Mobility is a crucial aspect of human development. Moving goods and people facilitates access to goods and services, particularly housing, work, healthcare, education, culture, etc. However, this has an impact on climate change, air quality, fossil resource consumption, biodiversity and people’s health. Mobility is currently a privilege unevenly distributed among communities and across the world. Projections for transport growth predict that the number of air passengers will double by 2040 and that there will be nearly 2 billion vehicles in circulation by 2050. Vehicle manufacturers and suppliers must propose technological solutions to help provide access to mobility for the greatest number of people while at the same time reducing the environmental and social impacts linked to transport.

Major Sustainability Challenges for the Sector

- Biological transition of transport
- Access to green mobility
- Reduction of the impact of existing technology
- Transport safety
- Responsible design
- Human capital management
- Exposure to military activity
- Business ethics
- Sustainable development governance

Governance has a potential impact on all sustainability and financial issues.

Sustainable Development Goal corresponding to opportunity or risk (detailed in the appendix).

High | Moderate | Weak
Table of contents

Sustainability Opportunities  4
  Ecological Transport Transition  4
  Access to Green Mobility  7
  Exposure to Opportunities  7

Environmental and Social Risk  8
  Reducing the Impact of Existing Technologies  8
  Transport Safety  10
  Responsible Design  11
  Human Resources  12
  Exposure to Military Activities  13
  Business Ethics  14
  Sustainable Development Governance  14
  Risk Assessment  15

Opinion Breakdown  16

Conclusion  17

Sustainable Development Goals  18

Sources  18
**Sustainability Opportunities**

**Ecological Transport Transition**

Current transport generates emissions (CO₂, NOx, fine particles, SOx) that have a negative impact on climate, the environment and people’s health (users, urban dwellers).

There are a wide range of solutions that could reduce the negative impacts of transport. These can be divided into four categories:

- **Transforming** vehicles from combustion to electric engines and replacing diesel/petrol with alternative fuels;
- **Improving** the energy efficiency of internal combustion vehicles and reducing polluting emissions from existing means of transport;
- **Modal shifting** to means of transport with a high energy efficiency and low pollution per unit transported;
- **Avoiding** the need for and/or the distance of transport.

The way in which these solutions contribute to moving from a 6°C climate scenario to a 2°C scenario by 2050 is modelled in the graph below. As an indication, since 2008, the trend in CO₂ emissions from transport has been close to the 6°C scenario (IEA, 2017).

*Figure 1: The potential for the reduction of greenhouse gas emissions by solution*

Vehicle manufacturers and vehicle equipment manufacturers (road vehicles, trains, aircraft, ships) can use these four levers. However, the long-term growth opportunities they can benefit from are mainly driven by transformation and transfer solutions that meet the demands of the transport energy transition; retrofitting solutions are more likely to reduce the risks of existing business models¹ (cf. section Reducing the impact of existing technologies) while avoidance solutions, linked to technologies for optimising journeys or avoiding travel, are to be developed mainly by the information and communication technologies sector.

¹ “Improving solutions” are linked to sustainable development opportunities for equipment suppliers and to risks management for vehicle manufactures.

---

14% of global greenhouse gas emissions, or 7.1 GtCO₂ (IPPC, 2014)

19% of primary energy used (IEA, OCDE, 2015)

> 50% of the final demand for petroleum products to ensure 97% of the energy demand for transport

Mirova
Transformation solutions are mainly based on the development of electric vehicles in the broadest sense\(^2\) in road transport and on the integration of 2\(^{nd}\) and 3\(^{rd}\) generation biofuels in aviation and maritime transport.

Whatever the scenario adopted by 2050, road transport retains an important place in the transport mix. Battery-powered electric vehicles, for which manufacturers have strong ambitions, will be essential in reducing the sector’s environmental impact. Taking into account the entire life cycle in countries with a high carbon mix, this type of vehicle currently still emits CO\(_2\). However, it nonetheless breaks the dependency on oil and should allow the sector to reduce its climate impact as the carbon factor of electric energy mixes is reduced. It also fully addresses local pollution issues.

