recycled materials cannot meet this growing demand, and therefore mining of primary materials will expand in the coming decades. This is likely to cause negative impacts for the environment, pollution of air, water and soil, CO2 emissions, as well as impacting on the health and livelihoods of workers and the communities living near mines and processing plants.

At the same time, recycled material sources come with their own challenges: Recycling rates are still low for many materials, especially from end-of-life electronics. Using recycled materials does incentivise more recycling, but there is more we must do to increase the pool of recycled materials available. In addition, recycling value chains can also be intransparent and informal, with 83% of e-waste treatment being unknown and 35% moved across borders uncontrolled, resulting in social and environmental impacts occurring in small-scale e-waste recycling in developing countries.

Therefore, the electronics industry has a key role to play in ensuring that demand is reduced by a move towards fuller circularity, and that this transition is fair and just - that it benefits workers, indigenous communities, local economies, and as a minimum does not harm the environment.

Our industry needs to act faster.

We are seeing some improvements, pushed by increased regulation, but companies should do more to make their material use fair.

Policy and regulation around responsible sourcing of materials and due diligence in supply chains (such as the EU Corporate Sustainability Due Diligence Directive and the Corporate Sustainability Reporting Directive) are increasingly accompanied by regulation centered around circularity, such as longer product lifespans and the right to repair (e.g. EU Regulation on Ecodesign Requirements for Sustainable Products, EU Directive on the Right of Repair), as well as requirements around recyclability and the use of recycled materials (e.g. in the EU Batteries Regulation). In addition, policies aimed at "on-shoring" the production and processing of critical raw materials, as well as the manufacturing of critical technologies and infrastructure needed for the energy transition (e.g. the EU Critical Raw Materials Act or the Net Zero Industry Act), influence our industry's sourcing and use of raw materials.

Is this enough for the change we need by 2030?

In our opinion, the industry needs to primarily focus on reducing demand for raw materials overall - and change its business model to design for longevity, repair, reuse and recycling. In a second step, responsible sourcing of raw materials and the use of recycled materials are important. There, the industry should ask itself: How can we make sure that the countries producing and processing the raw

materials benefit? How can workers extracting the minerals, and communities and indigenous peoples living nearby, benefit - and not just be left with the negative social and environmental impacts? If we move increasingly to recycled materials, how can the countries, workers and communities involved in recycling benefit appropriately as well?

In our last Fair Materials Roadmap, we set out to challenge the industry on sourcing from the most marginalized communities such as artisanal- and small-scale miners (ASM), to ensure community benefits from mining, and to use recycled materials as much as possible, especially materials recycled at the end of life (post-consumer recycling). We are happy to see that the industry has stepped up especially on using more recycled materials and making commitments to circularity. But much more is still needed!

We urge the industry to act on:

1. Inclusion and support to the most marginalized small producers such as artisanal- and small-scale miners (ASM).

ASM provides livelihoods to millions of people, who are often some of the most vulnerable and marginalized workers and communities, benefitting little from their hard and dangerous work. Our industry continues to consume their products, but still very few companies have ASM-inclusive sourcing policies or support ASM in their supply chain.

2. Demanding better practices from the mining industry.

Mining is here to stay for the foreseeable future. If everyone wanted to only use recycled materials, there would simply not be enough of it available at present. So we have to acknowledge the role of mining and take on responsibility for pushing the sector towards better practices - and that includes living wages and incomes, worker and community voice, and nature protection and regeneration.

3. Extending fairness to all workers and communities, including in the recycling value chains.

This means proactively including and supporting workers and communities involved in the recycling value chain, who can be marginalized and are often not acknowledged or seen by the industry. There are millions of informal waste workers worldwide, and a part of them collects, sorts, disassembles and recycles e-waste. These workers in small-scale e-waste recycling often face unsafe and precarious working conditions and impacts on their health and environment.

4. Prioritize materials based on impacts to people and the environment - and apply supply chain models that deliver impact.

This means focussing on the materials that have the biggest impact on people and planet, rather than prioritizing “low-hanging fruits”, i.e. materials used in large volumes, with the most weight, or those most recognised by consumers. Supply chain due diligence and tracking of material should be a means to an end, not the goal itself - and lead to meaningful impact. For the global and complex supply chains of electronics, innovative models are needed to drive the desired mitigation measures, positive impact and improvement at scale. This includes mineral credit systems alongside the more well-known chain-of-custody models.

5. Reducing material use, being truly circular and reporting comprehensively on it.

Only using recycled materials will not suffice to make our economy more circular. Companies also need to show how they reduce material use through longevity and repairability of their products. And they need to increase the recycled materials pool by enabling better re-use, collection and recovery of materials at the end of life of a product, and giving them back into the economy. More transparent reporting and communication in line with circularity principles is needed.

...and follow Fairphone’s journey towards Fair Circularity.

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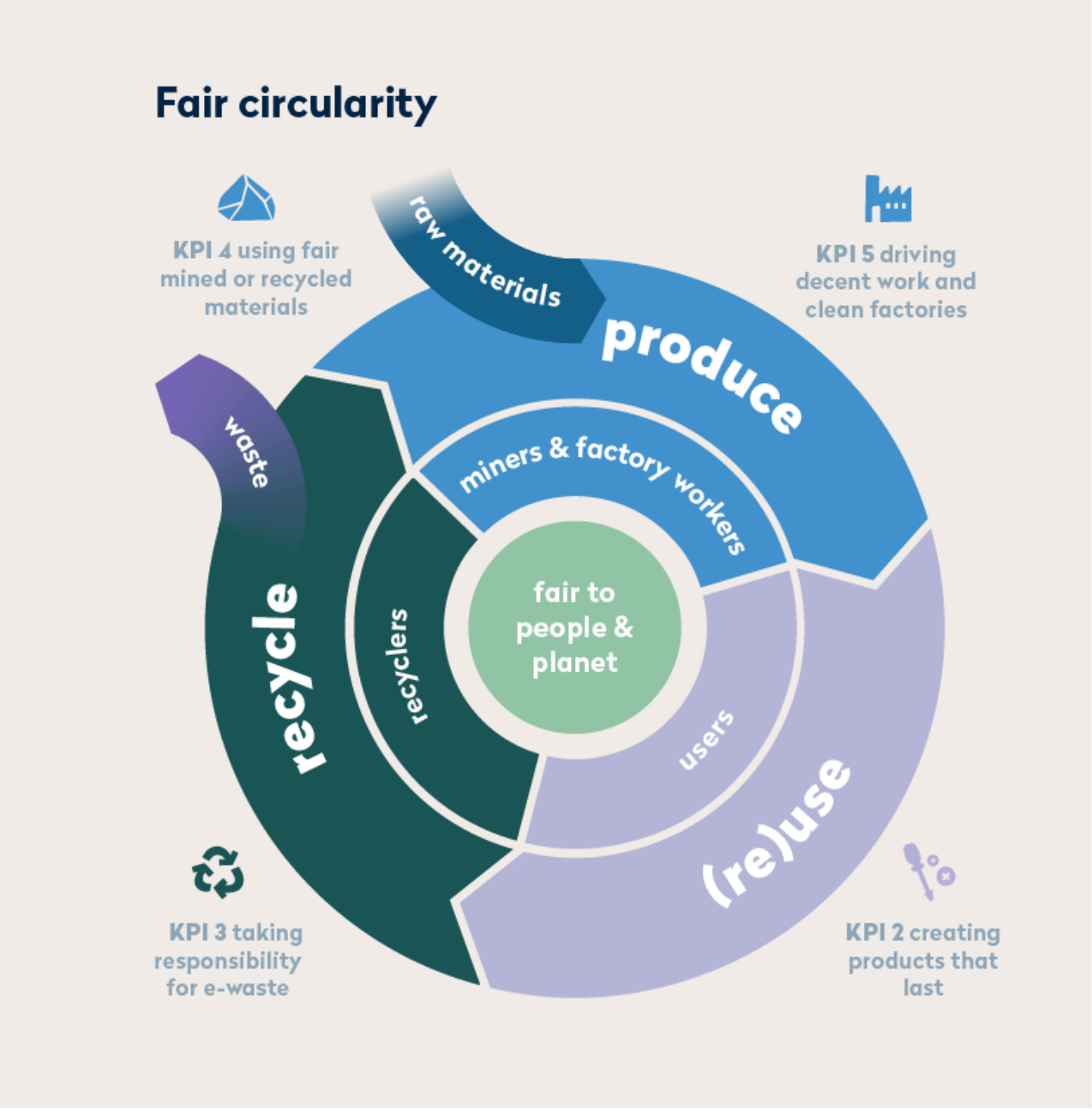
FAIR MATERIALS ROADMAP 2030

Our vision: fair circularity

Fairness

Fairness means we care for people and planet across the full cycle of our products and business. In material sourcing, we especially focus on the workers in mining and recycling, as well as their communities. This is also reflected in our company-wide Key Performance Indicators (KPIs).



Circularity

Circularity means we want to be accountable for our material footprint across all steps of circularity. This includes but is not limited to fair material sourcing.

<table>
<tr><th>Circularity steps</th><th colspan="2">What this means for fair materials sourcing</th></tr>
<tr><td>Refuse: Prevent raw material use
Rethink: Redesign product</td><td colspan="2">Avoid and prevent material use in design
- Restricted substances list
- Design choices for longevity & upgradeability
- Business model choices</td></tr>
<tr><td>Reduce: Decrease raw materials use
Repair: Maintain and repair product
Reuse: A new use for the product
Refurbish: Recondition used product
Remanufacture: Rebuild product from used parts
Repurpose: Reuse product with other function</td><td>Avoid and reduce material use:
- Product longevity
- Enabling and supporting product maintenance and repair
- Reduction of waste in manufacturing
- Use of recycled materials to reduce need for primary, mined materials</td><td>Source and use fairer materials:
- Fair recycled
- Fair mined
- Mineral credits: Match consumption with fair(er) production</td></tr>
<tr><td>Recycle: Recover materials</td><td colspan="2">Enable better and fairer material recovery & re-use at end-of-life:
- From Fairphones and e-waste generally</td></tr>
</table>

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FAIR MATERIALS ROADMAP 2030

Fair materials sourcing strategy

We want to make our material use fair.

This is how we aim to ensure that our sourcing and use of mined and recycled materials is fair to people and planet.[1]

We recognise that our products always have a footprint. So when we source and use materials, we want to ensure they benefit people and avoid impacts on the planet. We prioritize actions that are most needed and where Fairphone can make a difference.

We do this by investigating, linking and investing in fair mined and fair recycled sources, and applying supply chain models that deliver impact.

