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Business and nature working together: action by the energy sector to protect wild pollinators

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Why is this guidance needed?

This guidance document for businesses is part of the broader implementation of the EU Pollinators Initiative¹. The initiative was adopted by the European Commission (EC) on 1 June 2018, setting the framework for an integrated approach to address the decline of pollinators in Europe through three priorities:

1. Improving knowledge on the decline of pollinators, its causes and consequences;
2. Tackling the causes of such decline;
3. Raising awareness, engaging society and promoting collaboration.

One of the important actions of the initiative is to encourage and enable the business sector to take action for wild pollinators.

This document aims to provide such guidelines to the energy sector. Its scope includes both local actions (i.e., site-specific) and measures across the value chain that can contribute towards the conservation and restoration of wild pollinator populations. The guidance document also informs businesses on the risks that stem from the decline of wild pollinators, and opportunities that arise from taking action to reverse this negative trend.

Pollinators – such as bees, hoverflies, moths, butterflies and beetles – are declining dramatically around the world, and Europe is no exception. With pollinator populations being essential in underpinning the stability of pollinator services over time, this decline of pollinators puts managed and natural ecosystems functioning at risk.

Why should your business care?

There is growing recognition from a wide range of stakeholders, including regulatory agencies, customers and financial institutions, that biodiversity, including the protection of wild pollinators, needs to be integrated into government, financial and corporate policies and into the operations of companies within the energy sector.

The risks that energy developments and the associated transmission grid poses to biodiversity should be carefully managed and taken into account early in the design process, in order to avoid the raise of stakeholders concerns. In addition, when taking biodiversity and pollinator actions, the sector can benefit

from the ecosystem services provided by nature for free in the form of vegetation controlling erosion, slope stabilisation and protection against natural disasters which enable cost savings, and enjoy an enhanced reputation, preferential access to funding and reduced project development times.

The energy sector can also turn the reversing of pollinator decline into an opportunity. Restoring pollinator populations to healthy levels will help prevent economic losses, provide other environmental and social benefits and assist the company in building/maintaining a good rapport with the public.

¹ COM(2018) 395 final, <https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1528213737113&uri=CELEX:52018DC0395>

What can your business do?

The sector is well placed to seize opportunities and act positively and effectively for wild pollinator populations. This guidance provides recommendations for action by this business sector to protect wild pollinators illustrated with examples of companies taking the lead in creating opportunities for both the sector and pollinators. The energy sector should:

- ▶ decide strategically where to locate the business, thereby avoiding impact on biodiversity-rich areas;
- ▶ prevent and mitigate possible negative impacts during energy production activities, while aiming for biodiversity enhancement, following the mitigation hierarchy principles;
- ▶ develop an asset strategy in which biodiversity impacts are considered from an early stage, including:
 - a baseline inventory;
 - all activities that may have impacts on wild pollinators and broader biodiversity;
 - defining appropriate goals for pollinator habitat and other biodiversity features, to ensure restoration in line with regional and/or national biodiversity conservation objectives
 - monitoring and evaluating the impacts of actions on wild pollinators.
- ▶ partner up with NGOs, local nature authorities and/or academics when drafting and implementing actions for pollinators, and evaluating their impacts;
- ▶ collaborate across the sector and its stakeholders to put available knowledge into practice;
- ▶ raise awareness of the role of pollinators to its stakeholders and encourage them to partake in actions that promote pollinator conservation.





1. WHAT YOU AS A BUSINESS MANAGER SHOULD KNOW ABOUT POLLINATORS

Pollinator populations are essential to underpin the stability of pollination² services in the short- and long-term. Indeed, without pollinators, a large majority of flowering plants will not be able to reproduce and eventually will decline, causing serious cascading effects across ecosystems and business value chains. Many fruits, nuts and vegetables will be lost from our diets, but also other important raw materials and products, such as vegetable oils, cotton and flax, plant-based pharmaceutical and cosmetic products. In essence, pollinators play a crucial role in maintaining terrestrial ecosystems healthy and resilient, which in turn deliver essential services to our businesses and society at large.

