

MIROVA'S INSIGHTS

Sustainable investment research



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Short term thinking won't take you very far.

A financial industry out of touch with economic, ecological and social realities has no future.

That is why our investment decisions are motivated primarily by the industrial strategies of the companies we back. Our experts perform extensive analyses of sustainable business models that are engines for growth, employment and innovation, shaping the world of tomorrow.

Mirova was voted Best at SRI among Asset Management Firms for 2014 by Thomson Reuters and the UK Sustainable Investment and Finance Association^(*).

^(*)The 2014 Survey represents the views of over 360 investment professionals from 27 countries, making it the most extensive assessment of socially responsible investing (SRI) in the European investment community. Voting was conducted from 24th March to 7th May 2014. It reflects a contribution from 179 buy-side firms and 14 brokerage firms/research houses. Visit www.uksif.org for more information.

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MIROVA'S INSIGHTS

Sustainable investment research



Sustainable development starts with responsible investment.

Responsible investment is a powerful lever to develop a sustainable economic model.

To meet this challenge, we base our investment decisions on the strategies of forward-thinking companies and focus on creating long-term value. Our goal is to develop a new responsible investment model.

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‘ Innovation, social and environmental performance, and engagement are all notions inextricably linked to long-term responsible investment.

* Visit us: www.mirova.com

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By Hervé Guez,

Director of SRI Research Mirova

Hervé is a Certified International Investment Analyst and has guided Mirova SRI Research since 2008.

The philosophy and methodology he has developed are currently employed by 11 analysts to guide the integration of ESG criteria across the whole of Natixis Asset Management, and as a basis for the investment strategies pursued by Mirova's actively managed sustainability-themed conviction funds.

An Argument on Behalf of Long-term Investment

For some, a responsible investment is by definition a long-term investment. And they're right, to be sure. Problems arise, however, with any attempt to define these terms. Surprisingly, it is almost as difficult to achieve a consensus on the meaning of long-term investment as it is to arrive at a broadly acceptable definition of responsible investment.

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We will not here revisit the question of how responsible investment is to be defined, having treated it extensively elsewhere, but rather use our own understanding of the term: an investment that seeks to deliver a threefold return that is social, environmental and economic, thereby reconciling the pursuit of individual profit according to a particular management approach and the long term general interest. But, given how politicians, anxious about the difficulties of securing long term financing are nonetheless enacting regulations which, in the name of protecting household savers, actually penalize them, and as several working groups, notably within the PRI and UNEP-FI, are venturing definitions and measures to promote long-term investment, we consider it timely and worthwhile to fend off a certain number of preconceptions.

Long-term investment is not long-term

In reality, an investment horizon rarely extends beyond a few years. Even investors holding long-term liabilities confine the management of their equities to horizons that rarely exceed four years; in fact, they unfailingly peruse annual performances, revising their strategic allocations and their tactical positions accordingly. What we call long term in terms of investment is thus fairly short, all things considered. And if, as we believe, investment also means thinking about potential impact on the environment (climate change, resource depletion...) it would be foolhardy to base the definition of long-term investment exclusively on holding period, without integrating the broader environmental picture.

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A long-term
investor is above
all one whose
investment choices
are founded
on long-term
expectations.

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A long-term investment is patient ... but not lazy or dormant capital

Often, the only factor offered for identifying long-term investment is how long an asset is held. And yes, this is obviously a significant and necessary piece of information. It would be terribly ironic if high frequency traders were in a position to consider themselves long-term investors. However, it seems to us equally absurd that an investor who closely follows traditional market indices should be able to do so. Such investors might be able to show that their holding period for assets is relatively long, but at no point will their investment decisions be based on long-term concerns. Such investments are conformist in every way. Not only are their initial purchases guided by the number of shares available on the market at a given moment, with no attempt at qualitative judgement or projection, but any (minor) tactical adjustments throughout their investment period can only be dictated by short-term expectations. An investor might thus hold, on average, 10,000 shares of the largest large-cap for ten years, while nonetheless buying and selling hundreds of shares many times over within this period. Choosing to invest in the stock because it is the biggest company, and adjusting margins on the basis of immediate expectations doubly excludes such investors from being considered long-term investors, as far as we are concerned. A long-term investor is above all one whose investment choices are founded on long-term expectations, someone who contributes capital because they believe in a company's business model and its capacity to innovate. This perspective should automatically result in such an investor holding certain assets for a number of years. Exactly how many is really not the issue. It is perfectly normal for investors to revise their investment decisions at such time as their expectations are dashed, disappointed, or fully met.

Long-term investors must be active investors. They need to be seeking timely innovations, as we do within the pages of this journal by devoting a study to the emergence of civilian drones. They cannot blindly rely on traditional market indices, but must rather establish an approach and investment criteria, as we have attempted to do through the Mirova SI Europe index, which is also described in this issue of Insights.

For these reasons, we have severe reservations regarding proposals for distributing loyalty shares to investors considered 'long-term' shareholders on the criterion of holding period alone. By increasing the attractiveness of passive investment, this mechanism could have deleterious effects that erode, rather than contribute to its stated goal of developing long-term investment. What are we proposing instead? In the first place, we should stop subsidizing short-term investment by ceasing to make voters bear the entirety of voting costs. Surprising as it is when you stop to think about it, the costs associated with voting are in fact borne exclusively by those who actually vote. Other measures that would favour long term investing could also be considered, such as offering long-term investors a relative discount should new shares be issued.

A long-term investor is an investor who is active...and engaged

The reasoning described above naturally leads us to this conclusion. Being a long-term investor entails an *affectio societatis* expressed in an engagement policy that allows investors to play their rightful role in the governance of a company. Of course, this assumes that the engagement policy in questions is not the extension of an unbridled attempt to extort short-term shareholder returns, but rather the healthy exercise of a right, one inseparable from a responsibility to serve the best interests of the company itself. The debate pitting shareholder governance against stakeholder governance, which becomes irrelevant if each party takes the well being of the company as their point of departure, is too often carried over to engagement policies. This is a topic we consider at length in the pages ahead, through an overview of current engagement practices.

Innovation, social and environmental performance, and engagement are all notions inextricably linked to long-term responsible investment. The following pages invite our readers to explore how.

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LAUNCH OF THE 'MIROVA SI EUROPE INDEX'

EXECUTIVE SUMMARY

Written on 28/05/2014

Mirova promotes investment that is socially responsible. This is by definition an active process that involves making investment decisions guided by a constant search for environmental, economic and social value and then following through on the shareholder responsibilities of voting and engagement.

However, the most cursory observation reveals that market indices have outgrown their original comparative function to more and more become the basis of investment vehicles. Finance being anything but neutral, this has significant consequences for the economy. The more alike such indices become, the more they induce a dangerous copycat effect that amplifies a natural tendency. Money attracts money in a pro-cyclic and short-term manner. We decided it would be a useful exercise to reverse this trend, and instead imagine an index constructed to mirror a particular investment strategy as closely as possible.

Our aim is twofold:

- to explain our approach to responsible investing through concrete example
- to challenge conventional index-based investment strategies by providing an alternative

For our first index based on Mirova's research efforts in the area of responsible investment, we have focused on large companies traded on regulated European exchanges.

111 How are companies selected for the index?

Here, we asked ourselves two questions: What companies do we want to invest in? What risks are we not willing to take?

To address the first question, the companies we wish to invest in are those responsible for bringing to market products and services that offer a high social and environmental utility relevant to the challenges of sustainable development. Because we believe that the economy must shift to a sustainable model, we consider it in our interest to allocate capital towards these companies. Interest here should be understood in the fullness of its meaning: i) we have an interest as citizens in encouraging, through our investment, those companies most in keeping with a sustainable economy, and ii) as asset holders, we have an interest in entrusting our savings to companies with the potential to emerge as winners in the world of tomorrow. For this reason, Mirova's analysts employ a four point scale to rate how companies address the challenges of sustainable development.

Figure 1. Mirova Rating Scale

High Exposure	Companies who have orientated the main part of their business toward solutions to sustainable development challenges.
Significant Exposure	Companies who have orientated a substantial, but not the main part of their business toward solutions to sustainable development challenges.
Low or No Exposure	Companies whose products and services present either low or no opportunities to resolve sustainable development issues.
Negative Exposure	Companies whose products and services present significant risks to sustainable development and whose investments to make their current business more sustainable are non-existent or insufficient.

Source : Mirova.

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‘We wish to invest in companies responsible for bringing to market products and services that offer a high social and environmental utility.

Because it is based on how well companies' products and services meet the challenges of sustainable development, this scale offers an absolute standard and does not consider sectors as equal. Given this, it comes as no surprise that we came to place all companies whose activities are primarily related to renewable energy or health-care in the highest rating category, whereas practically all companies involved in the extraction, sale and fossil fuels or in tobacco were relegated the lowest. But while absolute rating predominates, there is also a relative component; after all, there can be no assessment without comparison. Thus, for sectors with only a moderate impact on sustainability, our analysts use their individual knowledge of the industries they specialize in to assign a rating that reflects the level of usefulness or innovation with respect to sustainability contributed by each company at the sector level.

These evaluations will be revised annually by the Responsible investment research team; only companies in the top two rating categories will be considered eligible. For the launch of the index, only 187 companies of an initial pool of over 1,000 Large-Cap European listed companies met our eligibility criteria.

The risk we want to avoid is finding ourselves the owners of assets:

- whose issuers' economic performance is too weak. We thus exclude companies with negative cash-flow return on Investment within the last three years;
- whose issuers' solvability or liquidity risk is too high. This causes us to exclude companies with insufficient ratios of operational cash flow generation to net debt and EBITDAR¹ to financial expenses, gross interest and rent;
- whose issuers' CSR practices are inadequate. Companies with human rights violations and/or inadequate business ethics are excluded.

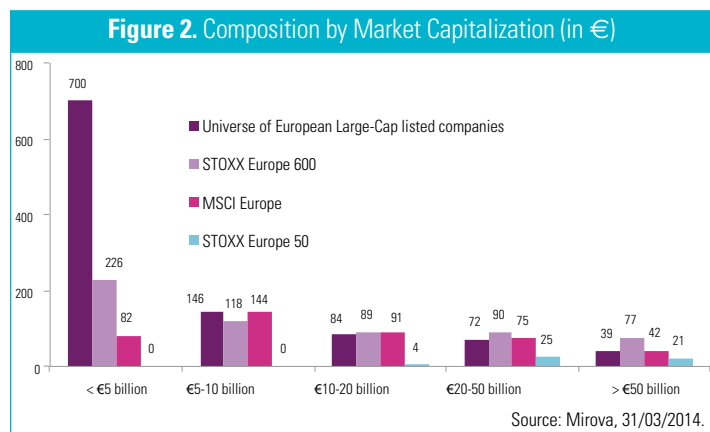
This amounts to evaluating companies' risk of economic or social unsustainability. Following this validation process, only 124 companies remained eligible when we completed our first annual review.

112 What does our index reflect in terms of company size?

So, how big is a 'large' company?

The commonly accepted definition of a large company in finance is one whose market capitalisation² is more than one billion euros.

In fact, traditional indices more often than not rely on many companies with very much larger market capitalisations. Thus, a single term covers companies with a market capitalisation of a billion euros, and companies 100 times this size. Figure 2 shows how the thousand or so companies we examined stack up relative to the primary European indices.



This is significant because these major indices are weighted by market capitalisation. In fact, they generally take into account only the free float, meaning they exclude shares held by parties that do not participate actively in the market such as the State, public agencies or family owners. As a result, these indices produce an especially skewed vision if one looks only at the index's value and not at the number of companies it is comprised of.

¹ Market capitalisation is the theoretical price necessary to purchase the entire company — to which there should hypothetically be added a controlling interest premium—we say hypothetical, because the transactions generally involved in company takeovers rarely attain these sums.

² Earnings before Interest, Taxes, Depreciation, Amortization and Rent.

As illustrated in Figure 3, companies with a market capitalization of less than €5 billions represent 41% of the Stoxx Europe 600, but only 8% of the index as weighted by market cap.

Yet these capitalisation-weighted indices serve as a point of reference for the markets. And when we say reference, this means not only for comparing the performances of different asset managers but also as a management tool. With the rise of index and benchmarked management, a substantial portion of savings, whether directly or indirectly, are passively funnelled into companies according to their market capitalisation.

In a country such as France, where elected officials of all persuasions constantly sing the praises of small and medium sized businesses, how is it that this topic of the sway held by indices fails to garner more attention?

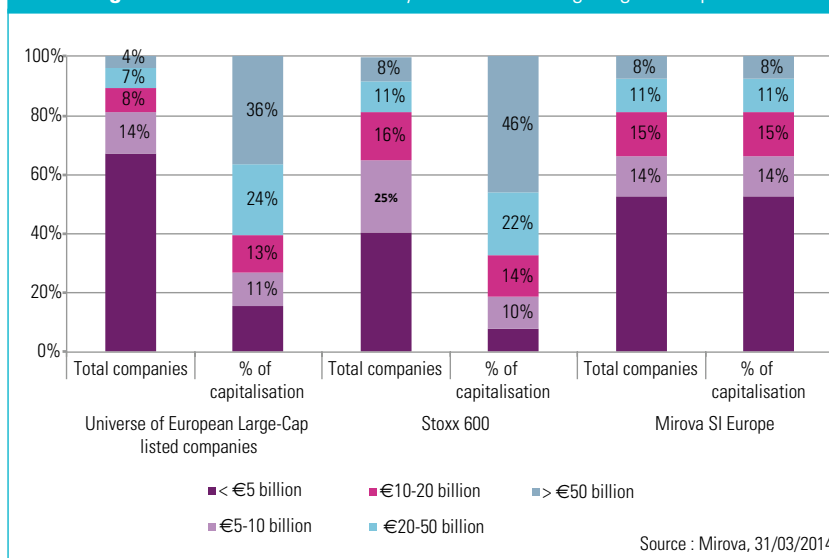
The only significant initiatives by public authorities have so far focused on developing vehicles for directing savings towards very small companies, with capitalisations of less than 1 billion euros. However, these niche products have by nature little impact on general savings. Furthermore, are small companies really what the economy lacks? And do such companies, or those still in the development phase, actually benefit from being listed on an exchange?

The concerns of the medium-sized enterprise would seem a more appropriate focus of our attention: the density of midsize companies is often what makes the industrial and commercial vigour of an economy. These medium-sized companies are large enough to absorb the onus of being listed on a market (reporting costs) and stand ready to benefit from easy access to financial capital as a bridge to further development.

What good is an SBF 120 index, if the CAC40 represents 78% of it? We have therefore elected to assign equal importance to each 'Large-Cap' company listed in our index, meaning that our index is not weighted by market capitalisation, but is rather an equally weighted index. Each company we select is granted an identical capital quota (see Figure 3).

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Figure 3. Breakdown of indices by number and weighting of companies



113 How representative of the economy as a whole is our Index?

We turn now to our second question: how representative of sectors and their relative importance our index should be. We tried to achieve a balance between an allocation favouring sectors that offer high environmental and social utility with one representative of the economy as a whole.

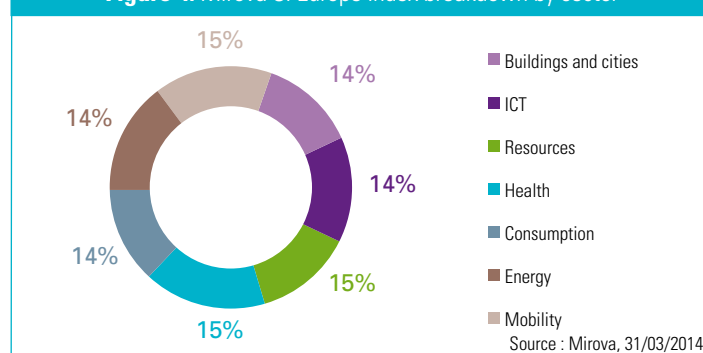
In order to accomplish this, we established a set of rules governing the selection process designed to identify, insofar as possible, the ten best companies within each of the eight macroeconomic sectors we retained for consideration.

We say 'insofar as possible' because in order for a sector to be represented, some companies therein have to meet the sustainability criteria explained above. Unfortunately, during our initial review, not a single company in the financial sector met our requirements for products and service. In certain other sectors, we were not able to provide a complete list of ten companies.

We then proceeded to select the best companies within each of these sectors based on three criteria: environmental and social benefits, economic performance and stability of economic returns.

In this manner, our 80 companies offer a panorama of the sectors and companies that best meet the challenges of sustainable development.

Figure 4. Mirova SI Europe Index breakdown by sector



Our task, now that we have created this index, is to convince everyone from asset managers, salespeople and structured product designers to regulating authorities and most especially individual savers, that there are double rewards to directing their capital away from traditional market indices, ideally toward the companies that comprise the Mirova SI Europe Index.

The initial listing for this index took place on 31 March 2014. Its composition will be reviewed in October of each year. The Mirova SI Europe can be followed on the Euronext website, at: <https://indices.nyx.com/en/products/indices/FR0011710326-XPAP/quotes>

We are aware that in order to be convincing, we must demonstrate that this type of approach is genuinely able to provide financial returns that are at least comparable to those of traditional indices. We will be closely following the performance of our index to obtain insights that can help us improve its composition. This is one more facet of our deeply held conviction that SRI means fulfilling what should be the social objective of financial markets: allocating capital where it best serves the economy.

“SRI means fulfilling what should be the social objective of financial markets: allocating capital where it best serves the economy.”

STUDIES

Mirova, a subsidiary of Natixis Asset Management, offers engaged asset management dedicated to reconciling the creation of value with sustainable development.

In order to do this, we consider a deep understanding of the latest global developments regarding technology, politics, regulation, society and commerce to be absolutely essential in order to identify the levers of sustainable economic development.

This forms the reasoning behind the work of Mirova's team of ESG research and engagement analysts, who continue to provide publications on the latest key issues within the framework of a responsible approach.

Engagement: Social Issues in the Supply Chain 14

by Louise Schreiber and Francesca Suarez, SRI analysts

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Game of Drones: do civilian applications harbour opportunities for sustainable development? 28

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Financing the energy transition is a high stakes game for investors 37

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ENGAGEMENT: SOCIAL ISSUES IN THE SUPPLY CHAIN



Louise Schreiber
SRI Analyst

Francesca Suarez
SRI Analyst

EXECUTIVE SUMMARY

Written on 08/04/2014

Last April, more than a thousand people were killed by the collapse of a building in Dhaka, the capital of Bangladesh. Most of the victims were employed in the workshops of garment manufacturers housed in the building. This tragedy echoed a large number of controversies that have erupted in the last few years (Foxconn, 'horsegate', etc.) in being tied to poor practices among actors in the supply chain.

Responding to pressures from civil society, companies have begun to acknowledge the importance of environmental, social, or simply reputational risks

within their supply chains. It is in their interest, and even more so in the public's, that companies forestall such events by increasing supervision of their various suppliers.

Here, we look at this issue from the standpoint of responsible investment. Working back from the analysis of supply chain risks, we attempt to define areas for improvement that take into account the specificities of each sector and company, and thereby encourage progress among the groups we invest in.

1 | Supply chain and corporate social responsibility

Why should supply chain issues fall within corporate social responsibility?

With the increasing trend toward globalisation, it is becoming more and more difficult to determine the boundaries of a business and its area of responsibility. This problem is well covered by the OECD in their 2011 Guidelines for Multi-National Enterprises (MNEs): 'Multinational enterprises, like their domestic counterparts, have evolved to encompass a broader range of business arrangements and organisational forms. Strategic alliances and closer relations with suppliers and contractors tend to blur the boundaries of the enterprise.' Consequently, the extent to which a company is responsible for what happens in its supply chain is not easy to determine. Many firms found in supply chains are independent organisations with complete autonomy over how they run their operations – causing them to fall outside the company's direct control.

“ Strategic alliances and closer relations with suppliers & contractors tend to blur the boundaries of the enterprise.

OECD Guidelines for MNEs, 2011

Historically, companies have only been held responsible for what happens within their walls. This is because, in the past, companies directly managed the majority of activities necessary for their business to function. However, with the growing trend of outsourcing and increasing globalisation, this is no longer the case. Companies are increasingly externalizing activities they no longer consider core to their business. For example, Adidas has transformed itself from a manufacturer of sports footwear that directly owned shoe factories, to become a sports brand company that outsources a substantial fraction of its production to third parties. The externalization of these activities also brings about a disassociation of the company from the accompanying risks. Be this as it may, environmental controversies and human rights violations have been revealed in the operations of several companies' suppliers, causing the general public to begin considering what goes on in the supply chain as within companies' realm of responsibilities – regardless of whether they have direct control. Although the extent to which a company is legally responsible for these violations has yet to be determined, thereby creating a grey area of responsibility hovering at the perimeter of companies' direct operations, the possible impact of such controversies on their businesses and reputations leads companies to seek a broader definition of the scope of companies' influence. The OECD's Guidelines for MNEs, for instance, are recommendations for responsible business conduct. This document is one of four elements that constitute the OECD Declaration and Decisions on International Investment and Multinational Enterprises, a policy commitment on the part of participa-

ting governments to increase transparency for international investment and to encourage the positive economic and social contributions of multinational enterprises. These governments work to promote the OECD Guidelines, and contribute to their implementation through the establishment of National Contact Points (NCP).¹ The OECD Guidelines are based on a variety of documents published by the United Nations and other supranational organisations. In terms of human rights and employee relations, the minimum required standards draw on the Universal Declaration of Human Rights and the International Labour Organization's (ILO) Core Conventions on Labour Standards. While these guidelines cover several topics, the most relevant to this study are those pertaining to the environment and human rights.

“ Companies are expected to continually seek to improve corporate environmental performance at the level of the enterprise and, where appropriate, of its supply chain.

OECD Guidelines for MNEs, 2011

In their Environment section, the guidelines encourage several specific practices that can help companies protect the environment, public health and safety, and conduct their activities so as to contribute to sustainable development. One such practice encourages companies to 'continually seek to improve corporate environmental performance at the level of the enterprise and, where appropriate, of its supply chain,' thereby including the company's supply chain within the its realm of responsibilities when it comes to environmental matters.

The Human Rights section of the OECD guidelines have incorporated the principles prepared by Professor John Ruggie, the UN Special Representative for Business and Human Rights appointed in 2005 by then Secretary General Kofi Annan. Throughout his tenure as UN Special Representative, Professor Ruggie worked to identify and fully describe the human rights responsibilities of businesses. His efforts resulted in the UN Guiding Principles on Business and Human Rights. These were presented to the Human Rights Council (HRC) in 2011, which unanimously endorsed the Guiding Principles – making it the first global framework to define the responsibilities of businesses regarding respect for human rights.

The Guiding Principles are built on a framework supported by three pillars: Protect, Respect and Remedy. The first of these outlines the state's responsibilities in terms of protecting individuals against human rights abuses by third parties, including businesses. The second pillar, respect, focuses on companies' corporate responsibility to act with due diligence to protect human rights and mitigate any negative impact.

1. The OECD guidelines for MNEs are non-binding principles and standards for responsible business conduct in a global context. Nevertheless, companies are held accountable for their actions, should the adhering government's NCP determine that the company has violated the guidelines.

Remedy, the third and final pillar, combines the roles of both state and companies, and explains their joint responsibility to provide access to remedy for any infringement of human rights by third parties.

The framework reiterates that 'business enterprises should respect human rights' and that in order to do so, companies are required to:

- (a) Avoid causing or contributing to adverse human rights impacts through their own activities, and address such impacts when they occur;
- (b) Seek to prevent or mitigate adverse human rights impacts that are directly linked to their operations, products or services by their business relationships, even if they have not contributed to those impacts.

The latter statement speaks to the human rights responsibilities with respect to supply chains that devolve to businesses. It affirms that through their business relationships with firms in their supply chain, companies make themselves partially responsible for any human rights impacts that occur as a result of these operations, whether or not they have directly contributed to such impacts.

The OECD Guidelines for MNEs and the UN Guiding Principles on Business and Human Rights, both standards for responsible business conduct, have incorporated the supply

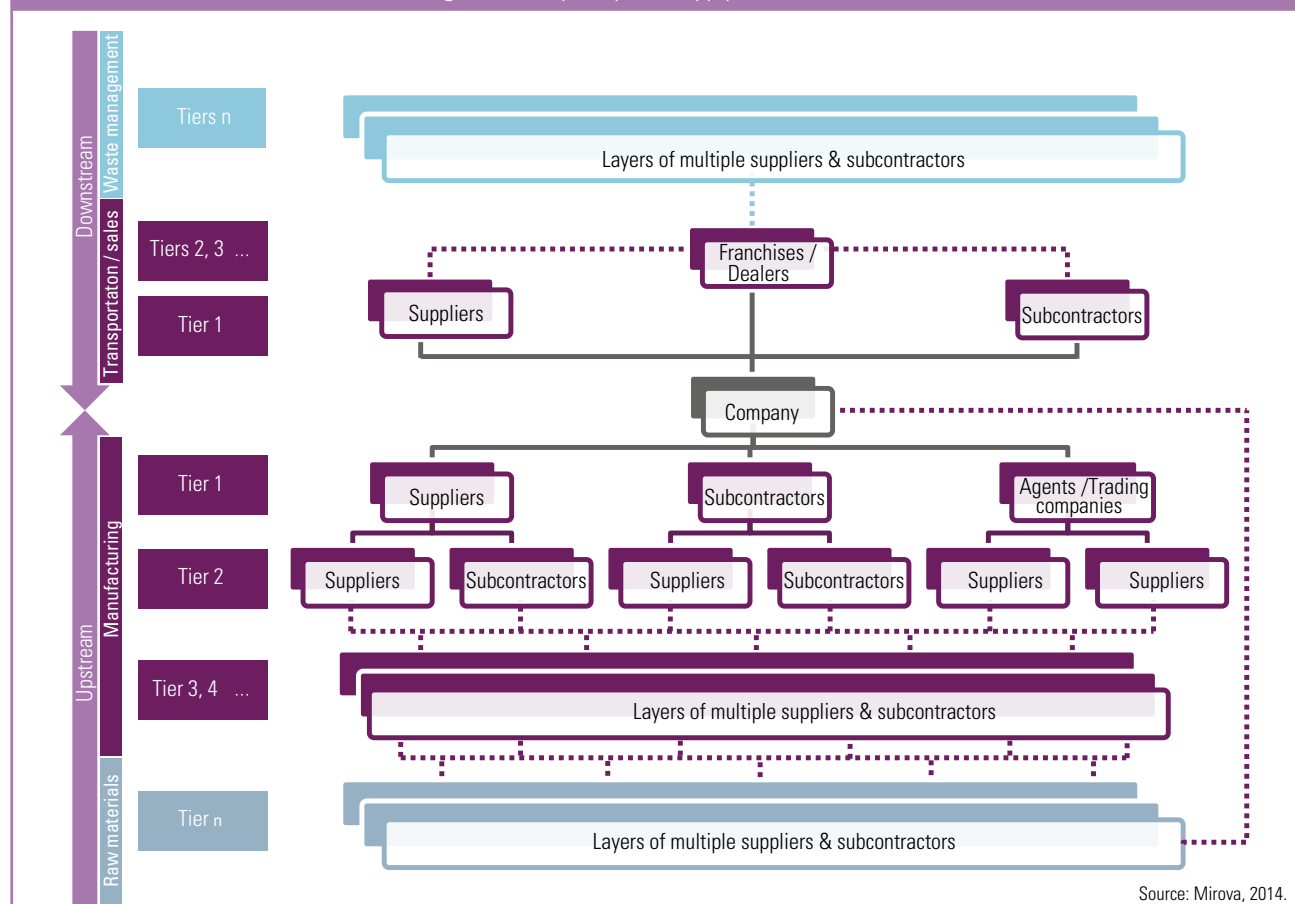
chain into companies' realm of responsibilities – thereby integrating the operations in the supply chain as part of a company's corporate social responsibility.

What is a supply chain?

Understanding supply chain issues is, in most cases, quite complex. Indeed, in order to fulfil a customer's need, an entire network of interdependent entities is articulated to offer products and services that satisfy this need. This network, upstream and downstream from the company itself, is called a supply chain. It may be as simple as an individual who offers services directly to the final customer and as complex as a tapestry of interlinked companies that include product designers, suppliers of raw materials, manufacturers, assemblers, warehouses, logistics providers, retailers and service providers.

Additional layers of complexity have been added to supply chains in our current era of globalization and 'specialization'. Organizations have begun using global suppliers in their businesses. Many have also re-thought their strategies to focus on their core business, outsourcing (that is using outside resources to handle activities that were previously performed internally) processes not falling within their area of specialty. Consequently, globalization and specialization, in their extreme cases, have engendered organizations that externalize their production, activities and risks to various companies in a diversity of countries. The large majority of companies have

Figure 1. Complexity of a Supply Chain Structure



Source: Mirova, 2014.

very complex supply chains which can be very different one from another, depending on the industry and business model. Following the UN's Guiding Principles, we adopt a broad definition of supply chain, covering all types of providers with which a company has business relationships. This includes direct suppliers (a business that provides a particular service or product) and subcontractors (companies hired to fulfil part of the company's activities or part of the suppliers' contractual commitments), and extends to the suppliers and subcontractors of these companies – as illustrated in Figure 1. Additionally, other parties may be involved, such as agents or trading companies – entities hired by the company to take over the relationship with some of its suppliers.

“ In an era of globalization and ‘specialization’, supply chains are becoming increasingly complex – creating a need to strengthen supply chain management.

One comprehensive approach to supply chain management involves the classification in ‘tiers’, a practice that has been adopted by a growing number of companies. Indeed, every single product and service can be seen as the cumulative effort of various ‘layers’ (or ‘tiers’) of organizations which collectively constitute the supply chain. By common understanding, Tier 1 refers to suppliers (and eventually other types of providers) with which the company maintains direct business relationships. Tier 2 consists of companies that supply these Tier 1 suppliers, and so on, down to providers of raw materials (for the upstream portion), and up to waste management suppliers (for the downstream links). Still, this classification should be handled with care, as companies often design their own approach to supply chain management, leading to different classification systems.

2 | Review of the primary issues affecting supply chains

Today, supply chains are integral to companies' business operations for increasing overall efficiency. Nevertheless, supply chains are also a great source of risk due to the impossibility of fully controlling all operations throughout each link – as illustrated by the horsemeat scandal that spread throughout Europe at the beginning of 2013. Consequently, the last few years have seen increasing attention drawn to the importance for companies of a strong supply chain management system.

ESG risks in the supply chain

The first risks coming from the supply chain to be recognized by companies have been operational risks – the inability to deliver certain products in time, or to meet a company's quality controls, etc. This has led to the implementation of supply chain management systems to help mitigate and minimize these risks. Nevertheless, while such management systems have helped minimize operational risks, companies still face hazards arising from the supply chain, albeit of a different kind.

Environmental, social and governance (ESG) risks are related to a company's corporate behaviour. Examples of ESG risks include how a company treats its employees and manages its waste. For certain companies, however, a majority of their ESG risks are actually located within the supply chain. While these are and should be primarily the concern of these suppliers themselves, companies elsewhere along the supply chain can also be affected, especially when suppliers fail to meet certain standards. For instance, whenever a scandal surrounding Foxconn arises, Apple's name is almost always mentioned. Mirova acknowledges the negative effects that ESG risks can have on a company's ability to create long-term value, and we therefore include how companies manage ESG risks across their supply chains into our overall ESG rating. Figure 2 illustrates how we categorize the ESG risks of supply chains.

Figure 2. ESG Risks in the Supply Chain

Environnement	Social	Gouvernance
•Pollution & waste management	•Working conditions	•Business ethics
•Energy efficiency & climate change	•Human rights violation	
•Resources & biodiversity	•Product safety & quality	

Source: Mirova, 2014.

Supply chain risks across sectors

The exact areas and the amplitude of these risks vary widely depending on the company and the industry it is involved in. To better picture supply chain risks per industry and their relative importance, we have mapped them in Figure 3.

Figure 3. Supply chain risks across different industries

Risks implied by the supply chain							
	Environment			Social			Governance
	Waste Management	Energy Efficiency / Climate change	Resources / Biodiversity	Working Conditions	Human Rights Violations	Product Quality and Safety	Corruption, Bribery and Fraud
Consumer Discretionary							
Automobiles & Components							
Consumer Durables (household electronics), Leisure Equipment							
Consumer Services							
Media							
Retailing & Apparel							
Consumer Staples							
Food & Staples Retailing; Food, beverage & Tobacco							
Household & Personal Products							
Information Technology							
Semiconductor, Technology Hardware & Equipment							
Software & Services	Supply chain risks are irrelevant compared to direct ESG issues						
Materials							
Materials							
Energy							
Energy (fossil fuel)							
Health care							
Health care							
Utilities							
Electric & gas							
Waste & water							
Industrials							
Cap Goods							
Transportation							
Commercial & Professional Services	Supply chain risks are irrelevant compared to direct ESG issues						
Financials							
Financials	Supply chain risks are irrelevant compared to direct ESG issues						
	Key:	High risk		Medium risk		Low risk	
Source: Mirova, 2016							

Source: Mirova, 2014.

As the figure shows, there are certain industries which, due to the nature of their businesses (mainly services and other intangible products), incur almost no supply chain risks. Additionally, the raw materials sector, positioned as it is at the beginning of the supply chain, is limited in terms of exposure since most of their risks involve the company's direct operations. At the same time, there is considerable variance in terms of potential ESG concerns even here. While the dark squares (signifying higher risks) vary across sectors and types of risks, the majority are clustered around social issues such as working conditions and human rights violations, highlighting the hazardousness of this area. Furthermore, news from the media and relevant NGOs further produce evidence that these social issues are increasingly pressing matters.

3 | Addressing social issues in the supply chain

Considerable social risks with regards to fundamental rights

As seen in Figure 3, the risks pertaining to supply chains are predominately social, and more specifically concern working conditions and human rights violations. The sectors most exposed to these risks are consumer durables, retail & apparel, food & staples retailing, food, beverage & tobacco, semiconductors, technology hardware & equipment, and energy, as well as electricity & gas.

“The risks stemming from the supply chain are mainly social, and pertain most particularly to poor working conditions and human rights violations.”

Based on similarities among the social risks posed by their supply chains, the six sectors mentioned above have been grouped into three categories:

- **Group 1:** consumer durables, retailing & apparel and semiconductors, technology hardware & equipment
- **Group 2:** food & staples retailing and food, beverage & tobacco
- **Group 3:** energy and electricity & gas

Group 1: The social risks of companies in these industries are to be found throughout their supply chains. They begin with the harvesting and procurement of raw materials and continue throughout the assembly and manufacturing of final products. The retail and apparel industry is exposed to social risks in the harvesting of cotton in countries, like India, where the process remains labour intensive. The remaining industries in the group confront the possible risk of incorporating conflict materials procured from the Democratic Republic of Congo.

In the manufacturing and assembly stages, all industries are exposed to the risk of poor working conditions and possible human rights violations on assembly lines and within manufacturing factories.

Group 2: The social risks of these companies are concentrated in the harvesting of agricultural produce. Farming practices in emerging and developing countries do not exhibit the level of automation shown by their counterparts in developed countries, and are thus still very much labour intensive. Additionally, agricultural employment is significantly less formalised than factory conditions, leading to heightened social risks (e.g. child labour, health and safety concerns arising from exposure to pesticides).

