

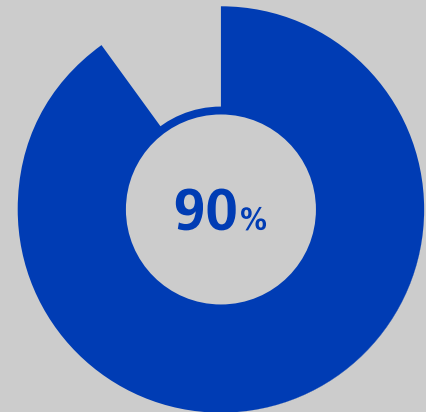
Investment Trends

Supplement to the publication "Investment Update"
Edition May 2023

**Global warming
and no end in
sight?**

**Sea fever –
between longing
and reality**

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In our special series on investment trends, we focus on sustainable development goals of the United Nations (UN), where no major progress has been achieved so far.

of fish stocks are economically overfished according to the World Bank

200%

overfishing of the world's oceans since 1950

x3

increase in prosperity in Switzerland since 1965



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Sustainability economist

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MSCI ESG rating of selected investment opportunities

13 Climate action

Global warming and no end in sight?

Global CO₂ emissions have still not peaked. What is the outlook and what is required to meet the needed reduction path?

Master Plan Part 3

This investor conference was supposed to be different. Elon Musk didn't want to start with the usual sales figures and strategies about Tesla, but with what he felt was really important. "Most intelligent people I know think a sustainable energy future is not possible, or only possible at great cost," he explained, and set out to show that just the opposite is true. "A future based on sustainable energy is absolutely technologically feasible" – he and his people had worked it out in the Master Plan Part 3.¹

Ambitious reduction path

The fact that most intelligent people Elon Musk knows cannot imagine this scenario probably has to do with Chart 1. It shows the strong growth of carbon dioxide emissions from 1950 to today and the emission reductions needed to reach certain temperature targets (reduction paths). A slight levelling off does seem to be in the offing in recent years. However, it seems difficult to imagine that the emission reductions will be so large in the future. How are these needed reduction paths to be achieved? Can we –

like Elon Musk – pin our hopes on a technical solution without having to accept major restrictions? What role do governments play?

The drivers of CO₂ emissions

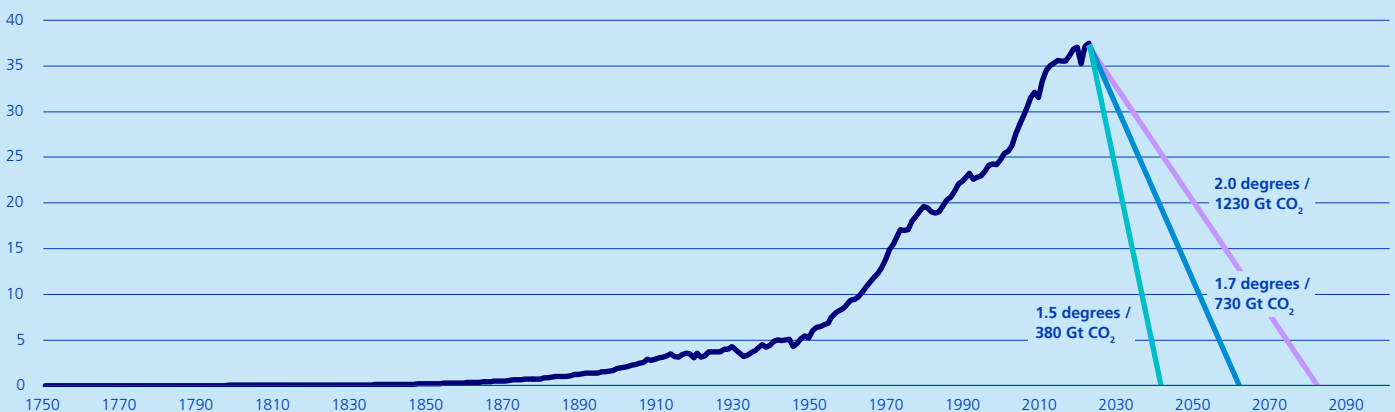
The drivers of CO₂ emissions can be explained with the so-called Kaya identity using the three factors population, prosperity, and technology (Chart 2). Population growth and increasing prosperity increase CO₂ emissions through rising consumption. The technology factor is divided into energy intensity and emission intensity. For example, a country with a large service sector has a lower energy intensity than a country with a large industrial sector. The emission intensity indicates how many emissions are produced per unit of energy. For example, a country's high share of emission-free energy, such as wind power, reduces the emission intensity.

