

DIRECT USERS, BUYERS, CONSUMERS, ETC.

People who are directly targeted by your intervention (e.g. users of your product or service), categorised according to their relationship to it.

Example(s)

In the case of a platform selling secondhand clothes, this would be buyers and sellers. It may be useful to differentiate between professional buyers and occasional buyers.



PRODUCERS, PROVIDERS, MANUFACTURERS, SELLERS...

The people up and down the supply chain that directly provide elements for and/or make use of your products and services in their businesses.

Example(s)

If your product is shipped in your branded packaging, this could be the owner of the business that prints the packaging used for your products or the person that rides the bike used in the delivery service.



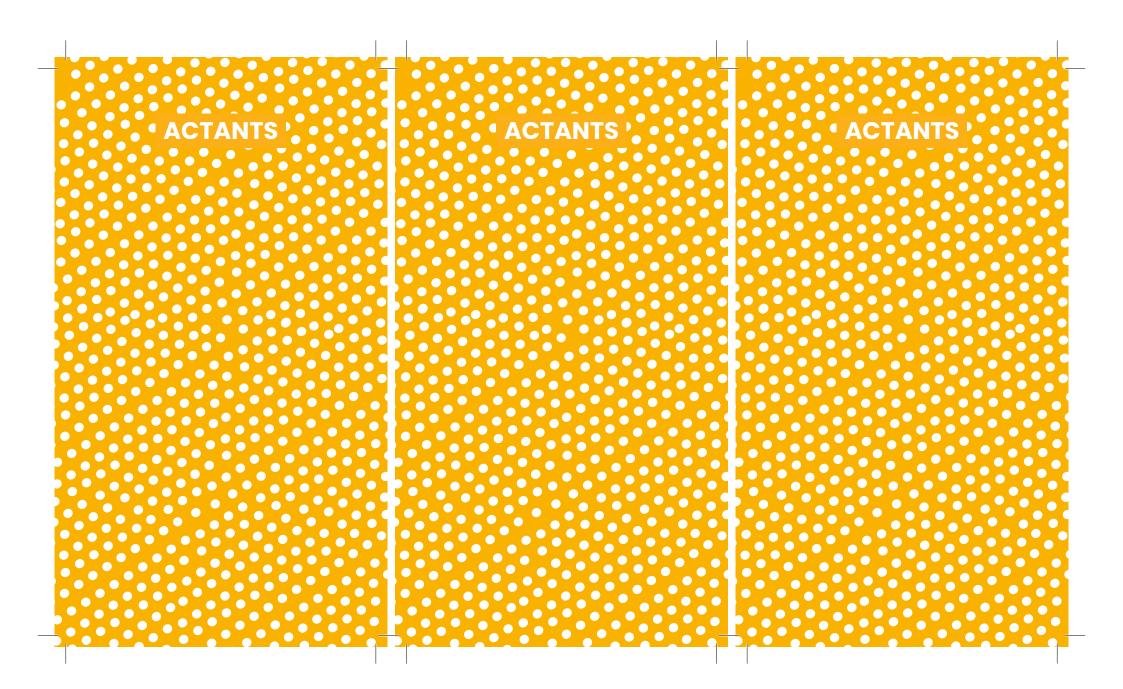
The structures, services and organisations that provide fundamental support for the operation of your intervention and that exist independently of it.

Example(s)

If your intervention is a digital service, it could be data centres. If you are planning to create a recycling service, it could be the city's waste collection service.











REGULATORS, GOVERNMENT, ETC.

The people working in organisations that create and monitor the rules that regulate how your product/service can be deployed and used.

Example(s)

Policy-makers creating the laws and regulations for use of social media. Think not just locally, but also on those people working in bodies such as the European Union or the UN.

OTHER GROUPS (IN)DIRECTLY AFFECTED (NON-USERS)

The people and other beings (animals, plants, ecosystems) that are not directly users of your product/service but that could be affected by others using it.

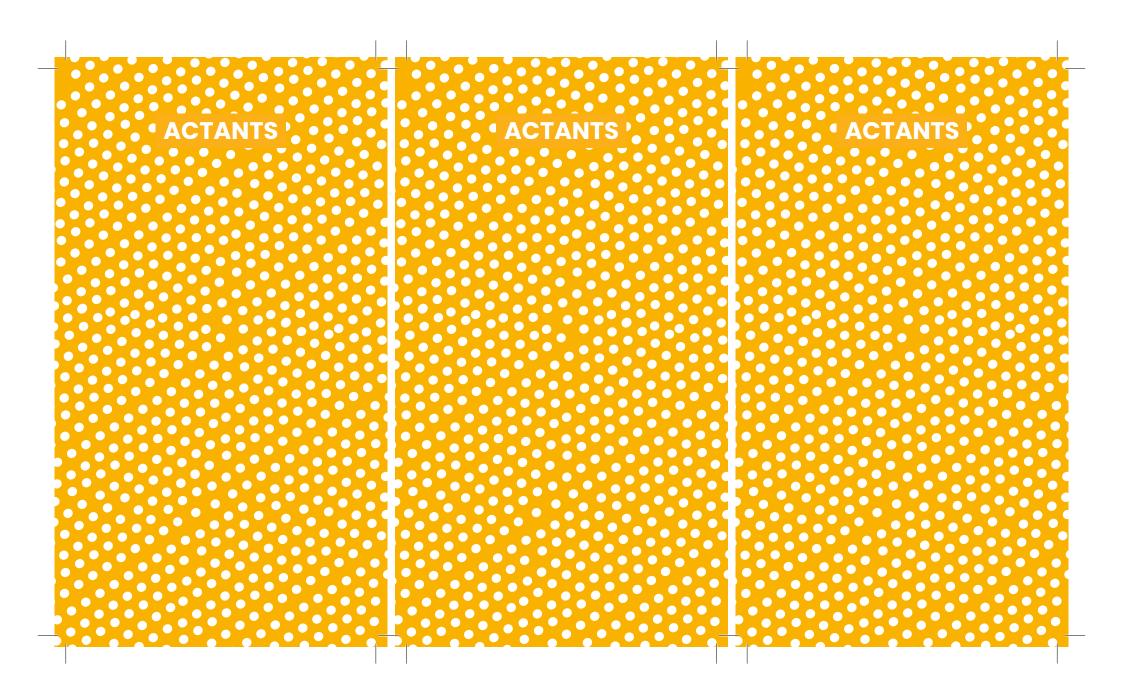
Example(s)

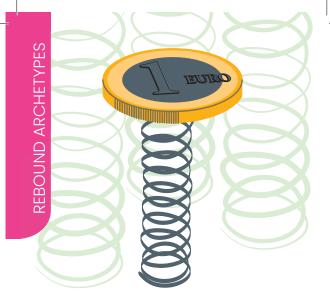
People and the ecosystems in regions where rare materials are mined for making the electronic devices needed to run a new app.

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THE BOUNCING COIN

Trigger

Could your intervention result in someone (e.g. consumers) saving money?

Rebound effect

This could allow them to use your product/ service more intensively, or to spend that money on carbon-intensive activities...

Example(s)

Improvements in the efficiency of car engines have led to fuel savings. Drivers have therefore been able to drive longer or more often, or spend the money saved elsewhere, for example on flights.



THE BOUNCING TIME

Trigger

Could your intervention result in someone (e.g. users) saving time?

