



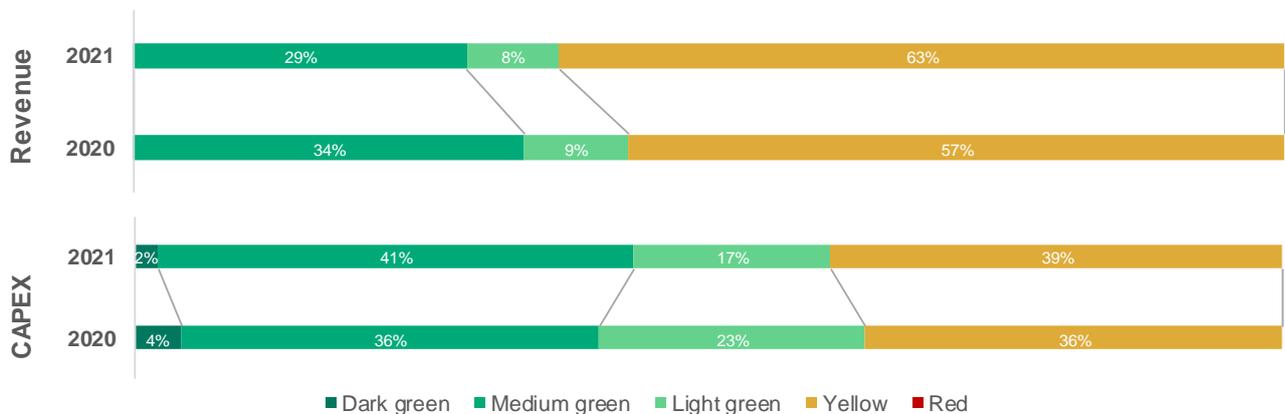
# Yara Shades of Green Assessment Update 2022



March 23, 2022

## EXECUTIVE SUMMARY

**Yara International ASA (Yara) is one of the world's largest producers of mineral nitrogen fertilizer, listed on the Oslo Stock Exchange and headquartered in Oslo.** This is an update of Yara's Shades of Green Assessments published in 2020 and 2021.



**37% of Yara's revenues in 2021 receive a Shade of Green, compared to 43% in 2020.**<sup>1</sup> While revenues from its products and services assigned a Shade of Green increased in 2021, sales of Yara's Yellow products and services increased at a higher rate (driven primarily by higher ammonia market prices). A Medium Green has been assigned to revenues from fertilizers which have approximately 90% less N<sub>2</sub>O process emissions because of N<sub>2</sub>O catalyst technology (NPK, nitrates and calcium nitrates). Light Green revenues relate to a wide range of Yara's products and services, for example the sale of fertilizers and chemicals with lower process emissions to industrial clients (i.e. non-agriculture), and mining activities required for the production of its fertilizers with lower process emissions. Light Green revenues also include environmental solutions such as NO<sub>x</sub> abatement for industrial plants and land and sea transport. Given the end-use of Yara's Light Green products is not always known, and could include substantial risks of lock-in and rebound (e.g. retrofitting old vessels with scrubber technology), they could feature Yellow elements if a more detailed analysis is conducted. A Yellow shade is given to Yara's other fertilizers (mainly produced from ammonia and urea, and third-party products).

**61% of investments in 2021 receive a Shade of Green, compared to 64% in 2020.** Investments in Medium Green and Yellow sites have increased in absolute terms, while investments in Light Green sites have decreased. Yara's Dark Green investments relate to its project to produce hydrogen from renewable electricity for use in ammonia production at its Porsgrunn site, and its investments in a zero-emission vessel for its fertilizers.

**In this assessment, nitric acid produced with high emissions intensity is considered Yellow, as are investments into the production of such nitric acid.** The threshold for 'high emissions intensity' has been taken as 0.230 tCO<sub>2</sub>e per ton of nitric acid, i.e. the EU ETS benchmark value for 2021-2025 for producing nitric acid. The EU Taxonomy includes a lower threshold: the criteria for alignment of nitric acid production with the

<sup>1</sup> Investors should note that CICERO Green has relied on the company's documentation and not conducted their own research on Yara's operations. Furthermore, our assessment is based on data reported or estimated by the company and has not always been verified by a third party.



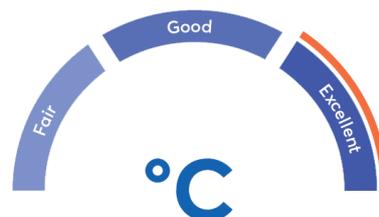
substantial contribution to climate change mitigation criteria is 0.038 tCO<sub>2</sub>e per ton of nitric acid, reflecting the average value of the 10% most efficient installations in 2016 and 2017. Had this threshold been used in shading Yara’s revenues and investments, the overall share of green revenues would have dropped to 35%, while the overall share of green investments would have decreased to 47%. Currently, only six of Yara’s nitric acid plants fall below the EU Taxonomy threshold. It is crucial that Yara has a short-term focus on replicating the performance levels of these six plants across its portfolio.

**The production of nitrogen fertilizers is energy intensive and currently involves large volumes of natural gas, giving rise to transition risks.** Yara is a large consumer of natural gas – a key input in the production of ammonia – and expects natural gas to remain its main feedstock in the coming years. Market and regulatory responses, for example carbon pricing, are therefore a risk. Yara shows a good awareness and responsiveness to these risks, targeting reductions in both CO<sub>2</sub>e emissions intensity and energy intensity. Given almost 80% of Yara’s GHG emissions relate to ammonia production, Yara’s investments in clean ammonia production are therefore crucial, and also represent a clear business opportunity.

**Scope 3 emissions are the largest source of Yara’s total emissions, and around 60% of its total emissions are from the use of its fertilizers in agriculture.** Increased attention on these emissions is encouraged, including promotion of targeted application and optimization. In this respect, Yara has introduced a target to have 150 million hectares under active management by 2025, which measures hectares owned by farmers who have registered them in Yara’s digital tool(s). Technology will undoubtedly play a large role in ensuring targeted use of fertilizers, though it vital that impacts from these tools and farm performance are measured and reported.

**Fertilizer producers are exposed to physical risks associated with climate change, for example more extreme precipitation events and associated flooding, drought, and sea level rise for production facilities close to the ocean.** Since our last Shades of Green Assessment, Yara has gone through its first iteration of a climate scenario analysis process. This is an important step and the incorporation of the findings into its risk assessment process is welcome. It is a strength that this extends to its upstream and downstream value chain (risk assessments for critical suppliers were included). Yara can moreover point to investments increasing climate resilience following site-assessments, for example building up its ammonia production site in Pilbara, Australia to withstand 1 in 100-hundred-year storm events.

