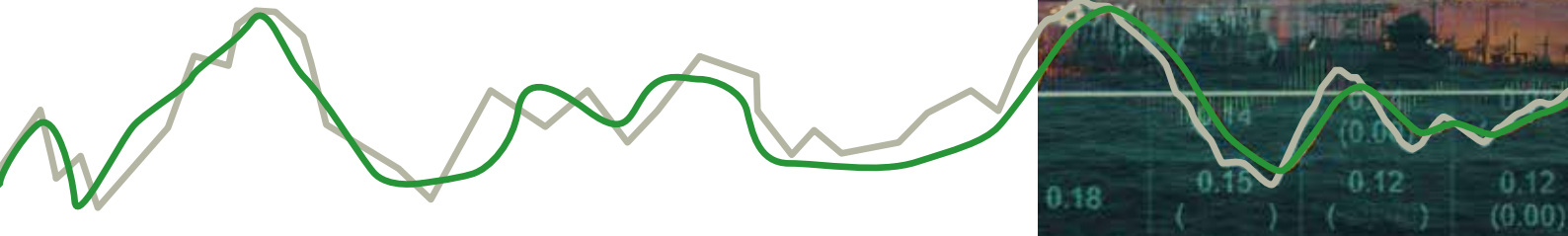


The Curse of the Carbon Bubble: How to Really Exit the Fossil

Age

New Hybrid Financial
Engineering for a Low-carbon
Economy in the 21st Century



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Introduction

The world has changed. We are now living in a new era – the Anthropocene – where everything is connected. At the same time, we are operating within geophysical planetary boundaries and face increasing levels of complexity, uncertainty, and acceleration. Such a “full world” confronts us with the challenges of asymmetric information, increased unwarranted liabilities and maturities, and uncontrolled feedback loops, which lead to vast direct and indirect costs and expenditures for damage control, spillovers, and negative externalities. What does this mean for the financial sector? The search for a new planetary balance will change our investment strategies, risk analyses, consumption patterns, political decision-making, and the way we do business. In fact, it will change everything – even our minds and consciousness. In the following,

we address the prominent role of the financial sector as one of the key players in this shift. New financial engineering will be required as we move toward a new equilibrium.

Eighty percent of our world economy depends on fossil fuels. On a global scale, this percentage has not changed since 1971. However, within this time period, total primary energy consumption has tripled in absolute terms. Fossil fuels generate CO₂ emissions that lead to global warming, and global warming is now considered to be the single largest threat to humanity. Robust scientific evidence has shown that going beyond the “2 degree scenario” (2DS) will cause huge disruptions to our planet in the form of extreme weather patterns and the loss of biodiversity and natural habitats. It will significantly affect human life due to forced migration, the rise in uninhabitable regions, and food insecurity



due to harvest loss, to name but a few factors. Although we have traditionally used a linear perspective to look at future trends, we will increasingly find ourselves confronted with non-linear tipping points, where no return to the earlier status quo is possible.

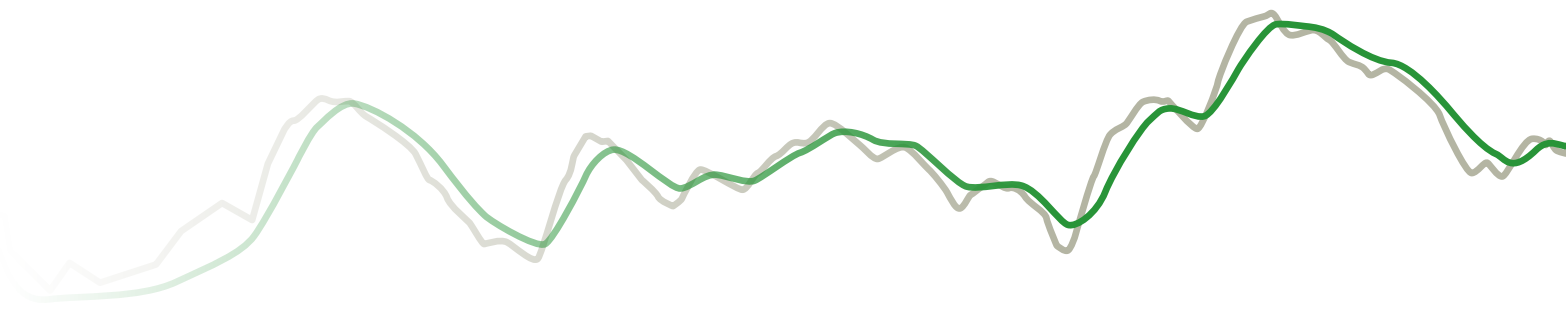
If we take the 2DS as a political benchmark, then the so-called carbon bubble represents the financial correlate to this scenario. It will affect approximately \$23–100 trillion in assets over the next two decades. This large range in estimation is related to the extent to which the fossil fuel value chain is taken into account. Of the 3 billion tons of fossil reserves still available on this planet, only 500 million tons can be used before reaching the estimated carbon limits of the 2DS. The rest of the fossil fuel reserves consist of stranded, unburnable assets that need to remain in the ground. In statistical terms: If we want to remain within the 2DS with 90 percent certainty, there is in fact *no* planetary carbon budget left, even with future food production and deforestation calculated in. This means that most listed companies will have to depreciate their balance sheets by up to one-third or more. Institutional investors with skin in the game in assets that are dependent upon fossil fuels will be forced to write off substantial parts of their investments.