Figure 2: Carbon impact of electric vehicles over 180,000 km\(^3\)


Depending on usage, fuel cell vehicles are also one of the possibilities to be explored in order to meet the sector’s environmental challenges. Fuel cells and hydrogen are also part of the scope of solutions in the maritime sector, and are now at test phase. Whatever the option chosen, there are still many challenges ahead in order to make each of these solutions affordable and technologically mature, as well as ensuring that they are secure, have a socially responsible supply chain, and are clean in terms of both CO\(_2\) emissions and polluting emissions. Companies that help to remove these obstacles will be central to a radical transformation. These are companies positioned on the value chain of storage batteries, electric motors, semiconductors for battery-powered electric vehicles; equipment

---

\(^2\) Battery-powered electric vehicles, rechargeable hybrids, electric vehicles with extended range, fuel cell (hydrogen) vehicles, two-wheelers and electric buses.

\(^3\) Hypotheses: The graph shows the carbon footprint of two electric vehicles, a B-segment city car and an F-segment luxury saloon car over 180,000 km. These vehicles are compared with combustion engines of equivalent segments. The consumption of the vehicles selected are those of the EPA standard, estimated as close to actual consumption. The carbon footprint of electric vehicle production includes CO\(_2\) emissions from battery production, vehicle manufacture and end-of-life emissions. Here, the battery life is the same as the life of the vehicle; although it probably requires more than one battery to cover 180,000 km, the old battery should be reused in new uses and/or recycled afterwards.
manufacturers of efficient and affordable on-board hydrogen tanks; and industrial companies offering low-carbon hydrogen production for fuel cell vehicles.

The 2nd and 3rd generation biofuel industries will also be essential in helping reach the climate objectives of the aviation and maritime industries by 2050.

**Transfer**

Maritime and rail transport emit less CO₂ than road and air transport.

*Figure 3: Direct CO₂ emissions per passenger/km and ton/km for the main modes of transport*

Therefore, the transfer solutions consist in making these modes of transport attractive in terms of efficiency, speed and cost, to offer a strong alternative to more polluting transport. Another transfer solution is the development of the cycle market, accelerated in Europe by the emergence of electric bicycles.

Regulatory requirements, as well as changes in the behaviour and desires of users with regard to climate considerations, have important financial implications for those involved in the sector, both positively for those who are well-positioned to take advantage of these changes and negatively for less advanced companies.

We favour companies well-positioned to take advantage of the transport transition towards much greener forms of mobility.

This transition brings a wealth of environmental and financial opportunities along the entire value chain.

**Key indicators**

- Quantitative data on low-carbon solutions: share of associated revenues and R&D investment, growth targets
- Low carbon transportation solutions portfolio
Access to Green Mobility

The development of transport promotes access to mobility for all. Some sparsely populated areas remain remote and difficult to reach. Mobility is a privilege unevenly distributed across society, whether in the suburbs of developed countries or in developing countries without infrastructure and means of transport. However, access to mobility for the most disadvantaged people should not come at the expense of responding to environmental challenges: the aim is not to increase the impact of transport on climate change and/or pollution. Here, the term "green mobility" refers to low-carbon, pollution-free mobility. It is for this reason that the rise of electric two-wheelers in China (OECD/IEA, 2017), electric buses and low-carbon electric vehicles are useful solutions that help to make mobility more accessible without damaging the climate or increasing air pollution in cities.

Access to sustainable mobility for suppliers and manufacturers of transport solutions consists in multiplying alternatives that are less polluting for everyone. This mainly concerns actors offering low-carbon solutions (vehicles, two-wheelers, electric or fuel cell buses) with low-cost variants or active mobility (bicycle markets).

### Exposure to Opportunities

<table>
<thead>
<tr>
<th>Indicator considered:</th>
<th>current performance or goals for transfer or avoidance solutions (revenue from and/or percentage of investments in these solutions)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High exposure</strong></td>
<td>&gt;50%</td>
</tr>
</tbody>
</table>
| **Significant exposure** | - Between 10% and 50%  
- Significant non-quantitative contribution (strategy and marketed products) | Analysis of investments directed towards transfer or avoidance solutions complements the quantitative, revenue-based analysis. |
| **Weak or no exposure** | <10% of products available with stated solutions | |
| **Negative exposure**  | No companies in this sector are currently considered to have negative exposure | |

---

~10% of the world’s population accounts for 80% of motor vehicle users  
(IPCC, 2014)
Environmental and Social Risk

Reducing the Impact of Existing Technologies

Transport, and more specifically road transport, is undergoing an unprecedented phase of transition with electric motors (cf. section Energy transition of transport). However, combustion vehicles remain present in all projections for 2050. This is all the more true for commercial vehicles.

