Report
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Climate: The Price of Conquest

In the previous Report, we sought to understand the reasons why the climate issue, despite being on the agenda of global discussions for the last fifty years, has become a serious and urgent problem. To this end, we used two analytical tools as compasses for our investigation: complexity and collective action. The first explains the difficulty in seeing with the naked eye the dynamics of the various elements that interact in the phenomena of nature until they manifest — often catastrophically — as "emergent properties." In this case, in the form of storms, hurricanes, droughts, fires, extinction of species, and degradation of biomes, among others. The second furnished us with the lens for interpreting the gradual progress of decades of collective concerted efforts to address a global problem involving externalities, multiple time scales, and dispersed incentives.

Equipped with both tools, we briefly perused the major Conferences of the Parties (COPs), the forum that concentrates negotiations and guides global climate governance. Next, we took a critical look at the design principles and outcomes of the conventions. Finally, in light of the empirical record and well-founded economic theory, we observed that the conferences have failed to bring together the two ingredients required to adequately address the problem: common reciprocal commitments and enforcement.

Carbon Price and Markets

And what would be the best candidate to establish the common commitment needed to overcome the problem of global collective action and promote good climate policy? Economists and policymakers suggest carbon pricing as an ideal instrument. A price on carbon addresses the climate issue in the most direct, efficient, and transparent way by internalizing the externalities caused by greenhouse gas emissions. Price provides the signals and incentives for consumers to adjust their preferences, for producers to assume the negative effects of emissions as costs, for entrepreneurs to seek innovative solutions in renewable and/or less carbon-intensive technologies, and for the capital market to mobilize financial resources for these activities. Joining a carbon market is a way to submit to a common commitment and, at the same time, an enforcement mechanism. Besides linking incentives to values and providing the informational signals necessary to trigger efficient decisions, participating in the market expresses agreed reciprocity, thus paving the way for effective cooperation.

The carbon price introduces a benchmark against which the costs of various abatement strategies can be measured and compared, thereby making decarbonization efforts more cost-effective. A carbon market should also eliminate the procrastination game that has dominated the climate diplomacy agenda over the past three decades (Cramton et al., 2017). Conceptually, an international price would facilitate reciprocity and enforcement, simplify negotiations by setting the focus on a single variable and bring more flexibility to national climate policies. Carbon pricing policies also make sense from the sole perspective of countries' domestic interests, as they bring environmental benefits to the local population as well as tax revenues that stay within the country and tend to outweigh the costs of mitigating undesirable climate effects (Parry, 2017).

After decades of half-hearted progress, over which climate negotiations have failed to align interests and incentives to overcome the difficult problem of global collective action, carbon pricing appears as a conceptually robust and potentially promising design. While the textbook solution suggests a common international price as the most desirable, in practice this will not be the case. We already have different carbon trading environments on the table. At this point, it may be useful to quickly survey the taxonomy of these markets.

First, the arena governed by the International Agreements. In Kyoto, the market instrument was the so-called Clean Development Mechanism (CDM). Paris replaced the CDM with NDCs (Nationally Determined Contributions), voluntary, step-by-step emission reduction targets announced by signatory countries. Under NDCs, countries can transfer mitigation results directly among themselves (articles 6.2 and 6.3), or public and private entities can trade credits validated in mitigation projects from a baseline system (articles 6.4 and 6.5), as long as they comply with the rules of the agreement's governing body. In both instruments, it is important to avoid double counting of traded credits by performing so-called "corresponding adjustments," whereby the seller increases its NDC by the amount traded to accommodate the buyer's NDC reduction.

The Kyoto Protocol established the first international carbon market, having its rulebook approved in 1997, consensualized in 2001, and ratified only in 2005. Paris succeeded Kyoto and had a new rulebook agreed upon in 2015 which was finally approved late last year in Glasgow. The regulation of Article 6 was one of the most celebrated outcomes in Glasgow. It is estimated that it can stimulate more ambitious NDCs, reduce their total implementation cost by about US$ 250 billion/year, and thus facilitate the removal of approximately 5 GtCO2/year by 2030 (IETA, 2019).