**We assess Yara’s environmental governance as Excellent.** Yara demonstrates high transparency on environmental governance and has good reporting procedures and standards. Three notable improvements since our last Shades of Green Assessment are i) the introduction of an absolute emissions target, ii) reporting in accordance with TCFD recommendations, and iii) undertaking its first climate scenario analysis process (see above). Yara could improve reporting on biodiversity and lifecycle impacts – to this end, we welcome Yara’s intention to introduce nature-related target(s) in 2022 or 2023. Yara also demonstrates a broad-ranging and comprehensive awareness of social issues, mapping and identifying social risks which form the basis of a thorough implementation system.



	Emissions intensity KPI (tCO <sub>2</sub> e/t N-fertilizer produced)	Scope 1+2 / Scope 1+2+3 Emissions (MtCO <sub>2</sub> e)	NO <sub>2</sub> Emissions (tonnes)	Energy intensity (GJ/ton ammonia)
2020 <sup>2</sup>	3.0	17.7 / 71.1	8,300	33.2
2019	3.0	18.5 / 74.2	8,500	33.7
2018	3.0	18.5 / 70.6	9,400	34.1

Table 1: Yara’s key sector metrics.

<sup>2</sup> Note that figures for 2021 are not yet public or final.



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# 1 Yara sustainability management

## Company Description

Yara International ASA is one of the world's largest producers of mineral nitrogen fertilizer, listed on the Oslo Stock Exchange and headquartered in Oslo. The company has around 17,800 employees, 28 production sites on six continents, operations in more than 60 countries and sales to about 160 countries. About half of Yara's production capacity, and about 40% of its markets, are in Europe.

Yara produces both commodity and premium products, but primarily targets growth in the latter. Consequently, Yara produces all upgrade steps of fertilizers based on ammonia, which it uses to produce urea, nitric acid, nitrates as well as nitrogen-based compound fertilizers (NPK). Yara is the second largest producer of ammonia globally and the largest producer of NPK.

Yara also sells urea, technical ammonium nitrate and calcium nitrate for industrial applications, including for mining applications, as well as industrial nitrates. Yara also has a portfolio of environmental solutions, which includes total solutions for NOx abatement for industrial plants and both land and sea transport.

Yara has identified the production of green ammonia as a strategic business opportunity and tool for mitigating certain transition risks. It established a clean ammonia unit in 2021 to develop this area of business, and a Joint Venture has been established to realize Europe's first full scale green ammonia project in Porsgrunn, Norway, with pilot projects in the Netherlands, Norway and Australia also live.

## Sector Risk Exposure



**Physical climate risks:** Fertilizer companies are naturally exposed to physical risks associated with climate change, such as more extreme precipitation events and associated flooding, drought, stronger winds, increased heat, and sea level rise for production facilities close to the ocean. As agriculture is especially vulnerable to physical risks, fertilizer companies are also exposed to indirect physical climate risks through their customers' exposure to such risks. Whereas increased physical climate risks are already certain due to current levels of global warming, a lack of ambitious policies at a global level to rapidly reduce greenhouse gas emissions will further increase the frequency of extreme events and increase the probability of physical damage to production facilities and associated infrastructure.

**Transition risks:** Fertilizer companies face policy risks due to GHG emissions associated with fertilizer production (e.g. CO<sub>2</sub> emissions from ammonia production) and N<sub>2</sub>O emissions from use of nitrogen fertilizers. Nitrogen fertilizer production is exposed to market and regulatory actions linked to being highly energy intensive, and on current production technology, CO<sub>2</sub> intensive. A dependency on natural gas poses a transition risk, particularly in the context of eventual economy wide transition away from fossil fuels.

**Environmental risks:** The production and (over) use of fertilizers can entail risks of air and water pollution. Issues around water availability, soil health and biodiversity issues can impact on the regulation, consumption, and demand of fertilizers. The mining of raw materials used in the production process, e.g. phosphate rock, can lead to local environmental and biodiversity issues.



**Social risks:** The fertilizer sector relies to a large extent on the sourcing of scarce materials, which brings social risk, especially in less well-regulated jurisdictions. Mining activities can give rise to risks relating to local opposition and interference with indigenous rights. A global presence and deep supply chain can also lead to human rights and labor risks.

### Governance Assessment

Yara has medium and long-term targets in place, with demonstrable strategies and measurable KPIs in place for their achievement. Specifically, Yara's aspiration is to become climate neutral by 2050 (Scope 1, 2 and 3). Relevant intermediate targets include:

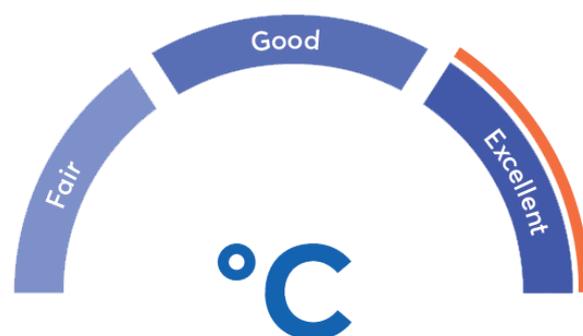
- 1) reducing CO<sub>2</sub>e emissions intensity from production by 10% by 2025 (2018 baseline) for Scope 1, 2, and upstream Scope 3 emissions from purchased ammonia only,
- 2) reducing absolute Scope 1 and 2 emissions by 30% by 2030 compared to 2019, and
- 3) achieving an energy intensity in the production of ammonia of 32.7 GJ/tonne.

We particularly welcome the introduction of an absolute emissions target since our last Shades of Green assessment. Yara, along with Nutrien and the World Business Council for Sustainable Development, began a process in February 2022 to develop a basis for setting a Paris-aligned target using the Sectoral Decarbonization Approach (SDA), which the Science-Based Targets Initiative (SBTi) is expected to publish for validation in 2022/2023. Yara also targets 150 million hectares under active management by 2025, which measures hectares owned by farmers who have registered them in Yara's digital tool(s).

Since our last Shades of Green assessment, Yara has for the first time reported in accordance with TCFD recommendations. It has also gone through its first iteration of a climate scenario analysis process to study strategic long-term risks and opportunities (inc. physical and transition risks). The climate scenario analysis process includes all parts of the organisation, all geographical regions in which Yara operates, and covers the full value chain (including risk assessments for critical suppliers). According to Yara, it expects to publish the results shortly after its integrated reporting in 2022 and that the outcomes of the first phase of the assessment have been integrated into its enterprise risk assessment process.