Flogging a dead horse

This will relatively quickly lead to a depreciation of large cohorts of pension funds and privately funded social security systems, in particular those of the Baby Boomers. But as long as no alternative scenario is available, rational investors will stick to their assets as long as possible and resist change – even if the horse they are flogging is dead. In the period up until 2017, only \$2.5 trillion of the estimated \$23–100 trillion carbon bubble was divested. What we need is a different perspective on how to invest in the future.

The six-pack

The carbon bubble is part of a larger picture, expressed in the 2015 UN Sustainable Development Goals (SDGs). A lot has been written about the SDGs, but little about how to finance them. Calculations demonstrate that the world community requires an additional \$4–5 trillion every year to finance our future. About one-third of the goals are eligible for private investments, while two-thirds refer to the global commons. If we had endless time, our options would be unlimited. We keep pretending that we are in such a situation – but we are wrong. We have 10–15 years, at most, to significantly >>



change the course of this planet for the better or for the worse. We do not have limitless time for academic discussions, further field studies, randomized controlled trials, or political propaganda or maneuvering, nor for endless expert panels or manipulated fake news campaigns. As our time is restricted, our options are limited, too, and we will have to carefully choose the tools and interventions that have the highest likelihood of changing the course of this planet for the better. We may also have to make bold decisions and adopt a multi-step approach to enable the world community to shift toward a more sustainable future. The longer we wait, the more limited the options and the smaller the window for opportunities will become. In the following, we introduce the so-called financial six-pack. It provides a rationale for operating within the given limits and will allow us to shift our society toward a sustainable model, ensuring the survival of our grandchildren and great-grandchildren.

- Regulation – harmonization – transparency*
 - Taxation, fees, and subsidies*
 - Impact funding*
 - Ex-swap strategies*
 - Private–public partnerships / private-citizen partnerships*
 - Parallel currencies*
- List 1: The financial six-pack*

In the following, we describe the six most relevant financial engineering tools required to finance our future. They are structured like a staircase (see graph below). The staircase follows the following rationale: The more time we have available and the more strongly our world is built on multi-lateral agreements, the more we will be able to favor the lower steps. The less time and the more multipolar and bilateral our world becomes, the higher we will have to climb up those stairs and the more we will be forced to favor bold and unconventional monetary and financial decisions in order to put a more sustainable common future in place. Whereas there is increasing literature and empirical evidence concerning the lower steps, there is less awareness about the upper steps of our staircase. In fact, a “tragedy of the horizon,” as Mark Carney coined it, is associated with the issue. Global warming and its associated risks imply a time lag of 25–30 years between the initial carbon emission, the resulting climate impact, and the discount of any future impact. In short, the future will be over before it has even started. As neither the Paris Agreement nor the SDGs contain any politically binding criteria, a multi-step approach is required.

Regulation – harmonization – transparency

Since 2008 in particular, efforts to regulate the international payment and trading system have gained momentum. Most, if not all, academic and political attention has focused on regulatory efforts that seek to avoid, prevent, and manage future crises. There is general agreement that financial crises, especially idiosyncratic ones, cannot be predicted, and that systemic crises require additional regulatory effort to insulate the real economy from these more intrinsic perils. There has been a wealth of proposals, most of which focus on singular codes of conduct and rules, and some of which suggest replacing the entire system with an alternative – past examples include the Chicago Plan in the 1930s, the introduction of the gold standard, and its abandonment in the 1970s.

Discussions cover aspects such as greater transparency and accountability; increase in the level of sound regulations; international cooperation and reinforced institutions; Basel III (plus); the recapitalization of the International Monetary Fund and the World Bank; a shift to more macro-prudential policy tools; and more surveillance strategies such as early warning exercises, mutual assessment programs, and peer reviews.