How did CO₂ emissions in Switzerland develop?

Chart 3 shows the three factors of Kaya identity for Switzerland since 1965. Compared to then, the population has

Chart 1: Steep drop in CO₂ emissions necessary

Global CO₂ emissions (fossil energy and industry) and CO₂ reduction paths according to the 6th World Climate Report of the Intergovernmental Panel on Climate Change (IPCC AR6) in gigatons (Gt)



increased by almost 50%. Prosperity shows the greatest increase at over 200%. CO₂ emissions have increased since 1965 but have decreased again in the last decade. Since wealth and population have grown, this decrease must be due to the technology factor, according to Kaya Identity. And indeed, emission intensity and energy intensity in Switzerland have fallen since 1965. In contrast to global emissions (Chart 1), in Switzerland, as in many other developed countries, the emission-reducing effect of the technology factor has outweighed the emission-promoting effect of increasing prosperity and population growth in recent years.

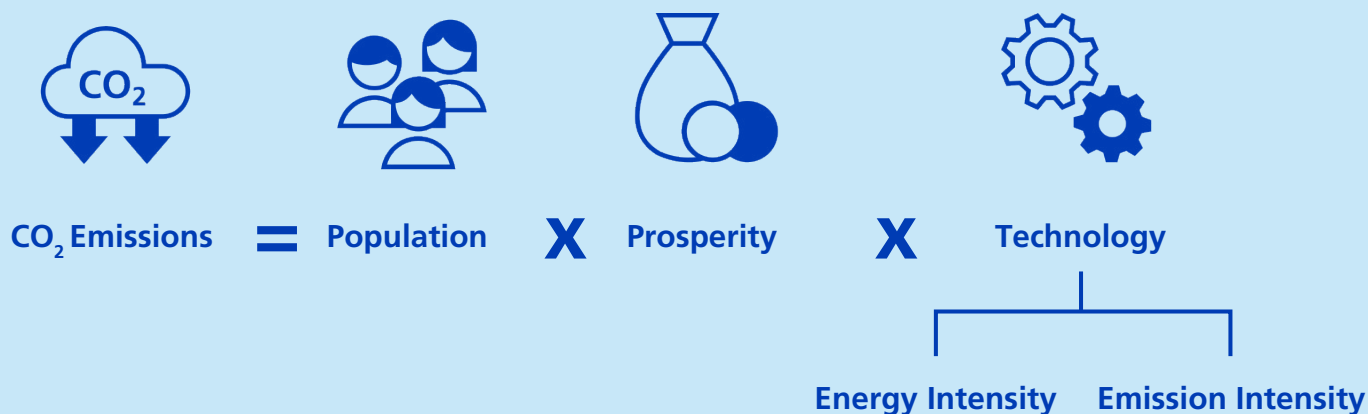
The role of technology

The decreasing trend in Switzerland's energy intensity can also be observed worldwide. For example, energy intensity in the US was halved between 1980 and 2016. On the one hand, this effect is due to the increasing use of energy-saving technology, but on the other hand it is also the result of structural changes: The further a country's economic development progresses, the less energy-intensive production,

and the more services it will have. The emission intensity in Switzerland is lower today than it was in 1965, even if it has fallen less sharply in recent years. Globally, emission intensity does not show a clear trend. The fact that energy intensity is decreasing globally, and emission intensity is not can be explained economically: High energy consumption costs – whether on the consumer or producer side – and is therefore addressed and reduced. For a long time, however, nothing had to be paid for the emission of carbon dioxide.

But at this point, at the latest, the question arises whether the decrease in CO₂ emissions in the developed countries is not due to the fact that developed countries have outsourced industries with high emissions. The answer is no. It is true that the picture changes if emissions are measured by consumption rather than production: China's emissions then fall significantly, while emissions in the developed countries increase. But the direction remains the same: developed country emissions have been declining slightly for a few years, even if you include emissions generated elsewhere through international trade.

