

ESG and the Invasion of Ukraine

Featuring:

Bhaveer Shah, ESG Researcher, MSCI

Andrew Young, ESG Researcher, MSCI

Antonios Panagiotopoulos, ESG Researcher, MSCI

Bentley Kaplan:

Hello and welcome to the weekly edition of ESG Now where we cover how the environment, our society and corporate governance affect and are affected by our economy. I'm your host for this episode, Bentley Kaplan. And truthfully, it's an unsettling time to be putting together a podcast as the surreal events in Ukraine play out. As of the time of recording, civilian casualties are climbing, hundreds of thousands of refugees are crossing into Poland, Romania, Slovakia, Hungary, and Moldova, and the heart-wrenching videos are dropping on social media sites with exhausting frequency. There are a lot of moving pieces and uncertainty about what comes next. Sanctions against Russia are intensifying, political unrest is being sparked by the conflict, experts are pointing to increased cyber warfare and even unthinkable mentions of nuclear readiness.

Now, our mandate on this show is to give investors and anyone interested in ESG a way of thinking about markets and events and companies through a pair of ESG-powered goggles. As I'm recording this, my colleagues are trying to make sense of things where they can and we'll be sharing any insights on this show in the weeks and months ahead. But as we do this, know that our thoughts are always with those caught up in the conflict or for those with loved ones or colleagues that are affected. Now, to try and get some sort of shape to the ESG-ness of this conflict, we're going to bring in three of my colleagues for their early impressions and views on how things are shaping out and where they might go.

We're going to start at a very high level, looking at the ESG ratings of whole countries, what they mean, how we can think about a place like Russia or Belarus and what the recent conflict could mean for Russia and Ukraine's neighbors and economic partners. Then we'll look at the different ways that tech companies are being roped into the conflict from content moderation, to advertising revenue, to the very employees that keep these tech firms running. And lastly, we'll finish by looking at how the conflict might be reshaping the energy sector and what that could mean for the newly minted climate ambitions of the long, long ago of 2021. Thanks for sticking around. Let's do this.

When you hear us talking about ESG ratings on this show, 99.9% of the time, we're talking about the ESG rating of a company, and that rating ranges from the cream of the crop at AAA all the way down to CCC. And for the purposes of MSCI ESG Research, this rating basically reflects how well a company is managing its most relevant, environmental, social and governance risks compared with a set of companies that operate in the same industry. Something else that we do is provide an ESG rating for whole countries, what we call the ESG government ratings. And as events in Russia, Ukraine and Belarus began to escalate in the past few weeks, maybe unsurprisingly, a lot of our clients started to ask a lot of questions about the ESG government ratings of those three countries.





On the 28th of February, MSCI ESG Research announced the downgrades of the government ratings of Russia to be from BBB, which leaves it one notch above the worst possible of CCC and the downgrade of Belarus to B from BB, both countries were given a negative rating outlook. Ukraine's rating has been maintained at BB, also given a negative rating outlook. To give more context to these gov ernment ratings and how recent events in Russia and Ukraine might plug into them, I dragged in one of my busier colleagues of late, Bhaveer Shah out of our Singapore office. He started us off with what exactly an ESG government rating is signaling to investors and why those same investors can't really ignore the signal and use a good old fashion sovereign credit rating instead.

Bhaveer Shah:

These ratings are mainly used by sovereign bond holders and they're almost a supplement beyond traditional macroeconomic data or beyond a credit rating insight that they will traditionally use to assess a country's ability to repay its debts. The ESG government rating tends to have a more longer-term focus and also more broader focus. The data helps to assess the sustain ability of the country's underlying macroeconomic model and how well that country can really maintain its competitiveness over the longer-term against ESG headwinds that we all know about such as let's say, youth unemployment or demographic aging or climate change.

Bentley Kaplan:

Okay. So that squares us up on what an ESG government rating is looking to measure. But as with all things ESG, once we answer the question of what it means, we very, very quickly move on to the next one, which is, how we measure it. What sort of data goes into the rating?