This debate also refers to a variety of contributions on a different set of risk assessments, such as market-to-model versus market-to-market; the “too big to fail” argument; bonus programs for top managers; the impact of bail-in strategies along a liability cascade and contagion effects (from stock owners to borrowers to clients to the taxpayer); whether ratings agencies should serve as a public good, and so on. This list is not complete and not fully updated, as regulatory efforts since 2008 alone would have filled a volume of some 35,000 pages. This process has also not come to an end. The argument on regulatory efforts needs to be more general and fundamental: Is regulating the monetary system currently in place the best way to achieve a maximum of output with regard to resilience, efficiency, and sustainability? Regulatory efforts always tend to be behind the curve, despite their ability to adapt to historical events. What if all these regulatory efforts produce a false sense of control over manifest reality? What if all these preventive regulatory efforts fail? What if regulation of the given system is a suboptimal, even wrong approach, like trying to put toothpaste back into the tube, making the overall system even less resilient to future adverse shocks?

If we cannot predict idiosyncratic and random crises and events like black swan effects but want to stop them from becoming



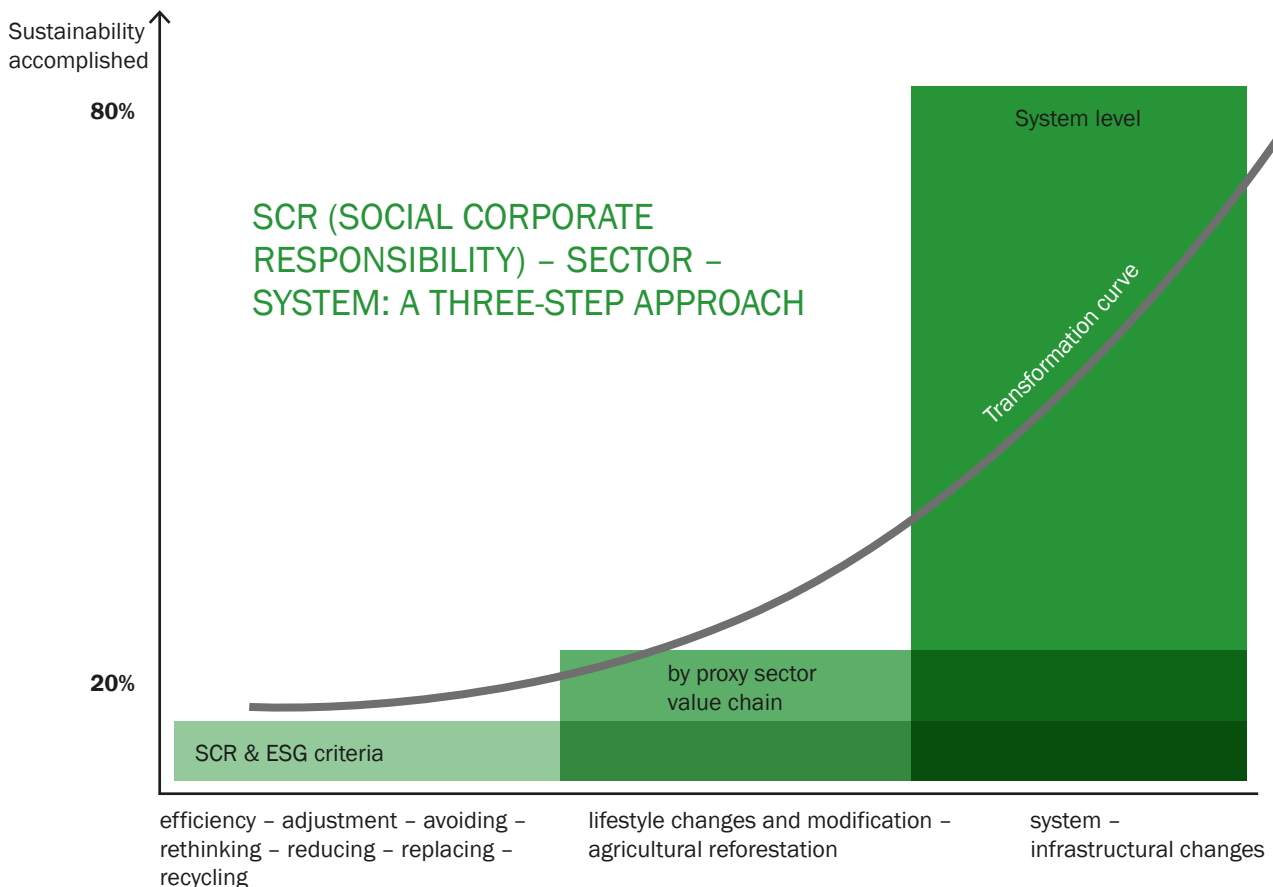
systemic risks, then regulating the given system may produce only limited results. It is somewhat like operating on the heart of a runner in an “Iron Man” competition while he is actually running. However, regulation has a moral and economic point to consider: A completely unregulated market is like forcing your six-year-old child to work on the streets shining shoes instead of going to school and becoming an MD, a teacher, an engineer, or a physicist. When we constantly regulate a system, we admit that we are unable to rely on the self-regulating or autopoietic power of the given, and thus implicitly admit that there is something wrong with the system’s design. Regulation is just the first step up the staircase.