Group 3: The social risks to which these industries are exposed mainly concern the production and procurement of coal and, to a lesser extent, oil. As in the agricultural sector, employment in coal mining is poorly formalised. This fact, combined with inherently dangerous working conditions, brings about elevated social risks. Unfortunately, because these products are highly commoditized, it is difficult to reliably trace the origins of any particular load. This lack of traceability in the area makes it difficult for a company to have a good overview of all its risks.

Across all three groups, those most at risk are also the most vulnerable populations (i.e. people from low-income communities) since the type of work required is low-skilled labour. However, while the risks are clear and persistent, the leverage available to companies for inducing change may not be as evident. Although companies are expected to mitigate the risks present across their entire supply chain, their ability to do so may not follow suit. The further down the supply chain negative social impacts are, the more difficult it is for companies to influence and improve conditions in these suppliers.

Looking at the three groups of industries, group 3 is the one where social risks are situated farthest from the corporations whose responsibility is being invoked: energy and electricity & gas. Coal, a highly commoditized product, goes through several intermediaries before reaching energy companies, which are thus not able to fully trace the exact origins of the coal they buy, thereby diminishing their capacity to encourage change. Companies in group 2, on the other hand, are better able to pinpoint where in their supply chain social risks occur. While certain of their raw materials are also commoditized, food companies have an interest in increasing the traceability of their products due to the need to ensure product quality. Nevertheless, companies' ability to influence better social practices on actual farms is still limited – again, due to the number of intermediaries between these farmers and the companies themselves. Finally, the companies in group 1 encounter social risks at different phases of their supply chain. Like the previous groups, they face risks in the procurement of their raw materials; however, they are also confronted with risks further along in their supply chain, in the manufacturing and assembly of their nearly finished to finished products. Because these manufacturing and assembly factories are usually located in tier 1 of companies' supply chain, they have direct contact with these suppliers and thus have greater leverage they can exercise to induce change within their operations. This is why we have narrowed our focus to companies in the Retail & Apparel and IT industries.

Focus on Retail & Apparel and IT supply chain risks

Companies in these industries have been repeatedly enmeshed in controversies over their supply chains during the past years. The most well-known controversies are the Foxconn suicides in 2010 (technology sector) and, more recently, the collapse of Rana Plaza in 2013 (clothing industry).² More than anything, these events highlight the urgency of immediate and long-lasting action on the part of governments, civil society, and even companies.

“The Foxconn and Rana Plaza tragedies highlight the urgency of immediate and long-term action from governments, civil society, and even companies.”

Following the tragedy in Rana Plaza, the French National Contact Point (NCP) for implementing the OECD Guidelines for MNEs published a report³ on how the textile industry can better apply these guidelines in light of what happened. In this report, the French NCP describes two types of supply chains found within the industry, as described below.

Customized Production

Companies that rely on this type of supply chain have a certain level of know-how regarding how the product they need is manufactured and require products with relatively specific production processes. Supply chains like these are usually fairly well-integrated, and factories are geographically close to the company to allow for better quality management. Additionally, due to the need for products with higher added value, costs and purchase price are rarely an issue. Companies whose supply chains fall into this category, have a better understanding of their supply chain structure and are, consequently, better able to manage the risks.

The supply chains of luxury goods companies are examples of this category, as the quality of the final products takes precedence over other factors, thereby requiring them to have a better handle on what goes on during the production of their goods.

Mass Production

This kind of supply chain manufactures products for mass distribution. In this type of structure, the costs of production are the most important driver. As a result, all other factors, like product quality, are pushed a significant step back. This kind of supply chain has a constantly changing structure dependent on the prevailing price for the product in question – leading to very complicated arrangements with multiple layers in an attempt to ensure the lowest costs possible. Additionally, companies with this kind of supply chain are expected to provide their consumers with these products within a very short time frame

relative to that needed for their manufacturing, further adding to the burdens of an already complex set of constraints.

Retail and apparel companies addressing mid to lower income markets typically have this type of supply chain. Hypermarkets and department stores that provide a low-cost private label also fall under this category. Finally, although meant to describe the supply chain of companies in the textile industry, we believe that technology companies should also be categorized here due to their similar business environments. Companies in these industries (clothing and technology) are expected to regularly provide customers with a new line of products at accessible prices in a very short time frame.

The second type of supply chain poses the greatest risks in terms of social issues – mainly due to the cost-driven aspects of the structure. Furthermore, to ensure that costs stay down, players all along the supply chain cut corners, usually at the expense of human rights. Accordingly, if changes are to be induced, they need to start at the level of the factories.

Moving toward responsible supply chain management

Responsible supply chain management

According to the Council of Supply Chain Management Professionals, ‘supply chain management encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities’. While traditional supply chain management has mainly looked at costs, and, to a certain extent the quality of products, past events have shown that the public expects companies to monitor the operations of their suppliers and ensure they meet certain environmental, social and governance (ESG) standards. For this reason, a growing number of companies have developed and implemented responsible supply chain management within their operations.

“Audit practices must be shored up and complemented with other initiatives.”

The International Chamber of Commerce defines responsible supply chain management as a voluntary commitment by companies to take into account social and environmental considerations when managing their relationships with suppliers. Responsible supply chain management relies on the presumption that while companies do not directly control the actions of their entire supplier base, the client status of a company may provide sufficient leverage to influence and monitor suppliers’ ESG performance.

While there are several tools available for companies to ensure their suppliers’ performance reaches certain standards, the most commonly used is auditing. The effectiveness of supplier audits depends on several factors. One of these is how they are conducted – how deep into detail does the audit go, are they announced or unexpected? Are workers

2. For more information regarding the Rana Plaza tragedy in Bangladesh and Mirova’s position, please refer to the Focus entitled ‘Cheap Clothing – At What Cost’ which can be found online at www.mirova.com.

3. <http://www.tresor.economie.gouv.fr/File/393376>

able to freely discuss their concerns with the auditor? For the moment, companies do not provide enough communication regarding the implementation of the audits they perform – making it difficult to determine whether or not they are effective in detecting actual risks at the factories examined. Beyond transparency, developing industry standards would help in structuring audits, thereby strengthening companies' capacity to implement a responsible approach to supplier-related risks.

Nevertheless, companies that expect their suppliers to reach certain ESG standards are often the very same companies that actually cause, or at least encourage suppliers to violate these standards. As previously mentioned, cost and lead times are the two biggest factors that drive companies' purchasing decisions. Knowing this, often suppliers promise to provide products at a cost and within a timeline they know they can't reach without violating the ESG standards imposed on them. For most suppliers, auditing is just a formality – they have yet to understand how reaching required standards can lead them to do more business. Consequently, auditing alone is not enough and must be complemented with other practices, the most important being for companies to integrate responsible sourcing policies into their own buying practices. A responsible supply chain policy would be one where buyers take into consideration factors other than cost and lead time when placing orders. Buyers should also be aware of the maximum capacities of the factories where they place their orders, and the feasibility of the time frame given. Suppliers are more susceptible to violations when their clients put in rush orders, require last-minute changes and/or place orders that exceed suppliers' capabilities. All things considered, the most effective way to ensure a sustainable positive impact is through the development of a long-term collaborative relationship between the company and its suppliers.

A responsible supply chain management is one where companies integrate a responsible sourcing policy into company buying practices and develop a long-term collaborative relationship with key suppliers.

Responsible supply chain management: best practices

Due to increasing public scrutiny of supply chain practices, standard practice is for companies to require that suppliers adhere to a code of conduct and to perform external audits as a means of ensuring compliance. However events have shown that this is not sufficient. Companies have therefore taken further steps toward minimizing social risks in their supply chains. Below is a compilation of the best practices currently found in the industries under consideration. Though not exhaustive, these practices have been shown to serve as a company's best defence against controversies in the supply chain.

Risk mapping

Before anything else, companies need to understand the structure of their respective supply chains and map out the risks inherent in each aspect. This includes knowing the several actors operating at each level, discerning the connections between them, determining their importance to

the company's entire supply chain and identifying the risks linked to each one and the sources of these risks (whether due to the geographic location or a specificity of the industry).

Simple as it may sound, this is actually extremely complicated due to the increased complexity of globalized supply chains (the supply chain structure illustrated in Figure 1 is more common than we think). Nevertheless, this is highly necessary, as it shows companies where the greatest areas of risk are, allowing a better allocation of time and resources.

Considering the increasing complexity of supply chains, risk mapping is a vital – yet equally complex – prerequisite to responsible management.

Increased transparency

Increased transparency benefits a company in several ways. The most relevant here is that it eases communication between companies and their stakeholders, allowing external parties to better understand the company's supply chain risks and the efforts they have in place to manage these risks.

As mentioned, it has been somewhat standard practice since the 1990's for companies to endorse and have suppliers adhere to a code of conduct or workplace standards, and to perform audits to ensure compliance. The codes of conduct to which multi-national companies adhere are usually based on the ILO's Core Conventions and generally contain the following social provisions:

Employment practices

- Prohibition of forced and/or child labour and discrimination
- Salaries of at least the minimum wage or the prevailing industry wage plus benefits
- Maximum of 60 working hours per week
- Recognition of and respect for employees' freedom of association and collective bargaining
- Publication and enforcement of a non-retaliation policy

Health and safety requirements for the workplace and residential facilities (where provided by the company)

- Accident prevention
- Access to clean and proper sanitation facilities
- Health and safety training

While the publication of a supplier code of conduct is almost industry-wide, there is still a lack of transparency regarding how the audits that ensure compliance with the code are conducted, specifically: the methodology used, the results of these audits, and the progress of suppliers following these audits.

In summary, disclosure of the information below would provide the general public with a better view of the company's supply chain and its inherent risks: liste des fournisseurs et de leur situation géographique ;

- List of suppliers and their geographic locations
- Conditions required of the suppliers
- Results and frequency of the audits performed
- Corrective action plans taken (if any)
- Measures to safeguard against illegal subcontracting

Enhanced supplier relationships

Company-supplier relationships are an integral part of sustainable supply chain management. For the most part, supplier-company relationships entail numerous audits, compliance checks and regular interactions regarding the orders to be filled. Additionally, suppliers in Group 1 industries are regularly faced with a dilemma: on one hand companies ask them to pay their workers a living wage, enhance working conditions and limit overtime, while on the other hand expecting them to produce quickly and be flexible at low cost. As a result, suppliers often violate the code of conduct (e.g. paying low wages, increasing overtime and hiring illegal subcontractors) in order to meet the demands that ensure their subsistence. Building a strong relationship between the company and suppliers allows companies to better understand the limits of their suppliers and thus better protect themselves against illegal subcontracting.

Building a relationship with suppliers starts within the company itself. In terms of policy, companies should integrate the use of ESG criteria into the supplier selection process, thereby encouraging suppliers to perform well from an ESG perspective. Moreover, they should train and educate 1) their purchasers, about the need to provide suppliers with fair lead times, fair pricing, on-time payments and open and clear communication, 2) factory owners and management, on what are considered adequate working conditions and how to best comply with standards and 3) factory workers, regarding their rights, how to ensure that these are upheld by their employers and what to do when their rights have been violated. A relationship is also better encouraged by having the company's production offices geographically close to suppliers. Having a clear ESG integrated purchasing policy, open communication lines and proximity encourages trust between a company and its suppliers.

Geared towards a systemic approach

Problems in the supply chain are currently too ingrained to be solved by the individual efforts of companies. Furthermore,

companies may possess sufficient leverage to instigate change among their suppliers. Indeed, despite the audits performed in factories, controversies over working conditions and human rights continue to arise. Additionally, issues such as establishing globally accepted standards for supply chain audits, paying a fair wage and ensuring freedom of association amongst employees cannot be addressed by an individual company and can only be systematically addressed using the combined leverage and resources of participating companies. The companies in an industry would thus need to collaborate both amongst themselves and with various stakeholders to tackle certain issues.

In the retail industry, there is an increasing trend of companies working together to address systemic issues in developing countries. The best examples to date are the Accord for Fire and Building Safety in Bangladesh, and the Alliance for Bangladesh Worker Safety. In each case separate retail industry working groups formed to tackle building safety issues in the country. While they employ different methods, both agreements promote the common goal of improving health and building standards in the factories of suppliers in Bangladesh. More details on these agreements are outlined in the later section devoted to Bangladesh.

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Collaboration throughout the industry may ultimately be the solution to ingrained supply chain issues.

In the ICT sector, the Electronic Industry Citizenship Coalition (EICC) brings together over 80 major companies (among them Apple, Microsoft, Samsung, etc.) to develop a Code of Conduct covering all aspects of ESG, from protection of the environment (mainly carbon footprint and conflict-free minerals) to high ethical standards, health & safety and appropriate labour conditions. Members are required to adopt the code and to invest in its implementation internally and within their supply chains. In order to ensure accountability, companies are committed to various levels of transparency depending on their membership category (two implementation phases exist –applicant and full). The EICC develops a comprehensive set of tools and methods that support credible implementation of the EICC Code of Conduct throughout the supply chain: assessment tools (initial risk assessment for the members and self-assessment questionnaire for suppliers), capability building (training tools for members, their suppliers' and their suppliers' employees), environmental sustainability, Validated Audit Process (a common model to assess compliance with the EICC code, laws and regulations), and reporting tools. The EICC follows-up on its members' improvements through an extensive set of KPIs disclosed in its annual report.

To get a clearer view of what is currently happening in the industry, we mapped the different initiatives of each of the industries' biggest companies according to four best practice categories (see Figures 4 and 5). Using this tool, we can see that companies actually still show room for improvement.

Figure 4. Technology Companies Initiatives

	Best practice			Systemic Approach	
	Risk mapping	Increased transparency	Enhanced supplier relationship	Initiative	Involvement
APPLE		- Discloses full list of its top 200 suppliers (name and addresses), representing 97% of spending. - Joined FLA and has the FLA conduct audits (Foxconn). - Discloses number of audits and evolution of compliance rate per issue. - Discloses audit findings and corrective actions. - Audits on tiers 1 and 2 (393 in 2012). - Audits are targeted on recurring issues: surprise audits, FLA audit of Foxconn, weekly tracking of working hours.	- Training for suppliers (workers and managers) on anti-discrimination, health and safety, conflict resolution. - Training for suppliers employees on their rights and their employers' obligations (1.3 million workers). - Actions taken based on audit, especially one case where business was terminated, with proper monitoring from the company. - Measures to protect the rights of workers who move from their home country (suppliers are to reimburse excess foreign contract worker fees).	EICC.	- Adopted EICC.
ERICSSON		- Prioritization of audits over suppliers' assessment, as a more robust approach. - Transparent disclosure on number of assessments, audits, auditors, as well as on audit findings (per degree of non-compliance and through time).	- Training of suppliers: requirements and training material available online in various languages.	Self-founded initiative.	- Ericsson launched a Joint Audit Cooperation with 9 European telecom operators which are also clients of the group).
HEWLETT PACKARD		- List of production suppliers including addresses of all facilities used for HP (represent over 95% of spending). - Internal scorecard to assess suppliers' practices. - Audit findings are transmitted to corporate governance bodies (general counsel, board committee and ad hoc council which reports to the executive committee). - Transparency on audits, audit findings and targets: extensive data per type of audit, issue and through time. - Labour rights NGO SAI runs independent assessment of HP's supply chain management system. Findings are disclosed (scope could be extended and recurring working hours non-compliance). Appropriate actions were taken. - HP commissioned an independent study on Chinese wages and a focus on health and safety.	- Suppliers are required to schedule and pay for the independent external audits and resulting corrective actions (enhance suppliers responsibility). - Five-tier rating system of suppliers' facilities focusing on labour practices. Highly rated will be rewarded, while poorly rated face decrease in terms of business awarded. - Suppliers training and capacity building: training Tier 1 suppliers to manage and audit HP's Tier 2 suppliers, participation to Tier 2 suppliers' training to manage Tier 3.	EICC & various.	- HP joined EICC in 2012 and co-chairs the working group on working hours. - HP participates in various NGO initiatives on human rights (Institute for Human Rights and Business, Global Business Initiative on Human Rights, UN BSR).
INGENICO			- Clauses relative to environment, health & safety, child labour, bonded labour, discrimination and corruption are included in "quality" contracts with the suppliers.		
MICROSOFT & NOKIA		- Required suppliers self-assessment as part of the on boarding process, based on Nokia's code and the web-based E-TASC (GeSi). Information on areas of improvements found in 2012. - Disclosure on number and type of audits, as well as selection of targeted suppliers. every new supplier is reviewed, suppliers with significant organizational changes / high non-compliance risk / key suppliers are reviewed every 2 years. Onsite assessments are also run specifically on E&S matters.	- Enforcement of the requirements through contractual agreements and verified by assessments. - Nokia trains its suppliers and helps them build internal capacity to ensure compliance.	GeSi IDH EICC.	- Nokia uses the Global e-Sustainability initiative to assess its suppliers' risks. - Nokia works within the IDH Sustainable Trade Initiative for improvements of working conditions and environmental performance. - Nokia refers to EICC for sustainable sourcing issues (conflict materials) and uses EICC-validated audit process.
SAMSUNG		- Requires supplier self-assessment of ESG performance (1791 suppliers reported in 2012). - External audit in China (249 major suppliers in 2012) following EICC's process (to be expanded).	- Offers CSR training to suppliers (4380 people in 2012). - Actions taken based on audit to tackle labour violations (recruiting process, penalty system, safety equipment, etc.). - Launch of a specific program aimed at favouring long term relationship: opportunities for SME's to become a supplier, for 2nd/3rd tier suppliers to qualify for 1st tier, guidelines to implement actions against illegal subcontracting, bribery, etc. (5392 contracts signed). - Training for suppliers employees on their rights and whistleblowing measures.	EICC.	- Adopted EICC in 2009. - Adopted EICC's Validated Audit Process in 2012.

Source: Company Websites / Mirova, 2014.

Figure 5. Retail & Apparel Companies Initiatives

	Best practice			Systemic Approach	
	Risk mapping	Increased transparency	Enhanced supplier relationship	Initiative	Involvement
ADIDAS	- Five categories of suppliers: main suppliers, subcontractors, material and other service providers, and licensees & agents. - Three sourcing relationships: direct sourcing model (direct contractual relationships with core suppliers supervised by Global Operations), indirect sourcing model (minor portion of production handled by agents or are made under licence), and local market production (sourcing done by the subsidiaries and not overseen by Global Operations, suppliers do not have authorisation from the Social and Environmentam Affairs team).	- Communicates the following lists of factories: Group Global Factory List, Group Licensee Factory List, and event specific factory lists (e.g. London Olympics and FIFA World Cup South Africa). - Basic concepts of how direct suppliers are audited: code of conduct, the six fundamental elements of social compliance, the C-rating score ranging from 1, lowest, to 5, highest, and the clusters of the suppliers based on their results (risk management, partnership, and self-governance clusters). - Explication of procedure in case of non-compliance by suppliers and the top 10 labour non-compliance findings from assessments.	- Compliance rating results are integrated into the supplier decision making process. - Staff and personnel training on fundamentals (workplace standards, new factory approval process, the operating guidelines), performance (assessment monitoring methods and specific issues like labour and health & safety practices), and sustainability (KPI and rating tools, sustainable compliance planning and supplier self-assessment methods). - Supplier training on how to improve social, health, safety and environmental performance through several initiatives such as the Better Work Programm.	Bangladesh Building Safety.	- Signed the Accord on Fire and Building Safety in Bangladesh in 2013.
FAST RETAILING	-	- Basic concepts of auditing program: code of conduct, grading system of audit (A, no violations, to E, highly unethical with serious offenses) and workplace monitoring framework.	- Enforces the Guideline to Prevent the Abuse of Superior Bargaining Power within purchasing departments. - Conducts surveys amongst suppliers to identify unresolved monetary issues.	Bangladesh Building Safety.	- Signed the Accord on Fire and Building Safety in Bangladesh in 2013.
H&M	- Identified suppliers who are considered long-term strategic partners (20% of total suppliers).	- Communicates on the names and location of suppliers representing 95% of production volume. - Basic concepts of their Full Audit Program (FAP) and internal rating, Index Code of Conduct (ICoC): minimum requirements, performance of head audits and follow-up audits, a focus on management systems.	- Have 15 production offices around the world to maintain close relations with suppliers. - Conducted an anonymous survey amongst suppliers to see how they feel working with H&M. - In-house buying and merchandising teams receive regular training on sustainability issues. - Performs capacity building for suppliers to understand their sustainability issues better and to raise the workers' awareness of their rights. - Rewards suppliers that show strong improvement in business performance and in the company's ICoC.	Bangladesh Building Safety.	- Signed the Accord on Fire and Building Safety in Bangladesh in 2013. - Collaborated with 18 other brands and employer associations, BGMEA & BKMEA, to spread two training films to increase fire safety awareness amongst employees.
				Sumangali Schemes in India Textile Industry	- Joined a three year multi stakeholder project headed by the Ethical Trading Initiative to tackle the issues.
INDITEX	-	- Basic concepts of auditing program: code of conduct, grading system (A-D), six different stages (raising awareness, supplier self-assessment, social auditing, assigning a rating, application of corrective action plans, monitoring programs). - 50% of manufacturing are done by local suppliers	- In-house training for buyer teams and all suppliers on the Code of Conduct and its updates. - Preference shown for suppliers with superior labour management performance.	Bangladesh Building Safety.	- Signed the Accord on Fire and Building Safety in Bangladesh in 2013 (part of the Steering Committee).
PUMA	- Defined the 4 tiers of their supply chain: Tier 1 (manufacturing), Tier 2 (outsourcing), Tier 3 (processing) and Tier 4 (raw material). - Identified 47 of all Tier 1 factories as strategic partners.	- Produced the list of supplier - Supplier's sustainability reports are found in company's website. - Basic concepts of auditing program: code of conduct, rating system, areas of failures on different aspects of the audit.	- Rewards suppliers who comply with basic standards and maintain proper management systems with more stable business.	Bangladesh Building Safety.	- Signed the Accord on Fire and Building Safety in Bangladesh in 2013.
WAL-MART	-	- Produced a list of not approved factories in Bangladesh. - Basic concepts of audit system: code of conduct, grading system (colour coded, green, yellow, orange, and red), minimal rating to work with the company (yellow), stages of the audit process (opening meeting, factory tour, employee interviews, documentation & review, and closing meeting).	- Has several types of training programs: supply chain capacity building, factory audit orientation, violation correction training, orange school program, supplier development program, supplier round table, and women in factories training program. - Preference shown for suppliers with superior labour management performance.	Bangladesh Building Safety.	- Founded and signed Alliance for Bangladesh Worker Safety in 2013 (part of the leadership committee).

Source: Company Websites / Mirova, 2014.

Certain practices, like publication of their entire supplier list and the locations of said suppliers, are not systematic among all companies – highlighting the fact that the journey towards a truly sustainable supply chain is by no means ended.

4 | Focus: Rana Plaza, the aftermath

A recap of events

On the morning of April 24, 2013 Rana Plaza, an eight-story building, collapsed in Savar, a suburb of Bangladesh's capital city Dhaka. The building was home to five garment factories that supply Western brands and, taken altogether, employed at least 3,500 people. The death toll reached more than 1,100. While not the first tragedy in the country's garment factories (a fire at another garment factory had occurred just months before), it is by far the most fatal such accident to have taken place in the country.

The importance of the garment industry to Bangladesh's economy is not to be overlooked. In 2012, the industry contributed 17% of the country's GDP and 77% of the country's total exports (BGMEA). Over the past 30 years, total exports have increased radically from around US \$131 million in 1985 to US \$19 billion in 2012 – creating jobs for many people from low-income populations. However, this rapid growth, combined with attempts at keeping costs down, may have led many factory owners to cut corners when it comes to building safety requirements.

Two industry-wide initiatives have been launched in response to the Rana Plaza tragedy.

Following the collapse of Rana Plaza, retail and apparel companies present in the area rushed to provide financial resources to victims and their families. Many also pledged to improve the fire and building safety of garment factories in the country by signing either the Accord on Fire and Building Safety in Bangladesh or the Alliance for Bangladesh Worker Safety.

Accord vs. Alliance

The Accord for Fire and Building Safety in Bangladesh, initially sponsored by IndustriALL Global Union and the UNI Global Union, is an agreement whereby its signatories agree to establish a fire and building safety program for a period of five years, thereby committing companies to remain in and source from Bangladesh for that length of time. Additionally, companies are required to maintain order volumes with certain factories for a minimum of two years. A legally-binding agreement, the accord commits signatories to financing and implementing a programme aimed at inspecting and remediating their suppliers in the country. Of the companies that have signed the accord, the most notable are Swedish clothing company, H&M, and their Spanish counterpart, Inditex. The governance of the pro-

gramme will be headed by a Steering Committee with equal representation from the trade union signatories, company signatories and a representative from the ILO. Additionally, the participation of workers via worker representatives will add value to the discussions. The inspections will be performed by an independent and qualified Safety Inspector, chosen by the Steering Committee, and corrective actions will be undertaken by suppliers according to a mandatory and time-bound schedule. A Training Coordinator, chosen by the Steering Committee, will also design and deliver an extensive fire and building safety training programme. Finally, one of the key aspects of the programme is its dedication to transparency' inspection reports will be publicly available as soon as a remediation plan has been finalized and insofar as doing so poses no imminent danger.

Alliance for Bangladesh Worker Safety

The Alliance for Bangladesh Worker Safety was founded by a group of North American apparel companies. Signatory companies commit to a five-year undertaking that aims to be transparent, results-oriented, measureable and verifiable. The governance of the agreement will be entrusted to a Board of Directors consisting of four company representatives (Gap, Wal-Mart, VF Brands and Target) and four stakeholder representatives (former US ambassador to Bangladesh, a representative from BGMEA, BRAC and an expert in fire protection and safety). Initiatives launched through this agreement are focused on

1. **worker empowerment** – establishing an anonymous hotline to report any safety concerns,
2. **fire and building safety training of factory workers and management** – a training committee will develop a uniform set of fire and building safety educational standards and curricula, and
3. **development and implementation of a common standard for inspections** – a committee of experts in fire and building safety will develop and implement the standards and the inspection process. Funds raised through the agreement will be used to fund the efforts enumerated above and to provide low cost capital for factory upgrades. In terms of transparency, the Alliance will develop a common information-sharing platform using the Fair Factories Clearinghouse, an already established platform for sharing factory information provided by companies.

The initiatives that will be launched by the Alliance for Bangladesh Worker Safety are focused on worker empowerment, fire building & safety training and standards for inspection.

While both agreements contribute to the same goal, the methods by which they intend to achieve them differ. For Mirova, we feel that because of its stronger commitment to the inclusion of workers in the implementation of the agreement

(trade unions are present in the steering committee and workers & workers representatives participate in the discussions) as well as its legally binding aspect, the Accord on Building and Fire Safety in Bangladesh has the potential to be more robust. Nevertheless, regardless of the agreement a company has signed, what is eventually evaluated and taken into consideration are the results that stem out.

It is important to note that these two agreements only address the issue of building and fire safety in the Bangladeshi garment factories. While relevant to workers' health and safety, it does not address the other underlying issue at hand...

Illegal subcontracting: the underlying issue

In its report, the French NCP identified illegal subcontracting as the source of some of the biggest risks in supply chains. Illegal subcontracting happens when suppliers subcontract part of their workload to other factories without securing the approval of their clients.

As already mentioned, cost is the most important factor driving most buying decisions in the mass market supply chain under consideration. The second most important factor is lead time. Consequently, increased pressure is placed on the suppliers to drive costs down and meet orders in time. In order to do this, suppliers engage in illegal subcontracting activities. As a result, products are being made in unauthorized factories without the company's knowledge. Had such factories been inspected and audited by the company, they would likely not have met the minimum requirements.

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5 Conclusion: towards a more integrated approach

Recurring events involving human rights violations in the supply chain reveal how, despite current efforts, global companies in the clothing, textile and technology industries are not yet able to ensure proper working conditions and eliminate negative human rights impacts in the entirety of their supply chains, particularly in the assembly and manufacturing stages. While these efforts have brought about positive changes in certain factories, evidence shows that there is still a long way to go.

While individual efforts have brought about positive changes, evidence shows that there is still a long way to go.

As a responsible investor and signatory to the PRI, we now believe it is necessary to reach out to clothing, textile and technology companies and encourage them to enhance their current supply chain management practices and work towards a more responsible supply chain.

To this end, we will discuss the following responsible supply chain management practices with companies for which they are pertinent:

- Mapping social risks throughout the entire supply chain
- Increasing transparency and communication concerning the supplier scorecard methodology, the nature and results of audits conducted and the action plans established for achieving improvement
- Developing longer-term and more sustainable relationships with key suppliers through a purchasing policy that integrates ESG criteria in the decision making process and opening communication lines between the company and its suppliers
- Participating in multi-stakeholder initiatives to aggregate companies' leverage for systematic change, particularly with regard to establishing globally accepted supply chain audit standards

Additionally, for companies exposed to Bangladesh, we will also discuss the following topics:

- Participating in the Accord on Building and Fire Safety in Bangladesh
- Putting in place measures to combat the risks of illegal subcontracting (e.g. enhancing company-supplier relationships)

While companies already certain best practices have in place, they still circle around the issue of communication. If there is truly to be a global sustainable supply chain, companies have to step up to the plate and take a more active stance towards improving the conditions in factories.

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GAME OF DRONES: DO CIVILIAN APPLICATIONS HARBOUR OPPORTUNITIES FOR SUSTAINABLE DEVELOPMENT?



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EXECUTIVE SUMMARY

Written on 20/05/2014

Multipurpose, efficient and inexpensive, drones have met with considerable success in the civilian realm, both among the general public (leisure drones) and as an alternative technology or source of innovative solutions in a professional context. The development of this market has been fostered by a large number of actors and an ever widening array of applications which should continue to multiply as regulatory mechanisms are established in countries across the globe. Like the internet, the civilian drone industry is likely to rapidly enter a structuring phase during which growth will become focused on applications with the

highest added value, and dispersed start-ups will gradually consolidate to produce industry behemoths. So competition, already fierce, is likely to intensify.

Employee and user safety, fuel efficiency, high-tech agriculture...some drones are already providing tangible social and environmental benefits, while many more applications still in the R&D phase are showing promise. The process of market structuring may amplify opportunities, because, in order to cash in, drone operators will have to become highly specialized in areas with high barriers to entry.

While the earliest drones were robots designed for launching attacks and protecting territory, unmanned vehicles are no longer confined to military uses. In the civilian realm, they are primarily tools for surveillance, intervention or assistance used by the police and firefighters, as well as technical support for researchers. Recently, though, they have increasingly begun finding commercial applications: high-tech toys, flying cameras and data gathering for professionals. Drones are making an entrance in a variety of industries too, something that has by no means gone unnoticed. In fact, experts are all predicting a radiant future for this new market.

1 | Drones burst onto the civilian scene

What is a drone?

The term 'drone' covers both cutting edge military machines that entail millions of dollars in R&D, and commercial drones for leisure purposes with a retail price of a few hundred euros (Figure 1).

Figure 1. Example of an AR 2.0 drone (Parrot)



Characteristic :
 Quadricopter using WIFI remote control (maximum distance: 50 meters)
 Carbon fibre structure for lighter body, equipped with 4 electric motors, a Li-ion battery and 2 HD video cameras (frontal and underside).
 Speed: 5m/s.- Battery life: ± 15 min. - Dimensions: 51.7 cm x 45.1 cm
 Weight: 420 g (including hull) ; 380 g (exclusive of hull)

Source : Mirova / PARROT.

Strictly speaking, drones are remotely dirigible unmanned aerial vehicles (UAVs), however, this term is now being increasingly replaced with the term Unmanned Aerial Systems (UAS) to accommodate the wide variety of applications. Their size and weight varies according to their function: they can be as small as a few centimetres across or as wide as a score of metres. Drones mimicking the natural world (dragonflies, flies) have been designed that are less than 30 cm across and weigh under 20 g (the DelFly Explorer). Meanwhile, civilian and military applications can employ vehicles with wingspans of up to 40 metres (RQ-4 Global Hawk).

What's the hubbub about?

While the military is still the largest market currently, civilian applications for drones are set to offer the greatest potential for growth. Luxury real estate, advertising, agriculture, events, civil engineering, mapping...drones can make themselves at home in a wide range of domains.

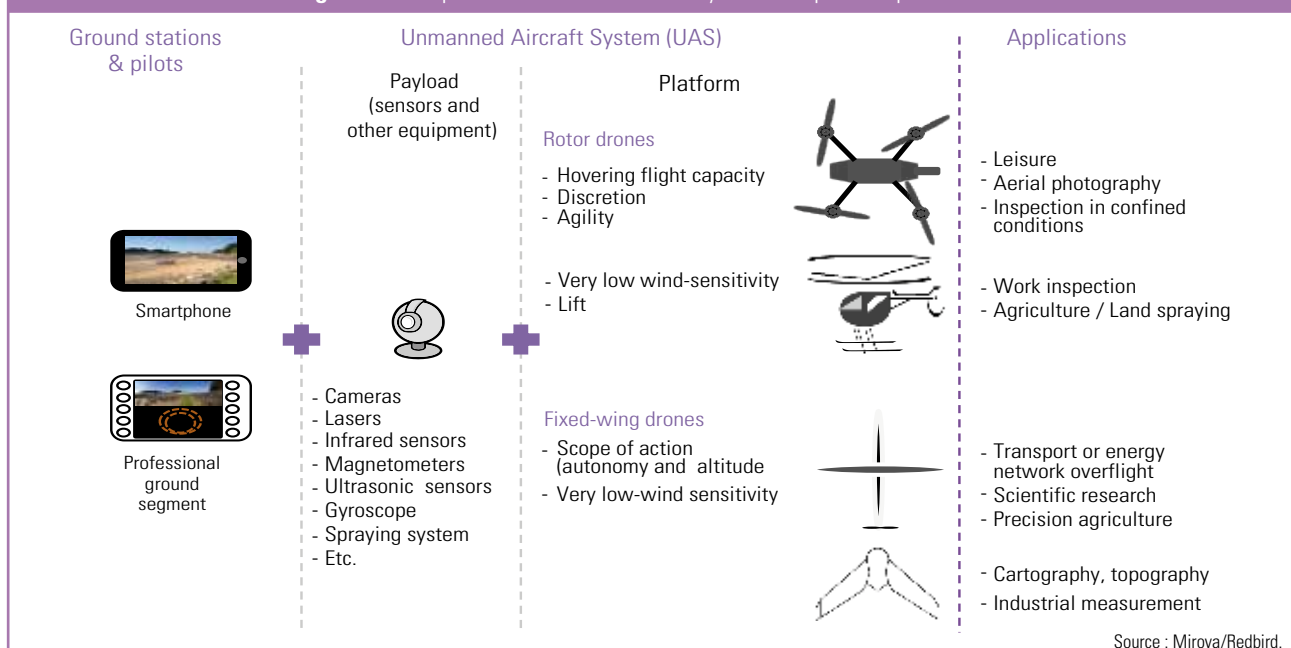
UAS draw on technological advances achieved by both military research (massive investments in drones, sensor technology and support vector regression) and the smartphone industry's innovations in the miniaturization of components such as processors, batteries and the like, which these vehicles also rely on. This means the technologies are ready to use, well-tested, and their R&D costs have already been paid down. Very standard drones can be had for less than a thousand euros; a high performance civilian UAS, on the other hand, can cost anywhere from €30,000 to €80,000.

— 29 —

As shown in Figure 2, most UAS consist of three elements:

- ➔ a ground station (for piloting the vehicle),
- ➔ the payload, including sensor(s), video and still cameras etc.,
- ➔ the platform (flying mechanism)..