Bhaveer Shah:

So firstly, our model is quantitative and it uses around 30 annual sources ranging from a primary country data from let's say the World Bank all the way through to quite bespoke specialist providers like Transparency International or Aqueduct which measures water withdrawal. We use the same data for every single country to try and assess them fairly and on the same page as each other. Now, drilling into some of these pillars in detail, let's start off with our governance pillar which has a 50% weight in the ESG government ratings model. So the goal there is to actually look through the short-term political cycle into structural issues like institutional strength or judiciary independence, property rights or stability and peace. And those factors are almost like quality factors that help the other factors of production in an economy too. And then the social pillar tries to look at the economy's ability to provide basic needs for its population, which GDP growth are quite often predicated on, things like healthcare or education.

And really those start to suffer, you see secondary consequences on the growth outlook. And the second focus in that [inaudible 00:05:49] is to look at human capital in depth. And that's where you're looking, not just at let's say the size of the workforce, but the quality of that workforce, how well trained they are and how well they're able to convert that training into let's say innovation or wider economic opportunities or whether you see effects like brain drain. And then finally, we look at our E pillar, which also has a 25% weight in our overall ESG rating. And that looks at natural resources, how well a country is endowed with those resources, but also how well it manages or potentially over-





exploits those resources. And then that E pillar also looks at issues like pollution or emissions, which also do have an impact on the domestic population and issues like air quality, for instance.

Bentley Kaplan:

And here is where it gets tricky, because we build ratings and we build models to reflect reality, which in itself is a challenge. But when the world is hit with extreme or unanticipated events, reflecting that new reality can be a bit of a moving target. I asked Bhaveer to try and give me some context on how these rapidly evolving social consequences in Ukraine and in Russia may move needles in their ESG government ratings.

Bhaveer Shah:

Firstly on Russia, what our country ESG model is trying to measure is really how recent events the impact of let's say complete isolation or sanctions have effects on Russia's own economy, people and GDP prospects over the longer-term. So first of all, this scale of sanctions that has been imposed, I think there's been ample talk already about the kind of short to medium-term GDP consequences, but there is also a wider trade off from this level of spending going towards, let's say military compared to issues like healthcare or education. And when you see under-investment in those areas over the short-term, you do get a bite over the long-term on let's say, Russia's human capital or the areas of training in an economy which are essential to continue seeing that economy kind of evolve and develop.

And then on this side of political governance, there are quite a few questions about whether judiciary independence or legal contract adherence is as strong as let's say it was before this happened. And then finally on financial governance, we are looking not just at Russia's ability to repay back its debt over the short-term, but the implications of this crisis in terms of let's say concentration of trading partners, and that has implications over the longer-term, it means that there is concentration in the way that Russia generates GDP growths and that will need to be addressed at some point in terms of how Russia reshapes its economy.

Bentley Kaplan:

Now, Russia invading Ukraine has triggered many different impacts not only in terms of geopolitical consequences and sanctions, but much more human stories foremost of which is the fleeing of civilians from conflict zones. And this is where a government ESG rating is different because what happens in one country can change what happens to its neighbors. Bhaveer highlighted this by covering what could happen as a result of refugees fleeing Ukraine.

Bhaveer Shah:

The UN has estimated that there might be a total refugee influx which is similar in numbers to the 2011 Syria episode. And that's going into quite a few concentrated countries, Poland, but also some less economically capable countries like Moldova. And it's one thing to think about kind of the short-term consequences where you can measure let's say how much fiscal spending or housing spending



or kind of social blankets being provided by those countries in the short-term but it's another thing to think a little bit deeper and longer-term about what are the consequences on let's say social cohesion or cultural integration that are going to be happening in those economies, particularly because the demographic that has been migrated, it does tend to be a little bit younger and those countries have already had existing pressures from issues like youth unemployment. And it's not always a negative thing, we have seen in the past migration can also lead to longer-term positives, but the tough thing right now is, how do we measure that using data in a quantitative manner and also in a manner that's timely?

