



CIO Special

September 17, 2019

Author:
Markus Müller
Global Head Chief Investment Office

ESG yesterday, today, tomorrow – sustainability across the centuries

01 The growing cost of inaction

02 The ancient origins of sustainable thinking

03 ESG during enlightenment and industrialisation

04 ESG as a positive narrative

Key takeaways

- There is growing evidence that climate change will have serious consequences on the natural world, society and the global economy.
- Yet the idea of sustainable living in harmony with nature arguably dates back to prehistoric times and has been promoted for centuries.
- The agrarian and industrial revolutions created huge benefits for humanity but also the present threat of environmental collapse.
- With Environmental, Social and Governance (ESG) investing, the power of finance can be channelled to support the broader objectives of society.

Around the world, a popular movement is growing in response to threatening scenarios about our future. We are being called upon to act by a diverse range of organizations, from the Intergovernmental Panel on Climate Change (IPCC) to 'Fridays For Future', the international youth protest group. We are also hearing the term Environmental, Social and Governance Investing or 'ESG Investing' – and other related terms – with increasing frequency in the mainstream media. It is time to ask ourselves: what is happening here, and why now?

01 The growing cost of inaction

Let's take a look at a few facts and figures. A new study by researchers at the Swiss University ETH Zurich suggests that, with a moderate average global warming of 1.4 degrees Celsius, European cities will become warmer by 3.5 degrees in summer and by 4.7 degrees in winter by 2050¹. The climate in London will be similar to that of Barcelona today, and the average temperature in Madrid will rise to the present-day level in Marrakesh. To put this another way: the prevailing climate is currently moving away from the equator at a rate of about 20 kilometres a year. Of 250 cities analysed worldwide, 22% are set to be confronted with a climate that, at present, does not exist in any city on Earth.

Meanwhile, the world's tropical rainforests are under serious threat. According to the Organization for Economic Cooperation and Development (OECD), they shrunk by 6.5 million hectares – an area larger than the UK – between 2010 and 2015. What's more, 60% of vertebrates have become extinct since the 1970s, according to the World Wildlife Fund's 'Living Planet Report' for 2018².

Another controversial piece of research published in recent months concerns the huge social cost of global warming. It concludes that the net cost of CO₂ emissions in economic terms is approximately USD417 per tonne worldwide – around 10 times higher than the current estimate of the U.S. government.



Please use the QR code to access our previous Deutsche Bank Wealth Management CIO reports.

¹ Bastin, Clark et al. "Understanding climate change from a global analysis of city analogue" July 10, 2019, ETH Zurich, <https://doi.org/10.1371/journal.pone.0217592>

² Source: World Wildlife Fund, <https://www.wwf.org.uk/updates/living-planet-report-2018>

³ Ricke, Drouet et al. "Country-level social cost of carbon" October 2018, Nature Climate Change, <https://doi.org/10.1038/s41558-018-0282-y>



It also says the U.S. bears USD50 of this cost while India bears USD90 (the largest share of any country in the world)³; this in spite of the fact that the average U.S. citizen is responsible for CO₂ emissions of 16.5 tonnes per year, while the equivalent figure for the average Indian citizen is just 1.7 tonnes⁴.

Emerging and developing countries are particularly affected by developments in global warming; they are often more vulnerable to the effects of natural events due to their geographical location and the poor development of social security systems.

02 The ancient origins of sustainable thinking

These figures strongly support the idea of sustainability and that we need to prevent something negative. This is true in part, but it's about more. It's about doing something positive. It's about preserving nature's essentials for the Earth and for us. To do this successfully, we need a positive ecological future. However, we can't develop such a future until we really know what we are talking about, which in this case is more than a threat scenario.

For example, it is often mistakenly assumed that sustainability is a modern invention. However, a quick examination of the term's history shows us how we should understand it and what we need to do to make it a reality.

The importance of sustainability starts early, in prehistoric times. Prehistoric people practiced animism, which meant they considered all things had a living soul and spiritual power. Plants, rivers and stones were regarded as living things. Prehistoric animism played an especially important role in ethnic religions⁵. In the later Greek and Roman antiquity, there was no scientifically based ecological awareness, but there was something like a foreknowledge. For example, the *locus amoenus* – meaning “pleasant place” in Latin, and emblematic of the beauty and life-giving properties of nature – was a recurrent theme in literature and painting.

