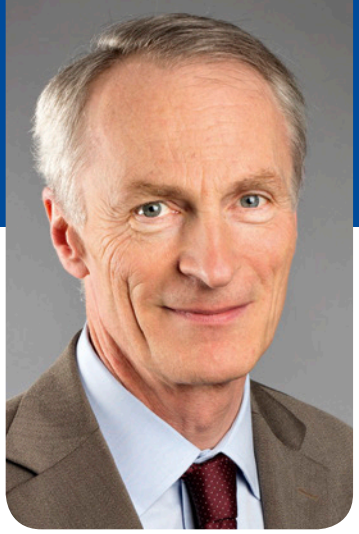
March 2017

Companies and biodiversity

Managing impacts on the value chain

entreprises pour l'environnement



Foreword from the **Chairman** of EpE

Biodiversity and ecosystems: we hear and use these words more and more every day. The extent of the impact of human activity on the biosphere is increasingly noticeable, sometimes positively, but unfortunately most often negatively, with the current status calling for a significant shift in our collective awareness and practices.

Companies – quarry and forestry operators, public works promoters, industries using and discharging water, to list just a few – are growing more alert to the issues; law and their own environmental awareness are encouraging them to make the shift towards "avoiding, reducing and offsetting". Some have even become experts in biodiversity: for example, linear infrastructure is progressively becoming green infrastructure, because it can provide a degree of ecological continuity; many former quarries have become areas of particular ecological wealth, etc.

However, this only represents an infinitely small part of regions and ecosystems whose ongoing decline is evident and can be traced back to many other root causes. Individuals and companies all have a significant effect on biodiversity today, indirectly in many cases: our purchases of plant, animal and mineral products often weigh on ecosystems already weakened by decades of hardly responsible exploitation; our discharged waste ends up in the natural environment, builds up and results in unforeseen damaging effects.

Some human activities now weigh very heavily on nature and have become a threat to us all. And yet, nature provides us with everything necessary for life. Clearly, therefore, it is in our interest that it prospers rather than slowly declines.

This calls for a change in attitude towards biodiversity that EpE members, major corporations in very diverse sectors, have already initiated: the aim is to be vigilant in reducing these indirect impacts, which are massive because of our size, even if they are remote and diffuse. Our experience, recorded in this brochure, shows that the gradual destruction of the living world's balances is not inevitable, even if the huge shift demanded requires some resources. Reacting means also providing our employees, partners, suppliers and without any doubt our clients with a motivating and even fulfilling pathway, as shown by experience.

As major corporations, we have the capacity to lead and influence across our entire value chains, in both directions, upstream and downstream. We must leverage this capacity for the benefit of biodiversity as the situation has become urgent: the scientific world regularly warns us of its rapid erosion, and we can't remain indifferent to this call.

I hope that this brochure will stimulate activity in many other companies, enrich ours, make the demands we place on our suppliers understood and contribute to mobilising our clients.
Thanks to everyone.

Jean-Dominique Senard, Chairman of EpE
President of the Michelin Group

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List of contributions by company and organisation

Introduction

The French (and others) regularly observe the continuing degradation of biodiversity and ecosystems; companies too are beginning to note the reduction in the services provided by such ecosystems, such as the provision of raw material, and the regulation of water quality and of the climate. These changes are a source of growing concern for many stakeholders: scientists, NGOs and lawmakers. The topic has even changed perspective, as recently emphasised by Jean-François Sylvain and Pierre-Edouard Guillain in an article in the Responsibility and Environment series published in the Annales des Mines[1]: the aim is not to prevent the disappearance of this or that species or to stop the ongoing erosion, but to find the means for us all, humans in the natural environment, to evolve with our ecosystems so that we adapt to changes as yet unknown to us: those shifts that have already occurred had not all been foretold. The degradation is not evenly spread, its effects are unforeseeable; but it is happening at an unprecedented pace and is largely irreversible once certain thresholds have been reached.

Companies are sensitive to the risks that this degradation and these imbalances place on their business. They are aware of the collective effect of degradation mechanisms on biodiversity, causing concern about the issues beyond their direct sphere of action but also raising many questions about what action to take: who can or must do what?

From this emerges the notion of the company's broader corporate responsibility, a term that refers to the fact that a company, in the environmental and societal context of globalisation, is considered by society, if not by law, as partly responsible for what its suppliers do, the transport of their goods, the use clients make of their products and their end-of-life. Taking the first steps towards a more collective approach, a certain number of companies are starting to work on improving their understanding of how they interact with biodiversity even when that interaction is attributable to their partners, subcontractors, suppliers or clients.

Aware of society's growing expectations from them, the EpE member companies have shared their experience and the tools they have developed or use to manage their dependency and impacts on biodiversity beyond their own production sites. This publication shows how the most advanced companies work on their products and services, with their suppliers and clients, to reduce their impact on biodiversity.

This evolution has been facilitated by the progress already made with the climate issue: this brochure addresses what is called "scope 3" in the context of climate. The approach and means of action often grow out of what has already been done to reduce companies' emissions, thereby paving the way for the various stakeholders to address the issue directly. Throughout this publication, we will nonetheless see that capitalising on this climate experience has its limits because of the particular complexity of biodiversity.

The brochure draws on some 30 concrete examples to demonstrate the benefits of this broader approach, its difficulties and the solutions that EpE members have found to incorporate this dimension in their operations. In the first section, it explores the dynamics that lead a company to take action. Why take action on indirect impacts? How to persuade all company stakeholders to commit to this at-times complex pathway?

The second section presents various solutions found by companies to take action at different stages in the value chain: supplies, transport or the products themselves and their use and end-of-life.

The third section looks at emerging areas of progress that everyone can use in their search for the new dynamic balances referred to above. The companies that have understood the challenges and taken them on board keep a watchful eye on the available solutions and new approaches to better manage the interaction between humans and nature.

1 Annales des Mines, Responsibility and Environment series, July 2016 – Où vont les sciences de l'environnement? [Where are environmental sciences heading?]

1 Why take action on indirect impacts?

Indirect impacts include impacts on biodiversity across the company's entire value chain, from the supply phase to management of waste from the used product, and including product transport and use. So a company, even without impacting directly on biodiversity during the production process, can impact on it through its raw material suppliers or its clients who use the products it sells.

At its recent international conference, the International Union for Conservation of Nature (IUCN), in one of its priorities for the coming four years, encouraged companies to report on the direct and indirect dependency and impact links between their activities, biodiversity and ecosystem services. This recommendation to broaden their scope of responsibility to include that of the companies they work with throughout the value chain is increasingly found elsewhere in international standards and agreements. It is not yet included in regulations, but companies have every interest in anticipating this development to ensure the long-term viability of their business and to meet society's growing expectations.

This section of the brochure presents the three main drivers for companies to take concrete action and reduce their indirect impacts: growing social and regulatory pressure, progress in knowledge and awareness of the issues, and lastly, economic opportunity and pressure from the financial world.

1.1 Social and regulatory pressure

No regulations govern indirect impacts on biodiversity in the value chain. However, a review of international agreements, non-financial reporting rules and stakeholders' expectations show that companies' actions in this area are coming under increasing scrutiny.

1.1.1 Regulatory pressure

France's recent adoption of a law on biodiversity, nature and landscapes[2] includes a suite of provisions expanding the economic stakeholders' responsibility to include biodiversity. This is the case, for example, with the inclusion of ecological damage in the French Civil Code, the integration of the Nagoya Protocol and its provisions concerning ecosystem access and benefit sharing (ABS), the management of ballast and even with raised penalties for introducing invasive alien species to the national territory.

Article 4 of the French Biodiversity Act includes ecological damage in Article 1247 of the French Civil Code: "Is recoverable, under the conditions of the present section, the ecological damage consisting in a non-negligible prejudice to the elements or functions of ecosystems or to the collective benefits humans derive from the environment." This new redress system consists in a mechanism by which an indemnity can be given for environmental damage, as part of non-contractual civil liability. Economic stakeholders thus face many consequences as a result of ecological prejudice having been included in the Civil Code, as explained in the contribution from the insurance broker Marsh.

Past experience shows that attributing responsibility could impinge on stakeholders whose economic weight leads to a degree of responsibility in the decisions made by other stakeholders, subcontractors or others. The general nature of the new law provisions are reshaping the landscape in companies' relations with biodiversity.

2 https://www.legifrance.gouv.fr/affichTexte.do?cidTexte=JORFTEXT000033016237&categorieLien=id

MARSH
The insurance sector: an important player in biodiversity preservation

Marsh has worked closely with markets specialized in the insurance of environmental risks to provide innovation compared with the traditional approach. This traditional approach has been to analyze losses from the past to encourage businesses to implement systems of prevention in order to reduce losses of the same nature in the future.

Because of new scientific research and a new regulatory environment, the insurance sector in 2008 when the EU directive 2004/35/EC was introduced as a public law in France, had limited ability to transpose loss histories from the past to the new legislative environment. Despite this the insurance sector agreed to cover businesses for the new exposure. They did this by adapting their rating systems over time as well as their recommendations on prevention for the future.

By introducing biodiversity under the definition of environmental damage under the French Code Civil – private law - No. 2016 - 1087 of August 8th 2016, France went further than any other country in the world to implement a system of accountability. The existing legal framework was thereby made significantly broader:

- Accountability under the European Directive was applicable only to damage arising from harmful events occurring since 2007. The new French law also applies to any prior harmful event provided the damage has not yet been identified,
- The law does not distinguish between exceptional biodiversity, the only type regulated till then, representing 17% of the area of France (Natura 2000 areas), and ordinary biodiversity (100% of the area of France) which is as well now regulated by law .
- Accountability applies to any person or entity,
- The right to act, previously mainly reserved for the Prefect, has been extended to any person having the capacity and interest in bringing legal action.
- Finally, registration under the Civil Code, will allow for better legal stability for the repair of environmental damage, which was formerly decided solely by case law.


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Marsh is working with insurance companies to extend policy wordings to include coverage for new needs and to partner with businesses throughout this transition for biodiversity risks.

1.1.2 Reporting obligations and standards

Reading sustainable development reports shows that companies are somewhat perplexed when it comes to biodiversity. What are the relevant indicators? Even if progress has been made in non-financial reporting, even if climate reporting has enabled companies to structure the Scope 1, 2 and 3 notions, biodiversity's inclusion in non-financial disclosure documents is still limited, as revealed in the B&L Evolution analysis of companies included in the Paris Bourse's CAC 40 index[3].

The companies that have ventured furthest down this track are of course those whose business directly impacts on nature (linear infrastructure, mining and quarries), and which have therefore a long history and level of maturity in this area.

It might indeed be considered that the mere mention of renewable raw material purchases is an indicator of biodiversity, as the company depends on these products and its purchases influence agricultural or forestry practices; its footprint depend on how the agricultural ecosystems providing them are managed.

France: a pioneer in CSR reporting

The so-called "NRE" or New Economic Regulations Act adopted in 2001 made France the first state to require listed companies to present non-financial reports on

3 http://www.empreinte-biodiversite.org/etudes/evaluation-strategies-biodiversite-du-cac40/ (in French)

© Convention sur la Diversité Biologique

their social, environmental and governance practices. In 2010, the Grenelle 2 Act and its Article 225 extended the 2001 Act by making it mandatory for companies to provide social and environmental disclosure. This Article includes biodiversity among the subjects to be addressed in non-financial reporting documents and encourages companies to include "the measures taken to conserve and develop biodiversity". Still, companies have the option of not including the required information if biodiversity is not deemed material to the company's business, although it still has to be justified pursuant to the principle of "comply or explain".

European law still silent about biodiversity

The European Directive 2014/95/EU regarding the disclosure of non-financial and diversity information makes it mandatory for public interest entities with over 500 employees to disclose environmental information, but biodiversity is not explicitly mentioned. Only the European Commission's CSR programme recognises the multi-dimensional nature of CSR and refers to biodiversity.

1.1.3 International agreements

International agreements, which are generally non-binding for companies, reflect a global undertaking by States, which, together with members of civil society, can nonetheless refer to them in their dealings with companies even if the agreements have not been transposed into national law.

The Aichi Targets: a framework of action for all stakeholders

Adopted in 2010 in Nagoya, Japan, by the Member States of the Convention on Biological Diversity (CBD) Agreement at the Conference of the Parties (COP10), the 20 Aichi Targets provide a framework of action for conserving biodiversity and increasing the benefits it provides for human communities. Target 4 directly concerns companies, which must "by 2020 [...] have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits".

In its mid-term review, the European Parliament indicated that the Aïchi

targets will not be met if the European Union does not do more and requires that measures must be taken to "address the root causes of biodiversity loss and improve the integration of biodiversity in sectoral policies, including agriculture, forestry, fisheries, energy and transport".[4]

Access and Benefit Sharing Agreement (ABSA)

Eighty-five countries have ratified the Memorandum of Understanding on the Access and Benefit Sharing Agreement (ABSA), which places management of the use of genetic resources and traditional knowledge among public policy concerns. The companies interested in such resources must obtain prior consent from the State where they are located and commit to fairly sharing the benefits prior to exploiting them. The way this Agreement is implemented varies by State; it is already applied in Brazil, for example. The client companies of raw material producers must therefore examine the situation and its potential effects on their own business.

