

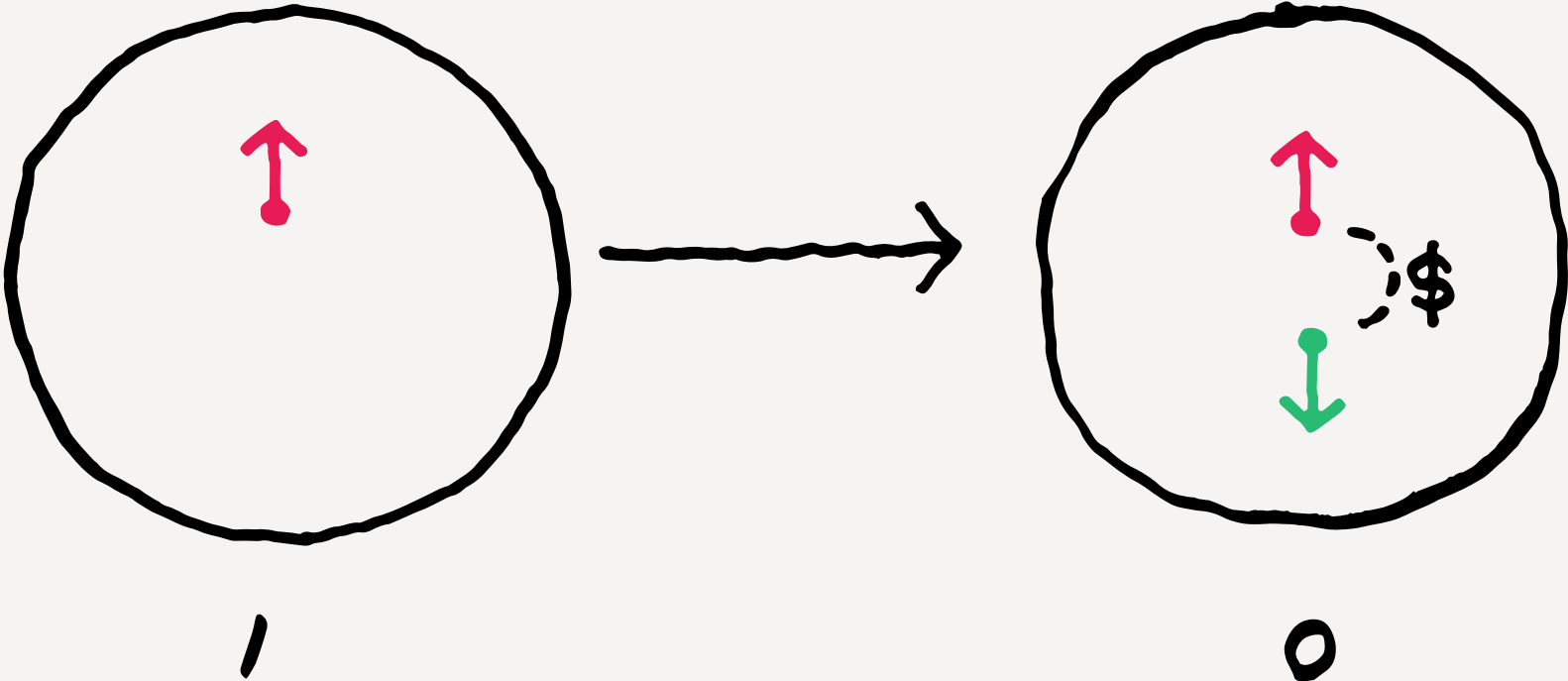


# Beyond Net Zero: 15 Limitations

APRIL 2022









# Base Case Net Zero Achieved As Intended





**The Ideal.** Our net-positive emissions today become net zero at some point in the future through a combination of emission reductions and purchased carbon offsets. Progress against goals can be accurately tracked and attributed to actions taken or not taken.

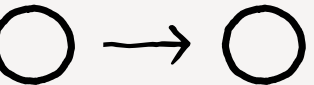
Source: BCG analysis.

-  Emitter
-  Carbon offset
-  The planet
-  Purchase of offset
-   Event not captured by net-zero accounting or implementation.

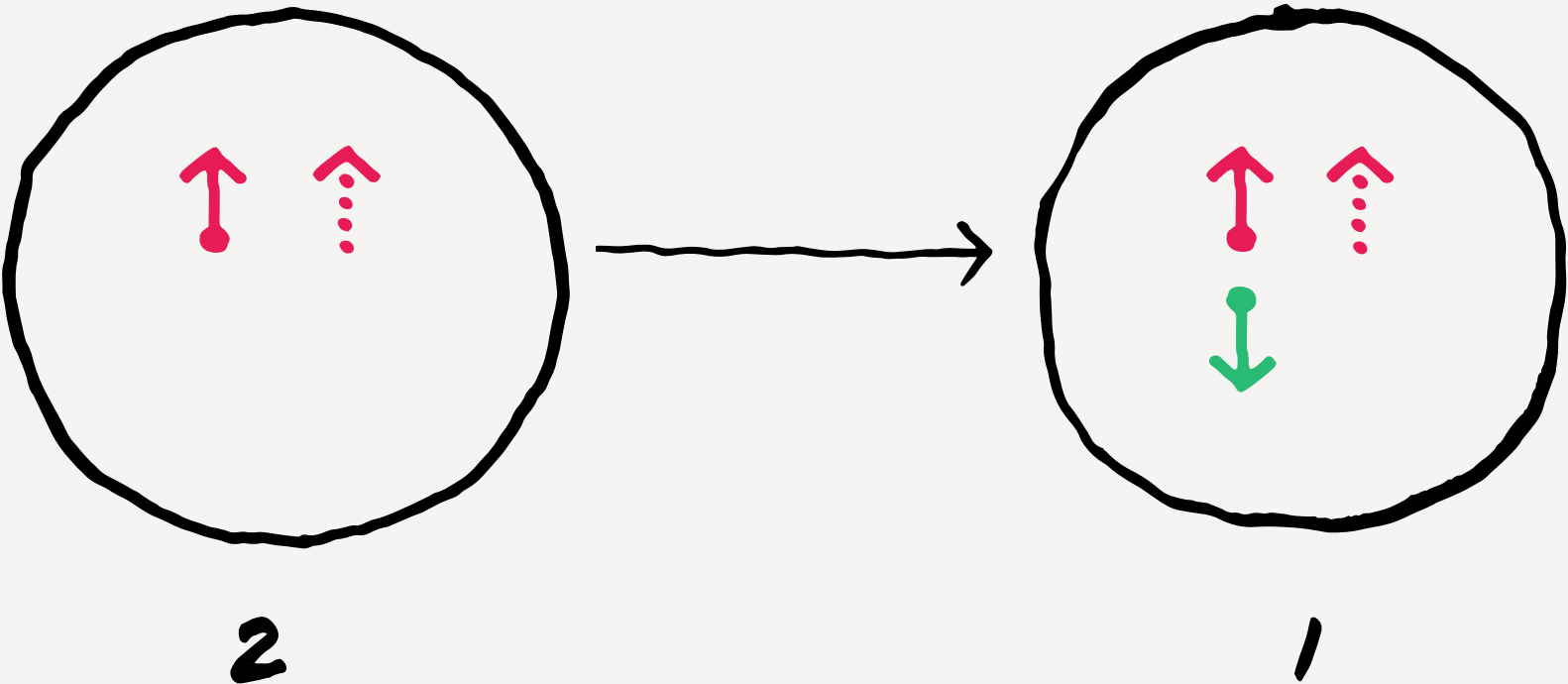
The numbers represent the net emissions of the planet

-  Positive emissions
-  Net-zero emissions

Time flows left to right, with each circle indicating a snapshot in time



# Limitation 1 Definitional Consistency/Completeness



Multiple net-zero accounting standards exist, which can distort the overall picture of progress. For example, pledges based solely on direct company operations and energy inputs (Scopes 1 and 2) but that exclude the full supply chain (Scope 3) can make heavy-emitting companies appear to be net zero and obfuscate the need for more transformative change. A similar distortion occurs when countries exclude the climate impact of their exports from net-zero calculations.

