

# Global carbon markets: Investing in the currency of decarbonisation – a synthesis

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**Carbon instruments bring unique portfolio benefits.**

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## At a glance

- We are rapidly shifting into a new era of carbon pricing where businesses and governments are increasingly associating a cost to emitting greenhouse gases into the atmosphere.
- By creating a means of exchange that puts a value on reducing emissions based on the credibility of government and corporate policies to address climate change, carbon markets establish what can be considered the currency of decarbonisation.<sup>1</sup>
- Mandatory (compliance) and voluntary carbon markets have matured into an investable opportunity with traded volume of over USD 900 billion annually<sup>2</sup> that covers over 17% of global emissions.<sup>3</sup> Carbon is on its way towards becoming a mainstream asset that could even rival the size of major commodity markets.
- There is broad consensus that the price of carbon needs to increase substantially over the next decade to meet stated emission reduction goals and that carbon markets must play a crucial role in achieving net zero carbon emissions globally by 2050.<sup>4</sup>
- An allocation to carbon markets offers attractive portfolio construction benefits, including as a natural hedge against climate transition risks to corporate earnings.
- An actively-managed and diversified strategy across markets and instruments globally, supplemented by strict quality criteria, offers investors the opportunity to manage risks and best capture returns from future carbon market developments.

<sup>1</sup> [Carbon is an emerging asset class, but what is it?](#) (Sainsbury, Carbon Risk, 2022).

<sup>2</sup> [Carbon markets: Invest in greenhouse gas emissions](#) (Credit Suisse, 2022).

<sup>3</sup> [Unlocking the Potential of Carbon Markets to Achieve Global Net Zero](#) (BCG, October 2021).

<sup>4</sup> [Infinite Market Cap](#) (Accessed: 12 July 2022).

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Effectively capturing the carbon opportunity.

# Introduction

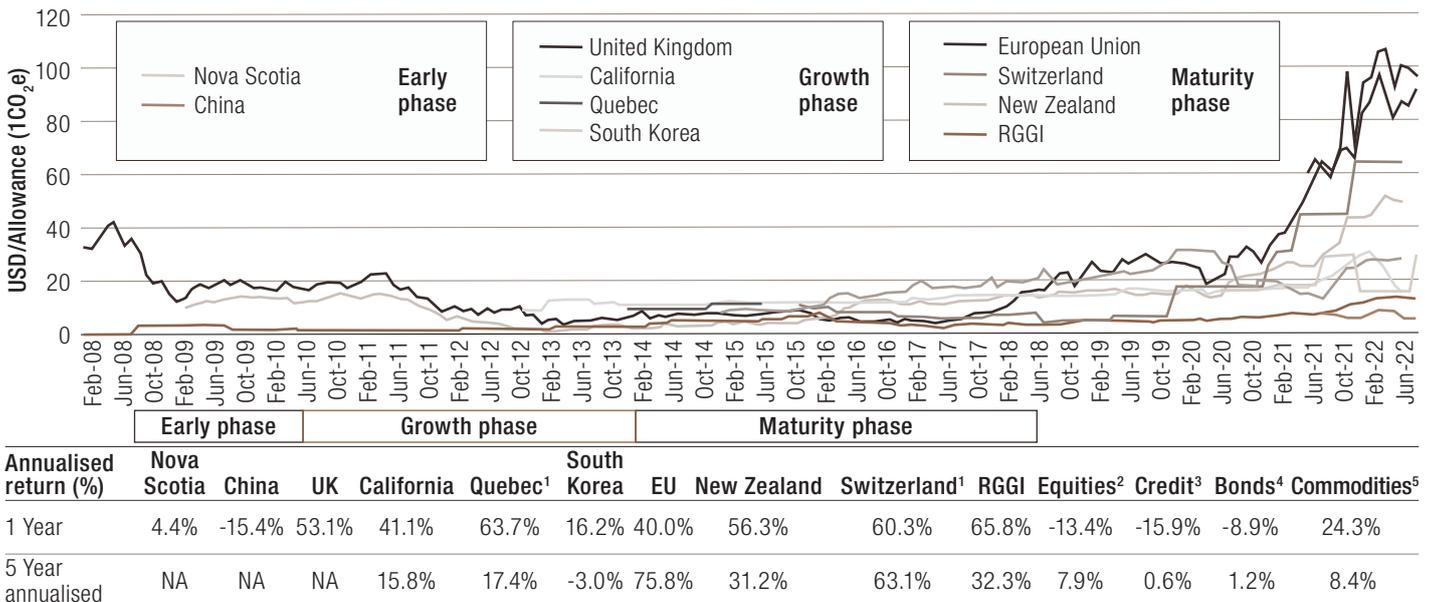
**At Lombard Odier, our core investment conviction is that sustainability is profoundly changing the risk and return profile of financial market investments.** This is rooted in our belief that the global economy is undergoing a major sustainability transition towards a Circular, Lean, Inclusive and Clean model (the CLIC® economy). The change will be as profound as the industrial revolution, globalisation, and the digital revolutions and will radically alter how companies do business and how individuals consume.