Meanwhile, the Ancient Egyptian culture depended directly on the fertility of the Nile. As German theologian Michael von Brück argued as part of the *Intercultural Ecological Manifesto*: “Political and economic action in ancient Egypt follows the natural cycle; it is not a counter-design to nature. The observance of this cycle and the legitimacy to rule are bound by each other... a sharp separation of nature and culture, of ‘base’ and ‘superstructure’, of economic and cultural action is by no means inevitable, but a problematic pattern of thinking.”⁶

As well as Europe and Egypt's approaches to nature, there were others in existence at the time. In Asia, the view of Buddhist teaching was mainly influenced by early animism. Earth and water must not be polluted because they are alive as part of the earth. In chronologies from the first millennium in Ceylon, now known as Sri Lanka, it is stated that Buddhist kings were expected to make an ecological and social contribution to the lives of their people.

The first school of Chinese Buddhism, the Tiantai, did not distinguish between animate and inanimate beings, meaning that nature, including animals and plants, is a part of creation; they spoke of a brotherhood, not only of all human beings, but of all living things⁷. The Chinese scholar Wang Yangming (1472-1529), who lived at the time of the Ming

Dynasty, summed up this concept. He wrote that heaven and earth and the myriad things in between are there to develop parts of a single body. This stems from the anthropomorphic cosmic worldview of Chinese Taoism, in which nature occupies the center of the universe, not man.

A few centuries later, it is worth noting the “Sun Song” of St. Francis of Assisi. This dates back to 1225 in the medieval western region and praises creation as a whole.

Sooner or later, as more considerations like this are expressed, we inevitably move closer to a definition of the relationship between man and nature, as well as between individuals and society. Thomas Aquinas, for example, dealt with the question of establishing a balance between individual freedom and common good, which is possibly the beginning of discussions around the idea of governance. The scholasticism⁸ of the eleventh and twelfth century limited the powers of the authorities to general justice, which was intended not to interfere too much in the lives of citizens and encourage individuals to feel a personal responsibility to do good. But scholasticism also shows that, above all, it's about the “Bonum Comune”, i.e. the common good, which is understood as a counter term to the mere individual or group interests.

03 ESG during enlightenment and industrialisation

What we can deduce from this is still true today: societies have a continuous “structural responsibility” towards themselves, the environment and the future. Even Adam Smith, a moral philosopher and father of modern economics, wrote in *The Theory of Moral Sentiments* (published in 1759) that if governments neglect the protection of our livelihood and our earth to a criminal extent, the entire population suffers. In the present day, this rings true for climatic and environmental risks, as well as social aspects such as equality, inclusion and social justice.

In the early 19th century, it was the German scholar Alexander von Humboldt who regarded nature and man as a whole. He was inspired by his travels to the new world, as well as by the deforestation he observed in Venezuela, which led to the drying up of nearby lakes with devastating consequences for the ecosystem. A little later in the U.S., more people started to share these views of the world. They were the New England transcendentalists from the U.S. state of Massachusetts, a group of writers and philosophers active between 1836 and 1860 who saw nature as an organism and a moral educator⁹. They advocated a liberal, self-reliant and nature-orientated lifestyle and can be regarded as pioneers of the nature conservation movement.

⁴ Source: The World Bank Group. Data status: 2014.

<https://data.worldbank.org/indicator/EN.ATM.CO2E.PC?locations=US>

⁵ Klaus E. Müller: Animism. Keyword in: Walter Hirschberg (Found.), Wolfgang Müller (Red.): Dictionary of Ethnology. New edition, 2nd edition, Reimer, Berlin 2005, ISBN 3-496-02650-2 . P. 25.

⁶ Michael von Brück, “Cultural Renewal – Ecology and Economics”, *Intercultural Ecological Manifesto*.

⁷ DR Bhandarkar, Ashoka, Calcutta 1925, p. 220f.