Rebound effect

This could allow them to use your product/ service more intensively, or to spend that time on carbon-intensive activities...

Example(s)

It's much quicker to send an email than a letter. That's why we send so many more messages these days (sometimes to hundreds or thousands of people at once).



EXCESSIVE ACCESSIBILITY

Trigger

Could your intervention make it more convenient for someone to access/do something?

Rebound effect

This could allow them to access/do this thing more intensively...

Example(s)

Some e-commerce services make it easy to return items directly from your letterbox. More and more customers are ordering the same item in several sizes, with the intention of sending back those that don't fit, thereby multiplying transportation.









DUMBING IT DOWN

Trigger

Could your intervention enable someone to access a service or product to which they did not have access before, for example due to a lack of resources or skills?

Rebound effect

This could increase the number of potential users, which could lead to more intensive use.

Example(s)

A car-sharing service could reduce the number of individual cars, but also increase the number of potential drivers (by enabling those who could not afford a car to drive).

THE LIGHTER SOUL

Trigger

Could your intervention give someone (e.g. consumers, users) the impression that a given activity has no impact on the environment?

Rebound effect

This could encourage them to pursue this activity more intensively, without feeling guilty...

Example(s)

On average, when people buy secondhand, they tend to buy more items than when they buy new. This is partly because it's cheaper, but also because they feel less guilty when they buy second-hand.

GREENWASHING

Trigger

Can your intervention be used by an organisation to improve its image?

Rebound effect

This could enable this organisation to deceive consumers/stakeholders by greenwashing....

Example(s)

For example, the big energy companies that exploit oil are redeeming their image and presenting themselves as sustainable because they are buying carbon offsets...





THE CARELESS LEASER

Trigger

Could people who own a product become leaseholders as a result of your intervention?

Rebound effect

This could lead them to treat the product carelessly because of the lack of ownership, resulting in more breakage and a need for increased maintenance.

Example(s)

On average, leased pushchairs are broken or damaged more quickly than those bought and then resold second-hand, because people pay less attention to them when they don't own them.



"ALL INCLUSIVE"

Trigger

Could your intervention enable people not to pay directly for their consumption (e.g. of energy)?

Rebound effect

This could lead them to pay less attention to their consumption and consume more.

Example(s)

For example, on average, tenants heat more and spend more on energy when service charges are included in the rent.



Indirect effect

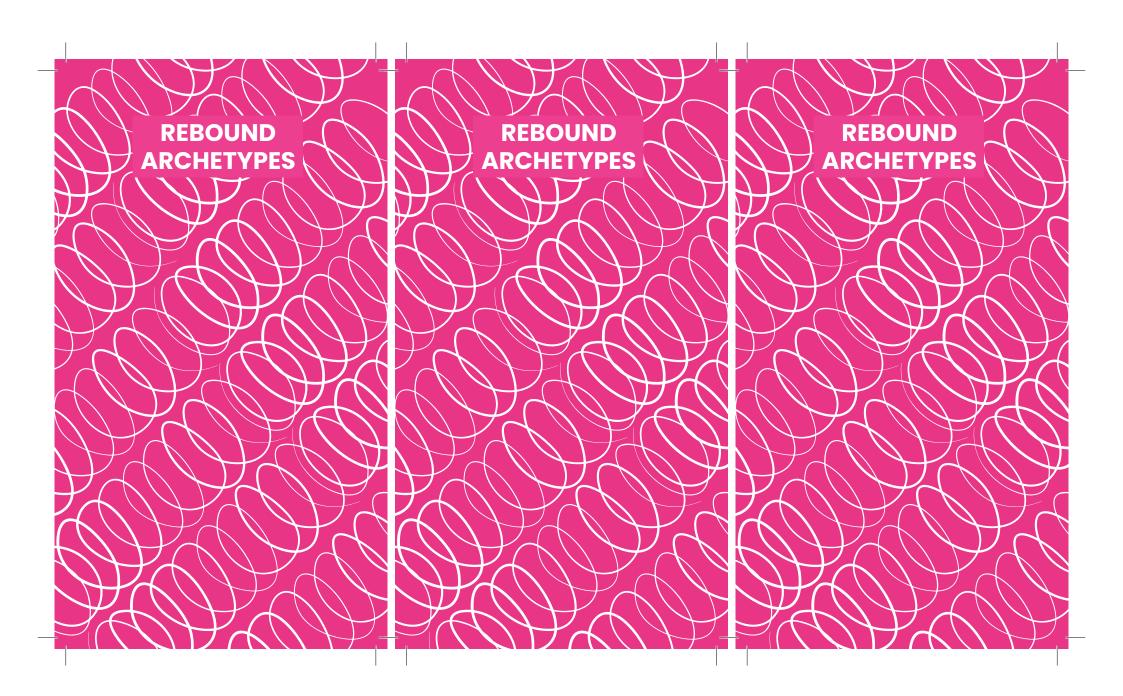
Does your intervention involve the circulation or use of resources (land, materials, energy, etc.)? If so, what and for whom would they have been used without your intervention?

Example(s)

Let's take the example of a second-hand sales platform. By facilitating second-hand sales, this platform encourages owners of second-hand clothes not to throw them away, but also not to give them away. The result is a drop in donations to charities.









SUBSTITUTION

Indirect effect

Is your intervention replacing an existing activity/practice? This substitution is probably accompanied by gains in terms of impacts, but also by new impacts. These new impacts must be taken into account, even if they appear to be less significant.

Example(s)

Reusable packaging must be transported, washed and re-distributed.



THE CHICKEN OR THE EGG

Indirect effect

REBOUND ARCHETYPES

Does your intervention result in the use of an infrastructure? Even if this infrastructure existed before your intervention, using it justifies its existence, its maintenance and perhaps even its development. In a way, we can consider that you are responsible for part of the impact of this infrastructure.

Example(s)

If your intervention encourages the use of bicycles on a large scale, we can assume that this will induce the development and maintenance of road infrastructure that allows the mass use of bicycles.



THE HIJACKING (MISUSE)

Indirect effect

Could some people misuse your product/ service/rule for their own benefit (e.g. to make money)?

Example(s)

Some users deliberately use second-hand platforms to finance their addiction to fast fashion. They sell clothes they have worn a few times, so that they can buy more new clothes. Others sell new items that they have bought at a promotional price to make money. You can role-play the 'bad-guy' to think about the possible weaknesses.









PARASITIC BUSINESSES

Indirect effect

Could people hijack your product/service to start a business? And if so, would this be harmful?

Example(s)

Some people have seized on the Airbnb service to develop a commercial activity, to the detriment of the initial idea, which was to make holiday accommodation more accessible. Others have started to develop a professional activity by travelling back and forth in minivans using the Blablacar service.

PANDORA'S BOX

Indirect effect

Could your intervention unlock new technologies, products or services? And if so, could it have an impact that might be perceived as negative on society or the environment?

Example(s)

5G and 6G could enable the deployment of autonomous vehicles, which could increase overall energy consumption.

THE COBRA

Indirect effect

Does your intervention contain an incentive to reward certain behaviours? If so, some players may try to obtain this reward, even if it means adopting behaviour that is contrary to your interests.