Pollinators – such as bees, hoverflies, moths, butterflies and beetles (Figure 1) – are declining dramatically around the world, and Europe is no exception [1, 2]. Many species are threatened with extinction creating a pollination deficit [3]. This puts managed and natural ecosystems functioning at risk, with businesses facing possible serious shortages of raw materials, a decline in crop quality and challenges with the security of the supply chain.



Figure 1. a snapshot of the diversity of wild pollinators - see Annex 1 for photo credits

² Pollination is the transfer of grains of pollen between flowers which enables the reproduction of flowering plants (both wild and domesticated). Without animal pollinators, many plants cannot set seed and reproduce. When humans benefit directly from this function, pollinators thereby deliver a free pollination service.

1.1 wild pollinators and the energy business sector

The energy sector encompasses a range of activities and subsectors involved in the exploration, extraction, processing and distribution of oil, gas and coal, as well as the generation, distribution and delivery of energy from fossil and renewable (non-fossil) energy resources. These activities bear strong links to biodiversity and ecosystem services, both in terms of impacts and dependencies, which the industry is well aware of:

- ▶ There is increasing recognition in the oil and gas industry of the need to explore and develop reserves without causing adverse environmental effects. This means integrating biodiversity management into business practices and operations throughout the project lifecycle.
- ▶ Renewable energy generation is an integral part of the low-carbon energy mix. While renewable energy plays a critical role in mitigating climate

change, it presents significant risks to biodiversity if not carefully managed. Carefully planned and well-sited projects can help avoid most potential biodiversity impacts, whereas poorly managed, unmitigated risks can lead to significant impacts and raise stakeholder concerns.

- ▶ The infrastructure required for these facilities, particularly on land (for example, roads, pipelines, dams, operational structures), will benefit from ecosystem services provided by nature for free in the form of vegetation controlling erosion and facilitating soil and slope stabilisation, and protection against natural disasters such as flooding and storm surges³. Further, nature may provide other services like remediation of waste and pollution from discharges and spills.



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There is growing recognition from a wide range of stakeholders, including regulatory agencies, customers and financial institutions, that biodiversity, including the protection of wild pollinators, needs to be integrated

into government, financial and corporate policies and into the operations of companies within the energy sector.

³ This concerns specifically extraction activities on land, chapter 8 explores the issues relating to extraction in the marine environment.

This guidance signals to the energy sector that environmental impacts can and should be reduced, and that design and cost considerations will provide benefits to the sector, as well as to wild pollinators and their habitat alike.

For the extractive energy businesses, such as coal, recommendations are included in a separate guidance developed specifically for the mining sector⁴.

1.2 Site and value chain impacts

Any business is a value chain. The link between the key drivers of biodiversity loss (which result in environmental and social impacts) and the value chain is shown in Figure 2.



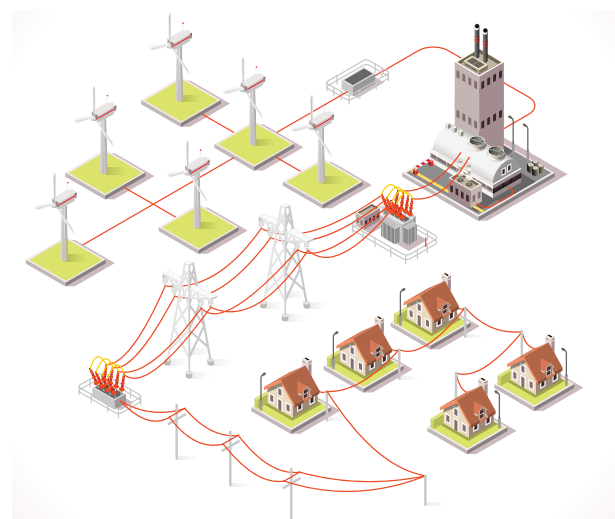
Figure 2. Value chain link with key drivers of biodiversity loss

