The Norwegian State’s Direct Ownership of Companies

Climate Related Risks

June 2017
CREDITS

Researched and written by:
Christina Weimann, Senior Research Analyst
Gautier Desme, Senior Research Analyst

Research team led by:
Lauren Smart, Head of Financial Institutions

Report edited and designed by:
James Richens, Editor
Rebecca Edwards, Marketing

ABOUT TRUCOST
Trucost is part of the S&P Global family, operated by S&P Dow Jones Indices. Our shared commitment to the environment will allow us to bring essential ESG investment opportunities to the global marketplace, enabling the combined entity to satisfy growing market demand through new products and enhancements of Trucost’s existing capabilities. Trucost assesses and prices risks relating to climate change, natural resource constraints and broader ESG factors. Companies and financial institutions use Trucost intelligence to understand exposure to ESG factors, inform resilience and identify the transformative solutions of tomorrow. Trucost data also underpins ESG indices, including the S&P 500 Carbon Efficient Index® and S&P/IFIC Carbon Efficient Index®. For more information, visit www.trucost.com.

ABOUT S&P DOW JONES INDICES
S&P Dow Jones Indices is the largest global resource for essential index-based concepts, data and research, and home to iconic financial market indicators, such as the S&P 500® and the Dow Jones Industrial Average®. More assets are invested in products based on our indices than based on any other provider in the world. With over 1,000,000 indices and more than 120 years of experience constructing innovative and transparent solutions, S&P Dow Jones Indices defines the way investors measure and trade the markets.

S&P Dow Jones Indices is a division of S&P Global (NYSE: SPGI), which provides essential intelligence for individuals, companies, and governments to make decisions with confidence. For more information, visit www.spdji.com.

CONTACT
E: Trucostinfo@spglobal.com
E: Trucostnorthamerica@spglobal.com
E: TrucostEMEA@spglobal.com
E: Trucostasiapacific@spglobal.com
E: Trucostsouthamerica@spglobal.com
T: +44(0)20 7160 9800
T: +1 800 402 8774
www.trucost.com
# CONTENTS

1. Executive Summary .................................................. 4
2. Introduction and Study Aim ........................................... 6
3. The State’s Expectations as Owner with Regard to Climate and Environment ........................................... 7
4. Methodology ............................................................ 9
5. Limitations ............................................................. 14
6. Portfolio Footprint ...................................................... 15
7. Risk Internalization .................................................... 20
8. Thematic Assessment .................................................. 30
9. Summary and Conclusions .......................................... 37
10. Appendix A – Key Findings for Portfolio Companies ....... 40
11. Appendix B - An Extraction of Norwegian Climate Related Policies .......................................................... 61
12. Appendix C - Glossary ................................................ 64
13. Appendix D - References ............................................ 66
The Norwegian State’s Direct Ownership of Companies – Climate Related Risks

June 2017

1. EXECUTIVE SUMMARY
Climate change poses a serious economic and financial threat to both the public and private sectors (World Economic Forum, 2017) due to physical, market, operational, regulatory, reputational, resource and subsidy risks.

There is a clear business case for companies to take action to mitigate and adapt to the risks of climate change in order to minimize the financial consequences for shareholders and customers. Investors can assist by engaging with companies it owns to encourage best practice on carbon management and adopt more sustainable business models.

The Norwegian government as owner believes it to be essential for companies in its portfolio to develop a sound understanding of the climate change risks they are facing, as set out in the Meld. St. 27 (2013–2014) Report to the Storting (White Paper) Diverse and Value-creating Ownership (Norwegian Ministry of Trade, Industry and Fisheries, 2014).

The Norwegian Ministry of Trade, Industry and Fisheries (NFD), in cooperation with five other ministries, commissioned Trucost to undertake this study to help it understand how the state as owner is exposed to the risks of climate change through its partial or full ownership of the 37 companies chosen for this study. Trucost was also asked to assess how the companies meet the government’s expectations in regard to climate and environment.

Based on the government’s expectations of companies owned partially or fully by the state as described in the white paper, Trucost developed five key themes which formed a framework to analyse the companies:

1. Performance
2. Transparency
3. Risk Understanding
4. Risk Reduction
5. Opportunity

The analysis is based on a specifically designed questionnaire sent to the 37 companies to gather both qualitative and quantitative information on their approach to these five themes including, for example, processes for assessing climate risks and setting carbon reduction targets. Trucost also gathered publically available information from annual corporate reports and sustainability reports. Where no emissions or consumption data was reported, Trucost used its proprietary modelling techniques to estimate a company’s emissions. The modelling techniques are described in chapter 4.

Within each theme, relevant benchmarks or industry best practice were used to compare the performance of companies. The methodology and limitations are described in chapter 4 and 5.

Norway’s portfolio of 37 partially or fully owned companies was grouped into four categories according to the state’s objectives for its ownership (see chapter 2), according to the size of their carbon intensity and whether they are listed on an exchange.

Key findings
- The portfolio of 37 Norwegian companies owned partially or fully by the state has total emissions of 53.75 million tonnes CO₂ equivalent (scope 1 and 2) and a carbon intensity of 32.43 tonnes of carbon dioxide equivalent per NOK 1 million of revenue (tCO₂e/NOKm). Apportioned to the state’s ownership, the absolute emissions are 27.18 million tonnes CO₂ equivalent.¹
- Twenty one companies (57%) report their carbon emissions, and a further 11 companies (29.7%) provide energy and other consumption data used to calculate emissions. For five companies (14%), not enough data was reported to calculate their emissions.²
- Five companies account for 92% of total emissions.

¹. Ministries of Health and Care Services, Local Government and Modernisation, Petroleum and Energy, Transport and Communications and Foreign Affairs.
². Data and information as of October 2016.
³. For these companies Trucost modelled the emissions based on sector averages.
• In terms of performance, most companies report a carbon intensity that is either in line or better than their respective sector averages. Of companies that disclose emissions or consumption data, 39% report decreasing emissions over the last few years.

• Transparency, as measured through questionnaire responses, is high across all companies. The larger commercial companies (mainly category 2) provide higher quality information due to being listed on a stock exchange and therefore required to produce annual reports incorporating information on climate-related risks. In terms of public reporting, 35% of the companies do not publish any information on climate-related risks.

• The analysed companies demonstrate varied understanding in their reports and questionnaire responses of the risks they are facing, with 22% showing a strong understanding, 53% medium and 25% low understanding. The worst performers tend to focus on their greenhouse gas (GHG) emissions footprint, overlooking other climate-related risks to their business. This is the case for smaller companies, where the state has purely commercial objectives (category 1), with 43% disclosing little to no understanding at all, which for some could be a result of their size and regional character.

• Companies in category 1 and companies where the state has commercial objectives and an objective of maintaining head office functions in Norway (category 2), are more proactive than companies in category 3 and 4 in reducing their emissions or exposure to climate change risks either through setting emissions and energy targets or through active reduction initiatives.

• Category 1 and 2 are also where most companies (58%), usually the larger ones, report having strategic plans to respond to climate change. Smaller companies or those with policy objectives are generally less flexible to adapt their business model to reap potential opportunities.

• For the themes of performance, risk understanding, risk reduction and transparency, all listed companies perform either in line with their sector or following best-in-class approaches. Only for the theme of opportunity did several listed companies perform below standard practices. The distribution of listed companies does not differ significantly from non-listed companies in terms of performance, yet for all other themes, the distribution shows listed companies perform better than non-listed companies.

• Companies with a high carbon intensity perform in line with the sector standard practices in terms of performance, risk understanding, and risk reduction. In terms of opportunity, these companies perform below standard practice, while for transparency, they perform best-in-class.

• The majority of companies with a medium-sized carbon intensity perform in line with standard practice for their sectors across the themes, with the exception of transparency, where all demonstrate best-in-class approaches.

• The minority of companies with a medium-sized footprint follow best-in-class approaches in terms of the themes of performance, risk understanding and opportunity.

• In terms of risk reduction, the minority of companies with a medium-sized footprint are split across performing below-standard approaches and following best-in-class approaches.

• The distribution of companies with a low carbon intensity is split across below standard practices, in line with standard practices or following best-in-class approaches in all five themes.
2. INTRODUCTION AND STUDY AIM

Failure to mitigate and adapt to climate change and extreme weather events are considered two of the top five risks in terms of impact, according to the World Economic Forum’s 2017 Global Risk Report (World Economic Forum, 2017).

The costs of pollution, ecosystem depletion and health impacts have grown steadily over the years and now exceed USD 3 trillion for global companies (Trucost & GreenBiz Group, 2015). While some industries and regions are at more immediate risk from the increasing impacts of climate change, all companies face some degree of risk and need to understand their environmental impacts. Business leaders have started exploring opportunities to create value in an environmentally challenged economy by building resilience, capitalizing on green markets and seizing circular economy opportunities. By 2016, around 71% of companies in the S&P 500 had publicly disclosed their carbon emissions.

In order to reduce and manage the risks of climate change, significant adaptation and mitigation efforts will be required from both the public and private sector. For the private sector, there is a clear business case for tackling climate change to avoid the financial internalization from the different manifestations of climate change risks (e.g., regulatory or operational). The public sector’s role in tackling climate change is manifold, from setting effective and meaningful regulations and adapting public infrastructure to supporting businesses in overcoming barriers and assisting them to decrease their risk exposure. The report will focus on the latter part of supporting businesses through analysing Norway’s state-owned companies.

This study was commissioned from Trucost by the Norwegian Ministry of Trade, Industry and Fisheries (NFD) to answer the following mandate: As a part of following up on the state’s expectations of companies work within the field of climate and the environment, the NFD seeks advice from external consultants. The advisor is asked to map out and consider the climate-related risks in the state’s direct ownership based on objective criteria, and assess how the companies meet the expectations set by the government in this field. The study interprets climate-related risks as how climate change and climate related regulation can affect the business activities of companies and therefore the risk exposure faced by the state as an owner of these companies. The objective of the study is to provide the state as a company owner with enhanced understanding to follow up the expectations as laid out in the White Paper and to develop their engagement work in this area.

The study will answer these questions through analysing how different types of climate-related risks can affect companies and their financial performance, as well as analysing how the 37 selected companies owned partially or fully by the state perform on the following five key themes:

1. Performance
2. Transparency
3. Risk Understanding
4. Risk Reduction
5. Opportunity

The study is based on a specifically designed questionnaire sent to the 37 companies to gather information on these themes, including, for example, their approach to assessing climate risks and whether they have set carbon reduction targets. Information from public disclosures or external reporting by companies was also used.

The study looks at 37 companies owned partially or fully by the state with business operations ranging from oil and gas exploration to real estate property management. The companies were chosen by the ministries from among about 70 companies owned partially or fully by the state. All companies in categories 1, 2 and 3 are included, and the largest/most relevant companies in category 4. Results are presented by key theme, as well as the companies’ ownership classifications (see Exhibit 1).
3. THE STATE’S EXPECTATIONS AS OWNER WITH REGARD TO CLIMATE AND ENVIRONMENT

Norway’s portfolio of companies owned partially or fully by the state has been grouped into four categories according to the state’s objectives for direct state ownership (see the white paper).

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>DESCRIPTION</th>
<th>OBJECTIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Commercial</td>
<td>No long-term ambition of owning such companies. Willingness to partially or fully divest the state’s ownership based on commercial, market or corporate circumstances, and provided it is financially beneficial to the state.</td>
</tr>
<tr>
<td>2</td>
<td>Commercial objectives and objective of maintaining head office functions in Norway</td>
<td>This category includes companies where the state has a commercial objective with its ownership, and an objective of maintaining the companies’ head offices and associated head office functions in Norway. To achieve this last objective, a shareholding of more than one-third is (normally) sufficient.</td>
</tr>
<tr>
<td>3</td>
<td>Commercial and other specifically defined objectives</td>
<td>Sound justifications for the state to have holdings in these companies beyond commercial objectives, although adjustments may be undertaken based on commercial considerations.</td>
</tr>
<tr>
<td>4</td>
<td>Sector policy objectives</td>
<td>The ownership should remain intact unless the sectoral policy interests no longer apply or can be fulfilled in another satisfactory manner.</td>
</tr>
</tbody>
</table>

Source: Norwegian Ministry of Trade, Industry and Fisheries, 2014

Corporate social responsibility (CSR) is an area that has garnered increased attention and importance in recent years, both in business in general and for the state as a company owner. The government expects companies in which the state has a holding to work systematically on their CSR and to be at the forefront in their respective fields.

In the white paper, the government draws attention to climate change and environmental issues and the impacts these may have on society as a whole and on companies in particular. The government expects companies to have a good understanding of risk, in terms of how climate change and climate policy initiatives may affect their activities. It also expects them to be at the forefront on the climate and the environment in their sectors.

The Norwegian government has developed ten principles of good corporate governance defining how the government will conduct ownership and what it expects of the companies (Norwegian Ministry of Trade, Industry and Fisheries, 2014). From these ten principles, the following are applicable to companies’ responses to climate change:

**Principle 2: There shall be transparency in the state’s exercise of its ownership and the company’s operations.**

*Transparency strengthens confidence in state ownership, and, owing to the large scale of state ownership in Norway, in the Norwegian capital market. Transparency also upholds the democratic ethos in that the public is given access to information.*

**Principle 10: The company shall work systematically to safeguard its corporate social responsibility.**

All Norwegian companies should demonstrate corporate social responsibility, whether under private-sector or public-sector ownership and regardless of whether their undertaking is located in Norway or abroad.

Companies fulfilling their CSR in a robust and visionary manner should adopt a strategic approach to CSR that embodies both risk management and the exploitation of new business opportunities. The reason why the state, in its capacity as an owner, sets out expectations for company commitment to CSR is that the government believes that sound management of such matters helps to safeguard the state’s shareholder assets and that it enables companies in which the state is a shareholder to demonstrate ethical conduct.

CSR is understood as the responsibility companies are expected to assume for people, society and the environment where these are impacted by the company’s activities. This includes climate change and its impacts on company profit as well as society.

4. Category 2 companies are mostly multinational, large cap and listed companies
The EU 2030 framework for climate and energy policies may potentially have great impact on economic activity both within and outside Europe. In addition to compliance with national and international environmental requirements, the Norwegian state expects companies it partially or fully owns to also take proactive measures to reduce their adverse environmental impacts – over and above the national and international requirements. This may contribute to cost reductions, a better strategic platform for business activities in the long term and new market opportunities.

As an owner, the state must protect the assets in its portfolio. In light of this, the government believes it to be essential for companies to develop a sound understanding of the risk entailed by potential changes in operating conditions ensuing from realistic climate change scenarios and national and international climate initiatives. Climate policy measures are also potential drivers of technological advances and can pave the way for new market opportunities. Companies in the state’s portfolio should take a well-informed approach to the business opportunities presented by such changes (Norwegian Ministry of Trade, Industry and Fisheries, 2014).

The government expects that companies partially or fully owned by the state should:

- Have a sound understanding of the risk posed to their activities by climate change and climate policy measures.
- Be at the forefront of climate and environmental performance in their sector, including initiatives to reduce GHG emissions.
- Be well-informed about the benefits to be reaped from early adaptation to new climate and environmental requirements.
4. METHODOLOGY

Based on the Norwegian government’s expectations outlined in chapter three, Trucost developed five key themes, which were used to frame the analyses and present the main findings:

1. Performance
2. Transparency
3. Risk Understanding
4. Risk Reduction
5. Opportunity

Analysis and materiality assessment

Each of the five key themes were broken down into different areas of focus. These can be grouped into general aspects which are applicable across sectors, as well as sector-specific aspects.

The five themes are mainly based on the following general issues:

Performance:
- GHG emissions (disclosed or, if applicable, calculated) and comparison to the relevant sector averages.
- Emission trend (where available) over the last couple of years.
- Scope of reported emissions.

Transparency
- Are companies transparent in responding to all relevant questions in the questionnaire?

Risk Understanding
- Are companies aware of all climate change risks (seven types of risk as identified in chapter 7 of this report) they can potentially face in terms of their own direct operations, their supply chain and through the use of their products and services?
- What is the highest level of direct responsibility for climate change risk mitigation within the company?

Risk Reduction
- Do the companies have GHG emission and/or energy reduction initiatives and what is the nature of these initiatives (actions, timeframes, etc.)?
- Do companies have active GHG emission reduction targets and what is the nature of the targets (timeframe, in line with peers, etc.)? Are targets achievable based on historical emission reduction trends?
- How do the companies integrate climate change into their business strategies (e.g., general vs. region/asset specific, timeframe, monitoring, etc.)?
- Are companies using an internal price of carbon or other scenario testing?
- Do companies include climate change in their risk management and how?
- How do companies engage their supply chain in terms of climate change risks?
Opportunity

- Are companies aware of all climate change opportunities they can potentially reap in terms of their own direct operations, their supply chain, and through the use of their products and services. Are they aware of the likelihood, magnitude and timeframe that these risks can materialize?

The sector-specific aspects, such as the energy consumption of a manufacturing process, were not compared across sectors. The underlying aspects were weighted within the themes based on their materiality for the individual sectors.

If applicable, certain aspects of the analysis were omitted for companies when they were judged to be immaterial for their operations. Companies’ public disclosures and the information provided through the questionnaires were compared to relevant benchmarks (and peer companies) or best-in-class approaches for each specific sector. Sector-specific benchmarking data was taken from a variety of publically available sources or, where applicable, from the Trucost database. Best-in-class approaches were informed by the general sector best practices, as well as relevant peers. The peer group was formed using:

- Similar peers: companies with similar operations, geographic focus and/or size. Chosen from a list of possible peers suggested by the ministries.
- Transparent peers: Companies reporting to the CDP that closely match the operations of individual companies to act as a benchmark for best practice in disclosure.

The absolute emissions of each company were taken as reported by the companies. Trucost did not verify the validity, quality or scope of the reported data and assumed that they cover 100% of the operations, unless stated otherwise. Where no or not enough data was available, Trucost used its proprietary modelling technique to model the emissions based on business activities in 464 sectors. Analysed companies were assigned the closest sector classification based on their activities, which was used as a basis for the emissions modelling, as well as for the sector average comparisons. Environmental impacts attributable to a business were calculated by Trucost using environmental intensities expressed as emissions or resource use per unit of revenue. These were calculated by obtaining emissions or resource data by sector and using this data in conjunction with financial data to create environmental intensities. These calculations combined quantitative government census and survey data on natural resource use through economic interactions between sectors with information on pollutant releases from national emissions registries. Information on company revenues in different industries was used to map environmental impacts from business activities.

Alternatively, where available, Trucost derived the emissions based on energy consumption data and other business activities. The absolute emissions were apportioned according to the state ownership share.