Example(s)

During the period of British colonial rule, the British government, concerned about the number of cobras in Delhi, offered a bounty for each dead cobra. However, some people started breeding cobras to earn easy money. When the government became aware of this, the reward scheme was abolished, leading breeders to release their worthless cobras back into the wild.





ECONOMIC & MARKET RESPONSE

Indirect effect

Could your intervention lead to a balancing of supply and demand? To the point of stimulating the market and propagating changes in the way it operates?

Example(s)

By diverting food crops such as maize and sugar cane to biofuel production, this reduces the availability of these crops for food markets, which can lead to higher prices for staple foods.



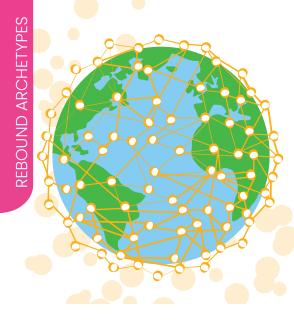
SHIFTING THE BURDEN

Indirect effect

Could your intervention solve the visible part of a deeper problem? By reducing the visible signs of a deeper problem, it may relieve other players (e.g. politicians) from tackling the real problem.

Example(s)

Recycling waste is essential, but it must not prevent political actors from tackling the real problem, which is the creation of waste.



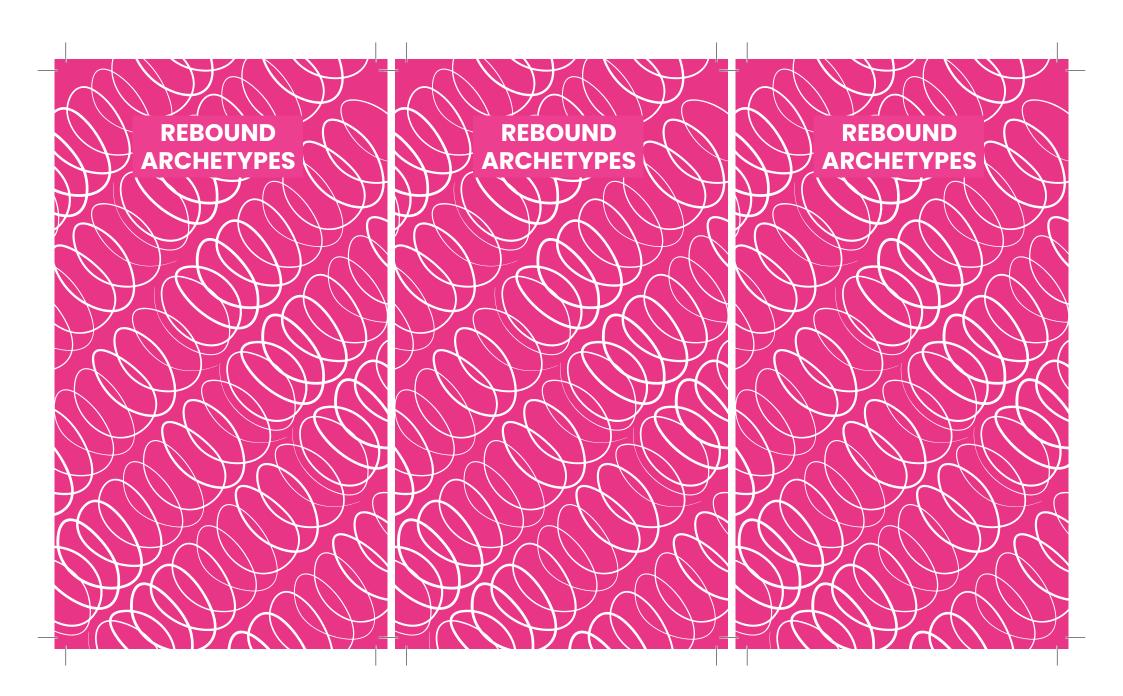
SYSTEMIC CHANGE

Indirect effect

Generally speaking, what could be the long-term impact on consumption and production practices, and on the organisation of work and cities?

Example(s)

Think of the car, which has profoundly changed the way our cities and our lives are organised. Even if you are only participating in a systemic change, you should consider it.

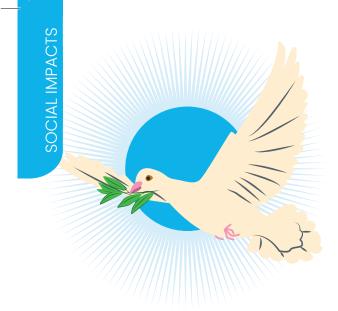


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PEACE & JUSTICE

How would the effects of your intervention influence peace and justice for different regions or groups of people? Do they bring advantages or disadvantages to certain groups? Could they lead to conflict or exploitation?

Example(s)

Increased use of electric vehicles could lead to a growing demand of rare minerals for battery production and lead to conflict over mining areas.



HEALTH

How would the effects of you intervention affect people's physical and mental health or their access to medical services?

Example(s)

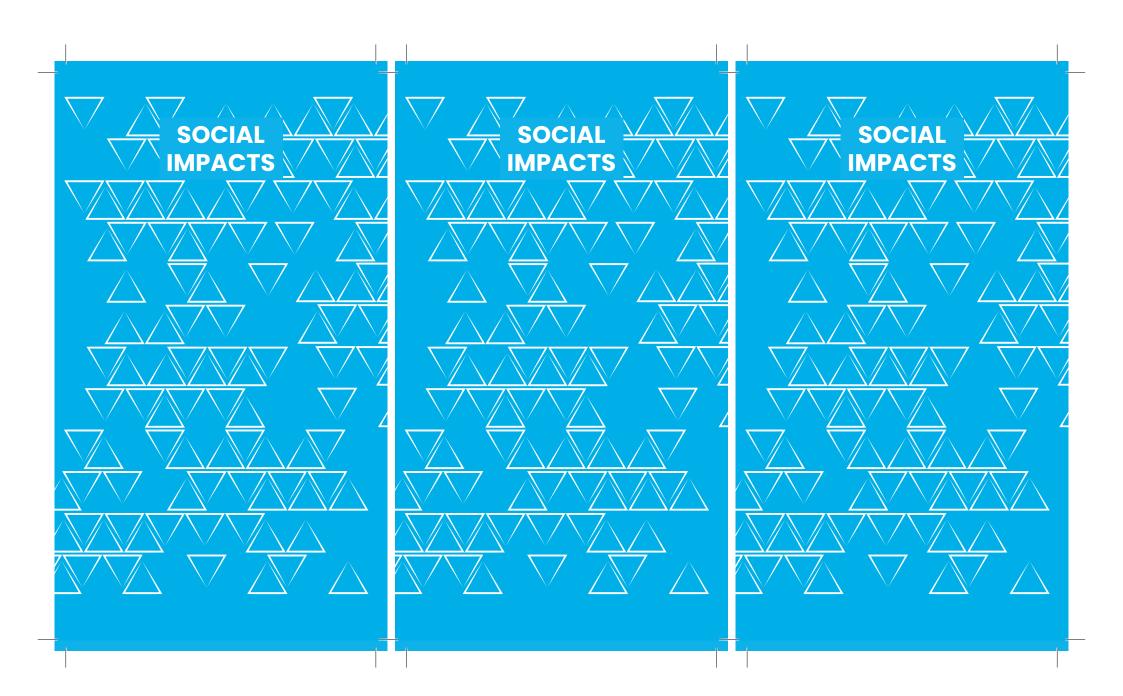
While using bicycles is linked to health benefits, if delivery workers use bicycles for extended periods in areas with air pollution this could lead to reduced health. You should consider possible benefits and potential harms.