Figure 4: Changes in the number of vehicles in circulation

Improvement solutions for vehicles with combustion engines are useful tools that companies in the sector can use to reduce the risks inherent in their activities. This type of activity causes various air and water pollution, noise pollution, adverse effects on biodiversity, on people’s health and quality of life, and damage to buildings.

Reduction of emissions

As far as CO₂ is concerned, these solutions focus on the energy efficiency of vehicles (more efficient engines and heat recovery) and the reduction of resistance forces (aerodynamics, rolling resistance, friction and internal friction, lightening).

Maritime and rail transport have less impact on the climate than road and air transport. Several improvement solutions remain to be deployed:

- Expanding the size of ships, improving their design (hull, engine, propeller, energy recovery), using renewable energies to cover consumption on board (ICCT, 2011) for the maritime sector;
- Optimizing the energy performance of propulsion, reducing train weight, optimizing aerodynamics or adding low-energy auxiliary equipment for railways.

Concerning pollution, although the automobile sector has made significant progress in recent years, combustion engines remain sources of emissions (NOₓ, SOₓ and fine particles) which are becoming less and less compressible. The level of strictness and rigour of regulations is increasing, while the awareness of city-dwellers is also on the rise, placing greater demands on manufacturers of light and heavy goods vehicles. Threats to manufacturers selling polluting vehicles are tangible and can have serious financial and reputational negative impacts (fines, marketing bans by governments, traffic bans by certain conurbations, mistrust of consumers). In this respect, improvement solutions are mainly found in the field of anti-pollution...
technologies: NOx traps, selective catalytic reduction (SCR), exhaust gas recirculation (EGR).

Although ships have low CO₂ emissions per tonne transported, they still emit significant quantities of nitrogen oxides (NOx), sulphur oxides (SOx) and fine particles, with a negative impact on marine ecosystems. The MARPOL International Convention, drawn up by the International Maritime Organisation (IMO), reinforces technological constraints in shipbuilding and encourages the integration of solutions such as the use of low sulphur fuel oil, EGR, SCR, gas or water vapour scrubbers in combustion. The use of liquefied natural gas also reduces SOx emissions because it contains no sulphur.

Finally, nearly 70% of railways are not electrified (IEA / UIC, 2017). This means that diesel locomotives are also responsible for polluting emissions (CO, NOₓ, SOₓ and fine particles).

Other pollution

In addition to emissions, transport generates other types of pollution. For example, maritime transport generates pollution from ballast water, which has a negative impact on biodiversity (acidification of the oceans, disturbance of marine chemistry, degradation of natural environments, modification of fish reproduction cycles, etc.) (UNCTAD, 2014)

Noise pollution is another significant transport issue. In cities, noise emitted by urban traffic is a strong detriment to quality of life. Noise pollution from aircraft is also an issue for people living close to airports. In aviation, however, noise emission has been reduced by 75% since the first airliners, thanks to technical progress on engines, gradual withdrawals of the noisiest aircraft and new landing and take-off procedures. (IATA, 2013). The European Council on Aeronautics (ACARE) aims at a 65% reduction in perceived noise by 2050 compared to 2000 and new standards are regularly set by the ICAO to reduce the noise of new types of aircraft for which an application for certification is made, which means pressure is put on the sector to continue to reduce noise pollution.

We encourage companies to integrate energy efficiency solutions to reduce the climate and energy impacts of their products, but also to use or develop technologies to clean up transportation.

Key indicators

- Exposure to pollution risks
- Improving the energy efficiency of vehicles
- Solutions implemented
- Existence of controversies
Transport Safety

Access to mobility has social benefits but also presents risks for the health and safety of users and urban dwellers (pollution, noise, stress, accidents). Target 3.6 of the UN’s Sustainable Development Goals (UN, 2015) is to halve the number of deaths and injuries caused by road traffic accidents by 2020 (cf. Appendix: sustainable development goals) vs 2013.