As companies are being pressed to account for those impacts, they are turning to their supply chain to disclose information in order to monitor and reduce impacts. This includes keeping track of where materials come from, under what conditions they are mined or manufactured, where and how things are made, and how products are packaged, transported, used and disposed of. This information is subject to scrutiny by stakeholders, investors and regulators alike [4].

wind turbines and solar panels, extraction of wood, etc.) and provision of services (for example, carbon storage etc.). Next, the end-product (for example, electricity, fuel, etc.) is transported and/or stored. This is followed by distribution and marketing. All aspects of the value chain are important for the energy business sector when identifying the full environmental footprint of the business' products [5].

Understanding the full environmental footprint of products and resources has become a critical challenge for the private sector and associated players such as manufacturers and retailers. Advances in accounting and reporting methodologies will enable companies to identify suppliers that perform best in relation to reducing resource dependence, social and environmental impacts (with climate-related impacts being an additional concern for the energy sector). This will, in turn, allow companies to encourage suppliers to cost-effectively manage risk and opportunity in their own supply chains and product development [4].

The full value chain of the energy production process includes all elements leading to the production of energy (for example, extraction of minerals for production of



Energy supply chain

⁴ Open-pit mining tends to have a greater impact on biodiversity, as the habitat in the immediate impact of the mine is destroyed or significantly disturbed. While underground mining, heap and in-situ leach mining do not necessarily cause as much surface damage, they can still have major negative effects on biodiversity through water, soil and air quality impacts.



2. WHY DO POLLINATORS MATTER TO YOUR BUSINESS?

Managing a business at any value chain level and the ecosystem services involved implies evaluating risks and opportunities at various levels: operational, regulatory and legislation, marketing and reputation, financial and societal.

There are clear benefits for the energy sector from mainstreaming biodiversity and pollinator actions, including enhanced reputation, competitive edge ('preferred development partner' status), preferential access to funding, and reduced project development times. Many businesses recognise the reputational risks associated with poor management of biodiversity and ecosystem services. Equally, financial institutions are increasingly adopting stricter standards on biodiversity that will restrict financing of projects that do not effectively assess and mitigate threats. Mainstreaming biodiversity into the energy sector could lead to sector-wide change and foster positive outcomes for local communities⁵.

The sector is well placed to seize opportunities and act positively and effectively for wild pollinator populations (see Table 1 for an overview).

Exelon participated in a National Pollinator Week programme, organized by a local NGO dedicated to promoting the health of pollinators. Within this programme it organized workshops to build bee hotels with children on the 'Take Your Child to Work Day'.

Interested in what other front-runners are doing? See Chapter 4.

SolarEnergyWorks designs and manages their solar park (Zonnepark Aadijk Almelo) such that they provide a suitable living environment for wild pollinators, for example, by providing healthy soil, flower meadows etc.).

Interested in what your business can do? See Chapter 3.

ELIA and RTE's transmission system operators worked with biodiversity experts to create win-win solutions combining safe distances from vegetation to overhead power lines thereby saving maintenance costs while strongly improving biodiversity.

Interested in what benefits this has created for the company? See Chapter 4.



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⁵ This concerns specifically extraction activities on land, chapter 8 explores the issues relating to extraction in the marine environment.

Table 1. **Why** pollinating insects matters to your business and **what** to do (risks & opportunities for the energy sector that are of key importance and sector-specific are highlighted in **bold**).