Bentley Kaplan:

Now, it's not surprising to see media focus on the human side of this conflict. These stories are gutwrenching and may only get worse, but in the background are longer-term factors that will also be shifting because of the conflict happening in the here and the now especially those related to the environment. Just because our attention is on the immediate human crisis doesn't mean that these longer-term factors hit the pause button. You may well have missed the recent release of the intergovernmental panel on climate change or IPCC's latest report which has painted an even graver outlook than previous iterations and for that, you could be forgiven. But many investors will still be looking to how these slower moving environmental factors may be affected by the conflict in Ukraine and that's something Bhaveer has been thinking about too.

Bhaveer Shah:

This is clearly an issue that has been flagged from this crisis where let's say countries in the EU have been more limited in their response against Russia, but also directly impacted through higher energy prices from external conditions. And that puts the agenda back onto de-carbonization and there have also been calls about whether some of these countries need to invest even faster towards maintaining their energy independence. But it's also highlighted problems of overdependence on any single energy source in some countries. And even with renewables, let's say in the Nile, you have had disputes over water resource between Ethiopia and Egypt. And again, there's an underlying issue there where when countries become dependent on any single energy source and there are then geopolitical concerns around it, that could have quite quick and rapid impacts not just into growth, but also into human lives.

Bentley Kaplan:

So Bhaveer gave us a breakdown of the different ways that investors can think about the ESG of a whole country and our conflict can result in changes to these underlying ES and G factors. What lingers for me is the complex interconnection between environmental and social factors some of which are operating at very different time scales. A war today can mean a radically different climate change trajectory over the next 10 or 20 years, which in itself can result in negative social consequences. And it was helpful to hear about ESG at a country level because for our next story, we're going to take a little bit of a sideway step.

The decisions of governments definitely impact on companies, that's nothing new, but in a kind of twist, there's also the impact that companies may be having on governments. And that's because some of the world's biggest tech firms, particularly those operating content platforms or social media,





like Alphabet aka Google, Meta aka Facebook and Twitter have become deeply embedded in how information and content is generated and shared, which makes this current conflict very, very different to those that preceded even as recently as 10 or 15 years ago. Media and content sharing has become supersized and turbocharged which raises the stakes considerably on who is saying what and who is listening.

For Facebook or Google, the challenges in sharing content are prickly. Think back to the heady days of fake news amid a US presidential election or vaccine misinformation slap bang in the middle of a global pandemic. If anything, things are getting harder, not easier. So I wanted to find out what the conflict in Ukraine means for the world's tech giants and what that means for people caught up in the middle of the conflict. As always, Andrew is our go-to for this coming fresh out of MSCI's London office.

Andrew Young:

I'd say you can draw a parallel to previous crisis. Since the Arab Spring, the social media had quite a pivotal organizing role in that crisis but since then, social media or the internet more broadly has had a tendency to exacerbate these crisis in terms of muddying the information landscape with misinformation and disinformation. And the tragedy is, this muddying of the information landscape can have real world consequences in terms of human lives or other forms and harm. So social media basically have a moral responsibility to act and they have learned from previous crises. They have both technological tools as well as human reviewers, this will enable them to suppress disinformation. Of course, it's not that simple. It gets a lot more complicated when they start to step in and moderate content because it's not like you simply click a switch and turn off disinformation, content is user-generated, it's published on the platform before it is reviewed. So as soon as you get into this effort to manage information on the platform, you start also stepping into human rights territories in terms of freedom of expression.

Bentley Kaplan:

So the challenge of moderating content or ensuring the integrity of content on platforms is definitely not going to get any easier for companies. And there's a genuinely complex trade off between enabling communication and information sharing with the risk of spreading misinformation or deliberately misleading content. And as we see increasing friction between governments and international content platforms over what is being shared or not shared and tagged or not tagged, well, it's not surprising that it's trickling over into revenue streams, revenue streams for both governments and platform companies. As of the time of recording, both Meta and Alphabet have imposed restrictions on Russian State media not only in Ukraine, but around the world. And these include labels about potentially misleading information and cutting off ad revenue for these media organizations. Amid calls for these companies to take even more aggressive measures like discontinuing services in Russia or even banning Russian government agencies from their platforms, I asked Andrew to talk us through how these companies might be thinking and what's going on in the background.