⁸ Scholasticism is the method of reasoning developed in the Latin-speaking scholarly world of the Middle Ages. The most famous part of scholastic literature today deals with theological issues. The term “scholasticism” is used to describe the epoch of the history of philosophy and theology, in which the scholastic method prevailed and shaped higher education.

⁹ The most important representatives of this literary movement are the writers Ralph Waldo Emerson and Henry David Thoreau.



Finally, in the 20th century, the idea of Environmental Protection was gradually established in western industrial nations, mainly in the 1980s, on a social and political level, and was particularly prevalent in Europe. This period marked the official inclusion of environmental criteria in governments' agendas and in the consciousness of a broad section of the population.

This brief historical review shows that the understanding of sustainability, in the sense of harmony between humans, other living beings and the earth itself, is not only to respect nature (which we belong to) and the world we live in, but also to realize that most environmental and social challenges can only be solved in mutual dependence.

Sustainability is therefore our most original "World Heritage Site", and a term that is deeply rooted in many of our cultures around the world¹⁰. The Dictionary of the German language published by Joachim Heinrich Campe in 1807 defines the word "sustainability" as "that which one holds onto when nothing else holds any longer"¹¹. From this, it can be deduced that sustainability is nothing more than a way to articulate our current nature, our responsibility to nature and finally to ourselves.

In 1979, in his book *The Principle of Responsibility*, Hans Jonas remarked for the first time in history that "humanity can annihilate itself and the whole world." For Hans Jonas, the relationship between man and nature is "not a relationship of domination but a relationship of responsibility." His central thesis, "Act so that the effects of your action are compatible with the permanence of genuine human life on earth," remains more topical than ever.

04 ESG as a positive narrative

Whilst everyone is talking about what individuals can do and what should be done through politics, the international financial world is approaching the issue through concepts such as 'ESG investing', which enumerates the key areas in which we must act to protect the environment, ensure social progress and enhance corporate governance standards that support the development and prosperity of the global economy.

The abbreviation was first used in a report published by the United Nations in 2004 titled, "Who Cares Wins"¹², which argued that the inclusion of ESG criteria in certain investment decisions could have a positive impact on society and financial markets, as well as on one's own portfolio¹³.

Since its inception, this abbreviation has become far more than a set of investment criteria. There are several style of investing that can be used to achieve ESG objectives. These include 'best in class' approaches and the exclusion of certain sectors and countries based on ESG factors. But essentially, any investments that can show a positive impact on certain ESG criteria are part of the ESG concept. The application of ESG criteria in the context of a portfolio is partly to help reduce risk, but also to show which companies are taking advantage of new opportunities, where new business models appear promising, how stable revenues can be generated, and that long-term sustainable profit growth is possible.

To sum up, "sustainability" is not something that can be imposed, and economic, legal and social systems that gradually destroy the environment cannot easily be made sustainable by

changing or renaming them. In order to achieve a real breakthrough, we need to think sustainably from the outset and plan ahead.

So, will it be worth it? Certainly. This is a positive narrative for our future.

Ecosystem services such as pollination of plants, water treatment, flood control and carbon sequestration are crucial to human well-being. Worldwide, these services are worth an estimated USD125-140 trillion a year¹⁴, i.e. more than one and a half times the global gross domestic product. Also, the benefits of "remediating" the environment can far outweigh the costs. For example, reaching the 'Bonn Challenge' goal – to restore 46% of the world's damaged forests – could mean a benefit of USD7 to USD30 for every dollar spent.

Biodiversity is a prime example of a key environmental issue that we can learn from; it is a prerequisite for human life. Cultural and gender diversity is just as important to the human and corporate existence as it is for natural biodiversity. It was and is the basis for innovation and therefore is the basis for productivity and prosperity as well.

Now look into the future. What is particularly interesting here is the potential for a "sharing economy", the economics of sharing and a change to "member value". The future will be more about the sharing of goods and resources between individuals and between companies – a process that will be stimulated and simplified by digitization. It will enable existing assets to be used more efficiently, lower costs and conserve resources – for example through rental concepts such as Airbnb¹⁵.