	Risks	Opportunities
Operational Regular business activities, expenditures, and processes	<ul style="list-style-type: none"> ▶ The operational risks for the energy business sector in relation to pollinator decline are limited and mainly relate to missing the opportunities the sector can seize (see next column). 	<ul style="list-style-type: none"> ▶ Adopting responsible practices of biodiversity management can bring opportunities such as access to land, both at the initial stages of project development and for ongoing exploration to extend the lifetime of existing projects. ▶ Reduced operational costs, for example for transmission system operators, when a shift is made to low-investment management habitat favouring biodiversity that is compatible with high-voltage power lines. ▶ Provision of other ecosystem services and associated benefits (for instance, by linking water and carbon management with pollinator-friendly actions).
Legal and regulatory Laws, public policies, and regulations that affect business performance	<ul style="list-style-type: none"> ▶ New regulations or license fees to protect valuable natural resources and ecosystem services such as animal pollination. ▶ Increased compliance costs. ▶ Increased capital costs or production losses due to permit denials or delays. ▶ Increased fines, penalties, compensation, or legal costs. 	<ul style="list-style-type: none"> ▶ Reduced compliance costs and/or other costs, and shortened licensing procedures, by: <ol style="list-style-type: none"> a. being more proactive towards (new) environmental legislative frameworks and government policies; b. anticipating negative impacts; c. embedding pollinator risk identification within the supply chain management and certification schemes of companies (for example, ISO14001).
Financing Costs of and access to capital including debt and equity	<ul style="list-style-type: none"> ▶ Increased financing costs (higher interest rates or more stringent conditions). ▶ Loss of investor's interest. 	<ul style="list-style-type: none"> ▶ Gain or maintain investor interest and confidence, which can improve access to finance and/or reduce financing costs. ▶ New "green funds" may become available. ▶ New environmental markets may emerge (for example, carbon offsets, habitat credits, payments for ecosystem services [6] etc.).
Reputational and marketing Company trust and relationships with direct business stakeholders	<ul style="list-style-type: none"> ▶ Changing customer values or preferences may lead to reduced market share. ▶ Increased staff turnover which in turn leads to higher recruitment and retention costs. ▶ Reduced loyalty of key suppliers or business service providers. ▶ Public campaigns against a project. 	<ul style="list-style-type: none"> ▶ Maintain a good relationship with direct business stakeholders, such as customers, employees and the local community. ▶ Improve physical and mental wellbeing of employees due to a biodiverse company landscape. ▶ Improve ability to attract and retain employees. ▶ Differentiating the business to key customers who demand strong sustainability commitments in an increasingly competitive market.
Societal Relationships with the wider society	<ul style="list-style-type: none"> ▶ Local communities may hold the energy sector responsible for the decline in pollination services (for instance, through habitat loss and fragmentation). 	<ul style="list-style-type: none"> ▶ Local communities may benefit from other improved ecosystem services that come along with the implementation of pollinator-friendly measures, for example, through improved recreational access to green areas, cleaner air and improved regulation of water flows.



3. WHAT CAN YOUR BUSINESS DO?

To avoid the risks and be able to seize the opportunities described above (see Chapter 2), it is important for the energy sector to take measures to improve the conservation status of wild pollinators.

A first step is to integrate biodiversity into the companies' core business strategies. The sector should capitalize on the opportunities identified while setting and working towards commitments to minimize its impact on biodiversity, including on wild pollinators. This approach will help energy companies to **make a positive contribution to the protection of biodiversity and ecosystem services, including those that pollinators (and their habitats) provide and that are significant for operations on land**. This is fundamental for the long-term health of the business and the wider landscape within which it operates.

The most important action that the energy business sector can take on their land holdings is by deciding strategically where to locate the business, thereby avoiding impact on biodiversity-rich areas. Other important actions are the sustainable management of existing habitat and the restoring of additional habitat for pollinators, for example through planting pollinator-friendly floral resources, providing nesting and overwintering habitat to wild pollinators, or applying a ban on chemicals.

Chapter 3.1 provides an overview of measures that are relevant for energy production sites that require high land intake. Chapter 3.2 focuses on actions that can be taken in the transmission of energy. Furthermore, there might be unused space on the estates where parts of the value chain linked to the energy industry are located. In Chapter 3.3 of this guidance there is advice on how to develop such spaces to the benefit of pollinators and biodiversity more broadly, including local-level actions that apply for all type of businesses. Such measures not only provide biodiversity benefit, but also improve the physical and mental wellbeing of employees through the creation of green spaces. Further benefits may arise associated with the provisioning of other ecosystem services and related business benefits (for example, by linking water management with water-related ecosystem services).