Yara has undertaken materiality assessments since 2015 and has moved to mitigate the identified risks with changes to its core business processes. For example, Yara has identified the transition risks arising out of its high GHG emissions from natural gas use in the production of its fertilizers. The ongoing development of its clean ammonia operations and the introduction of an internal carbon price for projects above USD 25m can be seen as responses to such risks. Yara furthermore integrates physical climate considerations into its operations, for example regarding production units in coastal regions and areas prone to flooding and cyclones.

Yara actively engages with its customers and partners in the value chain on climate-related issues, for example via farmer workshops, demonstration field trials, digital tools and communications, train-the-trainer programs, precision farming technology and more. Yara does not require farmers to report on impacts, but conducts its own quality checks to demonstrate improvements. However, Yara





expects to gradually improve the visibility of climate performance at farm level through digital tools. Yara has established the Agoro Carbon Alliance which aims to incentivize sustainable farming practices via carbon credits and certified low carbon harvests.

Yara demonstrates a broad-ranging and comprehensive awareness of social issues, mapping and identifying social risks forming the basis of a thorough implementation system to ensure compliance with its various social policies. Through the company's risk assessment, it has identified particular risks linked to contracting workers performing services for Yara, particularly where manual labor is combined with high temperatures.

Yara has a long-standing track-record of reporting key environmental indicators. It produces an annual sustainability report and integrated annual report prepared in accordance with the GRI Standard and TCFD recommendations. This includes reporting the share of revenues and investments designated a Shade of Green in our previous Shades of Green assessment. Its reporting is clear in linking its environmental performance to its targets, including against historical performance, and is transparent on methodology. Yara could improve reporting on biodiversity and lifecycle impacts – to this end, we welcome Yara's expectation to introduce nature-related target(s) in 2022 or 2023.

## Sustainability Management

### *Governance Structure*

Yara's Board of Directors has the oversight of climate performance, risks, and strategies and these are integrated in the reports to the AGM. The board provides strategy updates twice a year inclusive of company performance on energy climate and environmental performance metrics. Since the 2020 reorganization from functional segments into a geographic regional structure, the Executive Vice Presidents of the regions hold line responsibility for company performance on GHG emissions.

Yara has a Corporate Risk function that also covers climate, and reports to the Risk Committee which is chaired by the CEO. The overall sustainability reporting process sits with Yara's VP Sustainability Governance, reporting to the CFO. Sustainability governance and performance is overseen by the Board's Audit and Sustainability Committee.

### *Risk Assessment*

Yara operates an enterprise risk assessment process, covering both climate transition and physical risks. In this process, risk assessments are carried out on capital value projects, such as major investments, acquisitions, and joint ventures. Such assessments are also carried out on all production sites and business units.

Since our last assessment, Yara has gone through its first iteration of a climate scenario analysis process in accordance with TCFD recommendations, to study strategic long-term risks and opportunities (inc. physical and transition). This utilised three different scenarios - low emissions profile, medium emissions profile, and high emissions profile -<sup>3</sup> and time horizons of 2025, 2030 and 2050. The analysis covers all parts of the organisation and all geographical regions where Yara operates. The analysis extends to Yara's upstream and downstream value chain: during the process, Yara screened vendors who provide more than 40% of raw materials for Yara's production for climate risk, though Yara considers its integrated global business model provides it good hedging against the effects of climate change on its supply chain. The main suppliers of phosphate, potash and MAP/DAP were screened.

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<sup>3</sup> IPCC RCP 2.6, RCP 4.5, and RCP 8.5.



To counter climate risks, Yara has various sustainability policies and risk focused groups within the company. In addition, Yara has a multi-step process in place to manage climate-related risks:

- Risk appetite: The Board of Directors defines Yara's risk appetite annually.
- Country, plant level and business unit level: Country and plant managers identify and assess key risks as well as mitigation strategies.
- Regional level: Same process as above at the regional manager level. This leads to risk pictures and risk mitigation plans which are reported to the CFO and Risk manager, who will update Yara Executive Management.
- Yara level: Based on the regional risk pictures and escalated risks, the CEO is responsible for the annual Yara level risk evaluation which aims to identify and assess key risks.

### Reporting

Yara has a long-standing track-record of reporting key environmental indicators.<sup>4</sup> Yara reports key indicators in its annual report and produces both an annual sustainability report and integrated annual report prepared in accordance with the GRI Standard and TCFD recommendations. Yara's reporting includes the shares of revenues and investments assigned a Shade of Green in our previous Shades of Green assessment. Additionally, Yara reports to the CDP on Climate and Water.

Yara's sustainability report covers governance, strategy, risks & opportunities. Various metrics are included, such as absolute GHG emissions, GHG intensity, energy consumption and intensity, protection of ecosystems, water consumption and effluents, emissions, and waste.

Yara reports in its annual report for 2020, among others:

- Overall direct CO<sub>2</sub> emissions (and indirect emissions for Scope 2 and five Scope 3 GHG Protocol categories)<sup>5</sup>
- Carbon intensity
- Overall energy consumption
- NO<sub>x</sub>, SO<sub>x</sub>, dust emissions
- Raw material consumption of natural gas, phosphate, potash
- Water withdrawal
- Fines and penalties for environmental breaches (USD 340,500 in 2019)

Yara commits to regular reporting at least on an annual basis based on the GRI Standard and in accordance with TCFD recommendations. The reporting is published on its website. Yara's sustainability data is provided with limited assurance from the company's auditor, except for the climate KPIs, which are provided with reasonable assurance.

Yara expects the results of the first phase of its climate-scenario analysis to be published shortly after its annual reporting in 2022, and for these to be updated biannually.

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<sup>4</sup> Yara has an archive of its sustainability publications dating back to 2009 on its website.

<sup>5</sup> Categories 1 (GHG emissions from purchased goods and services), 3 (GHG emissions from fuel and energy related activities), 4 and 9 (GHG emissions from upstream and downstream transportation and distribution), and 11 (GHG emissions from the use of sold products).



## Key Issues

**Note that figures for 2021 are not yet public or final. This section of the assessment therefore uses figures for 2020.**

### GHG Emissions

Yara's GHG emissions in 2020 totaled 71.1 million tCO<sub>2</sub>e for Scopes 1, 2 and 3 (see Table 2), a reduction of 3.1 million tCO<sub>2</sub>e compared to 2019. According to Yara, this reduction is attributable to: i) Scope 1 – improved average energy efficiency at its ammonia production sites, ii) Scope 2 – purchase of green electricity, and iii) Scope 3 – lower purchased quantities of ammonia from third parties and reduced production volumes.