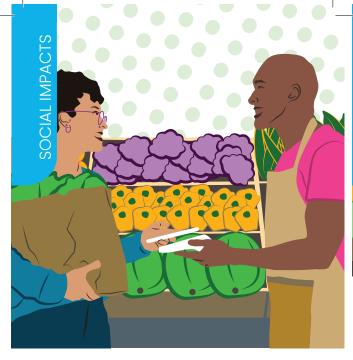
ACCESS TO EDUCATION

How would the effects of your intervention change people's ability to attend classes or share knowledge across generations and communities?

Example(s)

Interventions that increase the demand for production in areas with little regulation where children might be involved in labour. Or displacing people, breaking down communities and family life.





ACCESS TO WORK & INCOME

How would the effects of your intervention change people's work? Could it affect their ability to find employment, their pay and work condition (e.g., reducing or increasing the need for employing people)?

Example(s)

Substituting workers with Al powered services.



ACCESS TO BASIC RESOURCES (HOUSING, FOOD, WATER, ENERGY, ETC.)

Do the effects of your intervention affect people's access to resources to meet their minimum living conditions requirements? Is the demand for resources so intense that they are redirected from local communities to industrial production?

Example(s)

Data centres cooling systems requiring large quantities of water leaving local neighbouring communities with water scarcity.

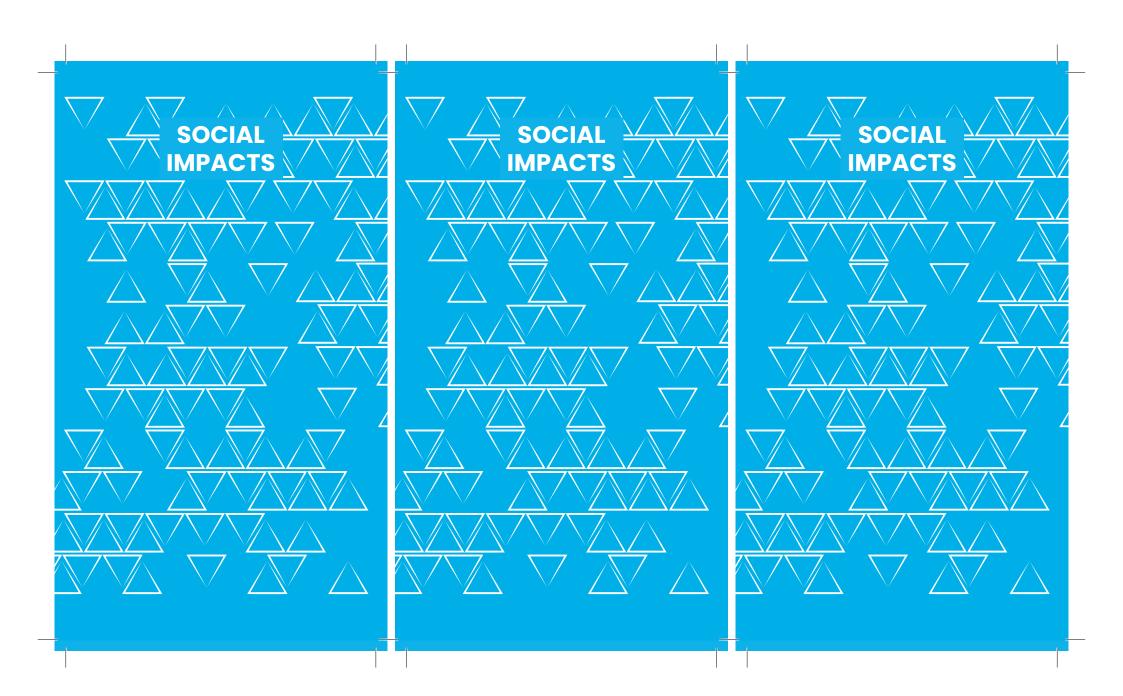


SOCIAL EQUITY, GENDER EQUALITY, COMMUNITIES & POLITICAL VOICE

Do the effects of your intervention alter people's ability to have their voices heard? Do they benefit certain groups more than others? Do they enable discrimination or segregation in society?

Example(s)

Providing services only via digital means could exclude certain groups that don't have access to technology.





RESOURCES DEPLETION (FOSSIL, MINERAL, METALS, ETC.)

Do the effects of your intervention lead to over exploitation and to the depletion of certain resources leaving little left for the next generations, other activities or local communities?

Example(s)

The use of rare minerals in electronic devices.

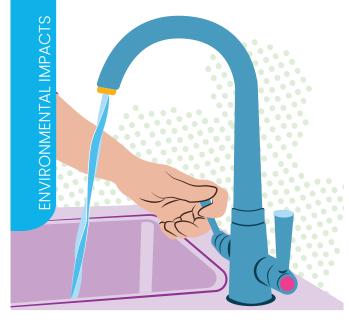


DEFORESTATION, URBAN DEVELOPMENT & OTHER LAND USE CHANGE

Do the effects of your intervention lead to a change of how the land is utilised?

Example(s)

Growing biofuel crops takes up agricultural land that could otherwise be used to grow food. The expansion of biofuel production can lead to deforestation or the conversion of non-agricultural land into agricultural land.

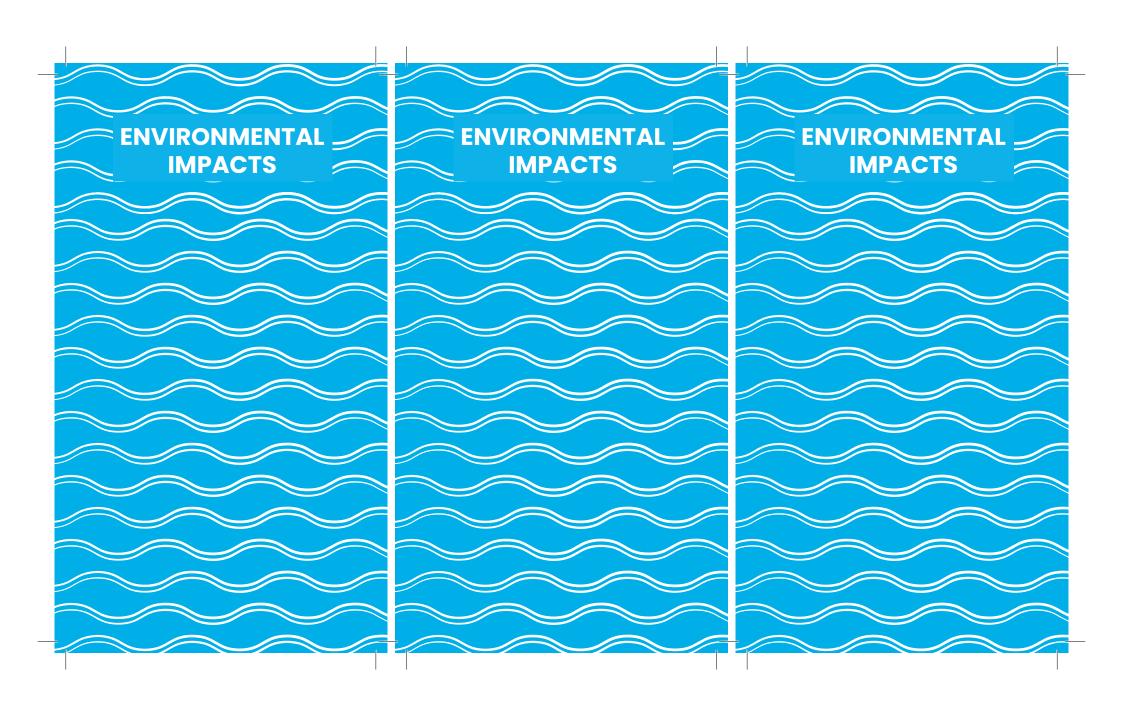


FRESHWATER USE

Does your intervention require the use of fresh water? How is the water transformed into beverages or sewage? Are there processes to replenish or to produce (e.g., via filtration) fresh water?