3.1 Actions for energy producers with high footprint

3.1.1 Broad actions

The categories of measures to preserve natural habitats and resources that may be taken in the project area can be distinguished as follows:

Strategic planning: Safeguarding ecologically-sensitive areas

The risks that energy operations pose to biodiversity and wild pollinators should be carefully managed and taken into account before they start.

When considering the impact of energy activities on biodiversity, the site of a project (including ancillary and subsequent development locations) is of critical importance.

Some examples:

- ▶ Oil and gas contract blocks can overlap with protected areas, or breeding grounds for migratory species.
- ▶ Hydroelectric dams that are developed in ecologically-sensitive locations can have severe implications for the surrounding area as a result of diverting the flow of rivers and changing flooding regimes.
- ▶ Solar installations often require large areas of land. If not sited properly, solar installations can therefore impact biodiversity through land use change and fragmentation [7].
- ▶ Factors such as distance from existing linear infrastructure and the type of land where solar and wind parks are installed can increase potential impacts on biodiversity⁶.
- ▶ Appropriate siting could provide opportunities for biodiversity, such as landscape diversification through species-rich grasslands on solar farms or on surrounding wind turbines in agricultural monoculture landscapes.

⁶ European Parliament (no date) European Parliament resolution of 9 October 2008 on Arctic governance [Online] Available from: <http://www.europarl.europa.eu/sides/getDoc.do?type=TA&reference=P6-TA-2008-0474&language=EN> [Accessed November 2017].

It is recommended for companies to develop an asset strategy in which biodiversity impacts are considered from an early stage. This strategy can support companies in planning effectively for development by **safeguarding ecologically-sensitive areas** from direct/indirect and cumulative impacts. The same applies to those companies that manage operations to reduce the direct, induced and cumulative impacts and deliver benefits to biodiversity and society. [8]

It is good practice to **involve local biodiversity experts (i.e. biologists, species experts etc.), the local community and/or nature conservation organisations** during the whole project cycle, starting from the selection of sites.

Preventing and mitigating possible negative impacts in the operational phase, while aiming for biodiversity enhancement.

The direct impacts on biodiversity associated with the production and distribution of energy relate to the footprint of the operations, their input needs in terms of water use, the use of land and the outputs in terms of waste, contaminated water and emissions. These activities can lead to habitat loss, degradation and fragmentation, and population declines of impacted species, including wild pollinators.

Operations include both direct infrastructure (for example, oil rigs, fields of solar panels or wind turbines) and ancillary developments (for example, worker camps, waste facilities and access roads). Distribution and processing operations (power lines, pipelines, power stations, processing plants etc.) can also have large direct impacts on biodiversity and ecosystem services. The extent of these impacts varies across the subsectors and between receptor groups.

An important early step is to identify all activities that may have impacts on wild pollinators, or broader biodiversity, in the initial phase of project design. It is therefore imperative to have a thorough understanding of the ecosystem and the biodiversity near to and at the planned project site. Such baseline inventory will enable the definition of appropriate goals for pollinator habitat and other biodiversity features. The full understanding of the impacts of energy production on pollinators and overall biodiversity, should be done as part of a thorough site specific risk assessment. The assessment needs to meet EIA or ESIA standards, but going beyond the mandatory requirements by engaging professional species expert surveyors will reap benefits later. The mitigation hierarchy⁷ needs to be followed. The **highest priority is to avoid significant negative biodiversity impacts by protecting existing habitats and species when planning the site.** If there are unavoidable impacts, the necessary mitigating and compensating measures should be defined before any work takes place.

Energy production companies should include stakeholder consultation or participation, including nature conservation experts, NGOs and local communities, to use all knowledge and perspectives to developing a suitable approach for pollinators and biodiversity more broadly.