Andrew Young:

Restricting advertising I would say is step two in a three-step process. Step one would be to label Russian State media, content funded by the Russian government to apply any of their labels in the case of their content is contrary to their terms of service or what they call community standards. Step two then would be to what they call demonetize. So if you have a certain number of views of your content, advertisement will be added to that content so what they do is demonetize so you cannot make any money through that media. Step three, which is the step I think Facebook, YouTube, Twitter have taken now in Europe, is to ban those users on their various platforms. So banning of Russian State media, this is also complicated because there will be consequences, there will be repercussions. For these international businesses, the revenues coming from Russia, it's really not significant, so from that point of view, it doesn't matter, but what matters is that there are hundreds of thousands, millions of users of these platforms in Russia and what it means is that they cannot use these platforms to communicate with their friends, families, communities.

Bentley Kaplan:

Exactly. So for now, big social media companies have not suspended their services and that's because in addition to risky disinformation, that's being spread, there are also millions of people that rely on social media to communicate with loved ones or to share honest and informative content. And the more we talk to Andrew, the more it becomes clear how many strands connect these global companies to countries like Ukraine and Russia. Reading through current headlines and social media posts will quite quickly help you realize that many companies either employ directly or use the services of IT workers in Ukraine and especially Kyiv and that many of them are figuring out what to do about operations and employees stuck in a war zone.

Andrew Young:

Now, under the Zelensky government, so since about 2019, there's been an initiative to develop a tech hub in Kyiv, it's called Diia City and what it means is that companies that are doing technology work, information technology work, hiring information technology workers, are entitled to some kind of benefits including tax benefits. So what this generally means is that there's quite a lot of outsourced work, outsourced tech work that is taking place in Kyiv reportedly around 200,000 tech workers at the moment but there were plans to double this by 2025. A lot of these international tech companies have disclosed efforts to relocate workers within Ukraine towards the west of Ukraine. What some companies have also done is disclosed their intention to reduce their reliance on the presence in this area. The nature of tech work allows for flexibility and so they can really minimize the business continuity issues of such a conflict but the real consequence is then for Ukraine and its plans to be a European tech hub.

Bentley Kaplan:

So from tech companies hustling through a global conflict and all of the complexity that brings, we've got one more angle to cover on the show. Mike hosted our colleague Elton on a couple of episodes in the past month to talk about the gas pipeline, Nord Stream 2 and the implications of sanctions for the transport of gas into Europe from Russia. Today, we are going to



tackle another angle in the energy story by looking at oil and gas companies both in Russia and Europe and how conflict in Ukraine is driving some sudden and sometimes unexpected consequences. To help me do that, I've got Antonios Panagiotopoulos, a serial guest on the show coming hot out of London. And the first thing he did was to school me on the links between European and Russian oil and gas companies.

Antonios Panagiotopoulos:

The past of oil and gas, if you like, has always had international oil and gas firms partnering up with state-owned firms to develop resource to share technology specifically on exploration and production. Now, what happens here is that the Russian invasion in Ukraine has caused a bit of a reshuffle, three of the main oil and gas companies in Russia, gas from Rosneft and Novatech have long partnered with Shell, BP and Total energies respectively. Now, BP has said over the weekend that it will exit its partnership with Rosneft. Shell also announced similar action with Gazprom while there has been no development so far as we know with Total. Now, all these have been longstanding partnerships and in some cases ranging over 30 years. So it's interesting to see what that reshuffle, if you like, kind of brings about.

Bentley Kaplan:

Now, I'm not an oil and gas man. I had no idea the scale of these partnerships and how strategically meaningful they actually are. For scale, Antonios took me through some estimates on what this could mean using BP as an example. Now, because BP is stepping back from its partnership with Rosneft, it could be losing access to around 50% of its proven reserves and around 30% of its production. Those are huge slices of the pie. So the real question for investors and for an analyst like Antonios, is what this could mean for European oil and gas companies that suddenly lose access to Russia. How do you plug this giant hole?