Example(s)

Take the example of a recycling scheme that reuses glass bottle that requires industrial washing and sterilising the bottles before they can be reused.





WASTE AND POLLUTION (NOVEL ENTITIES SUCH AS PLASTIC, TEFLON, ETC.)

What amount and type of waste do the effects of your intervention produce? Is it likely to pollute land, air or water ways. Does it introduce new entities such as microplastics into the environment?

Example(s)

Coconut water is drunk straight from the fruit in countries where it is grown, but commercialising it across the word means using cartons or plastic packaging.



(AFFECTING AIR, SOIL, WATER, ETC.)

Does your intervention require industrial production processes that generate emissions (e.g. factories or mining)? Does it use fossil fuel powered vehicles or machines (e.g. trucks, tractors, diesel generators etc.)?

Example(s)

The promotion of electric vehicles may lead to increased industrial emissions as their widespread adoption requires polluting battery manufacturing processes.



ACIDIFICATION (from CO2, from industrial emissions &/or intensive agriculture)

CO2 from atmosphere, as well as elements such as sulphur found in chemical fertilisers combine with water and soil and turning them more acidic. Do the effects of your intervention lead to an increase in CO2 in the atmosphere? Could the intervention contaminate soil or bodies of water?

Example(s)

The oceans absorb large amounts of carbon dioxide (CO2) from the atmosphere, which through a chemical process lowers the pH of ocean water, threatening marine life.



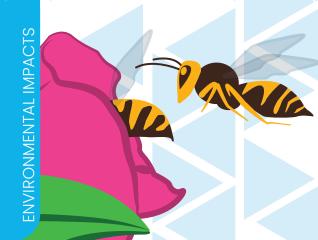


CLIMATE CHANGE

Does the effects of you interventions lead to the increase in greenhouse gases emission? Does it contribute to the warming of the planet?

Example(s)

Most activities will generate greenhouse gases emissions. Greenhouse gases are emitted when fossil fuel is burned in vehicles or for generating energy. It happens during the production of goods, the use of products and services, and in disposal or recycling.



BIODIVERSITY LOSS

What are the effects of your intervention for life on the planet? Does it lead to endangering the existence or extinction of species? Does it lead to reduction or increase in the number of individuals? Could it lead to desertification?

Example(s)

Biodiversity loss is primarily caused by the other impacts of human activities such as habitat destruction, overexploitation, pollution and climate change.

Deforestation, agricultural expansion and urbanisation reduce natural habitats, while overfishing, hunting and logging deplete species populations. Pollution, including chemical run-off and plastic waste, damages ecosystems.



OVER FERTILIZATION leading to eutrophication

Does your intervention require intensive farming or farming methods that over utilise fertilisers or result in the increase of animal waste that could contaminate soil and water?

Example(s)

Eutrophication is the process by which water becomes excessively enriched with nutrients, mainly from agricultural run-off, sewage and industrial effluent. This nutrient enrichment leads to excessive growth of algae, which consume large amounts of oxygen, creating 'dead zones' where aquatic life cannot survive.



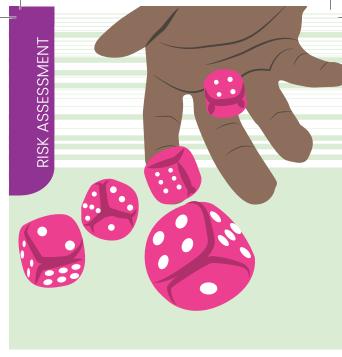


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DON'T NEGLECT THE LONG TERM

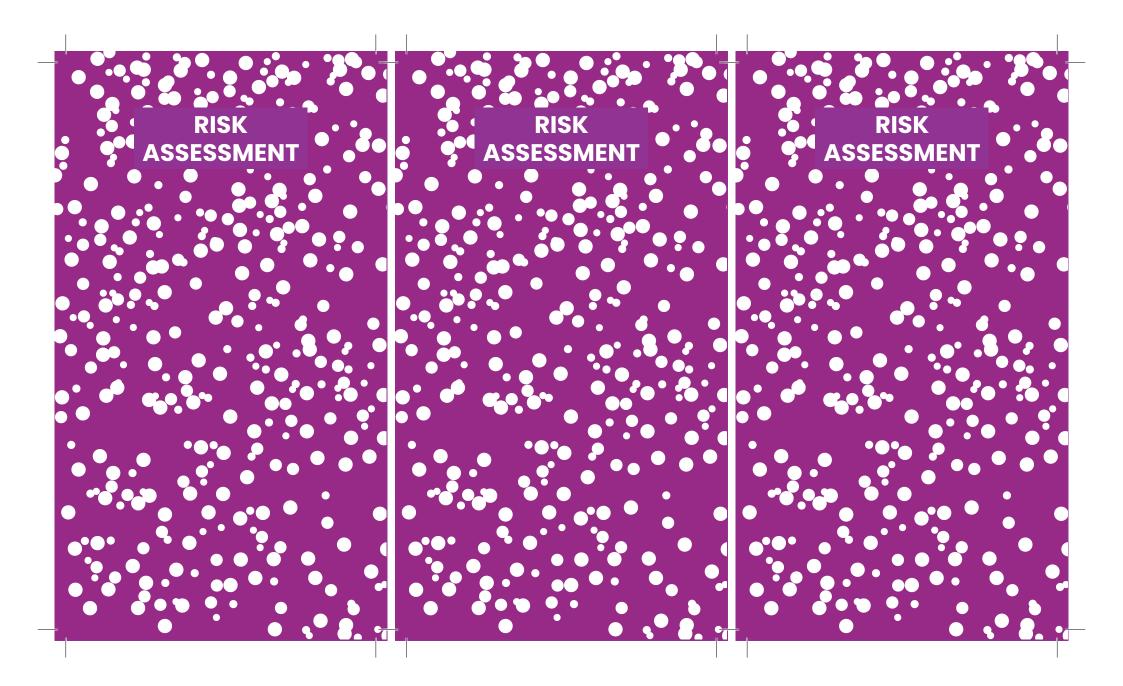
Generally speaking, we tend to overestimate the importance of events in the near future, and underestimate the importance of long-term events and consequences (present bias). Try not to neglect the long term when assessing risks.