**Our conviction is that the transition to a CLIC® economy will unfold through 3 + 1 major systems changes that will affect 95% of our investment universe** (Figure 1). Firstly, in the energy system, we foresee a trend of massive electrification underpinned by the greening of energy supply and demand, the emergence of new storage and distribution networks and increased energy efficiency. Secondly, in the materials system we anticipate that dematerialisation, the rise of new sustainable materials and resource efficiency will decouple production from primary material resource dependencies while avoiding waste and pollution. Thirdly, in the agriculture, food and land use (“AFOLU”) system we foresee the rise of new food systems to enable a halt to land degradation globally as well as major land restoration and nature regeneration efforts. Lastly, putting a price on carbon emissions incentivizes the

shift to low carbon technologies. Carbon markets, the focus in this research paper, play a key enabling role by providing incentives that internalize climate impacts within private decision-making so as to accelerate the transition across these three systems.

**By creating a means of exchange that puts value on reducing greenhouse gases and reflecting the market’s trust in government’s commitment to decarbonisation,** carbon market instruments act as the currency of decarbonisation. Carbon markets are a policy construct designed around the principle that scarcity of allowance supply will incentivize investment in decarbonisation. For carbon markets to change the cost-benefit calculus for high versus low carbon investments, market participants must trust that governments will reduce supply and impose penalties for non-compliance. In this sense, carbon markets share a likeness to currencies whose value ultimately also rests on the trust of the market in the government. But whereas a currency’s economic anchor is trust in government’s monetary and fiscal policies, carbon reflects the market’s trust in government’s commitment to decarbonisation. While the dynamics of the voluntary markets are different, the price of specific carbon credits still reflects the market’s trust in the effectiveness of these credits and companies’ willingness to meet their climate goals. In this regard, we see carbon as the currency of decarbonisation.<sup>5</sup>

FIG 1. HISTORIC DATA POINTS TO GREATEST PRICE APPRECIATION ON PATH TO MARKET MATURITY



Source: LOIM analysis (as at 30 June 2022), with returns all in USD. Data are from [ICAP Allowance Price Explorer](#) and [Bloomberg New Energy Finance](#).

<sup>1</sup> Data for Switzerland, Québec and Nova Scotia reflect auction rather than spot prices so are not directly comparable with other estimates; <sup>2</sup> MSCI World Net Total Return; <sup>3</sup> Bloomberg Barclays Global Agg 500 Corp Total Return Index Value Hedged; <sup>4</sup> Bloomberg Global Aggregate Index; <sup>5</sup> Bloomberg Commodity Index Total Return.

<sup>5</sup> [Carbon is an emerging asset class, but what is it?](#) (Sainsbury, Carbon Risk, 2022).

**Carbon markets are composed of two complementary market types, compliance and voluntary**, although there are increasing cross-overs between these (Figure 2). Under compliance or mandatory markets, companies have legal obligations to report and reduce their emissions and face fines and other penalties for failing to comply with program requirements. Compliance markets can operate solely within borders (e.g., in China) or have international elements through links with other systems (e.g., the California-Quebec link) and/or the acceptance of international credits (e.g., in the Republic of Korea). Voluntary carbon markets offer a way for companies, governments and individuals to help meet voluntary climate goals through the purchase of credits that represent quantified emissions reductions or removals achieved by other parties.