Source: BCG analysis.

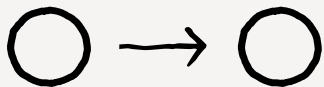
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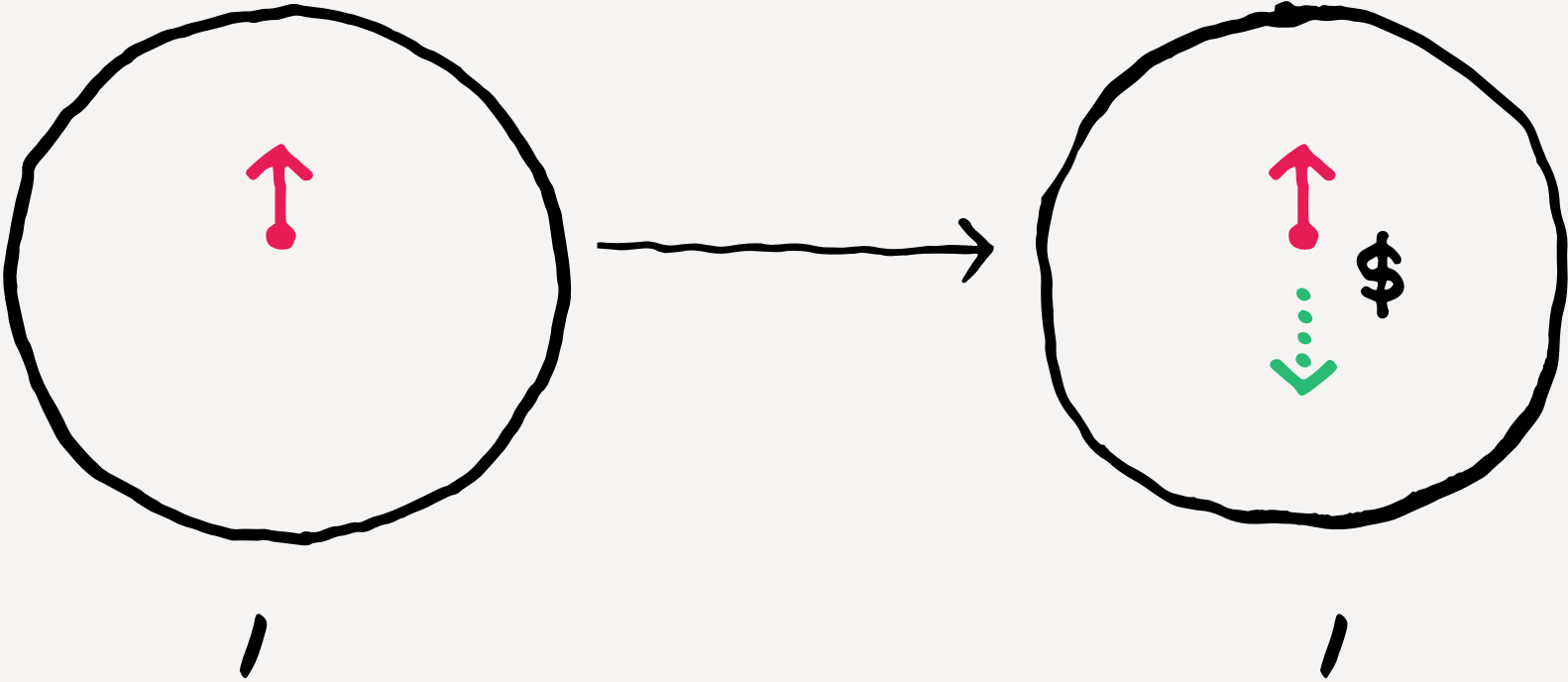
Positive emissions

Net-zero emissions

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# Limitation 2 Verifiability



The ability to verify reported reductions or the execution of offset pledges represents an increasingly complex challenge. Companies' promises to achieve net zero are accomplished with much fanfare—with significantly less attention given to the knottier problem of how to confirm the realization of these commitments. A lack of common definitions and standards makes verifiability even more challenging.

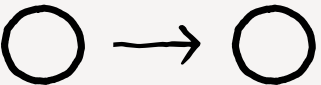
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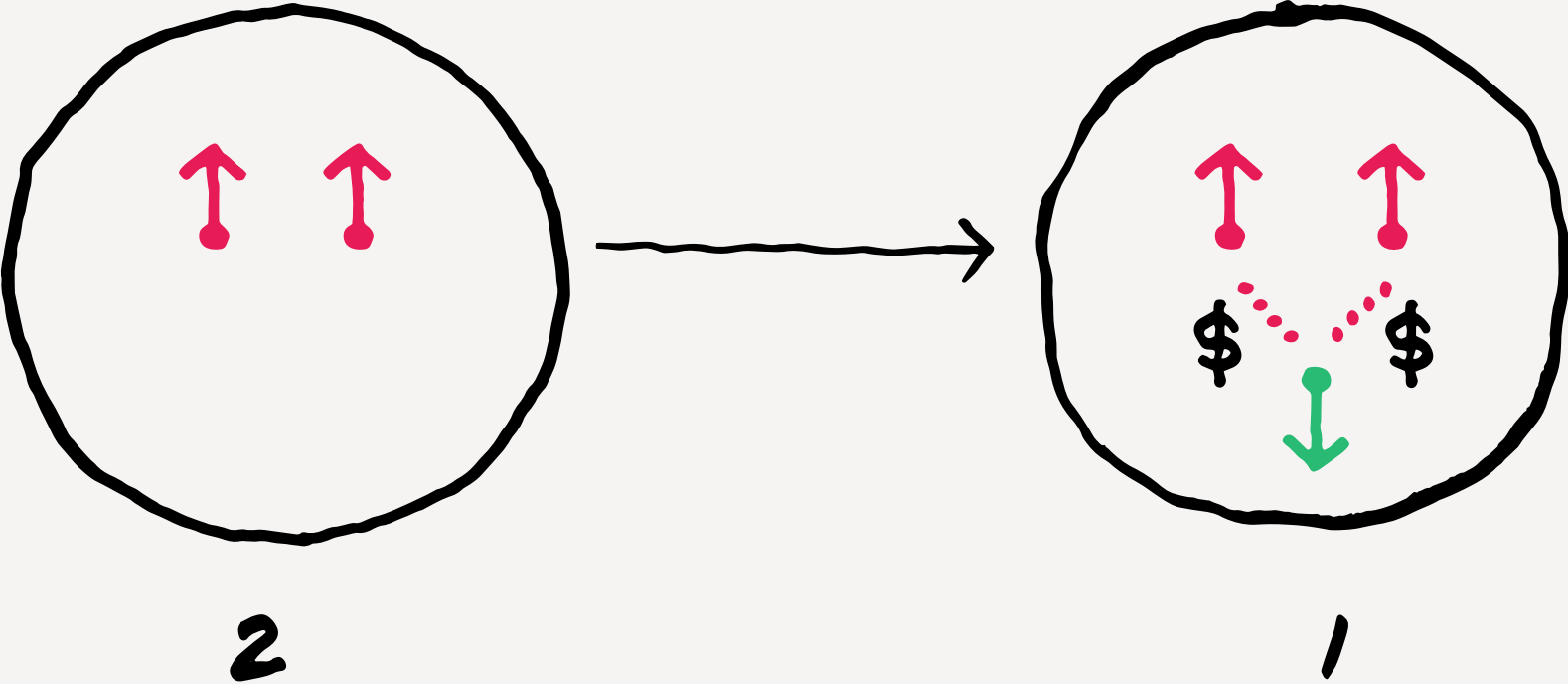
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# Limitation 3 Double Counting