Chart 2: Breakdown of the drivers of CO₂ emissions with the Kaya identity



What role do governments play?

Converting an economy to new energies is about as challenging as learning a new language. And like a language, the process depends on the path: If I can already express myself in one language, my incentive to learn a new one is rather small. It is no different in business. An innovation for a gas turbine in a fossil power plant is, ceteris paribus, more financially rewarding than an innovation in a wind turbine, if the former has a larger sales market. For David Hémous, UBS Foundation Associate Professor of Economics of Innovation and Entrepreneurship at the University of Zurich, it is therefore clear that environmentally friendly technologies will not grow on a large scale without government measures.

On the positive side, scientific studies show that incentives lead to more innovation. If the price of the input factor energy or the tax on one of the output factors, such as carbon dioxide, increases, innovation in the field of energy will increase. For example, energy efficiency patents in the US economy increased after the oil shocks of the 1970s.² To minimise the costs of the transition, Hémous recommends early and strong policy intervention.³

Back to the Master Plan

Elon Musk sought to spread hope and optimism with his calculations. Was he right to do so? Certainly, the growth of the population and above all the increasing prosperity have so far prevented a decrease in absolute CO₂ emissions. Technologically, however, an economy without emissions is feasible. He is right in this respect. And individual countries have already been able to reduce their emissions significantly. Only the speed is far from sufficient. It could be increased through political intervention. The sooner the better.

Sustainability view (ESG)

(E) Environmental

- + Exposure to companies with contributions to energy efficiency and renewable energies.
- Many of the essential metals for the energy transition are mined in regions with sensitive ecosystems, where resource-intensive and environmentally damaging mining causes ecological damage.


(S) Social

- Many of the essential metals for the energy transition are extracted in countries and mines that have a high number of controversies regarding human rights issues.

(G) Governance

- Many of the essential metals for the energy transition are extracted in countries that have a high number of controversies regarding corruption.

Investment opportunities selected by our investment experts have an MSCI ESG rating of AA.

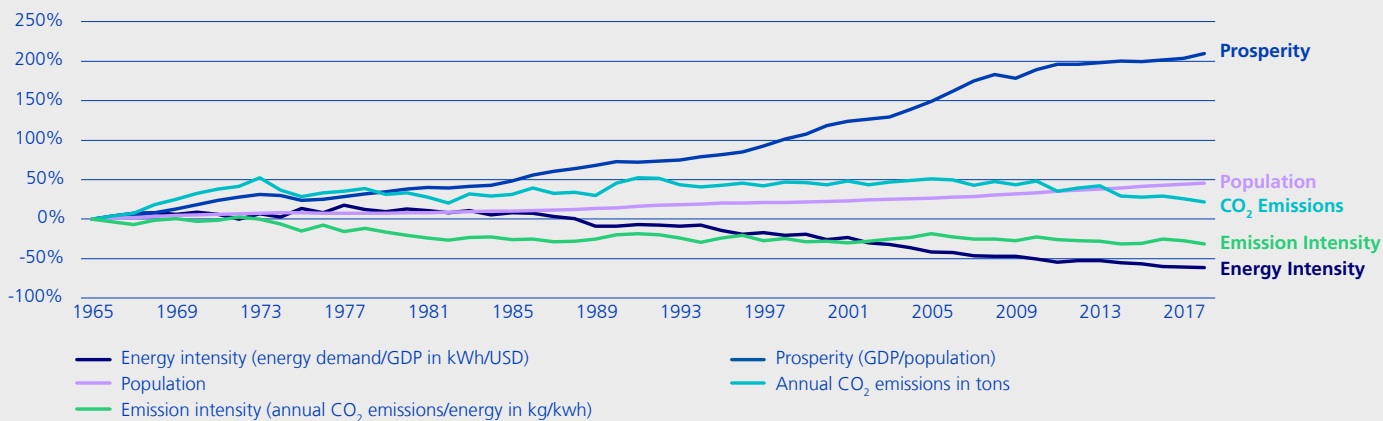


You prefer watching instead of reading?
The QR code will take you to our video on this topic (mostly in German language).

For additional information on specific investment topics, please contact your client advisor.