The liturgy of implementing the rules of the Agreements is slow, and even after the wording of the text has been agreed upon, discussions continue in the phase of interpretation and practical developments. In parallel, several national and subnational entities have moved toward developing their own regulated jurisdictional domestic markets. The World Bank (WB, 2021) currently counts 64 different carbon pricing initiatives around the world. The two most common mechanisms are (1) taxation and (2) emissions trading systems (ETS), otherwise known as cap and trade. In the tax system, a rate is established that is levied per amount of greenhouse gas produced, usually expressed in dollars per ton of carbon dioxide equivalent (US$/tCO2eq). In the ETS, certain activities and installations receive free or acquire rights via auctions allowances to emit that can be traded among the regulated agents.

The discussion between the relative advantages and disadvantages of the two models is a drawn-out one. Taxes are more direct, easier to implement, and have lower transaction costs, but they can be tied to the rigidity of tax legislation while also being more vulnerable to changing political preferences. ETSs tend to offer greater flexibility and at the same time institutional longevity. On the other hand, the cap and trade system requires greater regulatory density and can give rise to bargaining, cheating, or capture by the government when permits are distributed. In the taxation model, the price is fixed and the quantity of equivalent tons of carbon traded is variable, a scenario that offers no guarantees regarding the effective environmental result. In the cap and trade model, the quantities are known, but the price varies according to the supply and demand of credits, hence the historical volatility in these markets. In theory, from a strictly economic point of view, the two models are practically equivalent.[1] In practice, the choices between the two main systems have been driven by factors of political economy (cf. CDPP, 2021).

1 *Less for relative differences in the slopes of the marginal cost and benefit curves of emissions mitigation. In the presence of uncertainty, the models diverge. One should opt for carbon pricing when the uncertainty is greatest in the marginal cost of mitigation, and for ETS when the uncertainty is greatest in the marginal damage curve (Seroa da Motta, 2018).*

According to the ETS logic, installations should have their emission reduction targets stipulated (capped). If they fail to meet them, they must offset their excess emissions by acquiring emission rights or offset credits in the market (trade) and are thus charged for producing negative externalities. Taxation and ETS are pricing instruments used in regulated (or mandated) environments, where the scope of participants' actions is established by a regulator, which is usually the government.

An ETS requires a robust institutional framework with definitions according to a regulatory framework and precise roles for public administration bodies. These must have the ability to supervise; enforce regulations; manage the registration systems, trading platforms, and emission inventories; and register certifiers. In short, they must be capable of performing all necessary tasks for the establishment of a mandatory, standardized, and robust emissions monitoring, reporting, and verification system (CDPP, 2021). In formatting an ETS, there are two main concerns: the competitiveness of the participants and the possibility of carbon leakages. Hence, the care of the design elements in relation to the allocation of permits and the presence of the so-called compensation mechanisms in international trade, whether they are carbon border adjustment mechanisms (CBAM) or export exemptions.

Carbon markets, when linked to World Trade Organization (WTO) rules, can acquire even more interesting compliance strength. Under the rules of an international agreement, carbon taxation can be considered a cost of doing business. Therefore, avoiding the payment of this charge with the complicity of governments could be considered a subsidy and, as such, be subject to the compensatory penalty procedures under the WTO. Similarly, non-signatory countries could also be reached by the same sanctions (Cooper, 2017).

And what would be the performance evaluation of the carbon pricing experiments thus far? The World Bank recognizes as "encouraging" the finding that governments and companies are integrating carbon pricing into their climate strategies and highlights the progress of initiatives, with emphasis on robust carbon pricing policies, which would already cover 21.5% of global emissions (WB, 2021). On the other hand, it also recognizes the need to urgently expand the scope and ambition of these instruments, whose prices at the time of the report ranged from less than US$ 1 /tonCO_2eq in Poland and Ukraine to US$ 137 /tonCO_2eq in Sweden. Experts suggest that a price of US$ 40-80 /tonCO_2eq would be needed to aim for the 2°C target. Estimates for the so-called "social cost of carbon", which reflects the marginal damage caused by each additional ton of GHG emitted, would also be in the range of US$ 40 /tonCO_2eq.