Antonios Panagiotopoulos:

For the European oil majors, the access to Russian gas and oil, but mainly gas has represented a lower emissions pathway to de-carbonization compared to oil. Now, the dissolving of these partnerships with their Russian counterparts has brought forward any critical decisions these companies have to make with regards to their low carbon future. If gas is no longer available, what's the alternative? Will they be directed to another source of natural gas or fossil fuels, or will there actually be an opportunity or a pivot point to actually invest in more renewables?

Bentley Kaplan:

Right. So it makes for a very interesting space to watch. It's not clear if companies like BP and Shell are going to just look for more of the same from elsewhere or if this is going to be a definitive moment in their trajectories where they turn challenge into opportunity and pivot meaningfully into low carbon businesses. But this story cuts both ways because the Russian counterparts in these relationships will also suddenly be facing a brave new world.



Antonios Panagiotopoulos:

If we were to take it from the other side, from the Russian companies, so these partnerships have always been kind of mutually beneficial because Russia needs in a way foreign expertise and technology to extract hydrocarbons. Now, this is particularly true in the case of Arctic developments where all three European oil and gas majors had respective plans with the Russian counterparts for the development of Arctic oil and gas projects. In 2021, all three Russian companies entered separate memorandum of understanding with their partnerships specifically around efficiency and low carbon technology sharing, as well of course as the development of carbon capture in storage as well as hydrogen solutions. Now, the question becomes even more prominent because Gazprom and Rosneft are actually the second and fourth respectively largest emitters in the MSCI ACWI Index if you account scope one, scope two and scope three, so operation and value chain emissions.

Bentley Kaplan:

Exactly. Climate conscious investors in BP or Shell may be looking at this scenario with some potentially positive outcomes. Shedding oil and gas assets in Russia may mean a more aggressive, low carbon transition trajectory. But climate conscious investors looking at the big picture may be having more mixed feelings because sure, these partnerships between European oil majors and Russia State-owned firms effectively brought together the world's best extraction and production technology and Russia's huge oil and gas reserves, which overall is bad news for climate change. But these partnerships also meant that some of Europe's cutting edge, low carbon technology and ambition to lower emissions were rubbing off on some of the world's biggest emitters. So an end to these partnerships may slow the extraction of fossil fuels in Russia and the Arctic but in the same breath, it may also mean that some of the momentum towards low carbon solutions is suddenly lost for a big part of the global economy.

It feels weird to be closing out this episode because these stories are very much ongoing. And for all of the insights I could shake out of my colleagues, there are still so many unanswered questions. But some things did come out clearly, for Antonios, decades-old partnerships are one way to guide low carbon solutions to the world's biggest emitters. Now, that is looking much harder. For Andrew, it was all about how high the stakes have been raised for content platforms and the perilous tightrope between freedom of speech and misinformation. And Bhaveer cracked open a whole new story for us in the shape of ESG government ratings and how closely intertwined different countries are and how events can't happen in a vacuum. For investors, all of this is a timely reminder of how ESG can play out at the level of a company, at the level of a country, and often at the interface between the two. And making investment decisions now might not feel easy.

First and foremost, trauma stemming from the conflict only looks to be escalating. It will take Ukraine years to rebuild and recover not only the physical damage, but the senseless loss of loved ones or the psychological trauma of a nation and those bound to it. Many will feel helpless even after having made donations to effective aid organizations and pressuring their political representatives to do more. But the investment world's increasingly showing just how effective the movement of capital can be in creating change. In the wake of conflict, decisions about what to invest in or what to avoid would historically have been focused on asset or revenue exposure to a country like Russia. And that's still true today but ESG offers a new way of looking at these investment challenges and pushing for positive change.



And that is it for the week. A massive thanks to Bhaveer, to Andrew and Antonios for their take on the news with an ESG twist. Thank you very much for tuning in. If you like the story, please also do check out our past episodes, Nord Stream 2 and Vaccines for Everyone posted on the 25th of February and Europe's Dependence on Russian Gas and Online Gambling posted on February 18. We will keep covering the ESG bases of this conflict as the situation unfolds. But most of all, I do want to reiterate our thoughts for all of those affected by the conflict in Ukraine. We wish everyone courage and hope and that tomorrow brings an easier day for you. Thanks for listening. We'll talk to you again soon.