The beauty of taxation, fees, and subsidies

There are dozens of very clever and thoughtful taxation schemata on how to refinance social and ecological goods and invest in the commons. The debate of the last 50 years has demonstrated the intellectual power of these schemata. With the high growth rates during the post–World War II period in particular, redistribution mechanisms involving fees and taxes successfully provided additional sources of revenue and income to finance social and ecological projects and public infrastructure. However, although times of high growth are

now past, redistribution via taxation and fees has become more and more critical in a worldwide context. For example, if the poorest 20 percent of Scandinavian citizens are richer than the richest 20 percent in developing countries, the well-established and conventional way of redistributing money through taxation, fees, and subsidies becomes, at its best, one political tool among others, but it is not the tool to finance our future.

To further clarify the argument: Most financial experts and academics agree that a carbon tax is the best redistributive measure. Theoretically, it would be the mechanism to shift corporates, consumers, and states away from the fossil age toward a low-carbon-oxid economy. But the argument has several flaws. Firstly, implementing a carbon tax would require a high level of global consensus, as states and corporates would otherwise be incentivized to avoid the tax. Secondly, a carbon tax would have a massive impact upon the entire value chain. Currently, the average barrel of crude oil costs around \$10. To remain within the 2DS, a barrel would need to cost around \$75–100, and this increase would need to happen within the next 10–15 years. This means that most products along the value chain would face massive price and cost pressures with hugely disruptive social consequences, which are next to impossible to anticipate. >>



In other words, the dilemma is the following: We have to increase carbon tax and reduce the direct and indirect subsidies for all fossil energy, which will make it possible to lower CO₂ emissions in the atmosphere on a global level. At the same time, we have to reduce the tax burden and increase subsidies for renewables on a local and global level. Both of these strategies interfere with social and ecological tradeoffs on the local and global levels, such as overcoming poverty and hunger and protecting biodiversity, among other things. In such a complex, mixed, and unforeseeable situation, technology, taxation, subsidies, and regulation are part of the solution, but they are not the solution. Focusing only on taxation and regulation overlooks the speed, volume, and magnitude required to ensure the shift. Instead, it generates endless “socio-ecological paradoxes” and forces us to engage in multilevel re-regulatory efforts to compensate for unwanted social impacts. Such paradoxes are created when we want to do good and avoid harm, but they create the exact opposite. For example, if a nation representing 3–4 percent of the global burden of atmospheric CO₂ decides to exit the fossil age, the shock caused by the drop in demand for fossil fuels would trigger a decrease in the prices of fossil fuels for the rest of the world, leading to increased consumption.

The impact of impact funding

Ratings are a tricky problem. On the one hand, it is crucial that we learn to differentiate between green and “brown” or “black” investments. However, studying corporate reality reveals that, on average, about 20 percent of all tangible and intangible assets as well as short-term and long-term spillovers can be managed and mitigated within the corporation only. Anything above this would cause the

business to collapse. We can differentiate between three levels.

1. SCR and ESG criteria on a corporate level.
2. Sector level that implies value chains, customers, and clients as well as the social and ecological environment by proxy.
3. Systemic level. This requires a shift in the incentives to make it happen.