Carbon offsets that are allowed to sit simultaneously on multiple entities' balance sheets can inflate their apparent impact. When a company buys an offset in the Amazon rainforest, for example, how can it be sure that same offset isn't being sold to another company at the same time? Such lack of verifiability makes it difficult to buy carbon offsets with confidence, particularly for smaller companies.

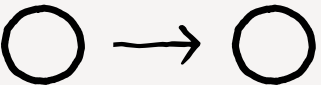
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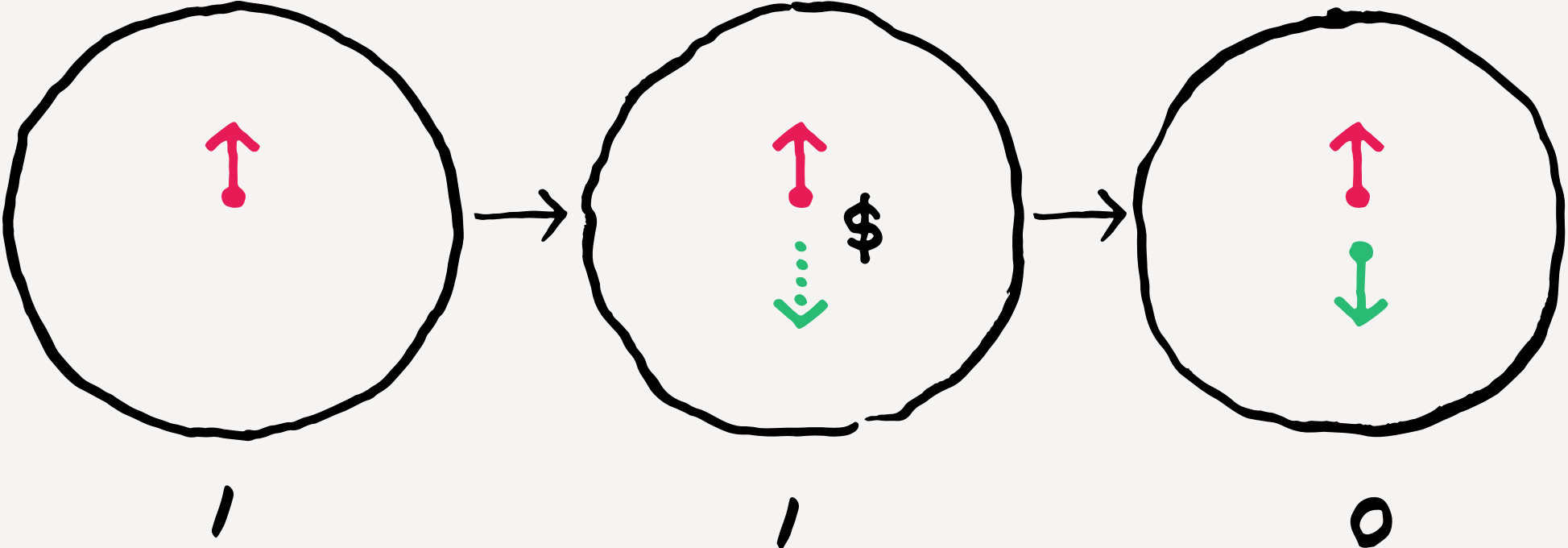
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# Limitation 4 Delayed Impact



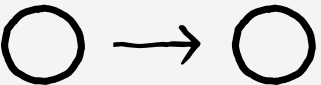
Nature-based offsets do not have an immediate impact—afforestation efforts, for example, take time to realize their full effect. The resulting short-term imbalance can lead to further climate deterioration.

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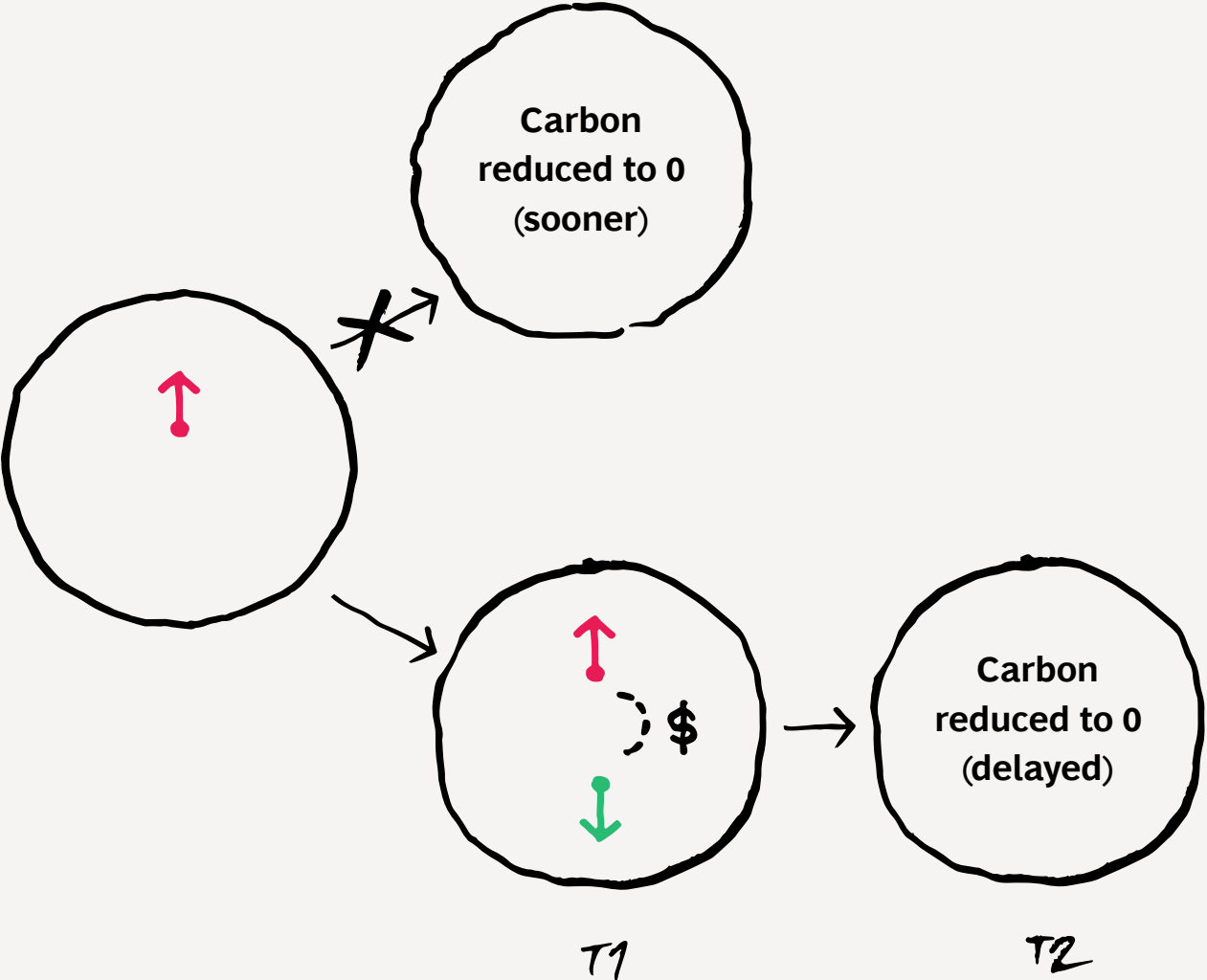
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Source: BCG analysis.