Sustainable Development Goals for the planet (SDGs)

At the end of 2015, the United Nations adopted 17 sustainable development goals for the planet for 2030. This agreement mentions that companies have a role to play in achieving these goals. Two of the goals refer directly to biodiversity: goals 14 (life below water) and 15 (life on land), many of the other goals can be included as ecosystems contribute to them through the services they provide (climate, food, water, etc.); if ecosystems cease working, other goals can no longer be reached. Coastal fishing is already a case: fishermen need to go further out in deeper water because of the overexploitation of fish stocks, 29% of which are overexploited and 61% completely exhausted[5], with consequences on Goal 1 (hunger).

In order to assist companies in their contribution to the SDGs, EpE and Global Compact France have translated the SDG Compass Guide developed by the Global Reporting Initiative (GRI), Global Compact and the World Business Council for Sustainable Development (WBCSD) into French[6]. This guide explains how companies can contribute to these goals and how they can include them in their corporate strategy.

The sheer number of conventions, while not always resulting in positive law, nonetheless creates a new context in which companies are deemed to have analysed numerous non-financial aspects including on biodiversity at large.

1.2 Progress in knowledge and awareness

As mentioned above, biodiversity has benefited from progress in the area of climate: as approaches have been developed for including climate in management systems, the authors of such systems have also incorporated biodiversity. Those in charge of managing them in companies have made progress on biodiversity in a relatively natural way. The population's growing awareness of biodiversity issues, and so that of company employees also, has also facilitated this progress. Some specific tools have been developed as well.

For example, in 2014, EpE published "Measuring and managing biodiversity[7]", a guide for developing and implementing biodiversity indicators, illustrated with around 40 case studies of EpE members' practices, some of which concern indirect impacts. This guide is still relevant and we encourage you to refer to it to help you develop appropriate indicators.

The following paragraphs present tools for assessing the contribution by economic stakeholders to the erosion of biodiversity in a context of broader corporate responsibility.

1.2.1 Environmental Management System (EMS)

In addition to environmental management systems, biodiversity labels have recently appeared.

ISO 14001 and ISO 26000 standards: consider the value chain and a product's life cycle

The ISO 14001:2015 standard extends corporate environmental policy to include the entire product life cycle, broadens the field of responsibility and encourages companies to adopt methods to improve both management of their supplies and the proper use of their products. Even if the question of biodiversity is not addressed explicitly, the standard's provisions require that the environment at large must be incorporated into long-term strategic planning for companies to obtain certification, thereby raising its level of protection.

The ISO 26000 standard encourages companies to compile a list of the direct and indirect impacts of their activity on biodiversity, taking into consideration the value chain and the products life cycle.

Eco-Management and Audit Scheme (EMAS)

This European environmental management system, adopted voluntarily by some companies, promotes organisations' continuous improvement in the area of the environment. It is based on the introduction of targets and tracking indicators, disclosing the results and engaging in dialogue with the relevant stakeholders. Companies therefore undertake to disclose their performance in the following areas: energy efficiency, rational use of materials, water, waste, biodiversity and atmospheric emissions. The company determines itself the extent of the scope included in its approach.

4 http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//TEXT+REPORT+A8-2016-0003+0+DOC+XML+V0//EN
5 WWF, Living Blue Planet Report. Species, habitats and human well-being, 2015
6 http://www.epe-asso.org/le-guide-des-odd-a-destination-des-entreprises/
7 http://www.epe-asso.org/en/measuring-and-managing-biodiversity-october-2014/

Biodiversity commitment: ECOCERT certification
This certification concerns biodiversity at the local level throughout the product's entire value chain. It is targeted at committed companies and provides them with guidance for structuring their biodiversity approach. To obtain this certification a prerequisite is to have measured and taken into account all biodiversity-related topics (cf. box below).

1.2.2 Qualifying links between biodiversity and the company

The interaction between companies and biodiversity generally entails one of the following three mechanisms, directly or indirectly:

- Exploitation of renewable natural resources (wood, cosmetics, paper, fisheries, tyres, etc.)
- Direct or indirect impact on nature (extraction, construction, industry, agriculture, infrastructure, chemicals, pharmaceuticals, etc.)
- No direct impact but potential synergies (water treatment, tourism etc.).

Almost all industrial and energy companies have an indirect link to biodiversity as their raw materials, whether renewable or mineral, and possibly transformed through a series of stages, are extracted from the natural environment. The various stages in this transformation may have used or impacted on ecosystems. The question is obviously whether this interaction is material or not, but as for greenhouse gas emissions, the sum of diffuse interactions has significant consequences and it is no longer sufficient to focus solely on heavy industries.

There is an increasing number of tools available for assessing the interaction between companies and biodiversity, reflecting the diversity of the issues at stake and situations encountered. Recent guides include these tools depending on their use. The main ones are WBCSD's

ECOCERT «BIODIVERSITY COMMITMENT» CERTIFICATION

In order to provide recognition for organisations that place biodiversity issues at the centre of their strategy, ECOCERT developed the "Biodiversity Commitment" methodology.
The "Biodiversity Commitment" certification is defined by the following seven criteria:

1. Universal certification that adapts to all types of organisations internationally.
2. Certification that takes into consideration local and global biodiversity throughout the organisation's supply chain, in the regions directly or indirectly affected by its activities.
3. Certification that encourages greater awareness of the role of biodiversity and organisations' dependency on it.
4. Certification that involves stakeholders in order to connect the organisation with its region and to share information and capitalise on experience.
5. Certification centred on measuring the biodiversity footprint through regular assessment of the pressure exerted by the organisation's activity on biodiversity at a given moment in time. This approach encourages biodiversity resilience and helps make the company's ecological functions more robust.
6. Certification that aims to avoid and reduce pressure on biodiversity at operational business level, by anticipating impacts right from a project's design phase, without forgetting the ecological component of related infrastructure projects.
7. Certification that drives towards continuous improvement in biodiversity performance enabling each organisation, following its audit, to mature and act gradually at the daily level on the drivers enabling it to reduce pressure on the ecosystem while at the same time having a positive impact on its region.

ECOCERT's "Biodiversity Commitment" certification is obtained for three years.

ECO4BIZ[8] guide "Ecosystem services and biodiversity tools to support business decision-making", and the CDC Biodiversité[9] guide "Companies and biodiversity: what tools for which decisions?", such approaches.

Such approaches can be directed on a broader perimeter than just the company as evidenced in the box opposite.

An analysis grid: the recognised five causes of biodiversity erosion

While a company pays attention to its indirect impacts, it can seek to assess its contribution to the main causes of biodiversity erosion and so gain a comprehensive and relevant view of the biodiversity issues that concern it in order

RTE
Collective tools to support research

In 2014, RTE with Linear Infrastructures and Biodiversity Club (CILB), joined forces with the French Ministry of the Environment and the Foundation for Research on Biodiversity to launch a call for proposals through ITTECOP research program (Land Transport Infrastructures, Ecosystems and Landscapes). Fifteen exploratory and research projects on the links between linear infrastructures of land transport, socioeconomic issues, biodiversity and landscapes, are being carried out between 2014 and 2017.

Different supports and tools enable to highlight these projects and to insure the widest possible transfer of scientific knowledge to public policies actors and practitioners. These works are completed by a systematic review, the first one in France, to evaluate quantity and quality of knowledge available on this subject. It will enlighten new orientations of the next call for proposals launched by RTE and its partnerships from 2017.

8 http://www.wbcsd.org/Clusters/Ecosystems-Landscape-Management/Resources/Eco4Biz
9 http://www.mission-economie-biodiversite.com/publication/entreprises-et-biodiversite- quels-outils-pour-quelles-decisions / Only available in French

to prioritise the required actions. The following is a non-exhaustive list of questions for an initial assessment of how companies contribute, based on five scientifically recognised (ordinary or exceptional) biodiversity erosion factors.
The contributions by EpE members in the following pages illustrate their use of certain tools.

As explained in the EpE brochure "Measure and manage biodiversity", a discussion and agreement between a company and its stakeholders will enable a solid understanding of the issues, establish the credibility of the assessment approach and form the basis for determining the management priorities.

Life cycle analysis

Life cycle analysis is used to identify a product or service's environmental impact at each step in its life cycle and for several indicators. To date, there is no precise and unified biodiversity indicator in life cycle analysis methods, and perhaps there can never be one, because of the many factors involved (species,

FRAGMENTATION AND DESTRUCTION OF NATURAL HABITATS	• In what way does my business or that of my suppliers contribute to soil degradation? • Are my suppliers responsible for the conversion of natural habitats? • Does road freight further fragment habitats in a particularly sensitive area?
INVASIVE ALIEN SPECIES	• Does freight transport help propagate invasive species? • What equipment does my ocean carrier have to treat ballast water? • Does the transporter have a biodiversity policy? Is it sensitive to the issue of invasive species?
POLLUTION	• What are the practices of my raw materials suppliers? • Do my transporters pollute? How much? Do they comply with the regulations? • Does the product have end-of-life impacts on biodiversity? • Does the product's use by the client impact on biodiversity? • Does the consumer or client's conduct contribute to the erosion of biodiversity?
OVEREXPLOITATION OF RESOURCES	• Are the raw materials used of natural origin? • Do they come from a sensitive area, or from a biodiversity hot-spot? • Are they certified? • Are there any alternatives? • Can I use less?
CLIMATE CHANGE	• Does my business degrade the soil and its ability to absorb CO_2? • Does my business destroy forests? (Release the carbon stored in the soil and reduce carbon absorption) • Does my business destroy coral reefs? • Do my suppliers' businesses destroy coral reefs? • What is my contribution to climate change[10]?

10 Combatting climate change is therefore one of the aspects of protecting biodiversity. Given the volume of work already devoted to this issue, we will not discuss it further here.

THE CORPORATE ECOSYSTEM SERVICES REVIEW

Ecosystem services concept is hard to grasp, but the use of assessment tools could facilitate the consideration of biodiversity in the decisions of the economic actors. In this perspective and in order to supplement its current environmental policy, RTE launched into an innovative approach to evaluate the ecosystem services in connection with the maintenance of the electricity network. This study, based on a recognized reference evaluation, The Corporate Ecosystem Services Review, provided a better understanding of the interactions between RTE activities and the ecosystems and to identify opportunities bound to the conservation of the ecosystem services, which were translated into concrete recommendations for the company.

With this new perspective, RTE develops its management policy of vegetation near electricity transport infrastructures. Ecosystems-friendly measures as hunting measures, extensive grazing, edges or restoration of natural specific areas, are now alternatives to mechanized management.

For example, RTE has signed a partnership agreement with the Aquitaine Regional Conservatory of Natural Areas in order to set up a vegetation management that favors biodiversity under certain power lines. This decision follows a study showing that these areas housed a quarter of the gentian pneumomanthe's population, the host plant of the Azuré des mouillères (Maculinea alcon), a protected species of butterfly.

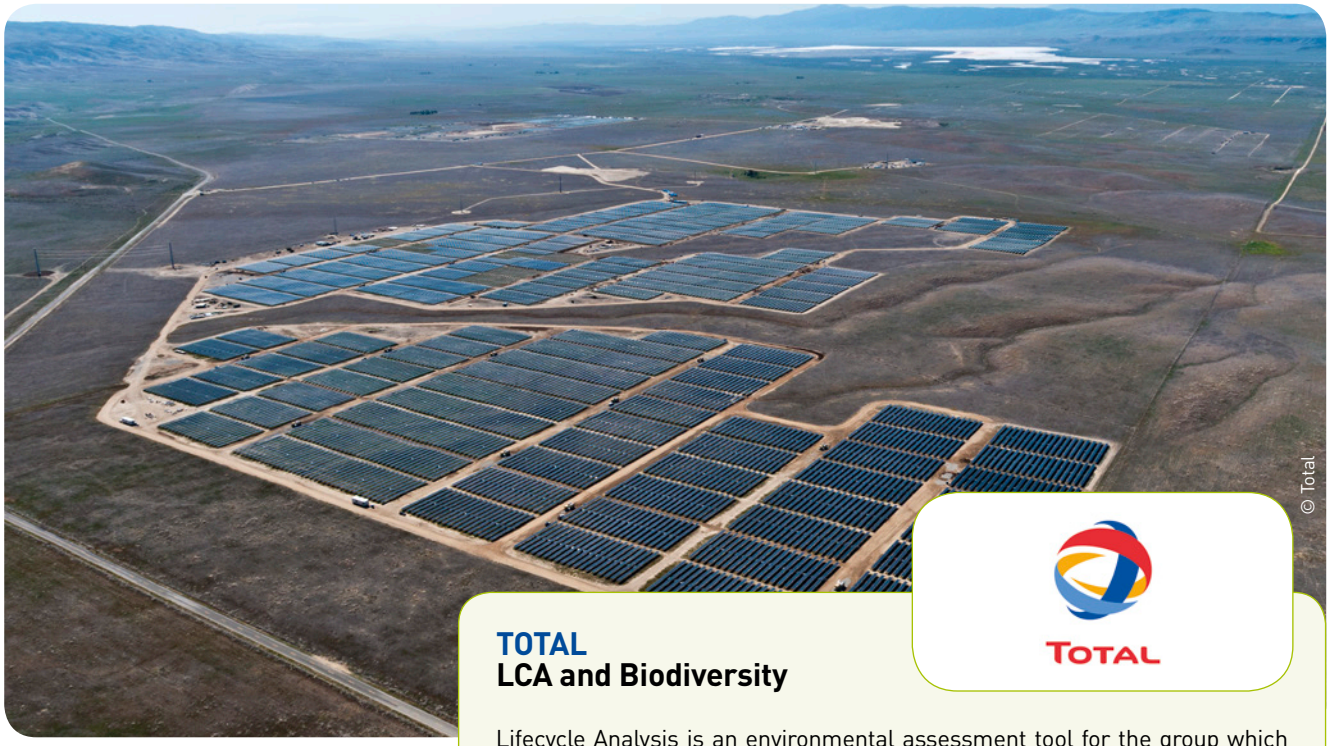
BAYER
A better understanding of biodiversity for a better preservation

Bayer is committed to a sustainable agriculture approach that respects biodiversity. Within this framework, actions of inventorying and preserving biodiversity are taken including wildlife useful for agriculture : pollinators, earthworms, ground beetles ... These latter mainly feed on crop pests and are thus beneficial insects.