However, the potential disadvantages of so-called peer-to-peer sharing must also be taken into account, such as the adverse side-effects on competition and the use of data. In addition, a possible wage decline in the service sector, unfair competition practices in the digital world, a concentration of data and the establishment of a non-taxed "shadow economy" are all considered to be potential risks that must be addressed in terms of environmental, social and economic sustainability.

Thus, Hans Carl von Carlowitz's maxim from the year 1713, "No more trees should fall than can regrow", acts as a guide for our actions and remains highly topical today. Sustainability must be built into the "system" and not imposed retrospectively. The careful use of resources, environmentally friendly production processes, an integrated economic order for the preservation of our natural habitat and an inclusive understanding of growth and society are essential prerequisites for the transition to a sustainable era: ecological balance, economic security and social justice.

¹⁰ The discovery of sustainability. Cultural History of a Concept", Ulrich Grober, 2010

¹¹ Ibid

¹² The Global Compact, "Who Cares Wins," United Nations, Swiss Federal Department of Foreign Affairs, 2004.

¹³ When choosing an ESG investment, the various financial and ESG considerations need to be weighed to ensure they fit in with your overall strategy. Ultimately, your ESG investment strategy will be unique to you, so it's important to choose an investment partner who understands your specific ESG target

¹⁴ OECD (2019), Biodiversity: Finance and Business Case for Action, report prepared for the G7 Environment Ministers' Meeting, 5-6 May 2019.

¹⁵ Airbnb is a rental concept similar to Airbnb that connects owners of furnished properties with short-stay tenants, providing an alternative to traditional hotel bookings. Half the resulting revenue is invested in local sustainability projects that counteract the negative impacts of tourism.



Glossary

The [Bonn Challenge](#) is a global effort to bring 150 million hectares of the world's deforested and degraded land into restoration by 2020, and 350 million hectares by 2030.

[ESG investing](#) pursues environmental, social and corporate governance goals.

[Fridays for Future](#) is a youth movement that has encouraged high-school students around the world to go on strike from school in order to join protests to demand action from governments on climate change.

The [Intergovernmental Panel on Climate Change \(IPCC\)](#) is an intergovernmental body of the United Nations, dedicated to providing the world with an objective, scientific view of climate change.

The [Organisation for Economic Co-operation and Development \(OECD\)](#) has 35 member countries and has the objective of encouraging economic progress and world trade.

[USD](#) is the currency code for the U.S. Dollar.



Important information

General

This document may not be distributed in Canada or Japan. This document is intended for retail or professional clients only. This document is being circulated in good faith by Deutsche Bank AG, its branches (as permitted in any relevant jurisdiction), affiliated companies and its officers and employees (collectively, "Deutsche Bank").

This material is for your information only and is not intended as an offer, or recommendation or solicitation of an offer to buy or sell any investment, security, financial instrument or other specific product, to conclude a transaction, or to provide any investment service or investment advice, or to provide any research, investment research or investment recommendation, in any jurisdiction. All materials in this communication are meant to be reviewed in their entirety.

If a court of competent jurisdiction deems any provision of this disclaimer unenforceable, the remaining provisions will remain in full force and effect. This document has been prepared as a general market commentary without consideration of the investment needs, objectives or financial circumstances of any investor. Investments are subject to generic market risks which derive from the instrument or are specific to the instrument or attached to the particular issuer. Should such risks materialise, investors may incur losses, including (without limitation) a total loss of the invested capital. The value of investments can fall as well as rise and you may not recover the amount originally invested at any point in time. This document does not identify all the risks (direct or indirect) or other considerations which may be material to an investor when making an investment decision. This document and all information included herein are provided "as is", "as available" and no representation or warranty of any kind, express, implied or statutory, is made by Deutsche Bank regarding any statement or information contained herein or in conjunction with this document. All opinions, market prices, estimates, forward looking statements, hypothetical statements, forecast returns or other opinions leading to financial conclusions contained herein reflect Deutsche Bank's subjective judgment on the date of this report. Without limitation, Deutsche Bank does not warrant the accuracy, adequacy, completeness, reliability, timeliness or availability of this communication or any information in this document and expressly disclaims liability for errors or omissions herein. Forward looking statements involve significant elements of subjective judgments and analyses and changes thereto and/or consideration of different or additional factors could have a material impact on the results indicated. Therefore, actual results may vary, perhaps materially, from the results contained herein.