# Limitation 5 Postponement of Decarbonization

Carbon offsets can encourage companies to put off decarbonization. This is best illustrated by asking the counterfactual: What action would the company have taken if buying carbon offsets weren't an option? Creating an "easy-out solution" may distract or delay companies from the hard but more meaningful and permanent work of reducing their carbon emissions.



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The numbers represent the net emissions of the planet

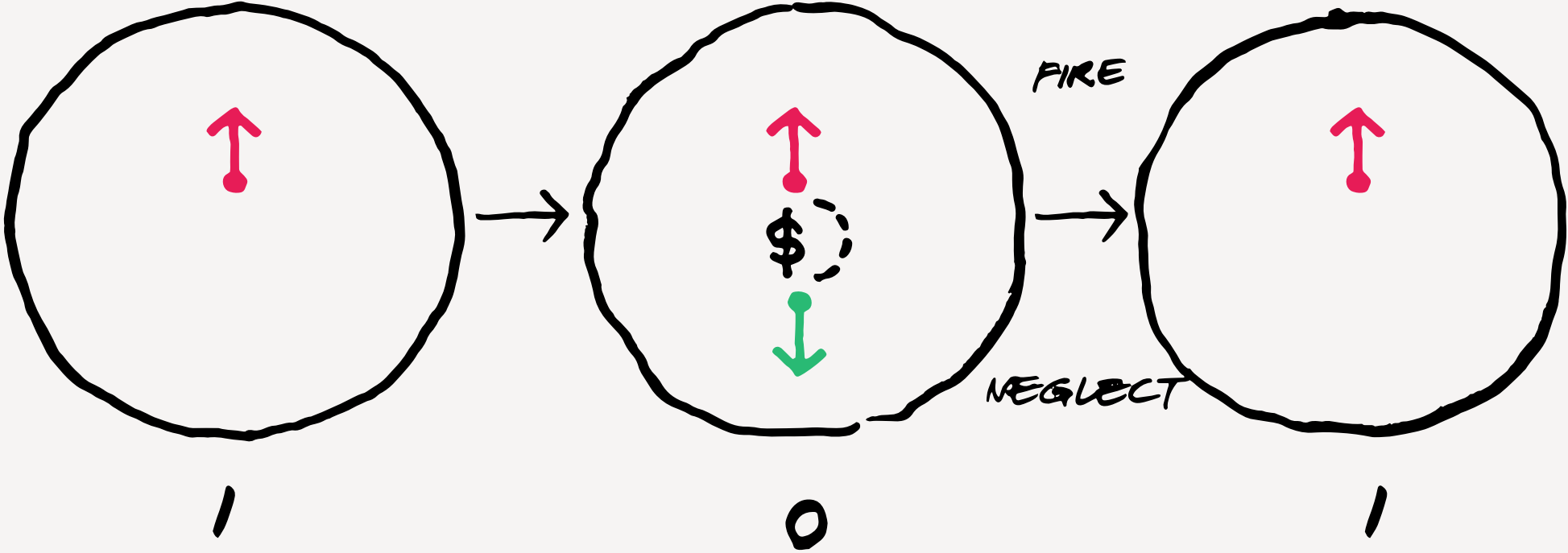
-  + Positive emissions
-  Net-zero emissions

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Source: BCG analysis.

# Limitation 6 Permanence





When a company emits a greenhouse gas it does so with 100% certainty. A carbon offset, meanwhile, requires ongoing stewardship and can therefore be considered to have an increasing discount rate over time. Example: an acre of forest that is sold this year as a carbon offset may be destroyed next year due to neglect, fire, or even willful gaming of the system on the part of the seller.