Bentley Kaplan:

The MSCI ESG Research podcast is provided by MSCI Inc subsidiary, MSCI ESG Research LLC, a registered investment advisor under the Investment Advisors Act of 1940. And this recording and data mentioned herein has not been submitted to nor received approval from the United States Securities and Exchange Commission or any other regulatory body. The analysis discussed should not be taken as an indication or guarantee of any future performance, analysis, forecast or prediction. The information contained in this recording is not for reproduction in whole or in part without prior written permission from MSCI ESG Research.

None of the discussion or analysis put forth on this recording constitutes an offer to buy or sell or promotional recommendation of any security, financial instrument or product or trading strategy. Further, none of the information is intended to constitute investment advice or recommendation to make or refrain from making any kind of investment decision and may not be relied on as such. The information provided here is as is and the user of the information assumes the entire risk of any use it may make or permit to be made of the information. Thank you.



About MSCI

MSCI is a leading provider of critical decision support tools and services for the global investment community. With over 50 years of expertise in research, data and technology, we power better investment decisions by enabling clients to understand and analyze key drivers of risk and return and confidently build more effective portfolios. We create industry-leading research-enhanced solutions that clients use to gain insight into and improve transparency across the investment process. To learn more, please visit **www.msci.com**.

The Information may not be used to create derivative works or to verify or correct other data or information. For example (but without limitation), the Information may not be used to create indexes, databases, risk models, analytics, software, or in connection with the issuing, offering, sponsoring, managing or marketing of any securities, portfolios, financial products or other investment vehicles utilizing or based on, linked to, tracking or otherwise derived from the Information or any other MSCI data, information, products or services.

The user of the Information assumes the entire risk of any use it may make or permit to be made of the Information. NONE OF THE INFORMATION PRO VIDERS MAKES ANY EXPRESS OR IMPLIED WARRANTIES OR REPRESENTATIONS WITH RESPECT TO THE INFORMATION (OR THE RESULTS TO BE OBTAINED BY THE USE THEREOF), AND TO THE MAXIMUM EXTENT PERMITTED BY APPLICABLE LAW, EACH INFORMATION PROVIDER EXPRESSLY DISCLAIMS ALL IMPLIED WARRANTIES (INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTES OF OR ORIGINALITY, ACCURACY, TIMELINESS, NON-INFRINGEMENT, COMPLETENESS, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE) WITH RESPECT TO ANY OF THE INFORMATION.

Without limiting any of the foregoing and to the maximum extent permitted by applicable law, in no event shall any Information Provider have any liability regarding any of the Information for any direct, indirect, special, punitive, consequential (including lost profits) or any other damages even if notified of the possibility of such damages. The foregoing shall not exclude or limit any liability that may not by applicable law be excluded or limited, including without limitation (as applicable), any liability for death or personal injury to the extent that such injury results from the negligence or willful default of itself, its servants, agents or sub-contractors.

Information containing any historical information, data or analysis should not be taken as an indication or guarantee of any future performance, analysis, forecast or prediction. Past performance does not guarantee future results.

The Information should not be relied on and is not a substitute for the skill, judgment and experience of the user, its management, employees, advisors and/or dients when making investment and other business decisions. All Information is impersonal and not tailored to the needs of any person, entity or group of persons.

None of the Information constitutes an offer to sell (or a solicitation of an offer to buy), any security, financial product or other investment vehicle or any trading strategy.

It is not possible to invest directly in an index. Exposure to an asset class or trading strategy or other category represented by an index is only available through third party investable instruments (if any) based on that index. MSCI does not issue, sponsor, endorse, market, offer, review or otherwise express any opinion regarding any fund, ETF, derivative or other security, investment, financial product or trading strategy that is based on, linked to or seeks to provide an investment return related to the performance of any MSCI index (collectively, "Index Linked Investments"). MSCI makes no assurance that any Index Linked Investments will accurately track index performance or provide positive investment returns. MSCI linc. is not an investment adviser or fiduciary and MSCI makes no representation regarding the advisability of investing in any Index Linked Investments.