Compared to its 2018 baseline, Yara has reduced its GHG emissions intensity by 2% for Scope 1, Scope 2 (purchased electricity consumption) and Scope 3 (emissions from purchased ammonia only). Scope 1 and 2 emissions have reduced by around 45% since 2005, principally because of N<sub>2</sub>O catalyst technology installed at its nitric acid plants.

Emissions	Total (million tons CO <sub>2</sub> eq)	Scope 1	Scope 2 (market based)	Scope 3
<b>Main targets</b>	Aspiration to be climate neutral by 2050.  Reduction in CO <sub>2</sub> e emissions intensity for Scope 1, 2 and upstream Scope 3 emissions from production by 10% between 2018 and 2025.	Reduction in absolute Scope 1 and 2 emissions by 30% by 2030 compared to 2019.		Currently N/A, though Yara states that a pathway for Scope 3 emissions will be defined through the process of establishing science-based targets, including a process to determine a Sectoral Decarbonization Approach for its industry. According to Yara, the SBTi is expected to publish the SDA for validation in 2022-23.
<b>2020</b>	71.1 <sup>6</sup>	16.6	1.1	53.4 <sup>7</sup>
<b>2019</b>	74.2	17.1	1.4	55.7
<b>Change 2019-2020 (%)</b>	-4.18%	-2.92%	-22.98%	-4.13%
<b>Main sources</b>	<ul style="list-style-type: none"> <li>Scope 1: 23.34%</li> <li>Scope 2: 1.54%</li> <li>Scope 3: 75.11%</li> </ul>	<ul style="list-style-type: none"> <li>Production of mineral fertilizers, mainly due to the use of natural gas in the production of ammonia</li> </ul>	<ul style="list-style-type: none"> <li>Purchased energy</li> </ul>	<ul style="list-style-type: none"> <li>Purchased fuels (around 16% of Scope 3 emissions)</li> <li>Upstream and downstream transport (around 5% of Scope 3 emissions)</li> <li>Use of fertilizer (around 79% of Scope 3 emissions) including from over-fertilization</li> </ul>

**Table 2: Yara's GHG emissions (2020).**

As well as the overarching targets/aspirations highlighted in Table 2, Yara also has individual GHG targets for all its ammonia plants and nitric acid plants.

<sup>6</sup> This includes only market based (and not location based) Scope 2 emissions.

<sup>7</sup> Traded products or blended products based on third party components were not included in Scope 3 estimations, neither were any industrial uses of Yara products.



Yara considers itself on good track to achieve its 2025 emissions intensity target on account of 90 GHG reduction projects at its sites which target energy efficiency and reducing N<sub>2</sub>O emissions to the minimum possible amount. According to Yara, on account of the implementation of N<sub>2</sub>O catalyst technology, its nitrate-based fertilizers have a carbon intensity below industry average.

Yara's Scope 3 emissions are based on the emission factors used in the Fertilizers Europe Carbon Footprint Calculator.<sup>8</sup> This includes emissions from third-party ammonia purchased. It however does not include emissions from leaked, vented or flared methane in its supply chain for natural gas. Use phase emissions are calculated with the emissions factors in the IPCC Fourth Assessment Report (2007).

Yara also has other emissions to air from its plants. In 2020, 8,300t of NO<sub>x</sub> (measured as NO<sub>2</sub>) were emitted, a reduction from 8,500t in 2019.

### *Energy Use*

In 2020, Yara's energy consumption in production was 279 million GJ. 87% of this was consumed as feed or fuel in ammonia production – the remaining 13% was consumed in other production processes such as the production of steam and pressure, as well as electricity generation. Its principal target in this respect is to achieve an energy intensity for ammonia production of 32.7 GJ/tonne by 2023 – in 2020 its energy intensity was 33.2 GJ/tonne, a 2.6% decrease from 2018 which Yara attributes to improved operational efficiency and reliable production.<sup>9</sup> Moreover, Yara claims that the average energy intensity of its ammonia plants in 2020 was 4 percentage points better than the 2019-20 International Fertilizer Association benchmark for global average of ammonia plants.

Around 8% of electricity Yara purchased for use in production had a guarantee of origin. Yara has shared that it does not know the overall share of renewable energy in the electricity mix purchased.

In 2020, Yara's total consumption of natural gas was 250 million GJ, 69% of which was feedstock and 31% was consumed as fuel. This is a decrease from 256 million GJ in 2019, attributable by Yara to reduced production volumes and improved operations. Yara purchases the majority of its natural gas on the spot market and, on account of its plant location in Canada, expects some exposure to fracked natural gas in its production system.

### *Climate Resilience*

According to Yara, acute physical weather-related risks are included in site-assessments and it can point to investments focused on increasing resiliency: in its CDP disclosure for 2021, for example, Yara references building up its ammonia site in Pilbara, Australia by 5m to withstand 1 in 100-hundred-year storm events.

At a business level, Yara has not recognized water scarcity as a material issue, considering instead that fertilizer demand is driven by food demand. Access to water is analysed for each production site, and further analysis will be undertaken as part of the refinement of Yara's approach to climate risk in an asset level.

### *Material Sourcing*

In 2020, close to 94% of Yara's operating expenses related to the purchase of raw materials, energy costs, and freight expenses, and Yara had over 30,000 active suppliers. Along with natural gas (see Energy Use, above), key materials include phosphate and potash, as well as ammonia produced by third parties.

According to Yara's CDP disclosure for 2021, good environmental practice is built into its contracts with suppliers due to the inclusion of its Business Code of Conduct in agreements. Yara's Business Code of Conduct sets out that

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<sup>8</sup> Fertilizers Europe is an industry group representing European fertilizer producers. Its calculator takes a life cycle approach to measuring emissions related to the production of selected fertilizers: <https://www.fertilizerseurope.com/initiatives/carbon-footprint-calculator/>

<sup>9</sup> Note that Yara's KPI for emissions intensity and the calculated figure for 2020 of 33.2 GJ/tonne does not include the performance of its Cubatão and Babrala plants, which were purchased after the setting of this KPI. If Yara's operational share of these plants is included, energy intensity in 2020 was 33.8 GJ/tonne. This latter figure is reported in its Sustainability Report.



business partners are expected to comply with all applicable environmental laws and regulations and implement an appropriate environmental policy and management system. The use of environmentally friendly technologies, products and services are also expected, aiming at optimizing the use of natural resources, energy and water and minimizing negative impact to air, water, soil, biodiversity, and the climate. Yara mentions that it has in the past screened for such aspects, however the introduction of its Sustainable Procurement Policy (currently under development) will make such screening more active. Yara’s General Terms and Conditions of Purchase furthermore require a supplier to ‘strive’ to keep the impact to the environment at a minimum and continuously reduce the impact of its emissions. Yara is also exploring circular economy opportunities, including in respect of phosphate recycling.