Chart 3: Increase in prosperity as the biggest driver of CO₂ emissions in Switzerland

Drivers of CO₂ emissions in Switzerland in % compared to 1965



Source: Our World in Data, Zürcher Kantonalbank

1 Link to the Investor Conference: <https://www.youtube.com/watch?v=H11zEzVUV7w>.
 2 Popp, David. 2002. Induced Innovation and Energy Prices. The American Economic Review, 92(1): 160-180.

3 Hémous, David. 2021. Green innovation policies. UBS Center for Economics in Society. Nov 2021. Issue 10.



Fischauktionshalle

H Landungsbrücken (Rheinweg)

Haltepunkt (Vogelmarkt)



Kein Verladen



Fahrradverkehr



Fahrradverkehr

Halteverbot



MSCI ESG rating of selected investment opportunities

14 Life below water

Sea fever – between longing and reality

Over seventy per cent of the earth's surface consists of oceans, which are the habitat for so many species. This habitat is threatened by industrial fishing. Where do we stand now and are there any signs of rethinking?

"I must go down to the seas again,
to the lonely sea and the sky,
And all I ask is a tall ship and a
star to steer her by;
And the wheel's kick and the wind's song
and the white sail's shaking,
And a grey mist on the sea's face,
and a grey dawn breaking."¹

John Masefield (1902)

John Masefield called his poem from the early 20th century "Sea Fever". It romanticises the longing for the sea and life on the high seas. Would John Masefield still have written such a poem today? Probably not. Because most fishing boats today do not sail out to sea with a white sail, but rather use an engine. The large fishing vessels even move across the water with a length of over 200 metres. Trawl nets are used to fish to the bottom of the ocean every year. Masefield would also probably not have imagined that only half of the fish consumed today originates from fishing in the open sea and the other half from aquacultures similar to livestock farming on land. What are the reasons? Fish stocks on the high seas have declined sharply and the yield today is only about 6% of what it was in Masefield's time – despite modern technology². No wonder, the World Bank concludes, that global fisheries are in crisis.

The false belief in the indestructible ocean

Whether humans can influence the ecosystem of the oceans at all has been the subject of various opinions in the past. For example, at the end of the 19th century,

T. H. Huxley wrote: "[...] probably all the great sea fisheries are inexhaustible: that is to say that nothing we do seriously affects the number of fish. And any attempt to regulate these fisheries seems consequently, from the nature of the case, to be useless."³ In fact, the increasing demand for fish has seriously affected fish stocks. While the world's population has grown at an average annual rate of 1.6% over the last 50 years, fish consumption has grown at almost twice that rate, 3%. Overfishing has tripled in the last 50 years and now stands at over 30% (Chart 1). If all fish stocks that are maximally fished or overfished are summed up, the proportion is over 90%.⁴

Technological progress in fishing

Three factors have particularly affected fish stocks: firstly, the increase in world population and the associated higher demand for fish; secondly, the increase in fishing fleets; and thirdly, technological progress in fisheries. The World Bank estimates that fishing efforts have quadrupled since 1970.⁵ Today there are over four million professional fishing vessels. Asian countries have by far the largest fishing fleet, with a share of two-thirds. Africa follows with a share of about a quarter. Although the huge fishing fleets have been reduced in recent years, technological progress in locating and catching fish has probably compensated for this effect.

This is not rational

With a fourfold increase in effort, one might think that the yield has also greatly increased. In fact, the yield in the oceans has increased only slightly since 1970 and not at all since 1990. For the World Bank, it is thus clear that we

are not in an economic optimum. In other words, from the World Bank's point of view, as much as 90% of fish stocks are overfished – from an economic point of view: If fish stocks were to regenerate, more fish could be caught with less effort. The World Bank puts this economic loss at 83 billion US dollars.⁶ That is a lot, considering that the value of global fish exports is 150 billion US dollars.⁷

What does this have to do with us humans?

Not only are we literally sinking billions, but we are also harming ourselves – ecologically and socially. About half a billion people depend directly on marine biodiversity for their livelihoods⁸. That is the social aspect. The ecological aspect is more complex: By absorbing just under half of global carbon dioxide, marine phytoplankton produce over half of all the oxygen in our atmosphere.⁹ So we owe every second breath to the oceans. The amount of phytoplankton living in the oceans depends on the biodiversity of the sea. So it doesn't matter whether we regret the extinction of a marine species or not. The conclusion remains the same: The health of the oceans is vital for mankind.