Since 2007, the number of deaths due to road accidents has stagnated at ~1.25 million, while the population and the number of vehicles in circulation have increased.

**Figure 5: Number of deaths due to road traffic accidents worldwide**

Many effective measures such as reducing speed (WHO, 2017), fighting drink-driving, improving the quality of helmets and their use, and wearing seat belts have been deployed in different parts of the world and are now making roads safer. However, efforts still need to be made to achieve the United Nations target, both in terms of behaviour and vehicle-integrated technologies, particularly in the least developed regions (WHO, 2015).

In addition to regulatory requirements, passive safety (safety belts, airbags, child restraint systems, head restraints, etc.) has been complemented for a number of years by active safety on board new vehicles (driving aids, steering assistance, automatic gearboxes, perception safety, etc.). By 2030, a technological and behavioural breakthrough could come via autonomous vehicles that may provide major safety gains, whether for private vehicles or for the transportation of goods by HGVs. Accident frequency could drop by 80% by 2040, once full automation mode is deployed in vehicles put into service (KPMG, 2015).

In addition to road transport, accidents are also an issue for rail transport (deaths of passengers and employees, potential leakages dangerous to the environment in the transport of goods), air transport (deaths following crashes) and maritime transport (marine pollution). However, the responsibility for these types of safety issue is more widely borne by operators of these kinds of transport.
Solutions include all technologies related to active safety and autonomous vehicles, which enable a significant improvement in safety.

The exposure to these risks is assessed on the basis of the number of accidents, repeated recalls or other signals of serious malfunctions linked to the companies concerned.

Key indicators
- Revenue/investment generated on active safety solutions or the development of autonomous vehicles
- Solutions for accident control
- Number of accidents recorded
- Number of recalls

E/S Responsible Design

The "Responsible Design" covers issues related to resources (energy, materials), the climate (carbon emissions), pollution, and social issues linked to the supply of materials.

In Europe, for the automotive sector, regulations require 85% of end-of-life vehicles to be recycled and 95% recovered. However, certain components present in vehicles pose recycling problems, such as rubber, plastics and textiles. These difficulties will be accentuated with the gradual integration of new materials such as composites, carbon fibre or rechargeable batteries for electric vehicles. This is an important issue for all modes of transport. For example, current aircraft models include more than 50% carbon fibre composites.

This means that, whether for regulatory or economic reasons, ecodesign and recycling are important themes for manufacturers and equipment manufacturers. In addition, although the carbon footprint of the use phase is more substantial for combustion vehicles, the production of a vehicle should not be neglected. Design and recycling are all the more difficult to master with the development of electric vehicles (cf. section Transform).

For some sub-sectors, such as the tyre industry, finding alternative sources of supply for natural or synthetic rubber is a necessity to reduce exposure to market risks and reduce the use of fossil resources in the case of synthetic rubber.

The emergence of electric vehicles also comes with new challenges on responsible procurement. For example, lithium-ion technologies require cobalt for the manufacture of cathodes. The accelerated deployment of these batteries is hampered by the fact that nearly half of cobalt reserves come from the Democratic Republic of Congo (DRC). This supply from the DRC raises issues of violations of International Labour Organization (ILO) conventions and support for armed conflicts in the country. These issues, which are already at the heart of the automotive industry's preoccupations, could eventually have serious financial consequences for companies that have invested heavily in supporting lithium-ion technology.
We support companies that integrate all the environmental and social risks associated with materials and their procurement into their strategic thinking, provide solutions to circumvent them and revise the design of their products.

**Key indicators**

- Percentage of recycled materials used in products
- Material end-of-life management
- Existence of a procurement policy (objectives and performance monitoring)
- Carbon objective, strategy and performance (scopes 1, 2 and 3)

**S Human Resources**

As it is highly sensitive to fluctuations in the economy, the automotive sector is confronted with the need to adapt its workforce to demand. This leads to human resources management issues, including restructuring, job security and short-term employment. Moreover, the sector is highly competitive and is undergoing technological changes linked to the energy transition. The expertise required changes, forcing companies to adjust employees’ skills. The attractiveness of companies has become a determining factor in maintaining competitiveness.