Notwithstanding the above, we understand that Yara does not have any specific emissions or climate criteria in respect of key materials. For example, Yara does not have emissions or energy intensity thresholds for purchased ammonia and it is not clear to what extent these factors feed into procurement decisions. The extent to which this will be covered in Yara’s Sustainable Procurement Policy is to be decided, with Yara noting that climate and energy performance transparency in the global ammonia market is not standard.

### Key Social Issues

To identify and handle social risks in its own operations and in business relationships, Yara has established a range of measures.

Yara has a Human Rights Policy, a Code of Conduct, and does risk assessments annually. Yara has identified various social risks relevant to its operations and supply chain and which are reflected in its Code of Conduct. These cover among others child labour, forced labour and interference with indigenous rights. No significant violations of indigenous rights or instances of child or forced labour were identified by Yara in 2020 in its own operations or supply chain.

In 2020, Yara’s risk assessment identified 18 high risk countries in which it operates, and in early 2022 it announced it would no longer purchase potash from Belarus. In response to Russia’s invasion of Ukraine, the company has also in mid-March 2022 stopped all sourcing from suppliers linked to entities and persons that have been sanctioned. All high and medium risk countries are monitored through the Compliance Program and specific action plans are developed to mitigate identified impacts.

Yara furthermore has a Code of Conduct for Business Partners, which is included in all major contracts and, like its own Code of Conduct, covers risks relating to human rights, business ethics, and labour conditions among others. Yara also undertakes Integrity Due Diligence on potential, new and existing business partners which, depending on identified risk categories, can include self-assessment and declarations, or continued monitoring or screening. Approximately 1% of potential business partners are rejected annually because of adverse findings in this process.

**Table 4: CICERO Green assessment of Yara’s management of key environmental issues**

Key issue	CICERO Green comments
GHG Emissions	<ul style="list-style-type: none"> <li>✓ Yara has concrete emissions reduction targets and measurable corresponding KPIs. The development of roadmaps for each production site, and site-specific KPIs, facilitates a more targeted approach. Consideration of energy use (see below) are crucial.</li> <li>✓ Yara’s installation of N<sub>2</sub>O catalyst technology in its nitric acid plants has led to a circa 45% reduction in Scope 1 and Scope 2 emissions since 2005. This is</li> </ul>



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	<p>substantial, yet the challenge is to ensure gains from this technology are maximized. In this respect, Yara informs us that there are opportunities to improve this technology, such as: i) upgrading catalyst installations, ii) installing larger burner baskets, iii) replacement of burners, and iv) modifying burners.</p> <ul style="list-style-type: none"><li>✓ Yara’s investments in 2050 solutions such as clean ammonia and fossil free transport solutions will positively impact emissions.</li><li>✓ Scope 3 emissions account for around 75% of Yara’s emissions. The conclusion of Yara’s science-based targeting setting process, which will define a pathway for Scope 3 emissions, is important. It is unclear whether this will address Scope 3 emissions from methane leaks, venting and flaring in its natural gas supply chain, which Yara does not currently measure.</li><li>✓ Fertilizer use accounts for 60% of Yara’s emissions. Fertilizer optimization is therefore crucial, and technology will play a vital role in correct and specific fertilizer use. In this respect, Yara has introduced a target to increase hectares of agricultural land registered to its digital tools. Note, however, that registration of hectares to digital tools does not provide an indication of impact. Increased consideration on final application of fertilizers is encouraged, including measurement of impacts and climate performance at farm level.</li><li>✓ Note that Yara attributes the reduction in Scope 3 emissions to lower quantities or purchased ammonia and lower production. Given input quantity and production values are driven by non-climate factors, such reductions are not locked in.</li></ul>
Energy	<ul style="list-style-type: none"><li>✓ Yara is a very large consumer of natural gas and expects natural gas to remain its main feedstock in the coming years. This is a weakness as natural gas use creates substantial climate risks.</li><li>✓ Yara shows awareness of climate risks related to natural gas use and explicitly targets a reduction in the energy intensity in the production of ammonia.</li><li>✓ While investments in energy efficiency and plant reliability are welcome to reduce energy use, given almost 90% of Yara’s energy consumption relates to ammonia production, the increased focus on the decarbonization of this process is key. Yara’s investments in clean ammonia production are therefore crucial, and also represent a clear business opportunity.</li><li>✓ Increasing the share of renewable electricity used in production is also paramount, both purchased and produced. The use of guarantees of origin does not eliminate the physical emissions associated with operations.</li></ul>
Climate Resilience	<ul style="list-style-type: none"><li>✓ Yara has undertaken its first climate scenario analysis – this is an important step and the incorporation of the findings into its risk assessment process is welcome. It is a strength that this extends to its upstream and downstream value chain.</li><li>✓ Physical risk is considered on a business level, as part of the capital value process, and included in site-assessments.</li></ul>
Material Sourcing	<ul style="list-style-type: none"><li>✓ The energy intensity of ammonia can vary widely, and we understand that Yara does not have an emissions or energy intensity threshold for third-party ammonia suppliers.</li><li>✓ Raw materials such as phosphorus can also feature significant sourcing emissions. It is not clear to what extent these are considered in the procurement process.</li></ul>

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- ✓ Several of Yara's sourced materials are mined (phosphorous and potash) – these materials are scarce and mining carries local environmental and social risks. It is vital that such issues are considered sufficiently in the procurement process.
  - ✓ We encourage Yara to report in greater detail on its raw material sourcing and the extent to which Yara is seeking to drive improved climate and environmental performance of its suppliers (particularly those supplying key materials).
  - ✓ Yara is currently developing a Sustainable Procurement Policy. This is a welcome step.