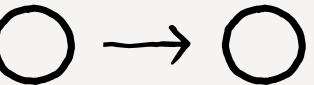
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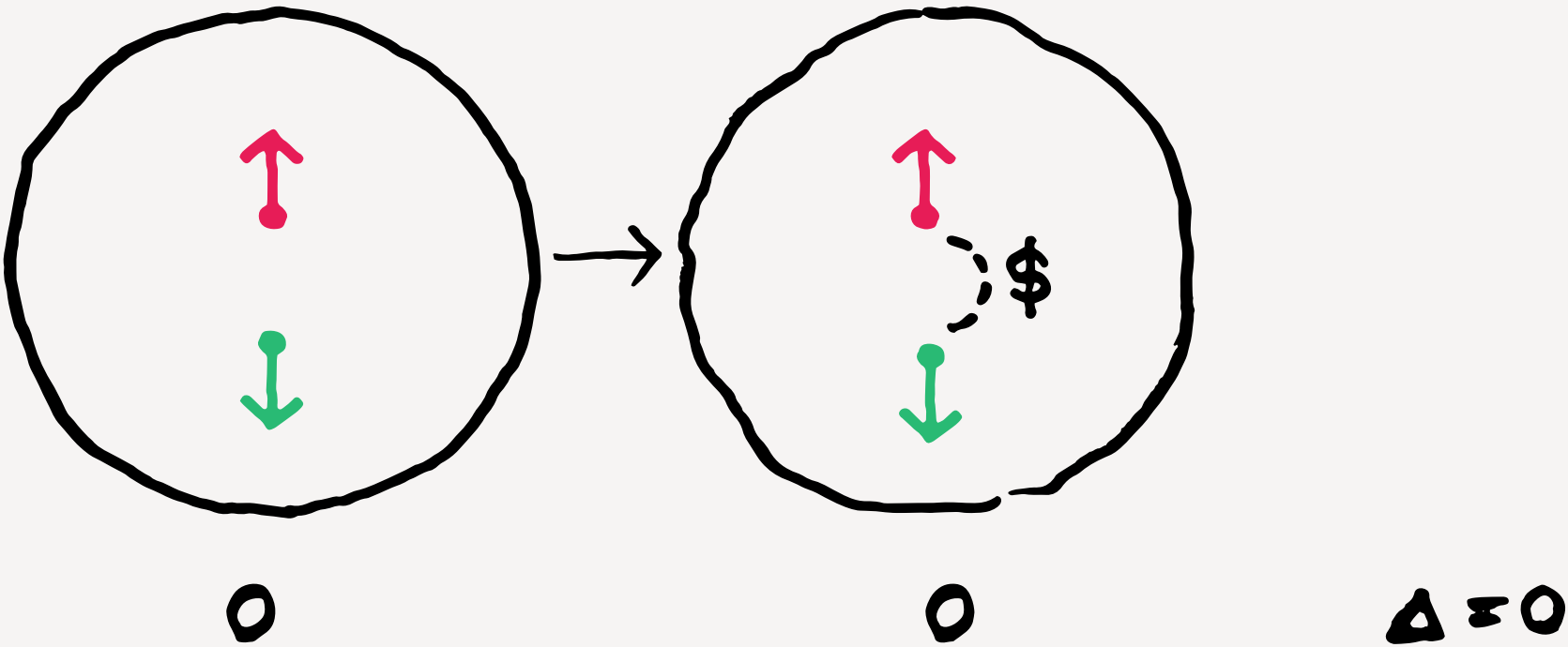
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# Limitation 7 Non-Additivity



If buying a carbon offset leads to a reduction of greenhouse gas emissions that would have happened independently, then the carbon offset is non-additive. For example, a company can pay someone to build a wind farm that will displace a coal power plant and provide cleaner energy. However, if that wind farm was going to be built regardless, the net effect has been to improve the business case for the wind farm—but not to create an additive offset.

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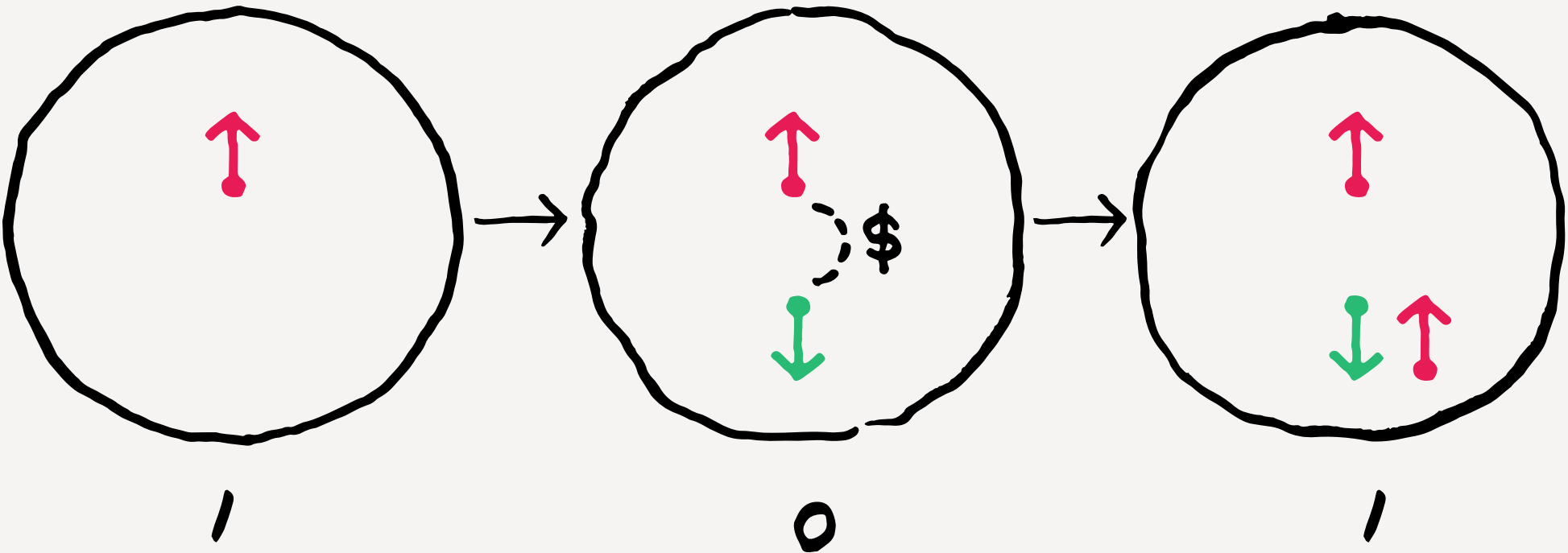
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# Limitation 8 Leakage



Leakage occurs when efforts to reduce emissions in one place shift emissions to another place where they are uncontrolled or uncounted. For example, “protecting” an acre of forest in Brazil from logging through a carbon offset program may result in the logging of an acre of forest in Borneo, particularly if there has been no reduction in demand for forest lumber—or if the price of lumber has increased due to scarcity driven by carbon offset programs.

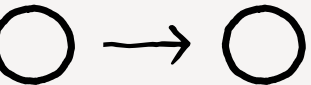
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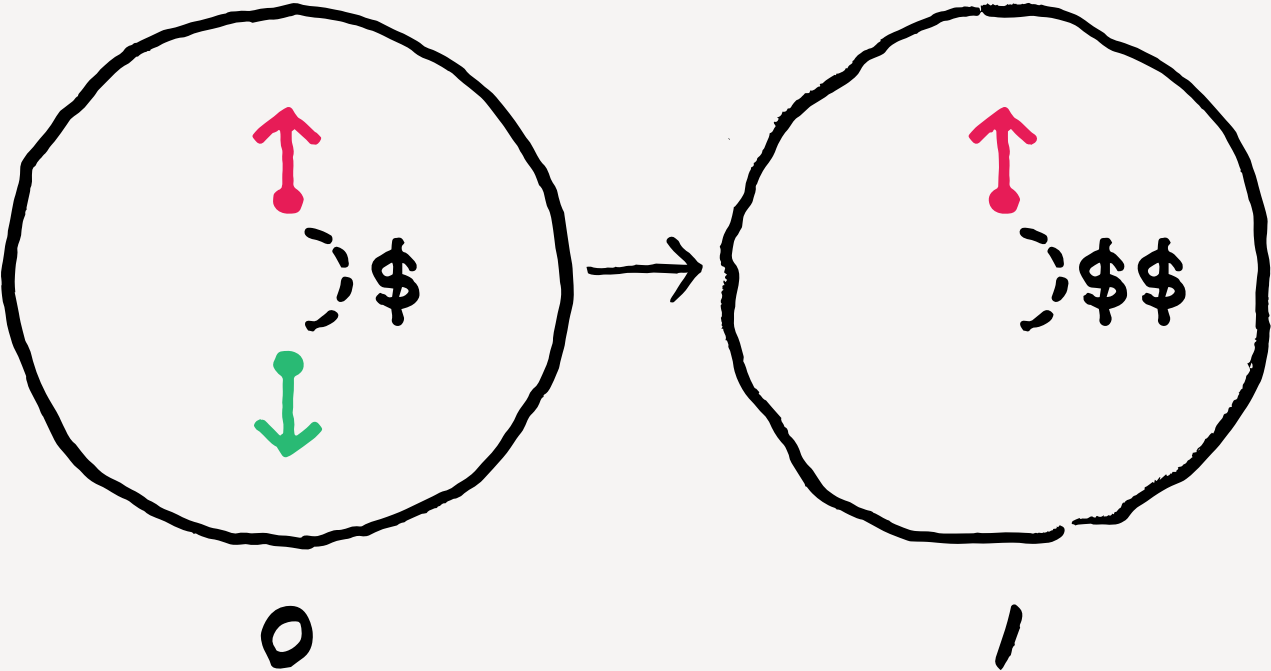
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# Limitation 9 Economic Viability (Inflation of Offset Prices)