EXHIBIT 2: PORTFOLIO COMPANIES - SECTOR ALLOCATION

<table>
<thead>
<tr>
<th>COMPANY</th>
<th>CLASSIFICATION</th>
<th>STATE OWNERSHIP</th>
<th>REVENUE NOKm (2015)</th>
<th>MARKET VALUE / BOOK EQUITY NOKm YEAR END 2015</th>
<th>CATEGORY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aker Kvæner Holding AS</td>
<td>Holding company of oil &amp; gas equipment and services companies</td>
<td>30%</td>
<td>25,078a</td>
<td>5,579</td>
<td>2</td>
</tr>
<tr>
<td>Ambita AS</td>
<td>Data processing &amp; outsourced services</td>
<td>100%</td>
<td>316</td>
<td>91</td>
<td>1</td>
</tr>
<tr>
<td>Andøya Space Center AS</td>
<td>Diversified Support Services</td>
<td>90%</td>
<td>119</td>
<td>86</td>
<td>4</td>
</tr>
</tbody>
</table>

5. Trucost maintains the world’s largest database of standardised corporate natural capital impact data. Trucost’s comprehensive coverage of more than 6,000 companies since 2000 ensures a global representative coverage.
6. Based on ICB and GICS classifications, where possible.
7. Kings Bay reported 2016 figures
8. Based on the apportioned revenue of its underlying companies
<table>
<thead>
<tr>
<th>COMPANY</th>
<th>CLASSIFICATION</th>
<th>STATE OWNERSHIP</th>
<th>REVENUE NOKm (2015)</th>
<th>MARKET VALUE / BOOK EQUITY NOKm YEAR END 2015</th>
<th>CATEGORY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argentum Fondsinvesteringer AS</td>
<td>Diversified Capital Markets (Private Equity Fund Management)</td>
<td>100%</td>
<td>488</td>
<td>7,955</td>
<td>3</td>
</tr>
<tr>
<td>Avinor AS</td>
<td>Airport Services</td>
<td>100%</td>
<td>11,989</td>
<td>14,832</td>
<td>4</td>
</tr>
<tr>
<td>Baneservice AS</td>
<td>Railtracks (i.e. Railway operations, maintenance and construction, freight terminal services)</td>
<td>100%</td>
<td>663</td>
<td>164</td>
<td>1</td>
</tr>
<tr>
<td>DNB ASA</td>
<td>Diversified Bank</td>
<td>34%</td>
<td>53,993</td>
<td>178,842</td>
<td>2</td>
</tr>
<tr>
<td>Electronic Chart Centre AS</td>
<td>Data processing &amp; outsourced services</td>
<td>100%</td>
<td>25</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>Eksportfinans ASA*</td>
<td>Specialised Finance: Export credit financing</td>
<td>15%</td>
<td>374</td>
<td>7,409</td>
<td>3</td>
</tr>
<tr>
<td>Eksportkreditt Norge AS*</td>
<td>Supranational: Export credit financing (fully guaranteed)</td>
<td>100%</td>
<td>100</td>
<td>45</td>
<td>4</td>
</tr>
<tr>
<td>Entra ASA</td>
<td>Diversified Real Estate</td>
<td>50%</td>
<td>1,999</td>
<td>13,091</td>
<td>1</td>
</tr>
<tr>
<td>Flytoget AS</td>
<td>Railroads (i.e. passenger trains)</td>
<td>100%</td>
<td>960</td>
<td>802</td>
<td>1</td>
</tr>
<tr>
<td>Gassco AS</td>
<td>Natural Gas Storage and Transportation</td>
<td>100%</td>
<td>26,969</td>
<td>14</td>
<td>4</td>
</tr>
<tr>
<td>GIEK Kreditforsikring AS</td>
<td>Multi-line Insurance (i.e. Trade Credit Insurance)</td>
<td>100%</td>
<td>97</td>
<td>63</td>
<td>3</td>
</tr>
<tr>
<td>Innovation Norway</td>
<td>Research &amp; Consulting Services</td>
<td>51%</td>
<td>1,739</td>
<td>1,513</td>
<td>4</td>
</tr>
<tr>
<td>Investor AS</td>
<td>Diversified Capital Markets (i.e. Private Equity Investments)</td>
<td>100%</td>
<td>120</td>
<td>2,011</td>
<td>3</td>
</tr>
<tr>
<td>Kings Bay AS</td>
<td>Diversified Support Services</td>
<td>100%</td>
<td>72</td>
<td>13</td>
<td>4</td>
</tr>
<tr>
<td>Kommunalbanken AS*</td>
<td>Supranational</td>
<td>100%</td>
<td>1,642</td>
<td>12,202</td>
<td>3</td>
</tr>
<tr>
<td>Kongsberg Gruppen ASA</td>
<td>Aerospace &amp; Defence</td>
<td>50.001%</td>
<td>17,032</td>
<td>17,400</td>
<td>2</td>
</tr>
<tr>
<td>Mesta AS</td>
<td>Highways &amp; Railtracks (i.e. maintenance and construction)</td>
<td>100%</td>
<td>3,631</td>
<td>1,003</td>
<td>1</td>
</tr>
<tr>
<td>Nammo AS</td>
<td>Aerospace &amp; Defence</td>
<td>50%</td>
<td>3,783</td>
<td>2,329</td>
<td>2</td>
</tr>
<tr>
<td>Norfund</td>
<td>Development Finance Institution</td>
<td>100%</td>
<td>431</td>
<td>15,521</td>
<td>4</td>
</tr>
<tr>
<td>Norsk Hydro ASA</td>
<td>Aluminium (i.e. Aluminium production and hydroelectric power generation)</td>
<td>34.26%</td>
<td>87,694</td>
<td>68,546</td>
<td>2</td>
</tr>
</tbody>
</table>
## COMPANY | CLASSIFICATION | STATE OWNERSHIP | REVENUE NOKm (2015) | MARKET VALUE / BOOK EQUITY NOKm YEAR END 2015 | CATEGORY
--- | --- | --- | --- | --- | ---
NSB AS | Railroads (i.e. Passenger trains, freight, bus, real estate and train maintenance) | 100% | 15,372 | 9,835 | 3
Petoro AS | Integrated Oil & Gas (i.e. Lessors of non-financial intangible assets) | 100% | 158,000<sup>10</sup> | 23 | 4
Posten Norge AS | Postal Services | 100% | 25,074 | 5,928 | 3
SAS AB | Airline | 14.29% | 38,045 | 8,028 | 1
Siva SF | Diversified Real Estate | 100% | 387 | 981 | 4
Space Norway AS | Diversified Support Services | 100% | 46 | 406 | 4
Statkraft SF | Independent Power Producers and Energy Traders (i.e. Power generation) | 100% | 20,090 | 76,524 | 3
Statnett SF | Electric Power Transmission | 100% | 50,906 | 13,564 | 4
Statoil ASA | Integrated Oil & Gas | 67% | 482,800 | 394,436 | 2
Store Norske Spitsbergen Kulkompani AS | Coal Mining & other shipping activities | 100% | 885 | -315 | 4
Telenor ASA | Integrated Telecommunication Services | 53.97% | 128,000 | 222,666 | 2
Veterinærmedisinsk Oppdragssenter AS | Pharmaceuticals (i.e. research) | 345 | 562 | 40 | 1
AS Vinmonopolet | Food & Drinks Distributor (i.e. alcoholic beverage retailer) | 100% | 12,793 | 553 | 4
Yara International ASA | Fertiliser Manufacturing | 36.21% | 111,900 | 105,329 | 2

Source: NFD

* Given the unique nature of operations for Eksportkreditt Norge, Eksportfinans and Kommunalbanken, the sector classifications assigned to them were agreed with the relevant ministries.

The types of GHG emissions included in the analysis are scope 1 and scope 2 (Greenhouse Gas Protocol, 2017):

- **Scope 1**: GHG emissions generated by burning fossil fuels and production processes that are owned or controlled by the company. Examples include the emissions associated with the use of company-owned cars.
- **Scope 2**: GHG emissions from the consumption of purchased electricity, heat or cooling by the company.
- **Scope 3**: Other indirect GHG emissions, such as from the extraction and production of purchased materials and fuels, transport-related activities in vehicles not owned or controlled by the reporting entity, electricity-related activities such as transmission and distribution losses not covered in scope 2, outsourced activities and waste disposal, etc. While scope 3 emissions can represent a material share of a company’s overall emissions, they have not been quantified in the analysis. The only exception is Avinor, for which the reported data could not be separated into the different scopes.

---

9. Petoro is the business manager for the SDFI portfolio and not an integrated oil and gas company itself.
10. Based on the revenue of the SDFI
GHG emissions for each company were measured in tonnes of carbon dioxide equivalents (CO₂e). The analysis includes the six GHGs covered by the UN Kyoto Protocol. Each GHG has a different capacity to cause global warming.

To help understand the potential exposure to carbon costs, the company’s carbon footprint was used as a quantitative risk assessment. This was expressed in terms of carbon intensity as tonnes of carbon dioxide equivalent per NOK 1 million of company revenue (tCO₂e/NOKm) to enable comparison across different operations and company sizes.

The companies’ results are classified into low, medium and high for each of the five assessment themes. The definition of the classifications is dependent on each theme and analysed sector.

The classifications are defined as follows:

- **Low**: the company performs below the standard practice and significantly below best practice of its sector.
- **Medium**: the company follows the standard practice of its sector.
- **High**: the company performs the best practice and above of its sector.

Within each theme, companies are classified in three different groups:

- Ownership category.
- Listed vs. non-listed companies.
- By the size of the carbon intensity.

**Data collection**

Data for the assessment of companies against the five key themes came from multiple sources, including a questionnaire developed by Trucost and sent to the 37 companies owned partially or fully by the state and companies’ public disclosure such as annual financial, sustainability or CSR reports and investor presentations. If companies responded to initiatives such as the Carbon Disclosure Project (CDP), Global Compact, the Global Reporting Initiative (GRI) or sector-specific reporting initiatives such as FracFocus, the latest publicly available data was included into the analysis.

The questionnaire developed by Trucost had questions about general and sector-specific information. Both were gathered in the form of qualitative and quantitative data for the latest fiscal year in which data was available. Companies were allowed several weeks to fill out the questionnaire, with the request that they only report existing public or non-public data and information, rather than collect new data for the analysis.

During the data collection process, companies were invited to communicate with Trucost regarding any uncertainties before returning the completed questionnaire. After receiving the questionnaire, Trucost engaged with the companies to clarify any remaining questions and presented each company with the key findings. Companies had another opportunity to provide feedback on these results. The data and information used in the analysis were the latest available as of October 2016.

**Risk Internalization**

The risk analysis in chapter 7 focusing on the different internalization pathways is based on Trucost’s research into the relevant different sectors and risk categories. The analysis was supported by publically available research, such as the Sustainability Accounting Standards Board (Sustainability Accounting Standards Board, 2016) and the Mercer report “Investing in a time of climate change” (Mercer, 2015). The risk descriptions and graphics (Exhibits 9 - 15) are focused on the relevant sectors for the portfolio companies, without taking into account the specificities of the companies themselves.
5. LIMITATIONS

Trucost developed the methodology of this study in line with the requirements of the analysis. However, a few caveats need to be taken into account when interpreting the results. These limitations fall into two distinct categories:

Peer selection and sector comparison

There might be limitations to peer selection in terms of both the sector categorization and the representativeness of the 2-4 selected peers. The analysis encompassed a wide variety of companies, ranging from large publicly listed companies to small companies operating in unique sectors. The companies operating in more specialised or unique sectors could not easily be categorized under the Global Industry Classification Standard (GICS) or Industry Classification Benchmark (ICB) systems due to the limited granularity available in these classifications. Consequently, some companies are included in sectors that do not perfectly reflect their business activities, thus limiting the comparison. Some of the companies within the state’s portfolio come from near monopolistic positions, operate in small niche markets or perform specific governmental tasks (for example, Petoro or Electronic Chart Centre). Hence, there may be differences between the precise business activities of assessed companies and those in the peer groups, which may mean that different climate change strategies are applicable. For example, Norsk Hydro is a vertically integrated aluminium company, but not all companies included in the sector average comparison for that company will have the same business model. This should be kept in mind when reading the analysis.

Additionally, larger international companies and companies listed on stock exchanges may have greater resources available to help them address climate-related risks and capitalise on opportunities, whereas smaller companies may have more limited capabilities. Moreover, their business models and, therefore, their risk exposure can vary. Some companies may have more unique business models or operations than the selected peers or may operate at a different stage in the value chain. When comparing small companies to large, listed companies, these issues have to be taken in to account.

Analysis

The information and data used in the analysis of the 37 companies in the Norwegian government’s portfolio were collected from public disclosure, as well as companies’ responses to the questionnaire. In contrast, the peer companies were researched using publically disclosed information only. While a transparent company would ideally disclose its climate-related risk strategies and all information addressed in the questionnaire, this methodology could miss information or data which is not publically available.

While each company was analysed using general and sector-specific information, only the general information was used as a basis for comparison across sectors. While this reduces the complexity of each company, it allows for comparison across sectors and across all portfolio companies.

The financial risk assessment presented in this report is not focused on the business activities of the portfolio companies but aims to provide a general overview of the way in which climate risks can be internalised as higher costs on corporate financial statements. The specifics of the portfolio companies’ business models as well as the Norwegian regulations and circumstances are not taken into account in this chapter. Some of the portfolio companies operate globally and are thus subject to risks outside the Norwegian context. Moreover, the analysis is based on a qualitative assessment of the risks. No quantitative financial modelling such as discounted cash flow analysis has been conducted to calculate the sensitivities of different financial metrics to the different types of risks. The nature of the qualitative assessment aims to illustrate how these risks can be internalized, rather than providing a quantitative assessment, with each company being affected differently depending on its business model. The carbon intensities of the portfolio companies were used as the primary performance indicator. The normalization of the absolute emissions by revenue allows for comparison between companies of different sizes and in different sectors. Sector-specific indicators, such as emissions per production unit, can represent a more accurate assessment due to revenues being dependent on exchange rate fluctuations, commodity prices and market developments, among other factors. This is mostly applicable to companies operating in production sectors. In events of significant commodity price changes affecting revenues of companies, carbon intensity can change compared to previous years. However, sector-specific emission intensities are not comparable across industries and are outside the scope of this report.
6. PORTFOLIO FOOTPRINT

Only 57% of the 37 companies assessed provided full disclosure of their scope 1 and scope 2 emissions, with 30% providing partial disclosure of consumption data used to calculate actual emissions and the remainder no data at all. While this is a clear limitation, companies which had poor or no disclosure do not account for a significant share of the overall portfolio footprint. As such, the amount of data is sufficient for the purpose of this study. A breakdown of the level of transparency can be found in chapter 8 and Exhibit 7 (emission reporting through the questionnaire and public disclosure, as well as general public reporting on climate-related risks).

EXHIBIT 3: CARBON DISCLOSURE LEVEL

Source: Trucost’s Research – companies’ latest data

Based on company disclosures and modelling by Trucost, the GHG footprint of the 37 companies stood at 53.75 million tonnes CO$_2$e in 2015 (scope 1 and 2 emissions), with the Norwegian government’s apportioned emissions totalling 27.18 million tCO$_2$e. This corresponds to a carbon intensity of 32.43 tonnes CO$_2$e per NOK 1 million revenue.

Fossil fuel energy activities, mainly in the integrated oil & gas sector, account for the largest impact, at 53% of the total emissions associated with the state’s ownership. This is followed by the fertiliser and agricultural chemicals sector (18%) and aluminium production (17%). Overall, the following five companies make up 92% of total carbon emissions from the portfolio:

1. Statoil
2. Yara International
3. Norsk Hydro
4. Petoro
5. Gassco
While the breakdown in scope 1 emissions is roughly the same as that of total emissions (all apportioned to the state’s ownership in each company), scope 2 emissions – related to electricity, heat and cooling consumption – originate mostly from the aluminium sector (48%), telecommunication services (17%), and fertiliser and agricultural chemicals (17%).

**EXHIBIT 5: EMISSIONS BREAKDOWN**

Source: Trucost’s Research – companies’ latest data
Since absolute emissions reflect the level of state ownership of each company, carbon intensity is a more useful indicator of each sector’s carbon efficiency.

The five most carbon intensive sectors, with intensities higher than the portfolio average, are depicted in Exhibit 6. The sector carbon intensity is based on the underlying companies of the state portfolio, while the sector average carbon intensity reflects the sector in general, based on the Trucost database. All sectors are energy-intensive, with aluminium production the most, at 150 tonnes CO$_2$/NOKm revenue. Fertilisers and agricultural chemicals come second at 120 tonnes CO$_2$/NOKm revenue, followed by airlines (101 tCO$_2$/NOKm revenue), coal mining (52 t CO$_2$/NOKm revenue) and oil & gas storage and transportation (51 t CO$_2$/NOKm revenue). While the airlines and coal and consumable fuels sectors have a lower carbon intensity (based on the portfolio companies) than the sector average, aluminium, fertilizers and agricultural chemicals, and oil & gas storage & transportation are above their respective sector averages.

EXHIBIT 6: FIVE HIGHEST CARBON INTENSITIES BY SECTOR (tCO$_2$/NOKm)

<table>
<thead>
<tr>
<th>Sector</th>
<th>Carbon Intensity (tCO$_2$/NOKm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum</td>
<td>150</td>
</tr>
<tr>
<td>Fertilizers &amp; agricultural chemicals</td>
<td>120</td>
</tr>
<tr>
<td>Airlines</td>
<td>101</td>
</tr>
<tr>
<td>Coal &amp; consumable fuels</td>
<td>52</td>
</tr>
<tr>
<td>Oil &amp; gas storage &amp; transportation</td>
<td>51</td>
</tr>
<tr>
<td>Portfolio average</td>
<td>33</td>
</tr>
</tbody>
</table>

Source: Trucost’s Research – Trucost database and companies’ latest data

The table overleaf provides an overview of the absolute carbon emissions of each company (adjusted to the state’s share of ownership in each company), carbon intensity and level of carbon disclosure.

11. Sector data is based on the underlying portfolio companies.
## Exhibit 7: Portfolio Companies - Emissions and Disclosure

<table>
<thead>
<tr>
<th>COMPANY</th>
<th>Absolute Emissions (tCO₂e) – Scope 1 &amp; 2 Apporportioned to the State’s Ownership</th>
<th>Absolute Emissions (tCO₂e) – Scope 1 &amp; 2 Company-Level</th>
<th>Carbon Intensity (tCO₂e/NOKm Revenue)</th>
<th>Sector Average (tCO₂e/NOKm Revenue)</th>
<th>Emission Disclosure in Trucost’s Questionnaire</th>
<th>Public Emission Disclosure</th>
<th>Public Reporting on Climate Change</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Norsk Hydro</td>
<td>4,498,008</td>
<td>13,129,037</td>
<td>149.71</td>
<td>58.72</td>
<td>Full Disclosure</td>
<td>Yes</td>
<td>Yes</td>
<td>2</td>
</tr>
<tr>
<td>Yara International</td>
<td>4,873,504</td>
<td>13,459,000</td>
<td>120.28</td>
<td>106.93</td>
<td>Full Disclosure</td>
<td>Yes</td>
<td>Yes</td>
<td>2</td>
</tr>
<tr>
<td>SAS</td>
<td>550,286²</td>
<td>1,850,849</td>
<td>101.22</td>
<td>124.59</td>
<td>Full Disclosure</td>
<td>Yes</td>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>Store Norske Spitsbergen Kulkompani</td>
<td>46,075</td>
<td>46,076</td>
<td>52.06</td>
<td>224</td>
<td>Full Disclosure</td>
<td>Yes</td>
<td>Yes</td>
<td>4</td>
</tr>
<tr>
<td>Gassco</td>
<td>1,376,332</td>
<td>1,376,322</td>
<td>51.03</td>
<td>48</td>
<td>Full Disclosure</td>
<td>Yes</td>
<td>Yes</td>
<td>4</td>
</tr>
<tr>
<td>Kings Bay</td>
<td>2,719</td>
<td>2,719</td>
<td>37.76</td>
<td>4.35</td>
<td>Partial Disclosure</td>
<td>No</td>
<td>Yes</td>
<td>4</td>
</tr>
<tr>
<td>Statkraft</td>
<td>11,128,748</td>
<td>16,610,072</td>
<td>34.4</td>
<td>46.41</td>
<td>Full Disclosure</td>
<td>Yes</td>
<td>Yes</td>
<td>2</td>
</tr>
<tr>
<td>NSB</td>
<td>369,083</td>
<td>369,083</td>
<td>24.01</td>
<td>37.72</td>
<td>Full Disclosure</td>
<td>Yes</td>
<td>Yes</td>
<td>3</td>
</tr>
<tr>
<td>Petoro</td>
<td>3,212,521</td>
<td>3,212,521</td>
<td>20.33</td>
<td>46.41</td>
<td>Full Disclosure</td>
<td>No</td>
<td>No</td>
<td>4</td>
</tr>
<tr>
<td>Statkraft</td>
<td>254,300</td>
<td>254,300</td>
<td>12.66</td>
<td>284.1</td>
<td>Full Disclosure</td>
<td>Yes</td>
<td>Yes</td>
<td>3</td>
</tr>
<tr>
<td>Nammo</td>
<td>21,805</td>
<td>43,611</td>
<td>11.53</td>
<td>4.44</td>
<td>Partial Disclosure</td>
<td>Yes</td>
<td>Yes</td>
<td>2</td>
</tr>
<tr>
<td>Telenor</td>
<td>597,667</td>
<td>1,107,406</td>
<td>8.65</td>
<td>3.13</td>
<td>Full Disclosure</td>
<td>Yes</td>
<td>Yes</td>
<td>2</td>
</tr>
<tr>
<td>Siva</td>
<td>3,171</td>
<td>3,171</td>
<td>8.19</td>
<td>8.15</td>
<td>No Disclosure</td>
<td>No</td>
<td>No</td>
<td>4</td>
</tr>
<tr>
<td>Posten Norge</td>
<td>143,305</td>
<td>143,305</td>
<td>5.72</td>
<td>16.55</td>
<td>Full Disclosure</td>
<td>Yes</td>
<td>Yes</td>
<td>3</td>
</tr>
<tr>
<td>Electronic Chart Centre</td>
<td>132</td>
<td>132</td>
<td>5.29</td>
<td>1.85</td>
<td>Full Disclosure</td>
<td>No</td>
<td>No</td>
<td>3</td>
</tr>
<tr>
<td>Baneservice</td>
<td>3,422</td>
<td>3,422</td>
<td>5.16</td>
<td>5.6</td>
<td>No Disclosure</td>
<td>No</td>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>Mesta</td>
<td>18,647</td>
<td>18,647</td>
<td>5.14</td>
<td>5.6</td>
<td>Full Disclosure</td>
<td>Yes</td>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>Flytoget</td>
<td>3,500</td>
<td>3,500</td>
<td>3.64</td>
<td>37.72</td>
<td>Full Disclosure</td>
<td>Yes</td>
<td>Yes</td>
<td>1</td>
</tr>
</tbody>
</table>

12. Full Disclosure: the company disclosed its carbon emissions. Partial Disclosure: the company provided consumption data used to calculate its carbon emissions. No Disclosure: the company did not disclose any information to calculate its emissions, and Trucost modelled its emissions instead.