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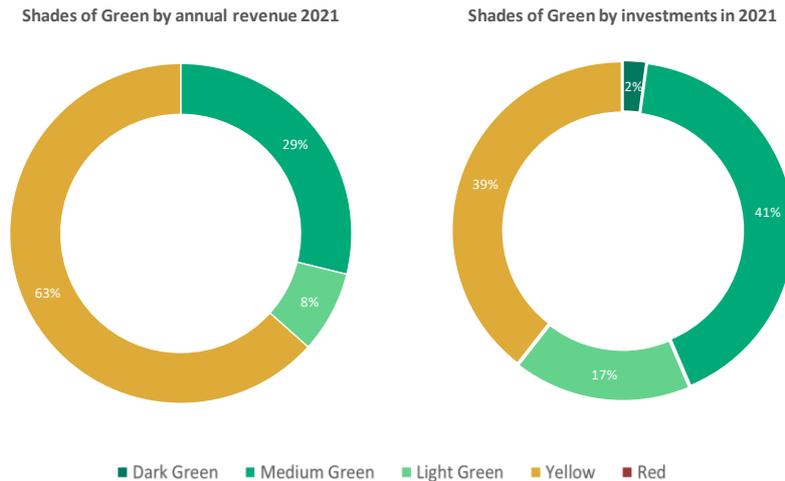
Social Issues

- ✓ The company's activities rely to a large extent on the sourcing of scarce resources and this sourcing is therefore carefully monitored. The most material social risks identified by the company are related to health and safety for workers and local communities, as well as workers' rights in relation to wages, contracts, freedom of association, grievance channels and right to remedy.
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## 2 Assessment of Yara’s Revenues and Investments

### Shading of Yara’s revenue and investments



Given Yara’s governance and management of key concerns, we have assigned a shade to its revenues and investments based on the following:

**Dark Green** is allocated to products, projects and solutions that correspond to the long-term vision of a low carbon and climate resilient future. These projects should be Paris aligned or have zero emissions around mid-century.

**Medium Green** is allocated to products, projects and solutions that represent steps towards the long-term vision but are not quite there yet.

**Light Green** is allocated to transition activities. These products, projects and solutions could have lower emissions, but do not by themselves represent or contribute to the long-term vision.

Investors should note that our assessment is based on data reported or estimated by the company and has not always been verified by a third party. We analyse revenue, operating costs and investments, however there is typically not an explicit link between sustainability and financial data.<sup>10</sup> Our shading often requires allocating line items in financial statements to projects or products, for this we rely on the company’s internal allocation methods. In addition, there are numerous ways to estimate, measure, verify and report e.g. data on emissions, which may make direct comparisons between companies or regulatory criteria difficult and somewhat uncertain.

### Revenues

Overall, 37% of Yara’s revenue can be considered green in 2021, compared to 43% in 2020. Despite increased green revenues in absolute terms, sales of Yara’s Yellow products and services increased at a higher rate, driven

<sup>10</sup> Most accounting systems do typically not provide a break-down of revenue and investments by environmental impact, and the analysis may therefore include imprecisions and may not be directly comparable with figures in the annual reporting.



primarily by ammonia market prices which were substantially higher in 2021 than 2020 (from 57% in 2020 to 63% in 2021).

**Yara does not currently have revenue streams shaded Dark Green.** CICERO Green would allocate a Dark Green shading to revenue streams stemming from fertilizer products and services that are part of a fully decarbonized and climate resilient future. These technologies already exist but are not fully commercially viable yet.

**29% of Yara's revenues in 2021 are considered Medium Green, compared to 34% in 2020.** This represents revenue from fertilizers (NPK, nitrates and calcium nitrates) which Yara produces with approximately 90% less N<sub>2</sub>O process emissions on account of N<sub>2</sub>O catalyst technology applied in the production of a key intermediate product, nitric acid. These fertilizers could be part of a 2050 solution but are not currently Dark Green given they i) are currently predominantly produced using grey or blue ammonia, and ii) need to be coupled with effective means for reducing emissions from the (over) use of fertilizers. In calculating this revenue, the value of the ammonia required for producing the nitrates, as well as intermediate nitric acid with high emissions intensity has been subtracted (see sub-section on methodology below).

**8% of Yara's revenues in 2021 are considered Light Green, compared to 9% in 2020.** Light Green revenues relate to a wide range of Yara's products and services. The sale of fertilizers and chemicals to industrial clients (i.e. non-agriculture) and raw materials for explosives (civil and military) are Light Green – while these products may also have lower emission intensity due to the use of N<sub>2</sub>O catalysts, they can be used in carbon intensive sectors with higher risks of lock-in or with potentially adverse or limited environmental impacts. Mining activities required to produce nitrogen fertilizers are also Light Green, given the lower process emissions of these fertilizers. Other Light Green revenues include environmental solutions such as NO<sub>x</sub> abatement for industrial plants and land and sea transport, for example AdBlue/Air1, a high concentration urea-based reagent used by heavy-duty diesel vehicles to reduce NO<sub>x</sub> emissions. While these activities are shaded Light Green, they can feature substantial risks of lock-in and rebound (e.g. retrofitting old vessels with scrubber technology) and could feature Yellow elements if a more detailed analysis is conducted.

**The remaining 63% of Yara's revenues in 2021 are considered Yellow, compared to 57% in 2020.** Yellow shadings are allocated to revenue streams from all other products (mainly ammonia, urea, and third-party products) as well as some of Yara's industrial services. Yellow shaded revenue also includes the market reference price of the ammonia value of the nitrogen component in the products, as well as nitric acid with high emissions intensity (see sub-section on methodology below).

### *Investments*

Overall, 61% of Yara's investments can be considered green in 2021, compared to 64% in 2020. Investments in Medium Green and Yellow sites have increased in absolute terms, while investments in Light Green sites have decreased.

**2% of Yara's investments in 2021 are considered Dark Green, compared to 4% in 2020.** This represents allocations to its autonomous, fully electric zero-emission transport vessel for its fertilizers, and to its project to produce hydrogen from renewable electricity for use in ammonia production at its Porsgrunn site. According to Yara, this hydrogen will for now complement grey hydrogen in the ammonia production process at Porsgrunn. While the end use of the ammonia cannot be specified, the Porsgrunn site includes the production of (Medium Green) NPK fertilizers, while ammonia can also be used as shipping fuel or as an energy carrier for co-firing in energy utilities.



**41% of Yara's investments in 2021 are considered Medium Green, compared to 36% in 2020.** These are investments relate to nitrate, nitric acid and NPK related assets, with low emissions intensity and which are not mainly dedicated to industrial applications. Yara's investments into ammonia production at its Freeport and Hull sites are shaded Medium Green. This is because they produce ammonia with significantly better emissions intensity than industry best practices, however they are currently closely linked to the petrochemical industry as they utilise respective by-products.