A simple reformatting of the data presented in the World Bank report shows that over 90% of the volume of GHG emitted is concentrated in markets whose carbon prices are less than US$ 10/tonCO_2eq (Jenkins, 2019). In other words, a more critical reading indicates that pricing instruments are still very ineffective. The reason for the delay? Some suggest a well-known villain: political capture by interest groups. The climate issue involves, on the one hand, dispersed actors with an interest in the distant common good. On the other, private incentives focused on the present. In the balance of forces, more organized sectoral coalitions prevail and manage to control the reform agenda (Cullenward & Victor, 2017).

Others see the gradual advance of pricing mechanisms as inherent in the nature of these arrangements. Like international agreements, the implementation of domestic carbon pricing instruments, in so-called regulated jurisdictional markets, takes time to develop. Especially emissions trading systems, which involve greater institutional complexity. The European Union, which houses the most remote and extensive international cap-and-trade experience (EU-ETS), stands out as an example that validates a more constructive view. After an ambiguous start, with too many permits in the early phase, periods with little liquidity, and high historical price volatility, it is now recognized that the system has, since then, been responsible for enabling a significant reduction

of emissions in the energy and heating sectors of 43%. Last year, revenues from allowance auctions reached US$ 22.5 billion (EU and WB, 2021).

On the eve of coming of age, the European scheme entered its fourth regulatory phase and is still adjusting guidelines. One important development was the market stability reserve (MSR) mechanism, conceived in 2015 and which began operating in January 2019. It determined a cap on the total number of permits in circulation, thus addressing the oversupply problem so frequent in the past. At each stage, new regulatory tradeoffs emerge, challenging the skillfulness of the Commission's policymakers. One illustration of the dilemmas on the agenda relates to the permit granting regime as a way to protect the industry in the first instance as companies invest in less carbon-intensive processes. With the recent (and significant) increase in the price of natural gas, under equal conditions, the green hydrogen production route in certain sectors would already be more cost-effective than blue hydrogen.[2] It so happens that with the "protection" of the permits, green hydrogen loses its competitiveness. That is, in this case, the incentive ends up acting in the opposite direction. Another difficulty consists in coordinating the gradual reduction of permits at the same time as carbon border adjustment mechanisms (CBAM) are introduced. The reduction of permits before the implementation of border adjustments could cause the transfer of production from the European industry abroad (carbon leakage). On the other hand, border adjustments cannot be carried out while the allowances are in effect; otherwise, WTO rules will be violated. In other words, a calibration error in regulatory fine-tuning could generate important losses or delays. Not to mention the impact of reduced permissions on European exporters, something for which, to date, there is still no resolution. Still, despite all the difficulties, flexibility in the ability to make adjustments in real-time builds credibility and resilience for the consistent advancement of the trading system.

Brazil is also mobilizing to implement its emissions trading system. We don't need to reinvent the wheel but merely take advantage of the lessons learned from the experiences of gradualist implementation in international schemes. The proposal forwarded to the National Congress in the form of a bill is interesting because it has the legal force to implement the Brazilian Market for Emissions Reduction with the entire set of necessary constituents: regulatory framework, institutional framework, competent bodies, regulation designs, and legal/tax treatment. The proposal also suggests the implementation of a greenhouse gas compensation market. The substitute for Bill 528 missed the legislative window in December and awaits an opportunity to return to the legislative agenda.

The reality of a regulated market in Brazil should take several years to become a reality. Following the steps of the European Community, we must advance gradually to avoid disruptions and not compromise the competitiveness of the participants — we must give them the necessary time to live and learn with the new regime. The initial phase will likely include Scope 1[3] emissions from fossil fuels and industrial processes. On the other hand, unlike the international reality, we know that Brazil presents particularities; for example, most of our emissions come from land use. We have a potential stock of low-hanging-fruit emission reductions in all segments — solar, wind, biogas, energy efficiency — but in particular in activities that involve land use. These range from fighting deforestation and more sustainable management such as the adoption of integrated crop-livestock and forest systems (ILPF), to forest conservation and restoration activities, among others. Establishing a