SOCIAL DIMENSION

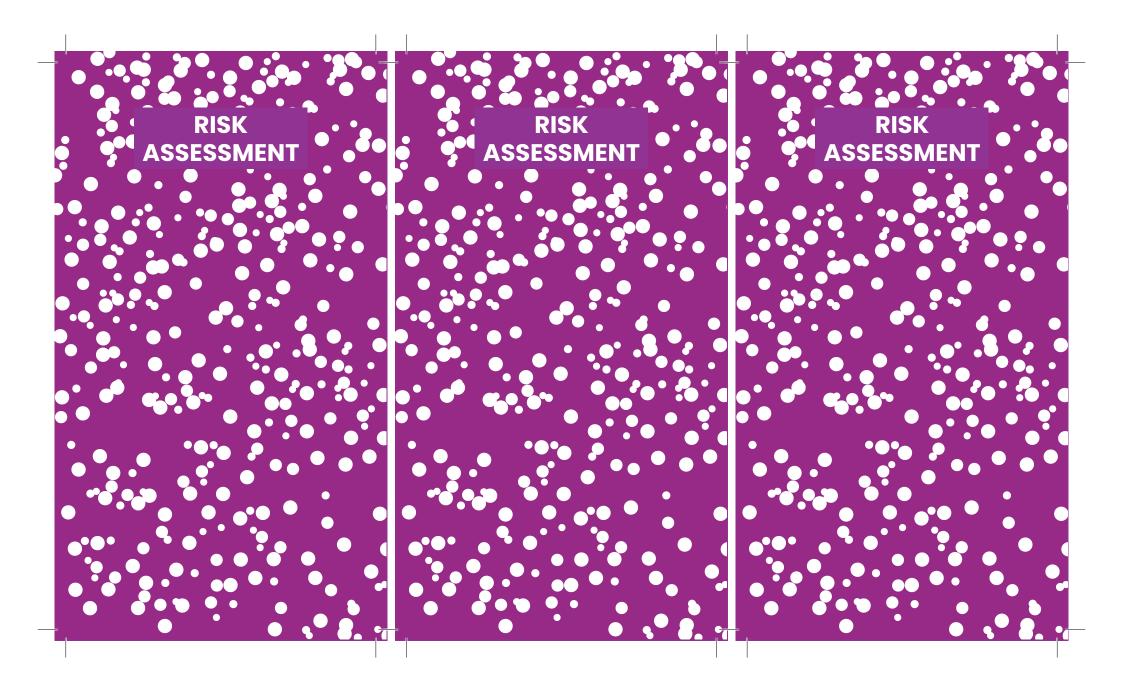
Don't forget to think about the people who will be indirectly affected by the operation. Are they already vulnerable? Is it likely to increase or evolve over time?

IRREVERSIBILITY

Be mindful to consider effects that appear irreversible as more dangerous than those that can be mitigated once known. For instance, if an effect could trigger several cascading effects over which you have no further control.

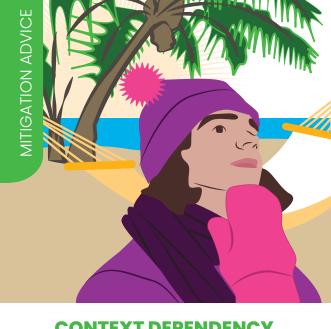


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FINDING ALLIES

If you don't have the agency to implement a given mitigation strategy, try to think of other stakeholders who might, and consider asking for their help.

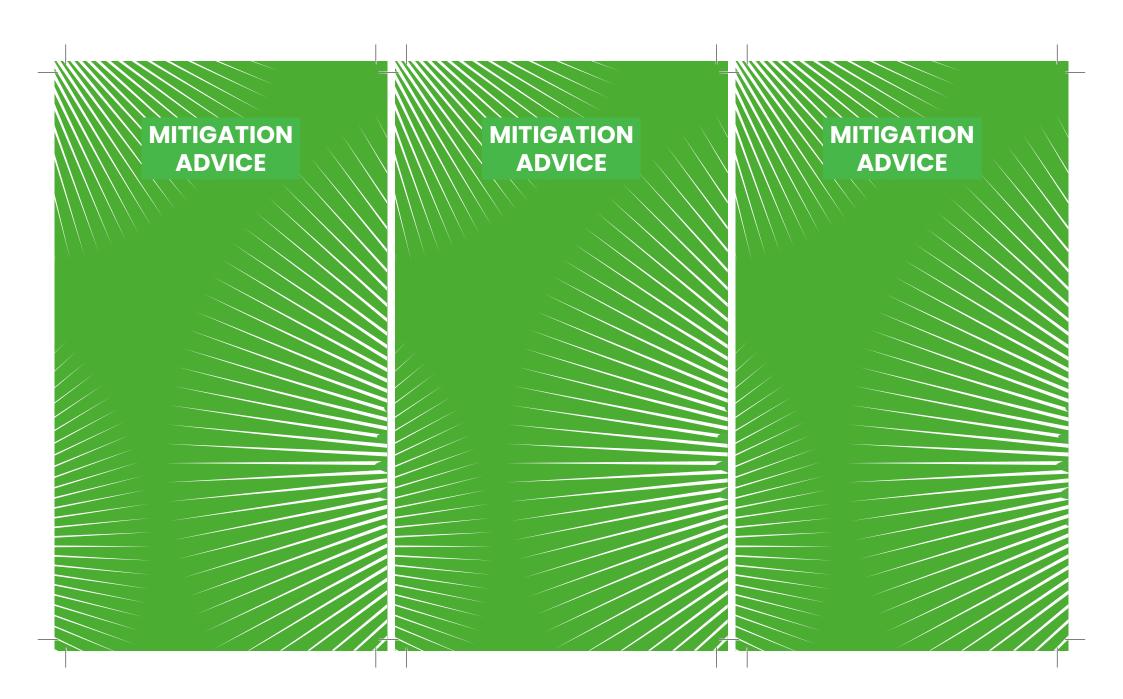
LEVELS OF AGENCY

In some cases, you may not be able to activate certain levers or mitigation strategies yourself, for example because of your role in your organisation. Don't forget that you also have the power as a consumer to influence companies and as a citizen to influence political decisions.

CONTEXT DEPENDENCY

Consider different contexts of use. A solution may be appropriate in one context and harmful in another.

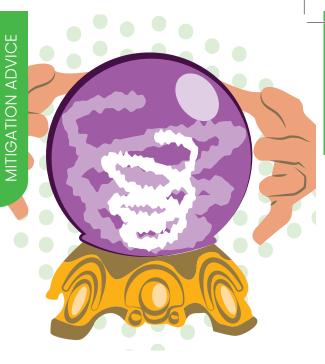
For example, the best option (with the lowest environmental impact) for delivering drinking water to users may depend on where you are located. Tap water is the best option in countries with an existing infrastructure, but for isolated populations in countries where the infrastructure does not yet exist, it may be preferable to deliver water in containers.





NO PARALYSIS

Don't get stuck: if you can't prevent or mitigate a potential rebound effect, you could plan to monitor it (provided that you can turn back the clock if the impacts are serious and prove impossible to limit).