In order to assess the impacts of any taken action to protect wild pollinators, it is fundamental that businesses ensure systematic monitoring of the impacts of such measures. This will allow the companies to track the extent to which their goals were achieved, while gaining invaluable insight on how to improve future actions. Such monitoring will also provide information on the quality of the wider environment as pollinators are excellent bioindicators of ecosystem health. In order for business' efforts to be recognized, local partners (such as NGOs, research institutions) could be crucial to assist with the monitoring of the efforts on the ground and with the evaluation of action plans.



⁷ SWD(2019) 305 final. Commission Staff Working Document: EU Guidance on integrating ecosystems and their services into decision-making. Available at: https://ec.europa.eu/environment/nature/ecosystems/pdf/SWD_2019_305_F1_STAFF_WORKING_PAPER_EN_V2_P1_1042629.PDF

They can also help with the design of conservation measures and strategies if no in-house knowledge is available, and monitor the state of wild pollinators, before, during and after the energy project.

Restoration: improving pollinator habitat and biodiversity in the afterlife of energy production activities.

Energy production sites can be important sites for the conservation of endangered pollinator species, bees, butterflies and hoverflies. To seize these opportunities, it is important for energy production companies to draw up a management plan for its production sites, which includes an evaluation of possible habitat improvements for pollinators. To this end, the management plan may describe the desired succession state of habitat patches, which vegetation meets the requirements of the pollinator species present, and which invasive or problematic species (pest species) will have to be removed. **Natural revegetation should be the main approach** for this, depending on there being sources remaining on site. If the site was already rocky or sandy, it is important to keep these 'refuge' areas of natural vegetation.

If the site was completely non-natural habitat (for example, intensive grassland), then efforts should be made to introduce species that are typical of such habitats and of local genetic provenance.

To contribute to improving the state of pollinators, the sector should look to cooperate with local NGOs, nature conservation authorities and/or academics. With their help, the company can incorporate ways to preserve biodiversity and reduce ecosystem threats across its operations. It is considered a best practice to involve these expert stakeholders in the initial phase of the project design, for example, to make the company's site as pollinator-friendly as possible, before, during and after energy production activities have begun. Examples of industries that have worked towards a biodiversity gain with the help of local NGOs are shown in Chapter 4. Another possibility is to partner up with these stakeholders to develop technical tools, such as GIS-tools, to assess the company's land assets and help the company identify how best to invest in a pollinator project or to reduce its negative impacts on biodiversity. The tool could for example enable a manager to quickly define the pieces of land that are directly adjacent to agricultural fields and are of greatest value to restore for wild pollinators.

As a very last resort, companies should offset potential residual impacts, in line with the mitigation hierarchy principles as outlined in the 'EU guidance on integrating ecosystems and their services into decision-making'⁸. The combination of pollinator-friendly measures with general biodiversity measures might also be a subject for new emerging environmental markets, such as carbon offsets or habitat banking systems⁹.

Collaborate across the sector and its stakeholders to put available knowledge into practice

There is potential to build further capacity among corporate stakeholders. Companies and industry associations (for example, ICM¹⁰ and IPIECA¹¹) are in an excellent position to develop capacity within the sector through peer-to-peer learning. These initiatives could encourage information exchange and awareness raising on the state of pollinators and the actions to take [8].

The energy sector could foster a closer collaboration with NGOs, local authorities and researchers to achieve an optimal result both for the business bottom line as well as for pollinators and their habitats. They could (co-)develop research to investigate viable alternatives that decrease environmental impacts caused by energy production, transmission and storage activities, and to improve the knowledge on which actions to take to promote healthy pollinator populations on the project sites (for example, by learning about local host plants and plant communities).

A broad industry-level collaboration may allow for mutual uptake of pollinator challenges into corporate risk management, responding to stakeholder engagement and long-term strategic asset management. In addition, engagement between industry and governments could be encouraged to facilitate training, capacity building and information exchange (for example, public-private partnerships).