Figure 2. Examples of Unmanned Aircraft Systems adapted to specific uses



Source : Mirova/Redbird.

These vehicles vary in terms of size and type motor, making them adaptable for particular tasks. Smaller drones with multiple rotors are quick and manoeuvrable; this gives them an advantage in flying in close quarters or over rough terrain. Models with fixed or flapping wings are silent, and autonomous; a preprogrammed UAS can complete a mission without instructions from its ground station, giving it a much larger range. While most unmanned vehicles are remotely controlled, preprogrammed drones are likely to become more common, especially as SAA (Sense And Avoid) technologies develop. Drones can also be fitted to gliders or dirigible-type balloons. While less manoeuvrable, increasing size goes hand in hand with a much greater carrying capacity, making it possible to transport equipment as well as unwieldy and weighty packages.

Lastly, the variety of sensors that UAS can be fitted with qualifies them to undertake a wide variety of tasks: taking aerial photographs and recording sound, but also creating maps in 3D, of temperature etc. Drones make it possible to quickly and easily collect data of many different kinds in a very short time span. As a result, they offer a solution that for many sectors is less time-consuming and more precise than traditional manual collection, while remaining less costly than earlier technological solutions (satellites, planes, etc.).

In some cases, UAS do more than provide an alternative to other technologies: companies are beginning to offer innovative services in which drones play a role, for instance, flying over fields under cultivation as part of a high tech agriculture design. All in all, about 200 new applications have been identified so far (L'Usine Nouvelle, 2014).

“Drones are versatile, efficient and competitively-priced, a perfect combination reflected in current enthusiasm.”

Basically, the wide range of applications for UAS, combined with savings in terms of labour and time, competitive pricing, and in some cases, better performances (i.e. surveying etc.) explains the current fascination with using these vehicles for civilian and commercial purposes. For the last three years, the sector has been in the midst of a very active development phase, and in order to understand this nascent industry, it is important to examine the current market and what underlies it.

Birth of an Industry

Stepping back to appreciate the international situation, it is clear that some countries have yet to adopt regulations that would permit the development and use of civilian drones, including for commercial purposes (see Figure 4). It goes without saying that a regulatory framework is essential to provide guidelines for UAS usage in civil society. Where such a framework does not exist, it is impossible for the industry

to really take off. France, the third country to regulate UAS, after Australia and Canada, has been at the vanguard of drone regulation in Europe, and, following a less than stellar performance in military applications, is home to the largest number of civilian drone operators in the EU. The country has a long and rich history of aeronautics, and thus possesses the specialized expertise needed for the UAS market to develop. Going forward, however, the financial means of the big groups in the United States is likely to permit them to catch up quickly as soon as the regulations governing commercial applications are in place. Thus the industry's international topography is likely to change drastically in the next few years.

Not only are regulations spotty and as yet unstandardized, actors in the industry are similarly disparate, with few manufacturers of unmanned vehicles, but increasing numbers of operators (companies specialized in offering services that rely on drones). The FPDC (Fédération Professionnelle du Drone Civil), a French professional body devoted to civilian drones, lists only 40 manufacturers or assemblers on the French market, which is one of the most developed. The European Commission recognizes 400 production sites, primarily in the UK, France, Germany, Italy and Spain (EUC, 2013). Only three companies have emerged as global competitors thus far: Parrot, DJI and 3D Robotics. According to the president of the board for Delta Drone, a publicly held French manufacturer of civilian drones, “the global market for civilian drones should reach 15 billion dollars in the next five to seven years” (Le Monde, 2013).

At the operations end, the progressive firming up of ad hoc regulations has encouraged a proliferation of players. Whereas at the end of 2012 there were hardly any operators, France is today the country with the largest number: 430 companies are licenced by the DGAC (Direction Générale de l'Aviation Civile), France's civilian aviation authority, whereas 240 are comparably licensed in the UK and Sweden (1400 companies total in Europe; as yet there are no commercial players in the United States). The gross revenues of French civilian UAS manufacturers and operators increased by 50% in 2013, for a total of 93 million euros; this number is expected to be triple by 2015, reaching 288 million euros (Air Cosmos, 2014).

Despite the fact that there are currently no operators in the US, in March of 2013, the AUVSI (Association for Unmanned Vehicle Systems International) put together a forecast of the economic potential of civilian drones. This study suggested the impact on the economy of the United States would be in the range of \$13.6 billion over the next three years, and reach \$82.1 billion in total between now and 2025. Despite these rosy figures, however, companies in this industry do face considerable risks, as a substantial portion of the market for civilian drones has matured very quickly.

Near-term structuring of the civilian unmanned vehicle market: fierce competition ahead

As was the case with the internet, also a technology initially developed for the military that rapidly developed in the civilian marketplace, the initial proliferation of players in the sector is likely to be followed by a period of market consolidation

driven by causes specific to each segment of the industry. With increasing competitive pressures, players in the civilian drone sector will be making vital strategic decisions: we can expect to see a failure rate of close to 50% for start-ups in the coming years (Air & Cosmos, 2014).

At the construction end, the industry should experience a large number of mergers, leading eventually to the emergence of a few major specialists, due on the one hand to competition from companies previously specialized in military drones that are beginning to market commercial civilian UAS for surveillance or industrial applications (Diamond, Lockheed Martin, Airbus, Thales, etc.), and on the other to the maturity of the leisure drone market (64% of the market for civilian UAS).

Parrot, the creator of the world's most popular leisure drone (700,000 units sold worldwide), has already embarked on this path with its acquisition of a 57% stake in SenseFly, a Swiss company specializing in drones for 3D mapping, 10% of Delair Tech, a manufacturer founded in 2011, and 21% of Airinov, which is dedicated to agricultural solutions.

However, the market consolidation is expected to be even more dramatic among operators. The overwhelming majority of operators are small to medium sized companies (EUC, 2013), 80% of which are located in Europe. Many are positioned on segments with low value-added. According to the operator Redbird, which specializes in professional services, only 10% of existing operators are actually ready to provide full spectrum solutions from data collection to information management and treatment that can meet a specific demand. 90% of professional UAS operators are specialized in audiovisual (aerial photography, etc.). With equipment that is far from costly and little in the way of image treatment services, the activity presents low barriers to entry. Operators are more or less interchangeable, and large scale clients can easily establish their own in-house image drones. We can thus expect to see considerable attrition among operators devoted to audiovisual, to the advantage of operators with strong expertise in handling collected data.

Up to 50% of start-ups in the sector could be affected by market consolidation and specialization in services with the highest value-added.

The time for selling drones by the hour is past; instead, the idea is to provide real value for the client in highly targeted areas. This means that the greatest potential for growth is to be found in professional drones for non-audiovisual applications, such as surveillance, inspection and agriculture, among others. Furthermore, this is where unmanned vehicles are potentially advantageous from a social and environmental standpoint. However, before turning to the opportunities that civilian drones can offer, it is important to address the risks involved.

2 | A legal framework is needed to contain significant risk

What is so risky about civilian drones?

Certain uses of drones may jeopardise privacy through the collection of information (audio and visual) without people's knowledge. Used for surveillance by cities or during public events, UAS could violate individuals' rights and freedoms. An unmanned vehicle can very discreetly take still photographs or video footage, record sounds or geolocalize individuals, intruding into people's private lives without drawing attention.

However, this should not permit us to ignore the more prosaic risks of accident, or the possibility of misuse. In March 2014, a drone was used to deliver drugs to a prison in Australia, while earlier, in September 2013, Germany's Pirate Party illustrated that it was perfectly possible to use a UAS to approach a political figure—in this case Christian Democrat Angela Merkel—with the intent of conducting an assassination.

Regulation is needed in order for the market to expand without threatening the security or privacy of individuals, while nonetheless ensuring that the risk of piracy or collision with other flying objects is contained and that these devices are not used to transport illegal substances.

A program of awareness and education will also be necessary to sensitize people to whatever framework is finally put in place. In some cases, users could find themselves in breach of the law out of mere ignorance and without ill intent. For instance, leisure drones are sold without any training as to what a user is entitled to do or prohibited from; early in 2014, the first arrest of this kind was made when an unauthorized amateur video of Nantes (a city in western France) began to circulate on social media.

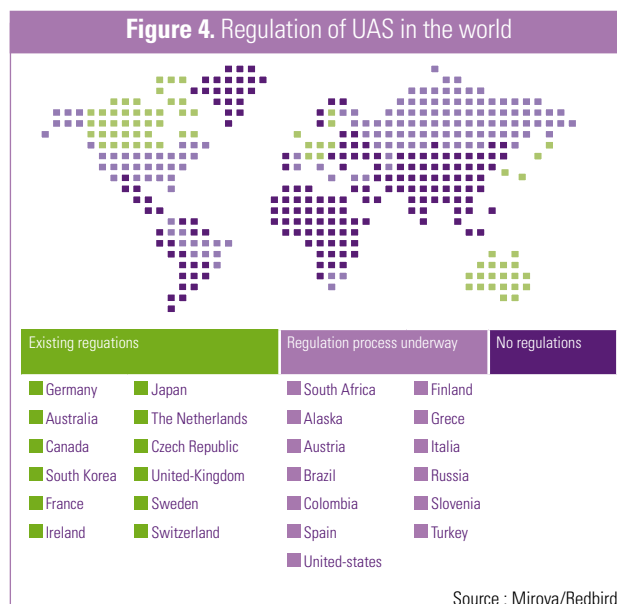
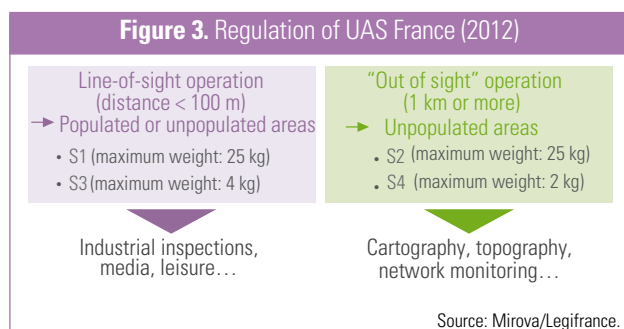
A regulatory issue of international scope

Since 2013, short-term objectives have been established and various regions have put together working groups and roadmaps to help integrate unmanned flying vehicles into civilian airspace. By 2015, 30 to 40 countries are expected to have put in place some kind of regulatory framework (see Figure 4), according to Redbird. As covered in Part I, such a framework is a necessary precondition for any development of professional activities; without it, the risk of subsequent interdiction is simply too high.

In April of 2012, France narrowly beat out Ireland to become the first country in Europe to regulate the civilian use of drones (Legifrance, 2012). The statutes provide for differing usages based on the characteristics of the unmanned system: weight, flying distance, presence of the drone in the operator's field of vision, and the types of sensors on board. Manufacturers need to secure approval from the DGAC for their designs, which must include the specifics of their mission type (classified as S1-S4). Operators must be licensed by the DGAC. The four currently authorized mission types are illustrated in Figure 3.

Also in 2012, but in August, the United Kingdom published recommendations (Civil Aviation Authority, 2012), and in 2013 made public a list of more than 100 companies authorized to fly unmanned vehicles within its airspace (The Guardian, 2013). Other countries, such as Sweden, have since established limits. However, there are no international standards at this time, so rules vary from one country to the next, and studies are still underway to identify and devise ways of controlling all the potential risks.

On 8 April, 2014, the European Commission proposed the establishment of new, stricter norms in order to unify the regulatory framework at the level of the European Union and meet the goal set by European Council (EUR-Lex, 2014) of bringing drones into civilian airspace as of 2016 (EUC, 2013).



3 | Can civilian drones contribute to sustainable development?

Indirect advantages: drones offer plenty of social benefits...

Beyond the boundaries of Europe, it will be necessary for the industry to balance rules established by the Canadian government (2010), Australia (2011) and New Zealand.

In December of 2013, the United States, the FAA (Federal Aviation Administration), which had previously limited civilian drone use to surveillance activities, permitted testing of various other uses at six sites scattered around the country.¹ These tests are part of a roadmap drawn up by the FAA (FAA, 2013) in view to establishing an official regulatory framework by 2015. This tardiness explains the lack of operators in the United States. China, Japan and Mexico use UAS for commercial applications, among other things, but have no regulatory framework to address associated risks. However, there is a general trend towards governments taking steps to contain the risks associated with the development of civilian drones and thus allow enterprise to fully take advantage of the opportunities for growth offered by this dynamic industry.

Health, security of users and workers, access to information... the social benefits of unmanned vehicles are many.

The most noticeable social and environmental benefits of UAS occur indirectly. New applications, running a gamut from the prosaic to the madly futuristic, are announced each day; some of these projects could make an undeniable contribution in terms of sustainable development (see Figure 5).

Initially used to improve security measures, civilian drones made their initial appearance in the sky thanks to their adoption by police and firefighting departments. There is no question but that unmanned vehicles are an asset in the context of rescue missions, preventative measures, and missions that would be overly risky for human beings. Some French and Chilean firefighters are already using UAS with optical cameras and infrared sensors. Impervious to smoke, these vehicles can create dynamic real-time maps of a fire front, making attempts to control forest fires more effective and less dangerous. But firefighting is only one example amongst many. Quadricopters were used to examine debris and identify victims of hurricane Katrina. Today, seagoing rescue drones can deliver life-preservers to persons in distress, while on land they distribute first aid kits to individuals who are geolocalized using specialized software applications; in mountainous regions, UAS are able to find and assist hikers. Meanwhile, the same advantages that attract security and rescue uses have made for adoption by environmental researchers and NGOs: drones are particularly well adapted to collecting data over a broad area that is difficult to access. To take one example, the WWF (World Wildlife Fund) has been testing drones as a method of deterring poachers since 2012, and NASA uses unmanned vehicles to map and announce storms, including hurricanes.

Public and parapublic institutions aside, many of the professional uses to which UAS are put can have a positive social impact. A California start-up called Matternet, for

1. These are located in Alaska, Nevada, New York State, North Dakota, Texas and Virginia.

instance, is working on how to use unmanned vehicles to deliver medicines and medical tests to the least accessible areas in emerging countries, notably in Africa and Asia. Internet giants Facebook and Google have each bought manufacturers of UAS that can fly at high altitudes (these being respectively, Ascenta, a UK company, and the US Titan Aerospace). Among other things, such vehicles could serve as telecommunications relay points, making internet access a reality for populations in the far periphery.

A more concrete example, no pun intended, is the use of drones for inspecting constructions (bridges, aqueducts, dams, etc.) and infrastructure such as electrical grids, rail systems and pipelines. This ensures proper functioning and user safety through the prevention of collapse for structures such as bridges and aqueducts, and the prevention of derailing in the case of train tracks, while avoiding the exposure of workers to the risk of personal injury involved in human completion of these long and perilous missions. The SNCF (Société Nationale des Chemins de Fer), which controls France's interurban rail system, the APG, responsible for Austria's electrical grid, and ArcelorMittal already employ drones to single out weaknesses in their infrastructure. This reduces the need for night crews, which always entail additional risks, as well as system down-time for maintenance, and avoids the risk of employee falls during viaduct inspections. ArcelorMittal uses its UAS to check the condition of its chimneys and the protection of its equipment without having to send personnel up on ropes to conduct inspections. Similarly, Geneva's airport has acquired a drone used to verify the safety of its take-off and landing strips.

Finally, drones have the potential to considerably increase safety in the nuclear sector. The IAEA (International Atomic Energy Agency) is planning to use UAS by 2015 to measure radioactivity in the zones of Fukushima that are not accessible.

...and they also contribute to environmental benefits

Even though drones are not likely to prove a substitute for trucks when it comes to home delivery, despite pronouncements by Amazon—given the average load capacity of a drone and the complexity of circulating in an urban environment, a small fleet of drivers will remain more profitable than dispatching dozens of drones—UAS still have an important role to play. Pollution associated with the transport of freight (mass mobilization of merchandise) could be eliminated using unmanned vehicles with high carrying capacities lofted by helium. Lockheed Martin's P-791 is one such prototype and has a load limit of 20 tonnes. However, it will take several years and substantial legislation before this solution becomes a reality.

A more immediate application for UAS is to be found in the construction industry. The cost of construction and, for cement-makers, quarrying, is substantially impacted by costs associated with moving heavy equipment (trucks, tractors etc.). In a matter of hours, certain UAS operators can create a 3D map of a construction site, allowing the contractor to optimize movement of the vehicle fleet, reducing valuable fuel by as much as a fifth (L'Usine Nouvelle, 2014). Beyond the cost savings, this obviously reduces considerably the negative environmental impact of a worksite.

Whether employed to optimize energy use in Construction or as a tool for high-tech agriculture, UAS offer tangible contributions to sustainable development.

Also geared toward environmental benefits, operators like Air Azur have specialized in providing residential thermal analyses. Using an onboard infrared camera, the drone charts zones of heat loss, making it possible to strategically reinforce insulation. GrDF (Gaz réseau Distribution France), which distributes natural gas, has already begun using this tool to raise awareness of energy consumption among subscribers.

Not all of the applications envisioned for UAS in the agricultural sector will have a positive effect on the environment. Some players will use these vehicles as a mechanism for blanket spraying operations, raising questions about the dispersion of chemical substances. When used for precision agriculture, however, drones provide technical support that can help reduce costs. While the maps provided by this method will never completely supplant satellite images, their data will be even more precise, making it possible to better localize and dose the inputs to be delivered. Relatively competitive costs, practicality and versatility set UAS up to play a facilitating role in many systems and in some cases give rise to new ideas about how to intervene. Whether their aim is to monitor, inspect, transport or rescue, the use of drones can clearly contribute to better controlling environmental and social risks, for example, by reducing the carbon footprint of activities or ensuring greater worker safety; they also present valuable opportunities for sustainable development in areas such as access to health and to information, sustainable buildings and the preservation of biodiversity.

Some of these projects are still experimental; nonetheless we may hope that many of the imputed benefits will come to fruition, especially given the fact that, as covered earlier, UAS operators offering services with high added value, especially in the areas of industry and agriculture are those expected to prove most durable and likely to see the greatest economic opportunities over the next few years.

Direct social benefits: predictions for job creation are hopeful, but circumspection is needed to judge total impact

Civilian drones are a fast growing industry that is expected to generate substantial employment. The AUVSI estimates that over a period of 10 years, 100,000 highly skilled jobs will be created on US soil alone. There are as yet no similar studies freely available for Europe; however, the economic trend of the sector is clearly positive, suggesting a similar impact on employment. Direct job creation should be especially pronounced among operators. For the time being, most operators are very small entities (40% of French operators currently have

fewer than two full-time employees): the rapid expansion of this sector will favorably affect the numbers of salaried personnel. The establishment of an entirely new technology also produces indirect employment through the emergence of ancillary services such as training pilots and technicians, or the maintenance and repairs of UAS.

Nonetheless, it seems only appropriate to bring some nuance to these optimistic projections. For one thing, the market will likely continue to structure itself, and intense competition, notably in the area of media-related drones, could lead to the failure of many current start-ups. New hires at some companies will thus be offset by some level of employment destruction.

Furthermore, one of civilian drones' trump cards is the capacity of these vehicles to perform what the industry calls '3D' tasks: those which are Dull, Dangerous and Dirty. While we may applaud the increase in safety, given that workers were formerly obliged to complete these tasks, UAS nonetheless take the place of these workers, potentially eliminating jobs. In a matter of hours, a drone can collect the data that previously required several days of work on the part of an entire team; meanwhile, the jobs that drones create will largely be high-skilled jobs such as engineers, UAS pilots, salespersons and media producers. The number of jobs created will thus not offset the destruction of jobs for less qualified workers, who have more trouble resuming a place in the workforce, on average.

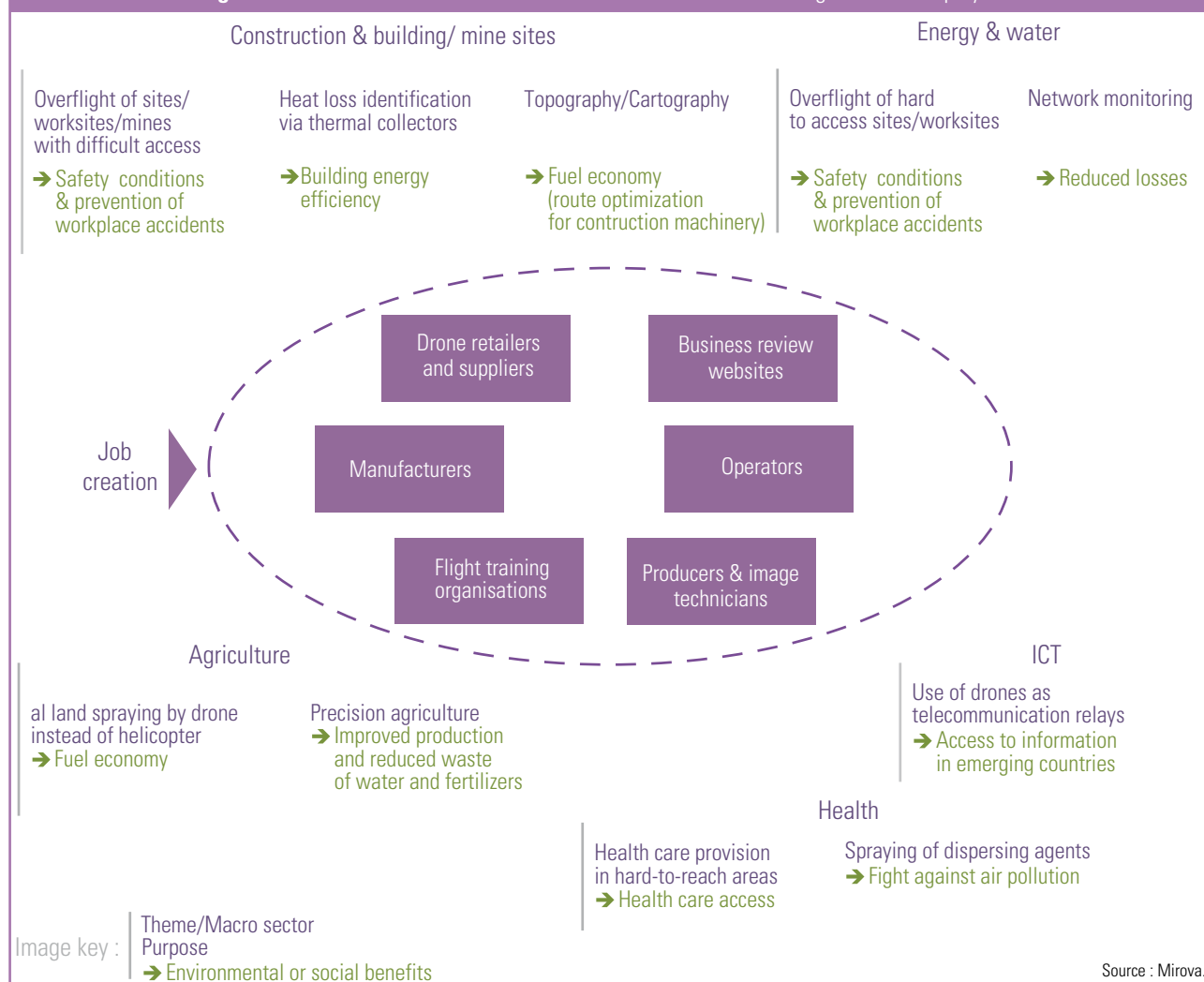
Given the variety of factors and the lack of perspective on an industry that is still in its infancy, it remains impossible to quantify either the gains or losses as far as employment is concerned. What we can count on is the creation of jobs requiring high levels of qualifications, and an improvement of working conditions for a certain number of lower wage jobs.

Direct environmental benefits will be limited

As with the social impact of civilian drones, it is difficult to reliably evaluate their environmental effects. Among other things, it is hard to determine how much UAS production contributes to the worldwide panorama of energy consumption, although the low capital intensity of the industry, largely concentrated on the capacity of employees to manipulate the data collected, makes the issue fairly limited in scope. This notwithstanding, most vehicles currently on the market are powered by electric motors that rely on Li-po (Lithium polymer) batteries. When their carrying capacities are comparable to those of conventionally powered vehicles, such as helicopters, there is a direct environmental benefit in terms of energy resources and hazardous emissions.

The use of drones in civilian airspace offers those who pursue responsible investing occasion to direct investment, on the one hand toward specialized operators in areas that foster social or environmental benefits, such as internet access in emerging

Figure 5. Direct and indirect social and environmental benefits ensuing from UAS deployment



countries, precision agriculture or energy efficiency within the building sector, and, on the other, toward manufacturers whose design of unmanned vehicles creates these opportunities.

At this point, there only a handful of listed companies in this sector, of which Delta Drone is one. It is important to carefully monitor new offerings as they appear, as the market is only beginning to establish a structure and launch the concentration of players we are likely to see take place.

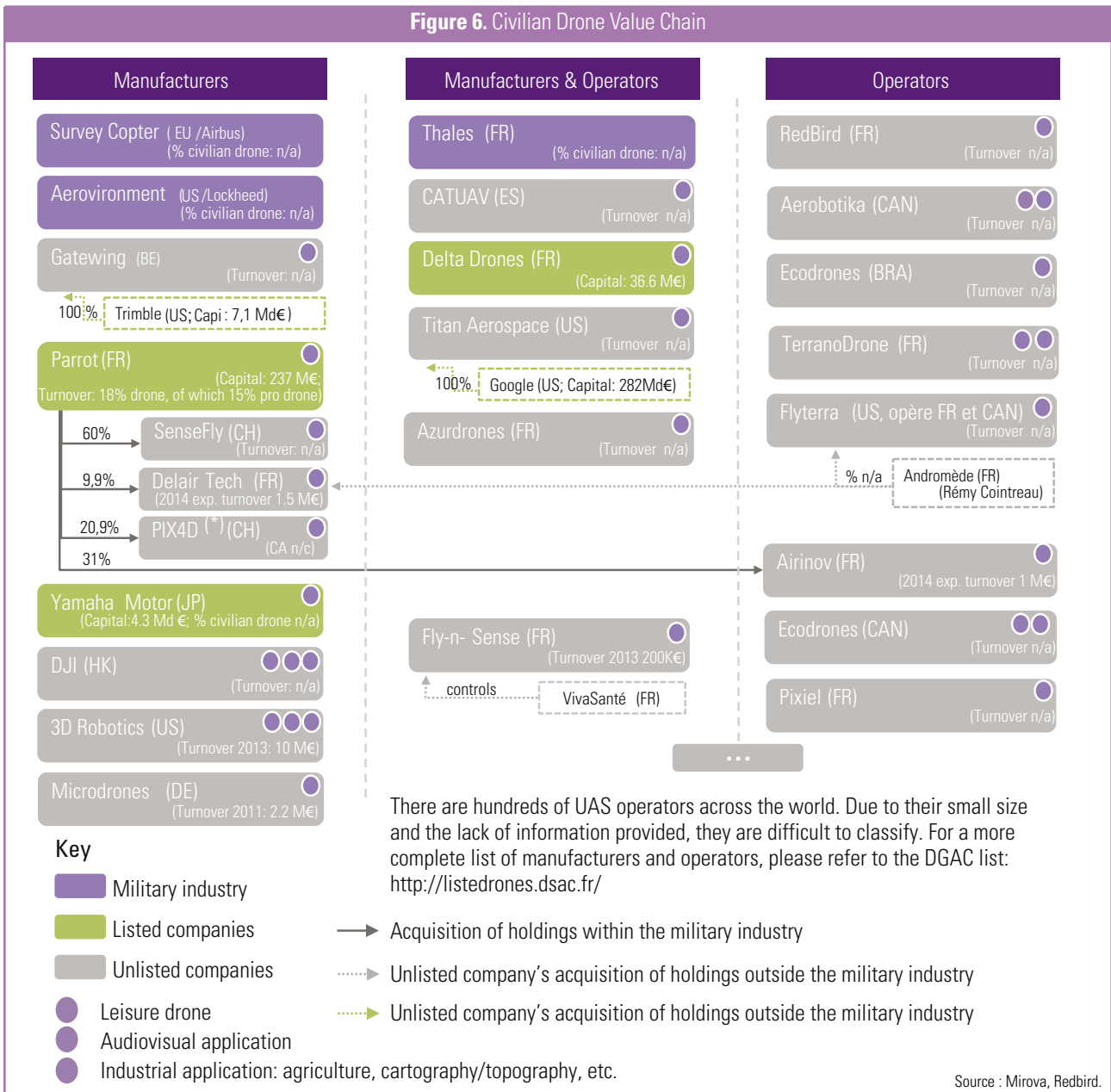
Additionally, unlisted companies in this industry may decide to issue sustainable bonds as a means of financing projects that have substantial social or environmental benefits (precision agriculture, energy efficiency of buildings etc.). Additionally, their potential contribution in terms of sustainable development can be a significant area for growth and a draw for larger companies.

In terms of product line (i.e. manufacturers), opportunities lie in the area of UAS developed specifically for industrial and agricultural functions ('eBee Ag from Sensefly, for instance), or

providing solutions for the population at large: drones made by Titan Aerospace, for example, help extend networks and contribute to closing the digital divide, and such drones could contribute to solving the problem of deforestation associated with towers. Other players, such as PIX4D, are focusing on the development of software for making extremely precise measurements using data collected by these UAS. On the service end of things, a number of operators are offering custom solutions (UAS flight and data analysis) that allow clients to optimise their environmental impact (RedBird, Ecodrones, etc.). Some companies are both manufacturers and operators, giving them the possibility of offering highly specific services such as helping to fight forest fires (Fly-n-sense).

Finally, in the context of a fund dedicated to overall job creation in France or in Europe, the world of unmanned aircraft systems, from construction sites to regulators, operators and pilot instructors offers real prospects for growth in terms of job creation, and should come to offer opportunities for investment.

Figure 6. Civilian Drone Value Chain



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FINANCING THE ENERGY TRANSITION IS A HIGH STAKES GAME FOR INVESTORS



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EXECUTIVE SUMMARY

Written on 24/06/2014

Worldwide demand for energy is expected to rise by 43% between now and 2035, driven by growth in emerging markets. In what is called the 450 Scenario, designed to limit global warming to 2°C, the IEA (International Energy Agency) calls for growth of demand to be limited to 14%, and recommends a radical change in the energy mix that would limit fossil fuels to 64% (vs. 81% in 2011) and double renewable energy's current share to 26% by 2035.

In view of the upcoming 2015 International Climate Conference (COP21) in Paris, we are seeing a number of new regulations emerge. The European Union's new Climate and Energy Package, for instance, aims for a 40% reduction in GHG emissions by 2030. In China, the government intends to reduce the weight of coal in energy consumption to 60% in 2020 (currently 68%).

In June of this year, President Obama presented a plan to reduce by 30% the CO₂ emissions of domestic electrical plants by 2030.

In answer to the challenges of climate change and reducing greenhouse gases, the two following sectors will be the object of substantial investment as we move forward:

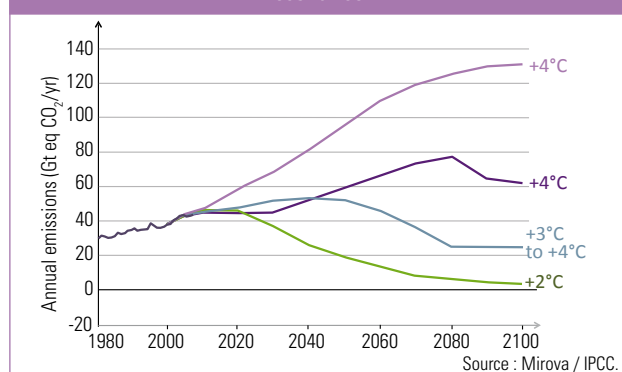
- Low carbon energy: the most recent IPCC report estimates at \$147bn the annual increase of investments in low carbon technologies, particularly renewables between now and 2035.
- Energy efficiency: the IPCC anticipates that investments in improving energy efficiency in building, transport and industry will grow by \$336bn annually over the same period.

In the latest reports from the IPCC (Intergovernmental Panel on Climate Change), published in 2013 and 2014, the scientific community has confirmed that it is extremely likely (>95%) that human activities have an impact on climate. We can already see some of the consequences of climate change, such as increasingly frequent heat waves and melting at the polar ice caps.

A continuation of global warming will exacerbate existing trends, producing greater frequency of droughts and coastal flooding along with diminishing agricultural yields, the extinction of species and the migration of tropical diseases toward higher latitudes.

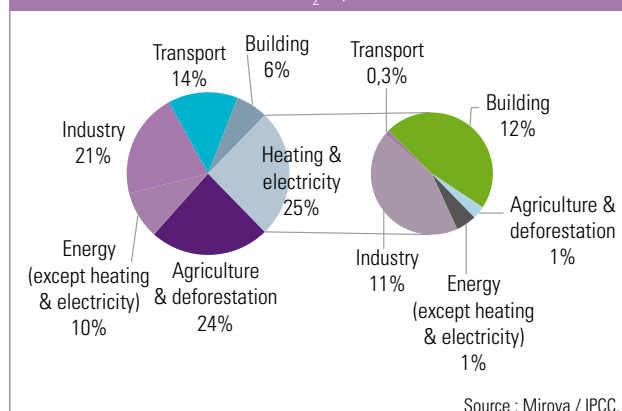
To limit the impact of climate change and stay on track toward sustainable development objectives, it is high time we implemented stringent measures for reducing emissions. As illustrated in the various scenarios published by the IPCC, only an immediate stalling of emissions, followed by a considerable drop throughout the remainder of the decade, will keep temperatures under the 2° mark, a goal, which, however ambitious it seems today, remains the object of an international consensus.

Figure 1. Climate impact of the various emissions scenarios



Making this objective a reality will require that society undertake structural changes at all levels, particularly in the way we use energy, which is currently responsible for ~75% of GHG emissions. We remain heavily reliant on fossil fuels, which provide 80% of the energy we consume, and coal, oil and gas continue to grow. Operationalizing the energy transformation will require major evolutions in most sectors: power production, transport, building, industry.

Figure 2. GHG emissions by sector (49 Gt CO₂ eq., 2010)



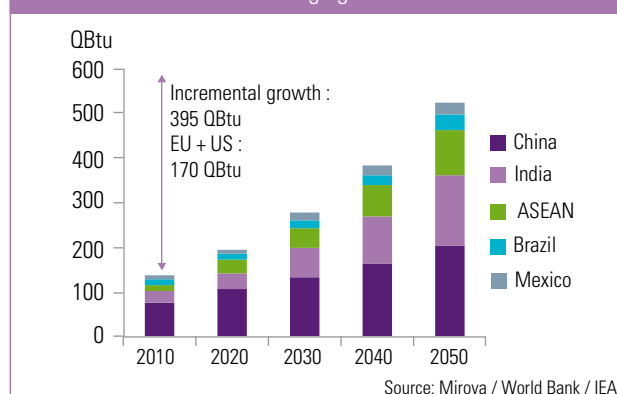
These transformations will present opportunities for companies able to offer solutions to the challenges they raise.

1 | The energy transition as the new frame of reference

Population growth, increasing urbanisation, and the rise of a middle class in emerging countries have contributed to a doubling of worldwide energy consumption in the last 40 years. Between 1973 and 2011, the proportion of energy demand from OECD countries shrank from 60% to 41% in the face of rising emerging markets (EM) demand.