Index returns do not represent the results of actual trading of investible assets/securities. MSCI maintains and calculates indexes, but does not manage actual assets. Index returns do not reflect payment of any sales charges or fees an investor may pay to purchase the securities underlying the index or Index Linked Investments. The imposition of these fees and charges would cause the performance of an Index Linked Investment to be different than the MSCI index performance.

The Information may contain back tested data. Back-tested performance is not actual performance, but is hypothetical. There are frequently material differences between back tested performance results and actual results subsequently achieved by any investment strategy.

Constituents of MSCI equity indexes are listed companies, which are included in or excluded from the indexes according to the application of the relevant index methodologies. Accordingly, constituents in MSCI equity indexes may include MSCI Inc., clients of MSCI or suppliers to MSCI. Inclusion of a security within an MSCI index is not a recommendation by MSCI to buy, sell, or hold such security, nor is it considered to be investment advice.

Data and information produced by various affiliates of MSCI Inc., including MSCI ESG Research LLC and Barra LLC, may be used in calculating certain MSCI indexes. More information can be found in the relevant index methodologies on www.msci.com.

MSCI receives compensation in connection with licensing its indexes to third parties. MSCI Inc.'s revenue includes fees based on assets in Index Linked Investments. Information can be found in MSCI Inc.'s company filings on the Investor Relations section of www.msci.com.

MSCI ESG Research LLC is a Registered Investment Adviser under the Investment Advisers Act of 1940 and a subsidiary of MSCI Inc. Except with respect to any applicable productsor services from MSCI ESG Research, neither MSCI nor any of its products or services recommends, endorses, approves or otherwise expresses any opinion regarding any issuer, securities, financial products or instruments or trading strategies and MSCI's products or services are not intended to constitute invest ment advice or a recommendation to make (or refrain from making) any kind of investment decision and may not be relied on as such. Issuers mentioned or included in any MSCI ESG Research materials, including materials utilized in any MSCI ESG Research materials, including materials utilized in any MSCI ESG Research. MSCI ESG Research materials, including materials utilized in any MSCI ESG Indexes or other products, have not been submitted to, nor received approval from, the United States Securities and Exchange Commission or any other regulatory body.

Any use of or access to products, services or information of MSCI requires a license from MSCI. MSCI, Barra, RiskMetrics, IPD and other MSCI brands and product names are the trademarks service marks, or registered trademarks of MSCI or its subsidiaries in the United States and other jurisdictions. The Global Industry Classification Standard (GICS) was developed by and is the exclusive property of MSCI and Standard & Poor's. "Global Industry Classification Standard (GICS)" is a service mark of MSCI and Standard & Poor's.

MIFID2/MIFIR notice: MSCI ESG Research LLC does not distribute or act as an intermediary for financial instruments or structured deposits, nor does it deal on its own account, provide execution services for others or manage client accounts. No MSCI ESG Research product or service supports, promotes or is intended to support or promote any such activity. MSG ESG Research is an independent provider of ESG data, reports and ratings based on published methodologies and available to clients on a subscription basis. We do not provide custom or one-off ratings or recommendations of securities or other financial instruments upon request.

Privacy notice: For information about how MSCI ESG Research LLC collects and uses personal data concerning officers and directors, please refer to our Privacy Notice at https://www.msci.com/privacy-pledge.

This document and all of the information contained in it, including without limitation all text, data, graphs, charts (collectively, the "Information") is the property of MSCI Inc. or its subsidiaries (collectively, "MSC"), or MSCI's licensors, direct or indirect suppliers or any third party involved in making or compiling any Information (collectively, with MSCI, the "Information Provides") and is provided for informational purposes only. The Information may not be modified, reverse-engineered, reproduced or redisseminated in whole or in part without prior written permission from MSCI.