2 *Green hydrogen is produced from the electrolysis of water with energy from renewable sources. Blue hydrogen is obtained from the steam reforming of natural gas with carbon capture, utilization, and storage.*

3 *In the taxonomy of emissions, Scope 1 are the emissions under the direct responsibility of the facilities/companies resulting from their own activities. Scope 2 are the indirect emissions from the use of power grid facilities. Scope 3 are the indirect emissions not controlled by the company, produced along the entire value chain.*

robust institutional framework that connects us to the regulatory structure of the International Agreements will allow Brazil to take advantage of its competitive advantages in low carbon activities, benefit from commercial transactions, and earn revenues derived from the use of these instruments.

Even so, conceptually it makes sense to advance now in the regulation of emissions from fossil fuels and industrial processes because they will continue to grow; also, the stock of abatement coming from land use is finite. It is also recommended to place limits on the volumes of offsets coming from the agroforestry sectors in order to avoid the accommodation of efforts in other sectors, especially industry and transportation.

If the regulated market should become a reality only in the medium term, wouldn't it be rather premature of us to dedicate two Reports to this subject? We believe not, given the recent remarkable awakening of civil society and the private sector. Companies, financial institutions, asset managers, and investors are moving more swiftly than political diplomacy and public officials, and are beginning to take their seats on the climate stage. Some examples and figures to illustrate. The so-called Glasgow Financial Alliance for Net Zero (GFANZ) in just one year of existence has managed to mobilize 450 members committed to aligning their portfolios with carbon neutrality goals. Spread across 45 countries, the financial resources these institutions represent amount a total of US$ 130 trillion. According to the IEA, the investments needed in all sectors to promote the transition to a carbon-neutral world in 2050 would be about US$ 4 trillion/year. In other words, in theory, under GFANZ alone, at least in the realm of aspirations, the financing needs for the transition would already be covered. The Science Based Targets initiative (SBTi) lists 2,700 companies around the world engaged in leading their transitions to a zero-carbon reality by committing to register on a platform based on exclusively scientific protocols. Likewise, Race to Zero is a United Nations campaign bringing together non-governmental entities committed to halving their emissions by 2030. The initiative includes more than 1,000 cities, 5,200 companies, nearly a thousand educational institutions, 400 financial institutions, and 3,000 hospitals.

Faced with the engagement of consumers, collaborators, and public opinion, and under the increasingly scrutiny of social media, environmental activism, and investigative journalism, pressure is growing on companies, which respond by upping their commitments to social responsibility and environmental goals, including the desire to offset emissions from their activities. Most of these companies are below the emission threshold above which their facilities are required to participate in the regulated market. And even those that will potentially be reachable by the jurisdictional markets are getting ahead of the curve while regulation is not established. Thus, at this first moment, demand will be channeled to the so-called voluntary market, where emission mitigation projects implemented voluntarily should be offered. The challenge of the voluntary markets is to offer quality credits backed by substantive processes that guarantee the fundamental attributes of environmental integrity, additionality, and permanence. If arranged in this way, that is, validated by high-standard certification processes, these premium credits will probably be able to transit through the regulated environment, something that is already provided through the so-called offsets. In this niche, the two markets should meet.

When developed, the regulated markets are estimated to be ten times larger than the voluntary ones. The fate of low-quality credits in the voluntary markets may be difficult: low liquidity and degraded prices, reflecting a possible bifurcation within the voluntary market itself.

There is also a fourth emissions reduction and offsets environment that covers transoceanic activities not covered by the Climate Convention, such as civil aviation and international maritime transport. By their nature, these are segments that make it difficult to assign precise responsibilities to each country. Moreover, these activities are already governed by specific international agreements.