Fair to people

For us, being fair to people in materials sourcing means especially:

- Ensuring health and safety for miners, recyclers and communities
- Ensuring voice and representation for miners, recyclers and communities
- Ensuring living wages and incomes for miners and recyclers, and economic benefits for communities

Fair to the planet

For us, being fair to the planet in materials sourcing means especially:

- Being climate conscious - avoiding and reducing greenhouse gas emissions
- Protecting and regenerating nature, including ensuring clean air, water and land, and protecting and fostering biodiversity.

We are aware that it is a long journey to achieve this. In some cases, we have to start at a very low level of performance, with mines and material sources that would not be called fair to neither the people nor the planet. We do not per se exclude such sources, because these are precisely the ones that need the most support and improvements.

What is most important to us is continuous improvement - ensuring and supporting our materials sources in improving their practices one step at the time. For this, we use a benchmark defining what we mean with basic, intermediate and advanced levels of fairness.

[1] *Fairphone's design, longevity and end-of-life strategies are not described here in detail, even though they feed into our vision of Fair Circularity for our material footprint.*

Continuous Improvement Benchmarks

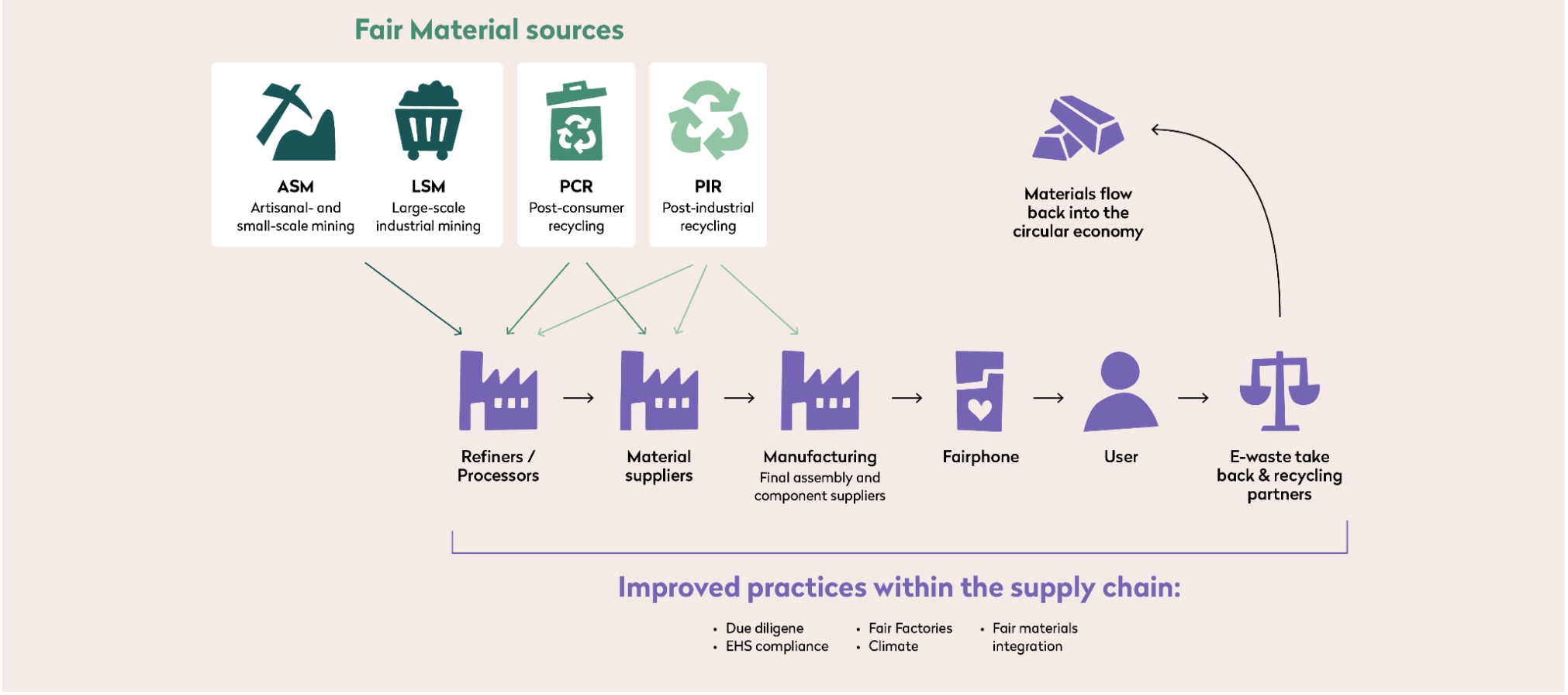
	Standards and assessments at material source	Material chain of custody	Environmental performance	Health & Safety for workers & communities	Worker & community voice	Living wages / incomes and community value creation
Advanced	3rd party assessment against standard with equal stakeholder governance, involvement of affected people and transparent reporting	Chain of custody information audited	Meets best practice standards, including: • Enhanced nature protection • Reduced GHG emissions	Meets best practice standards	Meets best practice standards, including: • Worker and community engagement and involvement in impact identification, improvement measures, and monitoring	Meets best practice standards, including: • Living wages paid (industrial sources) • Living income mechanism established (artisanal sources)
Intermediate	3rd party assessment against industry standard	Chain of custody information shared	Meets industry standards (industrial sources) Assessed and improvement plan established (artisanal sources)	Meets industry standards (industrial sources) Assessed and improvement plan established (artisanal sources)	Meets industry standards, including: • Worker and community surveys • Grievance channels • Free, prior and informed consent	Meets industry standards, including: • Gap assessment and improvement plan • Local content and economic diversification
Basic	Self-assessment or second-party assessment	Chain of custody self-declaration	Information shared	Information shared	Information shared	Information shared

We consider the full value chain in our strategy.

We focus on making four types of material sources fair:

- Artisanal- and small-scale mining (ASM),
- large-scale mining (LSM),
- post-industrial recycled content (PIR) and
- post-consumer recycled content (PCR).

In the process, we also improve the practices of our mid-stream suppliers, who work with us to integrate the materials from these sources and implement supply chain models and due diligence that delivers impact. All of this is embedded in Fairphone's broader impact strategy and work, across the lifecycle of our products.



Fair Material Sources

Recycled material sources

The challenge

The pool of recycled materials available is not big enough to satisfy the demand of our industry and other sectors at the moment, particularly because we need more materials for the energy transition. We need to close this circularity gap as much as possible, especially because the electronics sector remains particularly "non-circular", with limited recycled input into electronics products and low end-of-life recycling rates of e-waste. E-waste is predicted to increase from 50 to 120 million tonnes per year between 2020 and 2050, and consumer electronics will contribute significantly to this.

Many materials are currently lost and wasted at the end of life, especially for electronic products which end up as e-waste, where the collection, sorting, dismantling, separation, pre-processing and recovery are in need of improvement - including when they are done artisanally in countries that lack appropriate recycling infrastructure.

Sourcing recycled materials is a powerful way to motivate the recycling of waste at a product's end of life and ensure better efficiency and higher value of waste recycling. For some materials such as copper and gold, recycled content is already common due to their high value. For others, this is not yet the case. Even for the valuable materials, there are end-of-life sources with a low recycling rate - in particular e-waste. We therefore want to challenge ourselves to use recycled materials from sources and waste streams that are not commonly recycled yet.

In our view, impact is not only about material efficiency - it is also about fairness. This means that the countries, workers and communities involved in recycling e-waste should be able to benefit from this activity. Especially in small-scale or informal settings in developing countries, they currently bear the brunt of environmental, health and safety impacts, without being able to capture much value to build their own professionalized recycling sector.

Our ambition

We aim to further increase our use of recycled materials across all our products. This will support the move towards fuller circularity, help reduce the need for mined material, and avoid connected impacts on nature, including Greenhouse Gas emissions.

We know that using recycled materials reduces impacts on the environment and the climate: Secondary production can in some cases use two times less energy than primary mineral production from ores. At the same time, the recycling rates of some key metals are still very low.

Therefore, we also want to contribute to increasing the pool of recycled materials available, keeping the materials' value at their highest for as long as possible, and benefit people and planet in the recycling value chain.

We analyze where the issues are for each material - e.g. where material is lost due to inefficiencies, and where there are impacts on people and planet in recycling supply chains. We then tailor our strategy to what is most needed. This means for example:

- Focus on recycled sources for materials with a low recycling rate in order to use our buying power as a market signal.
- Improve transparency and credibility to create more responsible recycled sources, including through supply chain mapping and investigation.
- Improve the stages that contribute to a better recycling rate, such as collection and separation of post-consumer waste and the recovery rate of post-industry waste.

- Connect “new” sources and “upcycling” where possible, for example adding value and upgrading waste sources to ensure their use in high-quality electronics such as a smartphone.
- Invest in improving small-scale recycling sources, to improve health, safety, incomes and voice of workers who collect, sort, disassemble e-waste and support the building of a professionalized recycling sector.

What is a “fair recycled source" for Fairphone?

Post-industrial recycled (PIR)

1. **Basic**: Supplier self-declaration
2. **Intermediate**:
    a. 3rd party certification of recycled content
    b. Chain of custody information shared
3. **Advanced**:
    a. 3rd party audit with ESG requirements
    b. Chain of custody information audited
    c. New scope of application for waste source
    d. Source with reduced GHG emissions

Post-consumer recycled (PCR), including small-scale recycling

Basic: Supplier self-declaration

Intermediate:

a. 3rd party certification of recycled content
b. Chain of custody information shared

Advanced:

c. 3rd party audit with ESG requirements
d. Chain of custody information audited
e. New scope of application for waste source
f. Improved health, safety & environmental protection
g. Living incomes for workers

Our thought leadership areas

1. Fair sourcing of recycled materials in all our products - with a focus on fair batteries

We increase the recycled content in our products by also applying fair sourcing principles to our recycled material value chains. This includes improving transparency and credibility (supply chain mapping, due diligence and third-party certification, which includes clear requirements on chain of custody and ESG criteria). Especially battery materials will see a high demand increase, therefore incentivising increased recycling of these materials is important.

There is currently not enough incentive to recycle consumer electronics batteries, because they are small, with less and more dispersed materials. Also, the use of recycled materials in consumer batteries is not easy, due to the high quality and purity specifications required.

We therefore believe that it is important for the consumer electronics sector to increase recycled content in batteries - and to not lag behind other sectors who are increasingly mandated to do so by regulation.

→ We focus on and invest in fair sourcing of recycled materials in our products, especially for batteries.

2. Recycled plastics innovation and upcycling

Recycled plastics sources for electronics are currently limited to several common, pure, clean waste types. This means that the electronics sector is not sufficiently incentivising the recycling of more plastics.

To increase the total use of recycled plastics, it is critical to also use other waste plastics that are not yet commonly recycled or used, and to ensure these can be used in high-spec products such as consumer electronics. Where possible, bio-based plastic alternatives should be explored.