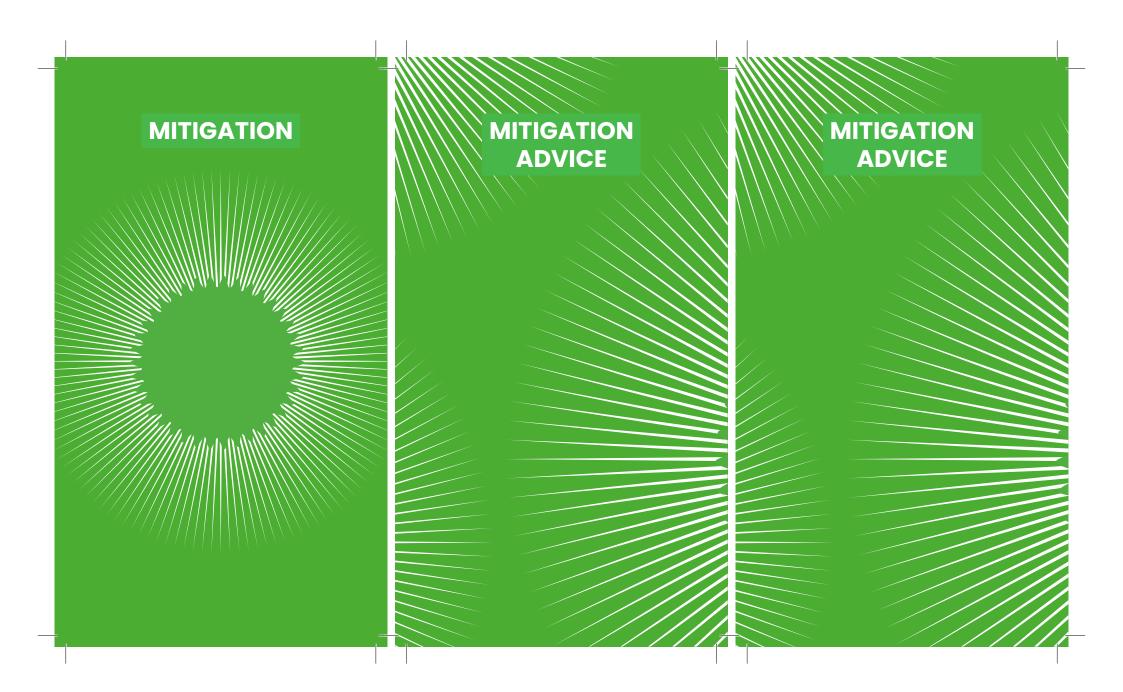


NO CRYSTAL BALL

It is impossible to consider all possible rebound effects, as it is impossible to predict the future. You should be aware that other effects may occur. Ideally, try to plan for monitoring.

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AWARENESS RAISING

SHORT TERM



LONG TERM

Raising awareness can help people to take informed action in the short term, and can support a paradigm shift in the long term.

Can be used for:

Bouncing Coin/Time, Excessive Accessibility, Lighter Soul...

Example(s)

This might involve explaining that electricity is not carbon neutral and therefore neither are electric vehicles. It may also include promoting active modes of transport.



SPEND THAT MONEY!

SHORT TERM



LONGT

You may want to encourage people to spend their money in a way that has little impact on the environment.

Can be used for:

Bouncing Coin...

Example(s)

In the case of the second-hand sales platform, this could involve, for example, telling users how much they have saved and suggesting that they donate it or spend it on a local (low-carbon) cultural event...

SPEND THAT TIME!

SHORT TERM

STRATEGY

MITIGATION



LONG TERM

You may want to encourage people to spend their time in a way that has little impact on the environment.

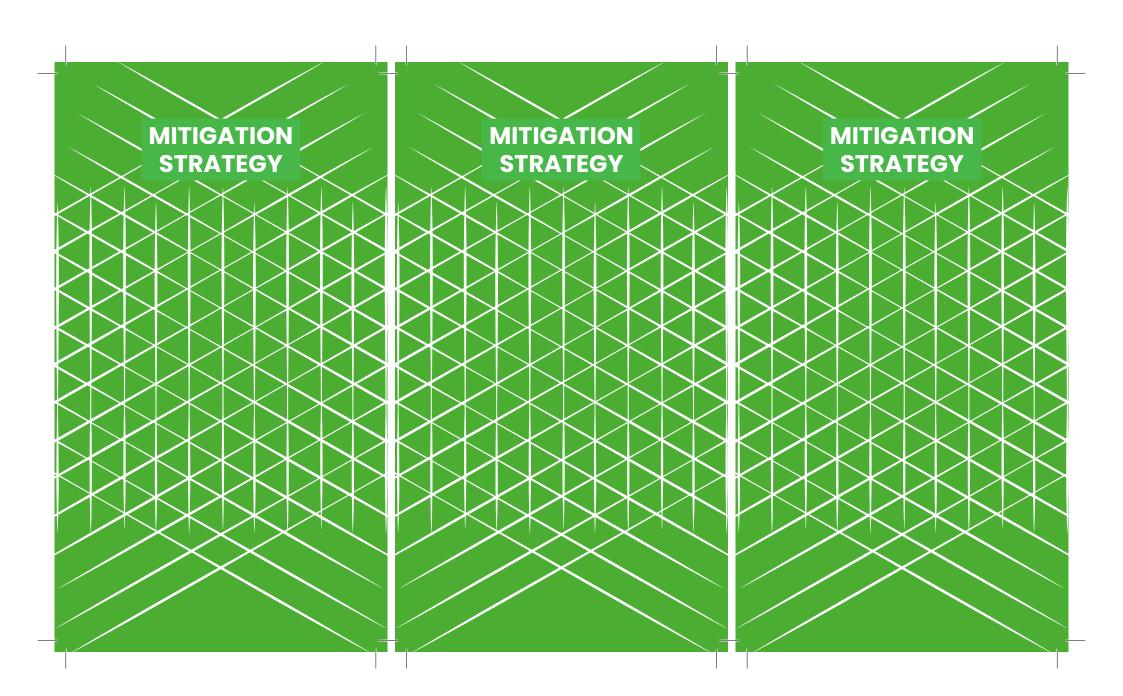
Can be used for:

Bouncing Time...

Example(s)

In the case of the second-hand sales platform, this could involve, for example, giving users an estimate of the time they have saved and suggesting that they use this time for low-carbon activities (e.g. cultural event, etc.).

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SAFEGUARDS

SHORT TERM

LONG TERM

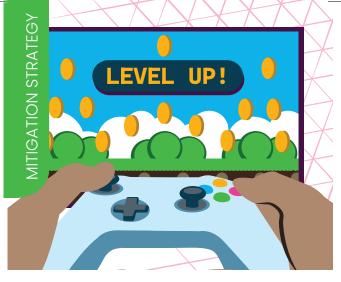
You may want to impose rules to prevent certain rebound effects. Be careful, though, as this could backfire if it is too restrictive.

Can be used for:

Dumbing it Down, Hijacking, Taken from, Parasitic Businesses...

Example(s)

If you set up a car-sharing scheme, and you're worried that people will use it for leisure and make more journeys, you could ban journeys outside the city, or longer than a certain length...



PLAY IT FOR THE GOOD

SHORT TERM

ONG TERM

You could use gamification to help your stakeholders understand how they can reduce their impact in a fun way. NB: beware of 'lighter soul' effect.

Can be used for:

Bouncing Coin/Time, Excessive Accessibility, Taken from...

Example(s)

In the case of the second-hand sales platform, you could set up a points and badges system that rewards ecoresponsible behaviour.