Finally, there is one last pricing mechanism — not a market per se, but a tool. This is the internal or shadow price of carbon, a parameter that allows emitters to compare alternative investment projects or capital allocation decisions by properly factoring in environmental costs. In our interaction with Dynamo's investee companies, we often recommend the use of this device. As companies prepare for the long journey of decarbonization — some announcing their ambition for net-zero trajectories for the next thirty years — an internal carbon price already prices in the possible externalities. It introduces the fundamental element of the "time value of carbon," by attributing a specific weight to near climate actions and adequately discounting more distant initiatives. Of course, because it is an internal artifice, with little transparency vis-à-vis criteria and methodologies, it is difficult to judge its effectiveness. The fact is that more and more companies are willing to use it. A CDP survey found that more than 2,000 companies around the world admit to employing an internal carbon price, with almost half (45%) among the 500 largest (in market value of the FTSE Global Equity Index). In this study, the average price used was US$ 25/ton (CDP, 2021).

Transition

Even with all the emphasis we have given so far, we know that carbon pricing is a necessary but not sufficient condition to address the climate agenda. It must be accompanied by other initiatives that direct resources to innovation and abatement strategies. Even so, the carbon market triggers the relative price signals to move the gears and accelerate the energy transition. The speed of change is the great unknown. If we look at the past, the two great energy transitions — from wood burning to coal in the 19th century and from coal to oil in the 20th century — lasted, on average, about seventy years. E&P (exploration and production) activity continues to show technological progress and productivity gains with the embedding of digital tools. Also, the industry's infrastructure, from wells to wheels, is well-established, capillary, and efficient. Oil, the incumbent, is a respectable competitor. So much so that despite all the progress in the climate discussion and the gradual advancement of pricing instruments, global emissions continue to rise. It is estimated in the business-as-usual scenario that global emissions will increase by 16% by 2030 (base 2010) when in the path compatible with a 1.5°C warming emissions would need to decrease by about 45%. Last year, total coal use in power generation reached a new record high of 10,350 TWh (IEA, 2021).

The rapid return of post-covid economies coupled with the 50% drop in investment in an industry suffering from natural depletion has pushed hydrocarbon prices higher. Could the rise in oil prices be a warning sign of a botched energy transition? Some believe so and see reasons for caution. Others see it as natural and point out that the spasms in the commodity are the best evidence that the transition is already underway for they reflect the reality of the one-way decline in investment in the industry which in turn manifests the degree of insecurity of the insiders themselves about the future.

Oil demand and supply are inelastic in the short term, since alternatives to substitute consumption are either unfeasible or too costly, while new projects are slow to materialize. In order to provide the necessary incentives to move such inertia, the agents need to be convinced that prices will sustain at this new level for a long time. An invincible uncertainty at this point. Meanwhile, the price increase in the short term is already triggering responses that show the temporal dilemma of the climate issue: instead of making sacrifices now for results later, we see several reflexes in the opposite direction — the search for immediate results for sacrifices down the road. And so, for example, several countries, including Brazil, have gone back on their biofuel blending targets; natural gas supply problems have led "green" nations like New Zealand to increase coal imports and use in their thermal power plants; Poland complains that its allowances deficit will consume important resources, thus compromising the country's ability to finance renewable investments, and the European Community itself intends to include natural gas and nuclear energy under the rubric of "sustainable"

sources, a decision environmentalists consider a historical mistake.

Likewise, Russia's invasion of Ukraine exacerbates the temporal dilemma of the climate issue. A somewhat surprising conflict — with unprecedented responses, whose unintended consequences in geopolitical and socioeconomic terms few risk assessing — has pushed the world into survival mode. In critical situations, the present becomes urgent; the future loses relative importance. In other words, our intertemporal discount rate has increased significantly. Under the threat of escalating war or even nuclear danger, all other peacetime constructs lose perspective. When it comes to climate policy, Germany properly sums up the impact on the agenda. Russia's main European trading partner, Germany has, in economic terms, the most to lose from war and sanctions. In order to reduce dependence on gas and oil imports, Germany has announced that it will switch on its coal-fired power stations. At the same time, it has brought forward by five years, to 2035, the commitment to get rid of fossil fuels. In other words, an increase in emissions in the short term, and the medium/long term, may make possible an acceleration of reductions. In Germany's case, there is no reason to believe that this is an empty goal. As an example, last year, for the first time in history, most new homes in the country were delivered untethered to fossil fuel supplies.