**17% of Yara's investments in 2021 are considered Light Green, compared to 23% in 2020.** These relate to investments associated with its mining activities, plus investments at two urea sites which predominantly use urea for Light Green environmental solutions products. Yara's mines involve fossil fuel use, and feature climate and environmental risks (e.g. biodiversity and local opposition). Such activities nonetheless receive a Light Green shade because the mined outputs are used as inputs in Yara's premium fertilizers. This in turn, embeds the mined materials in a trajectory toward a 2050 solution.

**39% of Yara's investments in 2021 are considered Yellow, compared to 36% in 2020.** These relate to investments in urea and ammonia plants' fossil fuel infrastructure, and investments that are not directly tied to the actual production of low emission intensity NPK, nitrates, nitric acid, or hydrogen-based ammonia.

### *Shading methodology*

In shading Yara's revenues, the value of nitric acid produced with high emissions intensity is subtracted from revenue from nitric acid-dependent final products and considered Yellow. Similarly, in shading investments, investments into the production of nitric acid with a high emissions intensity are considered Yellow. The threshold for 'high emissions intensity' has been taken as 0.230 tCO<sub>2</sub>e per ton of nitric acid. This threshold is the EU ETS benchmark value for 2021-2025 to produce nitric acid. This threshold was also used in shading Yara's revenues and investments in our 2021 Shades of Green Assessment.

In the proposal for the EU Taxonomy, as well as early draft versions of the EU Taxonomy, the EU ETS threshold of tCO<sub>2</sub>e per ton of nitric acid was the threshold for alignment with the EU Taxonomy's substantial contribution to climate change mitigation criteria.<sup>11,12</sup> In the final version of the EU Taxonomy, the threshold for alignment of nitric acid production with substantial contribution to climate change mitigation criteria was updated to 0,038 tCO<sub>2</sub>e per ton of nitric acid.<sup>13</sup> This reflects the average value of the 10% most efficient installations in 2016 and 2017, as set out in the in the Annex to the Implementing Regulation (EU) 2021/447.<sup>14</sup>

Had this threshold been used to differentiate high versus low emissions intensity nitric acid in shading Yara's revenues and investments, the overall shade of green revenues would have dropped to 35%, while the overall shade of green investments would have dropped to 47%. Note that these figures do not represent a comment on EU Taxonomy alignment – instead, they represent the percentage of Yara's revenues and investments that would receive a green shade if the EU Taxonomy threshold had been used as part of our Shades of Green methodology instead of the EU ETS threshold.

The tightening of the threshold in the EU Taxonomy reflects that large improvements are required from nitric acid producers and that, as a transitional activity, emissions associated with nitric acid production must continue to

<sup>11</sup> [https://ec.europa.eu/info/sites/default/files/business\\_economy\\_euro/banking\\_and\\_finance/documents/200309-sustainable-finance-teg-final-report-taxonomy-annexes\\_en.pdf](https://ec.europa.eu/info/sites/default/files/business_economy_euro/banking_and_finance/documents/200309-sustainable-finance-teg-final-report-taxonomy-annexes_en.pdf)

<sup>12</sup> [Annex I to the Commission delegated regulation supplementing Regulation \(EU\) 2020/852 by establishing the technical screening criteria for determining the conditions under which an economic activity qualifies as contributing substantially to climate change mitigation or climate change adaptation and for determining whether that economic activity causes no significant harm to any of the other environmental objectives \(europa.eu\)](#)

<sup>13</sup> [https://ec.europa.eu/finance/docs/level-2-measures/taxonomy-regulation-delegated-act-2021-2800-annex-1\\_en.pdf](https://ec.europa.eu/finance/docs/level-2-measures/taxonomy-regulation-delegated-act-2021-2800-annex-1_en.pdf)

<sup>14</sup> [L\\_2021087EN.01002901.xml](L_2021087EN.01002901.xml) (europa.eu)



reduce. Currently, only six of Yara's nitric acid plants fall below the EU Taxonomy threshold. It is crucial that Yara has a short-term focus on replicating the performance levels of six five plants across its portfolio. Yara informed us of opportunities to reduce emissions through: firstly, improvements/upgrade of catalyst technology, and, secondly, burner modification/replacement. Given they represent bridging and transition solutions respectively, the requirements for Medium Green and Light Green shadings increase over time. To maintain shadings, companies must also therefore demonstrate continuous improvements.

A similar approach is taken with ammonia: the ammonia value of the nitrogen component in any products assigned a Shade of Green is deducted, while investments in ammonia plants is considered Yellow.

Investments into assets that yield revenue streams that are associated with multiple Shades of Green are split up according to the asset value attribution.



### 3 Terms and methodology

The aim of this analysis is to be a practical tool for investors, lenders and public authorities for understanding climate risk. CICERO Green encourages the client to make this assessment publicly available. If any part of the assessment is quoted, the full report must be made available. Our assessment, including on governance, is relevant for the reporting year covered by the analysis. This assessment is based on a review of documentation of the client's policies and processes, as well as information provided to us by the client during meetings, teleconferences and email correspondence. In our review we have relied on the correctness and completeness of the information made available to us by the company.

#### Shading corporate revenue and investments

Our view is that the green transformation must be financially sustainable to be lasting at the corporate level. We have therefore shaded the company's current revenue generating activities, as well as investments and operating expenses.

The approach is an adaptation of the CICERO Shades of Green methodology for the green bond market. The Shade of Green allocated to a green bond framework reflects how aligned the likely implementation of the framework is to a low carbon and climate resilient future, and we have rated investments and revenue streams in this assessment similarly. We allocate a shade of green to the revenue stream and investments according to how these streams reflect alignment of the underlying activities to a low carbon and climate resilient future and taking into account governance issues.

SHADES OF GREEN	EXAMPLES
 <b>Dark green</b> is allocated to projects and solutions that correspond to the long-term vision of a low carbon and climate resilient future.	 Solar energy projects
 <b>Medium green</b> is allocated to projects and solutions that represent steps towards the long-term vision but are not quite there yet.	 Green buildings with a high level of certification and energy efficiency
 <b>Light green</b> is allocated to transition activities. These projects and solutions could have lower emissions, but do not by themselves represent or contribute to the long-term vision.	 Substantially more efficient manufacturing of fossil fuel intensive materials
 <b>Yellow</b> is allocated to projects and activities that do not contribute to transition. These activities could have some emissions and be exposed to climate risks. This category also includes activities with too little information to assess.	 Efficiency in fossil fuel infrastructure
 <b>Red</b> is allocated to projects and activities that have no role to play in a low-carbon and climate resilient future. These are heaviest emitting assets, with the most potential for lock-in of investments and risk of stranded assets.	 New infrastructure for coal

In addition to shading from dark green to red, CICERO Shades of Green also includes a governance score to show the robustness of the environmental governance structure. When assessing the governance of the company, CICERO Green looks at five elements: 1) strategy, policies and governance structure; 2) lifecycle considerations including supply chain policies and environmental considerations towards customers; 3) the integration of climate considerations into their business and the handling of resilience issues; 4) the awareness of social risks and the management of these; and 5) reporting. Based on these aspects, an overall grading is given on governance strength



falling into one of three classes: Fair, Good or Excellent. Please note this is not a substitute for a full evaluation of the governance of the issuing institution, and does not cover, e.g., corruption and tax.