Deutsche Bank does not assume any obligation to either update the information contained in this document or inform investors about available updated information. The information contained in this document is subject to change without notice and based on a number of assumptions which may not prove valid, and may be different from conclusions expressed by other departments within Deutsche Bank. Although the information contained in this document has been diligently compiled by Deutsche Bank and derived from sources that Deutsche Bank considers trustworthy and reliable, Deutsche Bank does not guarantee or cannot make any guarantee about the completeness, fairness, or accuracy of the information and it should not be relied upon as such. This document may provide, for your convenience, references to websites and other external sources. Deutsche Bank takes no responsibility for their content and their content does not form any part of this document. Accessing such external sources is at your own risk. Before making an investment decision, investors need to consider, with or without the assistance of an investment adviser, whether any investments and strategies described or provided by Deutsche Bank, are appropriate, in light of their particular investment needs, objectives, financial circumstances and instrument specifics. When making an investment decision, potential investors should not rely on this document but only on what is contained in the final offering documents relating to the investment. As a global financial services provider, Deutsche Bank from time to time faces actual and potential conflicts of interest. Deutsche Bank's policy is to take all appropriate steps to maintain and operate effective organisational and administrative arrangements to identify and manage such conflicts. Senior management within Deutsche Bank are responsible for ensuring that Deutsche Bank's systems, controls and procedures are adequate to identify and manage conflicts of interest. Deutsche Bank does not give tax or legal advice, including in this document and nothing in this document should be interpreted as Deutsche Bank providing any person with any investment advice. Investors should seek advice from their own tax experts, lawyers and investment advisers in considering investments and strategies described by Deutsche Bank. Unless notified to the contrary in a particular case, investment instruments are not insured by any governmental entity, not subject to deposit protection schemes and not guaranteed, including by Deutsche Bank. This document may not be reproduced or circulated without Deutsche Bank's express written authorisation. Deutsche Bank expressly prohibits the distribution and transfer of this material to third parties. Deutsche Bank accepts no liability whatsoever arising from the use or distribution of this material or for any action taken or decision made in respect of investments mentioned in this document the investor may have entered into or may enter in future.

The manner of circulation and distribution of this document may be restricted by law or regulation in certain countries, including, without limitation, the United States. This document is not directed to, or intended for distribution to or use by, any person or entity who is a citizen or resident of or located in any locality, state, country or other jurisdiction, where such distribution, publication, availability or use would be contrary to law or regulation or which would subject Deutsche Bank to any registration or licensing requirement within such jurisdiction not currently met. Persons into whose possession this document may come are required to inform themselves of, and to observe, such restrictions. Past performance is no guarantee of future results; nothing contained herein shall constitute any representation, warranty or prediction as to future performance. Further information is available upon investor's request.

Kingdom of Bahrain

For Residents of the Kingdom of Bahrain: This document does not constitute an offer for sale of, or participation in, securities, derivatives or funds marketed in Bahrain within the meaning of Bahrain Monetary Agency Regulations. All applications for investment should be received and any allotments should be made, in each case from outside of Bahrain. This document has been prepared for private information purposes of intended investors only who will be institutions. No invitation shall be made to the public in the Kingdom of Bahrain and this document will not be issued, passed to, or made available to the public generally. The Central Bank (CBB) has not reviewed, nor has it approved, this document or the marketing of such securities, derivatives or funds in the Kingdom of Bahrain. Accordingly, the securities, derivatives or funds may not be offered or sold in Bahrain or to residents thereof except as permitted by Bahrain law. The CBB is not responsible for performance of the securities, derivatives or funds.

State of Kuwait

This document has been sent to you at your own request. This presentation is not for general circulation to the public in Kuwait. The Interests have not been licensed for offering in Kuwait by the Kuwait Capital Markets Authority or any other relevant Kuwaiti government agency. The offering of

In Europe, Middle East and Africa as well as in Asia Pacific this material is considered marketing material, but this is not the case in the U.S. No assurance can be given that any forecast or target can be achieved. Forecasts are based on assumptions, estimates, opinions and hypothetical models which may prove to be incorrect. Past performance is not indicative of future returns. Investments come with risk. The value of an investment can fall as well as rise and you might not get back the amount originally invested at any point in time. Your capital may be at risk.