Net-zero pledges that depend on the use of carbon offsets are effectively commitments to buy offsets in the future at an unspecified price. The finite nature of verifiable, protectable carbon offsets—paired with a strongly increasing demand for carbon offsets between 2030 and 2050, when companies near their pledge dates—will inevitably drive up the price of offsets. This could make planned carbon offsets economically unviable.

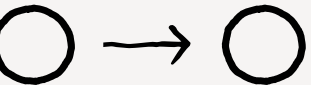
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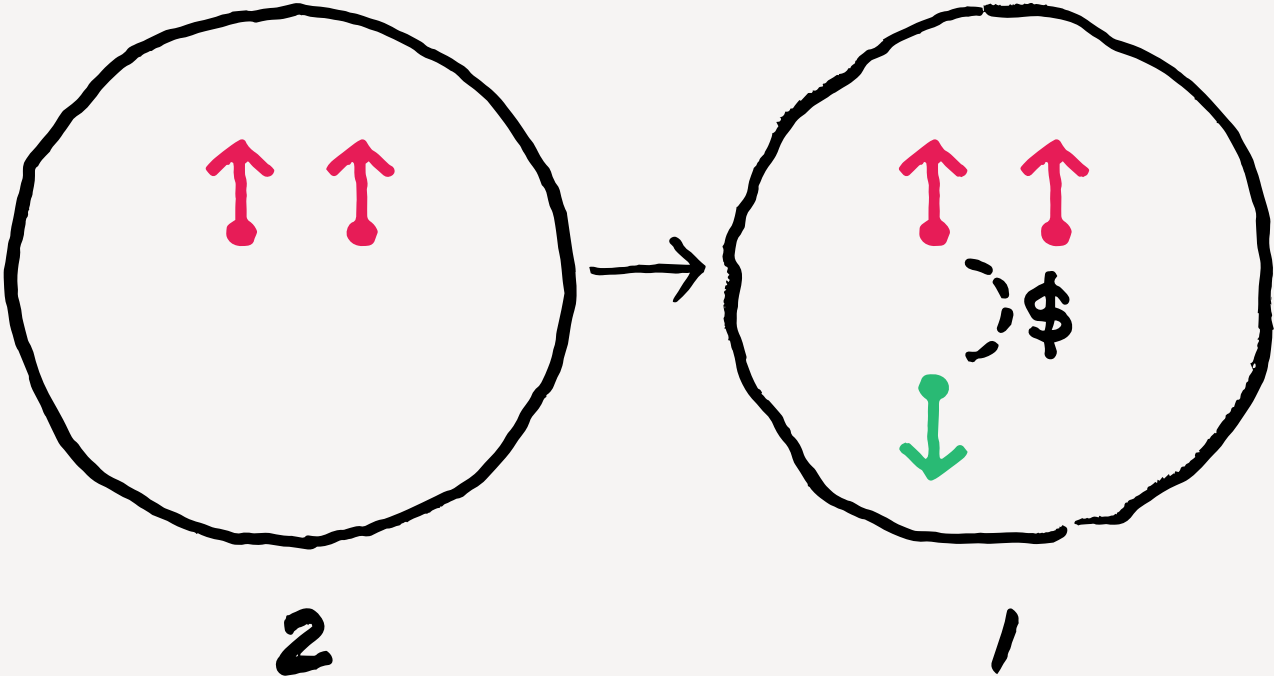
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# Limitation 10 Voluntarism



The voluntary nature of the net-zero system will inevitably result in limits to emitter coverage. The biggest emitters with the most intractable transformation challenges will have the least incentive to commit. Without the arrival of highly disruptive competitors or regulation, present incentives to take significant action may be insufficient.

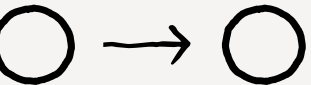
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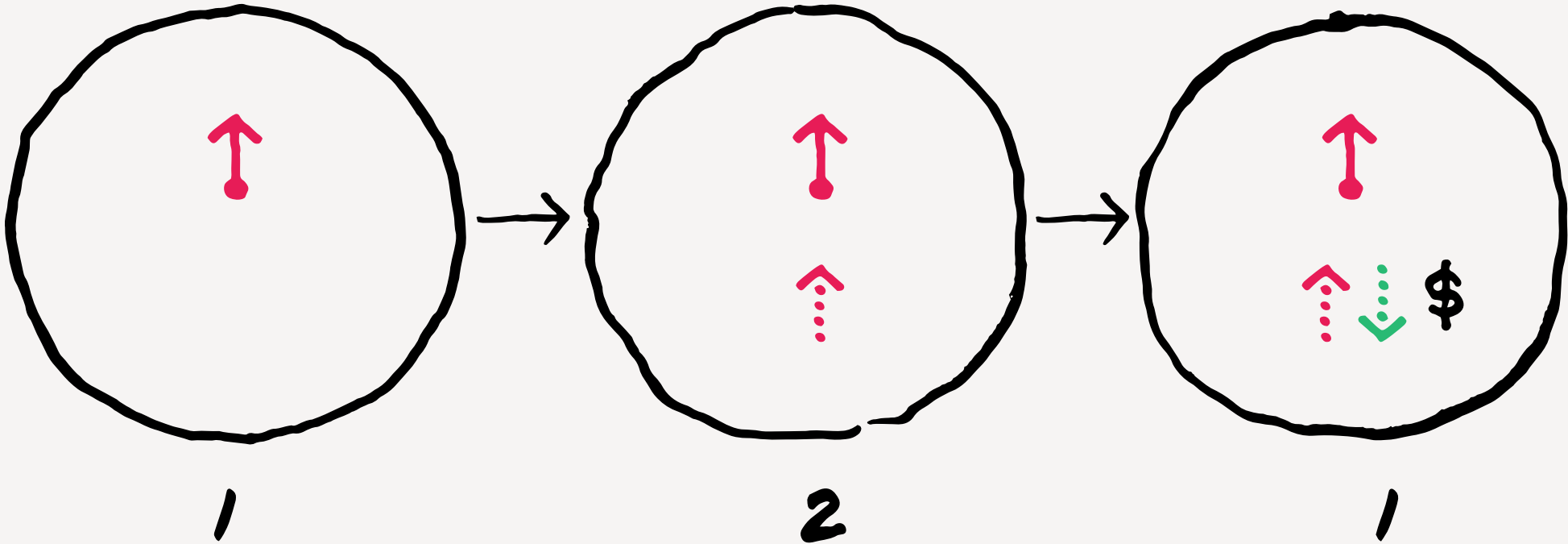
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# Limitation 11 Moral Hazard




The majority of carbon offset solutions available today involve paying someone to not take an action—not log a virgin forest, for example. This may encourage individuals or companies to project an action (e.g. log a forest) they had previously not intended to take. This is of particular concern in low- and middle-income countries, where many of the natural resources sold as carbon offsets reside and alternative economic opportunities are limited.