In addition to the inventory carried out by the network "Surveillance Biologique du Territoire", that involves Bayer, Bayer delves deeper into its own knowledge. Thus, 5 out of its 6 Reference Farms and some of its arboreal sites dedicate lands to biodiversity monitoring and study factors that can foster it (landscaping, crop rotation ...).

Initial results are promising. Farms show a good level of biodiversity : 160 species of ground beetles, some of which being conspicuous, have thus been identified during the inventories conducted by Bayer. There are about 1500 species in France whereas farmlands are often deemed to be poor in ground beetles by lack of study of these lands.

Numerous exchanges on these inventories with growers of Reference Farms have allowed the assessment of actions to be implemented to promote biodiversity in their farms.



habitats, ecosystem services, etc.) and the diversity of situations. Nonetheless, biodiversity is directly impacted by factors for which indicators exist: habitat quality (soil and water use), pollution (including ocean acidification, eutrophication and ecotoxicity), wetlands and climate change (Global Warming Potential). These factors are analysed by midpoint indicators, or problem-oriented indicators, that reveal a potential risk (ocean acidification, land use, climate change, etc.) and endpoint indicators, which focus on the damage liable to have direct consequences (e.g., health and biodiversity). Midpoint indicators are more precise as they are quantifiable (GHG emissions, acidifying pollutants, etc.), while endpoint indicators are more open to interpretation.

In 2013, I Care & Consult, at the request of the SCORE LCA[11] association, conducted a study to determine which flows in LCAs could be of use for biodiversity.

Current research work aims to develop an LCA method that improves how biodiversity is taken into account, especially by incorporating local data that are relevant to biodiversity.

TOTAL
LCA and Biodiversity

Lifecycle Analysis is an environmental assessment tool for the group which serves both to guide the research (orientation towards the solutions, for example in the field of photovoltaics), to support the development of products and their labeling (Total Ecosolutions ...) and advocacy (e.g. by comparing different fossil electricity production (Gas and Coal) etc).

The impacts on biodiversity of two products can be assessed using an impact indicator measuring the impact on the "Ecosystems Quality" (aggregate indicator or "endpoint").
This indicator makes it possible to have a comparative vision of the impact of two Solutions (ex Coal vs. Gas in electricity production, throughout the life cycle).

It should be noted that LCA allows only a limited approach to impacts on biodiversity.

1.2.3 Including biodiversity in environmental accounting

Several tools provide methods to link natural and financial capitals. These tools, as varied as they are, nonetheless serve to direct economic decision-making based on environmental criteria to reconcile economy and ecology within an

11 http://www.scorelca.org/scorelca/ressources_internes.php

POSTE IMMO
Poste Immo mainstreams biodiversity in real estate


© Lamiot

Poste Immo, real estate subsidiary of the group La Poste, was requested by the Plan Bâtiment Durable to lead with Gecina and Synergiz, a working group on the relationships between sustainable building and biodiversity. In 2015, about 70 participants participated and worked together at three different scales: the city, the building and "grey" biodiversity.

In terms of management of indirect impacts on biodiversity, by analogy with the concept of "grey" energy, "grey" biodiversity is defined as the accumulation of the impacts (positive and negative) on ecosystems and biodiversity over the whole life cycle of a material or a product.

While there are different initiatives undertaken to integrate biodiversity in real estate project management (e.g. revegetation, pollination services, creation of parks and gardens, urban farming), more efforts need to be undertaken on the impacts generated by products, equipment and the fluids in the value chain: e.g. impacts on biodiversity during the extraction phase and end of life of materials.

Assessing «grey» biodiversity is a complex subject. It involves a multi-criteria approach and with indicators specific to each material considered. For example, assessing the «grey» biodiversity of a wooden construction requires to define all the impacts of the production of wooden materials during their life cycles, including forest exploitation, log transformation, transport and wooden waste.

Potential tools and indicators for assessing grey biodiversity will emerge most likely from the development of Life cycle analysis to biodiversity issues.

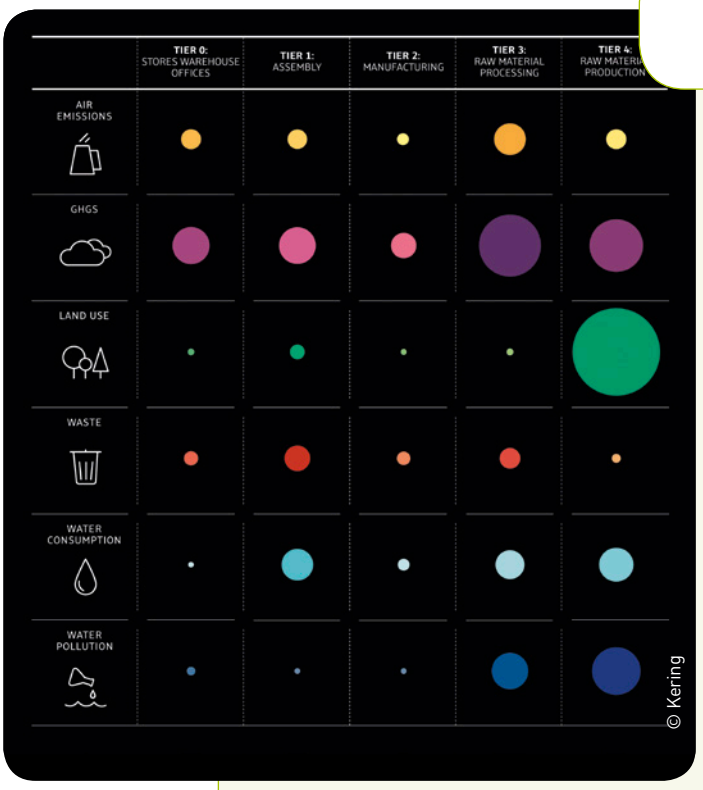
In other words, real estate and construction need to address both their direct and indirect dependencies and impacts on biodiversity. The working group recently produced a document which contains 20 proposals to mainstream biodiversity in sustainable building. These are organized in 6 themes and can be found here (in French):
http://www.planbatimentdurable.fr/IMG/pdf/Rapport_Batiment_et_Biodiversite_liens_actifs.pdf

environmentally and socially sustainable dynamic. Kering's Environmental Profit & Loss Account (EP&L) (cf. box), Integrated Reporting and the Natural Capital Protocol are just some examples.

The integrated reporting recommended by the IIRC (International Integrated Reporting Council) involves publishing a report summarising financial and non-financial data. It is used to show investors, and more generally a company's stakeholders, that it includes the notion of social and environmental performance representing a source of value added in its strategy.
Biodiversity is supposed to be one of the aspects, but there are few examples of its being included at this stage.

One relatively comprehensive example is Mean Species Abundance[12] that the IPCC and IPBES have jointly made into a tool to assess the effect of greenhouse gas emissions on biodiversity. However, it is very difficult to weigh the other impacts of a production plant in relation to this.

Other than the EP&L used by Kering as a basis for operational decisions, most of these tools are still in the research and validation stages, with complex weighting issues around the different factors and the lack of any ranking between the various forms of impact.



KERING

KERING
Kering's Environmental Profit & Loss: the key to measuring natural capital and its link with ecosystem services

Since 2013, all of Kering's brands and their supply chains have been accounted for by an EP&L. The chart opposite shows an analysis of the Group's 2015 EP&L results.

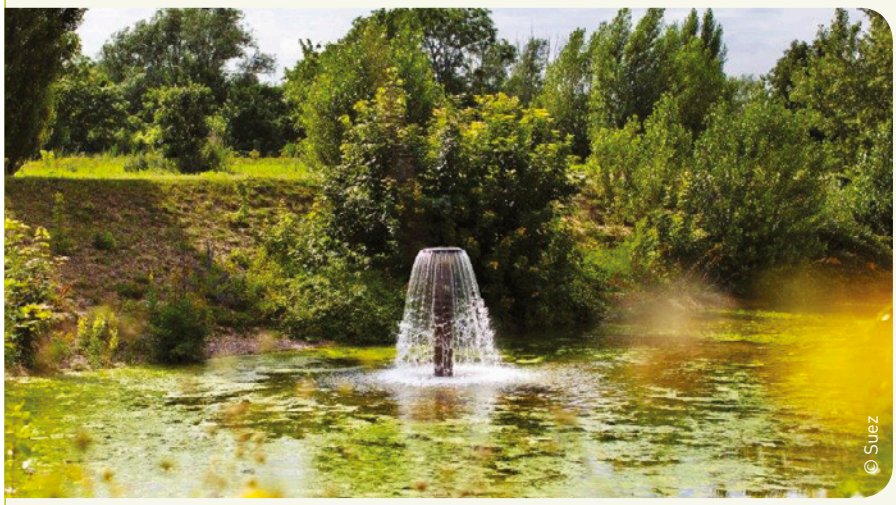
As the Group's leading pillar of action, the Environmental Profit & Loss (EP&L) is an innovative tool developed by Kering that measures in monetary value the environmental impacts of its activities throughout its supply chains. In 2015 Kering published the results of its first Group-wide EP&L, and has since gone on to also publish its 2014 and 2015 EP&L results. These first results confirm the efficiency of Kering's strategy in reducing its key environmental impacts, 93% of which are generated by the Group's supply chain and notably the production of raw materials. Moreover, the EP&L analysis has also unveiled that over 28% of the Group's impact relates to land use change, or in other words the loss of ecosystem services associated with land use due to the production of raw materials.

2016 saw Kering take a further step in its analysis of natural capital, when the Group joined forces with Stanford University's Natural Capital Project and Cambridge University to enrich the EP&L's methodology with regards to the evaluation of biodiversity and ecosystem services. The partners notably worked on enriching the EP&L's land use indicator integrating more reliable real-time data, and ensure all biodiversity impacts are taken into account by the methodology.

The results of Kering Group's EP&L, the EP&L methodology itself and the aforementioned research paper on biodiversity are available on Kering.com. By open-sourcing these reports, the Group hopes to encourage other corporations from across all sectors to adopt similar natural capital business strategies.

12 http://www.globio.info/background-msa

SUEZ
Towards new accounting dedicated to ecosystems



By the very nature of the Group's activities, SUEZ activities are simultaneously:

- Depending on biodiversity, the link between the good ecological status of aquatic environments and the quality of water resources being proven;
- Potential generators of specific pressures on biodiversity, linked for example to discharges of wastewater into the environment;
- Contributing to biodiversity, with the biodiversity reservoirs represented by the waste storage and recovery sites managed by the Group, or by the new ecological purification processes.

SUEZ thus wishes to contribute to the collective consideration both of the value of the services rendered by the ecosystems, but also of services provided for the protection of the ecosystems. This ambition, which is part of SUEZ's commitment in France in the National Strategy for Biodiversity, has motivated its support for several research programs on this subject.

In particular, SUEZ supported a doctoral PhD thesis* aiming at articulating new tools for evaluating the quality of ecosystems, new practices in socio-environmental accounting and the contribution potential of companies in the protection of natural areas.

This work initially proposed the development of «management accounting for ecosystems», at the intersection between accounting and conservation science, and focused on the collective management of ecological problems. But it has also traced the first tracks for the development of new business models based on the objectification of services rendered to ecosystems.

* Quelles comptabilités pour accompagner une entreprise dans la gestion des services écosystémiques ? C. FEGER (AgroParisTech/MNHM) – February 2016

1.3 Economic opportunity and the role of the financial world

1.3.1 Economic opportunity

Economics is one of the drivers for recognition of biodiversity. Reducing raw material consumption has a positive effect on the upstream value chain and costs.