13. Public disclosure on emissions and general sustainability has not been verified for quality and scope of disclosure

14. Norsk Hydro’s operations include the entire value chain. This is not the case for all companies underlying the sector average.

15. Based on 14.29% state ownership

16. Kings Bay has limited reporting on environmental issues

17. Petoro published a general corporate social responsibility policy

18. Siva publishes a general ethical guideline policy
<table>
<thead>
<tr>
<th>COMPANY</th>
<th>ABSOLUTE EMISSIONS (tCO₂e) – SCOPE 1 &amp; 2 APPORTIONED TO THE STATE’S OWNERSHIP</th>
<th>ABSOLUTE EMISSIONS (tCO₂e) – SCOPE 1 &amp; 2 COMPANY-LEVEL</th>
<th>CARBON INTENSITY (tCO₂e/NOKm REVENUE)</th>
<th>SECTOR AVERAGE (tCO₂e/NOKm REVENUE)</th>
<th>EMISSION DISCLOSURE IN TRUCOST’S QUESTIONNAIRE</th>
<th>PUBLIC EMISSION DISCLOSURE</th>
<th>PUBLIC REPORTING ON CLIMATE CHANGE</th>
<th>CATEGORY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entra</td>
<td>3,519¹⁹</td>
<td>7,077</td>
<td>3.54</td>
<td>8.15</td>
<td>Full Disclosure</td>
<td>Yes</td>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>Avinor</td>
<td>18,158</td>
<td>18,158</td>
<td>1.51</td>
<td>6.67</td>
<td>Full Disclosure</td>
<td>Yes</td>
<td>Yes</td>
<td>4</td>
</tr>
<tr>
<td>Norfund</td>
<td>426</td>
<td>426</td>
<td>0.99</td>
<td>0.63</td>
<td>No Disclosure</td>
<td>No</td>
<td>Yes</td>
<td>4</td>
</tr>
<tr>
<td>Aker Kværner Holding</td>
<td>7,090</td>
<td>23,633</td>
<td>0.94</td>
<td>15.81</td>
<td>Partial Disclosure</td>
<td>No²⁰</td>
<td>No²¹</td>
<td>2</td>
</tr>
<tr>
<td>Statnett</td>
<td>35,752</td>
<td>35,752</td>
<td>0.7</td>
<td>301.48</td>
<td>Full Disclosure</td>
<td>Yes</td>
<td>Yes</td>
<td>4</td>
</tr>
<tr>
<td>Kongsberg Gruppen</td>
<td>5,519</td>
<td>11,037</td>
<td>0.65</td>
<td>4.44</td>
<td>Full Disclosure</td>
<td>Yes</td>
<td>Yes</td>
<td>2</td>
</tr>
<tr>
<td>Vinmonopolet</td>
<td>7,185</td>
<td>7,185</td>
<td>0.56</td>
<td>5.75</td>
<td>Full Disclosure</td>
<td>No</td>
<td>Yes</td>
<td>4</td>
</tr>
<tr>
<td>Andøya Space Center</td>
<td>52</td>
<td>58</td>
<td>0.49</td>
<td>4.35</td>
<td>Partial Disclosure</td>
<td>No</td>
<td>No</td>
<td>4</td>
</tr>
<tr>
<td>DNB</td>
<td>3,212</td>
<td>9,448</td>
<td>0.17</td>
<td>0.63</td>
<td>Full Disclosure</td>
<td>Yes</td>
<td>Yes</td>
<td>2</td>
</tr>
<tr>
<td>GIEK Kredittforsikring</td>
<td>30</td>
<td>30</td>
<td>0.31</td>
<td>0.43</td>
<td>No Disclosure</td>
<td>No</td>
<td>No</td>
<td>3</td>
</tr>
<tr>
<td>Argentum Fondsinvestering</td>
<td>137</td>
<td>137</td>
<td>0.28</td>
<td>1.42</td>
<td>No Disclosure</td>
<td>No</td>
<td>Yes</td>
<td>3</td>
</tr>
<tr>
<td>Veterinærmedisinsk Oppdragssenter</td>
<td>44</td>
<td>130</td>
<td>0.23</td>
<td>4.26</td>
<td>Partial Disclosure</td>
<td>No</td>
<td>No</td>
<td>1</td>
</tr>
<tr>
<td>Ambita</td>
<td>32</td>
<td>32</td>
<td>0.1</td>
<td>1.85</td>
<td>Partial Disclosure</td>
<td>No</td>
<td>No²²</td>
<td>1</td>
</tr>
<tr>
<td>Innovation Norway</td>
<td>51</td>
<td>100</td>
<td>0.06</td>
<td>2.54</td>
<td>Partial Disclosure</td>
<td>No</td>
<td>Yes²³</td>
<td>4</td>
</tr>
<tr>
<td>Kommunalkanken</td>
<td>92</td>
<td>92</td>
<td>0.06</td>
<td>1.18</td>
<td>Full Disclosure</td>
<td>No</td>
<td>Yes</td>
<td>3</td>
</tr>
<tr>
<td>Space Norway</td>
<td>1</td>
<td>1</td>
<td>0.03</td>
<td>4.35</td>
<td>Partial Disclosure</td>
<td>No</td>
<td>No</td>
<td>4</td>
</tr>
<tr>
<td>Eksportfinans</td>
<td>1</td>
<td>6</td>
<td>0.02</td>
<td>1.18</td>
<td>Partial Disclosure</td>
<td>No</td>
<td>No²⁴</td>
<td>3</td>
</tr>
<tr>
<td>Investinor</td>
<td>1</td>
<td>1</td>
<td>0.01</td>
<td>1.42</td>
<td>Partial Disclosure</td>
<td>No</td>
<td>No²⁵</td>
<td>3</td>
</tr>
<tr>
<td>Eksportkreditt Norge</td>
<td>0.1</td>
<td>0.1</td>
<td>0.001</td>
<td>1.18</td>
<td>Partial Disclosure</td>
<td>No</td>
<td>No²⁶</td>
<td>4</td>
</tr>
</tbody>
</table>

Source: Trucost’s Research – companies’ latest data

19. Based on 49.73% state ownership
20. Akastor, Kvaerner and Aker Solutions disclose their emissions
21. Akastor, Kvaerner and Aker Solutions have public reporting on environmental issues
22. Ambita publishes a general corporate responsibility commitment
23. Innovation Norway has limited reporting on environmental issues
24. Eksportfinans publishes a general environmental awareness policy
25. Investinor publishes a general responsible investment policy
26. Eksportkreditt publishes a general social responsibility policy
7. RISK INTERNALIZATION

The following chapter outlines the mechanisms by which climate-related risks can be internalised by companies. These internalization pathways, defined as potential financial consequences arising from the different risk manifestations, can be either direct or indirect, as risks and related costs can be passed through supply chains. The severity of their impact will also depend on companies’ ability to pass the costs through to their customers. For example, Statoil might face direct increased production costs of petroleum products due to climate change affecting its offshore operational costs. These costs can be passed on to customers such as downstream companies and distributors who may therefore face these costs indirectly through their supply chain. However, crude oil is traded in an international market; therefore, oil companies’ ability to pass through cost is limited.

One sector where these risks materialise indirectly is the financial sector. While reputational risks through loans and investments are affecting financial institutions directly, the remaining risks are internalised indirectly through financial institutions’ vested interest in companies’ performance. For example, loan portfolios are likely to face higher credit risks if lending occurs predominately to high-impact, high-dependency sectors. The shareholder value for investors decreases once a company faces higher input costs or penalties for negative environmental effects, which threaten their ability to service loan repayments and potentially reduce shareholder returns. Investment strategies may underperform if they do not effectively mitigate climate-related risks and encourage investment in more sustainable sectors and business models.

Exhibit 8 provides an overview through real life examples of how the different risks can be internalised by companies. The exhibit is based on Trucost’s research, is not sector specific, and does not include the timeframe, magnitude or likelihood assumptions. The examples used in Exhibit 8 as well as in the risk descriptions below do not take account of the business models of the portfolio companies nor are they specific to Norwegian regulations and circumstances. Some of the portfolio companies operate globally and are thus subject to risks outside the Norwegian context. The descriptions aim to provide an overview of how the risks can, in theory, be internalised by drawing on examples from Norway as well as the rest of the world. The risks could be applicable to the portfolio companies to a varying degree, with not all examples being directly applicable in a Norwegian context.

EXHIBIT 8: FINANCIAL INTERNALIZATION PATHWAYS

Source: Trucost Research
The risks associated with climate change have been classified into seven categories:27

1. Physical Risks
2. Market Risks
3. Operational Risks
4. Regulatory Risks
5. Reputational Risks
6. Resource Depletion Risks
7. Subsidy Risks

These classifications represent all major types of risk through which climate change can materialise for companies. Despite representing seven distinctive risks and being presented as such below, they can be interrelated, with one risk following another or overlapping. For example, regulations can affect consumer behaviour, yet the risk is classified as market risk if the demand directly affects companies. However, it should be noted that not all risks are relevant for all sectors. Where relevant, each risk could be internalised differently by different sectors and companies within each sector, and risks may have different timeframe, magnitude and likelihood characteristics. Combining these three elements to form a risk matrix allows companies to prioritise risks and develop strategies to manage them.

The timeframe of an impact refers to the period over which an impact may materialise. Risks that could occur in the long term are more likely to have a high degree of uncertainty associated with them.

Magnitude of impact describes the extent to which the impact, if it occurred, would affect companies. This should consider the company as a whole and therefore the magnitude can reflect both the damage that can be caused and the exposure to that potential damage. It should be kept in mind that magnitude of impact is hard to quantify, as it varies from company to company depending on factors such as a company’s profit margin. Factors that can influence the magnitude are the proportion of business units affected, the size of the impact on those business units, and the potential for shareholder or customer concern. An impact of relatively high magnitude could occur because of a large effect in one of these aspects or small effects in all three combining to create a larger impact.

Likelihood of impact refers to the probability of the impact to companies occurring within the timeframe provided. For example, if the risk relates to a piece of new legislation that has already been prepared in draft form, the likelihood of the impact associated with that risk occurring will be relatively high.

**Physical risks**

The Norwegian economy, environment and society are all vulnerable to climate change (Norwegian Ministry of Climate and Environment, 2014). Physical risks result from disruption of vital infrastructure such as roads and transport caused by changing weather patterns and extreme weather events, resulting in higher costs and reduced revenue. Climate change may require increased investment in activities such as improved infrastructure, land-use and transport planning.

Projections (Hanssen-Bauer, 2009) indicate a warming in all parts of Norway and during all seasons. The annual mean temperature for Norway is estimated to increase by 3.4 (2.3-4.6) ºC by the year 2100. The growing season is projected to increase over large parts of the country. Annual and seasonal precipitation is also projected to increase. The annual runoff from the Norwegian mainland is estimated to increase, but regional differences can be expected. The snow season is projected to become shorter, and rainfall floods can be expected to increase.

Infrastructure will be exposed to climate change. The vulnerability of infrastructure varies, but the need for maintenance will be a major common challenge (Norwegian Ministry of Climate and Environment, 2014). Different types of infrastructure are mutually dependent, further increasing their vulnerability. For example, power supplies are essential for the functioning of the telecommunications network, and a functioning telecommunications network is necessary for stable power supplies. In the

27. The risk classification follows Trucost’s methodology
event of any disruption in power supply, the transport system is needed to access sites for repairs. These mutual dependencies make society and the economy more vulnerable to climate change. According to the national risk assessment carried out by the Directorate for Civil Protection and relevant partners, four of the worst case scenarios for possible disasters in Norway are climate related (extreme weather, flood, landslide, quick clay landslide) (Norwegian Ministry of Climate and Environment, 2014; Norwegian Directorate for Civil Protection, 2013). Moreover, the national risk assessment concludes that Norway is highly vulnerable to failures in critical infrastructure such as water and electricity, and that such failures may represent a threat to life, health and economic and material losses. The consequences of such failures will affect large parts of society and many business sectors.

Rising sea levels and storm surges may create problems linked to wave erosion and overflow, which may result in erosion damage and traffic disruptions. This can also increase the risk of water flowing into underground tunnels with low-lying entrances.

Increased amounts of water will also expose road fill and bridge foundations to more strain and erosion. Road and railway transport are exposed to natural events. An increased risk of floods, landslides and avalanches entails a traffic safety hazard and may increase the frequency of disruptions. Out of 50 Norwegian airports, 21 are only three to five meters above sea level. Rising sea levels and increased flooding could put these airports and Norway’s state-owned airport operator Avinor at high risk of infrastructure disruptions (Miljødirektoratet, 2016).

All Norwegian airports will be affected to varying degrees and in different ways by climate change. Climate affects both air traffic and the physical infrastructure. Many Norwegian airports are located near the coast on flat or reclaimed land near the sea or open water, making them vulnerable to impacts from higher sea levels and large waves.

Norway’s power supply is primarily based on renewable energy, such as hydropower, and it will thus be impacted directly by climate change due to increased precipitation. Expected increases in temperature could mean that Norway requires less heating and possibly more cooling.

Although the power supply system is designed to withstand the forces of nature, weather conditions are a major cause of the faults and disruptions that occur in the distribution, regional and national grids. The expected increase in extreme weather events will increase the risk of damage at various types of power supply infrastructure.

Oil and gas production on the Norwegian continental shelf is significantly affected by the weather and climate through the risks to power and transport infrastructure. Higher sea temperatures may reduce the capacity of gas pipelines and reduce the efficiency of liquid natural gas plants. If the temperature of the sea water used as cooling water increases, existing cooling water intakes may become too small in the future (Norwegian Ministry of Climate and Environment, 2014).

For buildings, increased precipitation, exposure to moisture and changes in the wind patterns are the key climate concerns. Rising sea levels, increased floods, landslides and avalanches are also important issues. (Norwegian Ministry of Climate and Environment, 2014).

Climate change can affect insurance policies and the market for insurance services. More frequent weather-related damage will change the risk pattern and stimulate demand for insurance. Climate change will result in a greater need for various insurance policies, among other things related to health, primary industries, buildings and equipment. It is also likely to increase premiums, potentially making some areas uninsurable due to flood risk, for instance.

The extreme weather during the 2010 winter period serves as a good example of risk internalization, as the volume of rail cargo in Sweden was reduced by 20%. The Hallsberg marshalling yard, one of Sweden’s main rail freight operation centres, had to close down for 14 days, resulting in costs between SEK 200 and 250 million (Ludvigsen & Klaeboe, 2014).

Exhibit 9 illustrates how physical risks can impact different sectors relevant to the state’s portfolio in terms of timeframe and magnitude of impact. The charts in this chapter do not take likelihood of impact into account, nor are sectors represented if the individual risks are deemed to be insignificant. The bubble size represents the apportioned revenue of the underlying portfolio companies. One should note that this is based on a qualitative assessment. Hence, the timeframe and magnitude cannot be read
in terms of certain years or financial consequences but as a relative indication. For example, physical risks could be internalized by the aluminium sector in the short term and at a lower magnitude, while the airline sector could potentially experience a higher magnitude of impact due to its higher exposure to physical risks.

EXHIBIT 9: PORTFOLIO SECTORS - PHYSICAL RISKS

Source: Trucost’s Research

**Market Risks**

Changing consumer preferences towards products made using sustainable production practices and raw materials supplies create a form of market risk through reduced demand for products made by companies that do not embrace this shift. Companies that offer more sustainable products and services can take advantage of growing demand and market share. This shift can be based on consumer changes, but can also be brought about through regulations affecting the affordability of sustainable products that can lead to an increase in demand. Companies that produce or sell goods and services with no or limited substitutes tend to be less exposed, since the time required to develop new technologies or disruptive products tends to be long. This is the case for aerospace and defence companies, which tend to benefit from – at least some – captive markets. The financial sector is also relatively less impacted, since market risk would mostly materialise indirectly through loans and investment exposure. The real estate sector is significantly exposed to a demand for “greener” buildings and is required by tenants to invest significantly in energy efficiency measures.

The energy sector, as well as most energy-intensive industries, are the most exposed to market risks, since the transition to a low-carbon economy has started and renewable energy technologies are now mature enough to be competitive (Fankhauser, 2012). The risk has already materialised for coal mining companies, with China and European countries reducing their reliance on coal-fired power generation. The oil and gas sector is also very much exposed to a sharp transition (IEA, 2016), and companies can respond by optimizing extractive processes, offering cleaner fossil fuel products such as natural gas, or increasing their use of renewable energy.

Exhibit 10 overleaf shows how energy-intensive sectors have a higher magnitude of impact compared with other sectors. The real estate sector has a more short-term risk exposure, as customers already demand more sustainable housing solutions.
As an example, the number of battery electric vehicles in Norway has risen from 3,347 to 98,884 and from 0 to 99,091 plug-in hybrid electric vehicles between 2010 and 2016 (22% market share) (Norsk elbilforening, 2016). The rise in demand can partially be explained by subsidies.

According to Rabobank (2015), a growing number of palm oil suppliers are seeking certification from the Roundtable on Sustainable Palm Oil (RSPO) standard to comply with increasing demand from food and consumer goods manufacturers in response to criticism of palm oil as a major cause of deforestation in South-East Asia. Moreover, the bank forecasts that global demand for RSPO-certified palm oil will double from 2014 to 2020, as traders and growers respond to sourcing requirements.

Within the Nordic region, the Swan Ecolabel has registered an increase of 141 licenses between 2014 and 2015, totalling 2023 (Nordic Ecolabelling, 2015).

EXHIBIT 10: PORTFOLIO SECTORS - MARKET RISKS

Source: Trucost’s Research
Operational Risks

While physical risks comprise any risks that arise from climate change (e.g., global warming, extreme weather events, etc.), operational risks are risks which directly affect the operations of a company, for example through its supply chain or inputs. Natural resources degradation increases operational costs and cost of goods sold for a company, placing pressure on profitability. Companies operating in sectors reliant on natural capital inputs may face difficulty maintaining profit margins in the face of rising input prices, unless such costs can be passed on to the consumer. For example, companies reliant on water as a key input to the production process will face increasing operational costs in the event of water scarcity affecting their foreign operations. However, companies focusing on efficient natural capital use have the opportunity to develop an advantage over competitors.

As can be seen from Exhibit 11, transportation sectors such as highways & railtracks are exposed to more short-term risks compared with the integrated oil & gas sector, which has a larger potential magnitude of impact.

The flooding that hit Thailand in 2011 disrupted local industries from car-parts manufacturing to hard-drive production. With 45% of the world’s computer hard drives made in Thailand, the global price of the product doubled (Hruska, 2013).

EXHIBIT 11: PORTFOLIO SECTORS - OPERATIONAL RISKS

Source: Trucost’s Research
Regulatory Risks

In the absence of adequate market mechanisms, unpriced natural capital costs (externalities) can trigger tighter regulation as governments intervene. Examples of intervention include emission targets and limits, taxes, fees, carbon pricing and subsidies. The purpose of these regulations is to control the natural capital impact of companies by driving natural capital cost internalisation. At present, more than 80% of Norway’s emissions are either covered by the EU ETS or subject to the country’s own carbon tax, or both. Increased compliance and litigation can also lead to higher costs – for example, to meet new product standards or remediate environmental or health damage. Additionally, increased compliance requirements can delay operations and impact revenues. These policies aim to place a monetary value on the unpriced impacts of companies by quantifying the cost of the externality generated. Carbon-intensive sectors, such as airlines or transport companies, are the most likely to face additional costs from regulation.