List 2: Ratings are tricky: from SCR to sector to system

Corporate profits are near record highs but are realized on the basis of huge, unpriced, negative externalities. Such negative externalities are transferred to

TAXONOMY is key to ensuring private equity impact-funding. There are initiatives by different stakeholders (NGOs, politics, the corporate world, science) with different interests and objectives that have to be reconciled. Essentially, we require a matrix that allows us to evaluate, measure, and compare the entire expenditure of human economic activities. This includes a “total costs analysis” upstream and downstream along the value chain; integral accounting; improved comparability for mergers and acquisitions; and measuring and evaluating the impact not only on profit, but on human wealth in general. In addition, we need a relative benchmarking for different sectors (such as aluminum, cement, agriculture) and between sectors, facilitating comparability as well as improving corporate decisions (de-risking) and public awareness on different levels (OECD, EU, G7, G20). Finally, we need an enabling environment for harmonized regulation and taxation that would set up a new global accounting system for every agent involved. Initiatives such as these that seek to better incorporate natural, social, and human capital have been around for at least 30 years. However, most of them already failed at the stage where the different stakeholders provide completely different views on the topic. For example, international accounting firms already have different opinions on how to evaluate and measure an upstream impact of child labor or water pollution on the corporate balance sheet. We might end up with three findings: relative banning, relative benchmarking, and single case-to-case approaches.

tax payers and governments. Disruptive and involuntary system changes can lead to unprecedented suffering and costs. Any change by design is better than by disaster. We have to differentiate between the sign and symptoms on the one hand, and the overall root causes on the other. Whereas ranking refers to symptoms in the form of further transparency, information, and documentation, the root causes lie in the monetary system itself. A system change such as this does not mean that we have to do everything all at once at the same time, but we do have to consider (almost) everything to ensure this integral change.

Generally speaking, investing in something is a commitment to the future and



“impact investments” even more so because they consider not only the returns in terms of money, but also the “impact” such an investment can have upon social and ecological perspectives. The higher the impact, the better. In 2017, the value of such impact funds — where capital is primarily divested from the fossil sector into the green sector — totaled \$250 billion. The taxonomy of impact funds (brown or black versus green) differentiates between good and bad investments in relation to their impact on social and environmental welfare (a “good” investment would involve no tobacco, no weapons, no coal, no alcohol, no child labor, etc.). In this respect, impact funding is the right choice. However, several aspects demonstrate that the matrix underlying impact funds is flawed. Firstly, the volume of funding is far too low and the speed too slow to guarantee any significant shift. Secondly, the approach is too silo and too micro, maximizing the interests of lobbies

without seeing the full picture on a macro level, which has to balance and reconcile the many different interests with each other. Thirdly, the impact funding strategy is skewed toward parts of the world with higher environmental, social, and governance (ESG) standards. This occurs at the expense of more vulnerable regions on the planet, where liquidity is most needed. Fourthly, the shift toward green bonds will put a risk premium on the old brown and black bonds, which will make conventional investors resistant to changing their portfolios or encourage them to simply greenwash their assets. All of this together will create further regulatory and documentation efforts and do little to nothing to change the negative impacts on the environment.

Impact funds remain a complex, well-nigh unresolved story of excluding or banning industries. There is even a strong argument for remaining invested in critical industries in order to keep control over the executive management and steer it toward greater social corporate responsibility and higher ESG standards. Whereas theoretically the difference between a “green,” a “brown” (fossil), and/or a “black” (guns, drugs, alcohol, child labor) investment is easy to make, in practical terms such a taxonomy has to take into account all the different business models and corporate shares and interconnected corporate participation. In short: Are Volkswagen and Apple green or brown? Are SAP and Deutsche Bank green, brown, or black? Those corporates that fail to achieve the “green” label will withdraw their collaboration, as they might have to pay a higher risk premium on their assets. Finally, the strategy behind impact funding leaves the 2DS almost untouched, as we see below.

PRIVATE EQUITY FUNDS

historically have high yields ranging between 19 and 25 percent annually. In a world where GDP grows by 2–3 percent and private investors demand 10 times more, this revenue has to come from somewhere. In fact, most of it comes directly or indirectly from the lack of financing for public goods. This means that instead of funding public preschooling and collective healthcare; protecting against pollution; eradicating poverty and hunger; and averting the collapse of biodiversity, the money instead goes into the private sector, where “high-net-worth individuals” realize additional returns. A 19–25 percent return for private equity, even with additional impact funding, is an unrealistic scenario in a world where the wealth gap is increasing and public common goods are underfunded. Private equity is a small part of the solution, but it is not the solution.