One example of this way of thinking is the current development of precision agriculture, which involves using observation and forecasting tools to track the real input needs of crops in order to reduce the quantities used. This is a winning model for everyone concerned since farmers reduce their costs, suppliers provide advice rather than products and the soil receives less input that is not used by the crops grown.

Michelin's work on tyres to reduce the amount of natural rubber needed per tyre as much as possible, while maintaining or even improving performance, is based on a similar rationale: the savings in raw material is beneficial for both biodiversity and the company.

1.3.2 Financial community's growing interest

The financial community is imposing increasingly demanding requirements around the environmental impact of the projects it supports, as demonstrated in BNP Paribas' contribution.

For its part, International Finance Corporation (IFC), a member of the World Bank which provides development aid for the private sector, lists Biodiversity Conservation and Sustainable Management of Living Natural Resources as paragraph 6 of its performance standards. To obtain project funding, a company or public investor must be able to demonstrate its sustainable management and how it mitigates the project impact on biodiversity and ecosystem services throughout its life cycle. The IFC recommendations introduce supplier assessment systems to verify the source and track of supplies.

BNP PARIBAS
BNP Paribas' strategy against deforestation

BNP Paribas has endorsed mandatory criteria to be respected by the clients in the agriculture, palm oil, pulp and paper and mining sectors where biodiversity is particularly at stake. Our clients in these sectors must have in place internal policies that strictly protect reservoirs such as High Conservation Values areas, Alliance for Zero Extinction sites, wetlands on the Ramsar Sites, IUCN Category I-IV areas, UNESCO World Heritage Sites.

The Group has also committed to exclude from its portfolio clients that are involved in the production, trade or use of drift nets over 2.5 kilometers in length; and those involved in the trade of any plant or animal species or products not authorized by a CITES permit.

Besides, BNP Paribas has endorsed the Zero Net Deforestation commitment set up by the Consumer Goods Forum and the Banking Environment Initiative where signatories commit to eradicate deforestation from downstream and upstream supply chain no later than 2020.

* https://goo.gl/tXBJiv

SOCIÉTÉ GÉNÉRALE
Biodiversity cross-sectorial policy

In 2011, Societe Generale published a cross sectorial policy on biodiversity, along with its 12 sector related Environmental and Social (E&S) policies, with an aim to clarify and strengthen its commitment for the preservation of biodiversity. The policy applies to all the banking and financial services provided by the Group, through review processes of both dedicated transactions and clients. These processes are subject to internal and external audits.
https://www.societegenerale.com/sites/default/files/documents/Document%20RSE/Finance%20responsable/Biodiversity%20Cross-sectorial%20Policy.pdf

Regarding dedicated transactions, the review is carried out on financings and services identified as being at risk of having impacts on protected areas (IUCN I to IV categories) or other "key biodiversity areas". For related projects, an independent evaluation of the potential impacts on biodiversity and ecosystem services is required, so as to ensure that an attenuation strategy with a zero net biodiversity loss objective is implemented. "Key biodiversity areas" are a list of natural areas which offer a pragmatic identification of "critical habitats" as defined by the Performance Standard 6 of the IFC (World Bank Group). Many of these areas are also considered of "high conservation value", as defined by a number of multi-stakeholder roundtables certification schemes such as FSC or RSPO.

IBAT (Integrated Biodiversity Assessment Tool) is used as a practical tool to identify "key biodiversity areas". This international database relies on multiple information sources.
https://www.ibat-alliance.org/ibat-conservation/login

Complying with IFC's requirements means a company or government has to assess its own interactions with biodiversity along with those of its suppliers.

1.3.3 New financial tools

Finally, new tools like the conservation market and ecosystem green bonds are becoming increasingly efficient and may lead to new projects or improve certain current economic models.

The recent alliance between The Nature Conservancy, Crédit Suisse, the International Union for Conservation of Nature (IUCN) and Cornell University, called the "Coalition for Private Investment in Conservation" (CPIC), aims to develop new investment models that are both financially profitable and good for the environment (cf box below).

CONSERVATION FINANCE

Today, about $52 billion per year flows to conservation projects, the bulk of it in public and philanthropic funds. The best estimates are that $300 to $400 billion per year are needed to preserve healthy ecosystems on land and in the oceans, and with them the earth's natural capital stock of clean air, fresh water and species diversity.

Filling this gap to finance the preservation of the world's precious ecosystems would require $200 billion to $300 billion in additional capital, and private investment capital may be the main source of additional capital. Attracting such a level of private capital will require new business models including the value of the biodiversity externality, attractive risk-adjusted rates of return, in addition to clear and measurable conservation impacts.

Extract from the "Conservation finance, from niche to mainstream" report

NATURAL CAPITAL FINANCING FACILITY (NCFF)

As part of the LIFE programme, the European Commission has entrusted the European Investment Bank (EIB) with the management of a new financial instrument called the Natural Capital Financing Facility (Decision published in the Official Journal of the European Union on 17 April 2014).
The NCFF will directly and indirectly fund four types of projects:

- Payments for ecosystem services
- Green or blue infrastructure
- Offset systems
- Innovative companies

Of the €3 billion allocated to the LIFE programme for the 2014-2017 period, the NCFF has €100 million provided in equal parts by the European Commission and the EIB. For the 2017-2020 period, the aim is to provide this financial instrument with an additional €400 million, again provided half by the European Commission and half by the EIB.

The access criteria to this funding have, however, not brought to light many projects so far.

One final recent example is the Nature 2050 programme launched by CDC Biodiversité and Caisse des Dépôts to establish a fund to finance ecosystems' adaptation to climate change. Supported financially with funding from companies that have no direct links with the projects (its role is neither to compensate nor provide a service), the funds will be allocated to collective projects that may involve other forestry, agricultural or ecosystem management companies.

In short, there is an increasing number of reasons for companies to actively commit to biodiversity, even if the impact is only indirect.

Popular support for this topic in the community as well as among employees is the strongest driving force. In the Greenflex responsible consumption survey conducted in May 2016, 36% of respondents asked for biodiversity impact to be included on product labelling (22% expressed the same request for climate)[13]. Similarly, many EpE members are finding that their employees are particularly interested in the issue of biodiversity, even when the company does not have a high direct environmental footprint, and that its inclusion in the company's business is a factor in providing a sense of stimulus in their work.

This societal expectation has led many companies to step up their action in this field. The following chapter looks at how they do it.

NATURE 2050
Adapting territories to climate change and restoring biodiversity

The Paris Agreement which seeks to cap global warming at below two degrees Celcius has now been ratified by the European Commission. Even if temperature increases are kept to between 1.5° and 2°, this will still have a radical impact on agriculture, nature and forests between now and 2050. Protecting and restoring biodiversity and ecosystems also helps us to adapt to climate change and to limit its impacts.

The Nature 2050 programme was launched on 18 October 2016 with the backing of a number of well-known nature conservation associations – Fondation Nicolas Hulot pour la Nature et l'Homme, France Nature Environnement and Ligue de Protection des Oiseaux (French Bird Protection Society) - and the French National Museum of Natural History, to begin the process of adapting French regions (including overseas territories) to climate change, starting right now.
This is an innovative programme given its long-term commitment and use of natural solutions, together with its partnership-based approach that brings together stakeholders from the research sphere, associations, managers of natural spaces, businesses from the public and private sectors and local and regional bodies.

Indeed, faced with uncertainty over climate change, the best approach is undoubtedly to bet on the resilience of restored ecosystems. This strategy is underpinned by three types of action designed to protect, connect and restore various different types of spaces, i.e., wetlands, ecological networks, forests and agricultural land and urban biodiversity. The actions will be undertaken in partnership with the stakeholders who provide the economic lifeblood of all territories, namely, local and regional bodies, businesses, professional bodies, associations, farmers and foresters.

The programme targets public and private sector businesses who wish to take voluntary action – that goes beyond their regulatory obligations – to fund local pro-nature initiatives. In exchange, as a measure of its commitment to climate change, for every 5 euros of funding put up, CDC Biodiversité undertakes to restore and preserve 1m² of land through 2050. Both public stakeholders and businesses have already signed up to the programme confirming Nature 2050's potential as a new tool for funding ecological transition at local and regional level in support of public policy.

13 https://goo.gl/oZYSB0

2 How to reduce the value chain's impacts on biodiversity?

Once the interaction between the company's value chain and biodiversity and the contribution of this value chain to the five factors of ecosystem degradation have been identified, the company can define its priority actions to reflect the sensitivity of these various proven or potential impacts and the assessment it has made of the associated risks.

With this overview, it is possible to choose specific approaches, often outside actual production sites, such as pressure on suppliers to conserve natural resources, research and development to design products with a lower ecological footprint or even different partnerships to improve the long-term protection of natural capital and its ability to adapt.

2.1 Acting on supply

2.1.1 Raw material purchases

Managing raw material supplies is a key step for a company's management of its indirect impacts on biodiversity. Natural resources are subject to massive pressure in today's globalised world and their renewability depends on how they are exploited. So, companies need to pay particular attention to defining a sustainable framework for the exploitation of these resources.

In a company, the prime point of contact for a supplier is of course anything but the environment department; influencing the policy around raw materials will

GROWING DEFORESTATION

There are many issues around raw materials including deteriorating biodiversity and climate change.

According to the Union of Concerned Scientists (UCS)[14] four commodities alone are responsible for the majority of tropical deforestation: beef, soy, palm oil and timber. Each year, a surface of forest equivalent to Switzerland is destroyed for the production of these commodities alone.

Deforestation accounts for 10% of the world's GHG emissions and so has the same effect on climate as 600 million cars. For biodiversity, this deforestation destroys many of the habitats of threatened species and weakens the associated ecosystems, essentially the remainder of the tropical forests.

© auteur = Jamj Dwyer ; fichier = Lacanjaburn_2005

14 An association of scientists created in 1969 to share knowledge and lobby governments to take environmental issues into account.

therefore require the involvement of numerous stakeholders including buyers, R&D, marketing and finance.

An initial step consequently requires that these various departments take into account and recognise the interest for the company of taking note of these new raw material requirements. This step may take time, particularly as companies are distant from the raw material supplier on the ground, but it is nonetheless crucial to ensure the success of this approach. In-house knowledge of the raw materials used, their origin and source of supply is sometimes lacking, especially in the case of semi-finished products transiting through ports where traceability is particularly challenging. This need for collective awareness is separate from supplier questionnaires, such as the Ecovadis questionnaires, that act like a compliance request but in which the biodiversity section is rarely filled out because the questionnaire concerns the supplier company and not the specific order.

In a second stage, buyers can add certain questions when consulting suppliers to improve traceability and product quality, and gradually stimulate more respectful practices.

This also requires to inform suppliers to boost their awareness of the advantages of including biodiversity in their strategy and exploitation methods. The example of the Antrak tool developed by Sequana for its paper purchases shows how this tool, initially deemed highly constricting and costly by employees and suppliers, has gradually become a tool for creating value for both buyers and the environment (cf. box opposite).

Other than adopting such a personalised purchasing policy, the simplest method for adapting purchases to include biodiversity requirements would seem simply to purchase certified products. This is a guarantee that their production conforms to clearly defined specifications and provides a simple method for communicating with the end client.

However, some of these certifications include only limited requirements with regard to biodiversity, even if they still deliver precise guarantees for other factors such as social fairness or climate issues. A recent study by the IUCN on the effectiveness of certification to conserve biodiversity[15] recommends that these labels include the following points to make them more effective:

- Meet local economic and stakeholders' requirements while protecting habitats and relevant species
- Ensure effective supervision over time after certification has been issued
- Encourage local stakeholders to monitor the state of biodiversity over the long term
- Make sure that the certification remains flexible with regard to climate change.

SEQUANA

SEQUANA ANTRAK
Traceability platform dedicated to suppliers

antrak
SUPPLIER CSR-TRACKING PLATFORM

Since 2013, Antalis, distribution's division of Sequana, has developed a platform dedicated to its suppliers in order to better manage its raw material traceability. As the European leader of paper distribution, Antalis' responsibility towards the wood natural resource is actually very strong.

Antalis' commitments to the protection of the primary forests, to the absence of illegal timber in its value chain and to the use of fibers coming from sustainably managed forests (FSC or PEFC certified) are key pillars of its CSR strategy.
Antrak is an on-line platform where all the Group's main suppliers provide numerous regulatory or traceability information, including, for each product, the trees species used to manufacture the paper as well as the country and the region of harvest.
A due diligence module estimates then automatically, the potential risk of each product according to three criteria:
- The "tree species" risk based on the red list of the UICN from 0 to 8
- The «country" risk based on the ranking of the Global Forest Registry (in connection with Transparency International) from 0 to 4
- The "certification" risk or the absence of certification from 0 to 3

The supplier receives a request for mitigation if the total level of risk exceeds 12. This request is validated by an internal committee regrouping procurement, legal and CSR department.

15 Policy Matters Issue 21 – Certification and Biodiversity – How Voluntary Certification Standards impact biodiversity and human livelihoods.