Important information

the Interests in Kuwait on the basis a private placement or public offering is, therefore, restricted in accordance with Decree Law No. 31 of 1990 and the implementing regulations thereto (as amended) and Law No. 7 of 2010 and the bylaws thereto (as amended). No private or public offering of the Interests is being made in Kuwait, and no agreement relating to the sale of the Interests will be concluded in Kuwait. No marketing or solicitation or inducement activities are being used to offer or market the Interests in Kuwait.

United Arab Emirates

Deutsche Bank AG in the Dubai International Financial Centre (registered no. 00045) is regulated by the Dubai Financial Services Authority. Deutsche Bank AG -DIFC Branch may only undertake the financial services activities that fall within the scope of its existing DFSA license. Principal place of business in the DIFC: Dubai International Financial Centre, The Gate Village, Building 5, PO Box 504902, Dubai, U.A.E. This information has been distributed by Deutsche Bank AG. Related financial products or services are only available to Professional Clients, as defined by the Dubai Financial Services Authority.

State of Qatar

Deutsche Bank AG in the Qatar Financial Centre (registered no. 00032) is regulated by the Qatar Financial Centre Regulatory Authority. Deutsche Bank AG -QFC Branch may only undertake the financial services activities that fall within the scope of its existing QFCRA license. Principal place of business in the QFC: Qatar Financial Centre, Tower, West Bay, Level 5, PO Box 14928, Doha, Qatar. This information has been distributed by Deutsche Bank AG. Related financial products or services are only available to Business Customers, as defined by the Qatar Financial Centre Regulatory Authority.

Kingdom of Belgium

This document has been distributed in Belgium by Deutsche Bank AG acting through its Brussels Branch. Deutsche Bank AG is a stock corporation ("Aktiengesellschaft") incorporated under the laws of the Federal Republic of Germany and licensed to carry on banking business and to provide financial services subject to the supervision and control of the European Central Bank ("ECB") and the German Federal Financial Supervisory Authority ("Bundesanstalt für Finanzdienstleistungsaufsicht" or "BaFin"). Deutsche Bank AG, Brussels Branch has its registered address at Marnixlaan 13-15, B-1000 Brussels, registered at the RPM Brussels, under the number VAT BE 0418.371.094. Further details are available on request or can be found at www.deutschebank.be.

Kingdom of Saudi Arabia

Deutsche Securities Saudi Arabia Company (registered no. 07073-37) is regulated by the Capital Market Authority. Deutsche Securities Saudi Arabia may only undertake the financial services activities that fall within the scope of its existing CMA license. Principal place of business in Saudi Arabia: King Fahad Road, Al Olaya District, P.O. Box 301809, Faisaliah Tower, 17th Floor, 11372 Riyadh, Saudi Arabia.

United Kingdom

In the United Kingdom ("UK"), this publication is considered a financial promotion and is approved by DB UK Bank Limited on behalf of all entities trading as Deutsche Bank Wealth Management in the UK. Deutsche Bank Wealth Management is a trading name of DB UK Bank Limited. Registered in England & Wales (No. 00315841). Registered Office: 23 Great Winchester Street, London EC2P 2AX. DB UK Bank Limited is authorised and regulated by the Financial Conduct Authority and its Financial Services Registration Number is 140848. Deutsche Bank reserves the right to distribute this publication through any of its UK subsidiaries, and in any such case, this publication is considered a financial promotion and is approved by such subsidiary where it is authorised by the appropriate UK regulator (if such subsidiary is not so authorised, then this publication is approved by another UK member of the Deutsche Bank Wealth Management group that has the requisite authorisation to provide such approval).