Continued economic expansion in emerging countries is expected to go hand in hand with rising per capita energy consumption, which remains two to three times lower than levels in developed countries. This means energy demand in emerging countries might as much as quadruple by 2050; this increase would represent 2.5 times the current consumption of the US and Europe combined.

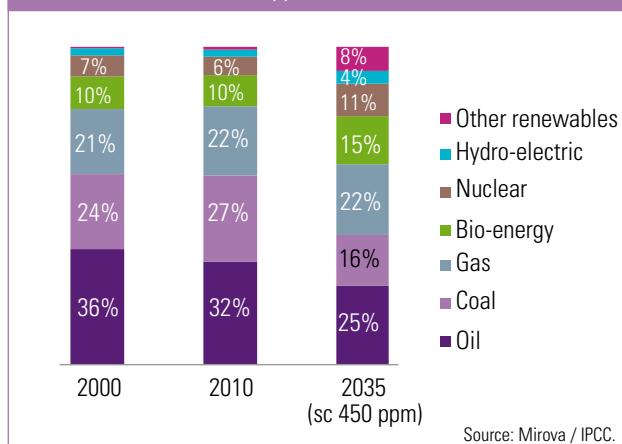
Figure 3. Predicted growth in energy demand for select emerging countries



In its latest study, the "World Energy Outlook" published in November of 2013, the IEA presents three possible scenarios describing the future behaviour of the market for energy to 2035. These are:

- ➔ **The Current Policies Scenario (CPS):** this is a 'business as usual' scenario, expected to produce a 43% rise in energy demand by 2035 in the absence of regulation to fight climate change in the next 20 years.
- ➔ **New Policies Scenario (NPS):** this base-case scenario predicts a 33% growth in world energy demand over the 2010-35 period, with 60% of it to come from China, India and the Middle East. Concurrently, GHG emissions would increase by more than 20%.
- ➔ **450 Scenario (meets 450ppm CO₂ equivalent quota):** 14% growth in energy demand between 2010 and 2035. This is the only scenario to permit a reduction in GHG emissions and be compatible with a global temperature rise of no more than +2°C.

Figure 4. Distribution of energy sources under the 450ppm scenario

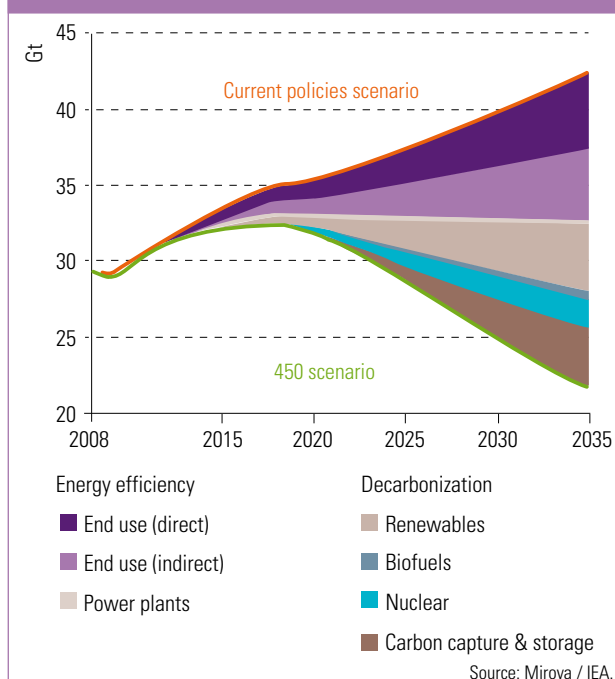


For implementation of the 450 Scenario, the IEA focuses on two types of measures:

→ **energy efficiency:** a severe curb on increasing energy consumption in order to ensure that 2035 levels remain under the 15,000 Mtoe, as compared to the 17,000 Mtoe levels predicted by its base-case scenario, the NPS. The IPCC believes that \$336bn of annual investments will be required over the 2010-35 period in the three sectors that consume the most energy: building, transport and industry)

→ **decarbonisation:** a radical transformation of the energy mix that includes a considerable reduction in the use of oil and coal, a stabilization of gas, and high growth in renewables and nuclear energy along with carbon capture technologies. The IPCC report estimates that investment in low carbon technologies will grow by \$147bn annually, as compared to current annual investments of \$1.2 trillion in energy today.

Figure 5. Comparison of world energy consumption under the different IEA scenarios



Legislation is taking shape

At the European Union level

It is against this background that the new Climate and Energy Package for 2030 proposes to bolster the targets of the 2020 plan on at least two fronts:

- Reduction of GHG levels. The EU shifted the -20% objective to -40% in its 2030 plan (given an effective reduction of 18% in 2012).
- The proportion of renewables in the global energy mix. This objective, which is -20% in the 2020 package has become -27% minimum for 2030 (2011 levels were 12.5%).

A 2030 target number for the reduction of energy consumption in the EU (-20% in the initial plan) is still under discussion at this time.

Beyond the question of climate change, concerns about the security of fossil energy reserves are likely to amplify the emphasis on renewables in the EU. In March 2014, following events in Ukraine, EU government leaders requested that the European Commission prepare a roadmap by June for reducing energy dependence on Russia. In 2012, 24% of the European Union's gas came from Russia (dependence varied, with highs of 37% for Germany and 29% for Italy), and 50% of these imports were piped through Ukraine.

China

In China, combating climate change, combined with the need to reduce pollution, are forcing a reduction in the reliance on coal. China today accounts for 50% of all coal consumption and a third of CO₂ emissions worldwide. The central government has announced it will reduce the proportion of coal in the country's energy mix to 60% by 2020 (currently 68%). A long term objective that will cap carbon consumption at the national level is also expected. Instead, China wishes to develop the contribution of renewables to its energy mix. From a base of 7% in 2011, the plan has a target of 15% for 2020 and calls for 40% by 2040.

Figure 6. China's Energy Plan: main objectives

	2012	2015	2017	2020
Primary energy mix				
-from non-fossil fuel	6%	11%	13%	15%
-from natural gas	3%	>7%	>9%	NA
-from coal	68%	NA	65%	60%
Power generating capacity (GW)				
Hydropower capacity	249	290	330	400
Wind power	61	100	150	200
Solar power	3	35	70	100
-from distributed energy	0	20	35	NA
-from power stations	3	15	35	NA

Sources : Mirova / NRDC (National Development and Reform Commission).

United States

The United States continues to exhibit some of the highest CO₂ emissions worldwide at ~21t eq. of CO₂ per capita, as compared to less than 10 tonnes in Europe. The disparity can be partially explained by the substantial place of coal in the US electric energy mix (~48% of mix). While the question of climate change has long remained a side issue, a number of regulations aimed at reducing CO₂ are now taking shape.

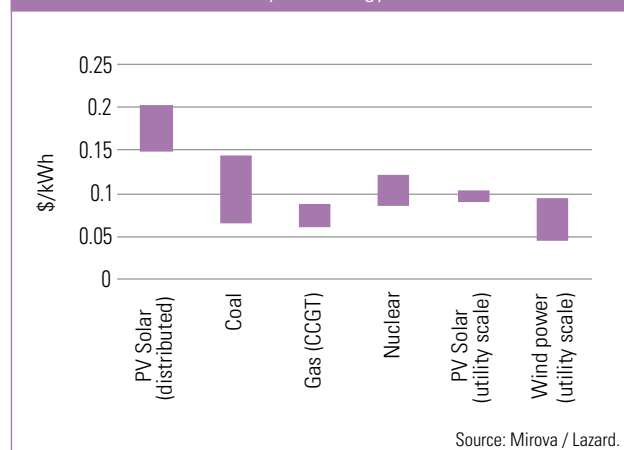
Thus 40 states have enacted RPS (Renewable Portfolio Standard), regulations that include targets for renewable energy development. The most proactive of these are California, which is aiming for 33% renewable energy by 2020, Nevada, which is targeting 25% for 2025, and Hawaii, which hopes to achieve 40% by 2030. In order to achieve its goal of 33%, California will invest \$115bn in the electricity sector between now and 2020, of which \$100bn in power plants and \$15bn in transmission.

At the federal level, President Obama introduced a plan in June 2014 to reduce CO₂ emissions from electrical power plants by 30% (compared to 2005 levels) before 2030. According to this plan, coal consumption would drop by 25-27% between now and 2020, replaced with renewables, whose contribution would increase by 12 GW, and natural gas.

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The strong decline of production costs associated with solar energy and its increasing disparity from the price of electricity sold on the grid makes it more attractive for individuals and businesses in the US to make their own electricity from solar panels installed on roofs, in what is called distributed generation. In the short period between 2010 and 2013, distributed solar went from 3% to 12% of all new solar capacity installed in the United States (4.6 GW total). In the first quarter of 2014, total solar installations jumped 79%, to 1.33 GW, with a third of these coming from individual households and commercial or industrial clients.

Figure 7. Cost of electricity production in the US, by technology



2 | An array of solutions

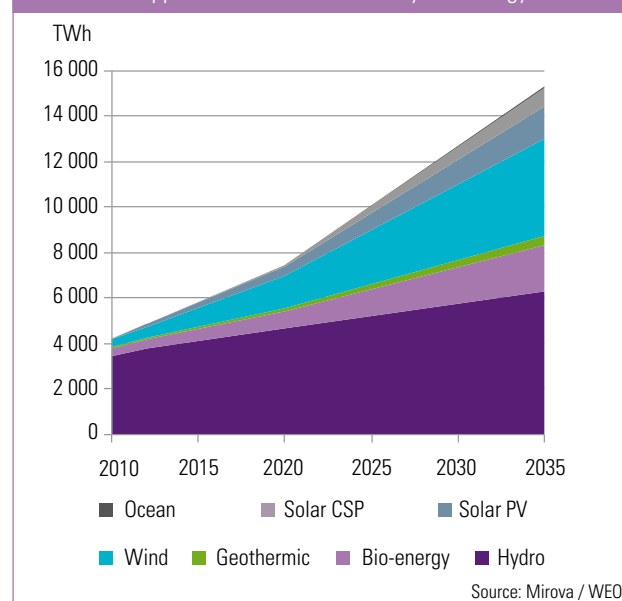
In order to best identify and take advantage of opportunities arising from these changes, we put together an investment universe focused on the various activities that contribute to the energy transition. This universe is built around the following solutions.

Low carbon energy

Renewable energy, the fuel driving the energy transition

Energy from renewable sources, which emits no CO₂ and is considered by and large acceptable in terms of other environmental concerns, is set to play a starring role in the struggle against climate change. Technologies like hydropower and biomass, biofuels and geothermal energy, which are relatively mature, will continue to increase their contribution to electrical power generation, however, the strongest levers for growth will be more recent technologies, especially solar and wind power.

Figure 8. Electricity from renewable sources in the 450ppm scenario: breakdown by technology



Solar

Solar energy made a strong comeback on the equity markets in 2013 on the basis of several fundamental drivers

1. Favourable regulatory changes, particularly in China and Japan;
2. a price stabilisation of solar panels since March of 2013, thanks to a better balance of supply and demand;
3. a continuing decline of the production costs for solar energy that have brought it close to 'grid parity' (the wholesale cost of electricity, excluding cost of grid integration) in some parts of the world. For instance, it is believed that solar energy has achieved grid parity in 10 of the 50 US states.

Following a 16% increase in the demand for modules in 2013, the total market is expected to show 20% growth in 2014 and 16% in 2015 (source: HSBC).

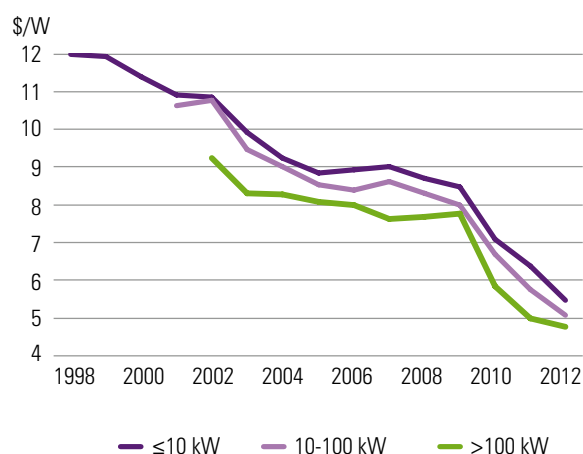
With capacities of 12 GW added in 2013, China has become the largest market for solar in the world. This number is forecast to reach 14 GW in 2014, according to China's NEA (National Energy Administration). The last reform of feed-in-tariffs, during the second half of 2013, extended their application beyond solar farms used by utility companies to residential installations, which are still relatively undeveloped in the country. The new solar targets published by the National Development and Reform Commission (NDRC) and NEA for 2017 are counting on a doubling of capacity to 70 GW from the 35 GW anticipated by 2015.

After China, Japan is the second largest market for solar energy, with 6.5 GW of installed capacity as of 2013, a number that is expected to grow to 7.5 GW in 2014. Even after the planned 11% drop in the price of solar electricity to 32 JPY/kWh came into effect in April, Japan remains one of the world's most attractive markets. Following the Fukushima catastrophe and a temporary ban on nuclear power, Japan has decided to undertake massive investments in renewables, which currently constitute 10% of the energy mix, with hydroelectric alone currently supplying 8%. Based on the proposals, which vary from one political party to another, this proportion could double or even triple by 2030.

In the US, 4.2 GW of new solar capacity was installed in 2013, representing 15% of the total market worldwide. Of this, nearly 90% involved large-scale projects; the rest consisted of residential projects. A system of Investment Tax Credits (ITC) grants developers a tax credit equal to 30% of their investment for all projects commissioned before 2016. Over the 2014-2016 period, the US market could amount to 20 GW in new installations, more than half of it from distributed solar by residential and commercial clients.

Japan has decided to undertake massive investments in renewables, which currently constitute 10% of the energy mix.

Figure 9. PV solar cost trends (1998-2012)

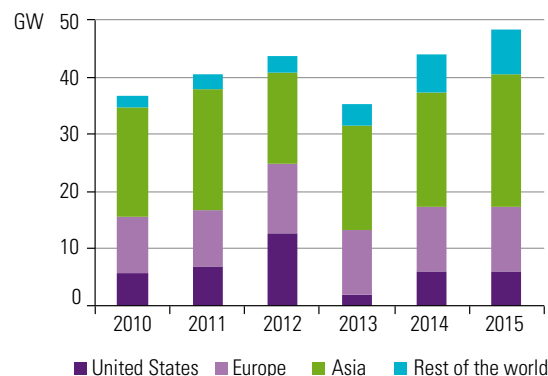


Source: Mirova / IEA.

Wind Power

After a 20% drop in new wind turbine installations during 2013, the market is expected to bounce back in 2014 and 2015, with growth estimated at 23% for 2014 and 11% for 2015, representing 44.3 GW and 49.1 GW, respectively (source: HSBC). The bulk of this expansion is expected to come from the Americas in 2014 and the Asia-Pacific region in 2015. European installation rates are expected to remain stable for the period.

Figure 10. New wind farm capacities by region (2010-2015)



Source: Mirova / GWEC / HSBC.

China will likely remain the largest wind power market (15 GW), although this market remains 'controlled' by Chinese turbine manufacturers. In the US, despite the lapse of the Production Tax Credit for wind power at the end of 2013, projects whose construction began before December 2013 will continue to receive tax credits for a 10 year production period. This provision applies to 12.5 GW of new installations in the 2014-15 period. The strongest growth in onshore wind is likely to come from emerging markets, where Brazil, in first place with 3 GW of new capacity anticipated in 2014, is on par with Germany and ahead of India (2.4 GW).

Europe's wind power equipment manufacturers made a strong recovery on the stock market in 2013 (+300% and +400%) buoyed by:

- an upturn in order intake starting in the first quarter of 2013, concurrent with a stabilization of turbine prices,
- manufacturers' implementation of restructuring plans (sales of assets, reduction of fixed costs) during the trough of their business cycle.

Given the context of double digit volume growth, manufacturers should see margins improve thanks to falling costs, economies of scale and efficiency gains.

Natural gas is an transition solution

Natural gas has a carbon footprint that is half that of coal for electricity production, and can thus play a temporary role in the reduction of CO₂ emissions when combined with energy efficiency measures and the development of low-carbon energy solutions. This is especially true in countries where coal plays an important role, such as China, India and the United States. Consequently, the 'natural gas as a transition solution' segment of the investment universe focuses on these countries.

In the United States, the Environmental Protection Agency's (EPA) new emission rules for coal-fired plants will take effect in 2015. According to the IEA, this will cause the equivalent of 60 GW of capacity to be shut down between now and 2020 (approximately 20% of capacity from coal-fired plants at end 2012). According to the IEA, 42% of the electricity produced today in the US still comes from coal, ahead of natural gas (25%), nuclear power (19%) and renewables (14%).

The development of shale gas production in the US, in addition to providing a substitute for other, more polluting fossil fuels, has allowed the US to reduce its dependency on imports, and allowed them to avoid gas prices in line with those of Japan, which are fixed by long term contracts pegged to the price of oil (American gas prices are a third of Japan's). Non-conventional gas currently accounts for 45% of US gas production, a number that could rise to 80% within the next quarter century.

Investments in pipelines and storage capacity (Midstream activities) related to the explosion of nonconventional resources in North America should see strong growth between now and a 2035 horizon (USD +14.1 bn/yr during 2014-2035 according to ICF International). As the US prepares to launch exports of LNG (liquefied natural gas), projects for building terminals are multiplying along the Pacific coast and the Gulf of Mexico, although none of these installations are operational as of yet. According to the energy consulting firm IHS, the United States' LNG export capacity should reach 66 bcm by 2018-2020, as compared to a total LNG market of 540 bcm by this time.

Sluggish growth for nuclear power

Nuclear energy is often touted, particularly by the IEA, as a viable option in the fight against climate change. It is true that this technology presents the advantage of a CO₂ footprint close to that of renewable energies, because fission reactions emit no GHG. Nonetheless, it is an energy source with risks of its own:

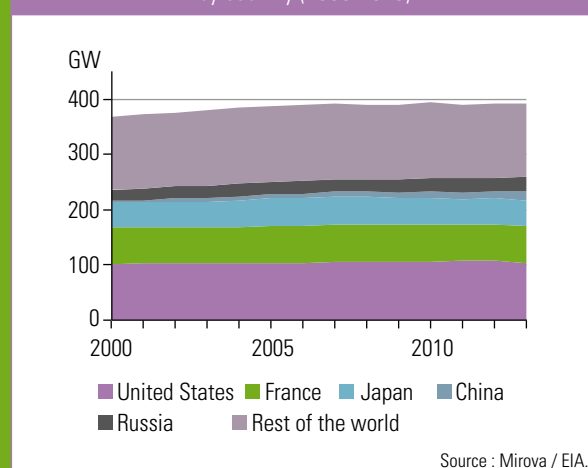
- The risk of nuclear accidents. Events like Three Mile Island, Chernobyl and Fukushima have demonstrated that nuclear accidents are a reality.
- Management of nuclear waste. Even after reprocessing of high-level nuclear waste, by-products of fission result in long-lived radioactive waste which can remain dangerous for thousands, even hundreds of thousands of years. This remains the biggest challenge facing the industry.

All of Mirova's funds share the belief that nuclear power can provide a solution for reducing CO₂ emissions. This said, the risks associated with this technology mean that it is not appropriate for every country. Political stability is essential, and a high level of technical know-how is necessary. A case by case analysis of the strategies pursued by players in the nuclear industry is thus necessary, especially for those whose contracts are in countries where a monitoring of the industry has yet to be established.

The want of a consensus has also weighed heavily on the development of the industry for several years now. This has shown up as production capacities that have flat-lined for the last decade or so.

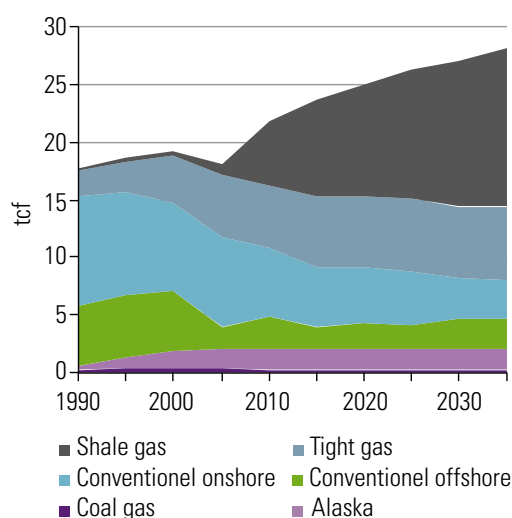
The Fukushima accident further reinforced existing concerns, and some countries, most notably Germany, have elected to withdraw from nuclear power. Even for countries relatively favourable to this technology, like the United States, France, Russia or China, the catastrophe has meant a strengthening of safety regulations and, consequently, increased costs.

Figure 12. Installed nuclear power capacity by country (2000-2013)



Given this context, the growth forecasts published by the IEA seem overly optimistic, and it appears more likely that we will see a relatively slow growth of nuclear power in the medium term. As of now, nuclear is not in and of itself a theme in our investment universe.

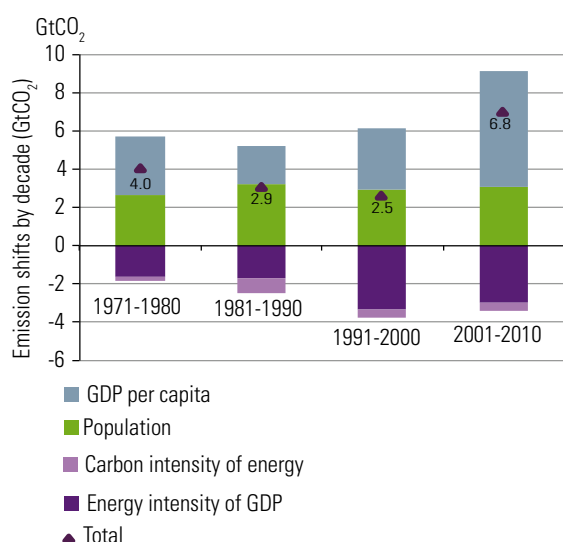
Figure 11. Natural gas production in the United States



Energy efficiency

Increased pressure and volatility in energy prices have pushed improving energy efficiency to centre stage in the strategy of many businesses, especially in the transport and industry sectors. Nonetheless, as illustrated in Figure 13, efforts made in recent decades to reduce the energy intensity of GDP, as well as the carbon intensity of energy production, have not been sufficient to offset increases in emissions due to population growth and a higher standard of living worldwide.

Figure 13. Changes in carbon emissions: positive and negative contributors



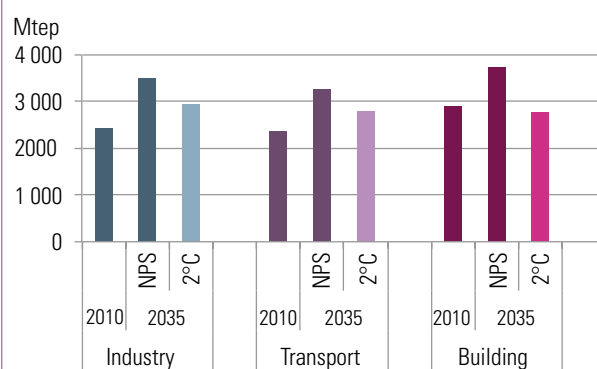
In anticipation of the 2015 International Conference on Climate Change to be held in Paris (COP21), new regulations are set to appear in several countries. China's 12th five-year plan (2011-15) aims for a 17% reduction in the

country's energy intensity (defined as energy consumption over GDP). This goal is likely to be carried over at the same rate in the 13th five-year plan (2016-20).

Guesses as to the size of investments related to energy efficiency vary according to the source. In a study from 2011, the IEA estimated the market's size as falling in the \$147-300bn range. The latest study jointly produced by Ecofys and HSBC arrived at a figure of \$365bn for investments devoted to energy efficiency in 2012, or half again as much as investments in renewables (\$244bn, according to the Renewable Energy Policy Network (REN21)).

Improvements in energy efficiency are predominately associated with the three most energy consuming sectors of the economy: Building (35% of global consumption), Industry (31%) and Transport (30%). According to the Ecofys-HSBC study, three quarters of the investments in energy efficiency in 2012 involved the Building sector, 80% of which went to residential.

Figure 14. Efficiency scenarios for the big 3 energy consumers



'Enabling technologies'

In addition to technologies that directly reduce energy consumption or GHG emissions, the fight against climate change involves massive investments in technologies that indirectly enable CO₂ savings. Two of these look particularly promising right now, and are examined below.

Smart Grids

Expansion of the renewables sector entails large amounts of funding for electrical infrastructure, particularly in the area of transmission/distribution and what are called smart grids.

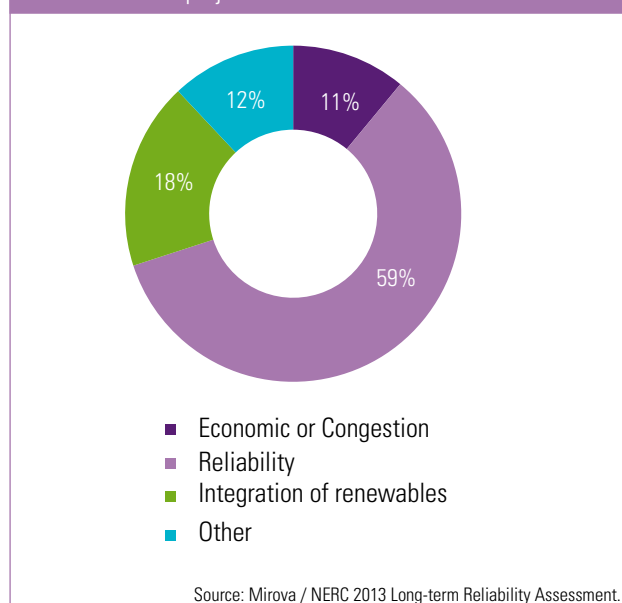
Firstly, the construction of new production capacity in places other than traditional power plants requires that new transmission infrastructure be built. Additionally, since electricity can basically not be stored, the incorporation of intermittent sources of energy such as solar or wind power requires an intelligent management of transmission in order to ensure load matching. The development of smart grids is thus a necessary condition of integrating renewables into

the electrical grid. Furthermore, smart grids make possible additional efficiency gains through demand response systems and peak levelling.

Investments in smart grids could amount to €290bn in Europe and boost growth in the long term for European utilities (UBS, 2014). After years of underinvestment, electrical infrastructure (Transmission and Distribution) is finally taking off in the United States, and should experience high growth through the 2030 forecast horizon (estimated at \$120-160bn per decade [Brattle Group, 2014], based on two major drivers:

- New reliability regulations for grids that include requirements as to repair, replacement, updates and maintenance.
- Increasing need for interconnection related to changes in the energy mix (decrease of coal in favour of natural gas and renewables).

Figure 15. Primary drivers of new transmission projects in the United States



Electric vehicles

Transport accounts for half of the world's oil usage, and nearly 15% of all GHG emissions. Developing electric vehicles is beginning to look like a serious alternative to combustion engines. While electric vehicles are comparable to conventional combustion-driven ones in terms of fuel efficiency, they eliminate dependence on oil, and make it possible to envisage 'green' mobility if the electricity to power vehicles can be generated from low carbon energy sources.

Hybrid electric vehicles (HEVs) represented a total of 1.7 million units, or 2.4% of all vehicles sold worldwide in 2012. Japan is the world's largest market for hybrids at one million units sold in 2012, according the International Council on Clean Transportation. The volume of hybrid vehicles purchased in the US and Europe during the same period was

substantially lower, at 360,000 and 135,000 respectively. Nonetheless, annual growth in these two markets is in the 30-40% range. With the favourable momentum seen in Japan, the US and Europe, hybrid vehicles could amount to 6% of the market by 2020.

Electric vehicles are a much smaller market than hybrids, with a total of 112,000 vehicles sold in 2012 (55,000 'plug-in hybrids' and 57,000 'full electric vehicles'). Despite these quite limited sales numbers, electric vehicles are already the target of massive investment on the part of automakers and equipment manufacturers. These investments should help remove current obstacles to widespread adoption of electric vehicles: their high price tag, lack of charging infrastructure and, more generally a lack of confidence in a business model seen as somewhat short of maturity.

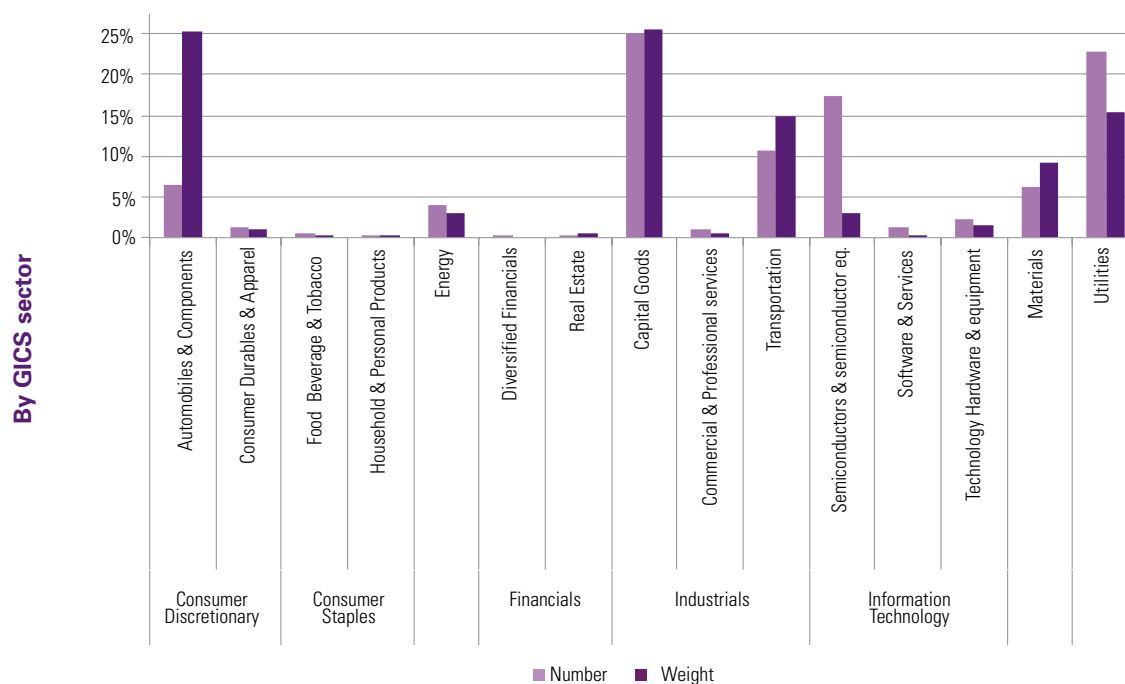
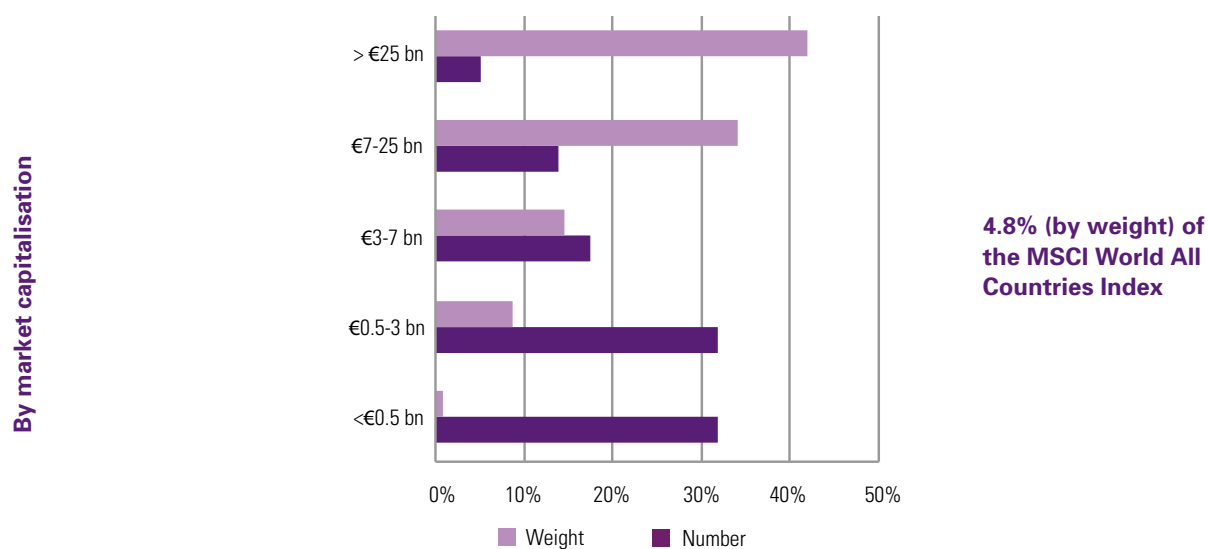
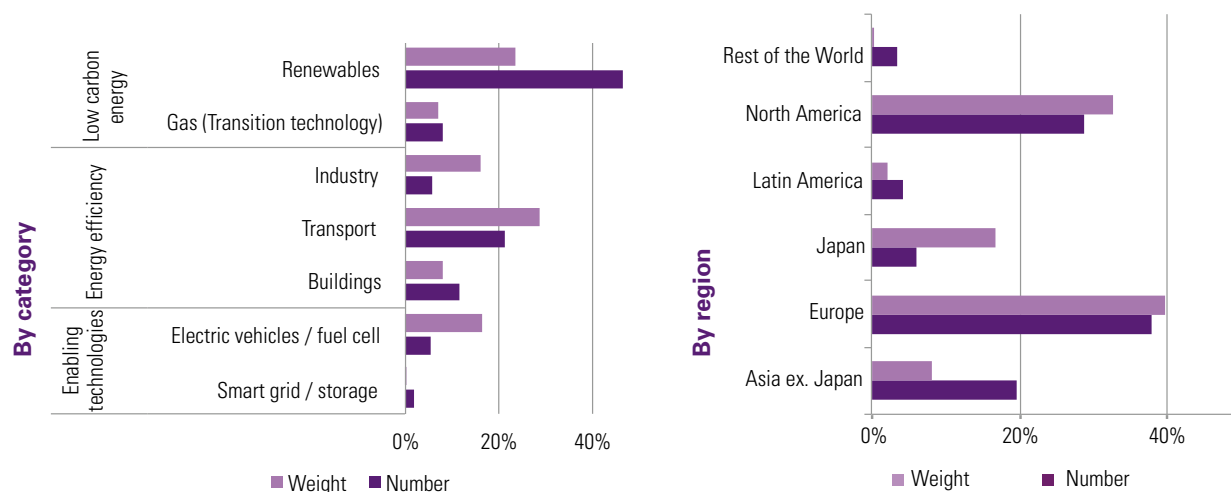
Driven by general regulations on CO₂ as well as those specific to automobiles, electric vehicles could snag a 3% to 4.5% share of new car sales by 2020, according to some scenarios (Rockwood, 2014).

3 Investment Universe

In order to identify the companies with exposure to these various opportunities we rely on an 'Energy Transition' investment universe comprising over 300 securities, 200 of which have market capitalisations of more than €500 million. This universe also shows a healthy diversity in terms of sectors and geographical areas (Figure 16). As of now, 55% of the total number of stocks falls into the 'low carbon energy' category, followed by 'energy efficiency' in second place at 38% and Enabling technologies at 8% in third. Given the global nature of these investment themes, 60% of the stocks in the universe are listed outside of Europe.