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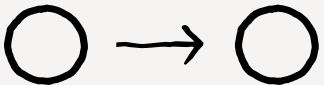
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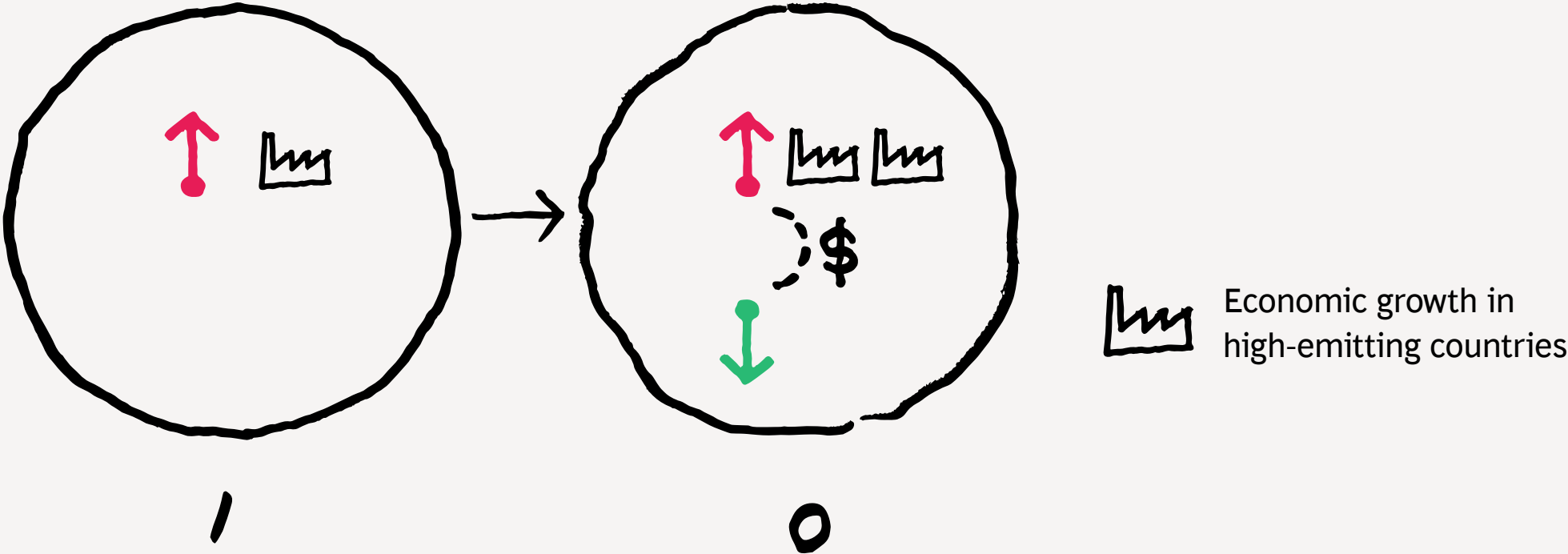
 + Positive emissions

 Net-zero emissions

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# Limitation 12 Inequity in Economic Development



High-income countries emit a larger share of emissions due to their greater levels of industrialization and consumption. Low- and middle-income countries, by contrast, could be frozen at current relative income levels if economic development is obstructed by incentives that overly bias the use of a country's resources for providing offsets beyond its borders.

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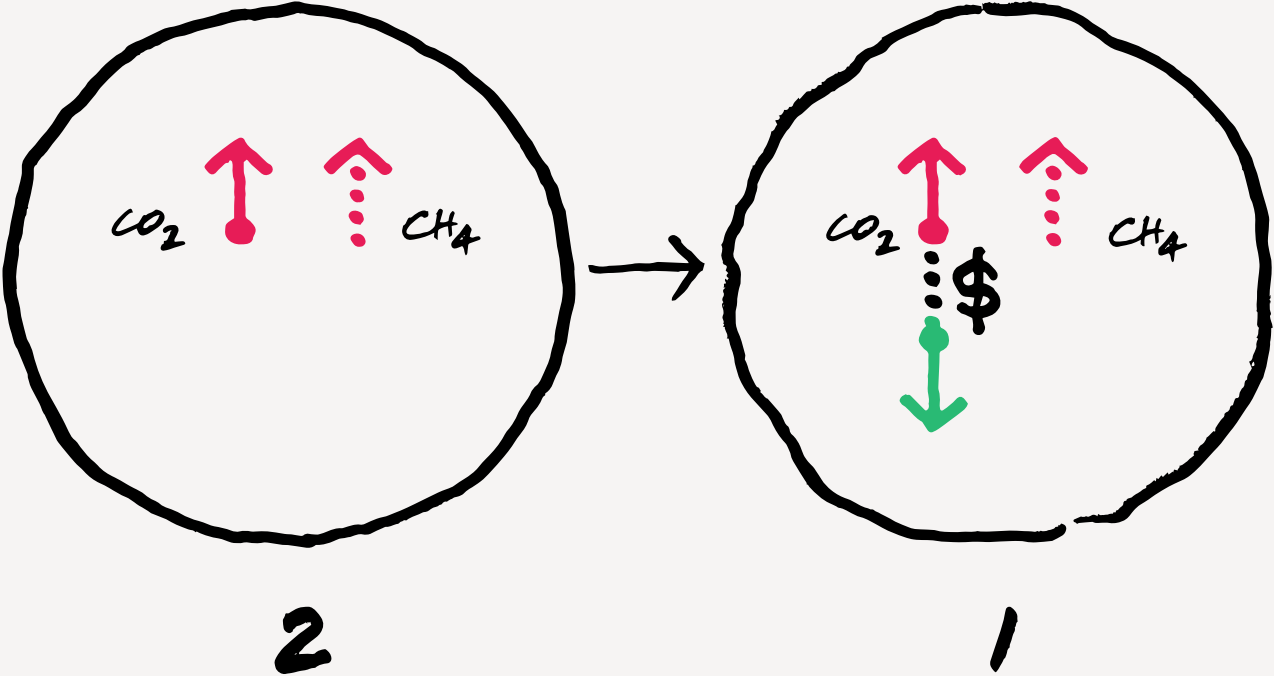
- Positive emissions
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Source: BCG analysis.