**The primary carbon instruments of compliance and voluntary markets are allowances and credits, respectively.**

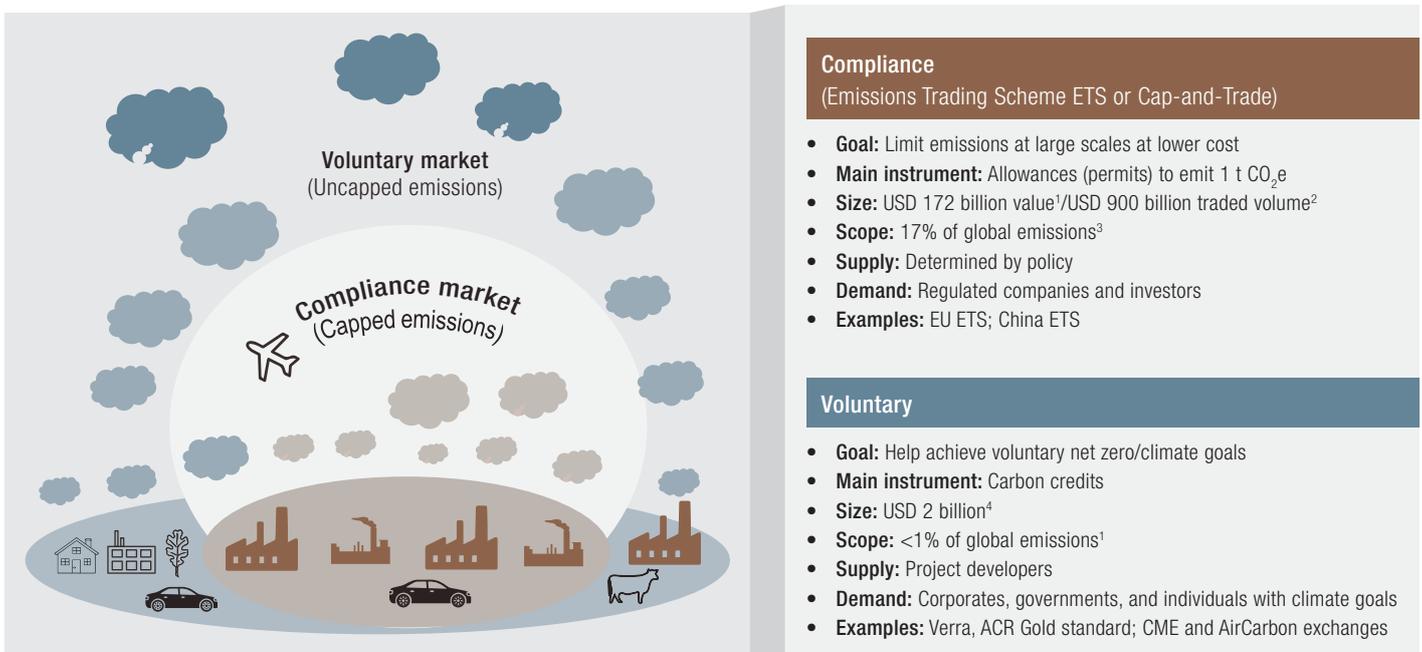
“Allowances” are government-issued permits which grant the legal right to emit a ton of CO<sub>2</sub>-equivalent gases as part of a compliance carbon market. On the other hand, carbon credits are certificates issued either by governments or by voluntary standard-setting bodies that represent at least one ton of CO<sub>2</sub>-equivalent of verified emissions reductions or carbon sequestration (uptake) relative to a benchmark or “baseline” level. Carbon credits, also known as “offsets”, are the primary instrument used in voluntary markets. Many compliance systems, including both Emissions Trading Systems (ETS) and other types of market-based frameworks, also

accept offsets, subject to eligibility criteria and sometimes limits on the quantities which regulated entities can use in place of allowances use. There are also some compliance programs that only operate with offsets, such as the international compliance program for international civil aviation known as CORSIA (Carbon Offset and Reduction System for International Aviation). There are also compliance programs, such as in Colombia and Singapore, where companies can use carbon credits in place of paying a carbon tax on their emissions. While compliance markets, such as California, develop their own domestic standards for carbon credits, certain compliance markets accept voluntary market standards (e.g., CORSIA, Korea), creating added sources of demand for the recognized types of credits.