Electric vehicles could snag a 3% to 4.5% share of new car sales by 2020.

Figure 16. Overview of the 'Energy Transition' universe



Source : Mirova.

SHAREHOLDER ENGAGEMENT IN EUROPE: A REVIEW



Zineb Bennani

Head of Governance and Engagement

EXECUTIVE SUMMARY

Written on 01/08/2014

Shareholder dispersion and the extreme liquidity of shares made possible by listing on the stock market may result in weakening links between companies management and their shareholders. After all, what is the point in trying to get involved in a company's governance for someone who owns only a tiny fraction of the capital in a large multinational? Why bother trying to influence management decisions when a share can be unloaded in a split second should disagreement or disappointment occur? When majority shareholders are in a position to dismiss a company's management at will, minority shareholders can be tempted to head for the door instead of the ballot box. Yet, as Pierre-Yves Gomez* forcefully and appropriately recalls, one of the key functions of shareholders is to inspire trust in the company's long-term strategy. When shareholder engagement disappears,

this trust vanishes as well, and with it the vision and purpose of the corporate mission, which may be supplanted by short-term profit imperatives or strategies on the part of management to exact more wealth or power.

While they cannot be called new, various forms of shareholder engagement have independently been taking shape in different areas of the world. Today, this issue is gaining ground: investors seem to be taking a stand more often and, what is new, regulatory measures have increased. The purpose of this study is to provide an overview of the issues, actors and current trends affecting shareholder engagement in Europe and the United States that explains the objective basis for Mirova's choices within its own engagement policy.

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1 | The history of shareholder engagement

Definition of shareholder engagement

Engagement is a fairly recent concept, which first emerged in the United States in the 1960s, driven by radical movements and religious congregations seeking to pressure companies to change their behaviour on ethical or moral grounds. The extreme dispersion of capital in Anglo-Saxon countries was favourable to the rise of engagement, especially initiatives designed to ensure that management ran companies in the best interests of shareholders.

With the rise of institutional investors as the holders of companies' capital and the recent development of responsible investment, what is known as "shareholder" engagement has progressively moved toward questions of corporate social responsibility, a trend that has significantly accelerated since the Great Financial Crisis began in 2008 due to pressures from both regulatory agencies and groups of institutional investors. Engagement strategies vary from one country to the next and from one category of investors to the next according to a number of criteria. These include the legal context, prevailing regulations, capital structure and types of shareholders involved as well as the organization of actors in the financial markets.

Much like SRI (Socially Responsible Investment), shareholder engagement suffers from the lack of a 'legal' definition. Nonetheless, there is a broad consensus within the investment community as to what constitutes engagement. According to the definition proposed by Novethic, engagement is *'the act, on the part of an investor, of taking a stand on ESG issues and demanding of the companies it targets that they meaningfully improve their practices. These demands are made by means of a structured process that includes direct dialogue with the company and ongoing monitoring. Investors may use any or all of several levers at their disposal should dialogue prove insufficient to induce change. These include public declarations regarding the engagement process and its progress or lack thereof and the inadequacies of companies' extra-financial practices, management actions ranging from a freeze on the position to full divestment, and, naturally, the exercise of shareholder rights: raising questions at general assemblies, voting against proposals, supporting or submitting external resolutions.'*

This definition highlights the two primary approaches to shareholder engagement that coexist on both sides of the Atlantic and serve to distinguish two categories of investors.

The two principal approaches to shareholder engagement

The first approach, commonly known as 'activist', is often associated with the 'aggressive' practices that seek to directly affect a target company's governance and influence the management strategy. American hedge funds are notorious for using this method to try and maximize short term shareholder return. For some, 'activism' may also refer to the mediatisation of engagement actions; some pension funds, particularly in the United States, tend to use the media as

a means of pressuring companies, employing reputational threats to wrest them into changing their positions. Shareholder dispersion and portfolio diversification particularly favoured the emergence and development of this approach in the United States, largely because the capital holdings of pension funds remain relatively small and consequently offer little leverage for influencing company management.

'Active' engagement, on the other hand, is associated with a more constructive process whose aim is to employ shareholders' rights to influence a company's behavior and encourage its management to progressively shift towards more responsible practices. Such engagement takes the form of face to face dialogue, or discussions between the company and a group of investors that share a set of values and collaborate to reach a common goal with respect to influencing a company's policies. While the content of such exchanges usually remains confidential, investors are tending more and more to make the outcome of their activities public. This approach first emerged in Europe in the Netherlands, with the 1997 creation of the 'Dutch Association of Investors for Sustainable Development' (VBDO); the institutional investors of the United Kingdom soon followed suit, goaded into action by the scandals and financial crises of the 2000s.

What makes shareholder engagement desirable for investors?

The growing interest of investors for shareholder engagement can be attributed to several factors. Seen first and foremost as part of the fiduciary duty of investors vis-à-vis the final capital owners, shareholder engagement aims to optimize the company's creation of long-term value by encouraging management to pay heed to the full range of risks associated with their activities, whether these be of a financial or extra-financial (environmental, social, governance) nature. Thus construed, engagement is the ultimate risk management tool.

In the case of passive investment strategies or Responsible Investment approaches that do not have a negative screening process, engagement can be a desirable alternative to divesting of an asset. In this way, engagement helps to anticipate and manage reputational threats arising from holding the securities of companies with highly controversial activities.

Collaborative engagement furthermore makes it possible to share associated costs, while increasing the leverage available to insist that company management address the demands involved; these advantages help to explain the considerable interest expressed by pension funds in this form of engagement.

The various mechanisms for shareholder engagement

Several methods can be employed in conducting engagement according to the strategy selected by participating investors. These include:

- ➔ actively exercising voting rights;
- ➔ Initiating dialogue with management and/or Board in writing or in person;

- external communications such as press releases;
- submitting resolutions or counterproposals;
- organizing 'vote no' campaigns among shareholders;
- initiating dialogue with national and supranational regulators;
- participating in coalitions with other shareholders.

Impediments to the development of shareholder engagement

Nonetheless, there remain a number of obstacles that impede the spread of shareholder engagement, something the OECD noted in its 2011 report on the role of institutional investors in corporate governance. The report points specifically to the following:

- a low level of encouragement at the European level as concerns the exercise of voting rights and engagement;
- a high level of portfolio diversification dictated by prudential statutes which limits the portion of a company's capital that can be held;
- A strong tendency for assets to be funneled into passive management strategies;
- the significant economic costs associated with implementing voting and engagement strategies;
- an ever greater lengthening of the investment chain;
- a model of executive compensation that fails to reward attempts to achieve outstanding extra-financial performance.

To these we would add the following:

- a lack of expertise and resources necessary to successfully conduct engagement;
- considerable uncertainty surrounding regulations at both the national and European levels, as well as confusion over the meaning of 'acting in concert';
- the lack of a clear definition for the notion of 'fiduciary responsibility'.

These obstacles notwithstanding, we have seen a noticeable increase of interest on the part of investors in the exercise of their shareholder responsibilities and engagement; this interest is manifest in a proliferation of voting and engagement strategies in Europe over the last 10 years (as visible in Figure 1).

Figure 1. Progression of voting and engagement strategies in Europe



This enthusiasm can be explained in a number of ways. First of all, the European Commission, national regulators and the primary professional associations of the financial industry, as well as national and international investor organizations have been applying increasing pressure to encourage more responsible investment policies geared toward the long term. Meanwhile, the gradual evolution of CSR (corporate social responsibility) toward greater standardization has tended to resituate extra-financial risks as factors at the heart of asset managers' and institutional investors' fiduciary duty, and thus to be taken into account by investment policies, as witness the case of POSCO

2 | The European framework for promoting shareholder engagement: between 'hard' and 'soft' law

The regulatory framework that handles questions of corporate governance and shareholder engagement involves a combination of binding legislative measures, or hard law, and codes of good practice, which are not binding, and hence 'soft law'. These various rules are generally established at the local level, thus explaining the heterogeneous practices and differing levels of maturity among the European markets.

At the European Commission level

The Directives related to shareholder rights were intended primarily to address issues related to the exercise of voting rights, in order to eliminate barriers to transnational voting. For instance, the 'shareholder rights' directive of 11 July 2007 put an end to lock-up provisions, which had previously been a major impediment to voting by foreign asset holders, and standardized certain mechanisms to facilitate the exercise of voting rights.

These include:

- the right to submit a question and have it appear on the agenda of the general assembly;
- the right to submit resolutions for the agenda of the general assembly.

The transposition of the directive into national law by European countries has led to an increase in shareholder participation rates at general assemblies. In Germany, for example, this number rose from 46% to 60% for DAX 30 companies between 2005 and 2011. However, the rules governing the exercise of voting rights continue exhibit considerable variance among European Union member States, and the actual impact of the directive on shareholder rights is in fact very limited, given the complexity of the procedures involved and the heavy requirements for submitting shareholder resolutions at general assemblies.

In truth, the European Commission only began to pay serious attention to the issue of shareholder engagement after the 2008 financial crisis. Analyses of the underlying causes that brought about the catastrophe brought to light considerable failings in terms of governance practices among all types of companies, but especially in the financial sector, leading the Commission to raise questions about the role of shareholders in this crisis, in particular with respect to their strong tendency to privilege short-term returns and maintain a passive attitude towards management and boards.

In view of these findings, shareholder engagement has taken on a very different cast, and has been identified as lying at the heart of debates over corporate governance.

In 2010, the European Commission published its first Green Paper on the governance compensation policies of financial institutions. This was followed by the publication of a second Green Paper on the topic in April of 2011. Needless to say, long-term investment and shareholder engagement were at the heart of both the issues identified and the process of reflection, which coalesced, in 2012, as a plan for action to modernize the legal framework governing European companies based on three broad principles, long term shareholder engagement first among them.

This action plan will likely give rise to a revision of the Directive on the rights of shareholders evoked earlier (directive 2007/36/CE); an initial proposal was, in fact, published by the European Commission in April 2014. The draft in question emphasizes the need for transparency on the part of institutional investors and asset managers regarding their investment and engagement policies, as well the importance of 'Say on Pay.'

If adopted, the directive will provide significant leverage for increasing shareholder engagement in Europe.

At the national level within Europe

Shareholder engagement is a relatively recent phenomenon in Europe, compared to the US, and regulatory frameworks are not designed to encourage it. Its development has been

largely due to institutional investors with long-term horizons, such as pension funds, which, because of the broad diversification of their portfolios, find themselves in the position of 'universal' investors and therefore must carefully monitor the companies they invest in and effects such corporations may have on the development of the world economy.

The relative weight of pension funds in the make-up of financial markets for different European countries goes a long way toward explaining the varying levels of development as concerns shareholder engagement in Europe. The countries where institutional investors are dominant, such as the United Kingdom, the Netherlands, Switzerland and Denmark, are also those in which engagement practices are most developed. In 2010, more than 44% of all securities in the UK were held by pension funds, whereas the average proportion was around 27%, according to an OECD report.

It is also worth noting that the regulatory frameworks of the United Kingdom and Netherlands are particularly favorable to the development of shareholder engagement.

The UK Pension Fund Disclosure Regulation (2000), which was an amendment of the 1995 Pension Act, had a significant impact on the Responsible Investment strategies employed to invest in securities managed by pension funds due to the obligation to integrate ethical, social and environmental considerations in their investments. This law inaugurated shareholder engagement on the part of British pension funds. Today, thanks to the establishment of the 'UK Stewardship Code,'¹ overseen by the UK's regulatory body for financial markets, the Financial Reporting Council, the British market has the most structured regulations for shareholder engagement in Europe. The stewardship code had garnered over 260 signatories by the end of 2012.

In the Netherlands, the Ministry of Finance played a decisive role in driving the development of shareholder engagement; the agency created a supervisory committee for governance, whose task it was to ensure companies' proper application of codes.

Meanwhile, institutional investors play a crucial role in monitoring respect for the provisions relating to the code of governance. They have organized an association, known as 'Eumedion', whose function is to represent the interests of institutional investors. In 2011, Eumedion published its own code, the **Eumedion Best practices for engaged share-ownership**,² aimed at encouraging shareholder engagement among institutional investors in the Netherlands and Europe, and supports the incorporation of ESG issues in shareholder policies.

Both these systems introduce considerable flexibility through their adoption of the 'comply or explain' principle, which lightens the burden of binding regulations, which can prove very expensive to implement and whose efficacy has yet to be demonstrated.

1. See the UK inset for further information.

2. See the Netherlands inset for further information.

In Switzerland, the rise of shareholder engagement is largely attributable to the Ethos Foundation,³ created in 1997 by two pension funds, one public, the other privately owned, managed equitably by employees and employer. These two funds wished to create a management tool for their assets that would help support sustainable development. Ethos currently brings together 139 institutional investors to promote the inclusion of sustainable development and good governance principles as part of investment activities as well as the long term interests of society. Ethos is very active in Switzerland via its overlay services division, which conducts engagement actions with Swiss companies on behalf of the pension funds that support the foundation. Given the significant holdings of these funds in Swiss companies, Ethos has considerable influence over CSR practices and corporate governance.

In France, the legal framework does not appear particularly favourable to the development of shareholder engagement. What obligations there are with respect to voting rights are applicable only to asset managers, who, alongside insurers, control the market. Despite this lack, we observe a distinct positive tendency, buoyed in part by a few large public retirement funds, such as the ERAFP (Établissement de Retraite Additionnelle de la Fonction Publique) that have adopted responsible investment as their investment strategy, and also by the larger asset managers whether general or more specifically oriented toward Responsible Investment, and in part by the larger asset managers, whether generalist or specifically oriented toward Responsible Investment. This said, the lack of structure in the market does not encourage shareholder engagement on the part of French players, despite the fact that France has the most developed regulatory framework as concerns responsible investment and CSR.

In Italy, shareholder engagement is taking its first steps. Like many European countries, Italy was hard hit by the financial crisis, forcing the market to adapt in order to revive the confidence of financial markets and attract foreign investors. In 2011, this led the country to revise its regulations in view of allowing investors to collaborate in the context of engagement issues relating to environmental, social, and governance (ESG) issues. In 2013, Italy published its stewardship code (Principi italiani di Stewardship) based on the EFAMA version. It aims to encourage institutional investors and asset managers to publish their voting policies, exercise their voting rights, and collaborate with other investors in opening channels of dialogue with issuers.

At the level of professional associations within the financial sector

The EFAMA, which is the European association for asset management, developed a code in 2011 of best practices geared to European asset managers, the 'Code for External Governance' and designed to encourage the proper completion of fiduciary duties and active dialogue with companies. However, it was less far-reaching than the British code. Furthermore, there is no information available regarding the number of European asset managers that adhere to or apply the code.

UNPRI – The United Nations' Principles for Responsible Investment

A list of Principles for Responsible Investing (PRI) was published in 2006, under the aegis of the Finance Initiative of the United Nations Programme for the Environment and the Foundation for a Global Compact, and with the active participation of a large worldwide network of institutional investors, experts in the investment industry, government representatives, academic researchers and other stakeholders. The ambition of this undertaking was to establish a framework that would make it possible for players in the industry to operate responsibly.

The second of these six principles expressly urges signatories to establish guidelines for actively shouldering their responsibilities as shareholders and exercising their voting rights, or, at the very least, ensuring that voting by proxies conforms to their voting policy. This principle also encourages engagement with issuers, whether directly or through a service provider, not only with regard to governance but also social and environmental issues.

In keeping with these principles, the PRI has established a platform for collaborative engagement (the Clearinghouse), which, in 2011, brought together more than 315 signatories who had conducted engagement actions vis-à-vis more than 782 companies.

By recognizing shareholder engagement as a significant contributor to increasing the creation of long term value, this initiative constitutes acknowledgement from an international organization of the importance of fiduciary duty and the role of institutional investors in promoting CSR among companies. To date, more than 1,200 investors have signed the PRI, representing a total of \$34 trillion in assets under management. Among these signatories 61% are asset management companies, 23% are institutional investors, and 16% are providers of specialized services for the investment industry (ratings agencies etc.).

Despite firmer regulations and an increase in shareholders' voluntary engagement in favour of responsible investment practices, shareholder engagement is still in its infancy among European companies.

3. See the inset devoted to Switzerland for additional information.

3 | Overview of shareholder engagement practices by country

Germany

Key Figures	Assets under management*: € 1,185,320 million, or 6% of all assets worldwide
	Percentage of assets held by pension funds: 13%
Legislative and Regulatory Framework	Law governing investments (Investmentgesetz): article 32
Principal actors	The Federal Financial Supervisory Authority (BAFIN)
	The Deutsche Schutzvereinigung für Wertpapierbesitz (DSV): one of the oldest shareholder associations, bringing together more than 25,000 shareholders that attend over 850 general assemblies all told
	Bundesverband Investment und Asset Management (BVI): the largest association of institutional investors, with more than 90 members and €1.5 trillion in assets under management
Prevailing governance code	Deutscher Corporate Governance Kodex
Principal catalysts	N/A
Active players	DWS Investment deka

* Source: EFAMA International Statistical Release: Worldwide Investment Funds Assets and Flows (T1 2012).

Focus on Germany

The German system of governance is heavily coloured by influence of the regulatory state. Shareholders enjoy considerable rights and have the means to support or submit counterproposals at general assemblies. There are no minimum requirements for eligibility to submit a counter-proposal at a general assembly, and there are no legal restrictions on proposals made by shareholders.

Shareholders play rather a large role in German companies. In 2009, investment firms, insurance companies and foreign institutional investors represented over 35% of all listed shares issued in the country, as concerns the 30 companies of the DAX, 70% of shares are held by German and foreign institutional investors. These elevated rates are a direct legacy of the cross ownership that predominated when companies borrowed massively to obtain financing the 1950s and 60s.

The state of affairs presented by the OECD report indicates that German institutional investors are encouraged to exercise their shareholder responsibilities. First of all, seen in terms of the legal framework governing voting, the trend so far in is in the direction of participation. In 1998, the principle of 'one share, one vote' was introduced; from 2003-2005 a series of measures were passed protecting minority shareholders and establishing a mandatory record date, which considerably facilitates the exercise of voting rights. One must recall that in Germany, the holder of a single share can set in motion a legal process to annul a decision made at a general assembly. Shareholders can also act by rejecting items on the general assembly agenda and presenting counter-proposals.

Mutual funds, which are the most common investment vehicle in Germany, are overseen by investment management companies, the largest of which are DWS Investment, Deka and Union Investment. These companies are governed by a law on investing (Investmentgesetz) whose function is to protect investors' rights. Article 32 of this law stipulates that: 'it is appropriate for institutional investors to directly exercise their voting rights as shareholders'. This recommendation has played an important role in the activities of institutional shareholders in the country. Lastly, the German association for asset management publishes a 'voluntary code of conduct' that defines a governance framework for the sector and stipulates that 'an investment company acts always and exclusively in the best interests of investors and market integrity... In keeping with this principle, the investment company exercises shareholder and claimant rights associated with the holdings of each fund independent of any third party interest, particularly custodian banks and affiliated corporations.'

In practice, institutional investors in Germany acquit themselves of their shareholder responsibilities through voting and the option of taking action at general assemblies via the submission of counterproposals, all performed through management companies. As a result they are some of the most active institutional investors in Europe, despite two significant obstacles also seen in France: collaboration as a necessary condition and the risks associated with collective action. German companies are remarkable for their capital structure: in close to 80% of German companies, at least one shareholder possesses more than 25% of the capital. Consequently, thresholds have been established to frame the rights of certain shareholders, which encourages institutional investors to cooperate without resorting to collective action.⁴

4. Since 2009, a law on the limitation of risk offers a more nuanced definition of concerted action: concerted measures that likely to influence corporate strategy.

On the other hand, there is very little transparency with respect to voting policies or reporting of votes cast, due to a lack of disclosure requirements. Transposition of the European Directive on UCITS (Undertakings for the Collective Investment of Transferable Securities), begun in 2001, should help to improve practices in this area. As concerns engagement, German institutional investors are highly focused on the national market and rarely vote abroad, while foreign institutional investors still rarely vote in Germany. Among those who do, 80% merely follow the recommendations of their proxy agency.

Focus on Germany's biggest pension funds: MetallRente

MetallRente is the largest retirement contribution system. It was created in 2001 by German employees in the electrical and metallurgy sectors. It is bundled with a platform for distributing retirement funds that employs three vehicles, the MetallDirektversicherung (an insurance policy), the MetallPensionskasse, and the MetallPensionsfonds. The funds, totaling \$780 Million, are managed by third parties.

The pension fund consists of only \$33 million. MetallRente has more than 210,000 beneficiaries, having progressively

expanded to employees in the textile and steel industries as well as those working in construction materials.

Since 2001, pension funds are under the obligation to disclose to what extent they take into account SRI criteria, and since this date, all of MetallRente's assets are managed in accordance with SRI criteria, with a specific focus on social and human rights issues. The fund employs an exclusionary strategy and boycotts companies with trouble managing their CSR performance and those 5% or more of whose revenues come from activities related to social undesirable sectors such as alcohol, the arms industry, tobacco or pornography.

The fund is overseen by a joint board consisting of employee representatives and corporate executives. Due to the German governance system, employees are heavily represented within the governing bodies of companies and influence companies' strategic decisions in no small way. In order to limit the possibility of undue influence, the pension fund has promised not to exercise its voting rights, exert influence, or undertake engagement vis-à-vis companies that are part of the fund.

While the fund is not a signatory of the PRI, it has committed to applying the principles.

United States

Key figures	Assets under Management*: €10,884,509 million, or 57 % of all AuM worldwide
	Percentage of assets held by pension funds: N/A
Legislative and Regulatory Framework	Article 14 of the Security and Exchange Act (1934)
	Employee Retirement Income Security Act or ERISA (1974) : law governing the shareholder engagement activities of pension funds
	Sarbanes-Oxley Act (2002)
	Shareholder Bill of Rights Act and Shareholder Empowerment Act (2009) [currently referred to committee]
	Dodd-Frank Wall Street Reform and Consumer Protection Act (2010)
Principal actors	Commission on Public Trust and Private Enterprise (2003)
	National Association of Corporate Directors (1977)
	Security Exchange Commission
Prevailing governance code	Report of New York Stock Exchange Commission on Corporate Governance 2011
Principal catalysts	N/A
Active Players	Pension funds (TIAA-CREF, CalPERS)

*Source: EFAMA International Statistical Release: Worldwide Investment Funds Assets and Flows (T1 2012)

Focus on the United States

The United States are remarkable for having no national corporate governance code. Despite this lack, however, various texts produced by the Federal governments or by state legislatures have made possible a fairly complete regulatory framework.

Shareholder rights were first guaranteed by the Security and Exchanges law of 1934, which in Article 14, assigns responsibility for protecting them to the SEC, already responsible for 'policing' the stock market. As such, the SEC must ensure the quality and transparency of the information circulated, especially within the proxy voting system that is the principal focus of Article 14. This same article also permits shareholders to individually submit resolutions at shareholder assemblies. The prerequisites for submitting a resolution being quite simple, the practice has become quite current in the US. While this mechanism is generally not viewed with great enthusiasm by management, it does nonetheless help move dialogue between a company and its shareholders forward; this is particularly true for subjects like executive compensation, shareholder rights or questions relating to ESG. As for their efficacy—Ernst & Young LLP found that 15% of the 800 proposed resolutions submitted by shareholders were withdrawn following dialogue between shareholders and the company.

In 1974, a piece of legislation known as ERISA (Employee Retirement Income Security Act) was passed. Its role: to oversee shareholder engagement activities and define the obligations of pension funds. Insisting, among other things, on the fiduciary duty of pension funds, this law establishes a requirement for maximized investment return, thanks to management focused on the interests of participants and beneficiaries. This law encouraged many private pension funds to exercise their voting rights, not only for domestic companies, but also for shares held abroad. In practice, ERISA also pushed public funds to exercise their voting rights, even if this was not its original intent.

The Sarbanes-Oxley Act of 2002 marked a turning point of global importance in terms of corporate governance. Coming in the wake of several financial scandals directly linked to the relationships between companies like WorldCom or EnRon and their external auditors, this Act dealt with the reform of corporate accounting practices at publicly listed companies and with investor protection. The various reforms set in motion by this law considerably increased requirements as concerns the transparency of information, a shift that has without a doubt had a positive effect on shareholders' exercise of voting rights. It is fair to say that the effects of Sarbanes-Oxley have been felt well beyond the frontiers of the United States.

More recently, two bills from 2009 indicate a rising concern with the protection of shareholder rights. The first of these, the 'Shareholder Bill of Rights Act' (S. 1074) was intended to give shareholders a greater say in the process of nominating, electing and compensating the executives of publicly held companies. It would have permitted shareholders to vote on various essential components of these governance topics. A second proposed law, the 'Shareholder Empowerment Act' (H.R. 2861), proposed a modification of the 1934 statutes to specify the rules and criteria governing the election of Board members and, to a lesser extent, the compensation of directors.

The proposal was notable for introducing the idea of an advisory shareholder vote on compensation reports.

While not enacted, both bills contributed substantially to the latest major corporate governance development in the United States, the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010. This legislation contains an entire section dedicated to provisions for investor protection and treats questions of executive compensation, such as an advisory vote for golden parachutes or the curtailing of discretionary voting by brokers on the topic of remuneration. The law also includes measures that touch on more general aspects of corporate governance: proxy voting, separation of Chief Executive Officer and Board chairmanship functions, etc. Since the law went into effect, the SEC has focused primarily on defining more specific measures for implementing these rules.

ERISA's 1974 package constituted a decisive step forward in terms of a framework for governance in the United States, and established several longstanding practices. Subsequent legislation has reinforced protection for minority shareholders and fostered awareness of the central issues of governance and their impact on both asset management and financial performance. Their measures have served to encourage active shareholder, as the growing number of resolutions submitted on the subject of executive compensation, which doubled in 2013 compared to the previous year, illustrates.⁵

Focus on the major US pension funds

CalPERS – California Public Employees' Retirement System

CalPERS can justifiably be described as a pioneer in the area of modern corporate governance, and is well-known for activist shareholders. This US agency, which acts as an institutional fund manager for the state of California, is the largest public pension fund in the US, with close to \$233 billion in assets under management in 2012. Created in 1932, the agency became involved in corporate governance only in 1984, under Jesse Unruh, following a financial blackmail incident in which a company it held passively was implicated. That same year, CalPERS adopted a corporate governance policy that stressed the creation of long-term value for shareholders. This shareholder activism played a non-negligible role in the resignation of several major chief executives, including Richard Grasso in 2003 (NYSE), and Michael Eisner in 2005 (The Walt Disney Co.). Through its many initiatives, which strive to be international in scope, the agency has become a major player in terms of corporate governance; these include launching the International Corporate Governance Programme's in 1996 and the UK's 1997 adoption of corporate governance principles, as well as US standards in 1998, and, more recently, establishing a strategic plan for combating abusive compensation among executives in 2003.

The Focus List, originally created in 1987, was completely revised in 2010 in order to make its engagement approach more effective. This formerly public list, which is now confidential, identifies companies within CalPERS' portfolio with particularly poor governance practices and financial results. A thorough engagement process allows the agency to work

5. Source: 2012 Proxy Season Review: US, ISS.

towards improving these companies' performance. Since 2011, the fund has been particularly involved in supporting shareholder resolutions that address management and director practices. The list has a longstanding reputation of being able to make previously laggard securities outperform their indices, a result known as the 'CalPERS effect'. Another distinctive feature of CalPERS is that the agency has for a long time taken center stage in the theoretical debates on the topic of corporate governance, in particular through its internet portal⁶ dedicated to the topic, created in 1999, which compiles no less than 14,000 documents on the subject.

CalPERS has also not hesitated to publicly take a stance on major issues, for instance, by calling for a reform of the corporate compensation system in 2004. The agency is deeply implicated in ESG issues, and has invested \$1.5 billion in cleantech to date. In addition, the agency pursues on-going engagement with corporations on ESG topics.

TIAA-CREF - Teachers Insurance and Annuity Association, College Retirement Equities Fund

TIAA-CREF is one of the world's largest financial services providers, and the primary supplier of retirement savings plans for teachers, academic researchers, medical professionals and workers in the cultural sector. The company manages over \$406 billion of assets in-house according to a predominately long-term strategy, and describes itself as a universal investor. TIAA also offers Plan Sponsor Services.

As a highly engaged investor, TIAA-CREF has been addressing social questions for close to 30 years. As early as the 1970s, the company began dialogue with management and boards of directors to promote change, for instance, in Apartheid South Africa. Since then, TIAA has acquired the distinction of being the first US company to adopt and implement, on a voluntary basis, an advisory vote by beneficiaries on its executive compensation policy.

TIAA also does not hesitate to make its position known on social topics that have an impact on shareholder value. In the last few years, TIAA has exercised its vote in support of greater transparency as regards activities related to environmental issues, human rights, and workers' rights. The fund also takes part in lobbying activities, particularly those aimed at improving global standards of governance, and participates in collaborative engagement initiatives alongside other investors within the context of the ICGN, the Council of Institutional investors, or the Asian Corporate Governance Association.

TIAA makes an effort to vote as often as possible at general meetings. Well-versed in voting procedures all over the world, the fund is deeply committed to exercising its voting rights. The company's engagement policy, which was updated in 2007, is anchored in the principle of 'quiet diplomacy', which eschews public confrontation in order to ensure that dialogue takes place under the best possible conditions.

6. <http://www.shareholderforum.com/>

France

Key Figures	Assets under Management*: €1,447,385 million, or 5.4% of all AuM worldwide
	Percentage of assets held by pension funds: 5%
Legislative and Regulatory Framework	2001: law concerning new economic regulations: nouvelles régulations économiques (NRE)
	2003: law concerning banking security loi sur la sécurité financière (LSF) Article L 533-22 of the Monetary and Financial Code presents voting obligations for portfolio management companies on a 'comply or explain' basis
	2003: AMF General Rules Articles 314-100 à 314-102 require that financial management companies possess a voting policy and compile a report on the exercise of voting rights
Principal Actors	AMF : autorité des marchés financiers
	AFEP and ANSA: associations of issuers
	AFG : Association Française de Gestion
	French government
Prevailing governance code	AFEP-MEDEF Code
	AFG Governance Code
	MiddleNext Code
Principal catalysts	'Say on Pay' introduced in 2013
	AMF report on General Meetings
Active players	Large national asset management companies
	Pension funds and insurers: ERAFP, FRR, Ircantec, CNP assurances
	FIR : Cordial

*Source: EFAMA International Statistical Release: Worldwide Investment Funds Assets and Flows (T1 2012)

Focus on France

The legal context for questions of shareholder voting and corporate governance is based on national legislation as well as the relevant European directives.

As early as 1997, the code of ethics for the AFG (Association Française de Gestion) encouraged members to exercise their rights in the interest of their clients. This code had a broad impact, fuelled, on the one hand, by laws associated with the 2001 NRE (nouvelles réglementations économiques)⁷ and 2003 LSF (lois sur la sécurité financière), and on the other by the general rules of the French market regulator, the AMF (Autorités des marchés financiers).

In France, the voting requirement applies only to asset management companies and is a provision of Article L533-22 of the Monetary and Financial Code governed by the 'comply or explain' principle. The general rules of the AMF (articles 314-100 to 314-102), however, require that financial management companies establish a voting policy that, among other things, specifies procedures for the exercise of voting rights, and that they draft a report on said exercise of voting rights.

Despite a lack of regulatory goals, most institutional investors (insurers and retirement funds) exercise their voting rights, generally through mandates delegating the task to their asset management companies.

The AMF, which is the regulating authority for financial markets in France, plays a leading role in improving practices where the exercise of voting rights and protection of shareholder rights are concerned. It provides oversight and control over how the AFEP-MEDEF's governance code (a code published by issuer organizations that is the primary reference point in terms of governance for French companies) is applied by CAC 40 companies.

Additionally, the AMF frequently sponsors working groups that bring together various stakeholders in order to produce recommendations for enhancing corporate governance in France. In 2012, the AMF published recommendations for the improvement of general assembly procedures for listed companies. The first of these entails the establishment of on-going dialogue between companies and their shareholders on the topic of voting policy.

Although the obligation to exercise voting rights currently only applies to asset managers at this juncture, the AMF encourages French and international institutional investors to define their own voting policies and vote at general assemblies (per recommendation AMF n°2011-06 regarding voting consulting firms) and adds that by voting, such investors contribute positively to the development of good governance practices at publicly listed companies by ensuring respect for rules promulgated by professional bodies.

Focus on the most prominent professional initiative: FIR

The Forum for Responsible Investment, commonly known as the FIR (Forum de l'investissement Responsable) is a

multilateral association that brings together various actors from the value chain of Responsible Investing in France which, in 2010, launched an initiative dubbed 'Cordial' (short for Corporate Dialogue), whose goal is to establish dialogue with companies from the SBF120 (Société des Bourses Françaises 120 Index) on environmental, social or governance topics. The singularity of this engagement initiative lies in its constitution of a workgroup that includes not only asset managers, but brokers, ratings agencies and consultants, which makes it the first initiative of its kind in Europe. However, it is not an attempt to directly influence company behaviour. The engagement process takes the form of a predefined questionnaire that is distributed to companies at face to face meetings; results are then summarized in a report that offers recommendations as to good practices to implement with respect to the particular topic of engagement.

The first two themes, launched in 2010, were, first, the submission of executive compensation policies and ESG criteria to voting by the general assembly (meetings with 22 companies) and second, Human Resources policies in the context of the financial crisis (meetings with 31 companies). A final report on each engagement process is published on the FIR website.

Focus on France's major pension funds

The ERAFP: supplementary retirement plan for public servants

The ERAFP is a public administration body created in 2005 following a reform of the law governing retirement benefits (article 76 of law 2003-775 of 21 August 2003) in order to manage supplementary retirement benefits due to public servants, local authorities and employees of public hospitals. The entity is placed under the authority of the State and administered by a joint board of directors consisting of employer representatives and representatives of contributing beneficiaries.

With 4.6 million contributing beneficiaries, the ERAFP is one of the largest public pension funds in the world. It controls close to €12 billion in assets, which are entirely invested according to an approach that is 100% socially responsible.

As a long-term institutional investor and signatory of the PRI, the ERAFP was a pioneer, establishing an SRI charter as early as 2006 to reflect its values and vision of responsible investing. This charter remains a reference for the ERAFP's asset managers, guiding their investment selection, portfolio construction process, and dialogue with companies as well as their exercise of shareholder rights (voting, submission of resolutions, questions at general meetings etc.) and their collaborative undertakings or participation in shareholder coalitions.

In 2012, at the initiative of its board, the ERAFP established guidelines for shareholder engagement that would become the first building blocks of the engagement policy that the institution is currently proposing alongside several other pension funds and long-term investors. One of the fund's first efforts in this direction was a press release published 2 October 2012, in

7. Economic regulations known officially as Loi NRE, no. 2-1-420 relative aux nouvelles réglementations.

which the ERAFP took a clear stand on Arcelor Mittal's proposed closure of the Florange blast furnace and expressed its concern regarding the need to balance the interests of all stakeholders.

This initiative heralds the emergence of a genuine desire on the part of the pension fund to develop an active and unapologetic engagement policy to address concerns that draw on the values of the establishment.

FRR: Reserve Retirement Fund (Fonds de réserve pour les retraites)

The FRR is a public entity created in 2000 to manage the country's collective resources for the purpose of ensuring the financing needed by the social security retirement schemes for employees in the private sector, artisans and business owners.