# Limitation 13 Oversimplification of Sustainability as Carbon Neutrality



Methane and nitrous oxide respectively have about 30 and 300 times the heat-trapping effect of carbon dioxide. Yet many climate change pledges today focus exclusively on CO<sub>2</sub> reduction, using terms like “carbon zero” and “carbon neutral.” This creates meaningful confusion about the scope of announced net-zero pledges, undermining the ultimate goal of climate sustainability.

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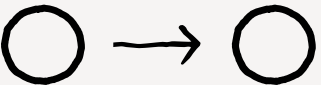
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Positive emissions

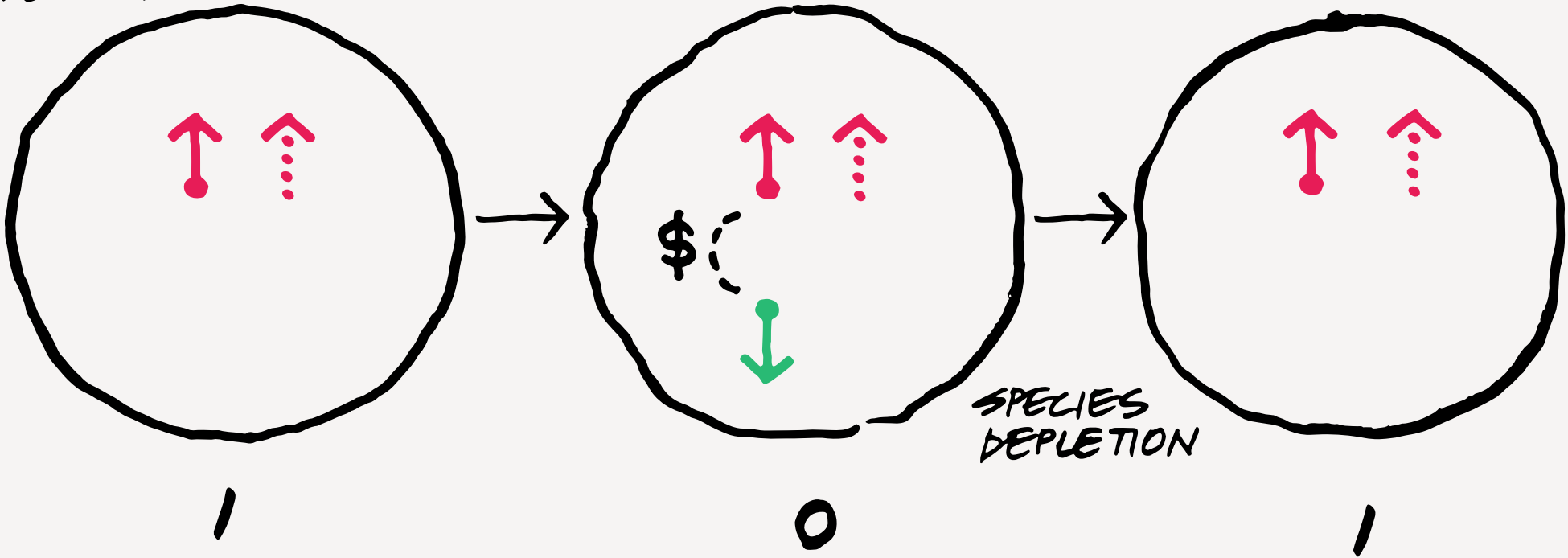
Net-zero emissions

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# Limitation 14 Oversimplification of Sustainability as Decarbonization

OTHER POLLUTION



- Emitter
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- Purchase of offset
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- Positive emissions
- Net-zero emissions

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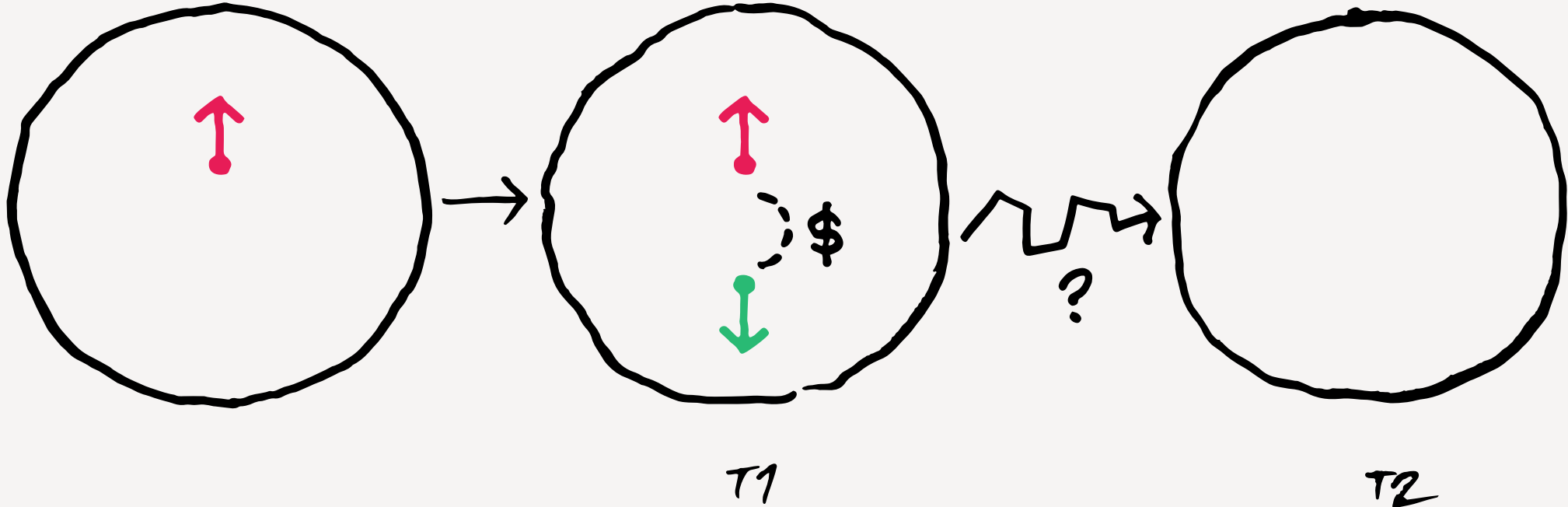


The mobilizing of attention and resources towards net-zero pledges is something to be celebrated. However, attending only to narrowly defined carbon-reduction goals could be self-defeating. For example, if non-GHG pollutants and other activities which lead to species depletion and the degradation of nature are not addressed, then the natural buffering capacity of the planet could be reduced—undermining climate sustainability efforts.

Source: BCG analysis.



# Limitation 15 A Goal Without a Path

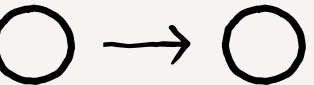


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**A Goal Without a Path.** Net zero sets a goal but not the path to reach it. Such an approach—which leaves room to innovate and try new solutions—might be effective in addressing simpler problems. However, the complex, unprecedented, interdependent, and transformative change required to reach global net zero may not be achievable without a coordinated transition plan and the research, investments, policies, and regulations to support it.

Source: BCG analysis.