Exhibit 12 illustrates how, for example, potential regulations could affect the aluminium sector in the medium timeframe and with a large magnitude of impact compared with the renewable energy sector, which could be affected sooner but with a potentially smaller magnitude.

Germany’s Bundesrat passed a resolution in October 2016 that aims to ban the internal combustion engine by 2030 and have only zero-emission passenger vehicles approved for European roads. Higher taxes could hasten the reduction of internal combustion engine sales (Schmitt, 2016). Furthermore, Norway’s Statoil is under the investigation by the Norwegian Police for accidental discharge of drilling fluids in the North Sea in 2015 (Faeraas, 2016).

EXHIBIT 12: PORTFOLIO SECTORS - REGULATORY RISKS

Source: Trucost’s Research
Reputational Risks

Negative public perception of a company’s activities can damage brand value, reducing intangible assets and revenue. Reputational risk is likely to be greater for client-facing industries that rely on brand equity to support sales generation, such as retail and consumer goods manufacturing. Companies that mitigate their climate impacts will be able to differentiate themselves with a more sustainable brand image.

Reputational risk can materialise though the loss of a social license to operate, defined as the local community’s acceptance or approval of a company’s site, which can affect the profitability of a project or a business (Business Council of British Columbia, 2015). While this concept was until recently limited to mineral resources mining companies, it has spread to the broader resources sector and business in general.

As can be seen in Exhibit 13, reputational risk can affect aerospace and defence companies in a more immediate timeframe but with a smaller potential magnitude of impact than electric utilities.

In 2015, Shell abandoned drilling for oil in the Alaskan Arctic, despite having spent over USD 7 billion in the project, a decision that was partly attributed to pressures from environmental campaigners and shareholder activism. In 2016, BP withdrew its plans to explore the Great Australian Bight, a project that also faced strong resistance from local communities.

As climate change materialises, the risk of more sectors facing social scrutiny is likely to increase and spread to the broad economy, including financial institutions which provide financing to carbon-intensive industries. This has materialised in the increasing divestment movement by major investors globally. By 21 December 2016, the Norwegian Sovereign Wealth Fund had excluded 59 companies and 38 subsidiaries that derive at least 30% of their revenue from coal-based activities (Holter, 2016).

Moreover, BP’s Deepwater Horizon oil spill in 2010 has shown how a company’s reputation and financial performance can be significantly affected by its environmental performance. Considered one of the worst environmental disasters in American history, it led to an unexpected increase of clean-up and litigation costs, as well as a drop in revenue and loss of shareholder value by 55% (Chamberlin, 2014).

EXHIBIT 13: PORTFOLIO SECTORS - REPUTATIONAL RISKS

Source: Trucost’s Research
Resource Depletion Risks

Companies dependent on primary natural resources such as water and minerals as key inputs to their operations are exposed to the risk of increasing costs and disruptions to operations resulting from the depletion or degradation of the resource. Increased operating costs and cost of goods sold threaten profitability. Climate change is affecting water availability and flow and will increase the risk of disruptions in the water supply.

Moreover, almost 90% of global coal, a third of global oil reserves and half of gas reserves should remain unused from 2010 to 2050 in order to meet the target to limit global warming to 2°C (McGlade & Etkins, 2015). The risk of having to keep a significant part of fossil fuel reserves in the ground poses a risk of asset stranding in the fossil fuel sector, where the extraction of resources becomes no longer viable. While the coal industry is already seeing some assets being stranded, climate change is likely to reduce the volume of economically viable reserves across fossil fuels. This would affect not only the extractive industries, but also all the economic sectors that rely on these fossil fuels or that are fossil fuel energy intensive, such as aluminium production, fertilisers and agricultural chemical production, as well as transport-related industries (see Exhibit 14).

EXHIBIT 14: PORTFOLIO SECTORS - RESOURCE DEPLETION RISKS

Source: Trucost’s Research

Subsidy Risks

Industries reliant on subsidies to maintain profitability are exposed to risk as a result of climate change. For example, shifts in subsidies away from fossil fuels and towards renewables aim to reduce climate impacts and support the development of renewable energy generation. As illustrated in Exhibit 15, subsidy risk is mainly relevant for energy-related sectors. For example, both the integrated oil & gas and the coal & consumable fuels sectors are potentially exposed in the short-term to subsidy risks which may have a large magnitude of impact. In contrast, the renewable energy sector has a similar timeframe exposure yet is deemed to experience a potentially smaller magnitude of impact.

Whether the Norwegian oil and gas industry is subsidised is subject to debate, due to the deduction from company tax of up to 78% of companies’ exploration costs (FT, 2016). However, experts agree that the Norwegian specific oil and gas tax system creates an incentive for companies to explore and has led to a tremendous growth in new projects on its continental shelf since...
its inception in 2004 (International Institute for Sustainable Development, 2012). Potential modifications to the system would likely have a significant impact on current projects’ profitability.

Norway’s subsidies for electric vehicles have increased the number of vehicles to over 100,000 by the end of 2016. Electric vehicles represent 28.8% of new car sales and a 20% market share, surpassing the initial goal of 50,000 vehicles that were to receive the subsidies (VG Nyheter, 2016). There have been concerns that the government would remove the subsidies, which include free parking fees, toll exemptions and free ferry usage, in addition to tax exemptions in the sale of electric vehicles (Jolly, 2015). However, it has been reported that the subsidies will continue until at least 2020 (Lambert, 2016).

EXHIBIT 15: PORTFOLIO SECTORS - SUBSIDY RISKS

Source: Trucost’s Research
8. THEMATIC ASSESSMENT

The following chapter is a summary of the assessment of companies’ climate change readiness across the five themes of risk understanding, performance, risk reduction, opportunity and transparency. As the portfolio of companies owned by the Norwegian government is very diversified, with significant contrast in terms of sector, size and ownership type, this chapter presents the results of the assessment according to the four categories of companies used by the Norwegian government in the white paper (see Exhibit 1 for category descriptions). Additional analysis is performed comparing listed vs. non-listed companies, as well as distinguishing the companies according to the size of their carbon intensities. The overall better performance of listed companies compared with non-listed companies across all five themes is expected, given the higher public scrutiny they are facing and the higher pressure to address climate change issues.

Performance

GHG performance was assessed relative to each company’s sector, which means that within a carbon-intensive industry, a company can still perform well, provided its relative footprint (carbon intensity per unit of revenue) is lower than the sector’s average, even though its absolute footprint may be high. The assessment also looked at whether the emissions have been decreasing or increasing over the last couple of years, as well as whether the emissions reported covered the entire business operations. Similarly, a company with low absolute emissions can perform badly if its carbon intensity is above its relevant sector average and/or its emissions have been increasing over time.

All companies tend to fare relatively well across all categories, with only a minority underperforming (see Exhibit 16). With a few exceptions, most companies reported carbon intensities either in line or better than their respective sector average. For those companies that disclosed either consumption or emissions data, 39% saw their emissions decreasing over the last three years. In contrast, 29% reported increasing emissions, 13% stable emissions, and 19% did not report any historical data.

When comparing listed vs. non-listed companies, a similar picture presents itself with listed companies being split equally between performing in line with their sector average or better. Non-listed companies follow a similar distribution, with 7% underperforming, while 54% and 39% perform in line or better than their sector average.

The majority of companies with a low carbon intensity perform in line with the sector average in terms of performance (47%) or above the standard and in line with best-in-class (47%), while only 7% score below. Companies with a medium-sized carbon intensity perform mostly in line with the standard for their sector (75%), while 25% outperform the standard for their sector. All companies with a high carbon intensity perform in line with the standard for their sector.

EXHIBIT 16: PORTFOLIO COMPANIES - PERFORMANCE

Source: Trucost’s Research

29. DNB ASA, Entra ASA, Kongsberg Gruppen ASA, Norsk Hydro ASA, SAS AB, Statoil ASA, Telenor ASA and Yara International ASA
Transparency

Regular public reporting of climate change strategy, targets and achievements is important in demonstrating transparency, especially for listed companies. Disclosure can be in a stand-alone report or integrated into mainstream financial reporting. Responding publicly to the annual CDP climate change survey also shows that issues are being addressed in line with best practice. Since many companies in the Norwegian government’s portfolio do not report to the CDP, they were all assessed on their transparency in answering Trucost’s questionnaire, with full and considered answers being the main indicator of transparency. General public reporting is not included in the analysis of this chapter.

Most companies provide a satisfactory level of transparency for the purpose of this report, with a significant proportion providing full disclosure. Larger commercial companies (mainly category 2) tend to provide higher quality information, since most of them are listed and are required to produce annual reports for shareholders. However, within all categories, there is a large share of transparent companies (see Exhibit 17).

Most listed companies demonstrate full disclosure (88%), compared to a more even distribution between medium and high levels of disclosure (46% vs. 50%) in non-listed companies. Out of non-listed companies, 4% demonstrate a low level of transparency.

While all companies with a medium or high carbon intensity demonstrate a high level of transparency, companies with a low carbon intensity are split nearly equally between medium and high transparency (47% and 50%). Three percent of companies with a low carbon intensity demonstrate low transparency.

EXHIBIT 17: PORTFOLIO COMPANIES - TRANSPARENCY

Aside from companies’ responses to the questionnaire (Exhibit 17), Exhibit 7 in chapter 6 shows which of the companies provide information on their climate change-related risk strategy through general public reporting. The quality of this reporting has not been assessed. One should also note that some companies that are transparent in the questionnaire do not provide information publically.
Risk understanding

The risks companies are facing vary depending on their business model, location, supply chain and profit margin, among other factors. Hence, while each company’s risk exposure will differ, companies should be aware of what kind of potential risks they are facing and how they can be affected in terms of likelihood, magnitude and timeframe of impact, or why certain risks are not applicable to one’s own operations. Companies also need to understand how to manage these risks. The inclusion of senior management through regular reporting to the board or adapting remuneration schemes are examples of best practice for understanding risk across the entire company.

Understanding climate-related risks is variable, with only 22% of companies across all categories disclosing a strong understanding of the pathways of materialisation, 53% disclosing a medium understanding, and 25% low or no understanding at all.

Companies held purely for commercial objectives (category 1) seem to fare worse (see Exhibit 18), with 43% disclosing little or no understanding at all, while those held with the intention of maintaining a head office in Norway (category 2) perform best, with all companies disclosing at least a medium understanding or better. This could be explained by the relatively small size and regional character of companies in category 1, while category 2 companies are mostly large-cap listed entities with bigger footprints, larger workforces and significantly more resources available to them for assessing and tackling risks.

Companies in category 3 (commercial companies with specifically defined objectives) come second, with 78% of them displaying a medium understanding, albeit none to a strong level. Companies in category 4 come third, which could be explained by their specific sectoral objectives.

Listed companies demonstrate an equal split between medium and high risk understanding. On the other hand, 32% of non-listed companies demonstrate a low understanding and only 14% a high understanding. The divergence between listed and non-listed companies could be explained by listed companies having higher stakeholder pressure and thus having developed a stronger understanding of their exposure.

In terms of carbon intensity, companies with a low carbon intensity are split between a low (30%), medium (47%) and high (23%) risk understanding. Companies with a medium-sized carbon intensity mostly demonstrate a medium risk understanding (75%), with the remainder showing a high risk understanding. Companies with a high carbon intensity show a medium risk understanding. These results show that the size of a company’s carbon intensity generally relates to the risk understanding of the companies.

EXHIBIT 18: PORTFOLIO COMPANIES - RISK UNDERSTANDING

Source: Trucost’s Research
Risk reduction

Setting a meaningful carbon reduction target that drives emission reduction activities is essential to maximising emissions-saving opportunities. Implementation of carbon and energy reduction initiatives in line with the target demonstrates that companies have a strategy for attainment. Including climate change in risk management and the overall business strategy is essential to success in adapting to and mitigating climate change risks.

Emission reduction measures can be categorised into two groups. First are emission reduction measures in the production process, such as reducing flaring in oil and gas extraction or reducing fugitive methane emissions from coal mines. These are the remit of industrial companies which can either improve existing technologies or develop new processes. As a consequence, it should be expected that these types or emissions reduction initiatives will require time and significant investment before delivering results.

The second type of initiatives targets energy consumption in order to indirectly reduce the associated GHG emissions. Examples include energy efficiency upgrades and retrofits such as LED lights or timers. These measures can be applied by all types of businesses and are especially relevant to the support services industries (airports, railways, roads), as well as the real estate sector. While reducing the consumption of fossil-based energy is certainly an appropriate strategy, targeting electricity consumption in Norway will likely produce limited results compared with fossil fuel-intensive countries, since 98% of Norway’s electricity is generated by renewable energy sources, mainly hydropower. However, the potential inclusion of hydropower-related emissions in carbon accounting (IPCC) could reveal a higher carbon intensity than anticipated.

Targets are expressed either in absolute terms (e.g., reducing absolute emissions), relative terms per unit of revenue or production (e.g., carbon per barrel of oil or square meter of rented space), or a combination of both. Only 41% of the companies in the study have some form of explicit emission or energy reduction target in place. These are mostly companies with large carbon intensities and account for the majority of the portfolio footprint: oil and gas, coal mining, fertiliser manufacturing, aluminium, transportation-related industries, and telecommunications.

The companies in category 1 and 2 are the most proactive in reducing their emissions or exposure to climate change-related risks (see Exhibit 19). For those companies that do, there is a general understanding that emissions or energy reduction measures lead to efficiency improvement and thus a reduction in overall costs, as well as supply chain risks. Companies with other objectives than purely commercial ones tend to be less incentivised to do so, especially when their operations are highly regulated and less flexible.

Listed companies are more pro-active in terms of risk reduction than non-listed companies, with 62% scoring medium and 38% high in this theme, compared with 68% and 32% of non-listed companies scoring low and medium, respectively.

The majority of companies with a low carbon intensity show low or below sector standard performance in terms of risk reduction (60%). One-third (33%) perform in line with their sector, and only 7% perform in line with best-in-class. Similarly, the majority of medium-sized carbon intensity companies (50%) perform in line with the standard for their sector. The other 50% of companies are split equally (25% each) in performing either below standard or in line with best-in-class. All of the high carbon intensity companies perform in line with the standard for their sector. The above shows that those companies with a larger risk exposure in terms of carbon intensity do not seem to all follow with more advanced risk reduction strategies.
Aside from the risks, climate change brings opportunities for companies. To take advantage of these opportunities, companies need to integrate climate change considerations into their strategies. For almost all companies, opportunities come from the cost savings associated with greater carbon efficiency such as improved logistics and reduction in fuel use.

Beyond costs savings, there are opportunities to discover new sources of revenue – an important aspect that only a small number of companies reported on. Climate change mitigation and adaptation often need technological changes, which will bring new products onto the market (or adapt enhanced ones) and provide competitive advantages for companies that develop and sell them. These include renewable energy (wind, solar, biomass) and lower carbon transition fuels (natural gas), but also associated support services such as new exploration and drilling technology in the offshore oil and gas industry; development of new marine technologies such as green shipping or satellite services; and smarter buildings, infrastructure and grid networks, amongst others.

Financing the transition to a low-carbon economy will require significant investment, with financial institutions expected to provide a large share of it. There are many opportunities from integrating climate change into financial products and services, ranging from increased demand for green loans to fund energy efficiency improvements to project finance opportunities for renewable energy projects and alternative risk transfers. The tremendous momentum in the green bond market is a clear example of the trend. In 2015, USD 42 billion worth of green bonds had been issued, quadrupling the 2013 issuances (Climate Bonds Initiative, 2017). The Climate Bonds Initiative estimates that 2016 issuance could reach USD 100 billion (Climate Bonds Initiative, 2017).

Finally, companies that rely on brand value have an opportunity to differentiate themselves by providing more sustainable and carbon-efficient products and services, which command price premiums, at least in the short to medium term. This could explain the better performance of commercial companies (category 1 and 2), of which 58% have strategic plans to respond to climate change (see Exhibit 20). Companies in category 3 also follow commercial objectives, yet they are more bound to policy objectives, rendering them less flexible. Smaller companies and those which are driven by a sectoral or societal objective are either less equipped or lack the strategic leeway to reap the benefits brought by climate change adaptation.

Opportunity is the sole theme where some listed companies demonstrate a low performance (25%). Yet overall, the performance is still better than non-listed companies, where 43% score low on opportunity uptakes and only 7% score high. This is in contrast with 38% of listed companies.
All companies with a large carbon intensity perform below their sector standard in terms of reaping opportunities, while the majority of medium-sized carbon intensity companies (75%) perform along the same line as the standard for their sector, with 25% following best-in-class approaches. Companies with a small carbon intensity are more or less evenly split between following the standard for their sector (47%) or below the standard (40%). Only 13% follow the best-in-class practices. Similar to risk reduction, risk exposure as measured by carbon intensities does not equate to reported advanced opportunity strategies.

EXHIBIT 20: PORTFOLIO COMPANIES - OPPORTUNITY

Source: Trucost's Research

Exhibit 21 below lists the companies that performed at a high level on each of the five assessment themes. With some exceptions, most companies are large and listed, and they tend to have large carbon intensities and climate-related risks that are material to their business.

EXHIBIT 21: PORTFOLIO COMPANIES – INDUSTRY LEADERS

<table>
<thead>
<tr>
<th>PERFORMANCE</th>
<th>TRANSPARENCY</th>
<th>RISK UNDERSTANDING</th>
<th>RISK REDUCTION</th>
<th>OPPORTUNITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entra</td>
<td>Nammo</td>
<td>Kongsberg Gruppen</td>
<td>Telenor</td>
<td>Flytoget</td>
</tr>
<tr>
<td>Posten Norge</td>
<td>SAS</td>
<td>Vinmonopolet</td>
<td>Statoil</td>
<td>Telenor</td>
</tr>
<tr>
<td>DNB</td>
<td>Store Norske Spitsbergen Kulkompani</td>
<td>Telenor</td>
<td>SAS</td>
<td>Gassco</td>
</tr>
<tr>
<td>Avinor</td>
<td>Avinor</td>
<td>Statoil</td>
<td></td>
<td>Kongsberg Gruppen</td>
</tr>
<tr>
<td>Flytoget</td>
<td>DNB</td>
<td>Gassco</td>
<td></td>
<td>Entra</td>
</tr>
<tr>
<td>Kongsberg Gruppen</td>
<td>Statoil</td>
<td>Avinor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Statoil</td>
<td>Kings Bay</td>
<td></td>
<td></td>
<td>Entra</td>
</tr>
<tr>
<td>Vinmonopolet</td>
<td>Posten Norge</td>
<td>Flytoget</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Statkraft</td>
<td>Kongsberg Gruppen</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambita</td>
<td>Gassco</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kommunalebanken</td>
<td>Telenor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Petoro</td>
<td>Vinmonopolet</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

30. Based on the questionnaire submissions
## PERFORMANCE

<table>
<thead>
<tr>
<th>Eksportkreditt Norge</th>
<th>Petoro</th>
</tr>
</thead>
<tbody>
<tr>
<td>Store Norske Spitsbergen Kulkompani</td>
<td>Eksportkreditt Norge</td>
</tr>
<tr>
<td>NSB</td>
<td>Yara International</td>
</tr>
<tr>
<td>NSB</td>
<td>Norsk Hydro</td>
</tr>
<tr>
<td>Statkraft</td>
<td>Mesta</td>
</tr>
<tr>
<td>Mesta</td>
<td>Flytoget</td>
</tr>
</tbody>
</table>

Source: Trucost’s Research

Exhibit 22 below lists the companies that should aim to improve within each theme. With a few exceptions, companies found to be lacking in the risk understanding and risk reduction themes tend to be small and focused on a single business model that is often regulated by a sectoral objective. The performance of those found lacking in the identifying and exploiting opportunities theme may be due to their unique business model or because their regulated status provides little flexibility.