CLUB MED
Eco responsible purchasing in specific areas and reduction of quantities

73% of its Resorts have Green Globe certification - the international label for responsible and sustainable tourism - a major factor in Club Med's efforts to promote sustainable access to pristine natural surroundings.

As part of its commitment to the environment, Club Med has implemented a number of initiatives to preserve biodiversity on its sites, both during the construction of new Resorts and once they are operational. The group is also working on reducing indirect impact throughout the value chain and working along two lines, i.e. an eco responsible purchasing policy and reduction in consumption.

Two highly sensitive areas where the eco responsible purchasing policy has been implemented are wood and food.

Club Med adopted a Wood Charter in 2007, in which it committed to purchasing exclusively PEFC or FSC-certified paper. And in terms of food, the group set up a Fishing Charter in 2008 whereby it agreed to purchase only responsibly fished produce. The Club also signed an agreement with Agrisud International to purchase produce grown close to its Resorts, in order to help small local producers to develop a sustainable market for their production, to promote small-scale farming and agro-ecology. It's also a great plus for Club Med clients to have fresh, local produce on the menu. This initiative has a huge social, cultural and environmental impact. In order to make it work, the Club has had to convince its buyers that local, quality products sometimes cost more.

The second area of action concerns reducing quantities of certain products used, in order to reduce environmental impact upstream.

Between 2009 and the present day, Club Med's consumption of paper used to produce its brochures has dropped by 56%, thus contributing to a reduction in its impact on the world's forests.

And producing less waste is another major way in which Club Med is limiting its indirect impact. That means creating less waste through careful management, and separating waste for recycling, which is working well in 80% of the Club's Resorts.

100% of wastewater is treated and recycled, and in regions where water stress or scarcity is a serious problem, every effort is made to reduce consumption of this highly precious commodity.

Last but not least, the Club has over 50 years' experience in managing food waste: while continuing to provide the legendary and abundant buffets for which it is famous worldwide, waste from the Club's kitchens averages less than 5%.

Over and above these meticulous, best-management practices in the everyday running of its Resorts, Club Med has another positive indirect influence on biodiversity: it enhances quality natural spaces in the countries where it is represented, thus showing that they create significant economic value, and indirectly encouraging governments and local authorities to protect nature.

Depending on the natural resource, labels do not necessarily guarantee the most effective reduction in impact on biodiversity and ecosystem services.

Compiling a supply charter for the raw material concerned can help overcome the weaknesses in certain labels. Michelin, for example, has done this with its charter for the sustainable extraction of natural rubber (see box p.27), in a sector where the majority of producers are smallholders.

The examples below illustrate the issues around some raw materials that are frequently used together with the certification labels generally associated with them.

Forestry resources

Risks of habitat fragmentation and destruction, resource overexploitation, reduced carbon sink

Wood

Since the end of the 1990s, the private sector has taken steps to exclude illegally harvested wood from its supply chains and only use wood from certified sources. Multinational corporations are the first to have implemented supply policies to protect biodiversity and local stakeholders, among other outcomes, as shown by the example of Saint-Gobain and its timber policy.

Labels :
Forest Stewardship Council (FSC) for forestry management. FSC is set to launch ForCES (Forest Certification for Ecosystem Services) in 2017-2018. This additional certification aims to guarantee effective management of forest ecosystem services. In 2014, 185 million hectares of forest were FSC certified worldwide, that is 5% of the world's total surface area of forests, while over 16% of forest allocated to

SAINT-GOBAIN

SAINT-GOBAIN
Certifying timber to effectively manage its indirect impacts

As part of its Responsible Purchasing policy, Saint-Gobain has identified its sourcing risks and undertaken an appropriate securing action plan. This plan incorporates a dialogue with the stakeholders involved and the labelling of certain materials, in particular timber.

Since implementing this action plan in 2007, the share of legally traded, traceable timber purchases coming from responsibly managed and/or certified forests has increased by 70%. The chain of custody certification of timber is an effective means of ensuring good forestry management for susceptible species and/or in regions where governance risks exist. Saint-Gobain has chosen the FSC and PEFC certifying bodies, both recognized for their demanding certification criteria.

Over 1000 sales outlets in Europe, ensuring the distribution of timber for the Building Distribution sector, are certified FSC and/or PEFC. This sales outlet certification, that helps guarantee the continuity of the chain of custody, is a real asset for Saint-Gobain customers. Indeed, the professional customers certified PEFC/FSC can resell their products labelled accordingly and facilitate the obtaining of an environmental certification for the buildings they sell, the market being particularly sensitive to such labels today.

The Saint-Gobain teams specialized in selling timber have been informed about this responsible purchasing approach for the purposes of communicating to the end customer.
Through the procurement of labelled raw materials, the certification of its sales outlets and the raised awareness of its sales people and its customers, Saint-Gobain is working actively to reduce the impacts of its timber purchases on biodiversity.

wood harvesting (source: FSC and FAO).

PEFC has certified 267 million hectares of forest, essentially in Europe, and more than 16,000 companies have introduced an appropriate supervision chain (source: PEFC 2016) with a view to obtaining this label. The organisation recently introduced a new standard, published at the end of 2016, to include far more practices to support biodiversity (protect areas of old-growth forest and biodiversity, use less impacting harvesting machinery, etc.).

Natural rubber

Natural rubber is one of the main causes of deforestation in South-East Asia, especially in Malaysia. Seventy percent of the world's production is used by the automobile industry (source: Greenpeace). In June 2016, to improve the production of natural rubber and help combat deforestation, Michelin introduced a global charter to make its natural rubber supplies more sustainable, and asks its suppliers to comply with it. The World Wildlife Fund (WWF), Michelin's partner in this approach, encourages the market's other stakeholders to join this initiative.

Latex is harvested by bleeding Hevea trees

MICHELIN
Michelin's approach to sustainable natural rubber and safeguarding biodiversity

Natural rubber is an essential raw material for the production of tyres. Three quarters of the 12 million tons produced worldwide every year, mainly in South-East Asia (of which half in Thailand and Indonesia), are used for this purpose. In order to preserve this resource and control the impacts, the Michelin Group has implemented a Sustainable Natural Rubber Approach. While rubber tapping does not in itself constitute a threat for the environment, nor in particular for biodiversity, it should be carried out in compliance with certain rules.

Drawn up with the help of all of its stakeholders, and especially with that of half a dozen NGOs specialized in environmental protection and human rights, the Sustainable Natural Rubber commitment drawn up in 2016 now serves as a template for the contracts with Group's suppliers. The policy, which can be downloaded from the Group's purchasing website (purchasing.michelin.com), clearly outlines the conditions for using this material, as regards environmental factors (zero deforestation, protection of areas of High Conservation Value (HCV) and areas of High Carbon Stock (HCS) as well as peatlands), social factors and factors related to human rights (working conditions, prior, free and informed consent of those concerned, etc.).

In 2017, Michelin will pursue its efforts to map out its natural rubber supply, in collaboration with its suppliers. The Group is currently developing an application intended to consolidate purchasing traceability, a prerequisite for starting to consider the «labeling» of rubber.

Michelin is keen to share this approach as much as possible with big global manufacturers with a view to changing the entire sector towards better agricultural practices. One of the most important challenges over the coming years is increasing per-hectare yields. This is by far the most effective means of controlling land pressure and reducing deforestation risks against the backdrop of an increase in demand.

In addition to this theoretical approach, the Group is getting involved in very practical projects on the ground. In 2015, Michelin set up a joint venture with an Indonesian partner, Barito Pacific, with a view to developing responsible rubber tree plantations in Sumatra and Kalimantan, in areas that have been ravaged by reckless deforestation and fires over past years. A dual sponsorship and partnership agreement has been concluded with the WWF, which is helping to implement the project and providing expertise in protecting and restoring flora and fauna.

Because of the slowing demand in China, the natural rubber market has been overproducing since 2011 and should continue to do so until 2017 (source: The Rubber Economist) without producers actually having cut back on their production, which means around 400,000 tonnes of raw materials is left unused. This could be an opportunity to improve the sector's practices.

Agricultural resources

Soil degradation, overexploitation of resources, pollution, climate change

With one-third of arable land now in a deteriorated state and the need for food production set to increase 70% by 2050, sustainable land management is a major issue. Around 10 commodities account for the bulk of food products and their markets have become globalised over the past 30 years. This growing distance between producers and consumers, through global supply chains, has done nothing to encourage sustainability of farming practices.

In some cases, the market has reacted and the pressure from public opinion is starting to produce change.

Cotton

The extent of the area used to grow cotton means it is one of the crops that takes up the greatest area of cultivated land (around 2.3% of the world's total cultivable land area), after cereals and soy. More than 100 million families are directly involved in cotton production (Fortucci, 2002), even if the sector has tended towards concentration.

In 2015, the FAO published its "cotton report" called "Measuring Sustainability in Cotton Farming Systems - Towards a Guidance Framework". This report aims to introduce 69 common indicators covering the main sustainability topics.

https://www.icac.org/getattachment/Home-International-Cotton-Advisory-Committee-ICAC/measuring-sustainability-cotton-farming-full-english.pdf

It has been compiled on the basis of many existing initiatives, such as the Better Cotton Initiative (BCI), and the tracking indicators they use, to promote and encourage the same best practices. Companies that use cotton in their direct or indirect input supplies (e.g., for their employees' work clothes) can use this guide to define, support and progress the demands they place on their suppliers.

Label: the Better Cotton Initiative (BCI)[16] is based on six sustainable production criteria for the environment and growers. These criteria are crop protection, water, soil, natural habitats, fibre quality and decent employment.

Palm oil

Palm oil production has increased considerably since the 2000s; it has a major impact on the environment and health through a variety of mechanisms. The first of these mechanisms by which it affects biodiversity is deforestation: primary forests are cut down to use the land for palm groves. Only 15% of the native species present in these primary forests survive in the plantations, and the fragmentation of forests further significantly reduces their habitat. To stop this trend, a growing number of palm oil user industries are introducing "zero deforestation" purchasing policies. Of course, the pressure their purchases place on the market still results in the cultivated area continuing to increase, but states are in parallel encouraged to adopt measures to limit deforestation. Further, there is growing discussion between stakeholders to improve practices, notably traceability and transparency: for example, the Palm Oil Dialogue initiated by BASF in 2016[17], or the Roundtable for Sustainable Palm-Oil (RSPO) certification applied by BASF since 2011. Some other tools are being developed to geolocate production areas to be avoided, for example, the PALM (Prioritizing Areas, Landscapes and Mills) tool recently introduced by Global Forest Watch.
http://commodities.globalforestwatch.org

Label: The label managed by RSPO (Roundtable for Sustainable Palm Oil) concerned 21% of the world's total palm oil production in 2015. The RSPO criteria are regularly discussed and revised by the various stakeholders to improve production sustainability.

Mining and extractive resources

Habitat destruction, pollution, climate change

Almost all sectors use raw materials extracted by mining. This can affect biodiversity by destroying natural habitats (the extraction itself but also access roads, nearby urban growth, etc.) and the use of chemical products for mining operations (lubricants, mining waste, etc.), leading to soil and water pollution, although varying significantly between countries, regulations and companies. It is also a source of deforestation. According to UCS (Union of Concerned Scientists), mining is directly responsible for 0.20% of deforestation worldwide and 2.1% of deforestation in South-East Asia.

Several companies, such as EpE members LafargeHolcim and Ciment Calcia (Heidelberg group), have been focussing on this issue for some time and have developed their own biodiversity policies. One of their

16 goo.gl/xZPgkZ
17 https://goo.gl/4rBQJf

main challenges is to roll out these more environmental-friendly practices across the board in all countries, which requires increased dialogue with local communities, governments and the various stakeholders in the value chain. By managing their direct impact and providing traceability, they become more secure suppliers for the transformation chain.

Running a mining operation in a way that is more respectful of biodiversity has a cost, and it is in the best interest of most advanced operators to see everyone comply with the most demanding practices to avoid any "environmental dumping". Again market pressure improves the uptake of such more sustainable production, helping the internal business case for biodiversity policy.

Among all the cases we have described, the purchase of traceable, certified or sustainable materials often results in an additional cost. Can it be directly incorporated into the company's economic model and passed on to the end client? Or what savings can the company make to offset these additional costs? This economic aspect also helps determine policy, but some changes of operating methods, when implemented early in the process, may not be costly.

2.1.2 Partnerships

Often less financially costly but more time-consuming, partnerships between a major stakeholder and their local supplier producers can extend the company's action across a far greater region. Partnerships with producers, associations and local stakeholders can help:

- Develop a shared view of what needs to be preserved or restored
- Identify local producers' needs in order to change their production methods to adopt more sustainable practices and meet their need for training to maintain more virtuous approaches over the longer term (cf. BASF France's contribution regarding Argan oil)
- Involve local governments to develop consistency across actions at the local level and even to make choices between the environment and economic development.