Hong Kong

This document and its contents are provided for information only. Nothing in this document is intended to be an offer of any investment or a solicitation or recommendation to buy or to sell an investment and should not be interpreted or construed as an offer, solicitation or recommendation. To the extent that this document makes reference to any specific investment opportunity, its contents have not been reviewed. The contents of this document have not been reviewed by any regulatory authority in Hong Kong. You are advised to exercise caution in relation to the investments contained herein. If you are in any doubt about any of the contents of this document, you should obtain independent professional advice. This document has not been approved by the Securities and Futures Commission in Hong Kong nor has a copy of this document been registered by the Registrar of Companies in Hong Kong and, accordingly, (a) the investments (except for investments which are a "structured product", as defined in the Securities and Futures Ordinance (Cap. 571 of the Laws of Hong Kong) (the "SFO")) may not be offered or sold in Hong Kong by means of this document or any other document other than to "professional investors" within the meaning of the SFO and any rules made thereunder, or in other circumstances which do not result in the document being a "prospectus" as defined in the Companies (Winding Up and Miscellaneous Provisions) Ordinance (Cap. 32 of the Laws of Hong Kong) ("CO") or which do not constitute an offer to the public within the meaning of the CO and (b) no person shall issue or possess for the purposes of issue, whether in Hong Kong or elsewhere, any advertisement, invitation or document relating to the investments which is directed at, or the contents of which are likely to be accessed or read by, the public in Hong Kong (except if permitted to do so under the securities laws of Hong Kong) other than with respect to the investments which are or are intended to be disposed of only to persons outside Hong Kong or only to "professional investors" within the meaning of the SFO and any rules made thereunder.

Singapore

The contents of this document have not been reviewed by the Monetary Authority of Singapore ("MAS"). The investments mentioned herein are not allowed to be made to the public or any members of the public in Singapore other than (i) to an institutional investor under Section 274 or 304 of the Securities and Futures Act (Cap 289) ("SFA"), as the case may be (as any such Section of the SFA may be amended, supplemented and/or replaced from time to time), (ii) to a relevant person (which includes an Accredited Investor) pursuant to Section 275 or 305 and in accordance with other



Important information

conditions specified in Section 275 or 305 respectively of the SFA, as the case may be (as any such Section of the SFA may be amended, supplemented and/or replaced from time to time), (iii) to an institutional investor, an accredited investor, expert investor or overseas investor (each as defined under the Financial Advisers Regulations) ("FAR") (as any such definition may be amended, supplemented and/or replaced from time to time) or (iv) otherwise pursuant to, and in accordance with the conditions of, any other applicable provision of the SFA or the FAR (as the same may be amended, supplemented and/or replaced from time to time).

United States

In the United States, brokerage services are offered through Deutsche Bank Securities Inc., a broker-dealer and registered investment adviser, which conducts securities activities in the United States. Deutsche Bank Securities Inc. is a member of FINRA, NYSE and SIPC. Banking and lending services are offered through Deutsche Bank Trust Company Americas, member FDIC, and other members of the Deutsche Bank Group. In respect of the United States, see earlier statements made in this document. Deutsche Bank makes no representations or warranties that the information contained herein is appropriate or available for use in countries outside of the United States, or that services discussed in this document are available or appropriate for sale or use in all jurisdictions, or by all counterparties. Unless registered, licensed as otherwise may be permissible in accordance with applicable law, none of Deutsche Bank or its affiliates is offering any services in the United States or that are designed to attract US persons (as such term is defined under Regulation S of the United States Securities Act of 1933, as amended). This United States-specific disclaimer will be governed by and construed in accordance with the laws of the State of Delaware, without regard to any conflicts of law provisions that would mandate the application of the law of another jurisdiction.

Germany

This document has been created by Deutsche Bank Wealth Management, acting through Deutsche Bank AG and has neither been presented to nor approved by the German Federal Financial Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht). For certain of the investments referred to in this document, prospectuses have been approved by competent authorities and published. Investors are required to base their investment decision on such approved prospectuses including possible supplements. Further, this document does not constitute financial analysis within the meaning of the German Securities Trading Act (Wertpapierhandelsgesetz) and, thus, does not have to comply with the statutory requirements for financial analysis. Deutsche Bank AG is a stock corporation ("Aktiengesellschaft") incorporated under the laws of the Federal Republic of Germany with principal office in Frankfurt am Main. It is registered with the district court ("Amtsgericht") in Frankfurt am Main under No HRB 30 000 and licensed to carry on banking business and to provide financial services. Supervisory authorities: The European Central Bank ("ECB"), Sonnemannstrasse 22, 60314 Frankfurt am Main, Germany and the German Federal Financial Supervisory Authority ("Bundesanstalt für Finanzdienstleistungsaufsicht" or "BaFin"), Graurheindorfer Strasse 108, 53117 Bonn and Marie-Curie-Strasse 24-28, 60439 Frankfurt am Main, Germany.