### EXHIBIT 22: PORTFOLIO COMPANIES - POTENTIAL TO IMPROVE

<table>
<thead>
<tr>
<th>PERFORMANCE</th>
<th>TRANSPARENCY</th>
<th>RISK UNDERSTANDING</th>
<th>RISK REDUCTION</th>
<th>OPPORTUNITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Space Norway</td>
<td>Andøya Space Center</td>
<td>Innovation Norway</td>
<td>Electronic Chart Centre</td>
<td>Electronic Chart Centre</td>
</tr>
<tr>
<td>Electronic Chart Centre</td>
<td>Andøya Space Center</td>
<td>Siva</td>
<td>Veterinærmedisinsk Oppdragssenter</td>
<td></td>
</tr>
<tr>
<td>Space Norway</td>
<td>Veterinærmedisinsk Oppdragssenter</td>
<td>Andøya Space Center</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Siva</td>
<td>Andøya Space Center</td>
<td>Space Norway</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electronic Chart Centre</td>
<td>Space Norway</td>
<td>Nammo</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambita</td>
<td>Baneservice</td>
<td>Yara International</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kommunalbanken</td>
<td>Innovation Norway</td>
<td>Baneservice</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Veterinærmedisinsk Oppdragssenter</td>
<td>GIEK Kredittforsking</td>
<td>Siva</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baneservice</td>
<td>Eksportkreditt Norge</td>
<td>Eksportkreditt Norge</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nammo</td>
<td>Norfund</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Investinor</td>
<td>NSB</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Kommunalbanken</td>
<td>Ambita</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Norfund</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Argentum Fondsinvesteringer</td>
<td>Eksportfinans</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mesta</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ambita</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Statkraft</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Store Norske Spitsbergen Kulkompani</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Trucost’s Research
9. SUMMARY AND CONCLUSIONS

Climate change is a material issue that needs to be addressed by business

Climate change-related risks such as extreme weather and the failure of climate change mitigation and adaptation are two of the top five risks identified in 2017 in terms of impact by the World Economic Forum. Significant efforts will be required from both the public and private sector to mitigate and adapt to climate-related risks.

To manage the risks, companies should develop a sound understanding of the risks that are caused by potential changes in operating conditions due to realistic climate change scenarios and the pathways through which they will likely materialize. They should reduce their carbon intensities as well as their risk exposure (see chapter 7) and seize the opportunities brought by the transition to a low-carbon economy.

The Norwegian government highlights in its ownership policy that companies owned partially or fully by the state shall work systematically to safeguard their corporate social responsibility towards people, society and the environment, as well as an expectation of transparency in the conduct of their business.

Companies owned partially or fully by the state show mixed results

Based on the Norwegian government’s expectations, Trucost developed a questionnaire around five key themes, which were used to frame the analysis and present the findings.

- Performance
- Transparency
- Risk Understanding
- Risk Reduction
- Opportunity

The information provided through the questionnaires and the companies’ public disclosures was compared with relevant benchmarks or best-in-class approaches for each specific sector.

While most companies provided a satisfactory level of transparency for the purpose of this report, with a significant proportion providing full disclosure, only 57% of companies provided full disclosure of their carbon emissions, with 30% providing partial disclosure of consumption data used to calculate actual emissions and the remainder no data at all.

With a few exceptions, most companies reported carbon intensities either in line or better than their respective sector average. For those companies that disclosed either consumption or emissions data, 39% saw their emissions decreasing over the last three years. In contrast, 29% reported increasing emissions, 13% stable emissions, and 19% did not report any historical data.

Companies held purely for commercial purposes (category 1) displayed the lowest understanding of the risks they may face, even for the most material risks, such as market risk, operational risk, physical risk and regulatory risk. Companies held with commercial purposes and the intention of maintaining a head office in Norway (category 2) perform best, with all companies disclosing at least a medium understanding or better. These are mostly large listed entities with bigger footprints, larger workforces and significant resources available.

Companies in category 1 and 2 are the most proactive in reducing their emissions or exposure to climate-related risks. For those proactive companies, there is a general understanding that emissions or energy reduction measures lead to efficiency improvements and hence a reduction in overall costs, as well as supply chain risks. Companies that have limited or no commercial objectives tend to be less incentivized to pursue emission or energy reductions, especially when their operations are highly regulated and less flexible.
Beyond costs savings, there are opportunities to discover new sources of revenue—an important aspect that only a small number of companies reported on. Climate change mitigation and adaptation often require technological changes, which will bring new products onto the market or enhance existing ones, providing competitive advantages for companies that develop and sell them. Companies that rely on brand value have an opportunity to differentiate themselves by providing more sustainable and carbon-efficient products and services that command price premiums, at least in the short to medium term. This could explain the better performance of companies in category 1 and 2, of which 58% have strategic plans to respond to climate change. Smaller companies and those that are driven by a sectoral or societal objective are either less well-resourced or lack the strategic leeway to reap the benefits brought by climate change adaptation.

The distribution of listed companies does not differ significantly from non-listed companies in terms of performance, yet for all other themes the distribution shows listed companies performing better than non-listed companies. Given the higher stakeholder pressure on listed companies in terms of transparency and risk exposure management, the results are in line with expectations.

The size of companies’ carbon intensities does not directly relate to a more advanced climate change risk strategy, with the exception of transparency. The themes of risk understanding, risk reduction and opportunity all show that companies with the largest footprints do not automatically demonstrate the most advanced or best-in-class strategies.

Companies with a low-carbon intensity do not perform uniformly in the themes of performance, risk understanding, risk reduction and opportunity, with some performing below sector standards, in line with sector standards or following sector best practices. Companies with a medium-sized carbon intensity perform either in line with standard practices for their sector or follow best-in-class approaches across the themes, with the exception of risk reduction, where a minority of companies perform below sector standards.

Fostering climate-change readiness as an asset owner

Commercial companies owned partially or fully by the state in Norway seem to have, for the most part, understood the case for energy and resource efficiency as a cost-reduction opportunity. This is particularly true for resource-intensive companies or companies that have been impacted by EU ETS carbon pricing or environmental regulation for the longest time. There seems to be a gap, however, between the emissions reduction measures and targets displayed by companies owned partially or fully by the state and the Norwegian commitment to reduce GHG emissions by 40% by 2030 compared to 2005 levels.

A significant number of companies, however, did not have such policy incentives in the past or could have been more restricted in their ability to adapt their strategy to climate change challenges. This is generally the case for highly regulated entities, such as financial and export credit institutions, despite the significant investments needed to support the transition to a low-carbon economy.

Finally, most companies tend to benchmark themselves, where relevant, to industry standards, even when conventional practices overlook climate-related risks and opportunities. The absence of standards and protocols are often a reason put forward by companies that have not taken steps to ensure they are climate-ready.

Below are potential pathways that are often considered by asset owners as best-in-class for active ownership (Blackrock & Ceres, 2015).

1. Set clear expectations and follow through on milestones

It is important that asset owners set out their views clearly in order to foster long-term, sustainable value creation, and integrating climate-change readiness as a clear and specific expectation is a useful tool.

Setting guiding principles for companies, along with defined objectives, is also an effective way of defining a trajectory for companies to aim for and milestones to deliver on. While businesses are likely to be best placed to devise ways of reducing their emissions, the owner can support the process by incorporating climate change risk management into the principles of corporate
governance. Initiatives such as the Science-Based Targets Initiative, the Sectoral Decarbonisation Approach (Science Based Targets, 2016) and the ACT Framework (REF) are recent examples of emission reduction goals.

2 - Engage with the Board of companies

Communication is a simple and effective way for owners to engage with companies. The board of directors is appointed by and accountable to the company’s owners. As such, the directors are best place to bear the ultimate responsibility of addressing climate-related risks and implementing an appropriate strategy to mitigate these risks.

3 - Be an active owner

Investor inquiries, shareholder proposals and assembly votes are effective ways to strengthen corporate transparency and reporting requirements. While large, listed entities already have reporting obligations, smaller companies and those with sectoral objectives have yet to achieve significant improvement. Stress tests and climate scenario analysis incorporating carbon pricing would enhance communication by companies of the viability of their business models in a carbon-constrained world.

4 - Foster dialogue

Norway enjoys a strong reputation globally for introducing sensible environmental policies, such as the reporting guidelines set by the Norwegian Oil and Gas Association and the work done with the International Maritime Organization on limiting GHG emissions (Norwegian Ministry of Climate and Environment, 2014). Most asset owners encourage companies to be active stakeholders in the design of climate change-related policies. Initiatives and frameworks are an effective engagement tool and are more likely to be successful if they are sector-specific and developed in collaboration with all stakeholders, including companies. Potential initiatives could include frameworks for transition financing in order to promote the effective deployment of capital towards renewable energy and low-carbon technologies.
10. APPENDIX A – KEY FINDINGS FOR PORTFOLIO COMPANIES

The following chapter presents the key findings for each of the state’s portfolio companies structured into the five key themes. The findings are preceded by an operational description as taken from the State Ownership Reports and the companies’ websites.

Aker Kværner Holding AS
Aker Kværner Holding AS’ business is to own shares in Akastor ASA, Aker Solutions ASA and Kværner ASA. Aker Kværner Holding owns about 40% of the shares in each of these companies and has the same rights as the other shareholders.

Akastor is an oil services investment company with a portfolio of industrial holdings, real estate and other investments. Companies within the portfolio focus, among others, on drilling systems and lifecycle services, vessel-based subsea well construction and intervention and equipment suppliers. Aker Solutions is a global provider of engineering, design, production systems and services with a focus on equipment, offshore field design and maintenance. Kvaerner delivers complete oil and gas offshore platforms and onshore process plants to operators and other customers. Their specialism lies in Engineering, Procurement and Construction (EPC) projects.

Aker Kværner (i.e., its three underlying companies) is categorized and compared to the oil & gas equipment & services sector. Based on public reporting and compared to the sector, the key findings are:

• Performance: the carbon intensity of all three underlying companies is well below the sector average (1.67 tCO₂e/NOKm revenue, 0.32 tCO₂e/NOKm revenue and 0.87 tCO₂e/NOKm revenue vs 15.8 tCO₂e/NOKm revenue). However, the reporting standards do not match the best-in-class reporting due to exclusion of certain gases and not presenting the emissions in terms of CO₂e.

• Transparency: While all three companies report their emissions and Aker Solutions and Kvaerner are transparent on their general environmental commitments, the overall disclosure does not match best practice standards.

• Risk Understanding: Aker Solutions demonstrates a good level of understanding in terms of identifying relevant sustainability trends in its industry. Kvaerner acknowledges climate change risks, yet it does not seem to have assessed them, while Akastor provides no clear identification of risks.

• Risk Reduction: All three companies range in their risk reduction performance, with none setting emission or energy reduction targets. Kvaerner engages with suppliers, while Akastor does not provide details on its climate change actions. Aker Solutions presents itself as the most proactive at emission reduction initiatives.

• Opportunity: Both Kvaerner and Aker Solutions identified opportunities on how to adapt their services to climate change risks. Akastor lags behind by having no reported opportunity strategy set up.

Ambita AS
Ambita AS (Ambita) was established to convert the Land Registry to an electronic platform in counterpart for exclusive rights to commercial provision of information from the Registry. The company has been wholly owned by the Norwegian State since 1992 and fully exposed to competition since 2014. Ambita is an ICT company which provides services, systems and products based on land register information and mapping data. The company processes raw data from the Land Registry and the Title Register and sells finished information products. Much of the company’s distribution is through the portal Ambita Infoland, which allows one-stop-shopping for property information from various public and private providers.

Ambita is categorized and compared to the data processing & outsourced services sector. Based on answers to the questionnaire and public reporting and compared to the sector and relevant peers, the key findings are:

• Performance: Ambita’s carbon intensity of 0.1 tCO₂e/NOKm revenue is significantly below its sector average, yet the company does not provide historical data.
• Transparency: Ambita provides transparent answers to the questionnaire given its small size. Yet Ambita does not report publically on climate change issues besides general corporate responsibility commitments.

• Risk Understanding: Ambita does not consider being exposed to climate change risks, based on its internal assessment.

• Risk Reduction: Despite integrating energy efficiency into its practices, Ambita does not have any direct risk reduction initiatives. The results of an internal climate change evaluation were not available for review.

• Opportunity: Ambita’s identification of opportunities within the use-phase of its services is relatively strong compared to its peers, yet it lags behind in addressing potential supply chain risks.

Andøya Space Center AS

Andøya Space Center AS delivers operational services and products related to space and atmospheric research, environmental monitoring, and technology testing and verification, as well as contributing to building knowledge and interest in these areas. In addition to the parent company, the Andøya Space Center AS group comprises two subsidiaries: Andøya Test Center AS and NAROM (Norwegian Center for Space Related Education). The ALOMAR observatory is also part of the company’s range of services. The group provides services for national and international research communities (launching of sounding rockets and release of research balloons) and technological testing environments (to test rocket motors). Andøya Space Center also has increasing activity related to the development, testing and use of unmanned aerial vehicles (UAV/RPAS) and conducts student-oriented work through its subsidiary NAROM.

Andøya Space Center is categorized and compared to the diversified support services sector. Based on answers to the questionnaire and public reporting and compared to the sector, the Key Findings are:

• Performance: Andøya’s carbon intensity is 0.5 tCO₂e/NOKm revenue (modelled by Trucost based on consumption data) — well below the sector average. However, the company did not provide any historical data. Given its unique business model, it is hard to compare Andøya to the more diversified group of companies underlying the sector.

• Transparency: Andøya demonstrates a lack transparency by not providing answers to the questionnaire and does not report publically on climate change risks.

• Risk Understanding: Based on its lack of questionnaire answers and public disclosure, Andøya shows no risk understanding.

• Risk Reduction: Based on its lack of questionnaire answer and public disclosure, Andøya seems not to have any risk reduction strategies.

• Opportunity: Based on its lack of questionnaire answer and public disclosure, Andøya seems not to have acted upon any potential opportunity.

Argentum Fondsinvesteringer AS

Argentum Fondsinvesteringer AS (Argentum) is a company that invests in private equity funds. The company was established in 2001 to manage the Norwegian state’s investments in private equity funds and contribute to a better functioning capital market for unlisted companies. Argentum mainly invests in private equity funds in Norway and Northern Europe, and in the international energy sector. Investments are divided into buyout funds and venture funds. Argentum is currently invested in 96 funds, which in turn own 581 unlisted companies, and is the largest Norwegian venture investor. Investments are made by investing in newly established funds (primary), by acquiring interests in existing funds (secondary) or through co-investments with private equity funds. Argentum manages total commitments in funds and structures worth NOK 13.8 billion for the state. Argentum has also mobilised NOK 3.7 billion in private capital through its investment programmes.
Argentum is categorized and compared to the diversified capital markets sector. Based on answers to the questionnaire and public reporting, and compared to the sector and relevant peers, the key findings are:

- **Performance**: Argentum did not provide its emission or consumption data; hence, Trucost calculated its emission intensity at 0.3 tCO$_2$/NOKm revenue.
- **Transparency**: Argentum reports annually on climate change issues and has a separate CSR report, providing a good basis for transparency. Argentum engages with fund managers on ESG, but it is not fully transparent on how the managers’ ESG performance has changed over time, besides a general status report.
- **Risk Understanding**: Argentum shows a good reported theoretical understanding of its indirect exposure, yet it has not identified other risks, such as increasing demand for climate change risk integration into fund selection.
- **Risk Reduction**: Argentum has a good risk reduction strategy by engaging with its fund managers, which could be enhanced by measuring the carbon intensity of its funds, as well as investing into more sustainability-focused funds.
- **Opportunity**: Argentum has invested into a specialised energy solution fund. It could consider taking this further by investing in sector-neutral low-carbon funds.

**Avinor AS**

Avinor AS was established on 1 January 2003 through the conversion of the public sector enterprise the Norwegian Civil Aviation Administration to a state-owned limited company. Avinor’s social mission is to own, operate and develop a nationwide network of airports for civilian aviation and a joint air navigation service for civilian and military aviation.

The flight operations business encompasses 46 airports in Norway, as well as air traffic control towers, control centres and other technical infrastructure for safe flight navigation. The operations will be conducted in a safe, environmentally friendly and efficient manner, and offer good accessibility for all categories of travellers. In addition to flight operations, Avinor receives commercial revenues from airport hotels, car parks, duty-free sales, cafés and restaurants, and other services for air passengers at the airports. Avinor will, to the greatest possible extent, be self-financed through its own revenues from the primary activities and its commercial activities.

Avinor is categorized and compared to the airport services sector. Based on answers to the questionnaire and public reporting and compared to the sector and relevant peers, the key findings are:

- **Performance**: With 1.5 tCO$_2$/NOKm revenue, Avinor is 75% below the sector average due to energy efficiency measures targeted at fossil fuels and building operational efficiency. Additionally, absolute emissions have decreased over the last three years.
- **Transparency**: Avinor has strong transparency in both the questionnaire and its annual reporting.
- **Risk Understanding**: Avinor shows a strong understanding of the potential risks it is facing.
- **Risk Reduction**: Avinor has a multitude of risk reduction initiatives in place, such as an emission reduction target, sustainability certifications and increasing the share of public transport.
- **Opportunity**: Avinor is actively pursuing opportunities in its direct operations by offering biofuels to airlines and identifying the potential for differentiation based on energy efficient travels. It could enhance its performance by strengthening its supply chain strategy.
Baneservice AS
Baneservice AS supplies technical railway contracting services for trains and trams in Scandinavia. The company was spun off from the Norwegian National Railway Administration on 1 January 2005. The company’s mission is to help its customers deliver safe, efficient and environment-friendly transport systems. The Norwegian operations are organised in the parent company Baneservice AS. In Sweden, Baneservice is represented through the wholly owned subsidiary Baneservice Scandinavia AB, which supplies shunting services at freight terminals.

Baneservice is categorized and compared to the railtracks sector. Based on answers to the questionnaire and public reporting, and compared to the sector and relevant peers, the key findings are:

- Performance: With no disclosed emissions or consumption data, Trucost calculated Baneservice emission at 5.2 t\text{CO}_2e/\text{NOK}m revenue based on sector averages.
- Transparency: Baneservice’s public reporting does not go beyond addressing climate change at a high level, yet the company is transparent in Trucost’s questionnaire about its lack of addressing climate change through, for example, targets or risk management.
- Risk Understanding: Despite understanding its risk exposure to regulations and changing consumer preferences, Baneservice does not seem to address these issues nor identified all relevant risks as material.
- Risk Reduction: Baneservice does not disclose a sound climate risk strategy.
- Opportunity: Baneservice demonstrates a low level of understanding of the potential opportunities available.

DNB ASA
DNB ASA is Norway’s largest financial service group and one of the largest in the Nordic region in terms of market value. The group offers a wide range of financial services to private customers, corporate customers and the public sector. They include loans, savings, advisor services, insurance and pensions. DNB’s services include financial service outlets, service phone lines as well as internet and mobile banking. Its international focus lies especially in energy, shipping, fisheries and seafood. The group is represented in 19 countries throughout Norway through its branch offices, post offices and in-store postal and banking outlets. The Norwegian operation serves 2.1 million personal customers and more than 200,000 corporate clients.

DNB is categorized and compared to the diversified bank sector. Based on answers to the questionnaire and public reporting and compared to the sector and relevant peers, the key findings are:

- Performance: Besides its decreasing absolute emissions in the last three years, DNB’s carbon intensity of 0.17 t\text{CO}_2e/\text{NOK}m revenue is below the sector average.
- Transparency: DNB’s transparency is very high, as it has disclosed to the CDP since 2009, in addition to responding thoroughly to the questionnaire and through its annual reporting.
- Risk Understanding: DNB shows strong risk understanding across the majority of its operations, with the seeming exception of its insurance business.
- Risk Reduction: Reflecting its risk understanding, DNB’s risk reduction initiatives are thorough. They include investment exclusion criteria for thermal coal, the goal to vote on sustainability issues in general meetings for global stocks in 2016, and the aim to introduce climate-related savings and credit products.
- Opportunity: DNB has a good understanding of the opportunities available to them, such as new market growth for certain sectors (e.g. renewable energy investments).
Electronic Chart Centre AS

Electronic Chart Centre (ECC) seeks to contribute to increased safety at sea through maritime innovation and the operation of socially beneficial infrastructure and technology. The company was established as a limited company in 1999 and has 19 employees. Activities are concentrated on delivery of services that ensure that Norway meets its obligations pursuant to international and national strategies regarding safety at sea, and meets requirements from new areas of use and new technology for users on both land and at sea.

ECC is categorized and compared to the data processing and outsourced services sector. Based on answers to the questionnaire and public reporting and compared to the sector and relevant peers, the key findings are:

- Performance: ECC’s carbon intensity of 5.2 tCO₂e/NOKm revenue is well above the sector average, and its absolute emissions have been increasing over the last three years.
- Transparency: Despite recognizing certain climate change topics as relevant, ECC was unable to provide answers to a majority of the questionnaire and does not report publicly on climate change.
- Risk Understanding: ECC demonstrates a limited reported risk understanding.
- Risk Reduction: ECC does not disclose any information on efforts to reduce its risk from climate change.
- Opportunity: ECC does not appear to recognise any climate change opportunities or consider them relevant.