© BASF France

BASF FRANCE
The Argan Program

Argan oil is an important resource for the cosmetic sector : the argan tree fruit contains, apart from oil, a flavonoid rich extract with anti-ageing properties. The argan tree forest represents an important Moroccan endemic ecosystem (800 000 ha), allowing the remuneration of more than 3 million people. That ecosystem is weakened by the modifications of land uses, erosion, desertification...

In order to stabilise it, BASF organized a partnership with L'Oréal and a network of cooperatives in Morocco, the Argan Program. It enables to optimise the production of the plant by using all parts of it : fruits, but also leaves.

This program is not only a support for women's cooperatives, but also the possibility to sensitize the partners to environmental trends and preserve the argan tree forest. It also reinforces the entire value chain.

KERING

Raw material supply-chains that protect and conserve biodiversity: the example of Kering.

A priority focus within the series of sustainability targets Kering set itself in 2012 was the responsible sourcing of raw materials, which for the most part come from animal or plant sources. Since then Kering has been working to implement concrete actions across its supply chain, notably with regards to procurement processes, as well as establishing cross-industry partnerships as the Group recognises that as a single actor they change they can create is limited.

In light of this Kering partnered with the International Union for Conservation of Nature (IUCN) and the International Trade Center (ITC) in 2013 to launch the Python Conservation Partnership: a triennial research programme exploring the python trade, its sustainability, animal welfare practices, as well as its impact on wild populations and local communities. Findings and recommendations of the PCP were made publically available in 2016, and notably integrated into other international and industry-wide initiatives including the work of CITES.

Amongst Kering's other actions, the Group has also partnered with the Wildlife Friendly Enterprise Network (WFEN) in order to better understand the impact that raw material production (wool, leather, cashmere etc.) has on biodiversity and wildlife. In the case of cashmere, one of the luxury industry's top materials, an increase in demand is posing a risk to the natural grasslands on which the goats graze. In response to this, Kering launched a programme in the Gobi Desert in 2015, where in collaboration with several nomadic shepherd cooperatives the Group is working on ecological grazing practices, responsible animal welfare practices and the conservation of biodiversity. In order to strengthen the promotion and development of responsible cashmere in Mongolia, the Group is also a founding member of the Sustainable Fiber Alliance (SFA).

BASF
BASF and the Bees Biodiversity Network

BASF France – division Agro has been involved since 2005 in pollinator protection in partnership with the Bees Biodiversity Network (BBN), an association of beekeeping and farming sectors' stakeholders acting in favour of quality of productions and environment protection around pollinator nutrition.

Created in 2007 by Philippe Lecompte, a professional organic beekeeper in Ville en Tardenois (Champagne - France), the Bees Biodiversity Network is the bee nutrition expert network in France. As an innovating and essential actor of biodiversity in France, BBN coordinates the development of apicultural set-aside areas and bee intercrop mixtures. Established all over France, these biodiversity areas are important food sources for bees, thus contributing to a new and efficient dialogue between beekeepers and farmers, in a win-win partnership. Today, more than 15.000 hectares of biodiversity-friendly and bee nutrition areas have been identified. www.jacheres-apicoles.fr (French website).

There is evidence that the modification of a small part (0,5%) of the domestic bee territory implies a modification of their alimentary bolus up to 75% (average).

Therefore BASF offers its customers (cooperatives...) partnerships with BBN in order to favour or maintain biodiversity in agricultural land in France, to ensure scientific knowledge and engage concretely in favour of pollinators. Domestic bee mortality is multifactorial (bee diseases as Varroa, bee impaired nutrition, wrong agricultural and beekeeping practices). Through those actions, BASF works in the direction of good agricultural practices (product use, new agricultural technics, sowings ... - see BiodiversID paragraph, page 38).


© BASF France

The certification of certain basic products (commodities) and their production practices would seem useful but not the only method that can be used. For example, the Rainforest Alliance recommends steps that can be as effective as certification but which cost less:

- Define standards
- Define how to support local producers
- Measure efforts: supervision
- Define the target on which the company wants to focus.

Partnerships also involve suppliers in order to extend the company's strategy to the entire value chain and to encourage the supplier to adopt the same approach.

2.1.3 Sustainable management of land

Taking raw material management a step further, the concept of sustainable land management broadens the approach to a more diverse community and a greater number of regional stakeholders. According to estimates, 33% of land is already moderately or severely deteriorated, and an additional 12 million hectares is added to the list each year; this means a loss of US$40 billion worth of crops (and that is without taking into account the degradation of the ecosystem services[18]). Sustainable management of land could restore two million hectares a year, generating US$1.3 billion worth of additional output.

18 CORNELL, A., WEIER, J., STEWART, N., SPURGEON, J., ETTER, H., THOMAS, R., FAVRETTO, N, CHILOMBO, A., VAN DUIVENBOODEN, N., VAN BEEK, C., and DE PONTI, T. Economics of Land Degradation Initiative: Report for the private sector. Sustainable land management – A business opportunity. GIZ: Bonn, Germany, 2016

There is an increasing number of programmes addressing this issue. Initial findings show that region-wide management can secure the quality of supplies and so reduce quality control costs. By including all the stakeholders, especially governments, a more positive regulation of the local market can be achieved. These approaches encourage the sharing of costs and can provide investment opportunities for investors.

A website to publish feedback and put stakeholders into contact with each other should soon be available online. It has been developed under a partnership between the World Business Council for Sustainable Development (WBCSD), the Sustainable Trade Initiative (IDH), The Forests Dialogue (TFD) and the Sustainable Food Lab (SFL).

2.2 Acting on freight transport

2.2.1 Propagation of invasive species

The economy's globalisation has led to a significant increase in freight transport resulting in the propagation of invasive alien species (IAS)[19]. Some animals, plants or micro-organisms can settle and proliferate in the ecosystems where they land, where they have no predators. The consequences can be considerable for the local economy (cf. BNP Paribas contribution on p.33) and society in general, because of the resultant imbalance and decrease in the services provided by nature to humans. This is the case, for example, of the spotted wing Drosophila (Drosophila suzukii) that arrived in Europe in 2008 and is responsible for the loss of up to 50% of cherry harvests in France.

Ocean freight accounts for 90% of freight transport (expressed as freight tonne kilometres or FTK). In addition to the content of the containers or cargo holds, it provides an opportunity for many species to travel attached to the boat hull or in its ballast water. An empty oil tanker can take on up to 200,000 tonnes


© Engie

ENGIE

Preventing the spread of invasive alien species

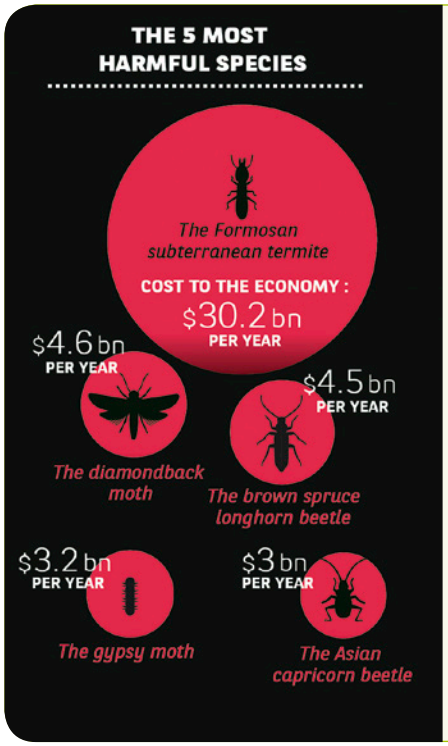
Six percent of shipping concerns the transportation of gas and chemicals.

The ENGIE group is a leading global player in the gas sector. In 2015, in France alone LNG carriers unloaded 113 cargoes of gas at Elengy's LNG terminals, which can accommodate a combined total volume of almost 270,000 m^3 of natural gas.

This activity displaces a volume of ballast water equivalent to discharging nearly 700 Olympic swimming pools around the world every year. In this volume of water, billions of marine organisms could be displaced from their original habitat and potentially contaminate the new host environment by introducing alien species.

This risk has been actively considered by the International Maritime Organization (IMO), which adopted an international convention on the subject, the International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM), due to enter into force in September 2017. ENGIE has already started equipping its LNG carriers with a ballast water treatment system. The first vessel equipped with such a system after its technical stop was the Provalys, fitted out in November 2016.

19 See glossary



BNP PARIBAS
Invasive insects: an underestimated cost to the world economy

Invasive insects cause at least 69 billion euros of damage per annum worldwide. Such is the estimation made by an international research team led by Franck Courchamp, CNRS research director at Laboratoire Ecologie, Systématique et Evolution(Université Paris-Sud/CNRS/AgroParisTech) in a study (www.invacost.fr) funded by the Foundation BNP Paribas, the ANR and published in Nature Communication in October 2016.

According to the authors, this huge impact could increase by 18% up to 2050 with the help of climate change that enables invasive bugs to migrate further from the tropics and to higher elevations, and of global trade and human transportation that give them access to new territories.

"The distribution of some invasive species is today limited by thermal barriers (low temperatures) and climate change could allow them to invade new regions that were inhospitable before", says Franck Courchamp.

of water to ensure its stability and so transport thousands of living organisms from one end of the earth to the other. The 2004 International Convention for the Control and Management of Ships' Ballast Water and Sediment, ratified in 2008 by France, includes a certain number of measures that will come into force in September 2017, one year after its ratification by 30 States representing 35% of the tonnage of the world's fleet of ships. It will require ships to be fitted with a ballast water and sediment management system.

In addition to regulations, cooperation with scientists makes it possible to detect and identify IAS and then implement solutions to eradicate or restrict their progression, as shown in Engie's example.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ENGIE
Detecting cetaceans sufficiently early to prevent collisions

Another risk to biodiversity linked to the transportation of liquefied natural gas by LNG carrier entails collisions with cetaceans. In France, one in 10 sperm whales fall victim to collisions with ships, and as many as 40 fin whales a year die this way in the Mediterranean.

One solution for preventing such collisions is to share the location of detected animals by centralising them on a land-based server, then sharing the data by satellite communication. The real-time plotting of cetaceans (REPCET) software system developed by the association has been installed on the three ships owned by ENGIE and operated by its subsidiary Gazocéan.

2.2.2 Fragmentation of natural habitats, pollution and species destruction

Industrial activity is often a threat to biodiversity, because of the energy or quantities of material it treats. On land, these impacts often lead to regulations that control these interactions giving rise to the "Avoid, Reduce, Compensate" policy now institutionalised in many countries. However, in ocean and sea areas beyond national jurisdiction, far less progress has been made with biodiversity being taken into account, and above all involves voluntary approaches when outside protected maritime areas. The previous example of REPCET illustrates this type of approach that can facilitate the coexistence of animal life and human activity in the world's oceans.

HOP! AIR FRANCE
HOP! BIODIVERSITÉ

HOP! Biodiversité is a young (2015) NGO dedicated to identify and value airport biodiversity, link and promote best practices between airports, in order to reach a better management of airport prairies, not only for the environment but also for the people working there, and all this in respect with the primary objective of air safety.
Using citizen science protocols, supervised airport staff have been able to generate scientific information about the living forms present on their airports. Staff being that of the airport itself but also from support companies or government bodies and eventually of airlines. The scientific strategy is defined under the supervision of a scientific comity, with members of the Natural History Museum, CNRS, or nature conservancies.
If the original program was launched by HOP! In 2013, and integrated to HOP! Air France, by 2015 it evolved into the NGO HOP! Biodiversité, which for the first time in France unites different components of the same industry (Airlines HOP! Air France and Air Corsica, the ruling air government body Direction Générale de l'Aviation Civile and already 14 airports- including the two largest). This effort pertains the logic of the Grenelle de l'Environnement, within the Guidelines of responsible business, into a sustainable development policy linked to the National Strategy for Biodiversity.

HOP! Biodiversité programs were recognised in 2016 by the French ministry of Environment within the National Strategy for Biodiversity and is awaiting recognition for 2017. They are also labelled by the same Ministry within the "Biodiversity in Action" program launched by the Secretary of Biodiversity in September 2016.

By definition, all linear infrastructure (roads, railways, pipelines, etc.) are responsible for the destruction and fragmentation of habitats; and the work by EpE members to reduce these impacts has been extensively described in the "Measure and manage biodiversity"[20] (2013) publication.

Aware of the transport sector's impact, some companies are going one step further and seek to use the areas under their control to encourage biodiversity, even if not directly linked to their business. Air France's Hop! contribution illustrates how this airline has created a structure for the conservation of biodiversity in the secured areas of several French airports.

2.3 Acting on products

By pursuing the long-term analysis of the value chain, after supply and transport comes the impact that product use can have on biodiversity. Companies are increasingly deemed responsible, even if their responsibility has no legal basis, at least until the recent reform of French biodiversity law.

The most advanced companies, aware of the expectations society places on them, have already taken into account these impacts and are working on reducing them, as part of an approach modelled on what they have done in the area of public health and adapted to the needs of biodiversity.
Their actions take place at all stages in the life cycle of their products.