⁸ SWD(2019) 305 final. Commission Staff Working Document: EU Guidance on integrating ecosystems and their services into decision-making. Available at: https://ec.europa.eu/environment/nature/ecosystems/pdf/SWD_2019_305_F1_STAFF_WORKING_PAPER_EN_V2_P1_1042629.PDF

⁹ A market where the credits from actions with beneficial biodiversity outcomes can be purchased to offset the debit from environmental damage. Credits can be produced in advance of, and without ex-ante links to, the debits they compensate for, and stored over time (source: https://ec.europa.eu/environment/enveco/pdf/eftec_habitat_technical_report.pdf)

¹⁰ International Council on Mining and Metals ¹¹ International Petroleum Industry Environmental Conservation Association

3.1.2 For specific subsectors

In this section, recommendations are given specific to each of various subsectors within the energy business:

Wind energy developments on land:

Wind energy developments may have negative impacts on pollinators through habitat loss, degradation and fragmentation associated with the construction of the wind turbines. The scale of direct habitat loss resulting from constructing a wind energy development and associated infrastructure such as access roads, intra-array cabling¹² and sub-stations depends on the size, location and design of the project. Clearly, appropriate siting of development locations and access roads by means of strategic planning is the most effective way to avoid significant effects on valuable pollinator habitats. Habitats which are degraded during the construction phase (for example, due to storage of soils and equipment) should be restored as soon as construction is completed. According to the current evidence, the wind turbines are not considered to be a major threat to insect populations once they are in operation. However, a recent study by Trieb (2018) showed that a large numbers of flying insects can be expected in wind farms and urgently recommends empirical quantification of the impact by comprehensive observation of wind farms and identification of the concerned taxa by DNA meta-barcoding of insect deposits on rotor blades. When taking adequate measures there are ample opportunities for the wind energy sector to enhance the habitat quality for pollinators in the vicinity of wind turbines.

Wind energy companies should look to minimize negative impacts and support rich biodiversity in the area surrounding the turbines.

Recommended literature for this sector is the recently updated EC Guidance on wind energy developments and nature legislation¹³.



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¹² Information presented in this guidance document on cabling to connect turbines is also relevant to overhead/underground electricity transmission, however detailed guidance on energy transmission infrastructure and EU nature legislation is published in a separate guidance document (European Commission, 2018).

¹³ European Commission. 2020. Guidance Document on wind energy developments and nature legislation, retrieved from https://ec.europa.eu/environment/nature/natura2000/management/natura_2000_and_renewable_energy_developments_en.htm

Solar energy developments:

Solar energy developments can offer interesting opportunities for improving wild pollinator habitat:

- ▶ On land, solar farms can be easily combined with promoting suitable pollinator habitat. Specifically, flower strips and other habitat requirements for pollinators can be catered for in between the parallel rows of solar panels and on the borders of a solar energy park. As with wind energy developments, having pollinator habitat combined with energy production, there may be additional benefits through increased pollinator services for agricultural land [10].
- ▶ On roofs again opportunities are available for combining solar energy with pollinator habitat. In detail, photovoltaic panels can be combined with green roofs thereby providing habitat to pollinators [11]. Green roofs and solar photovoltaic systems are two technologies that could contribute to sustainable building development and reduction of greenhouse gas emissions. When they are combined, plants having cooling and shading effects have a positive impact on the production of energy and the effectiveness of the solar panels [12-14] compared to solar panels on a gravel or bituminous roof.



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Bio-energy

The biodiversity impacts of bioenergy feedstock production mainly relate to intensive land-use or land-use driven by agricultural and forestry sectors. The production of feedstocks for biofuels is however perhaps the sector with the greatest dependency on biodiversity for services such as pollination, disease control, and water supply. Therefore, there are important opportunities for the sector to contribute to the maintenance and restoration of biodiverse landscapes. Especially in case of already degraded landscapes, restoration of habitats brings high positive impacts for pollinators and wider biodiversity. Also, there are financial opportunities arising from new environmental markets such as habitat banking and subsidies for farmers who contribute to biodiversity. For energy crop production, companies are referred to the pollinator guidance specific to the agri-food and beverage industry¹⁴.