Private vs. public financing of the commons

From an investor’s perspective, agents who invest in state bonds, pension funds, and/or private equity and who are engaged in impact funds represent clients’ selective interests. These interests are fundamentally mismatched with those of the global commons. Financing the SDGs requires an agent or co-signer with provision and revenue interests representing the global commons themselves. The United Nations, the World Health Organization, and the World Bank are three examples of such agents. In addition, the more connected we are, the more we need to invest in common goods. A real initial impact investment honors the fact that the commons come first and private investment second; it honors the fact that taxation, fees, donations, and other forms of redistributive financing are too slow in speed and too low in volume to >>



PRIVATE-PUBLIC CONTRACTING

allows for a long-term perspective, especially in critical infrastructure such as energy, health, education, and telecommunications. In 2017, \$90 billion was contracted globally, down from a peak in 2012 of \$140 billion. The World Bank advisory offers blueprints and guidance on how to contract private- and public-sector interests. However, the devil is in the details. De-risking is the major issue, where both sides have to clarify who is going to take the risk in the case of “force majeure,” such as natural catastrophes, terrorism, or state failure. Who is the insurer of last resort? How to determine payments, and who is fully and who is partly compensated? What is the very nature of the financial assets (bond, bank financing, or corporate financing)? The International Center of Settlement on Investment Disputes associated with the World Bank seems to be just one institutional alternative among others. In order to de-risk the project for the private sector and make it bankable for the public sector, both sides have to give in: The private sector has to surrender its high-yield expectations and its short-termism, and the public sector has to tackle corruption and bad public management. There is currently a tendency toward partisanism and to advocate for private-sector money instead of public procurements.

ensure the required change. Financing of the commons should not be a transitory measure in the case of economic crises, but rather a constant monetary intervention to ensure ongoing societal transformation toward a sustainable future.

From derivatives to hybrid ex-swaps

During the last two decades, derivatives were the new kids on the block. In an unstable economic environment, it was rational for investors to buy first-, second-, or third-tier derivatives in order to reduce the risk of failure. The “hot potato” could be handed over to someone else, and at the end of the day, someone always paid the bill — mostly taxpayers. These times are over. The greater the extent of our global interconnection and the more a risk is identified as systemic, the less a derivative can help leverage or hedge the investment. Put the other way around: As long as a risk remains local or sectoral, a deriva-

tive is a rational instrument to hedge microeconomic risks. This is because diverging expectations regarding a risk can be leveraged by buying a derivative. However, the rise of our global interconnectedness causes risks to be shared at a systemic level, where they can no longer be geographically or sectorally isolated. Future expectations such as pricing in the impact of global warming will be more likely to converge than diverge. This explains the increase in asymmetric shocks, where the agents in question did everything right, but still they were hit by the unexpected consequences of negative feedback loops and fat tail events, all of which have widespread repercussions. In this situation, using a derivative of any sort is an irrational financial decision because rather than reducing risks, they produce further systemic risks and lead to additional costs. A rational investor in the era of the Anthropocene fully understands this risk assessment, and therefore requires a different financial environment in order to become invested.

NIMBY (not in my backyard)

When the Vatican, for example, switches from brown to green investments, it clears its own balance sheet. However, the situation in the real world has not changed at all, because the brown or black investments — for example a coal site, mine production, or child-labor-intensive products — from which it has divested will still pollute the air and kill humans. Nor will this divestment change the working conditions for the children, whose labor will now be under different management that may be less competent than the former. This hot potato will thus be handed on repeatedly, but the ecological and social impacts will remain unchanged. In an unstable, non-linear complex scenario, only a so-called ex-swap asset makes sense: Swap the asset



and close down and exit the previous one as fast as possible to avoid asymmetric shocks, non-linear feedback loops, and increasing costs of damage control.

If such a global exchange bond or a global swap were created — where brown fossil fuel investments could be swapped for large-scale green investments — companies and investors would not face extinction but rather experience a very steep transition to different types of investments and businesses. These large-scale projects could include things such as reforestation of the Sahara, the electrification of Africa, and many others that have been outlined by various organizations. To overcome shareholder-value maximization, most ex-swap assets require a contract with the public sector, providing a co-signer with a long-term perspective. Globally, 200 fund managers manage \$47 trillion in assets, which is more than 50 percent of global GDP. So, if we want to gain momentum for a change toward a low-carbon economy, we need to get these 200 fund managers in one room and tell them what to do.

Hybrid private–public partnerships (hy-PPPs)

The standard argument is that we have a lot of liquidity in the market. We simply have to create an environment that will enable private investors to make green investments. Indeed, there are close to \$300 trillion in financial assets, in which institutional investors hold about \$150 trillion assets under management. Yet, less than 2 percent is invested in infrastructure or common goods, and about 10 percent of investments have negative yields. If we think this proposal through to its end, we will end up living in a privatized world: The investors' interest is to provide as much purchasing power as possible to fuel the consumption level

of the Baby Boomer generation of the Western world. This is indeed a feasible scenario for about one-third of the SDGs, but not for the other two-thirds — these are (global) commons and require an entirely different financial approach to ensure our common future. One way to guarantee the financing of the commons is a co-signer principle, with a different public and a common protagonist's skin in the game — a protagonist following a different agenda than privatizing the world. The federal public sector and the international multilateral development banks (European Investment Bank, World Bank, Asian or African Development Banks) are such candidates.