The question we ask ourselves every day is how long should this broad energy transition that we are witnessing last? Despite the worrisome short-term scenario that has already been committed to, looking forward, can we see a pattern that is different from the past? We know that the challenges of the transition to a low-carbon economy are colossal and need to advance in three fundamental dimensions at the same time. We need to count on substantive changes in behavioral patterns, in financial efforts and concentration of huge investments, and on acceleration at the technological frontier.

Thus, although we still have far to go, there are signs that we are headed in the right direction. The "green spirit" advances as a criterion for individual choices and social preferences, financial resources are mobilized in volumes compatible with the needs (opportunities) for investment, and technologies are developed at unprecedented speeds, suggesting that we may experience speedier transformations. In terms of technologies, while it is true that not everything we need to achieve carbon neutrality by 2050 is yet available on a commercial scale, the most recent advances are producing unprecedented acceleration. A few examples to illustrate. Renewable sources such as wind and solar have seen price declines of more than 95% in less than four decades. In the last decade alone, the price of energy generated by photovoltaic panels has fallen 85% and by onshore wind turbines 56% (IRENA, 2020). The speed of reduction is unprecedented in historical terms. Today, in many parts of the world, building a new wind or solar plant produces a more cost-effective unit of energy in megawatt-hours than running an existing coal-fired plant. While there is still no efficient solution for large-scale storage that meets the needs of the electric grid, the cost curve for electric batteries is also already showing compound annual declines of around 18 percent. Since 2010, the average cost of the lithium batteries used in electric vehicles has fallen by almost 90%, and a further 50% reduction is estimated by 2030 (Goldie-Scot, 2019).

Another glaring example of the speed of transformation: the International Energy Association (IEA), whose image has long been associated with the status quo of the fossil fuel industry, annually publishes the World Energy Outlook report, a reference in the sector. In the 2015 edition, the IEA estimated that in 2040 the production of electricity from renewable sources would be 13,400 TWh, which would represent a 34% share of the total energy supply of the electricity sector. In the last Outlook, published in 2021, the projections for electricity supply from renewable sources rose to 21,200 TWh, and the respective market share to 52% of the total supply. That is, in just six years, the IEA added about 7,800 TWh from renewable sources in its projections — practically the total produced by renewable sources in the world in 2020. The speed of transformation

has left even the greatest experts behind the curve, including IEA itself.

The above examples illustrate only a small part of the reality. Renewable sources are one of the many vectors of the energy transition, among which we can include shale gas, hydrogen, nature-based solutions, electrification, and digitalization. Not coincidentally, the topic touches on our portfolio from multiple angles. Hence our interest in closely following the evolving understandings and strategic responses of the companies most exposed to the energy transition.

Implications

The impacts of human activity on climate conditions and ecosystems are so unprecedented, important, and definitive that many believe that we are already in a new stage of the planet's history, called the Anthropocene. If the effects of these actions can already be perceived in the geological time scale, what can be said about the proximate epoch? We are facing a reality the confrontation of which presupposes a societal change of paradigm.

Because the effects are cumulative and self-feeding, with each year of hesitation, the bill going forward gets exponentially worse. The longer we take to act, the more acute future action has to be; and the more dependent we become on an uncertain bet on disruptive technological innovations. In natural phenomena, the sand in the hourglass does not fall constantly but quickens. The trajectories of business-as-usual projections pose worrying scenarios. We must act soon, already thinking about mitigation and adaptation strategies.

The effort must be collective and global. Public policies need to be recalibrated and personal preferences realigned. Between these two layers of society — the macro-institutional and the micro-individual — are precisely the companies that need to adapt by making the not-so-obvious synthesis of these great movements.

The long journey from the previous Report to here — we apologize to our readers for the boring text — has served to ground our perception that we believe the carbon price signals should get stronger and stronger. It is our best compass to guide us out of the climate labirynth. It is a construct supported by sound theory and empirical experience, not an experiment based on negotiating "expectations" or national "ambitions," which have proven insufficient. Pricing carbon seems to be the best design for us to align incentives to deal with the climate issue, which involves phenomena of a complex nature and problems of global collective action.