→ We want to build a partnership with a flexible, innovative, and qualified PCR plastics supplier to develop and integrate new sources of PCR plastics and make them available to the wider industry.

3. Fair small-scale recycling

Manual collection, sorting, disassembly, separation and sometimes recycling of e-waste is a large business and livelihood, mainly in developing countries.

Workers, communities and the environment are exposed to hazardous conditions in these settings, where recycling infrastructure is not yet matured. There is a huge opportunity to not only improve the recovery of materials from e-waste, but also to do this fairly, in a way that benefits the countries, workers and communities involved.

→ We focus on improving conditions in the small-scale recycling sector, supporting its professionalization, and aiming at reintegrating materials recovered from e-waste in our own supply chains.

Mined material sources

The challenge

The International Energy Agency calculated that if we are to reach Net Zero CO2 emissions in the energy sector by 2050, the demand for critical minerals will grow by 3.5 times. And this is just the demand from the energy technologies crucial for the energy transition. Demand from our own, and other sectors, will further add to this.

This means that even with our best efforts towards circularity, mining will remain important for decades to come. And mining has profound social and environmental impacts. There have been some improvements in recent years, especially through the push for assessments against comprehensive and high performance benchmarks such as IRMA. But far from enough progress is being made: In industrial mines, water pollution, violations of environmental safety rules, harm to wildlife and habitat are still frequently reported, and so are violations of indigenous peoples' rights to Free, Prior and Informed Consent (FPIC), attacks against human rights defenders and peaceful protests. Freedom of association for workers is infringed upon, inadequate health and safety measures persist, workers are being abused and some do not earn enough for a living. In addition, primary production of metals (this includes mining, initial processing, refining and fabrication) accounts for 7-8% of the global energy use - which has huge implications for the climate.

Artisanal- and small-scale mining (ASM) also has social and environmental impacts: Incredibly precarious and dangerous working conditions, irregular and unstable incomes, worst forms of child labour, pollution of soil, air and water (depending on the mineral), as well as financing of armed or criminal groups. At the same time, ASM is the primary source of employment for at least 44 million people across 80 countries worldwide (supporting around 134 million people in connected sectors), often in countries where few other livelihood opportunities are available. Depending on the mineral, ASM can account for up to a fifth of global production. Yet the workers and communities involved in ASM are some of the most marginalized in global supply chains. While many laudable efforts are being made to improve ASM and invest in its professionalization, we still see only few downstream companies in our sector transparently and proactively engage with, invest in, and source from ASM.

With the increase in mineral demand, we can expect more pressure for mining to expand to very sensitive, precious areas, such as the deep sea, high-biodiversity areas and protected sites, or areas of cultural heritage. This impact on our ecosystems should be of large concern for our industry. Collective, multi-stakeholder efforts need to be made to develop stringent rules or even restricted and "no go" areas for mining, and develop regenerative mining practices.

In summary: Mining is still needed, and has the potential to support decent livelihoods, poverty reduction and development. But it also has profound impacts, which risk undermining a just transition to green energy and circular economy. We have to acknowledge the role of mining and take on responsibility for pushing the sector towards better practices, and making sure that the workers, communities and countries involved in mining can benefit appropriately.

Our ambition

Because mining will be required for the foreseeable future, we aim to proactively engage with the mining sector and invest into improved practices.

We want to ensure that workers, as well as local and indigenous communities benefit from mining, and that the environment is not harmed as a minimum. We therefore focus on topics related to the most severe impacts and where Fairphone can make a difference:

- Safe and healthy working conditions
- Voice of workers and communities
- Living wages / living incomes for mine workers and ensuring benefits to local communities
- Where possible, innovate on nature protection and regeneration in collaboration with others

We aim our efforts at all types of mining, both industrial and ASM. ASM will remain a key focus, as Fairphone is well positioned to drive meaningful change through our supply chains:

- We see responsible ASM as a legitimate livelihood, and we commit to purposefully source from ASM and invest in its improvement, especially for materials where ASM provides a significant share of the production.
- We also commit to holding industrial mining accountable to high and credible standards. Due to our size, we have less leverage to change the industrial sector or make meaningful investments. We rely on collaboration with others and finding key areas where we can provide an added value to already ongoing efforts, in line with our thought leadership areas.

For all mined material sources, we commit to an approach rooted in engagement, dialogue and continuous improvement, rather than exclusion or disengagement. This is especially important where our decisions impact the most vulnerable and marginalized such as artisanal miners or communities.
We also focus our efforts on innovating supply chain models that drive impact on the ground, are connected to our material use footprint, and have the potential to be applied by and transform our wider industry.

What is a “fair mined source" for Fairphone?

ASM

1. **Basic**:
    a. Willingness to collaborate
    b. Assessment against CRAFT Modules 1-3
    c. No risks requiring immediate disengagement as per the OECD Due Diligence Guidance
2. **Intermediate**:
    a. Assessment against CRAFT or other standards (e.g. RMI Cobalt Framework)
    b. Chain of custody information shared
3. **Advanced**:
    a. 3rd party assessment against standard with equal governance rights for stakeholders (e.g. Fairtrade, Fairmined, CRAFT scheme)
    b. Improved health, safety & environmental protection
    c. Worker voice and community voice
    d. Living incomes, fair trading and community value creation
    e. Chain of custody information audited

LSM

1. **Basic**:
    a. Assessment or 3rd party audit against industry standard (e.g. ICMM, TSM)
2. **Intermediate**:
    a. 3rd party audit against industry standard with some involvement of affected stakeholders (e.g. Co/Ni/Zn Mark, Aluminium Stewardship Initiative), or IRMA self-assessment
    b. Chain of custody information shared
3. **Advanced**:
    a. 3rd party audit against a standard with equal governance rights for all stakeholders, participation of affected people in audits, checking effectiveness of measures and transparent reporting (e.g. IRMA, Responsible Steel)
    b. Worker voice and community voice
    c. Living wages and community value creation
    d. Enhanced nature protection (biodiversity and rehabilitation)
    e. Chain of custody information audited

Our thought leadership areas

1. Enabling fair production and supply chains from artisanal- and small-scale mines

For materials with a considerable amount of ASM production, we continue our focus on building fair ASM supply chains and proactively sourcing from ASM producers. This means setting up or collaborating in multi-stakeholder initiatives and investing in improvement programmes to build responsible supply chains from ASM.

→ We want to provide an example to the industry by leveraging market demand to catalyze fairer and inclusive ASM production and supply chains. Engaging with, investing in and sourcing from ASM is only fair.

2. Living income and living wages

Miners do extremely hard (and often dangerous) work, in both industrial and artisanal mining. Their health and safety needs to be the main priority. Beyond that, they should also receive fair compensation for their work.

Living incomes and wages are a key factor in preventing child labour, and in ensuring that the local community and economy actually benefit from mining.

→ We aim to bring our expertise around living wages further upstream, to our mining sources, and to apply lessons learnt from other sectors to find ways of enhancing incomes of ASM and LSM workers.

3. Worker and community voice

Workers and communities are most affected by mining. It is critical to listen to their voices to know what negative impacts need to be addressed and what positive opportunities need to be enhanced. The use of digital tools can support this, and enable their voices to be heard all along the supply chain.

→ We want to support the participation of workers and communities (including indigenous peoples) in determining what is important, what needs to change, and how this could be achieved, for both ASM and LSM producers.

4. Nature protection and regeneration

Industrial mining, and also certain types of ASM, can have profound impacts on nature through pollution of water, air and soil, GHG emissions, land use, forest destruction, biodiversity impacts, and so on. This also affects workers, surrounding communities and indigenous peoples.

Mining is moving into ever more sensitive and precious areas, where these impacts will be compounded and need to be addressed urgently.

→ As a small company, Fairphone is not able to move mining towards more regenerative practices by itself. But we aim to identify collaborative platforms where we can make a difference - e.g pilot climate- and forest-smart mining practices, biodiversity and regeneration in the mining life-cycle, etc.

Fair Material Supply Chains

Through our work on fair materials, we indirectly improve the practices of the mid-stream suppliers. We work with our key material manufacturers, component suppliers and industry associations to improve practices of those processing, refining and manufacturing materials. Refining and component manufacturing are key stages where our materials from different sources flow through. They sit between our material sources (where we focus our Fair Material work) and the component manufacturers (where we focus our Fair Factories work).

There are hundreds of processors, refiners and material manufacturers in our supply chain, and they frequently change. Therefore, our leverage is low and we rely on collaborating with others through industry associations or initiatives such as the Responsible Mineral Initiative (RMI).

Therefore, the mid-stream suppliers are not a key focus for our impact work. They form part of our supply chain due diligence and engagement when integrating materials from fairer sources into our supply chain. We aim at compliance with the RMI's Responsible Minerals Assurance Programme (RMAP) as a minimum. Where we have stronger influence such as in strategic component supply chains (e.g. battery), we support further improvement in a tailored approach.

What is an "improved mid-stream supplier" for Fairphone?

Processing, refining and smelting

1. **Basic:** 3rd party assessment against RMI RMAP
2. **Intermediate:**
   a. Conformance with RMI RMAP
   b. (Self-)assessment against standard with ESG criteria (RRA, RMI ESG)
3. **Fair:** 3rd party assessment against with equal governance rights for all stakeholders, participation of affected people in audits (IRMA)

Material and component manufacturing

1. **Basic:** Chain of custody and due diligence information for focus materials shared
2. **Intermediate:** Integration of material from fair mined or fair recycled sources
3. **Fair:** As defined in our Fair Factories and Climate Conscious Strategies

Supply chain models that deliver impact

For each of our (focus) materials, we apply a tailored approach to establish supply chains that deliver impact at the material source - while at the same time taking into account the specifics of the various sub-suppliers that manufacture the different components in which these materials are used.

This means we use several supply chain models and set-ups in line with the ISEAL Alliance's Guidance, sometimes in combination with each other, in order to link our material use to impact created at the sources. We apply several criteria to determine which model is the most appropriate for generating the largest impact possible.

Segregated	A material from a certified source is kept physically separate from non-certified material through each stage of the supply chain.
Mass balance	Material from a certified source may be mixed with non-certified materials at any stage, provided that the quantity of material labelled as certified at output is not exceeding the quantity of material labelled as certified at input. Mass balance can be done at batch-, site-, or group level.

Use
When a material is concentrated in one or few components, or when supply chains are comparatively short.

Benefits
Supports the collaboration and engagement with sub-suppliers and raises their awareness, knowledge and understanding of responsible sourcing.

Also allows for stronger "on-product" claims because the material flows physically into our supply chains and products.

Disadvantages
In most cases, segregation is economically and metallurgically not viable and mass balance is preferred. Both models require chain of custody management, documentation and oversight/auditing of each entity in the entire chain.