The FRR, which had €35.1 billion in assets in December 2011, is overseen by a supervisory board that includes repre-

sentatives of public authorities (parliament and ministers), representatives of social partners and qualified individuals.

A long-term investor and founding member of the PRI, the FRR launched a strategy of responsible investment in 2003. To this effect the FRR defined general guidelines defining a policy of responsible investing, and in 2004 incorporated SRI criteria in its specifications for traditional mandates. In 2005, the supervisory board adopted and implemented guidelines for the exercise of voting rights, then, in 2009, began its efforts at engagement, starting with the 10 companies it considered highest in priority. The FRR's engagement approach takes the form of dialogue with companies and maintains continuity with the exercise of voting rights. Also worth noting, a certain number of mandates are already implementing an engagement strategy alongside their SRI strategy that governs the funds. Lastly, the FRR plays a very active role in the development of PRI and lend support to a variety of collaborative engagement initiatives.

Italy

Key Figures	Assets under Management: N/A
	Percentage of all assets in pension funds worldwide: N/A
Legislative and Regulatory Framework	Principi italiani di Stewardship
Principal Actors	Comitato per la Corporate Governance
	Assonime
	Assogestioni
Prevailing governance code	Codice di Autodisciplina delle società quotate
Principal catalysts	N/A
Active players	Etica SGR
	Fondazione culturale Banca Etica
	Pension fund of the Banca Intesa San Paolo group
	Cometa pension fund

Focus on Italy

In 2011, a meeting between the Italian stock exchange, Abi, Ania, Assogestioni Assonime and Confindustria created a new 24 member Committee on Corporate Governance, charged with updating Italy's code of governance, the Codice di Autodisciplina. The changes to this code, which was first published in 1999 and overseen since 2001 by Assonime, the Association of the Italian joint stock companies, include the integration of d.lgs 6/2003 regarding reforms affecting private equity firms and d.lgs 262/2005 on economic protection. The new Code also addresses executive compensation policies from the perspective of the European provisions in article 123-ter of the Testo Unico della Finanza. The committee revised the standards for good governance as concerns the composition and functions of the Board. Member entities are encouraged to publish their criteria for nominating and

evaluating independent board members. These guidelines are applied in keeping with the European principle of 'comply or explain'.

The exercise of voting rights by Italian pension funds is governed by the legislative decree 252/2005, issued from the deliberations of Covip (Commission for oversight of pension funds) on 7 January 1998. More specifically, articles 6 and 7 of d.lgs 252/2005 define rules for voting, maximum holding thresholds to limit shareholder lobbying and reporting requirements on the inclusion of ESG requirements. Furthermore the Covip decisions of 31 October 2006 and 16 March 2012 require that funds explain to what extent ESG criteria have been included in their investment strategies, and to provide detailed information as to criteria employed in voting decisions. These provisions are designed to guarantee a transparent relationship between asset managers and pension funds.

Focus on the major Italian pension funds

The Cometa pension fund was created for the benefit of employers in the metalworking and plant operations industries. It is the largest pension fund in Italy, and covers employees in the goldsmith trades as per an agreement signed 1 February 1999. The fund was created by an agreement among industry organizations such as Federmeccanica, Assisital and Intersind, and employee organisations, including Fim, Fiom, Uilm and Fismic. The fund is designed around a responsible management of resources in order to ensure employees a more attractive retirement package than the legally mandated system.

In 2010, Cometa signed the PRI with the intent of progressively incorporating extra-financial considerations into its investment approach. In order to consolidate this process, Cometa first published a document covering the fundamental principles of its engagement policy and then implemented an analysis of investments already held in its portfolios in order to ensure that ESG criteria were respected. The fund exercises its voting rights to insist on greater transparency of dialogue on the part of companies it invests in. Cometa is one of Italy's most active members in the PRI, and participates in for a as well as in the activities of various working groups and collective engagement projects alongside other actors.

The pension fund of the Groupe Intesa Sanpaolo, created in 1999 on behalf of employees at the Banque Sanpaolo has assets under management of €1.465 trillion. The fund incorporates criteria measuring good conduct in the area of governance and corporate social responsibility. The fund launched its first engagement initiatives focused on human rights and environmental themes in 2011, ultimately becoming signatories of the PRI two years later. Additionally, the fund devotes an entire section of its annual report to principles of engagement and corporate responsibility.

But the most important efforts in the area of SRI and engagement in Italy can all be traced back to three entities: the Gruppo Banca Etica, Etica SGR and the Fondazione Culturale Responsabilità Etica.

Etica SGR is the only firm that manages savings assets to have committed to maintaining only socially responsible investment funds. Etica SGR also uses ESG criteria to select listed companies that are targeted for engagement, largely consisting of dialogue with companies regarding ESG criteria and encouraging CSR initiatives. Through the platform 'Linee Guida sull'Azionariato Attivo', Etica SGR contributes to improving corporate governance practices (compensation, composition of controlling bodies, etc.).

Norway

Key Figures	Assets under Management*: €67,499 million, or 0.35% of all assets worldwide
	Percentage of assets held by pension funds: N/A
Legislative and Regulatory Context	Public Company Act : article 45
Principal Actors	Norwegian regulator
Prevailing Governance Code	The Norwegian Code of Practice for Corporate Governance
Principal Catalysts	N/A
Active Players	The Norwegian Pension Fund
	The Norwegian Shareholders Association
	Financial institutions, Insurance Companies, Trusts

*Source: EFAMA International Statistical Release: Worldwide Investment Funds Assets and Flows (T1 2012)

Focus on Norway

While not a member of the European Union, Norway transposed the European directive on shareholder rights in 2009. The Norwegian system of corporate governance has traditionally been fairly restrictive and protective of management and large shareholders. In order to bolster the attractiveness of its financial market, Norway has adapted to better take into account the interests of minority shareholders and foreign investors.

Adherence to the Norwegian code of governance is based on the 'comply or explain' principle.

Focus on the major Norwegian pension fund

Government Pension Fund Global

This entity was founded in 1990 to ensure the long-term oversight of national oil revenues. In 1998, the Ministry of Finance delegated the Norwegian sovereign fund's management to an arm of the country's central bank: Norges Bank Investment Management (NBIM). The fund is invested internationally and in October 2012 represented assets of NOK 3.740 trillion, equivalent to €505 billion, distributed as follows: two-thirds equities, one third fixed income, with a marginal fraction in real estate. It is thus one of the world's largest funds. While

the fund has always clearly presented itself as committed to long-term investment, these principles and commitment have crystalized and deepened since 2008, when the government requested a review of the Government Pension Fund's ethical guidelines. Following the publication of the commission's conclusions, the Finance Minister emphasized that the fund had an obligation to behave responsibly as an investor by promoting better market functioning and sustainable development. To this effect, the fund introduced new investment and governance policies; these included a broader adoption of ESG criteria, adherence to the PRI and active participation in transnational initiatives.

In terms of voting, NBIM actively exercises delegated rights on behalf of the sovereign wealth fund, according to a policy that is transparent and incorporates social and environmental concerns. Each vote cast is reported on and published on their website. NBIM also takes an active stance when it comes to engaging with companies it holds, when their practices diverge from its voting policy or can negatively affect the market or the sector. Little information is available, however, regarding these activities. It is also the fund's policy to parti-

cipate in shareholder group litigation, and NBIM (or its parent Norges Bank) has participated in several suits, in particular against Vivendi, Merk, Citigroup (still pending), Porsche and Countrywide Financial Corp. (amicable resolution). Norges Bank is also a stakeholder in many collaborative actions, having signed on to 43 new class action suits since 2001 and collected over \$16 million as a result of previous cases. NBIM is also represented in several professional bodies (IIRC etc.).

The fund's investment strategies also take into account ESG issues and have established specific themes from children's rights and climate change to shareholder rights and water management questions.

The Norwegian sovereign wealth fund has become a recognized leader in responsible institutional investment thanks to its substantial size (among the world's largest) and the direct support it receives from the Ministry of Finance for ESG inclusion and long-term management. NBIM also raises its profile thanks to collaborative actions that entail a high level of public visibility and also make possible real progress.

The Netherlands

Key Figures	Assets under Management*: €67,201 million, or 0.35 % of all AUM worldwide
	Percentage of assets held by pension funds: N/A
Legislative and Regulatory Framework	Civil Code of the Netherlands (1992)
Principal Actors	Government of the Netherlands
	Corporate Governance Code Monitoring Committee (under the auspices of the 2004)
	AFM (Autoriteit Financiële Markten)
	Eumedion: association of institutional investors
Prevailing Governance Code	Eumedion Code
	Frijnscode Code
Principal Catalysts	N/A
Active Players	Pension Funds: PGGM, ABP
	Eumedion Association of Institutional Investors
	VEB (Vereniging van Effectenbezitters) investor association

*Source: EFAMA International Statistical Release: Worldwide Investment Funds Assets and Flows (T1 2012)

Focus on the Netherlands

The Dutch market exhibits a high level of transparency where governance is concerned, and companies largely conform closely to the Netherlands code. Governance rules are contained within the Dutch Civil Code, which is considerably influenced by the laws and directives of the European Union. Following the EU Commission's 2003 call for the implementation of governance codes, the Finance Minister established a committee, chaired by Morris Tabaksbalt, to draft the first Dutch code of governance. The minister then created a 'Corporate Governance Monitoring Committee',

whose primary function is to oversee application of the Frijnscode (2009), the official governance code, itself a revision of the Tabaksbalt code of 2004.

The Netherlands are very active as concerns shareholder engagement, and investor submission of resolutions is fairly common, contrary to prevailing practice in the rest of Europe. Institutional investors play a significant role in the governance of companies and in fostering good CSR practices through active voting policies, regular dialogue with companies and participation in collaborative initiatives alongside other engaged players across Europe.

This is all the more true since the law governing action taken in concert was recently revised in order to remove barriers to collaborative engagement.

Individual shareholders are also highly active and organized within an investor association called VEB (Vereniging van Effectenbezitters), which has nearly 45,000 members and attends more than 150 general assemblies annually.

Dutch shareholders are entitled to initiate legal proceedings against the strategy pursued by management by registering their complaint with the Ondernemingskamer, a distinct entity appended to the court of appeals whose mission is to resolve conflicts related to the application of statutes.

Focus on the Eumedion code

The Foundation for Corporate Governance Research for Pension Funds (SCGOP) was founded in 1998 to provide a means for pension funds to encourage companies in improving their governance practices, and actually published the first two codes in this area. In 2006, the SCGOP was replaced by Eumedion, a foundation dedicated to developing and maintaining good governance practices to serve as a reference point for publicly held companies and institutional investors in the Netherlands and Europe.

Today, Eumedion has close to 70 members, predominately institutional investors, collectively representing over a trillion euros in assets under management. The association is extremely active and undertakes numerous initiatives aimed at improving the governance practices of Dutch companies and encourage discussion among institutional investors, company management and professional associations. Eumedion also participates in consultations initiated by the government of the Netherlands, European Union institutions and other authorities as well as lobbying to influence laws and regulations; other activities include services related to governance issues which it provides to its members in the form of seminars, colloquia, round tables etc. Eumedion participated in 14 consultations in 2012, and has issued six position papers in addition to three governance handbooks since 2008. Finally, the foundation writes annual letters to each of the 75 largest publicly held Dutch companies in order to increase their awareness of currently prevailing best practices.

Focus on the primary Dutch pension funds

PGGM

With over €125bn⁸ in assets under management and 2.5 million beneficiaries, PGGM is the second largest pension fund in the Netherlands, and one of the five largest in Europe. Its role is to manage funds collected by the compulsory defined contribution plan for employees in the healthcare and social services sectors according to the principle of solidarity.

Prior to 2006, PGGM's responsible investment approach relied on the active exercise of voting rights and an engagement policy that was entirely delegated to F&C, a British asset management company specializing in voting and engagement services.

In 2006, PGGM became a signatory of the PRI and established a new responsible investment approach that provides a framework covering its investment strategy and execution, evaluation and reporting of its responsible investing activities. Concurrently, the fund has reinforced its internal resources and decided to conduct part of its engagement actions directly.

For Dutch companies, for instance, PGGM engages directly with companies targeted by its 'focus list' to address governance issues identified by Eumedion that are specific to the Dutch market. For European companies and those in the US, PGGM continues to delegate engagement on environmental and social issues to F&C. PGGM furthermore participates in collaborative engagement actions with other investors belonging to the PRI.

PGGM is also a member of the Institutional Investor Group on Myanmar and a leading member of Eumedion.

ABP

ABP, which administers the pension scheme for government employees, education and public sector employees, has €309 billion in assets under management. The fund exercises its voting rights for over 4,000 companies worldwide, and undertakes engagement activities largely in the voting process. Outside of this context, engagement is limited to specific cases in which ABP conducts dialogue with a company or sends a letter with specific concerns. The fund may sometimes resort to more active engagement, submitting resolutions or participating in class action suits. The fund also participates in collaborative efforts via Eumedion.

8. As at June 2012. Source: PGGM.nl website.

United Kingdom

Key Figures	Assets under management*: €884,938 million, or 4.6% of all AuM worldwide
	Percentage of assets held in pension funds: 44%
Legislative and Regulatory Framework	Financial Services and Markets Act 2000 - section 890 Funds are required to disclose the environmental social and ethical components of their investment strategies
	The Occupational Pension Schemes Regulation 2005: British Parliamentary legislation that governs the transparency of pension funds regarding their responsible investment policy
	Companies Act 2006: addresses transparency of voting by institutional investors
Principal actors	Institutional Shareholders' Committee (ISC)
	Financial Reporting Council
Prevailing governance code	The UK CG Code (2011) combining the Cadbury Report (1992) the Greenbury Report (1995) and the Hampel report (1998)
	Myners review of institutional investment (2001)
	Walker review (2009): covers the governance of banks and other financial institutions
	Stewardship Code (2010) revised September 2012
Principal Catalysts	Rapport Kay review (2012)
	Binding vote for Say on Pay introduced in 2013
	Binding vote introduced for executive stock options. Measure set to take effect in October 2013
Active Players	Management companies and consulting firms specialized in engagement overlay services: F&C, Hermes, Governance for Owners
	Pension funds: Environmental Agency Pension Fund (EAPF)

*Source: EFAMA International Statistical Release: Worldwide Investment Funds Assets and Flows (T1 2012)

Focus on the United Kingdom

The institutional Shareholders' Committee (ISC)

The ISC is a consortium of several different institutional investor groups that coordinate their activities in order to defend the interest of British investors. Its key members include the ABI (Association of British Insurers), the IMA (Investment Management Association), the AIC (Association of Investment Companies) and the NAPF (National Association of Pension Funds). The organization's principal objective is the establishment of a discussion forum for approaching important topics through concerted action to achieve greater impact, for formulating recommendations in the context of lobbying activities, and for openly discussing subjects relevant to investor interests.

In November 2009, the ISC published a code of responsibilities for institutional investors designed to improve quality of their dialogue with companies, optimize the long-term returns of shareholders, reduce risks associated with poor strategic decisions and help them meet their governance obligations. This code became the template for the first version of the 'UK Stewardship Code,' published by the FRC (Financial Reporting Council) in 2010.

Focus on the UK Stewardship Code

An initiative of the FRC, the UK Stewardship Code was launched in response to the 2008 Great Financial Crisis and based, as mentioned above, on the ISC's code of responsibilities. Its aim is to place shareholder engagement at the core of institutional investors' fiduciary responsibility by encouraging them to actively and effectively exercise their shareholder rights through ongoing dialogue with chairpersons of boards and collaboration with other investors.

Oversight of the code's application devolves to the FRC, which already published a first update to the code in September 2012 that included amendments designed to take into account the principal conclusions of the code's 18 month review.

The code is built around 6 key principles, and speaks both to institutional investors and the asset management companies that act as their agents, assuming the final responsibility for operationalizing these principles.

Now in its 19th month, the UK Stewardship code has garnered 234 signatures, of these, 175 are asset managers, 48 asset owners, and 12 are service providers. However, it

is wise to bear in mind that signatories do not necessarily implement the Code's recommendations.

Focus on a pension fund: Environmental Agency Pension Fund (EAFP)

This public-sector regulatory body is invested with the mission of promoting the protection and improvement of the environment. With close to £2.2 billion in assets under management, its pension fund is one of the largest British funds. The investment strategy adopted by the investment fund is in sync with values fostered by the EAFP, as witness the financial strength and environmental responsibility that characterize its investments.

For a number of years, the Agency had to contend with low market returns and criticism from the media as to its investment in highly polluting industries; these led to a revision of its investment strategy to incorporate its vision of exercising shareholder rights. As of 2005, its new responsible investment policy emphasizes criteria that take into account environmental issues and long term risks or opportunities that can have an impact on financial results. Thus, the investment selection process is based on environmental considerations that are justified on financial rather than ethical grounds.

In its 2010-2015 five-year plan, the EAPF reaffirmed its desire to play a leading role in resolving the environmental challenges facing society today. This plan is designed around five priorities, described by the agency as: act to reduce climate change its consequences; protect and improve water, land and air; work with people and communities to create better places; work with businesses and other organizations to use resources wisely; and, be the best we can. More than £1 billion was earmarked for this project for 2012. Most of the fund's engagement activity is delegated to asset management companies that are instructed to address a number of specific topics: climate change, environmental externalities, pollution and soil remediation, natural habitats and questions of flora and fauna. A report on these various engagement topics is then compiled quarterly

Concurrently, the EAPF encourages collaborative engagement, and works hand in hand with other pension funds as a means of amplifying the impact of its engagement with companies.

The fund has won a number of prestigious awards, among these the LCG Corporate Governance Award, and the Professional Pensions "Best use of SRI" award.

Switzerland

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Key Figures	Assets under management*: €290,017 million or 1.5 % of all AUM worldwide
	Percentage of assets held in pension funds: N/A
Legislative and Regulatory Framework	Directive issued by the SIX Swiss Exchange
	Swiss Economic Code
	Swiss Code of Obligations (Civil Code Part V)
Principal Actors	Federal Council
Prevailing Governance Code	Swiss Code of best practice for corporate governance (2008)
Principal Catalysts	N/A
Active Players	Ethos Foundation

*Source: EFAMA International Statistical Release: Worldwide Investment Funds Assets and Flows (T1 2012)

Focus on Switzerland: the Ethos Foundation

Ethos is a Swiss foundation created in 1997 by two retirement schemes, one public, one private and both jointly managed by employees and employer, which were seeking to create an asset management tool that would contribute to sustainable development. The foundation is supported by 139 institutional investors and promotes the integration of sustainable development and good governance principles within investment activities, as well as the long term interests of society at large.

Ethos owns the investment and consulting services company, Ethos Service, created in 2000, which specializes in SRI and active shareholding and has current assets under management of CHF1.6 billion, or €1.3 billion. Ethos is a signatory of the PRI and adheres to the UK Stewardship Code. The foundation received the prestigious ICGN award in 2009.

Consistent with the explicit intentions of its founding members, Ethos takes its shareholder responsibilities very seriously.

The company has established a charter, voting guidelines, and principles of governance that are clear, applicable and fully address environmental and social issues. Ethos systematically exercises the voting rights delegated to them, and prepares a detailed report on the topic that includes qualitative analysis and is made publicly available. Ethos first began conducting engagement in 2004, at the behest of the two founding pension schemes, which were looking to improve their governance practices and reinforce their CSR. Originally focused on the 100 largest capitalizations on the Swiss market, the Ethos Engagement Pool now covers all listed companies in Switzerland and brings together 86 Swiss pension plans (total holdings: €6.6 billion).

From the standpoint of active shareholding, Ethos has proposed shareholder resolutions on several occasions: at UBS in 1998 and 2008, Crédit Suisse and Zurich Financial Services in 2002, as well as Nestlé in 2008. Resolutions proposed by Ethos garner broad support and lead to a dialogue process with companies that contributes to reviewing practices, increased transparency, replacement of certain directors, and other concrete outcomes. In 2008, Ethos launched a 'Say on Pay' initiative alongside eight other pension plans, directed at the five largest publicly held Swiss banks, four of which ended up adopting an advisory vote in 2009. Ethos renewed this initiative the same year, with four other financial institutions. In all, 20 large corporations were convinced to adopt 'Say on Pay'.

As a service provider, Ethos also publishes thematic research on engagement topics and extra-financial evaluation.

“Because our engagement capacities are inherently limited, we need to make measured choices in order to optimize effectiveness.”

4 | Conclusion

The lack of an engagement policy is at best tantamount to writing management a blank cheque and at worst conceals an agenda of short-term profit maximization that ignores long-term consequences. However, as described above, shareholder engagement in itself is only a tool, and behind this concept are a variety of practices that range from those of religious organizations to activist funds in search of shareholder value maximization in the very short term.

In addition, whether they be institutional investors or asset managers, market players find it difficult to adopt a coherent stance due to the multiplicity of clients on whose behalf they act, and who may have diverging opinions, when they have an opinion at all.

These very real challenges, we believe, demand that the engagement strategy chosen by investors be clear and transparent in order for end-savers to use them effectively in making investment choices. Mirova's engagement policy is available to everyone (the Mirova Engagement Policy at <http://www.mirova.com/Content/Files/Mirova/Recherche/Mirova%20Engagement%20Policy.pdf>) and has a clear strategy: to express the vision of a responsible company whose aim is ensure the sustainability of its long-term economic performance. Any attempt to guarantee this sustainability, or 'license to operate', necessarily involves taking into account the impact the company may have on its stakeholders and on the environment. To this end, Mirova has set out an engagement strategy based on three pillars:

- ➔ Promote responsible governance. This primarily entails aligning the interests of company management with those of the company itself, and not with those of a single stakeholder, even shareholders. To this effect, we are committed to supporting and encouraging companies in the attempt to integrate social and environmental objectives in executive compensation criteria.
- ➔ Encourage companies to recognize human rights issues that may affect their practices. In a globalized, open and interconnected world, this involves companies taking into account social practices when choosing direct and indirect suppliers. In this area, we have launched active engagement strategies with companies in the textile and Information and Communication Technology industries.
- ➔ Support companies' attempts to reduce their carbon footprint. This involves complex, multiple and critical challenges. Because our engagement capacities are inherently limited, we need to make measured choices in order to optimize effectiveness. Because building a low-carbon economy has become a clearly pressing issue, we have decided to engage on the issue of Arctic offshore oil exploitation, which raises the question of whether investment projects will bring satisfactory yields.



Sustainable development starts with responsible investment.

Responsible investment is a powerful lever to develop a sustainable economic model.

To meet this challenge, we base our investment decisions on the strategies of forward-thinking companies and focus on creating long-term value. Our goal is to develop a new responsible investment model.

Mirova was voted Best at SRI among Asset Management Firms for 2014 by Thomson Reuters and the UK Sustainable Investment and Finance Association^(*).

(*) The 2014 Survey represents the views of over 360 investment professionals from 27 countries, making it the most extensive assessment of socially responsible investing (SRI) in the European investment community. Voting was conducted from 24th March to 7th May 2014. It reflects a contribution from 179 buy-side firms and 14 brokerage firms/research houses. Visit www.uksif.org for more information.

Promotional material. Any reference to a ranking, a rating or an award provides no guarantee of future performance and is not constant over time.

MIROVA'S FOCUS

A deep understanding of the latest global developments regarding technology, politics, regulation, society and commerce is absolutely essential in order to identify the sustainable economic development levers according to Mirova, the Responsible investment division of Natixis Asset Management.

This forms the reasoning behind the work of Mirova's team of ESG research and engagement analysts, who continue to provide publications on the latest key issues within the framework of a responsible approach.

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RESTRICTING INDUSTRIAL TRANS FATS: ONE STEP CLOSER TO A HEALTHIER DIET?

Written on 20/01/2014

The American agency responsible for promoting human health and food safety, the Food and Drug Administration (FDA), recently moved one step closer to banning trans fats in processed food products. This decision is in keeping with increasing awareness worldwide of the relationship between diet and health. This move by the American government is a positive sign for actors in the Agro-food industry that have best positioned themselves as improving the nutritional profile of products.

On November 7th 2013, the FDA, as the US Department of Health and Human Services agency responsible for regulating food safety as well as tobacco products, supplements and medications, announced its intention to remove partially hydrogenated oils (PHOs) - a primary source of artificial trans fats - from its list of products 'generally recognized as safe' (GRAS). Should the preliminary determination be confirmed, these substances would be considered food additives,¹ and food manufacturers would no longer be permitted to sell PHOs, either directly or as ingredients in food products, without prior FDA approval.

There are two primary sources of trans fatty acids (TFAs) in today's diet:

- ➔ Naturally occurring trans fats, small amounts of which are found in certain meats and dairy products.
- ➔ Artificial trans fats, which result from the industrial process of partially hydrogenating vegetable oils. This procedure became widespread in the agro-food sector as it makes possible the inexpensive solidification of liquid oils (soy, canola) and lends products both a moist texture and prolonged shelf-life.

Artificial TFAs are behind the ban on PHOs, which can be found in many types of industrial foods, from frozen pizzas and fried foods to chocolate bars, certain margarines and industrial cakes or cookies.

A proven impact on health

Industrial trans fats have no nutritional value. On the contrary, since the 1990s, mounting evidence from numerous scientific studies has forged a broad consensus as to their harmful effects, even when consumed in small amounts.

1. Food additives are subject to section 409 of the Federal Food, Drug, and Cosmetic Act (FD Act) (21 U.S.C. 348).

‘Further reduction in the amount of trans fat in the American diet could prevent an additional 20,000 heart attacks and 7,000 deaths from heart disease each year.’

Margaret A. Hamburg, FDA Commissioner

Without going into details, trans fats demonstrably contribute to increased LDL ('bad' cholesterol) and lowered HDL ('good' cholesterol). In this way, they are suspected of contributing to an increased risk of heart disease. Some studies have identified a link between trans fats and certain cancers, but this remains a topic of debate within the scientific community. However, there is no evidence that the consumption of naturally occurring trans fats at current dietary levels is associated with any health risks.

This preliminary determination appears at a time when the consumption of trans fats by Americans has already been considerably reduced. According to the FDA, average dietary intake of TFAs already dropped from 4.6 grams per day in 2003 to a single gram in 2012, in part thanks to the labelling requirement introduced in 2006.

Nonetheless, the Department of Health continues to see trans fats as a public health issue. According to FDA Commissioner Margaret A. Hamburg, the ban on PHOs would prevent thousands of deaths from heart disease annually.

Is such regulation on the rise worldwide?

Despite the scientific community's general agreement as to the harmfulness of trans fats, there are few legislative measures concerning these compounds. In the last few years, a small number of European states have pioneered legislation that bans or severely limits trans fats. Among these are Denmark, Switzerland, Austria and Iceland. However, there is no common basis to their approaches, and some countries have established different types of controls. The Netherlands enforces labelling, while the United Kingdom relies on voluntary self-regulation for reducing TFAs; yet other governments have merely published non-binding recommendations aimed at reducing consumption (France, Japan etc.).

Figure 1. Trans fat policies around the world, 2005-2012

Policy toward TFAs	Countries
Voluntary TFA limits	United Kingdom, Brazil, Costa Rica, Canada
Mandatory trans fat labeling	United States, Brazil, Uruguay, Paraguay, South Korea, Canada, Taiwan, Hong Kong
Trans fat ban	Iceland, Denmark, Austria, Switzerland, some states and municipalities in the USA

Source: WHO/Mirova 2013.

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The US is thus among the vanguard of states legislating this topic, and could influence the policies of other countries. Meanwhile, given the lack of national regulations, the WHO (World Health Organisation) has issued a recommendation that total TFAs constitute no more than 1% of daily energy intake, and suggests that member states take policy steps to eliminate industrial trans fatty acids.

Indeed, in a study published by the WHO in 2013 (Downs, Thow & Leeder) on the efficacy of public policies, researchers found that both local and national regulations aimed at curbing TFAs in foods have produced significant reductions and appear considerably more efficient than voluntary measures.

In light of this, we may see the topic of legislation raised at the level of the European Union. In fact, the European Parliament's Regulation 1169/2011 concerning consumer information on foodstuffs, adopted in 2011, calls for a report to be submitted by the Commission on TFAs by December 2014, which could lead to a proposed regulation regarding labelling or use.

Many alternatives to PHOs available

All restrictive legislation aside, the various campaigns designed to promote public awareness of TFAs have already pushed corporations to drastically reduce their use of hydrogenated vegetable oils.

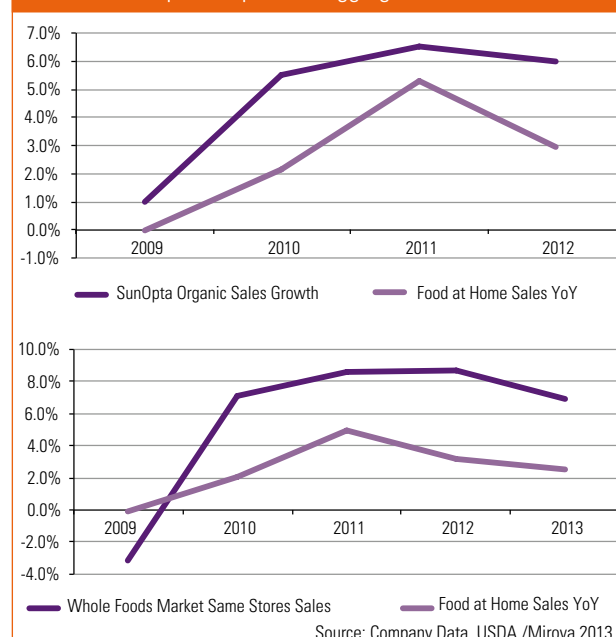
While the FDA's proposed withdrawal of PHOs from their GRAS list does challenge the food industry considerably,

as witness a prolongation of the FDA's comment period until 8 March 2014, there exist a number of alternatives to partial hydrogenation. But the issue for companies is offering products that meet public health standards without compromising taste, texture and product safety. Palm oil, due to its high saturated fat content, does not present itself as a desirable alternative. However, possible substitutes that we do believe hold promise include:

- Use of 'improved' oils (especially development of cultivars with a high proportion of oleic acid) allowing for a better oxidative resistance. These should be available for cultivation on an industrial scale by 2016.
- Alternative methods of modifying fats (including interestification, fractionation and mixture)
- Combination of substitute ingredients with useful properties: cellulose and other fibres, starches, proteins and emulsions, etc.

The elimination of trans fats from food products is a major issue that concerns all actors in the agro-food supply chain, from cultivar developers and seed producers to final product distributors. A company's concern for public health risks and a proactive policy of continuously improving the nutritional profile of products are two important criteria in our investment choices. The development of legislation concerning TFAs is a source of opportunities for both producers and distributors that have favourably positioned themselves on this topic. Whole Foods Market, for instance, has eliminated all trans fats since 2003. Producers of ingredients, such as SunOpta (which specializes in organic and/or natural foodstuffs and ingredients) that can roll out healthier alternatives to partially hydrogenated vegetable oils stand to benefit as well.

Figure 2. Organic sales growth for Whole Foods Market and SunOpta compared to aggregate 'Food at Home'



More broadly speaking, companies' positioning vis-à-vis 'eating healthy' is an issue Mirova has identified and taken into

consideration as part of our 'Sustainable Consumption' theme. We believe that the organic growth exhibited by both retailers that focus on health, like Whole Foods Market, and ingredient providers such as SunOpta is revealing of consumers' underlying expectations in our societies.

Glossary

Hydrogenation: Hydrogenation is the process by which hydrogen atoms are added to unsaturated sites on the carbon chains of fatty acids, in the presence of catalysts, reducing the number of double bonds. Partial hydrogenation describes incomplete saturation. This procedure increases resistance to oxidative damage and guarantees a creamy texture at room temperature.

Saturated fatty acids: these fatty acids are most frequent in animal fats (milk, cheese, butter, meat, lard etc.), but are also found in coconut and palm oils. They are largely solid at room temperature. In excess, their consumption has been linked to increases in LDL ('bad') cholesterol and heart disease, in addition to contributing to obesity.

Unsaturated fatty acids (mono- and poly-): Reputedly better for health than their saturated counterparts, these fatty acids are said to improve HDL ('good') cholesterol levels. They constitute the major part of most vegetable oils, including soy, sunflower, canola and olive oil. In particular, Cis fatty acids from the omega-3, omega-6, and omega-9 series are believed to ward against heart disease.

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SRI BOND FUNDS ARE SET TO SAIL ON THE RISING TIDE OF GREEN AND SOCIAL BONDS

Written on 05/02/2014

Sustainable debt securities experienced spectacular growth in 2013. As the vehicles of highly specific social or environmental benefits, these financial instruments have proven seductive for socially responsible investors, as demonstrated by the increasing numbers of issues. Initiatives aimed at providing a framework are now underway in order to consolidate this expansion and support further development.

A sustainable security is a debt instrument floated on the open market for the purpose of financing a project that offers a specific social or environmental benefit. The securities we will address here are environmentally dedicated 'Green Bonds' and socially oriented 'social bonds', often categorized together as 'sustainable' or 'impact' bonds.

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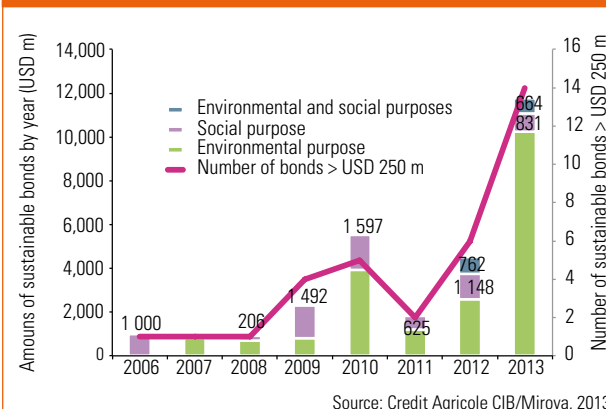
2013, the year of the green bond

In 2013, the market woke up to the importance of green bonds. Even if such bonds remain a niche market for now, with around USD 11 billion issued in 2013 compared to a fixed income market of USD 95 trillion in 2011, green bonds are attracting more and more issuers (development banks, local authorities, companies, banks). The rise of this relatively new financial product can be attributed to funding limitations plaguing both governments and banks, coupled with increasing awareness of the need to address sustainable development issues on the part of financial leaders such as Christine Lagarde, Director of the IMF. This concatenation of factors has favoured sustainable and impact bonds as a solution to the funding gap.

The first widely known green bond was issued back in 2007 by the European Investment Bank. This was quickly followed by an offering from the World Bank (which has since issued over USD 4 billion in sustainable bonds) and many other

multilateral banks. Last year, bonds from France's EDF's (EUR 1.4 billion issue) and Merrill Lynch-Bank of America (USD 500 million issue) finally put an end to the hegemony of multinational banks over green bond issuance.

Figure 1. Yearly Social and Environmental bond issues (USD M)



Social Impact bonds offerings: still hazy

Social impact bonds, however, remain rare compared to green bonds. Nonetheless examples do exist, such as the social impact bond for prisoner rehabilitation issued by the UK in 2010, the social bond for medical home care issued by Air Liquide in 2012 and the World Bank's women's bond, which last year raised money for businesses owned by women in emerging countries. In this field, however, the most fully developed offering remains the 'vaccine bond'.

First launched in 2006, vaccine bonds are a perfect illustration of how financial innovation can help promote sustainable development goals and thus have a positive impact on the real economy.