If this is the case, we at Dynamo have a major adaptation challenge ahead of us. We need to assess for each company in our portfolio the matrix of impacts and reactions. In some, we see more challenges; in others, great opportunities. In the vast spectrum of business models, the price of carbon can represent only costs, only revenues, or combinations with different proportions of both. It can represent "sunk" CAPEX, necessary to stay in the competitive game or investment with interesting and sustainable returns. For some companies, procrastinating on strategic decisions that are indispensable for adaptation will be the one-way ticket to losing relevance. For others, moving forward with conviction on the environmental agenda will open up an avenue of promising opportunities for many years to come.

Some companies have overcome their initial mistrust and have already realized that the profitability/sustainability trade-off is a false dichotomy. And so, environmentally sound initiatives, such as the reuse of waste, end up improving the financial result of manufacturing processes. This reminds us of the implementation of the Total Quality technique in the 1990s in Brazil. At first, it was viewed by executives with skepticism, since it would add costs of processes and controls, such as software and monitoring. Then, once the definitive gains were apparent, it was realized that the balance was largely favorable and the tool gained traction everywhere as a fundamental management method. Similarly, companies testify that by undergoing rigorous certification protocols for their

carbon inventories, they have discovered previously undisclosed regions of gains in earnings. Reducing the industry's carbon footprint means increasing energy efficiency in material conversion processes, which is synonymous with increased productivity.

This more benign view of the potential opportunities is manifested in the exuberance of the ESG phenomenon. The US$ 130 trillion in assets that are in theory committed to environmental issues is the best expression of a movement that began in a timid way and is rapidly becoming mainstream. Likewise the debt market, with the continuous expansion of green bonds and other instruments linked to environmental performance. Regulators, trading environments, certifiers, rating agencies, financial institutions, and asset managers: in short, all categories of market agents have been mobilizing institutionally around ESG. The underlying understanding is that by attending to ESG issues, companies would become more resilient, prosperous, and long-lived, thus promoting a healthier investment environment for the entire ecosystem of participants.

On the other hand, we have also seen situations where noble resolutions and effusive announcements lack genuine substance and soon weaken upon meeting resistance, be it from conflicting interests, tight budgets, or threats to business integrity. This is when the imperative of necessity comes to challenge the soundness of purpose. In this case, executives and investors alike tend to retreat to their more comfortable bases. As far as investors are concerned, this happens at times of greatest stress in the markets. When asset prices move nervously, risk aversion, fear, and survival instincts predominate among investors. Long-term purposes and strategies are displaced by short-term reactions. In the psychology of traders and investors, the "automatic system" (Kahneman, 2013) takes over and its power to influence behavior and decisions increases exponentially. The more uncertain the environment, the greater the cognitive effort, the busier the faculties responsible for analytical reasoning, and the greater the supremacy of reflexes and instincts.

As a result, short-term stock prices, especially in times of crisis, may distance themselves from the fundamentals that pledge more hidden long-term strategic orientations. The psychological tempo of the investor seeking quick results — a predominant species in the market ecosystem, which at the end of the day determines the short-term movement of stocks — does not align with the temporal dimension of climate phenomena. They are very different scales, which imposes a huge challenge of portfolio calibration for the long-term investor. The sell-off late last year made this ambiguity evident. Investors in aggregate interpreted that some companies would face greater near-term challenges than previously imagined. Among which, names at the forefront of sustainability suffered as much or even more than the market indices. Careful corporate responsibility agendas — credible commitments designed to guide the conduct of business years ahead — were virtually ignored. Concerns about operating margins over the next twelve months have completely dominated investors' agendas, leading them to distrust the cohesion of more durable constructs, not to mention a track record of consistent delivery. Another example of an opportunity for the patient investor? We have no doubt it is.

Dynamo Cougar x IBX x Ibovespa Performance up to March 2022 (in R$)

Period	Dynamo Cougar*	IBX	Ibovespa
60 months	119.9%	91.8%	84.7%
36 months	56.5%	29.7%	25.8%
24 months	67.2%	66.7%	64.3%
12 months	-12.1%	2.8%	2.9%
Year to date	5.7%	14.9%	14.5%

NAV/Share on March 31 = **R$ 1,466.261904200**

(*) Indices are presented as economic reference only, and not as a benchmark.