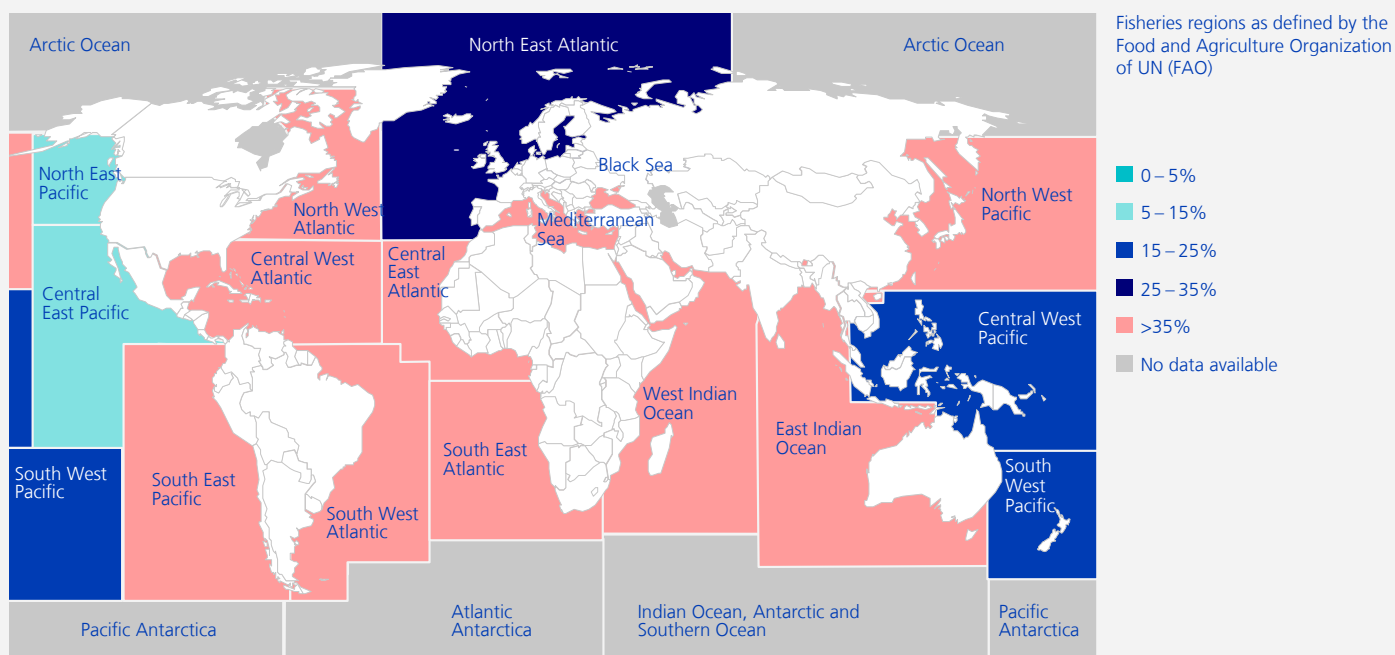
Who does the sea belong to?

The suspicion is that the exploitation of the world's oceans has to do with the fact that the oceans belong to everyone and no one. The first attempt to divide up the oceans took place in 1493 and even received the highest official support by the Pope. At that time, the Atlantic was to be divided between the colonial powers Spain and Portugal. Great Britain managed to prevent this. After that, the principle of freedom of the seas applied for a long time: marine resources belonged to the person who took them. In 1982, the United Nations Convention on the Law of the Sea (UNCLOS) formulated rights of disposal. Coastal states thus have exclusive rights in their "Economic Exclusive Zone", which extends 200 nautical miles from the coast towards the sea. On the open sea, however, the principle of freedom of the seas continues to apply in principle.¹⁰

Misallocated subsidies

To ensure that their own country does not lose out in this global competition, governments usually pay large subsidies to the fisheries sector. Over 35 billion US dollars in 2018

Chart 1: Most ocean regions suffer from overfishing
Proportion of fish stocks at unsustainable levels in 2019



alone. Instinctively, one would assume that these subsidies support small-scale fisheries in developing countries. Far from it! About two-thirds of the subsidies went to programmes that resulted in overcapacity and overfishing. Only a small part of these subsidies is used for conservation and management of fisheries resources (Chart 2). Just under a quarter of all subsidies even consist of fuel subsidies for fishing vessels.¹¹

First signs of hope from international politics

Exploitation of the oceans through fishing is only one of many pressures on the world's oceans. Pollution, warming and acidification from the uptake of carbon dioxide are also taking their toll on the ocean ecosystem. Since 1970, the oceans have warmed unabated, absorbing more than 90% of the additional heat in the climate system.¹² By now, the plight of the oceans has reached the attention of many decision-makers in politics and business. International cooperation, even if it is often very tough, plays a major role in protecting the oceans.