Mineral credits or book and claim	Provides tradable certificates for material from a certified source. Allows a product to be sold with a credit claim corresponding to the quantity of certified input material. Intended to reward responsible production where complex physical supply chains make sourcing the actual certified material very difficult.

Use

1. When a material is spread across many sub-components and in tiny amounts
2. When supply chains are long and complex
3. When a formalized, reliable chain of custody into our product is not yet possible from the specific source where we create impact.

Benefits
Matches material consumption with the same amount of responsible production, and drives impact by improving material sources and bringing more responsible materials onto the market. Requires documentation and oversight/audit at the source and credit purchaser only.

Disadvantages
Material does not flow physically into our supply chains and products.

Our thought leadership on mineral credits

Mineral credits, or book and claim systems, are an innovative way to drive impact in material sources. We are convinced that using a mineral credit model can drive much needed impact in materials sources, especially in sectors with hugely complex, widespread, long and specialized supply chains such as the electronics sector. Using a credits model does not remove a company's obligation to conduct due diligence in its supply chains, it rather offers a path to prevent and mitigate identified risks, and creating positive impact by ensuring that more responsibly produced materials are entering global supply chains.

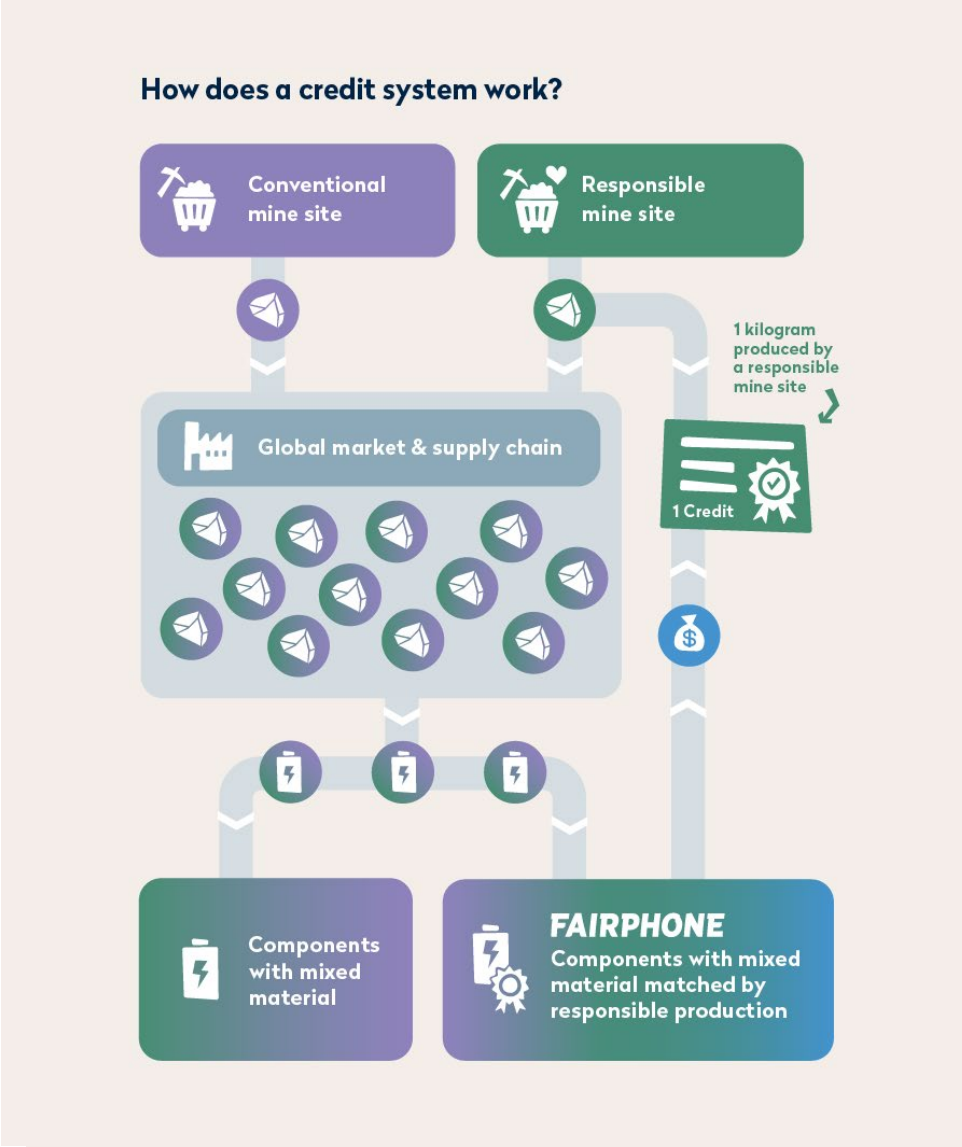
Mineral Credits match a downstream company's consumption of a particular material with fair(er) production of the same amount of material. Similar to Renewable Energy Certificates (RECs), such a Credit System provides a market signal for responsible production and brings more responsibly produced materials onto the market.

We aim to apply credits especially for materials that are spread across many components in very small amounts, or for the materials where we cannot (yet) physically connect fair sources to our specific component supply chains through mass balance.

Other sectors are already using such credit systems as a standard practice. We aim to contribute to their development in the mineral sector, ensuring that they are fair and credible, with robust verification systems, and taking into account the specifics of material transformation and use in complex global supply chains.

How a mineral credit system works

By purchasing mineral credits, an organization receives the right to make unique claims associated with the responsible production that generated the purchased credits.



Our approach to fair material sourcing

1. Inclusivity and fair sourcing principles

Our approach to materials sourcing and use is guided by our Fair Sourcing Policy, stipulating that we want to use our buying power as a catalyst for improvement, address risks as opportunities, focus on continuous improvement, reporting on progress, and work towards systemic change.

We are explicit about ensuring inclusivity of the most marginalized and vulnerable such as ASM miners in our supply chains. In addition, we take a step-wise approach to implementation: We research the issues, trace material and engage with suppliers and stakeholders, we build and invest in fairer material sources and connect them to our supply chains or footprint, and we continuously improve.

2. Prioritization of focus materials in line with good practice

Because electronic products contain many dozens of materials, we need to prioritize those with the biggest need for social and environmental improvement. And because our resources are limited, we also need to prioritise specific components and (sub-)suppliers for our impact interventions. We do this prioritization in line with good practice standards, such as the UN Guiding Principles and the OECD Guidelines for Responsible Business Conduct as well as our vision and mission.

3. Taking action that leads to concrete positive impact for people and planet

Our goal is to create a positive impact for people and planet. We believe that supply chain due diligence needs to serve this purpose and result in concrete improvements. We use it to help us prioritize our efforts and investments in impact. This means:

- Starting from the assumption that materials from sources connected to negative social and environmental impacts do end up in our products, due to the complexity of global supply chains.
- Recognising our responsibility to engage with and continuously improve even (especially) material sources showing a low level of performance, and refraining from exclusion and disengagement.
- Reasonable tracking (chain of custody) of materials as means to an end, not the goal itself: to understand our supply chains sufficiently, and to identify “hotspot” areas and supply chain tiers.
- A “hotspot” approach to creating positive impact: Engage and invest in the geographies and supply chain tiers where the most salient issues are found and where there is the biggest opportunity for positive change.

4. Meaningful engagement, voice and collaboration

We emphasize and foster engagement and collaboration. In everything we do, we encourage partnerships, especially multi-stakeholder approaches where companies, civil society and government come together. We believe it is important that all stakeholders have an equal voice, and that we listen to the voices of those affected most by our supply chains: the miners, workers and communities.

5. Advocacy and influencing

We do not just want to develop solutions for ourselves, we also want to influence and convince the electronic industry to follow. Therefore, advocacy and influencing is part of our strategy - vis-a-vis governments, regulators, and standard setters, and also towards our industry peers. We want to develop scalable solutions and approaches, and be transparent about what we do and how we do it, to make it easy for others to do the same.

Our process step by step

This is how we go about implementing our Fair Materials Roadmap, following the six steps of human rights and environmental due diligence.

Steps	Actions
Step 1: Policies and systems	• Setting company-wide performance indicators (KPIs) and targets • Establish requirements for our suppliers • Compiling and analyzing Full Material Declarations for each product.
Step 2: Identifying and assessing risks and opportunities	• Conduct research and stakeholder engagement • Prioritize focus materials based on severity and likelihood of impacts • Prioritize key components and suppliers using focus materials • Map and trace supply chains of focus materials
Step 3: Cease, prevent, mitigate adverse impacts and realise positive impacts	• Engage with affected stakeholders and build multi-stakeholder coalitions • Make existing sources fairer, or build new sources that create positive impact. • Invest in continuous improvement of the material sources • Establish chain-of-custody to connect the sources with our product
Step 4: Monitor performance	• Collect chain of custody documentation • Track progress on continuous improvement against international standards • Third party auditing of progress against KPI
Step 5: Communicate progress	• Report publicly and transparently • Foster and show continuous improvement in the long term
Step 6: Remediate adverse effects	• Monitor and act on grievances

FAIRPHONE

FAIR MATERIALS ROADMAP 2030

Our focus materials and impact strategies

Why focus materials

Electronics products contain a huge number of different materials: There are over 60 materials and elements in a phone alone. These materials are often distributed in small amounts across many different components and parts of the phone - each with their own sub-suppliers, material supply chains and sources. Not all of these materials come with the same level of urgency or impacts that need to be addressed, and therefore we need to prioritize key materials - our focus materials.