MITIGATION STRATEGY



FISH BOWL

SHORT TERM





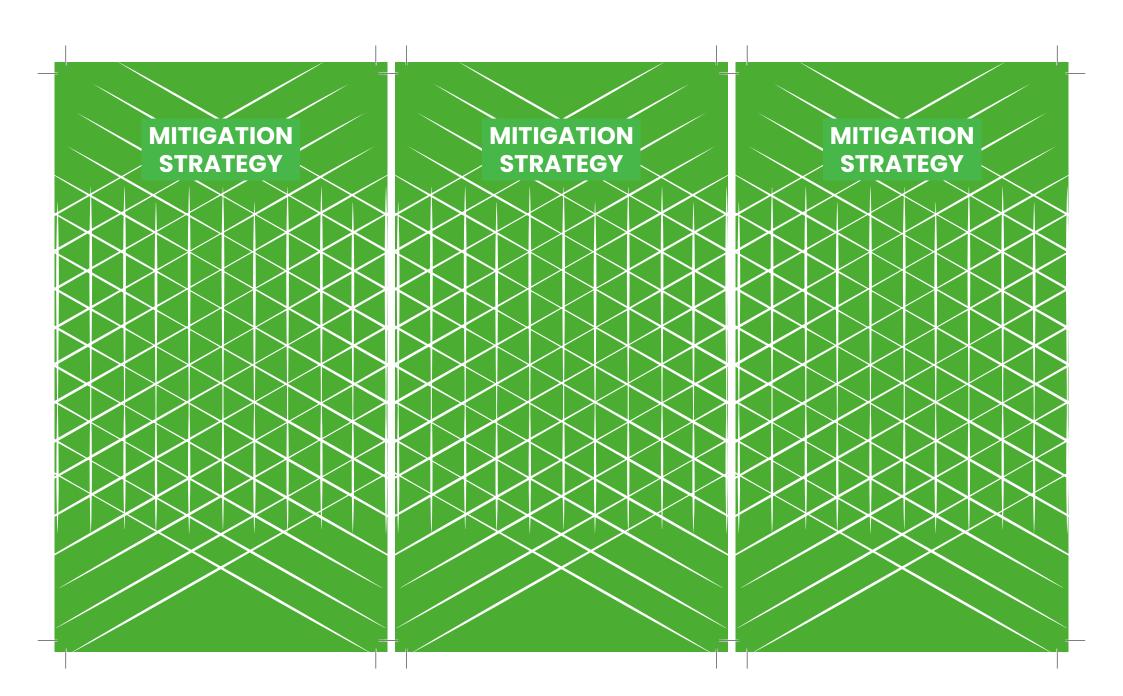
You could create a closed system to control certain rebounds. NB: beware of possible loopholes...

Can be used for:

Bouncing Coin...

Example(s)

In the case of the second-hand sales platform, you could set up a virtual currency that encourages (or requires) sellers to use the money from sales to buy second-hand goods from a network of partners.





QUOTAS & CAPPING

CHODT TEDM

LONG TERM

To prevent excessive behaviour, you could impose quotas (or try to lobby politicians to do so). Just make sure it's equitable and doesn't penalise the most vulnerable groups.

Can be used for:

Bouncing Coin/Time, Excessive Accessibility, Hijacking, Parasitic Business...

Example(s)

In the case of the second-hand sales platform, you could impose a maximum quota of sales per year to prevent the professionalisation of sellers and abuse by fashion addicts.



REDIRECTION

SHORT TERM



LONG TERM

You could redirect certain flows, or encourage people to do so.

Can be used for:

Taken from...

Example(s)

In the case of the second-hand sales platform, you could suggest that users donate their items to a charity (e.g. if they have already sold several items). In the case of a car-sharing system, you could suggest that users take the train instead of a shared car in certain circumstances.

BUSINESS MODELLING

SHORT TERM

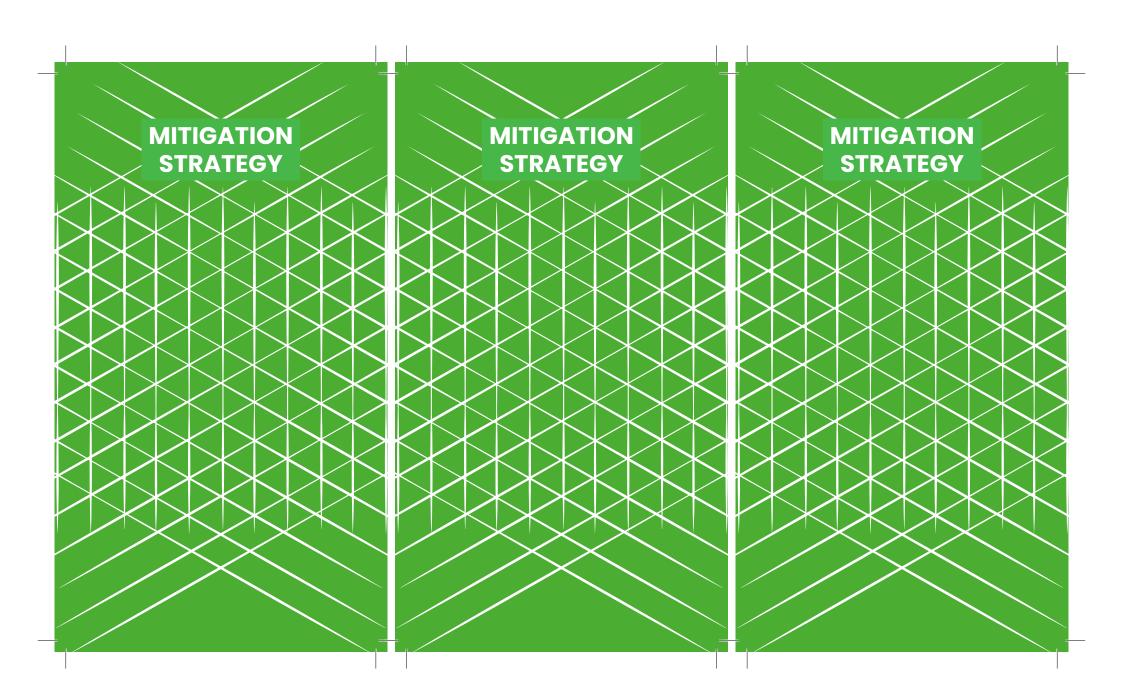
MITIGATION STRATEG

LONG T

You could rethink the business model (the system's objectives) if it leads to choices that are considered harmful to the environment or society.

Example(s)

Vinted has removed distance sorting. This is probably because their business model is based on the number of transactions (and therefore the number of packages sent by post). They certainly wouldn't have done this if their business model was based on annual subscriptions (number of subscribers, not number of transactions).





CO-DESIGN

SHORT TERM



LONG TERM

Co-design with the stakeholders (bring people into the decisions that will affect them).

Can be used for:

Taken from (and most of the others)...

Example(s)

If your intervention is likely to deprive some people of their jobs, or change their activities, you should involve them in the design process.



PARADIGM SHIFTING

SHORT TERM



LONG TERM

Paradigm shift is a powerful lever for longterm change. You can help to pave the way for a desirable future through your message.

Can be used for:

Systemic Change...

Example(s)

In the case of the second-hand sales platform, this could involve allowing clothes to be exchanged rather than sold. It could also involve encouraging users to repair and/or refresh the style of their clothes.

MITIGATION

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