Eksportfinans ASA

Eksportfinans ASA actively manages a large portfolio of loans to the Norwegian export industry, foreign buyers of Norwegian capital goods and the municipal sector in Norway. Almost all of the loans are guaranteed by the Norwegian Guarantee Institute for Export Credits (GIEK) and/or banks. The company also manages a substantial portfolio of international securities. The business is funded through bonds issued in the international capital markets. The company has about 30 employees and is owned by 24 commercial and savings banks in addition to the state, represented by the Ministry of Trade and Industry. The state acquired its 15 per cent ownership interest through a private placement in 2001.

Eksportfinans is categorized and compared to the specialized finance sector. Based on answers to the questionnaire and public reporting and compared to the sector and relevant peers, the key findings are:

- Performance: With a carbon intensity of 0.01 tCO₂e/NOKm revenue, Eksportfinans performs better than the sector average. However, the company does not report on its scope 1 emissions.
- Transparency: Eksportfinans provides transparent yet limited answers to the questionnaire. However, it does not disclose any information regarding climate change risks or sustainability publically.
- Risk Understanding: Eksportfinans demonstrated minimal understanding of climate-related risks in its reports and questionnaire response.
- Risk Reduction: As Eksportfinans does not issue new loans anymore, its options to reduce its risk going forward are limited. However, even with its past and present activities, it demonstrates limited initiatives.
- Opportunity: As Eksportfinans is not issuing new loans, the majority of the opportunities available to the sector are not applicable to it.
Eksportkreditt Norge AS

Export Credit Norway AS was established in the summer of 2012 to take care of the management of the state’s export credit scheme, which until 21 December 2011 was managed by Eksportfinans ASA. Under the export credit scheme Export Credit Norway offers loans to finance Norwegian export contracts. Borrowers can choose between government-supported loans with a fixed interest rate (CIRR – Commercial Interest Reference Rate) and loans with market interest rates. The terms of the loans are governed by the OECD arrangement on officially supported export credits, among others. The company’s activities are regulated by the Act relating to Export Credit Norway AS and regulations concerning the export credit scheme. The loans are funded by the Norwegian Treasury and are recorded on the state’s statement of financial position. The state thus assumes all the risks associated with the credit scheme. All loans are fully guaranteed by state export guarantee institutions or financial institutions with good credit ratings.

Eksportkreditt is categorized and compared to the supranational sector. Based on answers to the questionnaire and public reporting, and compared to the sector and relevant peers, the Key Findings are:

- Performance: Eksportkreditt’s carbon intensity of 0.01 tCO₂e/NOKm revenue is well below the sector average. However, the company does not report its scope 1 emissions.
- Transparency: Eksportkreditt provided transparent answers in the questionnaire submission. However, it does not disclose any information regarding climate change risks or sustainability publicly.
- Risk Understanding: Eksportkreditt demonstrates low reported risk understanding. It correctly identified that climate change can indirectly affect it through its funded projects, due to carbon regulations or restrictions on oil & gas operations. However, it did not identify all relevant risks nor has it quantified its exposure to fossil fuel reserves.
- Risk Reduction: Eksportkreditt follows the OECD’s Arrangement on Officially Supported Export credits which provides guidance on how climate change would be integrated into assessments, reviews and classifications, yet it has limited disclosure regarding how its projects fall into the different classifications or on any risk reduction strategy.
- Opportunity: Eksportkreditt, identified that some sectors provide opportunities in the face of climate change, such as green shipping. Yet, due to its nature, it is unable to influence the sectors receiving loans.

Entra ASA

Entra ASA is one of Norway’s leading real estate companies, with a majority of high-quality office buildings in central locations. At year-end, Entra owned 105 buildings and was the largest owner of office property in Oslo, and one of the largest owners in Norway. At the end of Q2 2016 the company owned 96 properties, covering a floor space of 1.2 million square meters. Following an IPO in late-2014 the company’s portfolio market value was NOK 32.1 bn. The company’s business strategy is to be a market leader on customer-perceived quality, achieve profitable growth and an environmental leader in the industry.

Entra is categorized and compared to the diversified real estate sector. Based on answers to the questionnaire and public reporting and compared to the sector and relevant peers, the key findings are:

- Performance: Entra’s portfolio of energy efficient buildings drives a GHG intensity (3.54 tCO₂e/NOKm revenue) far lower than the sector average.
- Transparency: Entra demonstrates best-in-class transparency by providing comprehensive and detailed responses to Trucost’s questionnaire, as well as through its annual public report and by becoming a CDP reporter in 2015.
- Risk Understanding: Entra has shown an understanding of all relevant climate change risks and opportunities within the real estate sector. The company has communicated an awareness of the financial materiality of climate change induced risks, and the understanding goes all the way up to board-level.
• Risk Reduction: Entra demonstrate leadership in its risk reduction initiatives, which include GHG emission reduction targets (both in absolute terms and intensity), reviewing climate change risks semi-annually and pursuing BREEAM environmental performance certifications for buildings.

• Opportunity: Entra is well aware of the opportunities available to the company and is acting upon them by targeting BREEAM NOR rating of at least “Very Good” for every new building.

Flytoget AS

Flytoget AS was founded in 1992 under the name NSB Gardermobanen AS. Operation of the airport express trains started when Oslo Airport opened in 1998. In 2003, the company was demerged from the NSB group as a separate limited company owned by the Ministry of Transport and Communications. In 2004, the management of the state’s ownership was transferred to the Ministry of Trade, Industry and Fisheries.

Flytoget operates a passenger transport service between Drammen and Oslo Airport. The company carried about 6.6 million passengers in 2015, which is approximately 10 per cent of all train passengers in Norway and around 20 per cent of all train passengers in Central Eastern Norway.

Flytoget is categorized and compared to the railroads sector. Based on answers to the questionnaire and public reporting and compared to the sector and relevant peers, the key findings are:

• Performance: Flytoget’s carbon intensity is 3.64 tCO$_2$e/NOKm revenue, which is significantly lower than the sector average. This is due to the company relying fully on renewable energy-based electricity. No historical trend data was available, as the company started reporting in 2014, but Flytoget provides detailed explanations for any potential increase or decrease of emissions.

• Transparency: Flytoget provides detailed and comprehensive responses to the majority of the questionnaire, and it was able to demonstrate its progress with limited time-series carbon performance data.

• Risk Understanding: Flytoget demonstrates a thorough reported identification and understanding of key climate change risks and ensures oversight at a board level.

• Risk Reduction: As Flytoget started collecting data only in 2014, the majority of its planned initiatives have not been fully implemented. The company is working towards setting new targets and including climate change risks into its investment decisions.

• Opportunity: Flytoget has a clear understanding of the key climate change opportunities facing the company. Using only renewable sources of energy, the company is well-positioned to attract people looking for sustainable transport solutions.

Gassco AS

Gassco AS was established in 2001 and operates gas pipelines and transport-related gas processing facilities. As an operator, Gassco is responsible for running the infrastructure and management of the existing gas plants on behalf of the owners. Gassco is also involved in the planning of new pipes, processing plants and gas receiving terminals. Capacity management is another main role for Gassco, which entails allocating and distributing capacity to the shippers in compliance with agreed rules.

Gassco is categorized and compared to the oil & gas storage and transportation sector. Based on answers to the questionnaire and public reporting and compared to the sector and relevant peers, the key findings are:

• Performance: Gassco’s performance is in line with the sector average at 51 tCO$_2$e/NOKm revenue. Its absolute emissions have been gradually increasing, reaching a peak in 2014 at 1,366,781 tCO$_2$e.
• Transparency: Gassco responds to the questionnaire to a reasonable standard, yet the answers lacked concrete details, which is reflected in its limited public disclosure.

• Risk Understanding: Gassco has a good reported understanding of the impact of changing weather patterns on its operations.

• Risk Reduction: Gassco displays a balanced awareness of risk reduction opportunities. For example, the company states that it has a scope 1 emissions reduction target based on a 1.5 degree strategy with a target year of 2030, but it does not disclose the actual target, making it difficult to compare the company to its sector or analyse progress. Furthermore, concrete details are not disclosed on its emission reduction initiatives.

• Opportunity: Gassco demonstrated great awareness of the majority of opportunities available to the company. For example, recognising that the ongoing “green shift” in the European energy mix could lead to higher demand for Norwegian natural gas.

GIEK Kredittforsikring AS

GIEK Kredittforsikring (GK) promotes Norwegian exports by offering credit insurance to Norwegian companies. The company insures accounts receivable, with a credit period of up to two years, and helps Norwegian exporters who export to some 90 countries. GIEK Kredittforsikring operates commercially, and offers stable and appropriate short-term credit insurance to small and medium-sized enterprises. It also provides services to large groups. The company’s core business is credit insurance in fish/seafood and industry. Its revenue for 2015 was NOK 97 million. Until 2001, the company was part of the Norwegian Export Credit Guarantee Agency, when it was demerged as a separate limited liability company. The state’s ownership was managed by GK until the end of 2014. On 1 January 2015, management of state ownership was transferred to the Ministry of Trade, Industry and Fisheries.

GK is categorized and compared to the multi-line insurance sector. Based on answers to the questionnaire and public reporting and compared to the sector and relevant peers, the key findings are:

• Performance: GK does not report any GHG emissions nor any consumption data. Trucost estimated the emissions at 0.3 tCO₂e/NOKm revenue, based on sector averages.

• Transparency: GK is transparent in answering all the questions for the analysis, but many of the responses were that no data was available or that the question was not considered to be relevant at this time. The company has no public disclosure regarding climate change risks.

• Risk Understanding: Based on GK’s responses to the questionnaire and its website, it has a limited reported understanding of how climate change will affect it operations.

• Risk Reduction: GK’s non-existent risk reduction initiatives are reflective of its limited understanding of how it can be affected.

• Opportunity: GK does not identify any opportunities relating to its insurance activities and focuses on reducing its resource use (e.g., through traveling).
Innovation Norway

Innovation Norway is a commercial public sector policy instrument. The company manages instruments to promote business development on behalf of various ministries, regional authorities and county governors. These instruments share the common goals of triggering economic development that is profitable on both firm and aggregate levels, by supporting promising entrepreneurs, high-growth companies and innovative business communities. Innovation Norway is organised as a special law company in accordance with the Act relating to Innovation Norway. This form of association means that the company is a separate legal entity with independent and professional responsibility for decisions concerning individual matters.

Innovation Norway is categorized and compared to the research & consulting services sector. Based on answers to the questionnaire and public reporting and compared to the sector, the key findings are:

- **Performance**: While Innovation Norway’s carbon intensity of 0.06 tCO₂e/NOKm revenue is well below the sector average, it does not report its scope 1 emissions and its reported emissions do not cover all facilities.
- **Transparency**: Innovation Norway provides very little information, both in the questionnaire and its public reporting, resulting in low transparency.
- **Risk Understanding**: Innovation Norway shows no reported risk understanding based on its questionnaire responses. Although its annual report makes numerous references to sustainability, it does not provide information on material risks that could either impact Innovation Norway directly or indirectly through its funding programme.
- **Risk Reduction**: Innovation Norway does not publicly disclose any targets or initiatives to reduce its potential risk exposure.
- **Opportunity**: Innovation Norway reports part of its financial portfolio to focus on sustainability, yet conflicting information between the questionnaire responses and the public reporting make it hard to verify. Generally, while identifying green innovation as an opportunity to be reaped, not enough information is available to analyse the effectiveness of how Innovation Norway acts on these.

Investinor AS

Investinor AS is a company that invests in competitive, internationally oriented unlisted (private) companies, primarily start-ups. Its returns are gained through divestment of the companies, with typical holdings ranging between 3 to 7 years. In addition to investment in the early stages of growth, the company has some flexibility towards the expansion phase. Investinor exercises active ownership. The company is operated on commercial terms in accordance with the market investor principle in the European Economic Area agreement, and aims to provide a good long-term return with good risk diversification. Investinor sells its stake in portfolio companies when other owners are better suited to take them to the next level. Investinor’s vision is to transform promising companies into global leaders by working with entrepreneurs and other investors.

Investinor is categorized and compared to the diversified capital markets sector. Based on answers to the questionnaire and public reporting and compared to the sector and relevant peers, the key findings are:

- **Performance**: Investinor’s carbon intensity, at 0.009 tCO₂e/NOKm revenue, is well below the sector average, and its absolute emissions have been decreasing over the last four years.
- **Transparency**: Investinor demonstrates low transparency, as many material questions for its sector have not been identified as such. Despite publically reporting its policy for responsible investments, it remains vague on initiatives and targets.
- **Risk Understanding**: While Investinor rightfully identifies risks, such as invested companies being dependent on subsidies and regulations, it shows an overall reduced reported awareness of the internalisation pathways of risks across its value chain, such as climate change potentially affecting investee assets and operations and subsequently their valuations.
• Risk Reduction: Investinor is a signatory of the UNPRI and includes ESG considerations into all investment decisions, yet it does not have a GHG emissions reduction target. Additionally, 19% of its investments are into oil & gas technologies, which are indirectly affected by the risk of stranded assets.

• Opportunity: While identifying investments into clean-tech companies and general market leaders, Investinor shows a limited awareness of opportunities arising from addressing climate change, such as increased demand for investment by start-up solutions or renewable energy companies.

Kings Bay AS
Kings Bay AS, which was founded in 1916, is responsible for the operation and development of the infrastructure in Ny-Ålesund in Svalbard. Operations include emergency preparedness, sea services, air transport, engineering services, accommodation, food and refreshments, and water and electricity supply. The company also provides services to cruise ships and other vessels that arrive for the day during the summer season. Kings Bay prioritises environmentally sound and efficient operations. One of the objectives of the state’s ownership in Kings Bay AS is to ensure that Ny-Ålesund can be developed as a Norwegian centre for international Arctic research in Svalbard. Ten research communities from different nations have a permanent base in Ny-Ålesund, and every year close to 20 different research communities carry out research projects on Kings Bay’s property in and around Ny-Ålesund.

Kings Bay is categorized and compared to the diversified support services sector. Based on answers to the questionnaire and public reporting and compared to the sector, the key findings are:

• Performance: Kings Bay’s carbon intensity of 37.8 tCO$_2$/NOKm revenue is significantly above the sector average. This can partly be explained by the high variety of companies included in the diversified support services sector, which are not directly comparable to Kings Bay, as well as Kings Bay’s remote location, resulting in self-generated electricity based on diesel.

• Transparency: Kings Bay provided responses to all questions in the questionnaire with enough transparency for the purpose of this study. However, the company does not seem to report publicly on climate change issues.

• Risk Understanding: Kings Bay has a good reported understanding of its potential risk exposure, such as climate change disrupting its operations or the need to look at alternative power generation sources.

• Risk Reduction: Kings Bay has several risk reduction initiatives in place, such as planning an environmental management system in Ny-Ålesund, as well as currently undertaking waste management and fuel efficiencies and retrofitting buildings. Future plans include the potential to use solar power and to define a risk management strategy focusing on climate change in 2017.

• Opportunity: Kings Bay clearly sees its services as an opportunity to allow the scientific community to research climate change. An extension of this is the prospect for increased activity as climate change risk materiality increases.

Kommunalbanken AS
Kommunalbanken Norway AS (KBN) offers loans to municipalities and county administrations, as well as companies performing public functions. KBN has granted loans to almost all Norwegian municipalities and has a stable market share of just below 50 per cent. Lending is financed through borrowing in the capital markets. KBN has the highest possible credit rating (AAA). The required rate of return is 10 per cent of value-adjusted equity after tax. KBN is subject to the supervision of the Financial Supervisory Authority of Norway, and has been identified as a systemically important financial institution in Norway. KBN’s vision is: "Long-term partner for local welfare". The vision is supported by the values “open, responsible and engaging”.

KBN is categorized and compared to the supranational sector.
Based on answers to the questionnaire and public reporting and compared to the sector and relevant peers, the key findings are:

• Performance: KBN’s carbon intensity of 0.06 tCO₂e/NOKm revenue is well below the sector average.

• Transparency: KBN performs well in its transparency. While it lacks reporting on emissions, targets or initiatives, it reports publicly in its annual report on its green lending programme.

• Risk Understanding: KBN has a good reported understanding of its climate risks and how it is affected through its investments.

• Risk Reduction: While KBN’s Green Lending Programme establishes KBN as a clear industry leader, the bank does not have any GHG or energy reduction targets for its own operations. There is currently no clear monitoring of climate change risks within ongoing investments. However, KBN’s customers are required to complete their own risk analysis.

• Opportunity: KBN shows good awareness of the opportunities available, such as loans targeting climate change adaptation and mitigation measures, increased demand for investments, access to special funding sources through green bonds and special interest rates for climate change projects.

Kongsberg Gruppen ASA

Kongsberg Gruppen ASA is an international, knowledge-based group that delivers high-technology systems and solutions to customers in the offshore industry, the oil and gas industry, merchant marine, defence and space. The company is listed on the Oslo Stock Exchange. Almost 80 per cent of the operating revenues in 2014 came from countries other than Norway. In 2014, Kongsberg Gruppen had 7,726 employees in over 25 different countries. 62 per cent of the employees work in Norway. The head office is in Kongsberg.

Kongsberg is categorized and compared to the aerospace & defence sector. Based on answers to the questionnaire and public reporting and compared to the sector and relevant peers, the key findings are:

• Performance: Kongsberg’s carbon intensity of 0.7 tCO₂e/NOKm revenue compares favourably with the aerospace and defence industry average in the Trucost database. Absolute emissions have not decreased over the last three years but remained fairly stable.

• Transparency: Kongsberg shows a high level of transparency, producing an annual sustainability report and reporting to various external organisations: The Global Reporting Initiative (GRI) G4 Guidelines, UN’s Global Compact and CDP. The company recognised most topics in the questionnaire as relevant and provided extensive responses.

• Risk Understanding: Kongsberg demonstrates a good understanding of the risks it faces. Its understanding of environmental risk goes beyond carbon to assess water and air pollution concerns.

• Risk Reduction: Kongsberg’s current risk reduction activities are limited. For example, the company does not currently consider climate change as part of its risk monitoring, does not use renewable energy in its production process, and does not integrate climate change factors into its design and engineering solutions.

• Opportunity: Kongsberg has identified the majority of opportunities from climate change, including the need to future proof its supply chain and the opportunity to develop more sustainable products.
Mesta AS

Mesta AS is a leading Norwegian contracting group within operation and maintenance of infrastructure. The company was established on 1 January 2003 when the production division of the Norwegian Public Roads Administration was spun off as a separate limited company. Since then Mesta has undergone extensive restructuring and rationalisation. Today, the company has a particularly strong position in operation and maintenance of the road network. The company’s motto is “Mesta Getting People There”. The company also has related activities in rail, electrical installations and energy.

Mesta is categorized and compared to the highways & railtracks sector. Based on answers to the questionnaire and public reporting and compared to the sector and relevant peers, the key findings are:

- **Performance**: Mesta’s carbon intensity is 5.14 tCO$_2$/NOKm revenue, which is almost in line with the sector average for the highways and railtracks sector. However, emissions from its operational activities have increased when compared to the previous years.

- **Transparency**: Mesta provides explicit, detailed and comprehensive responses to the majority of the questionnaire, and it was able to demonstrate its progress with time-series carbon performance data. The majority of the key topics were recognised by the company as relevant, and the company provides reasoning should some data be missing.

- **Risk Understanding**: Mesta shows a good reported risk understanding. The company has identified key risks, including operational risks from increasing fuel prices, financial implications due to changes in regulations, and climate change impacts on road maintenance. The company also acknowledges that the use of its products and services leads to an increase in GHG emissions.

- **Risk Reduction**: It is unclear whether climate change is fully integrated into Mesta’s business strategy and risk management. Mesta does not use an internal carbon price, does not focus on including demand-side management considerations into its services, and does not set a quantitative target to reduce its GHG emissions.

- **Opportunity**: Mesta identifies key climate change opportunities, such as an increase in demand for its services associated with a high likelihood of damaged infrastructure, and a growth in demand for new sustainable infrastructure driven by changes in policy standards and requirements.