2.3.1 From the design phase

Eco-design is one aspect of a company's environmental management that involves taking into account the environment from the product design phase. It is defined by an overarching view of the environmental performance of products or steps taken for its entire lifecycle based on several criteria, such as the consumption of materials and energy, discharge into the natural environment, and the effect on climate and biodiversity. Note, however, that current Life Cycle Analysis (LCA) methods used to measure the impact of products and services for the environment, notably in the design phase, focus more on climate and resources (materials, water, etc.) and are less advanced with regard to biodiversity, a more complex issue given the multipli-

VINCI
An innovative tool to integrate biodiversity into construction projects

Biodi(V)strict is a diagnosis tool and decision support system that improves the biodiversity potential of a construction or renovation project in a urban environment. It has been designed by the Agro ParisTech school and developed by VINCI Construction France, as part of the VINCI Eco-design Chair. It helps combining developers' obligations and environmentalists'scientific requirements on a project.

The tool uses 5 indicators :
- The percentage of green areas on site
- The natural habitats diversity
- The vegetable stratum diversity
- The connectivity between natural habitats on site
- The soil permeability to water

Based on these 5 indicators, the study highlights the major ecological stakes of the project and identifies new solutions in favor of the local flora and fauna. It draws a personalised roadmap, followed up all along the project.

20 www.epe-asso.org/en/measuring-and-managing-biodiversity-october-2014/

city of components, factors and indicators. Work is currently being conducted to improve the biodiversity aspect in LCA (cf. p.16).

Despite these difficulties, factoring biodiversity into the design phase of products and services allows a company to raise its employees' awareness of this issue and reduce any impact it may have. Tools like Biodi(v)Strict are designed to help decision-making for development projects as illustrated in Vinci's contribution on p.35.

Thinking about end-of-life and the degradability of products and materials right from the design phase also plays an important role in mitigating land and sea pollution.

2.3.2 On end-of-life

Moving towards circular economy involves reusing waste as a source of raw materials for other products and activities, which in turn reduces the extraction of virgin raw materials, reduces the footprint of waste treatment facilities and so places less pressure on biodiversity. Thinking this way and implementing measures with local stakeholders can prove positive for biodiversity, as shown by the Séché-Environnement example.

The management of product waste marketed or distributed throughout its entire lifecycle is, moreover, an obligation for many industries subject to the Extended Producer Responsibility (EPR). As this principle is becoming more and more widespread, companies' interest to take it into account now is increasing.

2.3.3 Involving consumers and user

Consumers play an equally important role: they are responsible for how they consume and use products and services, and manage waste after use.

© Séché Environnement

Séché environnement
Séché global solutions

SÉCHÉ ENVIRONNEMENT
Generating biogas from waste, feeding animals and climate change

An agricultural cooperative near Séché Environnement's energy recovery plant in Mayenne uses the waste heat from cogeneration to dehydrate alfalfa, making it easier to sow.

Using alfalfa in crop rotations protects against pollution, both directly through its role in purifying soil nitrates and indirectly, through its ability to directly capture nitrogen from the air so that farmers don't have to use nitrogen fertilizers. Alfalfa production covers the ground all year round and thus limits wind erosion and helps conserve water, one of the critical concerns of Séché Environnement on its landfill site where biogas is extracted. Differentiated management of the energy production site and the alfalfa fields provide shelter for a large number of animal species, including insects that help fight against crop pests, and are useful for local beekeeping with continuous pollination services.

The amount of recovered energy during this conservation process helps cut down greenhouse gas emissions, as the electricity sold and the steam come from biogas from waste. According to some INRA studies, alfalfa consumption even reduces methane production in livestock.

These actions can have consequences for biodiversity. In many cases, the company can inform the consumer of the issues, without adopting a moralising tone, by providing them with the capacity to make informed choices and the desire to change their behaviour in order to take into account the effects of their consumption on the environment.

Consumers are increasingly sensitive to biodiversity as demonstrated by the results of the annual surveys conducted by Ethicity and the Union for Ethical Bio Trade (UEBT)[21]. Although they feel concerned, they do not know what they personally can do. The following examples show how companies can educate consumers to take biodiversity into account when making choices.

SANOFI
Management of micropollutants in water

The diversity of pharmaceuticals and their specificity – including their metabolites - makes the environmental effects assessment complex. Some are actives at very low concentration, raising the question of their potential impact on health and the environment, even if they are frequently found at traces level in the natural environment.
Sanofi has developed a solid approach in this area of "Pharmaceutical In the Environment", aiming to manage this issue in an integrated manner throughout the entire life cycle of medicines.

This approach allows Sanofi to act at all levels (risk assessment, water treatment, ...) and thus to:
- Assess and control the impact of production sites, including a biodiversity assessment in the most sensitive cases;
- Assess the indirect impact of new molecules on the environment in the regulatory framework, but also voluntarily on certain other medicines;
- Develop scientific knowledge on this subject;
- Be an active stakeholder;
- Encourage the proper use of medicines and the appropriate waste management.

PIE (Pharmaceuticals In the Environment) is now a global challenge and Sanofi considers this stake as one of its priorities and a driving cooperation with many stakeholders.

EDF
Urban lighting: when biodiversity helps combat climate change... and save public money

Everyone agrees on the community benefits of public lighting. Nevertheless, its effect on Barau's petrel, an endemic bird species of Réunion Island, is far from positive. Indeed, every April, when young petrels leave their mountain nest to feed at sea, they are dazzled and disorientated by the halo of urban light and wash up on the coast.
In 2016, Réunion National Park ran the "Nights without light" campaign for 20 days. This campaign was made possible thanks to the partnership between SEOR* and EDF, and with the support of CCEE**. An astronomical clock, fully funded by EDF, is programmed to turn off street and other public lighting according to a schedule defined by SEOR. The resultant energy savings cut the carbon emissions from electricity produced locally using fossil fuels, and the power bill for public lighting is reduced by 10 to 20%. Moreover, the petrels' chances of breeding are significantly improved.
*SEOR: Réunion Society for Ornithological studies
**CCEE: Réunion Council for Culture, Education and the Environment


© David Dijoux

21 Results of the 2016 barometer: https://goo.gl/L5tB4O

BASF FRANCE
The BiodiversID program

BASF France division Agro focuses on responsible care of its commercial products, by comparing their effects on the environment and, particularly, on pollinators. Therefore, BASF launched in 2011 the BiodiversID program, a support system for a network of 50 farmers.

The aim is to sensitize the farmers to biodiversity trends and to build biodiversity projects on good agricultural practices with them. The program is integrated into a European BASF platform: the BASF Farm Network, a BASF partnership of experts whose 1st conference was held in 2015.

Furthermore, this program has a scientific committee, composed of Arvalis-Institut du végétal, GNIS (Seed interbranch org.), farmers, FARRE (Forum for Environmentally Friendly Integrated Farming), the Bees Biodiversity Network, ONCFS (National agency for hunting and wildlife), Ensaia (agronomic school) and BASF. Other programs and organisms are linked with BiodiversID: Auximore, Agribird, ACTA, APCA, Symbiose association, OAB, Agrifaune, etc.

These voluntary farmers realise bird, small fauna, beneficial and pollinator monitoring with the support of experts. In return, a diagnosis is realized for each farm every year to analyse its agricultural practices (soil and harvesting work, productions, crop protection),its economics (number of people fed by the productions of the farm, number of employees...) and the quality of the crops and of the natural set-aside areas (paths, fallows, bushes, herbal strips...). Training and technical days are organised by BiodiversID in the fields, for example on pollinator recognition. Those days give the opportunity to discuss good agricultural practices (how to handle a bee strip, how to cultivate a bee intercrop, which regulation around the protection of pollinators ?...).

The farms in BiodiversID are productive: they feed **75 694 pers./year** (reference Perlalim/Cereopa – data of 2015), equivalent to the population of the city of La Rochelle, for example.

Pollinators are favoured by the crops, intercrops and bee fallow strips: **those crops bring around 50% of pollen harvest** for BiodiversID domestic bees (average all farms - 2015). The quality and diversity of the practices and of the countryside are important for a good nutrition for pollinators, as **more than 5 pollen families** are needed for their health. BiodiversID farms participate to that effort by sowing diverse mixtures for them. Moreover, **15 BiodiversID hives** are effective, providing experts with precise data (for example through hive weighting or pollinic quality cartographies) and favouring exchanges between beekeepers and farmers on their practices.

BASF Farm Network : https://agriculture.basf.com/en/Crop-Protection/Farm-Network.html

BAYER
A network of Reference Farms

The network consists of six farms spread all over France. Each farmer is accompanied by a Bayer Sustainable Agriculture Engineer with a view to together identifying paths for progress and promoting innovative practices.

Actions are structured around five priority areas :

- User safety (security diagnosis and training to phytosanitary risks) (MSA/ Mutualité Sociale Agricole ...)
- Biodiversity including relationship with beekeepers, contributing to the acquisition of usable data in the framework of the Observatoire Agricole de la Biodiversité and the Réseau de Surveillance Biologique du Territoire (RSBT) of the Ministry of Agriculture
- Environments protection (development of filling/washing areas and management of phytosanitary effluents, grass strips around water points, planting hedges to limit runoff ...)
- Application optimization (application rationalization through decision making tools, pest trapping, spot treatment on the seed line ...)
- Crop trajectories: sowing into a cover crop, quality of grain sowing...

This partnership represents a real opportunity both for farmers who find new solutions to their local problems and for Bayer that enhances knowledge in the field and develops innovative solutions for sustainable agriculture.


© Bayer

BAYER
Seeding best practices

If the goal of the sowing is to place the seed in the best conditions for optimum sprouting, it must be accompanied by good practices notably with a view to minimizing the risk of wildlife exposure to the treated seed (seed coated with an insecticide or fungicide). These must therefore be planted in the soil deeply enough not to be ingested. It is consequently necessary to bury or pick up all seeds accidentally scattered on the surface and not to leave an open bag unattended.

In the framework of its commitment to sustainable agriculture, Bayer notably provides advice for the proper use of protected seeds, deriving in particular from the overview conducted by the Farre association in which Bayer has been an active member for many years.

Many documents are available to farmers (online articles, brochures on the quality of seeding ...) as well as training in the field to raise awareness on the best practices of wildlife friendly seeding.

DELOITTE
How to integrate biodiversity within one's business model?

CSR policy is evolving: it is acquiring a strategic edge and becoming an integrated part of new business models, in which biodiversity is gaining presence. Biodiversity should be addressed and tackled beyond agricultural issues and simple single-scope nature conservation, to become one of the major areas for improvement within CSR strategies.
It entails tailoring **project design in order to integrate biodiversity within activities, furthermore at the core of business economic models.**

Three key words to success:

- **Engage** with all stakeholders: foster interconnectivity between relevant local communities, businesses, and NGOs;
- **Share** technical and cultural knowledge to promote a deeper and mutual understanding from all vantage points;
- **Transform** through an addition of projects that integrate business and/or specific products, business models and corporate strategy.

We work on a variety of projects, including:

- **The creation of a market linked with a natural resource:** artisanal production of dyed fabrics from indigo plants;
- **Impact reduction on natural resources:** the suspension of deep sea fishing and what it entails;
- **Preservation of traditional knowledge:** work with local communities to regenerate forgotten cultures and essences.

3 Supporting research and sharing knowledge

Scientists, companies and associations work globally, regionally or locally to expand knowledge around the issues that link companies to biodiversity. The aim is to share this knowledge, test it and publish it in order to roll out solutions that are more economical and more respectful of natural resources.
The very high degree of uncertainty around the risks for our societies from the erosion of biodiversity prompts companies to ask what the links are between their activity and nature at all stages in their operations.

3.1 Biomimicry

This approach, defined in 1997 by the US naturalist Janine Benyus, involves "transferring and adapting the principles and strategies developed by living organisms and ecosystems, to produce innovative goods and services in a more sustainable manner, in order to take up the challenges of our society and make human societies compatible with the biosphere". The purpose here is for companies to innovate by using nature as inspiration to find solutions that are more energy and resource efficient. To date, there is no study demonstrating the benefits of biomimicry on biodiversity: the development of the helicopter, inspired by the fall of maple, hornbeam and sycamore seeds, did not actually lead to the development of the plants themselves! Strictly speaking, the term biomimicry should only be used for innovations inspired in this way making it possible to reduce the impact of humans on ecosystems.

Of more general interest is the fact that biomimicry encourages us to conserve biodiversity because it is a "library of innovations", according to the expression of the late Robert Barbault.

The CEEBIOS (European Centre of Excellence in Biomimicry) in Senlis, France, was created to develop this discipline and encourage discussion and cooperation between the various stakeholders: scientists, industry, academics, etc.

The opinion handed down by the CESE (France's Economic, Social and Environmental Council) presented by Patricia Ricard at the end of 2015[22] recommends structuring the approach and network of stakeholders, developing conditions favourable to the development of biomimicry and educating all the stakeholders involved.

3.2 Bioeconomics

Bioeconomics involves the use of biomass as a raw material to manufacture many products in a variety of sectors (energy, chemicals, materials and food). It covers the value chain from production to consumption. This discipline is progressing; it is perceived as a new model of economic development based around sustainability issues (climate change, overexploitation of resources and reducing pollution), but its precise definition, the framework for its development and monitoring have not yet been established.