CICERO Green has completed a light touch assessment of social safeguards with a focus on human rights and labor rights risks. This assessment is meant to provide information to readers on the context in which Yara operates and its approaches to the social risks it faces. It should not be taken as a full screening of alignment with relevant national or international laws, guidelines, or principles.



# Appendix 1: Referenced Documents List

Document Number	Document Name	Description
1	Yara Sustainability Report 2020	
2	Yara Integrated Report 2020	
3	Code of Conduct	
4	Code of Conduct for Yara's Business Partners	
5	General Terms and Conditions of Purchase	



## Appendix 2: Background

Agriculture accounts for around one quarter of global greenhouse gas (GHG) emissions, with land use change originating from agricultural expansion being the main cause.<sup>15</sup> In Norway, 8.6 % of total GHG emissions are agricultural, with slightly falling trend since the 1990s.<sup>16</sup> The lower figure for Norway is partly explained by less agricultural expansion and thus less land use change.

For the case of Norway, around 30% of agricultural emissions are due to fertilization. This includes organic fertilizers such as manure from cows, and industrially produced mineral fertilizers. For organic fertilizers, emissions occur in the form of methane while it is stored. These emissions amount to 340 000 tCO<sub>2</sub>e, or ca. 7.6% of agricultural emissions, and 0.7% of total Norwegian emissions.<sup>17</sup> Emissions also occur from the spreading of manure, where 20-70% of the ammonia contained in manure evaporates (global average, IPCC) and forms nitrous oxide (N<sub>2</sub>O has a global warming potential of 265:1 compared to CO<sub>2</sub>). These emissions amounted to 600 000 tCO<sub>2</sub>e, or ca. 13% of agricultural emissions, and ca. 1.2 % of total Norwegian emissions.<sup>18</sup> In total, manure stands for ca. 21% of agricultural emissions, and 2% of total Norwegian emissions.

For the use of mineral fertilizers at farm level, emissions occur after the fertilizer has been applied to the soil. Some of the nitrogen contained in the fertilizer is utilized by microbial life in the soils, forming nitrous oxide. The intensity of these emissions depends on soil conditions – however, it has been stated that these indirect emissions from nitrogen containing mineral fertilizers are higher than the direct emissions from the production of the fertilizer.<sup>19</sup> These indirect nitrous oxide emissions from mineral fertilizer amount to 480 000 tCO<sub>2</sub>e, or ca. 11% of agricultural emissions and ca. 0,9% of total Norwegian emissions.<sup>20</sup> In addition, while fertilizers such as NPK are considered efficient they nevertheless can contribute to depletion of soil of other micro-nutrients if not applied according to advice.

Direct and indirect emissions from fertilization as described above makes up ca. 32% of agricultural emissions, and ca. 3% of total national emissions. This group of emissions ranks second to direct methane emissions from ruminants, which amount to 51% of agricultural emissions and 4.4% of national emissions.

Global emissions from the production of mineral fertilizers (indirect emissions from use not included) are ca. 300 million metric tonnes of CO<sub>2</sub> per year.<sup>21</sup> This represents around 0,8 % of global CO<sub>2</sub> emissions.<sup>22</sup> Industrial fertilizer production (essentially NH<sub>3</sub>) accounts for 1% of world energy consumption and uses 3-5% of the worldwide natural gas. For Norway, mineral fertilizer production emitted 1.16 million tonnes of CO<sub>2</sub>e in 2015, which contributed 2.2% to the total Norwegian CO<sub>2</sub>e emissions that year. The fertilizer sector in Norway stands for a considerable part of industrial demand for natural gas.

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<sup>15</sup> [https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc\\_wg3\\_ar5\\_chapter11.pdf](https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_chapter11.pdf)

<sup>16</sup> Emission figures from 2018. Source: Miljøstatus.

<sup>17</sup> Miljødirektoratet, miljøstatus, based on 2018 emission figures

<sup>18</sup> Miljødirektoratet, miljøstatus, based on 2018 emission figures

<sup>19</sup> Ecofys and IPCC

<sup>20</sup> Miljødirektoratet, miljøstatus, based on 2018 emission figures

<sup>21</sup> Graves et al, 2018

<sup>22</sup> Calculated with 36 192 million tonnes of CO<sub>2</sub>, the average of 2017 and 2018 global CO<sub>2</sub> emissions according to the Global Carbon Budget



# About CICERO Shades of Green

CICERO Green is a subsidiary of the climate research institute CICERO. CICERO is Norway's foremost institute for interdisciplinary climate research. We deliver new insight that helps solve the climate challenge and strengthen international cooperation. CICERO has garnered attention for its work on the effects of manmade emissions on the climate and has played an active role in the UN's IPCC since 1995. CICERO staff provide quality control and methodological development for CICERO Green.

CICERO Green provides second opinions on institutions' frameworks and guidance for assessing and selecting eligible projects for green bond investments. CICERO Green is internationally recognized as a leading provider of independent reviews of green bonds, since the market's inception in 2008. CICERO Green is independent of the entity issuing the bond, its directors, senior management and advisers, and is remunerated in a way that prevents any conflicts of interests arising as a result of the fee structure. CICERO Green operates independently from the financial sector and other stakeholders to preserve the unbiased nature and high quality of second opinions.

We work with both international and domestic issuers, drawing on the global expertise of the Expert Network on Second Opinions (ENSO). Led by CICERO Green, ENSO contributes expertise to the second opinions, and is comprised of a network of trusted, independent research institutions and reputable experts on climate change and other environmental issues, including the Basque Center for Climate Change (BC3), the Stockholm Environment Institute, the Institute of Energy, Environment and Economy at Tsinghua University, the International Institute for Sustainable Development (IISD) and the School for Environment and Sustainability (SEAS) at the University of Michigan.