Nammo AS

Nammo AS is a global technology-driven aerospace and defence group whose core portfolio offers military and sport ammunition, shoulder-fired munition systems, rocket motors for military and space applications, and demilitarisation of outdated ammunition. The company has 2,160 employees, 22 production units and a presence in twelve countries. The main office, with almost one third of the employees, is located in Raufoss, Norway.

Nammo is categorized and compared to the aerospace & defence sector. Based on answers to the questionnaire and public reporting and compared to the sector and relevant peers, the key findings are:

- **Performance**: Trucost used its proprietary modelling techniques to estimate Nammo’s GHG emissions at 11.5 tCO$_2$/NOKm revenue, because its own disclosure on energy use and carbon emissions was of limited transparency.

- **Transparency**: While Nammo is a relatively small firm for the industry and the level of disclosure expected should be lower than for some larger peers, the responses to the questionnaire were still very limited.

- **Risk Understanding**: Nammo demonstrates limited awareness of environmental risks in its public reporting or in its responses to the questionnaire. The company acknowledges operational risk from potential energy price hikes but does not recognise the financial and business implications and has not taken any actions to address this.

- **Risk Reduction**: Nammo states that climate change is part of its general risk management strategy and that it has some energy reduction initiatives in place. However, it does not provide details as to what these initiatives are.

- **Opportunity**: Nammo reports no opportunities for its business in the questionnaire.
Norfund

The fund is an instrument in Norwegian development policy, which contributes to development by investing in profitable and sustainable companies in developing countries. Norfund invests equity directly in enterprises and indirectly through funds, as well as providing loans and guarantees to individual companies. It never invests alone and does not normally provide more than 35 per cent of the capital invested in a company. Norfund operates in some of the world’s poorest countries and invests in markets where ordinary commercial enterprises are often reluctant to venture alone because of the high risk. Norfund’s investment universe is East and Southern Africa, in addition to Central America and selected countries in South-East Asia. Norfund also works to identify investment opportunities in developing countries with a view to increasing investors’ interest in these kinds of investments. The total investment portfolio was NOK 12.8 billion at year-end 2014.

Norfund is categorized and compared to the development financial institutions sector. Based on answers to the questionnaire and public reporting, and compared to the sector, the key findings are:

- Performance: Norfund is not collecting GHG emission or any energy or fuel consumption data which could form a basis to calculate the GHG emissions. Trucost estimated its carbon intensity at 1 tCO$_2$/NOKm revenue.
- Transparency: Norfund has a report on operations that details its investment and lending activities as well as avoided emissions for its clean energy investments. However, it lacks transparency on how climate change risks are translated into reduction and opportunities initiatives across all its investment sectors.
- Risk Understanding: Norfund has a good reported understanding of how climate change will impact the profitability of investees and debtors and thus indirectly affect its own returns, yet it has not identified climate change regulations and changes in renewable energy subsidies as material risks.
- Risk Reduction: Norfund’s position regarding risk reduction rests primarily on the strong focus of its investments into renewable energy (40% of total loans).
- Opportunity: Besides renewable energy investments, Norfund has not identified any other opportunities related to climate change within its operations.

Norsk Hydro ASA

Norsk Hydro ASA is a Norwegian-listed, global aluminium company with production, sales and trading activities throughout the entire value chain, from bauxite, alumina and energy generation to the production of primary metal and rolled aluminium products as well as recycling. Hydro’s history goes back 100 years, with production of renewable energy and technology development. Based in Norway, the company has 13,000 employees involved in activities in over 50 countries on every continent. With more than a century of experience in renewable energy production, technology development and progressive partnerships, Hydro is committed to strengthening the viability of the customers and communities it serves.

Norsk Hydro is categorized and compared to the aluminium sector. Based on answers to the questionnaire and public reporting and compared to the sector and relevant peers, the key findings are:

- Performance: Norsk Hydro’s carbon intensity is 149.7 tCO$_2$/NOKm revenue, significantly above the sector average. This higher value is likely due to the vertically integrated nature of the company. The company’s absolute emissions have decreased slightly since 2012, and its emission intensity has reduced by 14% since the 2009 baseline, one year ahead of the target it set itself.
- Transparency: Norsk Hydro provides detailed and comprehensive responses to the questionnaire, and additional information was referenced in the company’s latest annual report.
• Risk Understanding: Norsk Hydro is well aware of the current regulatory risks facing its business, particularly the European Union’s Emission Trading Scheme (EU ETS), as almost 50% of revenue is derived from EU countries. The company is an active participant in policy framework dialogues and aims to set a level playing field for the global industry.

• Risk Reduction: Norsk Hydro set itself the goal of becoming carbon-neutral from a life-cycle perspective by 2020. Its emission intensity reduction target aims to reduce emissions by 2% per tonne of aluminium per year between 2009 and 2016.

• Opportunity: Norsk Hydro has already explored many of the operational opportunities on offer, including the development of new technologies such as HAL4e, the 100% use of pre-bake production technology and the onsite generation of hydropower to meet its energy requirements. Approximately 70% of the electricity used by Hydro in its smelters comes from hydropower and roughly 20% of the remainder is provided by natural gas.

NSB AS

NSB AS is one of Norway’s largest transport groups and also has operations in Sweden. The group consists of the business areas passenger trains (NSB AS, NSB Gjøvikbanen AS and Svenska Tågkompaniet AB), freight transport (CargoNet AS), bus operations (Nettbuss AS), train maintenance (Mantena AS) and property (Rom Eiendom AS), as well as support functions. NSB’s social mission is to provide efficient, available, safe and environmentally friendly transport of passengers and freight. The company operates passenger transport by train in Norway, transport of passengers and freight in Norway and the other Nordic countries, and other operations that are related to these.

NSB is categorized and compared to the railroads sector. Based on answers to the questionnaire and public reporting and compared to the sector and relevant peers, the key findings are:

• Performance: NSB’s carbon intensity is 24 tCO₂/NOKm revenue, which is lower than the sector average, primarily due to the company not being exposed to coal and being reliant on natural gas and renewable electricity.

• Transparency: NSB provides detailed and comprehensive responses to the majority of the questionnaire and was able to demonstrate its progress with time series carbon and energy performance data.

• Risk Understanding: NSB has a good reported understanding of key climate change risks for its direct operations as well as within its supply chain, in particular regarding disruption of services, which is dealt with internally and in cooperation with the government.

• Risk Reduction: NSB has a strong set of targets to decrease energy consumption with regards to its passenger trains, freight and real estate. It reports on its progress against targets to date, as well as reporting on future steps that will be taken to achieve the set target.

• Opportunity: NSB has identified some of the key opportunities, such as avoiding high oil prices and emissions taxes and attracting more customers through the promotion of sustainable transportation and a general increase in public transport use.

Petoro AS

Petoro AS manages the commercial aspects of the State’s Direct Financial Interest (SDFI) in the petroleum sector on the Norwegian continental shelf and other associated operations on behalf of the state, who participates as a direct investor in petroleum operations on the Norwegian continental shelf. The company was formed in 2001 as part of the restructuring of the state’s oil and gas operations. Petoro is the licensee for the state’s interests in production licences, fields, pipelines and onshore facilities. Petoro is responsible for managing the SDFI portfolio on commercial terms. At the end of 2015, the portfolio consisted of 34 producing fields, 174 production licences and 15 joint ventures for pipelines and terminals. Petoro is not an operator. Petoro is not responsible for selling the oil and gas managed by the company and is thus not a player in the oil and gas markets. Responsibility for marketing and sale of the state’s petroleum has been assigned to Statoil under a special instruction.
Petoro is categorized and compared to the integrated oil & gas sector. Based on answers to the questionnaire and public reporting and compared to the sector and relevant peers, the key findings are:

- **Performance:** Petoro reports a carbon intensity of 20 tCO₂e/NOKm revenue, well below the sector average. However, no details were provided on the breakdown between direct and indirect emissions, and it was assumed that these were direct emissions.

- **Transparency:** Overall, Petoro provides transparent responses to almost all of the questionnaire and, given its position as the manager of the state’s participation, complies with all the regulations applicable to the environmental reporting of the Norwegian Oil and Gas Association.

- **Risk Understanding:** Petoro is aware that the role of fossil fuels in the future global energy mix is being challenged and expects this will impact both the market demand and price of oil and gas.

- **Risk Reduction:** Petoro reports monitoring operators’ GHG reduction targets, mostly through efficiency measures and flare reduction initiatives, yet it has not set any of its own targets. The magnitude and effectiveness of these efforts, however, could only be assessed relative to the Norwegian industry as a whole, which reportedly achieved a 5 million tonne reduction per year since 1996.

- **Opportunity:** Petoro is aware of the opportunities offered by natural gas as a transition fuel, and it manages these assets in order to reduce the carbon intensity of its products. Moreover, the company reports promoting the adoption of carbon and energy-efficient production processes in order to follow the market transition and to maintain the Norwegian industry’s position amongst the leaders in low-carbon emissions from the production stage.

**Posten Norge**

The Posten group comprises the parent company Posten Norge AS and a range of wholly and partly owned subsidiaries. Posten operates in two segments: post and logistics. Posten provides services under the brand name Posten (for private customers) and Bring (for corporate customers). Posten’s ambition is to be a leading industrial player in post and logistics in the Nordic countries, which includes maintaining its position as market leader in post in Norway, and developing competitive and profitable market positions in the Nordic region.

Posten Norge is categorized and compared to the postal services sector. Based on answers to the questionnaire and public reporting and compared to the sector and relevant peers, the key findings are:

- **Performance:** Posten Norge’s disclosed GHG intensity is 6 tCO₂e/NOKm revenue, far below the sector average. Emissions have decreased on both an absolute and an intensity basis over the last three reporting years.

- **Transparency:** Posten Norge demonstrates a high degree of transparency, having participated fully in the questionnaire and reporting publicly using the GRI Guidelines. The company is not currently a CDP reporter but does disclose sustainability information in its annual corporate report.

- **Risk Understanding:** Posten Norge reviews climate change twice yearly and, through its questionnaire and its annual report, demonstrates a reported understanding of all the material risks identified in this report.

- **Risk Reduction:** Posten Norge has set a target of 40% reduction in absolute GHG emissions between 2008 and 2020. The company was 34% of the way towards achieving this target as of FY2015. Compared to the sector annual average target, Posten Norge is slightly below (3.3% vs. 4.7%).

- **Opportunity:** While the magnitude of the opportunities relating to climate change risk management are not particularly material, Posten Norge is aware of them and demonstrates clearly that it is maximizing the potential opportunities.
SAS AB
SAS is the leading airline in Scandinavia, and its main objective is to offer competitive passenger transport based on its home market in Northern Europe and the hubs in Copenhagen, Oslo and Stockholm. The company is part of the global Star Alliance. In addition to passenger transport, the group offers cargo transportation and other services at selected airports. In the 2013–2014 financial year, the company flew over 28 million passengers to 125 destinations. SAS is headquartered in Stockholm, and listed in Sweden, Norway and Denmark.

SAS is categorized and compared to the airlines sector. Based on answers to the questionnaire and public reporting, and compared to the sector and relevant peers, the key findings are:

- Performance: SAS’s carbon intensity is 101.2 tCO₂e/NOKm revenue, which is below the sector average. The company monitors its emissions and reports its emissions breakdown by scope and source.
- Transparency: SAS provides explicit, detailed and comprehensive responses to the majority of the questionnaire, and it was able to demonstrate its progress with time-series carbon performance data. It is also reporting to the CDP and has annual sustainability reporting.
- Risk Understanding: SAS has a good reported understanding of key climate change risks for its direct operations. The company recognises that the potential tightening of a carbon intensity minimum for new aircraft could lead to increased capital costs due to investment requirements.
- Risk Reduction: SAS has a strong set of targets with regard to decreasing energy consumption and reducing GHG emissions. The company has set a target reduction rate for scope 1 absolute emissions (2% annually), which is above the sector average. However, the target expired in 2015 and no new target has been set yet.
- Opportunity: SAS demonstrates a good understanding of its climate change opportunities. For example, the company has taken into account past weather complications and changing weather conditions by participating in research, development and having a dialog with SAS stakeholders.

Siva SF
Through its real estate and innovation activities, Siva is a government instrument for facilitating ownership and development of companies and industrial and knowledge clusters throughout Norway. Siva has a special responsibility for promoting growth in remote areas. The company’s areas of activity are real estate and innovation. Within its real estate activities, the company offers construction and leasing of buildings and physical infrastructure for business and innovation clusters. The company was founded in 1968, has 46 employees and is 100% owned by NFD.

Siva is categorized and compared to the diversified real estate sector. Based on answers to the questionnaire and public reporting, and compared to the sector and relevant peers, the key findings are:

- Performance: Siva has not disclosed its GHG emissions inventory. Trucost estimates its GHG intensity to be 8.2 tCO₂e/NOKm revenue.
- Transparency: Siva has, through its minimal response to the questionnaire, very low transparency on climate change risk or risk management. The company does not report publicly on sustainability.
- Risk Understanding: Siva has not demonstrated a reported understanding of any climate change risks and opportunities relevant to the real estate sector.
- Risk Reduction: Siva has not set quantitative reduction targets for energy use or GHG emissions.
- Opportunity: Siva did not report any program or plan to seize the business opportunities brought by low-carbon infrastructure.
Space Norway AS

Space Norway is a sectoral-policy tool in order to procure space-related infrastructure for Norwegian needs and to trigger business development related to Norwegian space-related activities. The company owns and manages the fibre-optic cable between Svalbard and mainland Norway. The line communicates data read by satellites in space to antennas on Svalbard, but has also become the ‘lifeline’ for communication for society in Svalbard. The company also has a long-term lease for a transponder on Telenor’s Thor 7 satellite for communication with the Norwegian Troll research station on Antarctica. Space Norway owns 50% of the shares in Kongsberg Satellite Services, which operates ground stations that communicate with satellites. Space Norway also owns all of the shares in Statsat AS, which will be a tool for development and operation of small satellites for state purposes, and will give Norwegian authorities an overview of possibilities and utility when using satellites.

Space Norway is categorized and compared to the diversified support services sector. Based on answers to the questionnaire and public reporting and compared to the sector, the key findings are:

- **Performance**: Space Norway’s carbon intensity is 0.03 tCO$_2$e/NOKm revenue, well below the sector average. However, this number is based on scope 2 emissions only (constant over the two years reported), as scope 1 emissions are not disclosed.
- **Transparency**: Space Norway does not disclose sufficiently across the themes of the questionnaire, nor does it publicly report on climate change and sustainability issues.
- **Risk Understanding**: Space Norway does not disclose any climate change risks impacting its business.
- **Risk Reduction**: The only risk mitigation strategy disclosed is that Space Norway aims to reduce its energy usage through temperature and lighting control in offices using automatic timers. No further quantifiable reduction targets have been disclosed.
- **Opportunity**: Space Norway does not disclose any opportunities related to climate change.

Statkraft SF

Statkraft is a leading international player in hydropower, Europe’s largest supplier of renewable energy, and a global market player in energy trading. Statkraft is the Nordic region’s second-largest producer of electrical power. The group owns 403 power plants with a total installed capacity of 18,159 MW (Statkraft’s share) of which 76% is hydropower, 15% gas power, 4% wind power and 5% district heating/bio power. Seventy per cent of installed capacity is in Norway, while the rest of the Nordic region accounts for 10%, the rest of Europe accounts for 16%, and the rest of the world accounts for 4%. Statkraft also has a total installed capacity in district heating of 714 MW in Norway and Sweden.

Statkraft is categorized and compared to the independent power producers and energy traders sector. Based on answers to the questionnaire and public reporting and compared to the sector and relevant peers, the key findings are:

- **Performance**: Statkraft’s carbon intensity is 12.7 tCO$_2$e/NOKm revenue, which is significantly below the sector and peer averages, mostly due to the fact that over 97% of its total generation and 80% of its total capacity derives from renewable sources such as hydropower and wind.
- **Transparency**: Statkraft provides detailed and comprehensive responses to the majority of the questionnaire and was able to demonstrate its progress with time-series carbon performance data.
- **Risk Understanding**: Statkraft already has a high proportion of renewables in its energy mix (97%); hence, traditional risks associated with fossil fuels use are not material for its operations. The company has a reasonable reported appreciation of the risks affecting its direct operations.
- **Risk Reduction**: Statkraft does not have an emission reduction target or disclosures on initiatives, despite this being best practice in the sector. However, the company is already achieving a low carbon intensity due to the high proportion of renewables in its energy mix compared to the sector.
- **Opportunity**: Statkraft has already made significant progress to decarbonise its energy mix and as such is already well placed to benefit from market opportunities brought by climate change.
Statnett SF
Statnett is the transmission system operator in Norway. Statnett is responsible for maintaining the balance between production and consumption of electricity at all times, including measures for handling critical energy situations. Furthermore, Statnett is responsible for ensuring the rational operation and development of the central grid in accordance with socio-economic criteria. Statnett is a monopoly enterprise subject to regulation by the energy authorities. This entails that the Norwegian Water Resources and Energy Directorate, which stipulates income limits for all the grid companies, sets an annual maximum allowed income for the enterprise. Statnett also owns and operates connections to Sweden, Finland, Russia, Denmark and the Netherlands.

Statnett is categorized and compared to the electric power transmission sector. Based on answers to the questionnaire and public reporting, and compared to the sector and relevant peers, the key findings are:

- **Performance**: Statnett’s carbon intensity is 10.7 tCO₂e/NOKm revenue, significantly below the sector average, although this lower value is likely due to Statnett not being involved in carbon intensive power generation using fossil fuel energy sources. The company’s absolute emissions have increased by 4% since 2013, and the company does not currently have an emission reduction target.

- **Transparency**: Statnett responds to the questionnaire to a reasonable standard. However, there were significant gaps in questions relating to risk understanding and reduction. The company’s public disclosure in its annual report is of a higher standard.

- **Risk Understanding**: Statnett has a good reported understanding of the impact of changing weather patterns on its operations. The company has commissioned a number of reports to better understand the impact of this risk on its business.

- **Risk Reduction**: The company does not have an overall carbon reduction target, and its last sulphur hexafluoride reduction target expired in 2012. The company states that it is waiting for updated EU regulations before it sets a new target, which suggests a reactive approach.

- **Opportunity**: Statnett is investigating the use of innovative technologies to improve transmission efficiency to power lines, cables and substations, and it is developing efficient grid solutions. Upstream, the company aims to facilitate the connection of renewable energy into its power system.

Statoil ASA
Statoil is an international technology-based energy company whose main activity is production of oil and gas, but which also has significant downstream operations and activities in renewable energy through offshore wind power. The company is based in Norway, with operations in more than 30 countries. Statoil operates about 70 per cent of production on the Norwegian continental shelf. The company is the second-largest supplier of gas to Europe. At the end of 2014, the company had 22,516 employees, of whom 19,670 worked in Norway.

Statoil’s ambition is to be industry leading in carbon-efficient oil and gas production and has established 2020 carbon intensity targets for each production segment.

Statoil is categorized and compared to the integrated oil & gas. Based on answers to the questionnaire and public reporting and compared to the sector and relevant peers, the key findings are:

- **Performance**: Overall Statoil performs well, with a carbon intensity of 34 tCO₂e/NOKm revenue, well below the sector average. Absolute emissions have decreased over the last couple of years.

- **Transparency**: Statoil reports to the CDP, and the company responded to all sections in the questionnaire using CDP reporting, with a level of detail that was sufficient for the purpose of this analysis.
• Risk Understanding: Statoil is aware of most risks related to climate change, such as regulatory changes that could increase the cost of compliance. New regulations may also encourage the development of low-carbon energy technologies, which could impact the energy mix and demand for oil and gas, particularly in Europe.

• Risk Reduction: Statoil implemented GHG reduction targets, mostly through efficiency measures and flare reduction initiatives, with objectives at asset level in line with the sector average. The magnitude of these local reduction targets, however, represents less than 3% of the company’s overall absolute emissions.

• Opportunity: Statoil is aware of the opportunities offered by natural gas and renewables, and it has invested in these assets in order to reduce the carbon intensity of its portfolio. It has invested in carbon capture and storage and is working on leveraging its offshore expertise in order to develop wind energy.

Store Norske Spitsbergen Kulkompani AS

Store Norske Spitsbergen Kulkompani (SNSK) was founded in 1916. Its main office is in Longyearbyen in Svalbard. The group consists of the parent company Store Norske Spitsbergen Kulkompani AS and the wholly owned subsidiaries.