**Carbon markets as an emerging opportunity**

**Carbon markets are now at the scale to become a mainstream investment opportunity.** Market analysts, including Credit Suisse, have suggested that carbon is on its way towards becoming a mainstream asset that could even rival the size of major commodity markets, including oil.<sup>6</sup> The market cap of traded global markets for government-issued carbon allowances, backed by legally-binding requirements, grew by 44% since 2019 to a record USD 172 billion last year in market cap, with USD 900 billion in transactions. Boston Consulting Group (BCG) projects this market to reach USD 1 trillion in market cap by 2030,<sup>7</sup> comparable

FIG 2. COMPLIANCE AND VOLUNTARY MARKETS



Source: LOIM Analysis. For illustrative purposes only. <sup>1</sup> BCG (2021) Unlocking the Potential of Carbon Markets to Achieve Global Net Zero; <sup>2</sup> Refinitiv, Carbon Market Year in Review 2021 (calculated using average EUR/USD conversion for 2021); <sup>3</sup> International Carbon Action Partnership (ICAP), Emissions Trading Worldwide Status Report 2022; <sup>4</sup> Ecosystem Marketplace, State of the Voluntary Carbon Market 2022 Q3.

<sup>6</sup> [Carbon markets: Invest in greenhouse gas emissions](#) (Credit Suisse, 2022).

<sup>7</sup> [Unlocking the Potential of Carbon Markets to Achieve Global Net Zero](#) (BCG, October 2021).

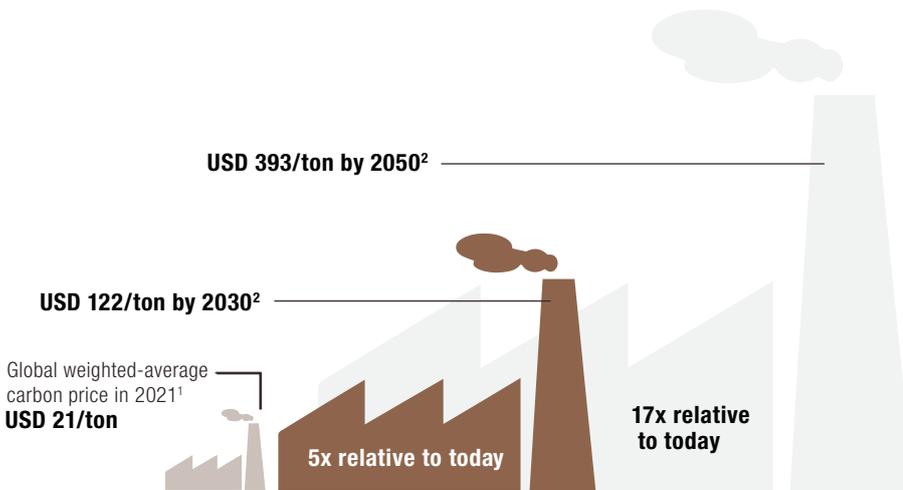
with the current market cap of silver and of cryptocurrencies.<sup>8</sup> A surge in net zero commitments by corporates has also driven rapid growth in voluntary markets in recent years.<sup>9</sup> Voluntary market transactions tripled in value to USD 2 billion in 2021<sup>10</sup> and are projected to reach USD 50 billion in transactions by 2030.<sup>11</sup>

**Carbon prices are still too low to reach existing climate commitments, particularly in emerging markets.** While prices have increased significantly across the carbon markets over recent years, prices are still low compared to estimates of what is needed to drive global decarbonisation over the coming decades (Figure 3). The Network for Greening the Financial System (NGFS), an expert group of central bank and financial supervisors, reports scenarios with an average global carbon price of USD 122 by the end of the decade to incentivize the necessary emissions to limit warming between 1.5°C to 2.0°C.<sup>12</sup> The World Bank estimates that just 4% of global emissions are currently covered by direct carbon prices in line with the levels needed in 2030.<sup>13</sup>

**Prices especially need to rise in developing countries where emissions are growing the fastest and where both compliance and voluntary carbon markets are more nascent.**