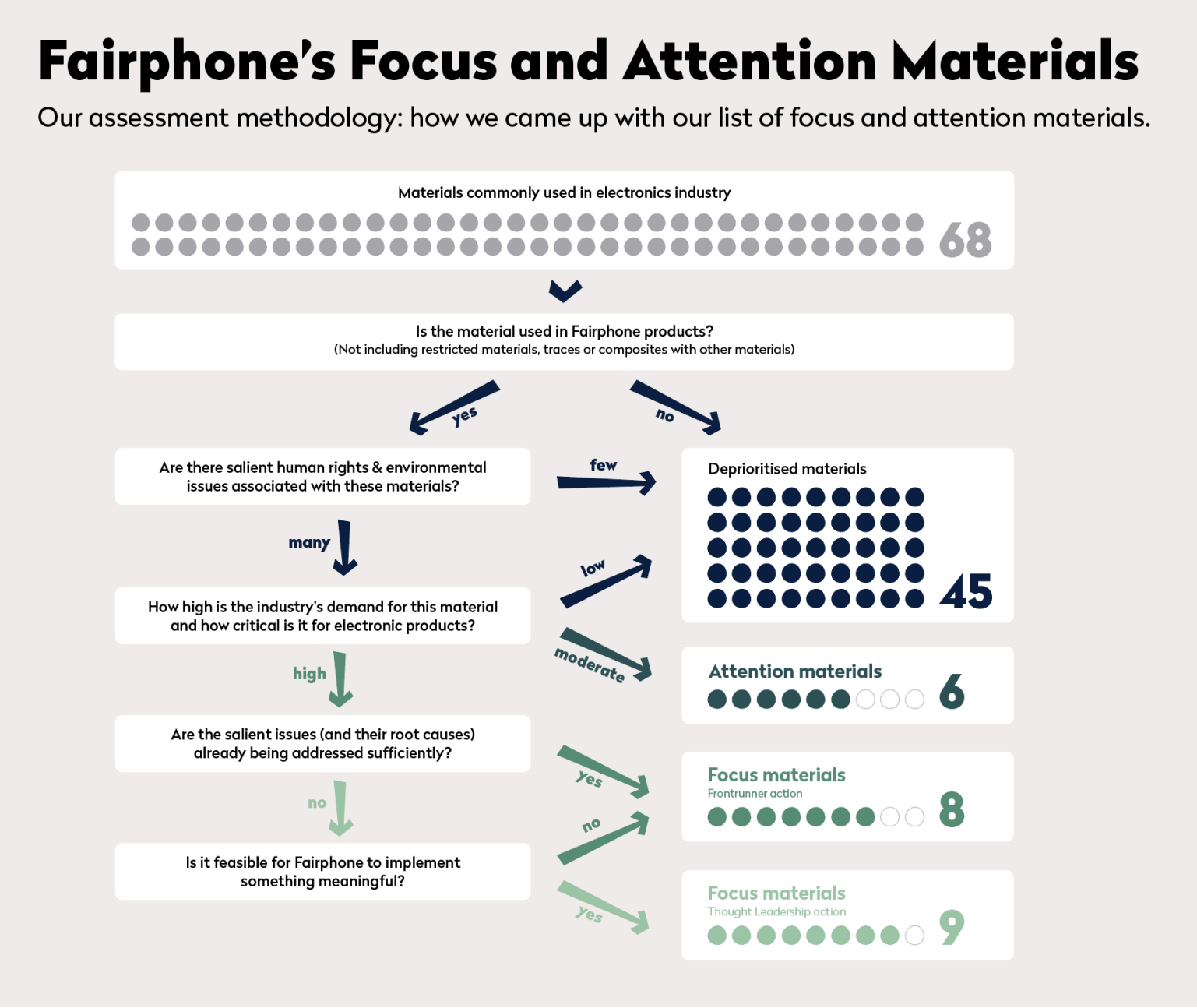
To prioritize materials, we have built on and updated the methodology of our previous Fair Materials Roadmap, to further align it with good practice standards such as the UN Guiding Principles on Business and Human Rights. We started from an overview of 68 materials commonly used in the electronics industry, and reduced that initial list by filtering out materials that are already on our restricted substances list, materials that are not present in our products or only in very small traces, or where materials form composites with other materials.

From this narrowed list of 49 materials, we then identified the materials causing the most severe human rights and environmental impacts in the supply chain (Filter 1: Salience). Within this list, we applied further prioritization filters to determine whether a material should be our top priority for action (focus materials), or whether the material needs attention but is rather of secondary priority (attention material). Because Fairphone's mission is to change the industry, and not just our own supply chain, these filters also looked at how critical a material is to electronic products, and how high the electronics sector's share of the demand is for this material (Filter 2: Leverage).

In addition, we assessed whether there are already existing initiatives and solutions that sufficiently address the issues related to a particular material (Filter 3: Opportunity), or where this was not yet the case, whether and how Fairphone could feasibly make a meaningful change (Filter 4: Feasibility).

Our assessment methodology

This is an overview of our process to select focus materials. A detailed description of the methodology, including the filters, criteria, indicators, benchmarks and sources is provided in the Annex.



The results: 17 focus materials…

These are materials with high social and environmental impacts, high criticality and high demand from the electronics sector. They include our previous 14 focus materials and add 3 additional ones. We will continue to focus our impact efforts on these.

Materials with salient issues	Environmental impacts	Social / human rights impacts	Governance risks	Functional criticality	Electronics demand
Aluminium (Bauxite)	High	High	High	Moderate	Moderate
Cobalt	Very High	Very High	Very High	Moderate	High
Copper	Very High	Very High	Very High	Very High	High
Gold	Very High	Very High	Very High	High	Moderate
Graphite	High	Moderate	Moderate	High	Low
Indium	High	Low	Moderate	Very High	Very High
Lithium	Very High	High	High	Moderate	High
Magnesium	Moderate	Moderate	Low	Low	n/a
Mica	High	High	High	Moderate	High
Nickel	High	Very High	Moderate	High	High
Plastics	Very High	High	Moderate	High	Moderate
Rare Earth Elements	High	High	High	Very high	Very High
Silver	High	High	High	High	High
Tantalum	High	Very High	Very High	High	Very High
Tin	Very High	Very High	Very High	Very High	Very High
Tungsten	High	Very High	Very High	Moderate	Moderate
Zinc	High	Very High	Moderate	Low	High

…and 6 attention materials

These are materials with high impacts and high criticality, but with a low demand from the electronics sector (resulting in low influence and leverage for Fairphone and our industry generally). Many of these materials have high environmental impacts, but also show relatively good recycling rates already.

We don't prioritise these materials immediately. We act when there is an opportunity for including fairer and recycled sources and plan to work on these over time. This could mean increasing recycled content of these materials, connecting material suppliers with a lower GHG footprint to our supply chains and products, or contributing to improved circularity of this material.

Materials with salient issues	Environmental impacts	Social / human rights impacts	Governance risks	Functional criticality	Electronics demand
Chromium	High	Moderate	Moderate	Very High	Low
Glass / glass fiber	High	Moderate	Moderate	Very High	Low
Iron (mainly as steel)	Very High	High	Very High	Moderate	Low
Manganese	High	High	High	Very High	Low
Silicon	Moderate	High	High	Very High	Low
Titanium	High	High	High	High	Low

Deprioritised materials

These materials did not make it to our list of focus and attention materials, and were filtered out in the assessment process. This does not mean we pay no attention to them - we reassess our priority list regularly as we keep raising the bar on fair materials.

Filter and reasoning	Materials
Filter 0 - Not included in assessment (19)	Restricted substances list: Antimony, Arsenic, Beryllium, Bismuth, Cadmium, Halogen, Mercury, Selenium Not present in Fairphone products or only as trace amounts, or as composites with other materials: Carbon/carbonates, Cellulose, Ceramics, Kaolinite, Leather, Organic Pigments, Quartz, Rhenium, Rhodium, Potassium, Zirconium
Filter 1 - Low(er) social & environmental impacts (20)	Barium, Boron, Calcium/Limestone, Gallium, Germanium, Iridium, Molybdenum, Palladium, Platinum, Potassium, Rhutenium, Scandium, Sodium, Strontium, Talc/Agalite, Tellurium, Terbium, Thallium, Yttrium, Vanadium
Filter 2 - Low(er) leverage / influence (6)	Lead, Niobium, Paper/Carton, Phosphorus, Rubber, Sulphur

Material assessments

In our quest to drive impact, we are making a conscious decision about which type of source we prioritize for which focus or attention material. To determine our impact strategies for the selected materials, and whether to prioritize fair mined or fair recycled sources, we conducted further assessments against a set of criteria:

- Industry demand increase and dissipative losses (= continuous dependence on mined sources that need to establish better practices)
- ASM production (= opportunity to benefit marginalized producers)
- Recycled material availability as well as end-of-life and refined recycled input rates (= uncommonly recycled materials benefit most from a market signal)
- We also assessed the greenhouse gas emissions of primary material production, in order to determine the raw materials that contribute most to our products' emissions. These are the materials where we need to work on integrating recycled materials or contribute to reducing emissions in different ways.
- Finally, we also considered how and where the material is used in our products, in which components and in which form. One type of source (and supply chain model) may be more suitable than the other for a given component containing the material.

This data was then used to determine the strategy and actions for each individual material. Not all data was readily available and we aim to fill the gaps over time.

Assessment of mined sources opportunities

	Materials	Projected global demand growth[2]	ASM production	Dissipative Losses Rate	Rock-to-metal ratio rating
Focus Materials	Aluminium (Bauxite)	Moderate	No	Low	Low
	Cobalt	Very high	Yes	Very high	Moderate
	Copper	High	Yes	Low	Moderate
	Gold	Moderate	Yes	Low	Very high
	Graphite	High	No	Moderate	n/a
	Indium	High	No	Very high	Moderate
	Lithium	Very high	Yes	Moderate	High
	Magnesium	Moderate	No	Moderate	Low
	Mica	Low	Yes	High	n/a
	Nickel	High	No	Low	Moderate
	Plastics	Moderate	n/a	Moderate	n/a
	Rare Earth Elements	High	No	Moderate	Moderate
	Silicon	High	Yes	Moderate	Low
	Silver	Low	Yes	Low	High
	Tantalum	Moderate	Yes	Moderate	High
	Tin	Moderate	Yes	Moderate	High
	Tungsten	Moderate	Yes	High	High
	Zinc	Moderate	No	Low	Low
Attention Materials	Chromium	Low	Yes	Low	Low
	Glass	Low	n/a	Moderate	n/a
	Iron / Steel	Low	No	n/a	n/a
	Manganese	Moderate	Yes	Low	Low
	Titanium	Low	No	Moderate	Low

[2] *Approximate estimates based on Fair Materials Roadmap 2023 and additional new data.*

Assessment of recycled sources opportunities

	Materials	Recycled material availability	EOL Recycled Input Rate	Refined Recycled Input Rate
Focus Materials	Aluminium (Bauxite)	Very high	High	High
	Cobalt	High	High	Low
	Copper	High	High	Very high
	Gold	Very high	Very high	High
	Graphite	Low	Low	Moderate
	Indium	Low	Low	Low
	Lithium	Low	Low	Low
	Magnesium	n/a	Low	Moderate
	Mica	Low	Moderate	Moderate
	Nickel	High	Very high	High
	Plastics	n/a	Moderate	Moderate
	Rare Earth Elements	Low	Low	Low
	Silicon	Low	Low	Moderate
	Silver	High	High	Very high
	Tantalum	Low	Moderate	Moderate
	Tin	Moderate	High	Moderate
	Tungsten	High	Moderate	Low
	Zinc	Moderate	High	High
Attention Materials	Chromium	High	Moderate	Moderate
	Glass	High	High	Moderate
	Iron / Steel	n/a	n/a	n/a
	Manganese	Low	Very high	High
	Titanium	n/a	Moderate	Moderate

Assessment of Emission Hotspots

We tried to identify which materials should be prioritized from the perspective of Greenhouse Gas (GHG) Emissions. For this, we researched the emission factors for the primary production of materials from publicly available sources, and plotted that against the amount of material used in our phone.[3] This allowed us to identify the key emission “hotspots" in our (primary) material use, resulting in a list of top ten materials. For these, we will increasingly use recycled materials and strategize how we can contribute to reducing GHG emissions in their primary production, processing, smelting and refining.