Vaccination offers the best solution in developing countries that have high rates of infant mortality. Furthermore, in addi-

“As a first step, we should aim to double the green bond market and reach \$20 billion by the September summit.”

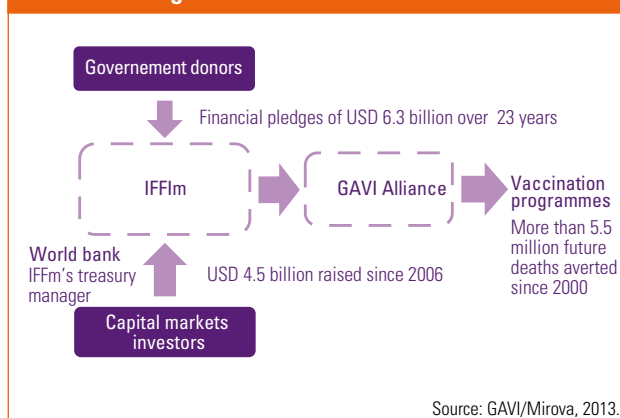
Jim Yong Kim, Davos 2014



tion to being the most efficient lever for combatting infant mortality, vaccination is in line with a transformation of the healthcare sector to privilege prevention and care that ensures health, rather than focusing on the treatment of disease.

On the basis of a realization that the deaths of nearly 1.7 million children could be avoided simply through vaccination, some of the world's largest organizations dedicated to change joined their efforts to achieve a lasting solution, forming the Global Alliance for Vaccines and Immunization (GAVI). This partnership between the public and private sectors was created in 2000 to combat lack of access to vaccination against potentially fatal common diseases and encourage the development of new vaccines through increased R&D in developing countries. In order to accelerate availability and ensure the stability of funding for GAVI vaccination programmes, the International Finance Facility for Immunisation (IFFIm) was created in 2006 by a coalition of European nations.¹

Figure 2. How Vaccine bonds work



The IFFIm relies on long-term commitment to giving by countries to issue bonds in the capital markets against these donations. The IFFIm has succeeded in raising USD 6.3 billion in pledges from nine sovereign donors² and USD 4.5 billion from investors.

GAVI publishes performance indicators to illustrate the effectiveness of its actions. For example, 145 million children have been vaccinated thanks to GAVI since 2010.

The transparency of GAVI's activities makes it possible to know the impact on the real economy of an investment in vaccine bonds. The one criticism we might level at such securities is that they are closer to donations where the markets are used to leverage a commitment by states than they are to real investment financing.

Eager investors are still waiting for the social bond market to really take off. No studies have been undertaken to identify barriers, but one could make an educated guess that defining and, especially, evaluating social projects is more complex than describing or categorizing renewable energy programs.

Indeed, both potential issuers and hopeful buyers for social bonds find themselves confronted with the difficulty of iden-

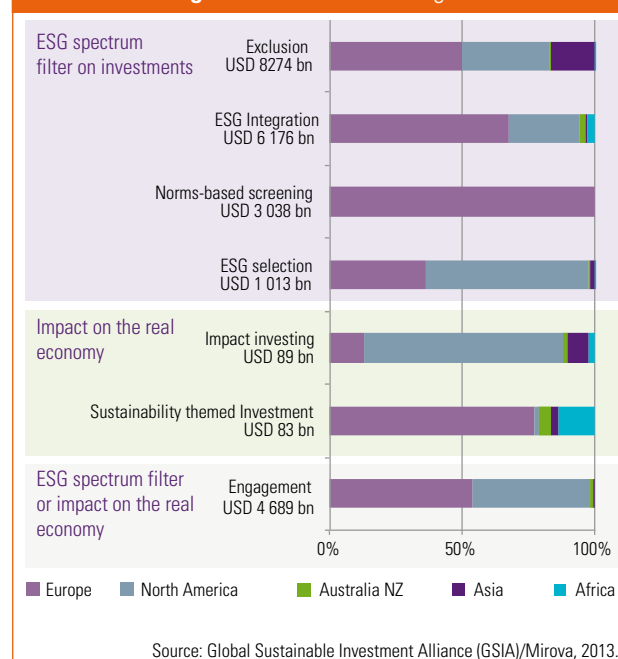
tifying reliable indicators of social performance. Improvements in transparency and a framework for establishing norms would greatly help to structure the still halting issuance of social bonds.

In what ways do sustainable bonds address the expectations of SRI investors, including Mirova?

According to the French Asset Management Association (AFG), Socially Responsible Investments, or SRI, is 'an investment that seeks to reconcile economic performance and social or environmental impact by financing public and private sector entities that contribute to sustainable development...' While this definition is widely shared, SRI can take several forms. Two broad philosophies can be distinguished:

- ➔ Investors seek to avoid the most controversial companies and favour those with the best social and environmental practices
- ➔ Investors seek to have an impact on the real economy through their investment by financing companies whose products offer solutions to issues of sustainable development.

Figure 3. Current SRI strategies



Sustainable bonds correspond perfectly to the needs of those investors who are seeking positive impact rather than a process of exclusion; they offer an opportunity for savings to participate in investments with an objective social or environmental return. First of all, they are investments, not debt refinancing operations, leveraged buyout manoeuvres, liquidity stop-gaps or some combination of the above, but specifically and exclusively investments. Secondly, they are environmentally or socially beneficial; by clearly identifying what is invested in, they make it easier to highlight the social

1. The United Kingdom, France, Italy, Spain, Sweden.

2. The United Kingdom, France, Italy, Norway, Australia, Spain, The Netherlands, Sweden and South Africa.

or environmental impact than it is when capital is placed with a whole company, which often has by its very nature a large number of impacts that are difficult to quantify.

Such bonds thus make it possible to sink capital into the financing of socially useful and profitable projects. Is this not the first and foremost function of the financial markets?

From self-styled market to stricter standards

However, until now, the sustainable bond market has been self-described, following no consistent set of definitions or requirements as to transparency. Much needed efforts to advance the question of standardization, however, have started to emerge. The Climate Bond Initiative, a project aimed at mobilizing the bond markets for climate change solutions, has launched the Climate Bond Standard, which offers detailed criteria for what should be considered green. Concurrently, however, the Green Bond Principles, a voluntary set of guidelines proposed by a consortium of major investment banks, does not propose a definition for green. Instead, it suggests a process for designating, disclosing, managing and reporting on a green bond to ensure adequate transparency and governance, believing that it is up to each investor to forge his or her own opinion. Investors too need to get behind the establishment of principles like these that can consolidate the market. Likewise, we encourage the establishment of similar principles or guidelines for social bonds, which are even more complex and difficult to define.

Mirova supports these initiatives, as we believe they are important for increasing the transparency, legitimacy and liquidity of the market. What appears to us essential to preserve across attempts to standardize green bonds is the logic of positive impact: at their core is participation in financing the ecological transition. This entails:

- ➔ The establishment of a system for rating environmental impact, ideally one making it possible to create an accreditation for funds holding such bonds.
- ➔ Securing the link between green bond issuance and new investment. In particular, the issue of refinancing green bonds when they achieve maturity will arise. As we see it, such refinancing should be possible as a green bond only for that portion of the underlying project not yet amortized.

In the meantime, while recognized standards are developed, we have our own internal system for considering sustainable bonds, which relies on four pillars: (1) strict criteria for projects and activities considered to ensure they offer direct environmental or social benefits, (2) a review of socio-environmental risks throughout the project's life cycle, including supply chain, (3) traceability of the funds to identifiable projects or activities, and (4) reporting that involves a detailed description of the projects, including an estimate of their anticipated benefits and regular updates on their development.

Conclusion

Standardisation efforts aside, sustainable bonds will find a welcome place in SRI funds if companies and states follow the way already in large part paved by supranational institutions and local communities. Companies stand to gain by offering SRI investors broader offerings in terms of credit ratings, and thus returns. States should join because this is the core function of their bond issuance. In fact, if the latter party were to support the development of extra-financial reporting, they might be better able to exploit, as borrowers or investors, the powerful financial lever they have available to promote good CSR practices.

Mirova believes that sustainable bonds are a very effective way for investors to address the challenges of sustainability. We welcome the boom in green bonds and encourage the market not only to continue growing, but to develop creative and responsible ways of addressing societal issues through social bonds as well. However, a minimum of standardization of this new product will be crucial for its success, and we have thus supported and contributed to its development through consultation. We do, however, have our own internal standards to ensure that we invest only in green bonds that are aligned with Mirova's principals from a socio-environmental and governance perspective. More than 8% of our flagship fund, Mirova Euro Sustainable Aggregates, today consists of sustainable bonds, and we look forward to contributing to the growth of the market as investors and stakeholders.

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2014-2020 : WILL LEDs BE LIGHTING THE WAY?

Written on 12/03/2014

Despite their energy efficiency, LEDs have thus far been used almost exclusively in electronic devices (screens for cell phones, computers or TV screens), largely due to high production costs. However, technological advances have progressively reduced manufacturing costs. Coupled with a regulatory focus on energy efficiency, these reductions are opening up new opportunities for LEDs to enter the lighting sector. With a further decline in production costs expected, and growing environmental concerns, the LED lighting market is set for promising growth in the years ahead.

Light Emitting Diodes, better known as LEDs, are electronic components designed to convert energy into light; they were first manufactured in the 1960s in the form of infrared diodes, but entered the lighting sector only 40 years later, when technological advances made possible to provide a bright, white-coloured light.

The lighting sector had previously been limited to:

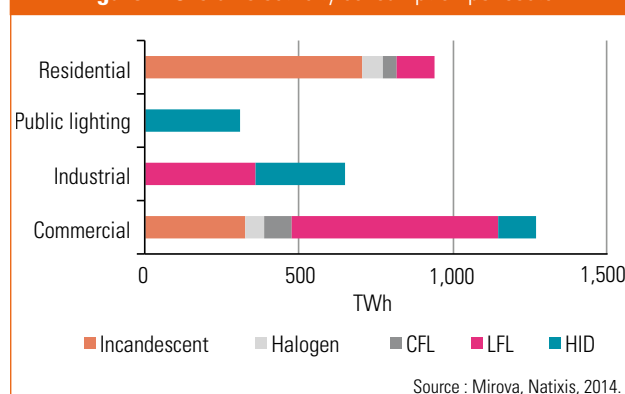
- Incandescent lights (traditional incandescent light bulbs and halogen lights) mainly used in the residential sector;
- Fluorescent lighting (compact fluorescent light bulbs (CFL) and fluorescent tubes (LFL)), mostly used in industrial and commercial settings;
- High intensity discharge lamps (HID) used for street lighting.

In the past few years, incandescent light bulbs have begun to be replaced by compact fluorescent tubes and halogen bulbs, both in France and elsewhere, as they offer better lighting and efficiency compared to incandescent light bulbs, which lose a considerable amount of energy as heat.

LEDs also present distinct advantages over compact fluorescent light bulbs: better lifetime and composition, shorter response time and more varied applications. Consequently, they are likely to edge out compact fluorescent lights fairly rapidly.

‘**LED lighting could consume up to 90% less electricity than incandescent bulbs.**

Figure 1. Overall electricity consumption per sector

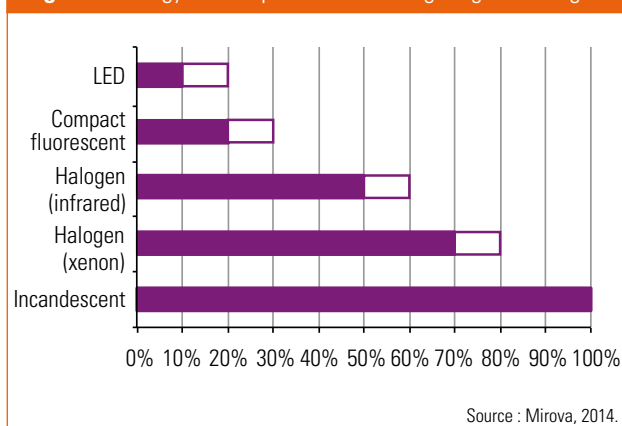


Clear environmental benefits for the lighting industry

Until now, LEDs were mainly used for backlighting the LCD screens of cell phones, laptops, tablet computers and televisions, or else for vehicle headlights because of their high production costs. Since most of these LED backlighting applications were new and did not replace less energy efficient existing technologies, the environmental savings associated with the growth of this technology have been limited.

Applied in the lighting industry, however, LEDs are a whole different story. LED lighting could consume up to 90% less electricity than incandescent bulbs (see Figure 2) and offer lower energy consumption than other low-energy technologies such as compact fluorescent light bulbs. Moreover, the energy performance of LEDs should continue to improve; performances of up to 3.5 times the current average have been achieved in a laboratory setting.

Figure 2. Energy consumption of various lighting technologies



Since electric lighting accounts for 6% of global greenhouse gas emissions and consumes 19% of the world's total electricity production (IEA, 2006), LEDs could provide significant environmental benefits. In the buildings sector more specifically, lighting represents about 35% of the total electricity consumed by a tertiary building unit.

From an environmental perspective, it is essential to reduce energy consumption; a life cycle impact assessment of the various lighting technologies shows that the usage phase of bulbs is overwhelmingly the most demanding, making it the focus of interest in their energy efficiency. Furthermore, LED light bulbs offer other environmental benefits. Their lifetime greatly exceeds that of lights based on other technologies (~40,000 hrs. as opposed to ~8,000 hrs. for compact fluorescent lights and ~1,000 hrs. for incandescent lights – ADEME, 2013). Such bulbs require less frequent maintenance and replacement, resulting in decreased waste in the end of life phase.

Finally, the environmental risks associated with LED lights' end-of-life phase are limited in that, contrary to fluorescent lights, they contain no mercury.

However, while LEDs provide real environmental advantages, particular attention must be paid to the social risks associated with manufacturing light-emitting diodes. Because most factories are located in Asia, where working conditions are less supervised than in Europe, the existence of such risks should not be underestimated.

Strong levers for growth

Owing to successive technological achievements, the cost of producing LEDs has been greatly reduced. In fact, cost per lumen has reduced tenfold every ten years, while performance (the amount of light produced per unit) has tripled every three years. Coupled with the overproduction prompted by State subsidies (particularly China), this structural trend, also called Haitz's law¹, is driving signs of market penetration in the lighting sector.

Thanks to further technological developments, costs should continue to decline in the years ahead. Moreover, from a

geographical standpoint, most of the actors involved in LED light manufacturing are currently located in China, Japan and Korea. Following a general trend in the electronics industry, production may be 'relocated' to other Asian countries where the workforce is cheaper, thus providing continued cost reductions.

LED lights should also benefit from increased adoption in the medium term due to other factors, among which:

- ➔ **A reinforcement of the legislative framework:** France's 2012 Thermal Regulations prohibit marketing energy-consuming household lamps in France, and similar regulatory measures have been implemented in other countries (see Figure 3). Measures designed to reduce energy consumption and greenhouse gas emissions are expected to harden, as suggested by the European 2050 Roadmap (goal of achieving a 20% reduction in total energy consumption and GHG emissions).
- ➔ **LEDs' longer life cycle:** While primarily a matter of convenience for the residential sector, LEDs' long life cycle is also an economic benefit in commercial and industrial applications, thanks to lower maintenance costs.
- ➔ **LEDs' greater lighting comfort:** The quality of compact fluorescent light bulbs' white and cool-coloured light is often criticized; LEDs, on the other hand, are able to provide warmer lighting that answers a broad variety of needs. In addition, LEDs ensure immediate lighting, while the longer ignition time of compact fluorescent lights is a frequent topic of customer dissatisfaction.
- ➔ **Increasing numbers of technological applications:** Thanks to their small size, resistance to impact, colour and temperature, LEDs are increasingly finding technological applications, for instance in the tablets and smart phones that have appeared in the last few years.

These various trends should drive a large increase in the market for LEDs for years to come (See Figure 4). And now that prices have fallen significantly, with a quality of light offered by LEDs comparable to — if not better than — other available lighting technologies, 2014 may be the year LEDs take off in the lighting sector. Several encouraging signs are already visible. China has set a 2020 goal for LED production equivalent to 164 billion dollars, 70% of which is expected to be devoted to lighting. New York City has undertaken the task of replacing its public lighting with LEDs, a project that is set to be completed in 2017.

This growth should provide benefits all along the value chain, especially among:

- ➔ LED manufacturers such as Epistar, Osram, Everlight electronics, Acuity Brands, Nichia, Cree, Philips electronics, General Electric and Zumtobel
- ➔ Suppliers of process systems (MOCVD systems) such as Veeco or Aixtron.

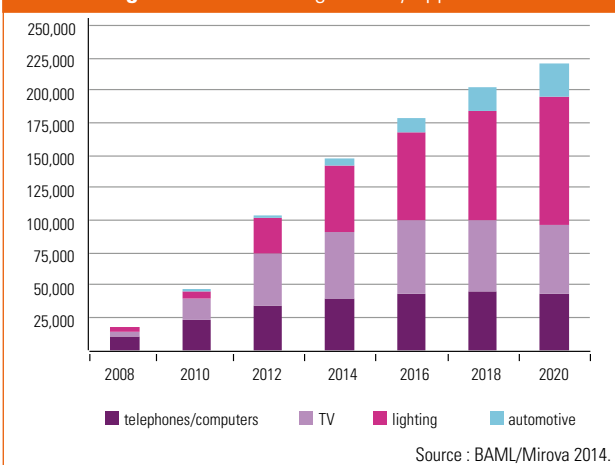
1. The counterpart to Moore's law in the electronic sector.

Figure 3. Ban on sales of incandescent lights global review

	2009	2010	2011	2012	2013	2014	2015	2016
United States				100W	75W	60W&40W		
Europe	100W	75W	60W	40W&25W				Halogens delegalized
Japan				Voluntary termination of all incandescent light bulb production in 2012				
China				≥ 100W		≥ 60W		≥ 15W
India	Certain states began to ban incandescent lighting in government buildings as of 2010. In 2009, India announced a program to replace incandescent with compact fluorescent lighting.							

Source : US DoE, EC, NDRC UBS/Mirova 2014.

Figure 4. LED market growth by application



For investors, this market offers an opportunity to concretely address environmental issues, while at the same time affording considerable prospects for growth. It seems therefore wise to pay attention to companies all along the value chain associated with LEDs, given that they are likely to benefit from the observed trends.

Figure 5. LED lighting's contribution to the revenues of sector leaders

Providers of process systems (MOCVD systems)	
Aixtron	100%
Veeco	100%
LED manufacturers	
Epistar	25%
LED and finished product manufacturers	
Osram	15%
Cree	40-50%
Everlight electronics	20%
Philips electronics	10%
Suppliers of integral lighting solutions	
Zumtobel	25%
Acuity brands	30%

Source : UBS/Mirova 2014.

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COAL IS HISTORY, OR IS IT?

Written on 14/03/2014

Given the spikes of pollution known as ‘airpocalypses’ that have become the third most urgent concern in China, and the tightening of regulations in Europe and the United States, it would appear that coal’s cycle of high growth is set to begin winding down. In light of this observation, certain investors such as the EIB and the Norwegian pension fund have modified their investment criteria. But despite this trend, the sheer magnitude of coal reserves, coupled with the potential for innovations in using this resource (liquefaction, gasification), suggest that coal will, in the long term, continue to pose a significant threat to climate stability.

In the course of the 1990's, worldwide coal consumption stabilized and the progress of renewable energies fostered hope that coal would soon begin to lose ground within the global energy mix. However, catapulted by growth in China, coal consumption began to exhibit tremendous growth in the early 2000s. If this tendency were to continue, the proportion of coal in the world energy mix could pass that of oil by 2017.

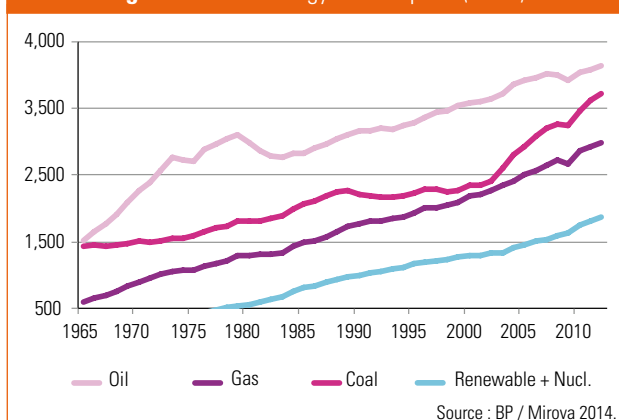
These serious social and environmental issues are likely to limit the increase of coal consumption in the long term.

China is sick of coal

China alone consumes as much coal today as the rest of the world combined. Veritably fueling China’s growth, coal use in the country has more than doubled in the last decade.

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Figure 1. World Energy Consumption (Mtoe)

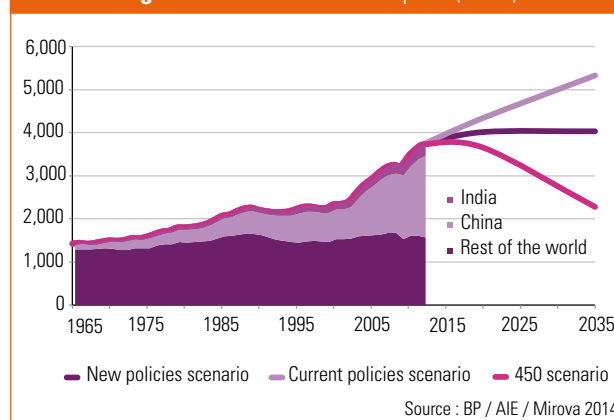


Coal is one of the most polluting sources of energy there is. In addition to the nitrogen and sulphur oxides (NO_x and SO_x) and particulate matter emitted, coal produces the most CO_2 of any combustible. To provide an idea of scale, a coal-burning power plant emits more than 800g CO_2 /KWh, compared to around 400g CO_2 /KWh for a comparable gas driven plant. In the first 13 years of the millennium, more than 60% of energy-related CO_2 emissions¹ were due to coal.

Even if we set aside the polluting emissions responsible for respiratory ailments, coal causes the death of several thousand miners each year, for the most part in emerging countries. Miners are exposed to a multitude of risks: collapsing tunnels, landslides, toxic fumes etc.

1. Energy-related CO_2 from oil, gas, and coal combustion accounts for around two thirds of all GHG emissions. The remaining third is attributable to deforestation, agriculture and waste management.

Figure 2. World Coal Consumption (Mtoe)



The country now experiences such pollution as a result of burning coal that the issue has become as much a public health concern as an environmental one. Spikes of extreme pollution, known as ‘airpocalypses’, have become an increasingly frequent phenomenon in China.

During these events, the density of the most harmful particulate matter ($\text{PM}_{2.5}$) can reach from 27 to 40 times the recommended maximum set by the WTO (World Trade Organization). Air quality has become the third most serious cause of concern among the Chinese population, in turn forcing the government to strengthen its environmental policy. Consequently, in January 2014, the city of Beijing announced that no new coal-fired power plants would be permitted. This ‘exit’ of coal may find itself reinforced by structural economic changes China has undertaken.

The stated goal of the Chinese government to foster an economy less entirely focused on production and exports should produce a slowdown of growth, accompanied by a commensurate trend in the demand for energy.

It is to be expected that this inflection will nonetheless take several years. Despite the Chinese government's desire to decrease its dependence on coal, the contribution of renewables and nuclear power to the energy mix is currently too low to meet the country's need for electricity. An increase in the use of gas would entail substantial investments in infrastructure (construction of pipelines, LNG terminals, and gas-fired power plants) and must be considered a medium-term solution. Given these constraints, China's coal usage is likely to continue increasing for several years to come, as witness a 2013 decision to authorise construction of 15 new mines, thereby stepping up annual production capacity by 100 million tonnes (Mt).²

Meanwhile, the West is tightening regulations

In the United States, coal consumption is already showing some decline, from 910 Mt in 2011 to 808 Mt in 2012. The United States EPA (Environmental Protection Agency) has focused on power plants, with a 2020 goal of reducing GHG emissions by 17% compared to 2005 levels. The EPA is seeking to impose a limit of 500 gCO₂/MWh on existing facilities, and to effectively halt construction of new coal-fired plants.

The easing of coal consumption in the US is also due to the development of shale gas, which improves the competitiveness of gas-fired power production. A certain number of coal mines, notably in the Appalachians, have depreciated, and American mining corporations have already started closing the least profitable concerns.

In Europe, coal prices are currently in a low bracket, between \$80 and \$85 USD per tonne, in part because of an increase in exports from the United States caused by the development of shale gas. These low prices are responsible for a considerable increase in coal use in Europe over the last years. The carbon intensity of power production in Europe is thus creeping upwards following several years of decline driven by the expansion of renewables and gas.

However, the price of coal is expected to bounce back over the medium term, buoyed by a stabilization of the American market.³ The per tonne cost of CO₂, which had also dropped drastically, should start climbing again in Europe over the medium term as well. A concatenation of these two factors could raise costs for the operators of coal-fired facilities and jeopardize the long term economic viability of new investments. Building a power plant takes about six years on average, the costs of which are amortized over a period of about 20 years. Indeed, the industry's lack of projects for new coal burning plants suggests that such looming risks are already being taken into account.

2. For comparison, China's total production was 3,650 Mt in 2012. The additional facilities thus represent an increase of about 3% in total capacity.

3. The shale gas revolution in the US has provoked an explosion of drilling sites and caused gas prices to tumble. Since actors have suspended investments while waiting for the price of gas to bounce back, energy prices should start climbing again in the medium term.

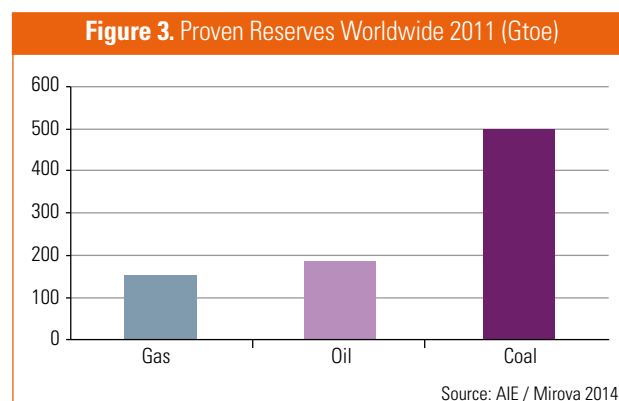
China consumes as much coal as the rest of the world combined.

Furthermore, the EU regulatory environment is piling new demands on power plants as regards the release of particulate matter into the atmosphere. Energy companies will henceforth be obliged to make ever larger investments in order to bring existing plants up to code. For instance, the European IED (Industrial Emissions Directive), which replaces the LCPD (Large Combustion Plants Directive), contains provisions tightening restrictions on NO_x and SO_x emissions. This directive took effect in early 2013 for the construction of new facilities, and applies to existing ones as of January 2014. This directive will have a considerable impact on the UK, forcing a 10 GW/year reduction of capacity, which amounts to 12% of all electricity derived from coal in the country. British plants are on the whole older and thus less efficient than those of other countries, such as Germany. Indeed, certain British energy companies have already announced closure of several sites.

Liquefaction and gasification: are they long-term climate threats?

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Despite these trends, the sheer abundance of this resource makes coal a long-term threat to the environment.



While dependence on coal for electricity production (currently 70% of total coal usage) and industry (30%) could eventually be reduced, there remain certain industrial applications in metallurgy for which there are currently no substitutes for coal, and none likely for as long as recycling cannot fully meet all needs. Furthermore, processes for liquefying and for gasifying coal are becoming more competitive, and may become attractive alternatives for countries lacking in oil or gas resources. Unfortunately, these processes entail CO₂ emissions that exceed those of the energy sources they would replace.

The magnitude of coal reserves is a reminder that simply waiting for fossil fuel resources to be exhausted is not a viable solution to the problem of climate change.

The achievement of a binding agreement at the Paris Conference of the Parties on Climate Change 2015 (COP21) appears an urgent necessity if we are to make headway against climate change.

A growing topic of investor concern

In tandem with the increasing restrictiveness of legislation, a growing number of investors are expressing concern. As of July 2013, the EIB (European Investment Bank) has excluded coal-fired power plants from its investments. In Norway, the Finance committee is expected to rule shortly on a proposal from the Workers Party that would require the Norwegian sovereign wealth funds to desist from investing in companies involved in coal production. While discussions are still largely motivated by ethical considerations related to the ecological transition, some investors are beginning to look seriously at the matter from a financial point of view, and consider that increasingly restrictive regulations will have a negative impact on companies in the sector.

Stances such as these regarding the opportunities available to invest in the coal sector are interesting, not only from an ethical or financial standpoint: 'Should investors actively engage in the fight against climate change?' versus 'Will these investments be profitable?' They also both reflect a shift that breaks with years of index-driven and passive strategies, and highlight a return to the roots of investment: choosing how to allocate capital.

‘ Since July 2013,
the EIB has excluded coal
from its investments.

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THE DEBATE ON RISKY OIL ASSETS BUBBLES UP

Written on 03/06/2014

The oil and gas sector is undergoing profound changes: rising costs and increasingly challenging operational conditions leave little room for doubt that the era of easy oil is over. As major oil companies are increasingly forced to explore unconventional frontier reserves, investors' concern over the riskiness of these investments, especially vis-à-vis potential carbon regulation and the uptake of alternative technologies, is putting the sector under unprecedented pressure to demonstrate its ability to find a sustainable mode of operation.

There is widespread agreement in the market that the era of easy oil is history. In fact, over the past two decades, the production (output) and proven reserves growth (which determine future production) of International Oil Companies' (IOCs) portfolios have shown a 1.4% and 1.6% compounded annual growth rate (CAGR), respectively, for the past twenty years; however, this number conceals the reality of a significant slow-down over the past decade. On the other hand, oil prices have consistently risen, from a little over \$20 per barrel (bbl) in 1994, to over \$100/bbl this year, making oil the largest earnings driver for the sector.

‘ **Despite increasing oil prices, high sector costs have eroded return on capital employed in the sector.**

Today, the average Return on Capital Employed (ROCE) of the ten largest international oil companies (ranked by reserves) is running at levels similar to those registered in the late nineties. As shown in Figure 1, ROCE peaked in 2005, when oil prices were around \$20/bbl. However, oil prices increased six-fold over the 1997-2012 period, indicating that sector costs rose practically as fast as returns could compensate for. This also suggests that the foregrounding of new resources, such as shale and tight oil, have not so far helped integrated oil majors with diversified portfolios in boosting their balance sheets.

New challenges emerge...

There are a number of interrelated factors that contribute to explaining why the sector has been experiencing such increasing challenges:

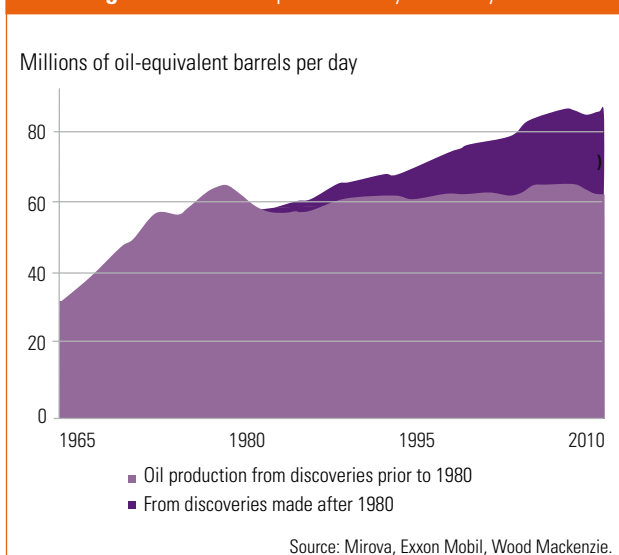
Figure 1. Return on Capital Employed vs. oil price



1. Declining oil production: several important areas in which the oil majors are heavily involved are experiencing natural decline, with the North witnessing the heaviest slump in productivity. Looking at the situation historically, oil discoveries have been quite meager in the past thirty years; since the early 80s we have consumed more oil each year than the extractable fraction of new discoveries. As figure 2 illustrates, 75% of the oil produced today was discovered before 1980. This is reflected in companies' reserve replacement ratios, or RRRs (the amount of proven reserves¹ added to a company's reserve base compared to its production in a given year), which have declined to an average of 95% this decade from the 119% of the previous ten years. It also has an impact on future investments: even if oil demand does not grow, new investments will nonetheless be needed in the sector to replace declining reserves.

1. Reserves describes the volume of hydrocarbons that are anticipated to be produced cost-effectively using today's technology.

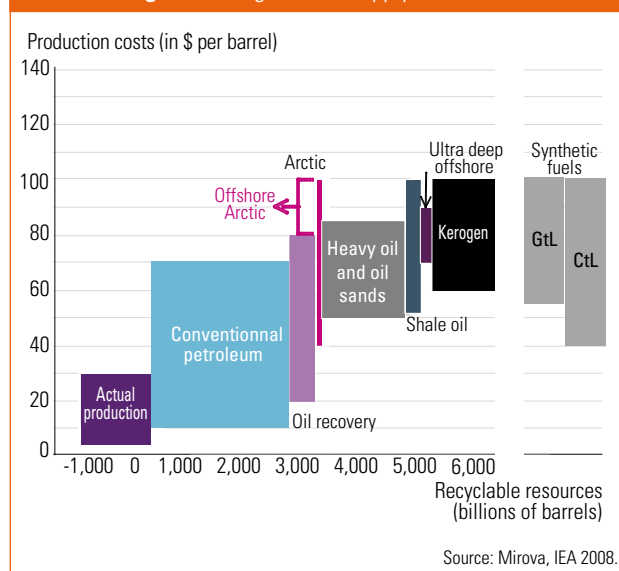
Figure 2. Global oil production by discovery date



2. Shifting balance of power: Currently, around 90% of readily and cheaply accessible oil and gas reserves are held by national oil companies (NOCs) — which largely equates to OPEC countries — compared to only 10% in the 1970s. Although the real volume of reserves controlled by OPEC national companies (estimated to hold about two-thirds of the world's proven reserves) remains shrouded in secrecy, this changed situation has pushed IOCs to develop greater technical competences in the area of harsh operating conditions. Such know-how is increasingly sought by countries such as Argentina, Brazil and Russia, that wish to explore their unconventional frontier reserves.

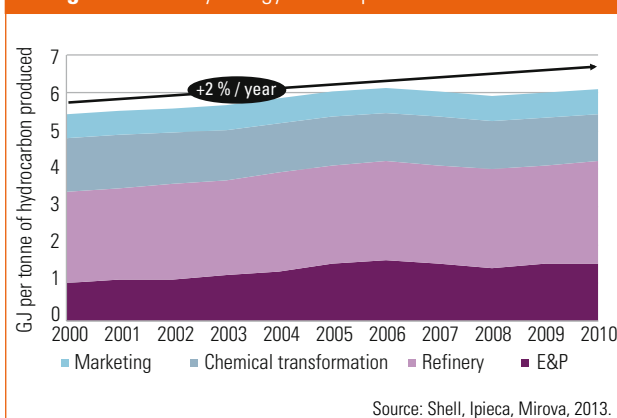
75% of the oil produced today was discovered before the 80s.

Figure 3. Long-term oil supply cost-curve



3. Extreme conditions: The pursuit of oil in places where access is difficult has noticeably increased operational challenges as well as the risk of project delays. For instance, last January, the American Ninth Circuit Court of Appeals ruled that licences granted to Shell in the Chukchi Sea (Alaska) in 2008 were wrongfully issued, because the environmental risks involved in Arctic drilling had not been fully taken into account, and the estimates of proven reserves were not based on adequate analysis. As a consequence, Shell's CEO announced that the group has shelved its exploration programme in Alaska for 2014. In 2013, we identified the Arctic as an extremely risky frontier for oil companies, and one where investors should be particularly wary (see Mirova's study 'Offshore Oil in the Arctic': should investments be frozen?).