DYNAMO COUGAR x IBOVESPA
(Performance – Percentage Change in US$ dollars)

Period	DYNAMO COUGAR* Year	DYNAMO COUGAR* Since Sep 1, 1993	IBOVESPA** Year	IBOVESPA** Since Sep 1, 1993
1993	38.8%	38.8%	7.7%	7.7%
1994	245.6%	379.5%	62.6%	75.1%
1995	-3.6%	362.2%	-14.0%	50.5%
1996	53.6%	609.8%	53.2%	130.6%
1997	-6.2%	565.5%	34.7%	210.6%
1998	-19.1%	438.1%	-38.5%	91.0%
1999	104.6%	1,001.2%	70.2%	224.9%
2000	3.0%	1,034.5%	-18.3%	165.4%
2001	-6.4%	962.4%	-25.0%	99.0%
2002	-7.9%	878.9%	-45.5%	8.5%
2003	93.9%	1,798.5%	141.3%	161.8%
2004	64.4%	3,020.2%	28.2%	235.7%
2005	41.2%	4,305.5%	44.8%	386.1%
2006	49.8%	6,498.3%	45.5%	607.5%
2007	59.7%	10,436.6%	73.4%	1,126.8%
2008	-47.1%	5,470.1%	-55.4%	446.5%
2009	143.7%	13,472.6%	145.2%	1,239.9%
2010	28.1%	17,282.0%	5.6%	1,331.8%
2011	-4.4%	16,514.5%	-27.3%	929.1%
2012	14.0%	18,844.6%	-1.4%	914.5%
2013	-7.3%	17,456.8%	-26.3%	647.9%
2014	-6.0%	16,401.5%	-14.4%	540.4%
2015	-23.3%	12,560.8%	-41.0%	277.6%
2016	42.4%	17,926.4%	66.5%	528.6%
2017	25.8%	22,574.0%	25.0%	685.6%
2018	-8.9%	20,567.8%	-1.8%	671.5%
2019	53.2%	31,570.4%	26.5%	875.9%
2020	-2.2%	30,886.1%	-20.2%	679.0%
2021	-23.0%	23,762.3%	-18.0%	538.9%

2022	DYNAMO COUGAR* Month	DYNAMO COUGAR* Year	IBOVESPA** Month	IBOVESPA** Year
JAN	6,0%	6,0%	11,4%	11,4%
FEB	2,9%	9,0%	5,2%	17,2%
MAR	14,2%	24,5%	15,1%	34,8%

Average Net Asset Value for Dynamo Cougar (Last 12 months): R$ 6.902,2 millions

(*) The Dynamo Cougar Fund figures are audited by KPMG Auditors and returns net of all costs and fees, except for Adjustment of Performance Fee, if due. Dynamo Cougar is destinated for qualified investors, defined accordingly Brazilian laws. The Fund is currently closed for new investments. (**) Ibovespa closing.

The climate issue establishes the need for a global transition to a low-carbon economy. Public policies, social preferences, and individual choices are already on the move. The journey imposes major changes on the competitive landscape. Companies face the non-trivial challenge of adaptation, with material risks for all their stakeholders.

At the same time, Brazil has a privileged competitive position, with the potential to play a leading role in the (bio) economy of the future. Our natural capital is a unique asset, one capable of providing valuable services to the world. The carbon market is a channel through which this wealth is expressed. As carbon pricing spreads, the potential spectrum of our opportunity increases.

We should not delude ourselves: complex realities require complex responses. All initiatives that are oriented in this direction are valid, but the most promising strategies should contemplate the three interconnected system dimensions: climate, biodiversity, and social. As a long-term investor, attentive to important transformations, this is where we at Dynamo are directing our gaze, our thoughts, and our action plans. The already perceptible effects of this action encourage us to move forward.

Rio de Janeiro, April 1st, 2022.

To find more information about Dynamo and our funds, or if you wish to compare the performance of Dynamo Cougar to other indices in different time periods, please visit our website:

www.dynamo.com.br

DYNAMO

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