This helped us identify a list of top ten emission hotspots in our primary material use, making up 96% of emissions in the 77% of the Fairphone’s weight represented by the list of assessed materials.

Material	% of phone weight	Primary production emission factor (kgs CO2e/kg)	Emissions in kgs CO2e	Emission % of assessed materials
Aluminium	18.25	14.30	0.5533	31
Chromium	1.07	2.40	0.0055	0
Cobalt	5.81	6.40	0.0788	4
Copper	7.95	5.00	0.0843	5
Glass	11.54	3.50	0.0857	5
Gold	0.01	23300	0.5305	30
Graphite	5.25	9.60	0.1069	6
Indium	0.00	102.00	0.0000	0
Lithium	0.69	4.00	0.0059	0
Magnesium	2.34	21.80	0.1080	6
Manganese	0.22	1.00	0.0005	0
Mica	0.01	n/a	0.0000	0
Nickel	1.44	13.00	0.0396	2
Palladium	0.00	9297	0.0147	1
Plastics	15.21	3.46	0.1116	6
Platinum	0.00	12500	0.0000	0
REE	0.07	n/a	0.0000	0
Silicon	0.34	11.3	0.0081	0
Silver	0.04	95.00	0.0079	0
Tantalum	0.01	260.00	0.0057	0
Tin	0.41	6.63	0.0057	0
Titanium	0.30	8.10	0.0051	0
Tungsten	0.35	12.60	0.0094	1
Zinc	0.49	3.50	0.0036	0
Iron / steel	5.64	1.85	0.0221	1
Total	77.43		1.7929	100.00

[3] We assessed the 23 focus and attention materials, plus palladium and platinum, which make up about 77% of the weight of a Fairphone. This assessment can only be a rough approximation at this stage. We had to take a lot of assumptions and the emission factors we found in publications might not correspond exactly with the context of our material sources. They may also reflect different scopes. In addition, we encountered data gaps. We will work to improve the accuracy of this assessment over time.

Our impact strategies

Based on the above data and assessments, we pursue specific impact strategies for the focus and attention materials, prioritizing either fair mined or fair recycled sources. We initially prioritize our efforts for impact on the focus materials (dark green). The sources and strategies for the attention materials (light green) will be further developed over time. This gradual approach will be reflected in our Material Impact KPIs for the 3-year periods of 2024-2026 and 2027-2030.

	Material	Use in phone	Impact strategy	Reasoning
Focus Materials	Aluminium (Bauxite)	Mainly in midframe	Focus on recycled sources, especially PCR. Use ASI certified suppliers with a low carbon footprint.	There are already strong incentives to recycle aluminium, but using recycled aluminium reduces energy use and GHG emissions significantly while primary aluminium is a key GHG emission hotspot. PIR sources are common in electronics, therefore using PCR aluminium should be the focus.
	Cobalt	Mainly in battery	Focus on fair mined sources, especially ASM. Continue thought leadership with the Fair Cobalt Alliance and Cobalt Credits. Where possible, increase the recycled content in the battery from (currently) uncommonly recycled sources.	Cobalt is already recycled from batteries, though it has not been feasible to feed this back into batteries at scale until now. This will change in the coming years, esp. for EV batteries. Using recycled content is still impactful and will help reduce GHG emissions. Cobalt demand will increase significantly, and the dependency on mined material remains. In addition, a large proportion is produced by ASM.
	Copper	Mainly in PCB and shielding alloy, as well as display, midframe, battery and many other components	Focus on recycled sources in the shielding, battery and PCB, especially from PCR sources. Encourage the use of recycled copper alloys in additional components. For the remainder of copper-containing components, push for IRMA audited mined sources or explore mineral credits. Potential for exploring worker and community voice in the copper-lithium area in Chile or for responsible ASM in the copper-cobalt belt in DRC.	There are already strong incentives to recycle copper. A market signal (by using recycled content) has limited impact, but helps reduce GHG emissions, setting up more robust chains of custody to track the recycled sources, and using additional waste sources. Also, copper demand will increase significantly and the dependency on mined material remains. Mining is mostly done by LSM, and also by a small share of ASM.

	Gold	Across many components, especially connectors	Focus on fair mined sources, especially ASM. Continue thought leadership with different gold credit models (Farmined, Fairtrade, TIF). As a secondary strategy explore gold from uncommonly recycled sources, i.e. e-waste recycling.	As a precious metal, gold is very widely recycled already. No additional market incentive is created, except from currently uncommonly recycled sources (e.g. e-waste). Primary gold is a key GHG emission hotspot. At the same time, ASM remains a significant producer.
	Graphite	Mainly in battery	Focus on increasing the recycled content in the battery. Explore mineral credits for natural graphite and low carbon sources for synthetic graphite.	Recycled graphite is available, but its performance is not yet fully proven to be reused in a battery anode. Using recycled material is impactful as a market signal, and also to reduce GHG emissions.
	Indium	Mainly in display	Focus on recycled content, and explore PCR sources within a broader coalition where feasible.	Post-industrial recycling (PIR) of indium is commonly done, but post-consumer recycling (PCR) does not exist on a commercial level. Using recycled material, especially PCR, is impactful as a market signal.
	Lithium	Mainly in battery	Focus on fair mined sources (LSM). Continue thought leadership with IRMA audited lithium, explore enhancing worker and community voice. Explore recycled content in the battery from (currently) uncommonly recycled sources.	Lithium is not yet commonly recycled, but this will change in the future with research and finance going into recovering lithium especially from EV batteries. Lithium demand will increase significantly, and the dependency on mined material remains.
	Magnesium	Mainly in display frame and midframe	Focus on recycled sources, especially PCR, and enable use in high-end electronics (upcycling).	Magnesium recycling is difficult as often it involves downcycling without proper segregation. Using recycled material is impactful to reduce GHG emissions and as a market signal, especially if uses in high-end electronics can be proven.
	Mica	In many different connectors	Focus on fair mined sources, especially ASM. Collaborate with the Responsible Mica Initiative with an aim to establish a supply chain model	The vast majority of mica cannot be recycled at present, and a large share is produced by ASM.

			from their partner mines; explore contribution to living incomes.	
	Nickel	Majority in shielding alloy and battery, and also across many components as alloy	Focus on recycled content for shielding and battery, from uncommonly recycled sources. As a secondary strategy, for other nickel-containing components, focus on fair mined sources, e.g. through IRMA audited suppliers (or credits) and supporting an alliance focussed on improving nickel mining in Indonesia, exploring innovation on nature protection.	Recycling is already well established (esp. for alloys), though less so for nickel in batteries. This will likely change in the coming years, esp. for EV batteries. A market signal (by using recycled content in the battery) is still impactful, but the demand for nickel will increase significantly and the dependency on mined material remains.
	Plastics	Mainly in back cover, antenna cover, midframe, and also many other components	Focus on maximising recycled content, especially from PCR sources that are not commonly recycled, or that are not yet commonly used in electronics (upcycling), e.g. e-waste, ocean waste. Explore bio-based alternatives in parts where PCR is not technically possible yet.	Plastics are commonly recycled, but only some recycled plastics sources fulfill the high quality specs needed for consumer electronics. Using and upcycling recycled plastics for consumer electronics is impactful as a market signal.
	Rare Earth Elements	Mainly in camera, speaker and vibration motor	Focus on recycled sources, and explore PCR sources within a broader coalition where feasible.	While PIR is common, the end of life recycling input rate (EOL-RIR) of REE is currently low. Using recycled material, especially PCR, is impactful as a market signal.
	Silver	In many components including passive, ICs, solder paste and battery	Focus on fair mined sources through credit models. As a secondary strategy, explore silver from uncommonly recycled sources, i.e. e-waste recycling.	As a precious metal, silver is very widely recycled already. No additional market incentive is created by using recycled silver, except from currently uncommonly recycled sources (e.g. e-waste). In addition, a proportion is produced by ASM.
	Tantalum	In many Surface Acoustic Wave	Focus on fair mined sources, especially ASM, potentially through a credits model. In parallel, explore recycled content recovered from	Very little tantalum is being recycled at the end of life (much of it is used in capacitors). Using recycled materials could provide a market signal, but at present,

		(SAW) Filters and Duplexers	uncommonly recycled sources such as capacitors (low feasibility currently).	the technological and economic feasibility of recycling is still too far away. In addition, a significant share is produced by ASM.
	Tin	Mainly in solder paste, including battery solder paste, and also across many components	Focus on recycled content for the main tin-containing part, the solder paste in the final assembly or components assembly process. For the many other parts, focus on fair mined sources from ASM, where a credit-based system may be feasible. Explore thought leadership on living incomes in ASM through the unconditional cash transfer (UCT) partnership.	Tin is moderately recycled, but demand will increase, and the dependency on mined material remains. Tin extracted to a large degree by ASM. Tin is used mostly in solder in main PCBs and battery PCB, where recycled content is feasible. Beyond that, tin is spread over many components like chipsets. For this, a mineral credit system may be the most feasible option.
	Tungsten	Almost exclusively in vibration motor	Focus on fair mined sources, especially ASM. Continue partnership with current supply chain partners, and explore thought leadership opportunity on worker and community voice in ASM.	Tungsten is already commonly recycled in different streams, though recovery from electronics waste is still low. A proportion of tungsten is mined by ASM. In addition, tungsten is used in mainly one component of a phone.
	Zinc	Mainly in shielding alloy, and also used in other components	Focus on recycled sources, especially for parts containing most zinc in alloys. For other zinc-containing parts, explore the option of mineral credits.	Zinc has relatively high post-consumer recycling input rates, especially in different alloy streams. Due to its use in alloys spread across many components, mineral credits may be the most feasible strategy, supported by recycled content where possible.