According to a document[23] issued by the French Ministry for Agriculture, 5% of the

22 Biomimicry: sustainable innovation modelled on nature
23 https://goo.gl/NFGz6i (in French)

EU Horizon 2020 Research Programme's budget is devoted to Bioeconomics (that is over €4 billion), signalling the importance of the production of biosourced products, the development of biotechnologies (green, red, white, blue and grey[24]) and new value chains. Nonetheless, the rollout of bioeconomics raises many questions:

- operational, in terms of the limits of its potential development: won't a massive increase in the use of natural raw materials risk leading to overexploitation of resources even worse than at present? The pressure on palm oil plantations for first-generation biodiesels sounded the alarm
- ethical, regarding the manipulation of living organisms and its potential impact on biodiversity: industrial seeds and their specialised development has resulted in fewer varieties being cultivated
- ecosystem services: there is a risk in considering biomass as an input rather than as living tissue. Furthermore, the use of biomass for biotechnologies raises the question of conflicting uses.

It would be worth encouraging more multi-disciplinary work and dialogue with the stakeholders in this field in order to better identify the development conditions that are effectively positive for biodiversity. EpE was a partner in the Festival du Vivant[25] which specifically opened a debate on these issues.

3.3 Value chain and biodiversity footprint

There is a growing body of work on value chains aimed at improving our understanding of the strategic challenges around the globalisation of trade and biodiversity.

The Institute for Sustainable Development and International Relations (Iddri) is working on value chain governance to improve knowledge of the pressures placed on biodiversity, broken down by sector, and to determine where action might best be taken.

CDC Biodiversité, for its part, is conducting research to quantitatively assess the global impact of companies on biodiversity. Starting with raw materials, the programme aims to analyse the entire value chain (cf. box below).

3.4 Discussion platforms

In the past few years, the number of "business and biodiversity" websites has increased significantly, at both the cross-sector and sector levels (cf. box opposite). They all have the same purpose: to publish knowledge, share feedback from experience and help actors to progress together.

All the examples in this publication show that companies are making headway with biodiversity issues but that the

CDC BIODIVERSITÉ
Global Biodiversity Score™

Evaluating biodiversity is a very tricky process and specialists agree that it can only really be done in a thorough manner on a local scale. Consequently, the impacts of the private sector are generally assessed at project level, and this greatly limits the scope of economic activities that are actually analysed.

To get around this problem and enable economic stakeholders to mainstream biodiversity into their calculations in a systematic manner, CDC Biodiversité has devised the Global Biodiversity Score™. It bases its inputs on aggregate data produced by the UN Convention on Biological Diversity (CBD) which provide a «spatialised» assessment of the global state of biodiversity. The CBD framework guarantees input data that are as public, transparent and consensual as it is possible for biodiversity-related data to be.

Therefore, the Global Biodiversity Score methodology seeks to reallocate these spatial impacts back to the various different economic activities and businesses that actually generate them.

The first phase, currently in progress, consists of evaluating the impacts of the production of raw materials. The second phase will consist of using these findings to evaluate businesses' entire value chains by incorporating them into spatialised Life Cycle Assessment-type (LCA) applications.

Club B4B+ is open to all businesses who wish to clearly assess their links to biodiversity by participating in the development and operational roll-out of this innovative methodology.

24 See glossary
25 http://www.lefestivalvivant.org

conditions for large-scale rollout still raise issues. The involvement of companies, scientists and NGOs in these platforms contributes to the discussion about how biodiversity can be incorporated into economic models and the directions in which to take those.

Business & biodiversity platform[26]

Launched in 2007 by the European Commission's Directorate-General for Environment, and then revived at the end of 2014, this platform has 250 members (as at early 2016), including many SMEs; EpE is also a member. Its main areas of work are:

- Natural capital accounting
- Innovation, biodiversity and business opportunities
- Biodiversity finance

The annual meeting of the platform's members held at the end of 2016 was an opportunity to work on the role of this platform in supporting European companies and their response to biodiversity issues. Many businesses, NGOs and public institutions attended the meeting, aimed at both taking stock of what has been achieved and planning new expectations for the phase 2017-2020. They agreed to expand the Natural Capital Accounting approach to more businesses, including SMEs, and launched the EU Community of Practice for Finance and Biodiversity (the EU CoP F@B), a forum of dialogue dedicated to integrate biodiversity priorities within the financial sector (for example by measuring the impacts of investment portfolios on biodiversity and by integrating biodiversity into decision-making).

Global Partnership

This is an initiative of the Secretariat of the Convention on Biological Diversity aimed at creating a link between national and regional private sector initiatives to make them more effective. Further information is available on the CBD website https://www.cbd.int/business/gp.shtml.

Participatory science and data distribution

Participatory science is another way of generating awareness of the changes in biodiversity and the associated issues. The transparency and delivery of the data collected open up new challenges for processing, qualification, analysis and use of the data. For example, a hackathon was held to look at the biodiversity data available in France's Nature and Landscape Data System (SNIP), and in France's National Inventory of Natural Heritage (INPN).

THE LINEAR INFRASTRUCTURE CLUB

In 2012, in France, the Linear Infrastructure and Biodiversity Club (CILB) member companies, together with the National Museum of Natural History (MNHN) in Paris, France, and its French Natural Heritage Department, approved the centralised management and sharing of their inventory data, especially the flora and fauna inventories compiled as part of mandatory environmental impact studies. Trials have since been conducted on standardising this data for a massive transfer in CardObs, an online tool for the management of nature data and the associated information (location, observations, dates, etc.), to allow it to be banked and used to greater effect. In 2015, following the results of these trials, the CILB - MNHN partnership was renewed in order to provide the Museum's scientists with all the data. The regular transfer of this data from CardObs will further enrich the Nature and Landscape Data System (SNIP).

Since 2008, seven major linear infrastructure operators have joined this club aimed at protecting biodiversity: Enedis, GRTgaz, RFF, RTE, TIGF, VINCI Autoroutes and VNF. In 2011, they signed the Club Charter, and since then ASFA has replaced VINCI Autoroutes, and Eiffage and LISEA have joined as new members.

26 Executive summary of the meeting : http://ec.europa.eu/environment/biodiversity/business/assets/pdf/executive-summary-conference-2016_en.pdf

Conclusion

The previous chapters show that the links between business and biodiversity are regularly growing in depth and content. After a few decades in which only direct impacts were managed by mining and infrastructure operators, mainly within the context of regulatory requirements, a growing number of companies have become more aware of the vulnerability of ecosystems, and their own influence, even indirect, on this vulnerability.

The many examples illustrating this publication highlight the dynamics behind companies' integration of biodiversity: buyers, researchers, marketers, production services and finance departments are starting to act, stimulated if not driven by their sustainable development departments.

There is hope that this integration may become a reality in the wake of the awareness of climate issues, given that in just a few years, they have gone from being the concern of environment departments to become part of the strategic dialogue with shareholders.

But many difficulties lie ahead if we are to follow the "climate model"; they are at once conceptual, economic and organisational.

- The first difficulty is conceptual: the metaphor of the Bombay butterfly is well known; the same applies to biodiversity where infinitely small phenomena can have extremely serious consequences for ecosystems despite their massiveness: introduction of the Asian predatory wasp in Europe, mycosis from South Africa that is decimating amphibians around the world. How can a company employee working in its transport department integrate his or her company's responsibility in its logistics? Above all, how to understand that the issue is no longer how to stop the erosion of biodiversity, but rather how to ensure that ecosystems and humanity together evolve and adapt in a sustainable way, especially in light of the world's ever-growing population. We know that we have to look after biodiversity, but finding the solutions is an ongoing process.

- The second is economic: building detailed knowledge of biodiversity in a given place is difficult and time consuming; insuring its protection is even more so. How can we find the economic models that protect ecosystems in general, at a time when all human development is tending towards a rational and uniform state, with processes and products being standardised to make them less costly? How can we make the conservation of biodiversity profitable when it is difficult to place a value on the services provided by a given ecosystem? How do we distribute the cost of its conservation? Initial simple examples do work: changing farming practices funded by an underground water user, sustainable forestry or market gardening supported by clients who are willing to pay a slightly higher price, and so on. How do we make this the norm so that economic rationality leads to flourishing biodiversity? Devoting a few "per thousandths" of our resources or of the amount of an investment would be a first step, but is this acceptable on a large scale for all economic stakeholders? Would it be sufficient?

- The third difficulty is organisational: biodiversity is defined by the variety of local indicators specific to a product or given geographic place, and companies that do implement a procedure struggle to diversify their approach. The case of the carbon price is exemplary: the company can set for itself an internal carbon price for use when taking any decision. How can the same approach be adopted for biodiversity, given the infinite variety of situations and ecosystem contexts involved? This means resorting to local procedures based on individual decentralised operators. It is an efficient method when the indicator is as simple as operating income; but the effectiveness is far more difficult to assess when considering more complex indicators. The organisational challenge for switching from pilot practices to a mass action is no easy feat.

These difficulties mean that biodiversity cannot be managed according to the model used for climate, but rather that more decentralised approaches must be adopted.
The many examples presented throughout this publication reveal a diverse range of methods and actions, many of which are successful. Using these best practices at more massive scale has not yet been achieved. Many challenges lie ahead of us!

Buoyed by their collective drive, encouraged by the growing expectations of society, partners, employees, and increasingly of shareholders, the EpE member companies are determined to pursue their efforts, and hope, in any case, that this publication will prompt many of their partners to also engage in favour of biodiversity.

Glossaire

Biodiversity: Biological diversity means the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part: this includes diversity within species, between species and of ecosystems (Definition of the Convention on Biological Diversity).

Biomass: The biodegradable fraction of products, waste and residues from biological origin from agriculture (including vegetal and animal substances), forestry and related industries including fisheries and aquaculture, as well as the biodegradable fraction of industrial and municipal waste (EU definition).

White biotechnology: or industrial biotechnology as it is also known, refers to the use of bacterial biological systems to produce, transform or degrade molecules using enzymatic and fermentation processes for industrial application in the materials, chemicals and energy sectors. They are used as an alternative to conventional chemical processes for the economic and environmental benefits derived from the use of renewable raw materials. White biotechnology (Germany) = Green chemicals (France) = Bioconversions = new transformations = industrial biotechnology (Europe).

Blue biotechnology: Applications for environmental protection and environmental diagnosis.

Grey biotechnology: Applications for environmental protection and environmental diagnosis.

Red biotechnology: Refers to the human and animal health field and includes new therapeutic molecules, molecular diagnosis, tissue engineering and the development of genetic processes for therapeutic purposes. The most ethically controversial areas are cloning human cells and research into embryo stem cells.

Green biotechnology: Green biotechnology or plant biotechnology includes new molecular biology techniques and its genetic applications. It covers a range of technology, such as the manipulation and transfer of genes, DNA profiling and cloning plant and animal genes. Green biotechnology applies to the agricultural and food & beverage sectors.

Natural capital: All renewable and non-renewable environmental resources and processes that provide goods or services to support the past, current or future prosperity of an organisation. It includes air, water, soil, minerals and forests [and] biodiversity and eco-system health (Integrated Reporting ←IR→ definition).

Invasive Alien Species (IAS): an allochthonous species whose introduction by humans (voluntarily or unwittingly), installation and propagation threaten ecosystems, habitats or indigenous species, with negative consequences for the ecology, economy or health (IUCN 2000, McNeely et al. 2001, McNeely 2001).

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EpE's latest publications

Entreprises pour l'Environnement, EpE, created in 1992, is an association of some forty large French and international companies from all sectors of the economy, who want to make environmental considerations a greater part of both their strategies and their day-to-day management.
EpE does most of its work through permanent and temporary committees and working groups. They focus on newly emerging and forward-looking subjects such as climate change, the link between health and environment, environmental foresight, biodiversity, the green economy and others. Some of this work is published. It can be freely downloaded from the EpE's website: **www.epe-asso.org**

Internal carbon pricing
A growing corporate practice
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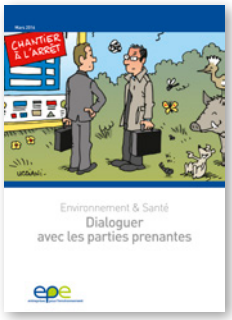

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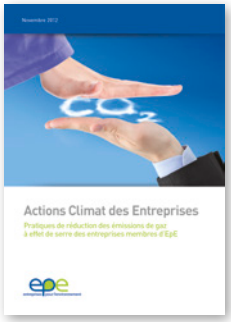

Corporate actions for the climate – Greenhouse gas reduction practices
November 2012

Measuring and managing greenhouse gas emissions
May 2011

Formation Business et Biodiversité
2013

Aknowledgements

This brochure is the result of the work by the Biodiversity Committee since 2013. Written by EpE, it is built on a collation of the experiences and best practices of EpE members in the area of biodiversity management throughout the value chain.

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Claire Tutenuit, EpE General Delegate

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