Faced with difficult circumstances in mature economies, it should be remembered that the annual growth rate of car ownership is 7% in India and 10% in China, compared to 0.6% in OECD countries. Therefore, whether it is to move production areas closer to sales areas or to reduce costs, manufacturers tend to develop their industrial tools in emerging countries where social practices may be less strict in terms of respect for labour law and human rights.

Aeronautical manufacturers are also faced with social challenges such as attracting and retaining highly qualified employees, but also with restructuring needs in the face of fluctuating civil and military demand. In addition, in a 2°C climate scenario, air traffic growth is expected to be moderate in OECD countries (+1.3%/year) or even low in Europe (+0.7%/year) by 2050, putting additional pressure on the sector and on human capital management.
We assess the transparency of companies regarding their social practices, whether in developed or emerging countries. In particular, we expect companies to manage restructuring in a responsible manner.

Beyond regulatory constraints that vary from one country to another, we support companies with a rigorous and uniform human resources policy in these areas, regardless of their geographical area and throughout their entire production cycle.

**Key indicators**
- Adjusting the workforce to meet demand
- Adapting the workforce to technological change (training)
- Compliance with ILO conventions throughout the entire production cycle (risk mapping, social audits, integration of environmental and social criteria in the selection of suppliers, etc.).

## Exposure to Military Activities

A company is considered to be active in the military sector if it participates in the production of a key component integrated in a product designed for aggressive military use. Taking into consideration the need for democratic regimes to have an arms industry to ensure the security of their people, these companies are not excluded a priori from socially responsible funds. Nevertheless, it is the joint responsibility of governments and companies to ensure that the arms trade does not seriously undermine universal respect for and observance of human rights. Companies in the sector must guarantee the non-export or re-export of products for military use to non-democratic states, or whose democratic practices are deemed to be deficient, since weapons may be used against civilian populations.

At this stage, no defence company in the investment universe applies sufficient practices to guarantee such non-exports.

**Key indicators**
- Share of revenue linked to aggressive military products
- Governance bodies for export control
Business Ethics

As with all sectors, business ethics is an important issue and transport companies must be able to prevent the risks of bad practices (corruption, fraud, practices lacking in transparency, etc.).

For example, manufacturers and equipment manufacturers are forced to comply with increasingly stringent regulations on CO₂ emissions and polluting emissions. Although progress has been made, improvements have recently been questioned and criticised, particularly in the automotive sector. Whether it is related to limited and imprecise testing or deliberate manipulation, controversies have shown that products or vehicles in use do not achieve the same results during testing and in actual conditions.

These failures illustrate serious weaknesses in the business ethics of automotive companies, which voluntarily or through lax behaviour, market products that do not comply with regulations and commitments to consumers.

With regard to aerospace and defence companies, the nature of their activities implies special links with governments, sometimes undemocratic or insufficiently democratic. The sector is highly exposed to issues around corruption. Most companies in the sector are implementing measures to reduce these risks, such as compliance programmes, rationalisation of intermediaries, codes of ethics, training and support systems for employees and whistleblowing systems. However, controversies remain.

We encourage companies to demonstrate a high level of transparency around their practices and products.

In aerospace and defence, we ensure that control measures are in place, and we also rely on past controversies to assess the effectiveness of these control measures.

Sustainable Development Governance

The integration of sustainability strategy into governance structure is essential for the industry, which has the potential to support the transition towards a sustainable development model for our societies, but is also affected by serious risks relating to social and governance aspects.

We encourage companies to set up governance bodies dedicated to implementing corporate responsibility and mechanisms for integrating the interests of all stakeholders, as well as aligning the interests of executives with the long-term development of the company.