Attention Materials	Chromium	Mainly in steel sheets/plates in many components, including USB-C port, camera, midframe, speaker and others	Using recycled content for chromium-containing alloys in battery and other main components.	Chromium occurs mainly in alloys and is recycled in these alloy waste streams. Improved segregation of alloys from end-of-life products will further enhance the efficiency of recycling.
	Glass / glass fiber	Glass mainly in display panel; glass fiber in PCBs, connectors	Using recycled content for display panel, as much as technologically feasible.	Recycled content for displays is not yet commonly available. Using it sends a market signal and helps reduce GHG emissions.
	Iron / steel	Mainly in steel plate of battery pack, as well as alloys in many other components	Focus on increased recycled content in alloys for key components.	Iron and steel are already commonly recycled in respective alloy-waste streams.
	Manganese	Mainly in midframe and alloys in many other components (battery pack steel plate, shielding, etc)	Using recycled content for the main manganese-containing alloys.	Manganese is commonly recycled in its respective alloy waste streams.
	Silicon	Spread across alloys, as well as wafers for integrated circuits / chipsets	Explore lower carbon sources if and when feasible.	Extremely high purity requirements hinder use of recycled content, and lead to high GHG emissions. Our leverage is low because tiny amounts are spread across a large number of integrated circuits and other components.
	Titanium	Mainly in capacitors as barium titanium trioxide	Where feasible, encourage reducing dissipation during production and use, to increase circularity. Raise awareness on toxicity and social / environmental impacts.	Barium Titanium Trioxide uses high purity Titanium Dioxide as raw material (which is not a metal). Titanium dioxide can be recycled from waste paints, but applying this to electronics is not feasible. Titanium metal has potential for recycling, though the main applications of titanium metal are not in electronics, but in aircraft, ships, paint, construction, etc.

Conclusion: Thought leadership actions

Based on the above, Fairphone will prioritize and invest its resources in the below priority strategies and projects over the next KPI cycle (2024 - 2026). Of course, while still advancing fair material sourcing in other areas, and in line with our selected focus materials and our ambition on Fair Circularity.

1. A new e-waste source from small-scale recyclers in developing countries (e.g. for plastics, copper, gold), connected to supporting improved working conditions and business practices.

2. A recycled plastics innovation, connecting a new or added-value plastics source to our products (e.g. upcycled use of post-consumer waste plastic in electronics).

3. New (e-)waste sources for recycled content in our batteries (e.g. for copper, nickel, graphite, and potentially cobalt and lithium).

4. A material source that demonstrates a scalable model to provide living incomes or wages to mine workers (e.g. mica, tin)

5. A material source that demonstrates a scalable model for improved voice of and engagement with mine workers and local communities (e.g. for tungsten, lithium)

6. A material source that demonstrates a scalable model for improved nature protection and regeneration in mining (e.g. for tantalum, nickel, copper, zinc).

FAIRPHONE

FAIR MATERIALS ROADMAP 2030

Reporting on fair circularity of our materials

Our ambition to track and record on progress

We want to hold ourselves - and the industry - accountable for the actions we take on fair material sourcing. As with our previous Fair Materials Roadmap, we will set ourselves auditable fair materials Key Performance Indicators (KPIs) and targets at company level.

These will guide us in implementing the fair materials strategies and enable us to transparently report on how we create impact for people and planet every year. Our KPIs and targets are updated in 3-year cycles, meaning that this Roadmap will be covered by the KPI periods of 2024-2026 and 2027-2030.

Telling the full story of our materials

In addition to setting auditable KPI, we want to challenge ourselves - and the industry - to report on what really matters. Fair Circularity means looking beyond fair material sourcing and use and telling the full story of raw materials across a products' life cycle.

Therefore, in our public communication, we want to transparently and honestly show how fair and circular our material footprint really is. We believe that it is important for the entire industry to do the same, because transparency is the foundation for continuous improvement and true impact. Without this fuller, more transparent story, we risk that:

- Consumers may not be able to compare fair circularity practices between different companies if these are not providing the full picture.
- Companies may focus their efforts on "low hanging fruits" rather than on the most urgent social and environmental issues in material supply chains, for example:
    - if they don't report in detail on how and why they select priority materials
    - If they only report on materials in specific sub-components rather than in the entire product
    - If they only report on "marketable" aspects such as recycled packaging
- Companies may report on a particular area while not considering all aspects and steps of fair circularity - for example, companies may report on the use of recycled materials in their product, but remain intransparent about how:
    - their product design and life cycles contributes to reduced material use and footprints
    - their end-of-life collection and recyclability work contributes to giving materials a second life in the economy
    - their sourcing benefits people in both the primary production (mining) and secondary production (recycled) cycles.
- Companies may report on progress related to tracking and tracing materials supply chains, but less on the measures they take to prevent, mitigate and remediate negative impacts and / or to create positive impact.

Therefore we want to create a template on how to report on fair circularity of materials. We believe it should contain the points listed below, and we aim to report on these in the coming years. We would love to see the industry following us on this!

Reporting on Fair Circularity of Materials

On product(s) level:

- Total material use / footprint of the product
- How much of this is made fairer or improved in the entire product:
  - Fair mined
  - Recycled
  - Mineral credits
  - Unknown
- Amount of focus material use avoided through design for longevity
- Amount of focus materials given a second life through reuse and recycling

On company level:

- Selection methodology for focus or priority materials
- Use of focus materials in the products
- Status of focus materials supply chain due diligence and mapping
- Risk / impact areas encountered in the supply chain of focus materials
- Measures taken to prevent and mitigate negative impacts and create positive impact - for both primary loops (mined materials) and secondary loops (recycled materials)
- Engagement conducted with key stakeholders and partners, such as suppliers and representatives of affected people (workers, miners, communities)

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ANNEX:

Focus material selection methodology

Overview

Electronics products contain a huge number of different materials - there are over 60 materials and elements in a phone alone. Often, these materials are distributed in small amounts across many different components and parts of the phone - each with their own sub-suppliers, material supply chain and sources. We cannot address all of these at once, and therefore need to prioritise key materials - our focus materials.

For this prioritisation of materials, we have built on and updated the methodology of our previous Roadmap, to align it further with good practice standards such as the UN Guiding Principles on Business and Human Rights. The main change we made from the previous Roadmap was establishing “salience” as the first assessment criteria, even before other indicators such as functional criticality to our products and demand from the electronics sector. “Salience” means the severity and likelihood of human rights impacts in the value chain of a particular material, and assessing the scale, scope and irremediability of these. This also includes a consideration of environmental impacts, especially where they in turn affect human rights.

On the following pages, we provide a detailed overview of each assessment step, the criteria and methodology we used, the benchmarks we set, and the data we used. Not only do we want to be transparent about how we made our choices, we also want to make it easy for other companies to use the same approach.

Filter 0: Inclusion of materials in our assessment

We started out from a long list of 68 materials and elements that commonly occur in consumer electronics products. As Fairphone is now not only producing phones, but also other electronics products, we wanted to make sure we are considering all materials and elements relevant for a more diversified product portfolio.

A more granular look at whether and how these 68 materials are used in our products then led us to reduce this list further. Firstly because some materials, even though they are reported to be used in consumer electronics generally, did not appear in our specific products at all, or only as trace elements, or as chemical composites with other materials. These are materials such as: Carbon/carbonates, Cellulose, Ceramics, Kaolinite, Leather, Organic Pigments, Quartz, Rhenium, Rhodium, Potassium, Zirconium. We did not include those in our assessment.

In addition, we decided to not include in our assessment those materials that we have already defined a clear approach for: the materials and elements on our Restricted Substances List. In the Restricted Substances List, Fairphone defines substances which cannot be used or found in Fairphone's product above specific threshold values defined by regulatory, industry code of conduct, ecolabeling scheme, or customer demands, and how these materials are managed. These substances and materials are, amongst others: Antimony, Arsenic, Beryllium, Bismuth, Cadmium, Halogen, Mercury, Selenium.

Overall, this gave us 49 materials and elements to be assessed in more detail:
(Materials in grey were filtered out at the next stage)

Aluminium (Bauxite)	Iridium	Plastics	Tantalum
Barium	Iron	Platinum	Tellurium
Boron	Lead	Potassium	Terbium
Calcium (From Limestone)	Lithium	Rare Earth Elements	Thallium
Chromium	Magnesium	Rubber	Tin
Cobalt	Manganese	Ruthenium	Titanium
Copper	Mica	Scandium	Tungsten
Gallium	Molybdenum	Silicon	Vanadium
Germanium	Nickel	Silver	Yttrium
Glass	Niobium	Sodium	Zinc
Gold	Palladium	Strontium	
Graphite	Paper / Carton	Sulphur	
Indium	Phosphorus	Talc / Talcum / Agalite	

Filter 1: Salience

The first filter evaluated the salience of the human rights, environmental, and governance issues in the supply chain of each material to identify where the need for intervention is greatest. Those materials with a high or very high salience rating were prioritized and taken through the next steps of the assessment, whereas materials with a low or moderate overall salience rating were deprioritised.

Salience is used to determine the severity and likelihood of human rights (and connected environmental) impacts, assessing the scale, scope and remediability of such impacts. This is used by companies to prioritize the issues, materials and supply chains where they need to focus their attention and ensure that such impacts are prevented, mitigated and remediated. To conduct this assessment, we used a mix of methods.

In a first step, we used the methodology underpinning the RMI's and TDi Sustainability's Material Insights platform. This helped us assess the gravity, reach and resonance of 19 different Environmental, Social and Governance (ESG) issues reported in publicly available online sources. TDI Sustainability's methodology defines an issue as an instance where a supply chain operator has failed to meet stakeholder expectations, such as enforcing poor labour conditions or improper safeguards against environmental hazards. The data used for this was based on TDi Sustainability's ESG issues database for material supply chains, which is comprised of publicly available reports on ESG issues in over 40 different minerals and raw materials. The database is built by TDi's Search360 web scraping tool, which identifies the key ESG issues in a given material supply chain against a set of ESG risk keywords, such as air pollution, indigenous people's rights and tailings waste. A wide range of sources are used including national and international media, academic journals, government publications, industry white papers, and international organizations such as the World Bank and various UN bodies.

These identified issues were assessed against TDi's scoring benchmarks, which combine to give an overall priority score. "Gravity" represents a 1-5 score of severity of a given issue in a material supply chain, "reach" represents a 1-5 score of the influence and credibility of the source of the report, and "resonance" assesses a 1-5 score reflecting the number of times a given issue was reported on online. For a given material, averages were taken of the 1-5 scores in each of the issue areas of the environmental, social and governance risk areas, producing a 1-5 scores for each of the three areas. The indicators below were then adjusted to fit within a four-tiered low, moderate, high or very high ratings for each material:

- Low: 1 to 1.5
- Moderate: 1.5 to 2.5
- High: 2.5 to 3.5
- Very High: 3.5 to 4

In addition to this quantitative scoring, a qualitative assessment and description of the most salient issues in each material supply chain was compiled, providing more granular information on impacts and where they happen in the supply chain (supply chain tiers and geographies).

The scoring based on TDi's methodology was applied to those material for which there was sufficient data available. For the remaining materials, additional qualitative research was made based on publicly available information. An assessment was then made against the same benchmarks for gravity, reach and resonance, in order to determine a comparative four-tiered score of low, moderate, high or very high.