In a fully connected world, there is no private without public — there are more and more hybrids. In fact, this situation requires a closer look with regard to the agents and protagonists involved. In a country with a low income level, a low tax base, low tax-collection levels, and a high debt burden, there are a variety of possibilities for the private and public sectors to generate additional liquidity to finance public goods. Each possibility follows a different protocol, risk assessment, liability, and type of politics. Done the right way, they reverse short-termism toward a long-term view, reverse maturity toward long-term yields, and honor and foster the relevance of public goods and infrastructure for a common sustainable future.

Take the generally accepted UN human right for access to fresh potable water for every human being. Should we privatize this right so that all freshwater springs become a private equity and these equities are then sold to humans with private yields, which then increases the wealth of the owners of those springs? As more than 500 million people do not have access to fresh water, the owners

of these springs would have to be taxed to generate sufficient revenue to ensure that those 500 million can exercise their right to access drinking water. Instead of this linear process of privatizing the commons and taxing the private yields, we could start creating hy-PPPs, where 5 percent of the assets are private and 95 percent public, for example. The public money comes from a monetary source in the form of parallel green additional liquidity (earmarked for this specific right, see details below). This combination can bring private entrepreneurial expertise and risk assessment together with a public co-signer (such as a governmental body or an international development bank). Yields, maturity, liability, and risks are split respectively, and both agents (private and public) have a long-term interest, creating a win-win situation with constant private revenue and more healthy people while meeting public interests at the same time: There will be fewer negative social spillovers, such as healthcare costs for the treatment of diarrhea. A healthier population is able to attend school, do business, pay taxes, extend their lives, and increase their own wealth and the wealth of nations in parallel. This is true for all global commons: fresh air, access to basic healthcare, schooling, protecting biodiversity, and reversing global warming, among others.

A common is a common and remains a common as soon as we, as a world community, declare it a common. Private equity is private equity as soon as we, as a world community, declare and define it as a private asset. However, the financial tools for achieving both are different. Financing the commons as commons requires an entirely different approach than turning them into private equity. Do we want to live in a fully privatized world? No, we do not. Instead of >>

violating the nature of the commons, we should adopt the financial architecture to the nature of the commons and not the other way around. This requires a shift in our mindset and a shift in the architecture of our monetary system.

End-of-pipe financing and redistributive measures

The most commonly advocated form of financing for our commons is so-called cofinancing, which constitutes the core argument in most, if not all, economic proposals on financing the social and ecological commons. So far, the staircase has been following this rationale. Cofinancing has the following rationale: Goods and services freely traded on the market are taxed, and this revenue becomes the main source of finance for common goods. In this widely accepted view, the commons are secondary and subordinate to the activities of the free market. Only when the market generates sufficient yields and liquidity and the political will is strong enough are common goods eligible to be financed. This cofinancing strategy is a form of end-of-pipe technology, well known in engineering science: We first implement a technology, lifestyle, or economic activity that harms our environment (e.g., polluting fresh air), then add a filter at the end of the process (i.e., at the end of the pipe) in order to avoid too much damage. The cofinancing strategy follows the same rationale. The economy grows first, we take a certain amount of money (through tax or fees) from the added value chain, and finally distribute it to social and ecological projects.

Parallel currencies

So far, we have been working our way up the six-pack ladder, defining new financial engineering in the Anthropocene. One step — probably the biggest one — is still missing: a parallel currency system. This is necessary because the first five steps are unable to guarantee the volume of liquidity required and the speed we need to generate sufficient purchasing power. A parallel currency system is about additional, optional, targeted liquidity or purchasing power, running in parallel to the given system, designed (partly) differently to the well-established monetary system. It uses new technology (mainly distributive ledger technology) with a smart contract, earmarked to (mainly) finance our global commons and operate through complementary monetary channels. This mechanism would make it possible to steer economic decision-making, stabilize the overall economy, and orient our entire society toward a sustainable future in a coordinated way.