We also pay close attention to the company’s approach to value distribution, which should be done in a way that is fair to all of the company’s stakeholders.
### Risk Assessment

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Positive</th>
<th>Neutral</th>
<th>Risk</th>
</tr>
</thead>
</table>
| Positive                        | - Strong policy including a strategy, indicators and performance evaluations for one of the key issues mentioned in the risk review  
- Absence of serious controversies regarding other key issues | All other cases                  | - Exposure to the armament sub-sector and lack of adequate practices on exportation and reexportation OR  
- Repeated ethical controversies with inadequate or insufficient company response OR  
- Inadequate or insufficient company response to a labour law controversy in production factories or the supply chain OR  
- Repeated restructuration or work conditions controversies with inadequate or insufficient company response OR  
- Inadequate or insufficient company response to a transport pollution controversy OR  
- Product safety controversy |
Opinion Breakdown

A sustainable development opinion is defined for each entity on a six-level scale.

*Figure 6: Scale of sustainability opinions*

The following graph illustrates the distribution of sustainable development opinions for companies in the mobility sector included in the MSCI World Index.

*Figure 7: Sustainable development opinions for manufacturers and equipment manufacturers vs. MSCI World Index*

This distribution shows that companies in the mobility sector contribute to sustainable development issues and have very different CSR approaches. As the sector is marked by both strong environmental and social risks and opportunities for green growth, the graph shows that some companies seize the opportunities associated with the ecological transition of transport while others find this difficult.

Almost 30% of companies are rated as "negative". Most of this is due to their exposure to military activities without the existence of sufficient governance bodies to avoid export risks (cf. section *Exposure to military activities*).
Conclusion

Manufacturers and equipment manufacturers are subject to increasingly stringent regulations concerning energy efficiency and pollution. In addition, there is growing consumer pressure on the sector. Whether the motives are economic, environmental or social and whether they come from a professional customer base or private individuals, there is a strong demand from users for sustainable mobility solutions. Many technological solutions exist and investments are growing to deploy them.

Fully affected by the energy transition, the transport sector is undergoing major changes and offers a significant range of sustainable development opportunities. However, some of them are facing new environmental and social challenges that are increasing the constraints on the industry.

In addition to their provision of solutions, companies are also assessed on their environmental and social risk management. Transport pollution is one of the strongest sources of pressure in the sector. From a social point of view, these companies create many direct and indirect jobs, but are also confronted with the vagaries of a fluctuating economic context. The quality of employment must be questioned. Insecurity, pressure on production rates and the growth of factories in countries with weaker regulations in terms of labour law are all risks for the manufacturing base of companies in the sector, which must seek to adapt to demand while maintaining responsible practices towards employees.
Sustainable Development Goals

1. End poverty in all its forms everywhere
2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture
3. Ensure healthy lives and promote well-being for all at all ages
4. Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
5. Achieve gender equality and empower all women and girls
6. Ensure availability and sustainable management of water and sanitation for all
7. Ensure access to affordable, reliable, sustainable and modern energy for all
8. Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
10. Reduce inequality within and among countries
11. Make cities and human settlements inclusive, safe, resilient and sustainable
12. Ensure sustainable consumption and production patterns
13. Take urgent action to combat climate change and its impacts
14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development
15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
16. Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
17. Strengthen the means of implementation and revitalize the global partnership for sustainable development

Sources


Disclaimers

This document is intended for professional clients only in accordance with MIFID. If no and you receive this document sent in error, please destroy it and indicate this breach to Mirova.

Products and services do not take into account any particular investment objectives, financial situation nor specific need. Mirova will not be held liable for any financial loss or decision taken or not taken on the basis of the information disclosed in this document, nor for any use that a third party might make of this information. This document in no way constitutes an advice service, in particular an investment advice.

This document is a non-contractual document and serves for information purpose only. This document is strictly confidential and it may not be used for any purpose other than that for which it was conceived and may not be copied, distributed or communicated to third parties, in part or in whole, without the prior written consent of Mirova. This document may not be used in some jurisdictions where such offers or promotions have not been authorized by the competent authorities. Each investor must ensure he complies with these requirements and prohibitions.