Store Norske Spitsbergen Grubekompani AS (SNSG), Store Norske Boliger AS and partly owned Pole Position Logistics AS (55 per cent ownership stake). SNSK is engaged in coal-related activities in Svalbard through SNSG. Roughly 95 per cent of its production is exported. Most of the mining activities are at the Svea Nord mine and in the company’s new mine in Lunckefjell near by Svea. The company also has smaller operations in Gruve 7 in Longyearbyen, which delivers 35 per cent of its coal production to the local power plant. At the end of 2014, the company had 343 employees.

SNSK is categorized and compared to the coal mining sector. Based on answers to the questionnaire and public reporting and compared to the sector and relevant peers, the key findings are:

• Performance: Although thermal coal represents two thirds of its production, SNSK provides the market with efficiently produced coal, with lower methane emissions than the industry average for underground mines. This translates into lower carbon intensity than the sector average, at 52.1 tCO₂e/NOKm revenue.

• Transparency: The company responds to all sections in the questionnaire and started an annual environmental report in 2014.

• Risk Understanding: SNSK is aware of market and regulatory risks that could lead to asset stranding (by calculating embedded emissions of its reserves), and it has taken action to mothball some of its coal mines and diversify its services.

• Risk Reduction: Energy reduction targets have recently been put in place, using energy efficiency measures to target a decrease in energy use of 2.5% per year until 2020. Unfortunately, an energy use target cannot be translated directly into GHG emissions and, as such, it could not be put into context.

• Opportunity: SNSK has been realistic in its strategic development and has acted on the recent forecast decline for coal production. It well positioned to achieve high energy and GHG efficiency. The company has also reacted by planning to diversify in other services that it is well positioned to offer in Svalbard.
Telenor ASA

Telenor is one of the world’s leading mobile telecommunication operators, with over 200 million mobile subscriptions and 35,000 employees around the world. The company has operations in Norway, Sweden, Denmark, Hungary, Serbia, Montenegro, Bulgaria, Thailand, Malaysia, Bangladesh, Pakistan, India and Myanmar. The company also has a 33% financial stake in VimpelCom Ltd., which operates in 14 countries. Telenor was established in 1994 upon the conversion of Televerket into a limited liability company. The company was listed on the stock exchange in 2000 and is headquartered in Oslo.

Telenor is categorized and compared to the integrated telecommunication services sector. Based on answers to the questionnaire and public reporting and compared to the sector and relevant peers, the key findings are:

- **Performance**: Telenor’s carbon intensity is 8.65 tCO$_2$e/NOKm revenue, which is significantly higher than the sector average. This is mainly due to different geographic areas of operations, as Telenor is very much active in Asia, where grid electricity is not widely available and topographic challenges are greater, necessitating a greater reliance on fossil fuels.
- **Transparency**: Telenor provides detailed and comprehensive responses to the majority of the questionnaire and was able to demonstrate its progress with time-series carbon performance data, as well as explain its performance trends.
- **Risk Understanding**: Telenor demonstrates a good reported understanding of climate change risks and business implications. The company acknowledges that it is heavily dependent on electricity, and higher prices as a result of stringent climate change regulations represent a direct risk for Telenor.
- **Risk Reduction**: Telenor has a robust and comprehensive strategy, and it has implemented a number of initiatives directed at selected climate change risks. The company mitigates its regulatory risk by actively participating in the dialogue with policy makers and a number of industry studies, one of which in particular (SMARTer 2030 report) was used during the Paris COP 21 meeting.
- **Opportunity**: Telenor identifies an opportunity within each of its risks and describes actions taken to embrace such business opportunities.

Veterinæmedisinsk Oppdragssenter AS (VESO)

VESO consists of two business areas: distribution of all types of pharmaceuticals for animals in the Norwegian market and clinical infection tests on fish as part of vaccine development, feed development and breeding. The company is currently a leading distributor of veterinary pharmaceuticals in the Norwegian market and operates one of the leading global clinical laboratories for fish infections in salmonids. The company also owns Akvaforsk Genetic Center AS, a major company in the design of aquaculture breeding programmes. The company’s mission is to offer products and services that contribute to good animal and fish health, thereby increasing efficiency and sustainability in aquaculture and livestock production.

VESO is categorized and compared to the pharmaceuticals sector. Based on answers to the questionnaire and public reporting and compared to the sector and relevant peers, the key findings are:

- **Performance**: VESO compares favourably to the industry norm, at 0.2 tCO$_2$e/NOKm revenue, due to its relatively limited use of diesel, electricity and heating oil. VESO’s absolute electricity consumption has increased in the last few years.
- **Transparency**: VESO provides limited responses to the majority of the questionnaire. It was able to demonstrate its performance on scope 2 with time-series electricity data.
- **Risk Understanding**: VESO shows a limited reported awareness of climate-related risks.
- **Risk Reduction**: VESO has not disclosed any targets or impact reduction initiatives.
- **Opportunity**: VESO has not identified any climate change or resource-related opportunities.
AS Vinmonopolet

AS Vinmonopolet is a state-owned company with exclusive rights to sell alcoholic beverages containing more than 4.7 per cent alcohol by volume to consumers through retail outlets. The company was established on 30 November 1922. Vinmonopolet is one of the most important tools in Norway’s alcohol policy and is intended to help limit alcohol consumption by regulating availability. The alcohol policy is expressed through effective social control, measures to create positive attitudes, efficient operations and no purchasing pressure. To ensure legitimacy with the general public, Vinmonopolet places emphasis on being a specialised trade chain with a wide range of products and personal customer service.

Vinmonopolet is categorized and compared to the food & drinks distribution sector. Based on answers to the questionnaire and public reporting and compared to the sector and relevant peers, the key findings are:

- **Performance**: Vinmonopolet compares favourably to the industry norm, at 0.6 tCO₂e/NOKm revenue, due to its relatively limited direct diesel use for its fleet of eight vehicles, the use of purchased electricity and district heating.
- **Transparency**: Vinmonopolet provides detailed and comprehensive responses to the majority of the questionnaire and was able to demonstrate its performance on scope 1 and scope 2 with time-series carbon performance data.
- **Risk Understanding**: Vinmonopolet is aware of both downstream and upstream climate-related risks.
- **Risk Reduction**: 99% of Vinmonopolet’s real estate assets (which consist of 310 stores, plus a warehouse and headquarters) are currently certified Eco-Lighthouse, Norway’s most used certification system supported by the Norwegian government. Vinmonopolet has implemented operational energy reduction initiatives to reduce energy consumption.
- **Opportunity**: Vinmonopolet identifies around half of the possible climate change opportunities, with a good understanding of their direct operational risks (disrupted logistics and carbon regulations).

Yara International ASA

Yara International ASA (Yara) is involved in the production, distribution and sale of nitrogen-based chemicals. The products are mainly used for mineral fertilisers, but industrial application is an important and rapidly growing area. The company’s product mix is diverse, although its largest product groups in terms of revenue are NPK (30%) and Urea (19%). The company has more than 20 major production units, of which two are located in Norway, in Glomfjord and Herøya. Yara has built a global presence in the fertiliser industry. The company’s distribution and marketing network includes more than 200 terminals, warehouses, blending plants and bagging facilities located in over 50 countries. Yara has 12,000 employees, who handle sales in over 150 countries. The head office is located in Oslo, and the company is listed on the Oslo Stock Exchange.

Yara is categorized and compared to the fertilizer manufacturing sector. Based on answers to the questionnaire and public reporting and compared to the sector and relevant peers, the key findings are:

- **Performance**: Yara’s carbon intensity is 120.2 tCO₂e/NOKm revenue, which is slightly above the sector average. Yara prioritises the use of low-carbon natural gas as a feedstock for ammonia production.
- **Transparency**: Yara has a good level of transparency.
- **Risk Understanding**: Yara shows good management of its direct carbon risk, but the total the risk understanding across its value chain is below best practice in the sector.
- **Risk Reduction**: Yara has a risk reduction strategy in progress, but it is not in line with best practice in the sector and has fallen behind its targets in the past.
- **Opportunity**: Yara shows understanding of its risk opportunity on a general level, but it is still below best practice for sector-specific opportunities.
11. APPENDIX B - AN EXTRACTION OF NORWEGIAN CLIMATE RELATED POLICIES

Norway aims to be a low-carbon society by 2050 and is committed to reducing GHG emissions by 40% by 2030 compared to 2005 levels through a dialogue with the EU on joint fulfilment. This is an economy-wide target, covering all gases and all sectors regardless of their inclusion within the EU Emissions Trading Scheme (energy, industrial processes and product use, agriculture, land-use, land-use change and forestry and waste). In sectors covered by the EU Emission Trading Scheme (EU ETS), Norway aims to reduce emissions by 43% compared to a 2005 baseline through participation in the scheme (Norwegian Ministry of Climate and Environment, 2014 - 2015).

Priority areas for enhanced national climate policy efforts are:

- Reduced emissions in the transport sector
- Low-emission technology in industry
- Carbon Capture and Storage
- Renewable energy
- Environmentally friendly shipping

In addition to the overarching objectives on emission reductions, there is a consensus on a series of climate policy measures that will be implemented in Norway. These include:

- Implementing climate and technology investment, funded through the yield from a new fund for climate, renewable energy and energy restructuring
- Phasing out heating oil from fossil fuels
- Stricter energy requirements for the building sector
- Continuing to increase climate research
- Maintaining or increasing carbon storage in forestry
- Continuing to developing biogas in Norway
- Seeking to ensure that growth in passenger transport in city areas is absorbed by public transport, bicycles and walking
- Vehicle taxes to achieve a more environmentally friendly vehicle fleet
- Strengthening the role of railways in the transport system

Tools

Cross-sectoral policies and measures

In 1991, Norway became one of the first countries to introduce a carbon tax (proposed by the Syse government in 1990). Now, more than 80% of Norway’s emissions are either covered by the EU ETS, subject to the carbon tax, or both.

The main structure of the tax has remained relatively stable, with some exceptions. The CO\textsubscript{2} tax is levied on about 60% of total GHG emissions. The tax rate varies between different energy products and usages. High rates apply to petrol (0.93 NOK/l) and petroleum activities (0.98 NOK/l), and lower rates apply to the use of mineral oils (0.88 NOK/l).

The growth in HFC and PFC emissions from product use slowed after a tax on import and production of HFCs and PFCs was introduced in 2003. In 2004, this tax was supplemented with a refund scheme which is available when gas is destroyed.

To encourage Norwegian industry to bring the results from more projects on environmental technology to the market, Norway established an environmental technology scheme in 2010. The scheme aims to promote Norwegian environmental technology in national and international markets and to strengthening the competitiveness of Norwegian industry.

Norway has also taken over one of the co-chairs of the Green Climate Fund board in 2014 and pledged NOK 1.6 billion for the period of 2015 - 2018 (Norwegian Ministry of Climate and Environment, 2014 - 2015).

31. For more details, please refer to: (Norwegian Ministry of Climate and Environment, 2014)
Sector-specific policies and measures

Petroleum

A CO₂ offshore tax regime was introduced in 1991, which includes burning of natural gas, oil and venting for CO₂ in the production phase on the Norwegian Continental Shelf. From 2008, offshore activities were included in the EU ETS. More than 90% of the emissions from the sector are covered by the EU ETS. In addition, the sector is subject to a CO₂ tax.¹²

Several energy conservation measures have been carried out. Other important mitigation actions are the CO₂ storage projects at Sleipner and Snøhvit and the replacement of gas turbines with electricity from the onshore power grid. Power supply from the mainland gives lower emissions compared with using offshore gas turbines.

Energy and transformation industries

Over 95% of electricity generation in Norway comes from hydropower. The legal framework encompasses statutes and regulations concerning public ownership of hydropower resources, licenses for the construction and operation of installations, and regulations of the power market. The legislation is intended to ensure effective management of resources and to ensure that various user and environmental interests are heard and considered.

While hydropower is usually regarded as a low-carbon, renewable source of energy, growing evidence from scientific research indicates that dams are globally a significant source of methane, for which the global warming potential is considered to be 28 times higher than that of CO₂, by most recent estimates (Deemer, Harrison, Li, & Beaulieu, 2016; Hertwich, 2013). Potential inclusion of hydropower in the IPCC framework for carbon accounting could have a significant impact on Norway’s power generation industry.

The Norwegian target for renewable energy share is 67.5% by 2020. This target is the highest in Europe and represents an increase of around 9.5% from 2005. A common Norwegian-Swedish market for electricity certificates was established 1 January 2012. The electricity certificate system is a market-based support scheme with the objective of increased renewable electricity production.

Additionally, the government, through the Ministry of Petroleum and Energy, has established an Energy Fund to ensure a long-term, predictable and stable source of finance to promote an environmentally friendly change in the consumption and production of energy and the development of energy and climate technologies. The state enterprise Enova manages the Energy Fund and has been in full operation since 1 January 2002. Enova’s obligations are specified in an agreement between the Ministry and Enova.

The Norwegian technical building regulation code (TEK) under the Planning and Building Act contains specific energy demand requirements for all new buildings. The ten-year Low-Energy Programme (Lavenergiprogrammet) was established in 2007. It is a collaboration programme between government agencies and the building and construction industry which aims to increase the energy efficiency and use of renewable energy in buildings. The programme has completed a number of courses, information campaigns and projects.

Transport

The tax system is the main instrument for limiting CO₂ emissions from the transport sector, including domestic air traffic. In Norway, a CO₂ tax is levied on mineral products. This means that petrol, jet fuel and diesel are subject to the CO₂ tax, while bio ethanol, biodiesel and hydrogen are not subject to this tax. Currently, biodiesel that meets the sustainability criteria is subject to a reduced road usage tax, corresponding to one-half of the rate for road vehicle diesel. In order to increase the use of biofuels, there is also a mandatory biofuels turnover in Norway. Changes in the vehicle purchase tax towards a system that rewards vehicles with low CO₂ emissions and penalises vehicles with high emissions has led to reduced emissions from new cars. Intra EU-EEA aviation is subject to EU ETS. This also includes domestic air traffic in Norway.

31. For more details, please refer to: (Norwegian Ministry of Climate and Environment, 2014)
The broad agreement on Norway’s climate strategy gives high priority to developing a competitive railway transport system for passengers and freight. Norway has for a number of years worked actively through the International Maritime Organization (IMO) to limit GHG emissions from international shipping. Since the last National Communication submitted by Norway, the IMO has adopted energy efficiency requirements which entered into force on 1 January 2013. Norway has promoted the introduction of gas-fuelled ferries through public procurement and as a climate measure.

Within the International Civil Aviation Organization (ICAO), Norway has acted as an observer in the Civil Aviation Environment Programme (CAEP) and, as part of the European Civil Aviation Conference (ECAC), participated actively with a view to limiting GHG emissions from international aviation. For international aviation, Norway is pursuing the introduction of targets for emission reductions and use of market-based measures for achieving such targets.

Industry
Since 2013, emissions from processes in the manufacturing industries have been to a large extent covered by the EU ETS. Norway has established a new CO₂ compensation scheme for manufacturing industry sectors. The purpose of the scheme is to prevent carbon leakage resulting from increased electricity prices due to the EU ETS.

Importantly, Norway has implemented EU Regulation No. 842/2006 on certain fluorinated GHGs (F-gases). Measures following the regulation comprise containment of gases and proper recovery of equipment; training and certification of personnel and of companies; labelling of equipment; reporting on imports, exports and production of F-gases; restrictions on the marketing and use of certain products and equipment containing F-gases.

Agriculture
GHG emissions from agriculture are mainly associated with methane from animal husbandry and N₂O from nitrogen fertilization. Such emissions are difficult to measure, and they are neither covered by the EU ETS nor subject to CO₂ taxation.

Forestry
Norway has an active forest policy aimed at increasing forest carbon stocks. Forests are also an important source of renewable energy and a raw material for wooden products which can replace materials with a larger carbon intensity. Norway’s Climate and Forest Initiative is the country’s largest contribution to international climate action, with up to NOK 3 billion pledged annually (Norwegian Government, 2017).

Waste management
Waste is an important source of GHG emissions, either directly in landfills, where methane is produced from organic waste, or indirectly, since the production of discarded goods and material generates emissions. The main goal of the Norwegian waste policy is that waste should cause the least possible harm to humans and the environment. Towards this end, the growth in the quantity of waste generated should be considerably lower than the rate of economic growth and the resources found in waste should be utilised as far as possible by means of waste recovery and recycling. Furthermore, the amount of hazardous waste should be reduced, and hazardous waste dealt with in an appropriate way (Norwegian Ministry of Climate and Environment, 2014).
12. APPENDIX C - GLOSSARY

BEV – Battery electric vehicle

Carbon Scope 1 (tonnes CO$_2$e) – GHG emissions generated from burning fossil fuels and production processes which are owned or controlled by the company (reference: GHG Protocol).

Carbon Scope 2 (tonnes CO$_2$e) – GHG emissions from consumption of purchased electricity, heat or steam by the company (reference: GHG Protocol).

Carbon Scope 3 (tonnes CO$_2$e) – Other indirect GHG emissions, such as from the extraction and production of purchased materials and fuels, transport-related activities in vehicles not owned or controlled by the reporting entity, electricity-related activities (e.g. Transmission & Distribution losses) not covered in Scope 2, outsourced activities, waste disposal, etc. (in line with GHG Protocol standards) (reference: GHG Protocol).

Carbon intensity (tonnes CO$_2$e /NOKm revenue) – The scope 1 and scope 2 GHG emissions apportioned to the portfolio per USD 1 million revenue generated by the company.

Companies in category 1 – Commercial objectives: No long-term ambition of owning such companies. Willingness to partially or fully divest the state’s ownership based on commercial, market or corporate circumstances, and provided it is financially beneficial to the state.

Companies in category 2 – Commercial objectives and objective of maintaining head office functions in Norway: This category includes companies where the state has a commercial objective with its ownership, and an objective of maintaining the companies’ head offices and associated head office functions in Norway. To achieve this last objective, a shareholding of more than one-third is (normally) sufficient.

Companies in category 3 – Commercial and other specifically defined objectives: Sound justifications for the state to have holdings in these companies beyond commercial objectives, although adjustments may be undertaken based on commercial considerations.

Category 4 companies – Sector policy objectives: The ownership should remain intact unless the sectoral-policy interests no longer apply or can be fulfilled in another satisfactory manner.

CCS – Carbon Capture and Storage is a technology that can capture the CO$_2$ emissions produced from the use of fossil fuels in electricity generation and industrial processes, preventing the CO$_2$ from entering the atmosphere.

CDP – formerly the Carbon Disclosure Project, it is a not-for-profit that runs a global disclosure system with self-reported environmental data for investors, companies, cities, states and regions to manage their environmental impact.

CO$_2$e – Carbon Dioxide Equivalent. Each GHG differs in its ability to absorb heat in the atmosphere. Calculations of GHG emissions are presented in units of millions of metric tons of carbon equivalents (MMTCE), which weights each gas by its GWP value, or Global Warming Potential.

CSR – Corporate Social Responsibility are corporation’s initiatives to assess and take responsibility for the company’s effect on environmental and social wellbeing.

DCF – Discounted Cash Flow analysis is a valuation method used to estimate the attractiveness of an investment opportunity. DCF analysis uses future free cash flow projections and discounts them to arrive at a present value estimate, which is used to evaluate the potential for investment.
**EU ETS** – the EU Emissions Trading System is part of the EU’s policy to address climate change and is a key tool for reducing GHG emissions through its “cap and trade” principle. It represents the world’s first and currently biggest carbon market.

**GHG** – abbreviated for Greenhouse Gases (CO$_2$e), are emissions to air that contribute to the greenhouse effect and global warming. Each GHG differs in its ability to absorb heat in the atmosphere. HFCs and PFCs are the most heat-absorbent. Methane traps over 21 times more heat per molecule than CO$_2$, and nitrous oxide absorbs 270 times more heat per molecule than CO$_2$. Often, estimates of GHG emissions are presented in units of millions of metric tons of carbon equivalents (MMTCE), which weights each gas by its GWP value, or Global Warming Potential.

**GRI** – the Global Reporting Initiative is an international independent organization that helps businesses, governments and other organizations understand and communicate the impact of business on critical sustainability issues such as climate change, human rights, corruption, etc.
13. APPENDIX D - REFERENCES


FT. (2016, May 5). Norway: Environmental hero or hypocrite. Retrieved from Financial Times: https://www.ft.com/content/6c984298-12bc-11e6-bb40-c30e3bfcf63b


IPCC. (n.d.).