A parallel currency system could be implemented through new third- or fourth-generation blockchain technology in digital form only, competing with bank deposits and conventional cash money as a medium of exchange, a store of value, and an international unit of account. It would operate in parallel to existing currencies and be eligible for the payment of

taxes and wages. Such green “central bank digital currencies” do not settle wholesale inter-bank payments like reserves do, nor do they provide anonymity like cash does — they have a larger direct impact on the retail markets. They can achieve a significant welfare effect through targeted and earmarked outputs. This can happen through three alternative channels. Firstly, it can serve as a “citizen dividend,” whereby the additional money is given to private households either directly or via tax reductions, stimulating consumption. Secondly, the money is given to the public sector, stimulating public infrastructure (education, security, health). Besides this “public channel,” there is another, third channel. Here, the money is given to NGOs, SMEs, or local community organizations. In the traditional perspective, we generate unspecific, expansive growth in a first tier and then battle with regulatory efforts and transfer payment systems (fees and taxation) to generate enough money to finance ecological and social projects in a second tier. In this new approach, the money is distributed first.

It is this pre-distributive design rather than a redistributive mechanism (end-of-pipe financing) that has the potential to shift and transform our entire society, moving it in the right direction. It will increase the overall welfare effect in the form of millions of green jobs, fewer illicit transactions, additional green growth, an enlarged green tax base, and reduced costs for negative spillovers and disaster management, among others. Such a parallel optional currency mechanism would provide targeted, programmable, identifiable, recordable financial transactions and earmarked and dedicated funds, avoiding fraud and corruption. This would create a new parallel marketplace for the 75 percent of the world population that has not been benefiting from the existing operating model. This new mechanism would also eventually become intertwined with the traditional sector and would provide central bankers with an additional monetary tool to achieve price stability, employment, and the global commons at the same time. The residuum left — meaning the additional liquidity injected through this mechanism — is determined by whether, and to which extent, the previous five steps of the six-pack have been completed.

The multi-step approach to a sustainable future: the six-pack

To note: In this perspective, the higher the global consensus is on the lower steps, the lower the necessary effort will be for all further steps. For example, if we can come up with a global agreement on regulating tax havens, common accountings standards, harmonized ESG criteria, and a global carbon tax, we may end up with less need for ex-swap asset strategies, public contracting, and a parallel currency system. The lower the level of global consensus achieved on the lower steps, the bolder the decisions will have to become on the higher steps. Assuming that we end up with next to no global governance consensus but still want to finance our future, we will have



to make the effort to install additional parallel liquidity to ensure the transition from a high-carbon society to a low-carbon one.

Conclusion

What is required is an exit strategy aiming for a rapid phase-out of high carbon emissions and socially critical projects that not only guarantee the end of our high-carbon-oxid economy, but also lay out a plan to shift to a low-carbon economy, while consolidating existing collaterals such as pensions, private insurances, and so on. This procedure requires a new financial mechanism that differs from the approaches taken in the past, such as hedging, leveraging, and derivatives.

The scope, speed, scale, and symmetry (4-S) of the challenges ahead should match the 4-S of the solutions. Unprecedented action must be taken, or we will have to bear unprecedented consequences. Thinking the unthinkable will be the most advantageous and rational strategy. A successful risk analysis requires overcoming the executive myopia

and linear thinking predominant in corporate and public leadership, beyond the “least drama” and “lowest common denominator” scenarios. These “business as usual” scenarios have simply become far too expensive. What is required instead is an emergency-like transition to a post-fossil era. Finding the fastest and least disruptive way to do this is key, as time is not on our side. The new financial mechanisms described will make the world safer, more resilient, more foreseeable, and more certain. Traditionally, we have gone to vast lengths to regulate the given system with taxed economic activities and increased charity, philanthropy, and private pledges, and we have redistributed that money to social and environmental projects — with reasonable but insufficient results.

To conclude, the multi-step approach of regulatory efforts — including stress tests; agreed accounting systems; total costs approaches; wise taxation and steered subsidies; private-impact funding with relative benchmarking; a negative ban list and case-to-case management; new ex-swaps that guarantee the phasing out of the fossil age; and hy-PPPs, which al-

low for a longer-term perspective — will finally achieve the necessary but hitherto lacking liquidity and purchasing power through a parallel currency system. All steps together provide the rationale for such a multistakeholder approach.

If we consider the timeline of 15 years, the magnitude and additional volume required (\$4–5 trillion annually) and the fact that half of the world population is living in either autocratic systems or failed states, achieving a global democratic mandate seems unrealistic. We require a bold and unorthodox approach on how to finance our future. Considering further the little leverage available on a corporate and sectoral level and the high amount of leverage possible through a systems change, there are six steps we have to accomplish as a world society. If we do this in a smart way, we will generate a situation beyond the tradeoff between social and environmental challenges: We will end up with millions of jobs, a cleaner environment, and a better place to live. The mechanism presented here — or a very similar one — will be the fastest and least disruptive way to ensure this change. ■