No information contained in this document may be interpreted as being contractual in any way. Information contained in this document is based on present circumstances, intentions and beliefs and may require subsequent modifications. No responsibility or liability is accepted by Mirova towards any person for errors, misstatements or omissions in this document or, concerning any other such information or materials, for the adequacy, accuracy, completeness or reasonableness of such information. While the information contained in this document is believed to be accurate, Mirova expressly disclaims any and all liability for any representations, expressed or implied, with respect to this document. Prices, margins and fees are deemed to be indicative only and are subject to changes at any time depending on, inter alia, market conditions. Mirova reserves the right to modify any information contained in this document at any time without notice. More generally, Mirova, its parents, its subsidiaries, its reference shareholders, the funds Mirova manages and its directors, its officers and partners, its employees, its representative, its agents or its relevant boards will no guarantee the accuracy, adequacy or completeness of information obtained from external sources included in this document.

Additional Notes

This material has been provided for information purposes only to investment service providers or other Professional Clients, Qualified or Institutional Investors and, when required by local regulation, only at their written request. This material must not be used with Retail Investors.


In Switzerland: Provided for information purposes only by Natixis Investment Managers, Switzerland Sàrl, Rue du Vieux Collège 10, 1204 Geneva, Switzerland or its representative office in Zurich, Schweizergasse 6, 8001 Zürich.

In the U.K.: Provided by Natixis Investment Managers UK Limited which is authorised and regulated by the UK Financial Conduct Authority (register no. 190258). This material is intended to be communicated to and/or directed at persons (1) in the United Kingdom, and should not to be regarded as an offer to buy or sell, or the solicitation
of any offer to buy or sell securities in any other jurisdiction than the United Kingdom; and (2) who are authorised under the Financial Services and Markets Act 2000 (FSMA 2000); or are high net worth businesses with called up share capital or net assets of at least £5 million or in the case of a trust assets of at least £10 million; or any other person to whom the material may otherwise lawfully be distributed in accordance with the FSMA 2000 (Financial Promotion) Order 2005 or the FSMA 2000 (Promotion of Collective Investment Schemes) (Exemptions) Order 2001 (the “Intended Recipients”). The fund, services or opinions referred to in this material are only available to the Intended Recipients and this material must not be relied nor acted upon by any other persons. Registered Office: Natixis Investment Managers UK Limited, One Carter Lane, London, EC4V 5ER.

In the DIFC: Provided in and from the DIFC financial district by Natixis Investment Managers Middle East (DIFC Branch) which is regulated by the DFSA. Related financial products or services are only available to persons who have sufficient financial experience and understanding to participate in financial markets within the DIFC, and qualify as Professional Clients as defined by the DFSA. Registered office: Office 603 - Level 6, Currency House Tower 2, PO Box 118257, DIFC, Dubai, United Arab Emirates.


In Taiwan: Provided by Natixis Investment Managers Securities Investment Consulting (Taipei) Co., Ltd., a Securities Investment Consulting Enterprise regulated by the Financial Supervisory Commission of the R.O.C. Registered address: 16F-1, No. 76, Section 2, Tun Hwa South Road, Taipei, Taiwan, Da-An District, 106 (Ruinetex Financial Building I), R.O.C., license number 2012 FSC SICE No. 039, Tel. +886 2 2784 5777.

In Singapore: Provided by Natixis Investment Managers Singapore (name registration no. 53102724D) to distributors and institutional investors for informational purposes only. Natixis Investment Managers Singapore is a division of Natixis Asset Management Asia Limited (company registration no. 199801044D). Registered address of Natixis Investment Managers Singapore: 10 Collyer Quay, #14-07/08 Ocean Financial Centre, Singapore 049315.

In Hong Kong: Provided by Natixis Investment Managers Hong Kong Limited to institutional/corporate professional investors only.

In Australia: Provided by Natixis Investment Managers Australia Pty Limited (ABN 60 088 786 289) (AFSL No. 246830) and is intended for the general information of financial advisers and wholesale clients only.

In New Zealand: This document is intended for the general information of New Zealand wholesale investors only and does not constitute financial advice. This is not a regulated offer for the purposes of the Financial Markets Conduct Act 2013 (FMCA) and is only available to New Zealand investors who have certified that they meet the requirements in the FMCA for wholesale investors. Natixis Investment Managers Australia Pty Limited is not a registered financial service provider in New Zealand.

In Latin America: Provided by Natixis Investment Managers S.A.