This qualitative analysis was carried out for environmental and social issues, including human rights issues. In addition, governance issues were taken into account in order to capture the fuller risk-landscape, as governance issues are often an enhancing and systemic factor for environmental and social or human rights impacts. These governance aspects were quantitatively calculated based on country governance indicators for the top producing countries of each material, weighted in proportion to the global production share of each country.

Where data was available, this included all countries with more than a 1 percent share of global production for a given material. In some cases the reported production values for a given material were not consistent across countries, as

some countries assess production by the amount of the target material present in crude ore, while other countries report the amounts in a refined concentrate of a material, for example.

Risk-based country-level data was used from well-established country governance indicator datasets. Two indicators were defined for the governance rating for each material supply chain, one reflecting the exposure to armed conflict and the second reflecting strength of the rule of law and propensity for corruption. Each of these indicators is based on an average score from a set of country governance indices.

The Armed Conflict indicator was based on the following indices:

- Fragile States Index (Fund for Peace)
- Global Peace Index (Institute for Economics and Peace)
- Heidelberg Institute Conflict Barometer (Heidelberg Institute for International Conflict Research)
- Political Stability and Absence of Violence World Governance Indicator (World Bank)

The Weak Rule of Law and Corruption indicator was based on the following indices:

- Control of Corruption World Governance Indicator (World Bank)
- Corruption Perceptions Index (Transparency International)
- Rule of Law World Governance Indicator (World Bank)
- Global Rights Index (International Trade Union Confederation)

Each of the mentioned indexes gives scores for all countries, with the average of the groups of four indices above then taken for each country. For each material, the indicator scores are multiplied by that country's fraction of global extraction, and averaged across all major producing countries in a given material supply chain. An average was then taken of each of the Armed Conflict and Weak Rule of Law and Corruption indicators to arrive at a final governance 0-100 score for each material:

- Low: 0 to 25
- Moderate: 25 to 50
- High: 50 to 75
- Very High: 75 to 100

This resulted in three overall scores indicating the severity of 1) environmental, 2) social/human rights and 3) governance issues in a given material supply chain on a scale of low, moderate, high and very high. Any material with at least two high ratings in each of the environmental, social and governance risk areas was assessed as having high / very high overall salience, which means that these materials are of the highest priority and were taken further in the assessment steps. The materials with a low or moderate score were deprioritised. That does not mean we pay no attention to them - we reassess our priority list regularly.

The assessment of salient issues in materials supply chains remains on a high level at this stage of the assessment. This is because it is used as an initial filter to come up with an overall list of priority materials. Further drilling down into specific details of salient issues of each priority material is needed once the list of focus materials is determined. Our work on focus materials therefore usually starts off with additional research and stakeholder engagement to get to a more granular understanding of salient impacts. This also involves more targeted engagement and involvement of key stakeholders such as suppliers, miners and mine operators, communities or NGOs, government representatives in a specific supply chain or producing region.

Materials with high and very high salience scores (29):
(Materials in gray were filtered out at the next stage)

Aluminium (Bauxite)	Iron (steel)	Paper / Carton	Tantalum
Chromium	Lead	Phosphorus	Tin
Cobalt	Lithium	Plastics	Titanium
Copper	Magnesium	Rare Earth Elements	Tungsten
Glass	Manganese	Rubber	Zinc
Gold	Mica	Silicon	
Graphite	Nickel	Silver	
Indium	Niobium	Sulphur	

Filter 2: Leverage and responsibility

We further assessed the 29 materials with salient environmental, social / human rights and governance issues to understand the influence, leverage and responsibility we have as a company and also as an industry to address these issues. This assessment consisted of two key aspects: The functional criticality of a material to our products (or the electronics industry more generally where there was no product-specific data available), and the share of the demand for this material coming from the consumer electronics sector vis-a-vis other sectors.

1. Functional criticality

This consisted of two sub-criteria, a) the substitutability of a material and b) its criticality to the well-functioning of our products.

In terms of **a) substitutability**[4], the substitute performance of a given material was defined as the likelihood that the substitution of a given material's major uses are likely to be successful. For each major application, literature review and expert consultation was used to identify the functional performance of the substitute material that will most closely achieve the performance of the material in question. Once assessed for all major uses, a 0-100 score was defined measuring the substitute performance of all of the different possible substitutes:

- Low: 0 to 50
- Moderate: 50 to 70
- High: 70 to 85
- Very High: 95 to 100

[4] *The references and sources used for this included: Graedel, T.E., et al, On the materials basis of modern society, p. 6298 (2015).*

In terms of **b) criticality**[5] for the well-functioning of the product, this was defined as the degree to which the material performs a purpose that cannot be fulfilled by an alternative, potentially more sustainable substitute without compromise to the quality or functionality of the product. If there was no likely viable substitute, the material was considered critical to functionality. Where data was available, the specific functions performed by the material in electronic applications were considered. This meant that some materials assessed with a low score for their general substitutability across their common end uses scored higher when their substitutability was considered for use in a specific application.

As stated above, the substitutability scores under a) were used to inform the evaluation of functional criticality under b), combining quantitative and qualitative data, using the following benchmark:

- Low: many viable substitutes available that match material on performance
- Moderate: viable substitutes available, some with lower functional performance
- High: few viable substitutes available, some with lower functional performance
- Very High: no viable substitutes available

[5] *The references and sources used for this included: Cobalt Institute, Cobalt is used in a wide variety of applications (2021); European Carbon and Graphite Institute (2022); European Commission, Study on the EU's list of Critical Raw Materials (2023); Critical Raw Materials Factsheets (2021), Geological Society of America, Minerals in a smartphone (2018); Grand Review Research, Glass Manufacturing Market Size, Share & Trends Analysis Report By Product (2021); Mining.com, A breakdown of the critical metals in a smartphone (2021); The Silver Institute, Silver in Electronics (2022); Visual Capitalist, Visualizing the critical metals in a smartphone (2021).*

2. Electronics demand[6]

The second criteria under filter 2, demand for a material from the electronics sector, was defined as the percentage of total global consumption of a material that can be attributed to the electronics industry. For the electronics industry, the rating uses information for the consumption of consumer electronics, as this is the strongest data set available. Sometimes, data was only available for a more general category of electronics goods. The availability of information and the conclusions drawn on consumption by material for each industry varies considerably and for that reason four bands of consumption from low (less than 5%) to very high (more than 30%) were defined:

- Low: less than 5%
- Moderate: from 5% to 10%
- High: from 10% to 30%
- Very High: more than 30%

Combined filter 2: Leverage and responsibility

Once low (1), moderate (2), high (3) or very high (4) ratings were obtained for both the functional criticality and industry demand indicators, an average was taken to arrive at a final 1-4 leverage score for each material, which was then categorised into ratings within the following thresholds:

- Low: 1 to 1.5
- Moderate: 1.5 to 2.5
- High: 2.5 to 3.5
- Very High: 3.5 to 4

Materials with high and very high leverage and responsibility by the industry (23) *(Materials in gray were filtered out at the next stage)*

Aluminium (Bauxite)	Graphite	Mica	Tantalum
Chromium	Iron (steel)	Nickel	Tin
Cobalt	Indium	Plastics	Titanium
Copper	Lithium	Rare Earth Elements	Tungsten
Glass (composites)	Magnesium	Silicon	Zinc
Gold	Manganese	Silver	

[6] The references and sources used for this included: CRM_InnoNet, Critical Raw Materials Substitution Profiles (2015); Deloitte, Study on data for a raw material system analysis: Roadmap and test of the fully operational MSA for raw materials (2015); European Commission, Study on the EU's list of Critical Raw Materials (2023); European Commission, RMIS – Raw materials information system (2022); European Economic and Social Committee, Identifying the impact of the circular economy on the fast-moving consumer goods industry (2021); Globe News Wire, Global Bauxite Market Report [2022 to 2030] (2021); Nickel Institute, First uses of nickel (2015); World Bank Group, The mineral intensity of the clean energy transition: The mineral intensity of the clean energy transition (2020); United States Geological Survey, Mineral commodity summaries (2022); World Gold Council, Gold demand sectors (2023)

Filter 3: Opportunity and Filter 4: Feasibility

Filters 3 and 4 were applied simultaneously in a qualitative assessment of the remaining 17 materials, as well as to 5 materials that showed a moderate to high salience score but a low to moderate score on leverage and responsibility.

Filter 3: Opportunity assessed whether there are existing initiatives, programmes, actors or associations which address the salient issues and their root causes, and whether these were sufficient or whether there were still remaining gaps where Fairphone's actions or membership could provide an added value.

It also considered in detail how and where the material is used in Fairphone's products, i.e. in how many and which components, in what amounts (i.e concentrated in a few components or spread across many) and in what composition (i.e. as an alloy or not). Depending on this, the opportunity for Fairphone to implement meaningful changes, and through what possible means, was assessed.

Filter 4: Feasibility assessed whether and how it is feasible for Fairphone to implement meaningful changes and create an added value in our material sourcing, in terms of concretely improving the impacts on people and planet. For this we considered questions such as: a) Can Fairphone contribute to addressing salient issues and root causes that are not yet sufficiently addressed, b) can Fairphone do so in a way that is replicable and scalable in the industry at large, c) can Fairphone channel its (limited) resources towards issues that do not receive the deserved attention and implement unique and innovative programmes and actions where no or few others act (yet)?

To determine opportunity and feasibility, we used the research, data and sources from the previous assessment filters, as well as a specifically designed "Recycled Material Dashboard". This provided key data points to steer our decision on when and for which materials to use (or create newly) recycled content, when and for which materials to support improving mined content. In addition, interviews were conducted with industry experts, representatives of civil society and advocacy groups, academics and organizations working on responsible mining and sourcing.

Based on this assessment, we devised key strategies for each individual material, and we categorized the materials into three categories, each with a broad overall strategy associated to it:

- **Focus material - thought leadership**: Materials that are our priority and where Fairphone can support the creation of fair(er) material sources and drive innovative solutions and improvements for people and planet. The strategy for these materials includes proactively investing to create improved sources and link them to our and the industry's supply chain, in addition to requesting the use of certified/audited or recycled material sources. It also involves setting up, implementing and steering (multi-stakeholder) coalitions, and raising awareness with suppliers, the industry and consumers at large.

- **Focus material - frontrunner:** Materials that are our priority, but where solutions and fair(er) sources are already largely available. The strategy for these materials includes requesting the use of certified/audited or recycled material sources, joining existing initiatives and associations working on addressing salient issues, and raising awareness with suppliers and the wider industry.

- **Attention material:** Materials that require our attention but are not immediately our priority. The strategy for these materials includes enquiring for certified/audited or recycled material sources, raising awareness with suppliers, and increasing our leverage where possible.

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