India

The investments mentioned in this document are not being offered to the Indian public for sale or subscription. This document is not registered and/or approved by the Securities and Exchange Board of India, the Reserve Bank of India or any other governmental/ regulatory authority in India. This document is not and should not be deemed to be a "prospectus" as defined under the provisions of the Companies Act, 2013 (18 of 2013) and the same shall not be filed with any regulatory authority in India. Pursuant to the Foreign Exchange Management Act, 1999 and the regulations issued there under, any investor resident in India may be required to obtain prior special permission of the Reserve Bank of India before making investments outside of India including any investments mentioned in this document.

Italy

This report is distributed in Italy by Deutsche Bank S.p.A., a bank incorporated and registered under Italian law subject to the supervision and control of Banca d'Italia and CONSOB. Luxembourg This report is distributed in Luxembourg by Deutsche Bank Luxembourg S.A., a bank incorporated and registered under Luxembourg law subject to the supervision and control of the Commission de Surveillance du Secteur Financier. Spain Deutsche Bank, Sociedad Anónima Española is a credit institution regulated by the Bank of Spain and the CNMV, and registered in their respective Official Registries under the Code 019. Deutsche Bank, Sociedad Anónima Española may only undertake the financial services and banking activities that fall within the scope of its existing license. The principal place of business in Spain is located in Paseo de la Castellana number 18, 28046 - Madrid. This information has been distributed by Deutsche Bank, Sociedad Anónima Española.

Portugal

Deutsche Bank AG, Portugal Branch is a credit institution regulated by the Bank of Portugal and the Portuguese Securities Commission ("CMVM"), registered with numbers 43 and 349, respectively and with commercial registry number 980459079. Deutsche Bank AG, Portugal Branch may only undertake the financial services and banking activities that fall within the scope of its existing license. The registered address is Rua Castilho, 20, 1250-069 Lisbon, Portugal. This information has been distributed by Deutsche Bank AG, Portugal Branch.

Austria

This document is distributed by Deutsche Bank Österreich AG, with its registered office in Vienna, Republic of Austria, registered with the companies' register of the Vienna Commercial Court under FN 276838s. It is supervised by the Austrian Financial Market Authority (Finanzmarktaufsicht or FMA), Otto-Wagner Platz 5, 1090 Vienna, and (as entity in the Deutsche Bank AG group) by the European Central Bank ("ECB"), Sonnemannstrasse 22, 60314 Frankfurt am Main, Germany. This document has neither been presented to nor been approved by any of the before-mentioned supervisory authorities. For certain of the investments referred to in this document, prospectuses may have been published. In such case, investment decisions should be made exclusively on the basis of the published prospectus including possible supplements. Only these documents are binding. This document constitutes marketing material, which has been provided exclusively for informational and advertising purposes, and is not the result of any financial analysis or research.

In Europe, Middle East and Africa as well as in Asia Pacific this material is considered marketing material, but this is not the case in the U.S. No assurance can be given that any forecast or target can be achieved. Forecasts are based on assumptions, estimates, opinions and hypothetical models which may prove to be incorrect. Past performance is not indicative of future returns. Investments come with risk. The value of an investment can fall as well as rise and you might not get back the amount originally invested at any point in time. Your capital may be at risk.



Important information

The Netherlands

This document is distributed by Deutsche Bank AG, Amsterdam Branch, with registered address at De entree 195 (1101 HE) in Amsterdam, the Netherlands, and registered in the Netherlands trade register under number 33304583 and in the register within the meaning of Section 1:107 of the Netherlands Financial Supervision Act (Wet op het financieel toezicht). This register can be consulted through www.dnb.nl.

029181 091719