In Chile: Esta oferta privada se inicia el día de la fecha de la presente comunicación. La presente oferta se acega a la Norma de Carácter General Nº 336 de la Superintendencia de Valores y Seguros de Chile. La presente oferta versa sobre valores no inscritos en el Registro de Valores o en el Registro de Valores Extranjeros que lleva la Superintendencia de Valores y Seguros, por lo que los valores sobre los cuales ésta versa, no están sujetos a su fiscalización. Que por tratarse de valores no inscritos, no existe la obligación por parte del emisor de entregar en Chile información pública respecto de estos valores. Estos valores no podrán ser objeto de oferta pública mientras no sean inscritos en el Registro de Valores correspondiente.

In Uruguay: Provided by Natixis Investment Managers Uruguay S.A., a duly registered investment advisor, authorised and supervised by the Central Bank of Uruguay. Office: San Lucar 1491, oficina 102B, Montevideo, Uruguay, CP 11500. The sale or offer of any units of a fund qualifies as a private placement pursuant to section 2 of Uruguayan law 18,627.
In Colombia: Provided by Natixis Investment Managers S.A. Oficina de Representación (Colombia) to professional clients for informational purposes only as permitted under Decree 2555 of 2010. Any products, services or investments referred to herein are rendered exclusively outside of Colombia. This material does not constitute a public offering in Colombia and is addressed to less than 100 specifically identified investors.

In Mexico: Provided by Natixis IM Mexico, S. de R.L. de C.V., which is not a regulated financial entity or an investment manager in terms of the Mexican Securities Market Law (Ley del Mercado de Valores) and is not registered with the Comisión Nacional Bancaria y de Valores (CNBV) or any other Mexican authority. Any products, services or investments referred to herein that require authorization or license are rendered exclusively outside of Mexico. Natixis Investment Managers is an entity organized under the laws of France and is not authorized by or registered with the CNBV or any other Mexican authority to operate within Mexico as an investment manager in terms of the Mexican Securities Market Law (Ley del Mercado de Valores). Any use of the expression or reference contained herein to “Investment Managers” is made to Natixis Investment Managers and/or any of the investment management subsidiaries of Natixis Investment Managers, which are also not authorized by or registered with the CNBV or any other Mexican authority to operate within Mexico as investment managers.

The above referenced entities are business development units of Natixis Investment Managers, the holding company of a diverse line-up of specialised investment management and distribution entities worldwide. The investment management subsidiaries of Natixis Investment Managers conduct any regulated activities only in and from the jurisdictions in which they are licensed or authorized. Their services and the products they manage are not available to all investors in all jurisdictions. It is the responsibility of each investment service provider to ensure that the offering or sale of fund shares or third party investment services to its clients complies with the relevant national law.

The provision of this material and/or reference to specific securities, sectors, or markets within this material does not constitute investment advice, or a recommendation or an offer to buy or to sell any security, or an offer of any regulated financial activity. Investors should consider the investment objectives, risks and expenses of any investment carefully before investing. The analyses, opinions, and certain of the investment themes and processes referenced herein represent the views of the portfolio manager(s) as of the date indicated. These, as well as the portfolio holdings and characteristics shown, are subject to change. There can be no assurance that developments will transpire as may be forecasted in this material. Past performance information presented is not indicative of future performance.

Although Natixis Investment Managers believes the information provided in this material to be reliable, including that from third party sources, it does not guarantee the accuracy, adequacy, or completeness of such information. This material may not be distributed, published, or reproduced, in whole or in part.

All amounts shown are expressed in USD unless otherwise indicated.
MIROVA
French Public Limited liability company with board of Directors
Regulated by AMF under n°GP 02-014
RCS Paris n°394 648 216
Registered Office: 21 quai d'Austerlitz – 75 013 Paris - Tel.: +33 (0)1 78 40 80 00
Mirova is a subsidiary of Natixis Asset Management.

NATIXIS ASSET MANAGEMENT, S.A.
Limited liability company
Regulated by AMF under n°GP 90-009
RCS Paris n°329 450 738
Registered Office: 21 quai d'Austerlitz – 75 634 Paris Cedex 13 Tel. +33178408000