By 2030, the European Commission predicts that 85% of global emissions will occur in emerging economies, from 77% in 2020, including China where carbon prices are roughly at USD 10 per ton and India, where compliance carbon markets are not yet in place.<sup>14</sup> Average prices across the existing major markets, including China, are USD 31 per ton if weighted by current market caps but just USD 21 per ton when weighted by projected national emissions by 2030.<sup>15</sup> This implies an average compound annual growth rate (CAGR) across existing markets of 22% to 35% given the prices that leading governments and companies are using for their internal planning for 2030, ranging from USD 100 per ton for BP, USD 130 per ton for the government of Canada, USD 200 for SwissRe and USD 237 for the government of Norway.<sup>16</sup>

**FIG 3. CARBON PRICES NEED TO INCREASE SIGNIFICANTLY TO ACHIEVE NET ZERO**  
Carbon prices need to increase significantly by the end of the decade to stay within a 1.5 – 2.0°C scenario...



... a fact increasingly recognised by governments, businesses, and investors

	Shadow prices (USD/t CO <sub>2</sub> e)		Implied CAGR from current average market price <sup>1</sup>
	Price today	Price 2030	
BP (2022)	40	100	22%
Canada (2022)	50	132	26%
High-level commission on carbon prices (2020)	50	100	22%
Net Zero Asset Owner Alliance (2021)		147	28%
Norway (2021)	70	237	35%
Novartis (2021)	100		
OECD (2021)		120	24%
SwissRe (2020)	100	200	33%
Wood Mackenzie (2021)		160	29%

Source: LOIM Analysis. For illustrative purposes only. <sup>1</sup> Average price on 30 June 2022 across EU, UK, California, RGGI, New Zealand, South Korea, China, Quebec and Nova Scotia compliance markets weighted by 2030 projected national emissions based on European Commission/JRC GECCO (2022) under current policy scenario. NGFS; <sup>2</sup> Average across NGFS orderly climate transition scenario estimates for 2030 and 2050. Includes both net zero around 2050 (1.5°C) as well as less stringent below 2°C scenarios.

<sup>8</sup> [Infinite Market Cap](#) (Accessed: 12 July 2022).

<sup>9</sup> Net zero refers to a state in which the greenhouse gases going into the atmosphere are balanced by removal out of the atmosphere. A net zero commitment for a company or government refers to reaching net-zero carbon emissions by a selected date, by reducing emissions by 95% by 2050 or earlier and using carbon credits in addition to, not as a substitute for, reducing own emissions.

<sup>10</sup> [State of the Voluntary Carbon Markets 2022 Q3](#) (Ecosystem Marketplace, August 2022).

<sup>11</sup> [A blueprint for scaling voluntary carbon markets to meet the climate challenge](#) (McKinsey, 2021).

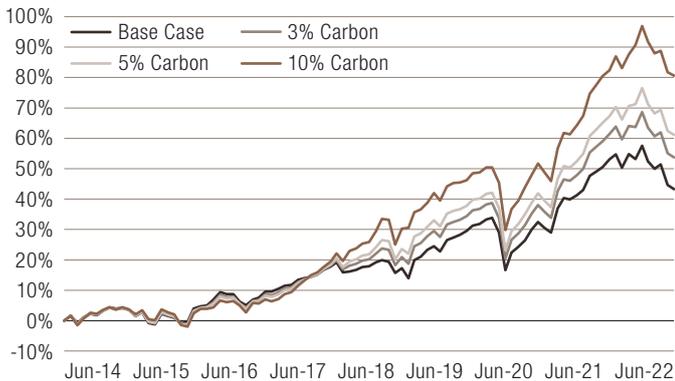
<sup>12</sup> [NGFS Climate Scenarios for Central Banks and Supervisors](#) (NGFS, 2021).

<sup>13</sup> [States and Trends of Carbon Pricing 2022](#) (World Bank Group, 2022).

<sup>14</sup> LOIM analysis based on [Global Energy and Climate Outlook 2021](#) (GECCO, European Commission, Joint Research Centre, 2021).

<sup>15</sup> LOIM analysis based on prices as of June 30, 2022 across EU, UK, California, RGGI, New Zealand, South Korea, China, Quebec and Nova Scotia markets weighted by 2021 caps ([Emissions Trading Worldwide: 2022 ICAP Status Report](#)); and 2030 projected national emissions under current policy scenario ([Global Energy and Climate Outlook 2021](#); GECCO, European Commission, Joint Research Centre, 2021).