Figure 4. Primary energy consumption in the O&G sector



4. Rising costs: As IOCs are forced to seek oil in places it is harder to access, or where the quality of hydrocarbons makes extraction more difficult, such as oil sands, extra-heavy oil, deep offshore and shale oil, sector costs rise steeply. Although, in the US, shale gas extraction costs have abated due to the implementation of new technologies, contributing to a reduction in the price of gas, in most other cases the technological challenges posed by unconventional hydrocarbons have driven capital spending upwards: over the past two decades, average project size increased fivefold, driven primarily by the use of more advanced technologies to penetrate increased water depths, or by different resource categories. This contributes to explaining the 10% per year increase in investment budgets since 2004. In addition to this capital intensity, variable costs also exhibit an upward tendency; complex extraction processes, combined with a decreased quality of hydrocarbons, have pushed the sector's energy consumption upwards, for a total average rise of 2% per year, whereas industrial sectors (e.g. chemicals, capital goods) experienced a 4% decline over the same period.

Historical problems persist...

These new challenges aside, the sector remains exposed to historical problems stemming from geo-political risks and local socio-economic issues, which have often been exacerbated by the high environmental and social impacts of today's operations. Such issues are not set to go away, even though increased exploration and production challenges have brought new problems to the fore:

1. Political instability: Oil and gas companies have long operated in countries with an unstable political context, such as Libya, where, after Kaddafi's regime collapsed in 2011, oil majors with significant exposure to the country such as ENI and Repsol suffered production halts and uncertainties. In addition, political instability has also led to asset expropriation, as in the case of YPF, confiscated from Repsol by the government of Argentina in 2010. More recently, separatist tensions in eastern Ukraine have led to rapidly broadening sanctions against Russian and Ukrainian companies on the part of the West. This could have a significant impact on western oil majors like ExxonMobil, BP and Shell that have significant investments and plans for future development in Russia.

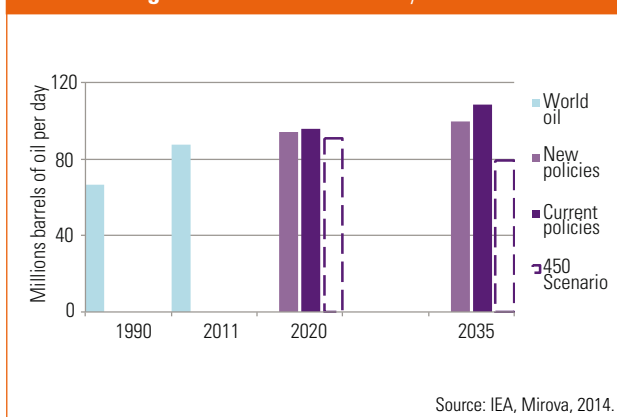
2. Corruption and poverty: Operating in extremely poor countries where transparency around the distribution of royalties from oil extraction is low has long earned oil majors a place in the spotlight, as in the case of Shell, alongside ENI, Total, Chevron and ConocoPhillips for their operations in Nigeria. As a result, some IOCs have recently decided to leave the country by selling their assets to local companies, as ConocoPhillips did this year.

3. Technical challenges: As projects become bigger and more complex, operational delays are a persistent challenge for the industry. The super-giant Kashagan oil field in Kazakhstan, led by the consortium of ENI, Total, Shell and ExxonMobil, began production in 2011, nearly a decade behind schedule, and will be shut down for two years due to pipeline leaks.

Concerned investors face risk denial over stranded assets

In light of increasing challenges, oil majors all announced investment cuts in 2014 and promised to deliver sustained dividends as a means of regaining investors' confidence. These announcements are partly explained by the fact that the sector as a whole is exiting a significant investment cycle, with several important projects entering production between 2013 and 2015. However, there remains uncertainty as to whether the industry will be able to avoid production delays that would further increase costs.

Figure 5. World oil demand by scenario



Within this context, however, investors are also concerned about another issue: the risk of 'stranded assets'. This argument, developed by the Carbon Tracker Initiative² in 2011, goes roughly as follows: in the carbon-constrained world depicted by the IEA's 450 Scenario,³ many fossil-fuel assets will necessarily become 'unburnable,' leading to lost value for both companies and investors. Under this scenario, oil demand in 2035 will reach 79 million barrels per day (mb/d), i.e. 25% of global primary energy demand, down from 32% in 2011 (see figure 5). This contraction would expose unconventional 'frontier' reserves, such as deep-water and oil sands, to the greatest potential devaluation, since these are the most expensive, risky and carbon-intensive to extract, as previously discussed.

Nonetheless, even without a carbon-constrained scenario, increased oil prices and high sector costs could create momentum towards the deployment of technological solutions to replace oil in various end-use sectors. However, within the context of transport, which accounts for about 2/3 of oil end-use, renewables play a limited role as substitutes for oil. In our view, the risk for the oil sector will become tangible with the increase in lightweight vehicles that use less fuel and, most importantly, with the commercial expansion of the electric car. While today the electrification of transport is still far from a mainstream phenomenon, there remains, in our view, room for technological improvement that can increase the appeal of this form of transport and spur higher demand (see Mirova's December 2013 study *Sustainable Mobility*).

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“The battle over fossil fuels will be waged in the electric sector.”

Expanded use of the electric car is set to reduce demand for oil, thereby shifting the debate around decarbonisation toward the electric sector. The electric sector will become the actual battlefield for the deployment of non-fossil feedstock (as a reminder, around 41% of electricity currently comes from coal and 22% from gas). In this context, renewable energy, energy storage and smart-grid infrastructure will need to play a leading role in the decarbonisation of energy. As a matter of fact, the IEA recently reported that additional investment in the electric sector is needed in order to meet the 2050 carbon reduction objective of +2C°. In this context, the Paris-based agency predicts that the electric sector will increasingly compete with the oil sector to feed the world's increasing energy needs.

Investors' concerns vs. denial of risk

When questioned about the risk of stranded assets, western majors have so far dismissed investors' concerns by pointing out that the probability of reaching a global climate deal at the next Conference of Parties (COP) scheduled in Paris in 2015

2. The Carbon Tracker Initiative is a non-profit organisation working to align the capital markets with the climate change policy agenda.

3. The IEA's 450 Scenario assumes strong policy action globally to put greenhouse-gas emissions on a long-term trajectory that will ultimately limit the global average temperature increase to 2 °C.

is practically nil, as is the possibility that the 450 Scenario will ever materialise. In fact, following shareholder pressure, ExxonMobil published two reports detailing its carbon-risk management last March. In these reports, the company ruled out any risk of its portfolios' containing stranded assets, arguing that a business as usual scenario will prevail, with corresponding growth of oil demand. A similar position was recently taken by Shell, which has argued that in light of carbon policy delays, its investments – most of which have a 10-year time frame – are preserved from a potential 'carbon bubble'. On the other hand, Shell is betting on carbon capture and storage technologies, which have yet to achieve large-scale commercial application.

Other oil majors, such as BP and Total, issued a more concise response to investors. BP categorically dismissed the probability of a low-carbon scenario hitting its portfolio, without revealing any additional details of its carbon risk-assessment. Total, however, reassured investors that through a portfolio 50% tilted towards gas, and investments in solar technologies via SunPower, the company is protected from carbon risks (although, today, SunPower represents less than 1% of Total's revenues). It is thus evident that all companies view their climate risk exposure as limited to the probability of a global climate agreement in the short-term, which they estimate as nil. They consistently fail to take into consideration the possibility of national carbon regulations or other environment-related risks to their portfolio (e.g. extreme weather events, reduced sector subsidies to favour new technologies, an expansion of electrified transport, etc.), arguing that the totality of their assets are safe simply because demand for oil is expected to rise in the IEA's other scenarios (i.e. the business as usual scenario and the New Policy Scenario)⁴ without providing granular insight into their assessment of carbon risk by asset or by type of resource, which is what concerned investors seek.

Be this as it may, oil majors' recently-announced capex cut-backs indicate that current oil prices are not high enough for them to earn sufficient returns across their portfolios, let alone on specifically capital intensive projects that are subject to significant and recurrent delays, such as the Kashagan fields, or Shell's Arctic operations.

The attitude of oil majors is reminiscent of some energy utilities that, a decade ago, decided not to invest heavily in renewable energies, such as RWE. As it happens, following the German government's decision in 2011 to phase out nuclear power plants across the country starting from 2015, this company is now forced to switch to coal power plants and has very little room to manoeuvre, given its low exposure to renewables (a mere 6% of its portfolio or thereabouts), while the renewable energy market, through subsidies and preferential grid access, has increased its market share in Germany to a record high 24%. As a result, RWE's new CEO, Peter Terium, recently acknowledged the company's mistake in entering the renewables market 'possibly too late'.

4. The New Policy scenario takes into account broad policy commitments and plans that have been announced by countries, including national pledges to reduce greenhouse-gas emissions and plans to phase out fossil-energy subsidies, even if the measures to implement these commitments have yet to be identified or announced. This broadly serves as the IEA's baseline scenario.

What choices do investors have?

To summarise, the attitudes of investors with regard to the issue of climate change could follow either one of the following routes:

- ➔ In a 450 ppm scenario, the growth of oil companies will be less than the current market discount and thus the valuations of these companies are currently inflated. Investors following this route therefore have no interest in investing in these companies.
- ➔ In a 'business as usual' scenario, future growth is more likely to be in line with current market forecasts, unless the climate starts affecting oil companies materially, along with the rest of the economy. While it may be advantageous for investors to make short to medium-term investments within this context, they will need to ask themselves whether such investment choices do not encourage companies to promote a climate scenario that will have a deleterious impact on all their investments in the medium to long term.

It is thus clear that whatever the climate scenario turns out to be, oil companies will be making investments carrying increasingly heavy risks, both financial and environmental, that exacerbate the likelihood of accidents like Macondo, which could dramatically affect current valuations. Thus, investors need to think carefully about the risk/return profile before investing.

Without waiting for debates over 'stranded assets', or the obligation for investors to divest from oil companies to reach their current levels, Mirova arrived several years ago at the conclusion that there are simply more attractive risk/return profiles in the markets. We would however, consider revising this opinion if we encountered a corporate strategy coherent with the concerns of a low carbon economy. And one may also wonder whether current debates about how rational it is to invest in the oil sector are really about fundamental analysis, or whether they rather reflect anxieties about the investment styles involved: passive, quasi-passive (little leeway to deviate from traditional benchmarks) or short-term-oriented.

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READY-TO-WEAR GARMENT INDUSTRY: THE ROAD TO PROGRESS

Written on 11/07/2014

Insights from the Bangladesh Field Trip

After the Rana Plaza collapse in April 2013, many people hoped that the tragedy would serve as a catalyst for change in the textile industry. In light of this, a group of concerned investors organized a trip to Bangladesh to gather more information on the ground as to what has happened since the events themselves. While the messages we received were at times mixed, one clear affirmation was that progress is indeed being made – slowly but surely.

The trip was a fact-finding visit, designed to help investors better understand the challenges that companies face when it comes to sourcing from Bangladesh. The trip consisted of three factory visits, two of them in the presence of company representatives, as well as several meetings with stakeholders in the industry, such as representatives from both the Accord on Fire and Building Safety in Bangladesh and the Alliance for Bangladesh Worker Safety¹, two internationally led initiatives to improve the fire and building safety of the garment factories, and the International Labour Organization (ILO).

The trip offered the investor group interesting insights into the garment industry of the country – both developments in terms of fire and building safety in the factories since the Rana Plaza catastrophe and the other challenges the industry faces when it comes to sustainable development. Additionally, our visit revealed how the problems found in Bangladesh can easily be identified in other sourcing countries as well.

Improvements *have* been made...

Fire and building safety inspections are on-going

The Alliance, the Accord and the National Tripartite Plan of Action² have made strides in the fire and building safety inspection of their members' factories in the country. The initiatives are currently focused mainly on factory inspections in order to get remediation underway as soon as possible. The average remediation required at a factory is estimated to be around \$200,000. Access to capital is also available; however, not many factories have taken advantage of this offer. It is not clear whether the reasons for this are cultural (e.g. not wanting their clients to become their creditors and know more about the financial status of the factories) or due to the possibility that the factories actually may not

need the financing and have the funds necessary (most of the factory owners seem to belong to the country's upper classes). Nevertheless, factory inspections and much needed remediation are under way.

Picture 1. Buildings in Bangladesh



Buildings similar to this are prominent in and around Dhaka.

Photo Credit : Mans Carlsson-Sweeney.

Certain factories have been able to create more value

Factories, too, have been doing their part. As is to be expected, the three factories visited were amongst the best to be found in the country — they were selected to show the investor group what could be actually done in a Bangladeshi context, and it is, in fact, good. These factories have gone beyond the manufacturing of basic clothing like jeans and t-shirts. Two of them are vertically integrated, including dyeing and spinning among their capabilities; the other was a suit manufacturer. Both indicate that at least some factories in the country are capable of manufacturing more complex products that have a higher value than previously assumed. Even before Rana Plaza, some companies had already been working towards creating a more sustainable

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1. For a recap on the Rana Plaza accident and the Accord and Alliance, refer back to "Cheap Clothing: At What Cost?" written 28/05/2013 <http://bit.ly/1qvqqZg>

2. The National Tripartite Plan is a joint initiative between the Bangladeshi government and the ILO to tackle fire and building safety issues in factories.

garment industry in the country – beyond just fire and building safety. All three factories are located in buildings built for the purpose, which escape the structural problems faced by multi-purpose buildings. Moreover, the factory management is fairly open about and proud of the initiatives that they have undertaken to ensure that their factories are a good place to work for their workers – salaries are slightly higher than the minimum wage, a pension is sometimes offered, day-care and medical centres are available on-site, transportation and/or lunch is provided or subsidized, etc. Additionally, these factories have demonstrated that investing in human capital has a clear and positive business impact. Their staff turnover is roughly half the industry's monthly average of 8-10%. Factory productivity is increased due to lower absenteeism and increased worker engagement. Finally, certain factories have been able to move away from pricing per article provided, to pricing based on the space used to produce the client's goods.

Retailers are creating relationships

Finally, retailers have been doing their share as well. Certain companies have a local presence in the country, for example Marks & Spencer and H&M both have locally based teams – showing their commitment to sourcing in the country and ensuring that their employees understand the local context as well as maintaining a good relationship with suppliers. Additionally, certain companies have indicated that, when necessary, they coordinate with other companies when it comes to auditing common suppliers, thereby better utilizing their resources and taking the first steps towards industry-wide coordination on supply chain matters.

Case Study: H&M and their Supply Chain

H&M is a global retailer with more than 3,000 stores in 53 markets all over the world that sources from the world's biggest garment producing countries. The key sourcing markets for the company are China, Bangladesh, India, Cambodia and Turkey. Like most companies in the industry, H&M has practices and initiatives in place to ensure that social conditions in their factories meet international standards. Nevertheless, Mirova believes that H&M's practices are among the most advanced in the sector.

Commitment to changing purchasing practices

What sets H&M apart from its peers in terms of sustainable supply chain management is their acknowledgement that if the company is truly to have a sustainable supply chain then their purchasing practices need to be improved to provide reasonable lead times, fair pricing, timely payments and transparent communication to their suppliers – this acceptance is currently not found anywhere else. To show their commitment to this idea, their first action related to supply chain improvement has been to 'update their strategy for sustainable purchasing practices' by 2015.

Dedication to their suppliers

Bangladesh is H&M's second key sourcing market, after China, and one of the riskiest. Because of this, H&M employs a team of 400 people in the country fully dedicated to their relationship with their suppliers. While not all are focused on sustainability matters (roughly 30 of the 400 are sustainability managers), the sheer volume of locally based employees shows the company's commitment to sourcing in the country and to accompanying their suppliers in their development. One excellent example is how, since its inception, the suit manufacturer visited is currently manufacturing exclusively for H&M – demonstrating the company's dedication to accompanying this factory along a path to success.

Yet there is still much to do ...

Despite the improvements that have been made, the path to a completely sustainable garment industry is still a long one.

Fire and building safety issues are still prominent

While the factories visited were located in buildings designed for the purpose, not all factories can boast such accommodations. The amount of improvement needed per factory varies, and while factory inspections are taking place, not much is yet known about the remediation process or how factories are progressing in their corrective action plans. Additionally, of the roughly 5,000 factories there are in the country, only around 3,500 export to western brands and are therefore most probably included in at least one of the initiatives to improve fire and building safety. The remaining factories, which cater mainly to local markets, are off the radar and thus still pose a risk to the safety of their workers. Additionally, the risk of unauthorized subcontracting to 'at risk' factories is still one that a lot of brands sourcing from the country face. Moreover, while the utmost efforts are made to ensure that factories remain open and are safe, some factories that would have to close entirely as their facilities cannot be made fit for use. The question of how to handle this likely event, including how to help employees find jobs elsewhere, has yet to be dealt with.

Lastly, after discussions with representatives from the Accord, the Alliance and the National Tripartite Plan, it appears unclear what is going to happen after the five-year term of the initiatives comes to an end. While it is important that these initiatives focus on factory inspections and remediation at the moment, there is also a need to begin discussing how to ensure that the work and positive outcomes achieved by these initiatives extend beyond the current five year plan.

Picture 2. Factory Buildings in Bangladesh



Garment factory buildings of this sort are scattered all over the city. This factory wasn't one of those visited by the group.

Photo Credit: Mans Carlsson-Sweeney.

Beyond fire and building safety: other obstacles to a sustainable garment industry in the country

The long term outlook of the sustainable growth of the industry is still blurry. In addition to fire and building safety matters, other issues, such as the need for proper working

conditions, much needed infrastructure and a long-term attitude on the part of both brands and factories are hampering the industry's development.

From a country-wide perspective, the current infrastructure cannot effectively support the garment industry's growth. Infrastructure, such as paved roads, highways, ports and a steady flow of electricity, is limited. Additionally, a lack of trained technicians is a concern for the industry and country. Before the Rana Plaza event there were only 11 building inspectors, now there are more than a 100 with targets to reach 500 in the next year. While the numbers are impressive, some question whether or not the inspectors have the necessary skills and educational background to conduct proper inspections. The question of a living wage is still an issue. How much more than the minimum wage should a factory pay? How does this relate to how much the middle management is earning? And finally, how does this relate to how much other people in the country such as teachers are earning? Moreover, social unrest is frequent – with massive strikes, heightened particularly during election periods, causing the country to be at a standstill leading to work stoppages and disruptions in the supply chain. These issues are national matters that cannot be dealt by one industry alone.

Social issues remain prevalent in the industry. Proper worker representation is still limited, and effective unions in factories are almost non-existent. Furthermore, factories are faced with other issues such as the quality of the labour force (as previously mentioned). Absenteeism and employee turnover are high amongst workers – particularly during the periods following national holidays such as Eid-al-Fitr.

Factories also still get mixed messages from their clients. Audits are not standardized and are sometimes contradictory, depending on the company performing the audit. One anecdotal story from a factory manager recounted how the factory had to move the day-care centre several times because of the audit results; this shows how much time and effort factories have to exert just to comply with varying standards. Additionally, certain companies are still bargaining on price – making it difficult for factories to make the necessary investments and implement the initiatives to become better garment factories.

Brands source in other risky countries as well

Bangladesh is only one chapter of the entire supply chain story. The issues raised with regard to Bangladesh are not entirely unique to the country. Retailers are exploring other countries from which to source inexpensively, such as Ethiopia and Myanmar, where the environment and conditions are hardly better than that of Bangladesh and possibly even worse. Additionally, retailers are currently sourcing in countries such as Vietnam and Cambodia where similar problems in working conditions and social issues can be found. While attention is focused on Bangladesh due to the urgency of the situation, as highlighted by the Rana Plaza tragedy, it must not be forgotten that there are other countries where similar contexts and conditions can also be found and must also be attended to.

And all the players must do their part

Moving towards industry standards

The Accord, the Alliance, and the National Tripartite Plan of Action all have the same goal: to ensure the fire and building safety of factories in Bangladesh. Nevertheless, despite their common purpose, collaboration among the three initiatives has been far from smooth sailing. Discussions with factories have brought about the need for an agreement on factory standards. While certain companies may impose requirements beyond the minimum, standardized requirements would considerably increase efficiency in these factories. Should they succeed in setting their differences aside, the three initiatives have the possibility to create an industry standard for fire and building safety regulations in Bangladesh and, if successful, could pave the way for a standardization of other types of audits – not only nationally, but also in other garment sourcing countries.

Picture 3. Road to the Factory



Bangladesh is known for heavy traffic jams. The ride from the hotel to the factory could take up to 2 hours in the car but in terms of distance is less than 60km away.
Photo Credit: Francesca Suarez.

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Government action is needed

The role of the government in the sustainable development of the garment industry is not to be overlooked. As mentioned previously, basic infrastructure in the country is still limited. In order to support the growth of the industry, the government would need to make significant investments in better roads, a dependable electricity network, and a deep sea port, which the country does not currently possess. Additionally, the issue of living wage would be more efficiently addressed at a national level. Increasing wages is a delicate subject, as it can create social imbalances and lead to strikes in the country (as it turns out, it is very easy to get a group of people protesting on the streets). This was demonstrated when the government increased the minimum wage last year, causing both the factory workers and middle management went on strike. The factory workers believed that the increase was not enough, while the middle management believed that they too deserved an increase in their salaries. Additionally, garment factory workers earn

more than school teachers. Consequently, the issue of a living wage needs to be tackled through collaboration among the different players, government included. Finally, the lack of skilled labourers and even chronic social unrest can best be addressed through an effective public system of education. Much of Bangladesh's past economic growth can be attributed to the private sector. It is now the government's turn to ensure that this growth is sustainable.

Picture 4. Road between Dhaka and Chittagong



Chittagong (roughly 300 km away from Dhaka) is where the country's main port is located. To get to the port, the goods manufactured in Dhaka travel in unpaved roads majority of the time.

Photo Credit: Francesca Suarez.

Retailers need to start from within their operations

Retailers still have a role to play, the most important aspect of which is to realize that if they do want to clean up their supply chain, this has to start from within their company. After discussions on the ground, it became clear that most companies' buying practices have changed little since the collapse in that it hasn't really moved beyond the price of the product. There is still a discrepancy between the audits and improvements made to increase social standards and what the buyers are really looking for. Improving buying practices in such a way as to create and maintain a relationship of open communication lines between retailers and factories would be a step towards a more sustainable supply chain. This extends to relationships between the retailer, the intermediaries, and the factories. Enhancing the company-supplier relationship is currently the most effective way to combat unauthorized subcontracting. Additionally, retailers need to have a better understanding of the risks that come with sourcing from countries such as Bangladesh and need to better plan for them. Having direct employees on the ground is a step forward that permits better knowledge of the local context. Retailers also need to integrate the potential effects of social risks into their financial planning – for example, retailers were caught by surprise and financially unprepared when the minimum wage of Bangladesh increased last year. Indeed, some factories were forced to swallow the extra costs for fear of losing the orders retailers had already placed. At the same time, responsible supply chain management requires that companies deploy a lot of resources, thus we don't expect this for all the countries they are sourcing in, and we expect this amount of effort to be limited to countries where the company's exposure and

the risks are high. As mentioned, Bangladesh is not the only country where human rights issues are prominent; similar problems are also found countries such as Cambodia and Pakistan. With their global reach, companies should be able to use their positive influence in these countries as well.

The road to progress

The road to a sustainable supply chain is still long and its path not very clear. The problems encountered in Bangladesh are not limited to the country and extend to other source countries such as Cambodia and Vietnam. There many improvements to be made on the part of all the different players in the industry. The trip highlighted the importance of collaboration if we are to progress towards a global sustainable supply chain. With government support, companies have the capability to ensure that sustainable supply chain management best practices prevail not only in Bangladesh, but also in other sourcing countries. Companies cannot do this alone, however and the participation of governments and society at large is essential.

Investors too have their role to play. One is by applauding and endorsing the companies that have made significant progress towards this goal. Companies need to know that they can be open and transparent about existing challenges and their initiatives to clean up social issues in the supply chain. Following this, investors can and should also engage with retailers, accompanying them in improving the sustainability of their global supply chain. With this in mind, we believe that a collaborative engagement with other investors would be more effective in inducing change within companies and would yield more favourable results. As a result, we have launched a collaborative engagement with other institutional investors in hope of using our combined investor leverage to discuss how to best improve supply chain practices directly with companies.

This trip has afforded us deeper insight into the challenges that retail companies face on the ground and will thus, hopefully, lead to more fruitful discussions in our engagement with them, particularly relating to the following axes identified in our previous study of supply chain issues :

- ➔ increased transparency: more communication on the structure of retailers' supply chains, their initiatives and progress thereof;
- ➔ social risk mapping: better understanding of the risks linked to the supply chain, where they are situated and how large the negative impacts could be;
- ➔ enhanced relationships with suppliers: development of longer-term relationships starts with the company's buying practices;
- ➔ multi-stakeholder initiatives: a systemic approach to addressing issues that the industry as a whole faces (e.g. lack of worker representation, providing a fair living wage, etc.).

THE SOCIAL PROGRESS INDEX: A NEW TOOL FOR BOTH POLICYMAKERS AND INVESTORS

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Interview with Michael Green

CEO of the Social Progress Imperative
co-author of *Philanthrocapitalism*

Interviewed by Mirova

Written on 30/03/2014

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MICHAEL GREEN

Michael Green is an economist and writer based in London. He is the CEO of the Social Progress Imperative, a US-based non-profit organisation. He is a member of the advisory boards of the Impetus Trust and the B Team, and is a fellow of the Royal Society of Arts. Mr Green served as a senior official in the U.K. Department for International

Development, where he managed British aid programs to Russia and Ukraine and headed the communications department. He is co-author of *Philanthrocapitalism: How Giving Can Save the World* and *The Road from Ruin: A New Capitalism for a Big Society*. He is @shepleygreen on Twitter.

Can you explain briefly how and why the Social Progress Imperative was created?

The Social Progress Imperative was born about four years ago. It grew out of the World Economic Forum Global Agenda Council on Philanthropy and Social Investment. A group of people there really felt there was a need for better metrics to foster collaboration between business, philanthropy and government in solving social problems.

Initially we were talking in terms of what we called a 'social competitiveness index.' We approached Michael Porter at the Harvard Business School, and, in conversation what really emerged was a feeling that the model we have for national performance is incomplete: GDP is not telling the whole story, it's an incomplete model. Michael Porter's insight was that, if you take economic indicators out, and make an index composed entirely of social and environmental indicators, you can then look at the relationship between what we call the Social Progress Index scores and GDP.

Just to give an example, look at the run-up to the Arab spring; one of the world's top economic performers was Tunisia. This country was growing rapidly, but still hit social problems. Or today, following the financial crisis of 2008 there's a lot of talk about 'inclusive growth' and 'shared prosperity' but much less clarity about what these popular phrases mean. There's a whole host of problems with GDP and with measuring national performance solely in terms of GDP. We need a complementary measure to put alongside it to create a more complete story and this is what the Social Progress Index (SPI) aims to do.

Can you tell us a little bit more about the index?

The Index is founded on the principle that what we measure guides the choices we make. By measuring the things that really matter to people—their basic needs, their food, shelter and security; their access to healthcare, education, and a healthy environment; their opportunity to improve their lives—the SPI is an attempt to reshape the debate about development. The framework we have captures 12 different dimensions of wellbeing and has had very robust feedback.

‘If you take economic indicators out, and make an index composed entirely of social and environmental indicators, you can then look at the relationship between what we call the Social Progress Index scores and GDP.’

Social Progress Index		
Basic human needs	Foundations of wellbeing	Opportunity
Nutrition and basic medical care	Access to basic knowledge	Personal rights
Air, water and sanitation	Access to information and communications	Access to higher education
Shelter	Health and wellness	Personal freedom and choice
Personal safety	Ecosystem sustainability	Equity and inclusion

In terms of our findings so far, the good news is that yes, economic development does seem to be good for social progress. There's a positive correlation; there's also some flattening out in the curve, so that as you get to higher levels of income, the benefits of more economic development slow down. But on the whole there is a positive correlation between GDP per capita and social progress. But there is a but, and the but is that around that trend there is a lot of noise. This means there are things other than economic growth that also matter; there are other policies, institutions and practices that matter in advancing social practices besides GDP. That's a really important finding: our levels of social progress are not determined solely by GDP, so other things matter as well. And what we want to do over time with that insight is understand what those other things are.

Take for instance Nigeria, which has a higher GDP than Ghana. Ghana, however, has a much higher level of social progress. So there are things that Ghana is doing right that will contain lessons about how to deliver more social progress for the same GDP. So that's the exciting part, learning about how we can take these insights and turn them into action.

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We've found that there's enormous value in creating a holistic framework for a country's wellbeing. One of the problems, in terms of advancing social progress, is that social issues are very prone to falling into sectors or silos. For instance, 'the education lobby wants something' or 'the justice lobby wants something' or 'the health lobby wants something'. The Social Progress Index brings all those issues together in one holistic framework.

What is distinct about the Social Progress Index compared to other indexes like the UN's Human Development Index or the OECD's Better Life Index?

SPI is an index that measures the performance of countries entirely based on social and environmental outcomes. We include no economic indicators at all. The Human Development Index, Gross National Happiness, OECD's Better Life Index, the Gartner Prosperity Index and most other alternatives to GDP still include GDP in the measure.

The other distinction is from happiness measures. Happiness measures are looking to the public and asking them to estimate their life satisfaction. Although it's a valid and useful way of obtaining information, happiness measures don't provide you with the origin of happiness. We can say that Denmark is happier than Britain, but what do we do in response? Get people in Britain to speak Danish? Happiness doesn't tell you what to do.

Also, we could be happily consuming away the planet but a happiness measure doesn't incorporate environmental sustainability. So we see social progress as measuring, not so much what a happy society is, but what a good society is. So, unlike Happiness measures, the SPI helps to identify areas for improvement for action. The Social Progress Imperative was created, not in order to design an Index, but to drive change.

‘The Social Progress Index is an attempt to reshape the debate about development.’

What about the relation between the SPI and the upcoming Sustainable Development Goals (SDGs) issued from Rio+20?¹

The Millennium development goals (MDGs) were not oriented towards well-being but focused, quite rightly, on the most needy. The SPI, on the other hand, includes shelter and housing, personal safety, and emerging health problems like non-communicable diseases and obesity, which are not in the MDGs.

Also, more fundamentally, one of the three dimensions of the SPI revolves around opportunity, personal choice, tolerance and inclusion, which are not part of the MDG framework.

I think that the SDGs are going to be a political process. There are new, future problems that we need to capture as part of a holistic wellbeing framework that I don't think are going to be part of the SDG framework. I've not seen in the debate around the SDGs much talk about including obesity. Yet obesity is soaring in the developing world. It's an incredible epidemic. Countries are going from malnutrition to obesity incredibly quickly. The highest obesity rates in the world are now in middle income countries like Egypt and Mexico.

What are the limitations of the SPI?

The biggest limitation we face is quality of data. The SPI is the best index we could create based on the available data. Astonishingly, there is no good, globally comparable data on shelter and housing. The last data is from 2005 UN habitat. So here we have a really basic human need: shelter and housing, that doesn't have good data. There are also other emerging challenges in the world, like mental health; the data on mental health is incredibly poor. We would love to have an indicator for something like 'strength of family' and wider social networks, but we don't have one. There's a whole list of areas where I think measurement of social performance needs to improve. One of our primary messages in the 2014 report will be highlighting where those gaps are. We'd love to have better data and we want to campaign around this issue.

Sticking with the data for a moment, do you try to use only public data? Is this an issue for you with regards to transparency?

Yes, we want to use as much data that's non-proprietary as possible. For each 'component' of the Index, we have identified the best available measures. For example we're using Gallup data to measure tolerance and inclusion, like respect for women, treatment of homosexuals. Gallup data gives us a measure of people's lived experience which is particularly relevant around treatment of minorities.

This brings us to another point we hoped you'd touch on, which is the 'outcome oriented' aspect of the index. Could you explain that a bit?

If you measure inputs, you're making judgments about what the right policies are, what the right institutions are. And that involves a whole host of value judgments. So we decided to build our framework on outcomes to try to be as non-judgmental as possible. An outcome-based framework can help lead to an understanding of how input measures are correlated with good outcomes. So our plan over time is to use SPI outcome numbers to start generating analysis and knowledge about the inputs.

Is there a suggestion that the SPI reflects a rather western vision of wellbeing and progress? Has that been an issue for you?

We are aware that any framework, SPI included, will incorporate value judgments about what societies should be like. It's impossible to have a value-free index.

1. In Rio+20, Member States decided to launch a process to develop a set of Sustainable Development Goals, which will build upon the Millennium Development Goals and converge with the post 2015 development agenda (<http://sustainabledevelopment.un.org/rio20.html>).

‘
If you measure
inputs, you're
making judgments
about what the
right policies are,
what the right
institutions are.

We've been talking to philosophers, to economists, development people, sociologists, policymakers and we've tried not to have a particularly western set of values.

‘ The SPI could definitely become meaningful market data for understanding the performance and sustainability of a country.

As you know, the United Nations publishes an inequality-adjusted HDI. We were wondering how the SPI addresses issues of inequality?

Sometimes, when talking about inequality, people are only referring to income inequality. We don't include that in the model because it's an economic indicator. And I must say I would express concern that we focus so much policy concern solely on income inequality as being the driver of all other inequalities.

In the SPI, a whole bunch of our indicators aren't talking about the average value for a country, they're looking at 'does everyone have access to this?' 'Does everyone have this service, this thing in their life?' So I think we're really picking up inequalities in terms of how people can live their lives in a society, but what we're not relying on is the income inequality proxy.

We have in mind to incorporate SPI into our investment process. What is your take on this?

Determining a country's social sustainability is actually very important if we're thinking about sovereign creditworthiness. Even if a country is experiencing a short term economic boom, if there are signs of a lack of social sustainability, I am convinced that would signal a risk that has to be reflected in sovereign credit. Of course, SPI's short track record does not enable us yet to validate this opinion, Yet.

SPI could definitely become meaningful market data for understanding the performance and sustainability of a country. Taking this line of thought further, this would hopefully mean that countries which are better at promoting social progress are actually rewarded by the market, creating an incentive for countries to promote social progress.

Others uses of the SPI could emerge from risk management innovation. We see the SPI as being meaningful data for rating agencies or the insurance industry, but also for companies. For instance, in a particular country, how well-focused are a company's social and environmental impacts and opportunities on the priorities for that country? Because, if success is partially predicated on demonstrating social usefulness, then investing in shared value is a road to success, long-term success.

Thanks for speaking with us, Michael. We're looking forward to the 2014 Social Progress Index. Are you still on track, and is there anything you'd care to share about the upcoming publication?

April 3rd is our publication date. Just to let you in a bit, there are things that social progress can actually add to the analysis of happiness that we'll be reporting on this year. That's my teaser, I'll not give you the finding just yet, but we'll be reporting on it this year. We think that there is new information we can offer about what actually drives happiness in addition to GDP.

The full, interactive dataset from the Index is available at: <http://www.socialprogressimperative.org/data/spi>

 @shepleygreen

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