Two new agreements have been reached recently: In March this year, the United Nations (UN) made a breakthrough by adding an amendment to UNCLOS to protect biodiversity on the high seas. The core of this amendment is that 30% of the high seas should be declared marine protected areas. In addition, the World Trade Organisation has concluded

a new agreement in 2022 to prevent harmful subsidies in fisheries. The subsidies for illegal fishing, fishing in overfished fish stocks and fishing on the high seas in general are to be stopped. Finally, we as consumers and investors can also determine where our money goes. After all, when we think of sea fever, we want to continue to think of our fervent longing for the sea and not of its desolate state of health.

Sustainability view (ESG)

(E) Environmental

- + Exposure to companies with a positive ecological impact on natural resources.
- Exposure to companies with high water intensity.

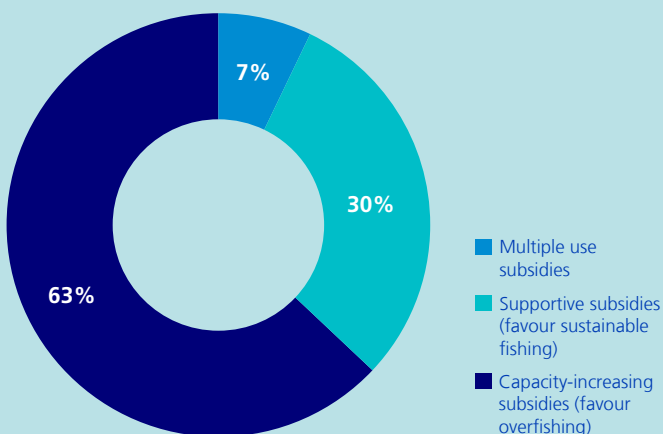
(S) Social

- + Companies with a positive social impact in the field of sustainable food production.

Investment opportunities selected by our investment experts have an MSCI ESG rating of AA.

For additional information on specific investment topics, please contact your client advisor.

Chart 2: Over USD 30 billion in subsidies – two thirds of which support overfishing



Source: Sumaila R. U. et al. (2019). Updated estimates and analysis of global fisheries subsidies. Marine Policy, Zürcher Kantonalbank

- 1 <http://ia800802.us.archive.org/8/items/SaltWaterBallads/SaltWaterBallads.pdf>
- 2 Robert Callum in Bottom Trawling: How to empty the seas in just 150 years. The Guardian. Robin McKie. 10.2.2014. Accessed 18 Apr 2023.
- 3 Quoted from Gordon, Scott H. 1954. The Economic Theory of a Common-Property Resource: The Fishery. The Journal of Political Economy. Vol 52. No. 2.
- 4 Food and Agriculture Organization of the United Nations (FAO). 2022. The State of World Fisheries and Aquaculture.
- 5 World Bank. 2017. The Sunken Billions Revisited.
- 6 Food and Agriculture Organization of the United Nations (FAO). 2022. The State of World Fisheries and Aquaculture.
- 7 United Nations. Sustainable Development Goal 14. <https://unstats.un.org/sdgs/report/2022/goal-14/>
- 8 Chami, Ralph et al. 2019. Nature's Solution To Climate Change. Finance and Development. International Monetary Fund.
- 9 Fontaubert, Charlotte, Lutchman, Indrani. 2003. Achieving sustainable fisheries. International Union for Conservation of Nature and Natural Resources.
- 10 Sumaila, U. R. 2019. Updated estimates and analysis of global fisheries subsidies. Marine Policy.
- 11 World Bank. 2017. The Sunken Billions Revisited.
- 12 Intergovernmental Panel on Climate Change. 2019. The ocean and the cryosphere in a changing climate.



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