<sup>16</sup> [The Business of Pricing Carbon](#) (C2ES, 2017).

**FIG 4. MODEL PERFORMANCE INCLUDING CARBON**

Source: LOIM analysis through June 2022. For illustrative purposes only. Base case portfolio is 30% Equities, 47% Bonds, 3% Commodities, and 20% Real Estate. Carbon returns are based on the IHS Markit's Global Carbon Index started on July 2014. Returns to equities, bonds, commodities, and real estate measured, respectively, by MSCI ACWI Net Total Return USD Index, Bloomberg Global-Aggregate Total Return Index Value Hedged USD., Bloomberg Commodity Index Total Return, and FTSE EPRA Nareit Global REITs TR Index.

**There is growing investor interest in carbon as an asset class,** focusing on futures contracts for the EU compliance market.

Figure 4 shows a six-fold growth in the participation of investment funds<sup>17</sup> from 72 actors in January 2018 to 449 in July 2021, as well as a more than tripling in participation of other financial institutions (from 42 to 149 entities).<sup>18</sup> This trend may be driven by growing awareness of climate change among investors (e.g., the Net Zero Asset Managers Initiative with over 236 signatories representing USD 57.5 trillion in AUM). As investor participation grows, the trend is further enabled by the growing size and liquidity of global carbon markets and rapidly expanding accessibility, including through exchange traded funds, publicly listed companies focused on carbon credits, new exchanges for voluntary markets, standardised futures contracts, and tokenized products.

Carbon instruments offer a unique set of benefits for the construction of investment portfolios, including the potential for risk mitigation, returns with low correlation to major asset classes, inflation protection, and positive impact. For example, carbon instruments are a natural hedge against the adverse effects to portfolios of increasing carbon prices and of carbon transition risk more broadly. Under a policy scenario consistent with a USD 100/ton price on carbon emissions, while some companies are

projected to lose and others benefit across all sectors, we estimate that global equity risks are skewed to the downside, with about half of earnings in the MSCI World index at risk of a 5% to 20% loss by 2030.<sup>19</sup>

At Lombard Odier, a core investment conviction is that carbon markets will play a central role in accelerating the global economic transformations as part of a sustainability transition towards a Circular, Lean, Inclusive and Clean model (the CLIC<sup>®</sup> economy). There is no path towards limiting global warming and achieving the necessary transitions across the energy, materials, and food and land-use systems without the use of carbon pricing further expanding and intensifying globally. In particular, we expect that both regulated and voluntary markets will play an increasingly central role in enabling the climate transition by creating value for emissions reductions globally, akin to a currency of decarbonisation. Carbon markets are poised for continued growth offering attractive investment opportunities across global markets. Nevertheless, in order to tap the economic opportunity and support the climate transition, investors will require an active strategy with access to high quality carbon instruments, as well as the expertise to properly assess them.

Effectively capturing the carbon opportunity of the next decade requires closely following policy and market developments and a flexible strategy that can invest on a discriminating basis across various markets, both established and emerging. Given the dependence of carbon markets, and the opportunities for investors, on policy and regulatory decisions, it is critical to understand market fundamentals and future trends, while carefully monitoring policy and regulatory developments to guide investments. An actively managed approach to investing in carbon also offers the potential for diversified returns due to the many inefficiencies that go hand in hand with a rapidly evolving asset class. Conducting thorough due diligence to assess the quality criteria of the carbon credits is also essential to avoid reputational risks and protect economic value. An active investment strategy based on a diversified allocation to the most promising markets and instruments, globally, both compliance and voluntary, supplemented by strict quality criteria, trading flexibility, and hedging of downside tail risks, merits consideration for capturing the most attractive risk/return opportunities over the short and long term.

<sup>17</sup> Investment funds includes entities holding investments directly in the commodity derivatives market as a form of collective investment scheme, including hedge, pension and exchange-traded funds.

<sup>18</sup> Other financial institutions includes investment firms, banks, other firms regulated under MIFID II, and insurance and re-insurance companies.

<sup>19</sup> This analysis was conducted using Lombard Odier's Climate Value Impact (CVI) analysis framework and considered one of the Net Zero by 2050 climate transition scenarios reported by the Network for Greening the Financial System (NGFS) in which global average carbon prices are about USD 100/ton CO<sub>2</sub>e by 2030.

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