In terms of energy wood production, low-intensity forest management has been shown to have certain positive biodiversity impacts, and Europe has extensive unprotected forests that are not managed. The possibilities for this sector to contribute to the protection of pollinators mainly relate to the implementation of ecosystem-based forest management. Concrete actions that can be taken in forests are described in the pollinator guidance specific to the forestry sector¹⁵.

Hydropower

The range of effects a hydropower facility can have on species and habitat varies considerably from one site to another, depending on the individual characteristics of the river, its physical and ecological state as well as on the type and scale of hydropower facilities and the species and habitats for which the site has been designated.

¹⁴ Arcadis Belgium. 2020. Business and nature working together: Action by the agri-food and beverage sector to protect wild pollinators. Technical guidance prepared by Arcadis for the European Commission under contract No 07.0202/2018/795538/SER/ENV.D.2 "Technical support related to the implementation of the EU Pollinators Initiative".

¹⁵ Arcadis Belgium. 2020. Business and nature working together: Action by the forestry sector to protect wild pollinators. Technical guidance prepared by Arcadis for the European Commission under contract No 07.0202/2018/795538/SER/ENV.D.2 "Technical support related to the implementation of the EU Pollinators Initiative".

Hydropower projects can result in the loss, degradation and fragmentation of natural habitats and populations of species that depend on these habitats for their existence, on the one hand due to the construction of the hydropower plant and on the other hand due to changes in river morphology, river habitats, ecological flow regime, seasonal flood cycles and water temperature.

Mitigation measures such as the restoration of the river continuity and the functioning of sediment dynamics can either mitigate potential negative effects before they happen or restore damage that has already been done. In case the damage occurs, adequate measures should be introduced to actively restore, reconnect or recreate valuable natural habitats for rare and endangered species, including pollinators that live in the vicinity of rivers. In any case, **the mitigation hierarchy as outlined in the 'EU guidance on integrating ecosystems and their services into decision-making'¹⁶ should be followed.**

More guidance on potential mitigation measures is given in the EC Guidance on the requirements for hydropower in relation to EU Nature legislation¹⁷.

3.2 Actions for the energy transmission sector

The construction of linear infrastructure such as pipelines and power lines may require the clearance of land and the removal of surface vegetation (often referred to as direct land-take). Through this process existing habitats may be altered, damaged, fragmented or destroyed [7] and landscape connectivity may get disrupted. Nevertheless, the portion of land that is assuring there to be a network for distributing energy, provides ample opportunities to also be approached as a grid for improving the state of pollinator habitat.

When considering the construction of overhead lines, for example, management needs to be such that trees cannot grow in the vicinity of high-voltage lines avoiding any risks on circuits cuts due to falling trees or large growing trees. To this end, most electricity transmission companies have a maintenance policy for overhead lines in place consisting of levelling all vegetation in a corridor of about 30-50 meters below the lines. Such management is very costly and detrimental to biodiversity.

By deliberately choosing for pollinator-friendly management of energy transmission corridors, management costs can be reduced while favoring wild pollinators and other species habitat. When having floral resources underneath the powerlines or on top of the pipelines, the linear shape can act as a corridor to help pollinators move through the landscape, either for daily foraging or for dispersal between larger habitat patches. An example by Elia and RTE is shown in Chapter 4.

Assist other actors in the value chain to support rich biodiversity

In order to make a value chain green, it is necessary to consider all activities in the value chain such as design, supply, production, assembly, packaging, logistics, distribution, marketing, after-sales and appropriate product disposal.

Improving the value chain performance with nature-based solutions, includes the reduction of energy consumption, environmental accidents, air emission, waste, harmful gasses, etc. Companies should ensure that its products and operations cause the least damage to the environment during the whole product life cycle via green purchasing, green design, internal environmental management, green production, environmentally friendly packaging and transportation. Reverse logistics activities such as reuse, remanufacture and recycle that are used at the end of product's life cycle contribute to the sustainability of products. [12]

Green value chain solutions can help companies to increase corporate image, employee satisfaction, customer loyalty/satisfaction and better relations with stakeholders, while positively impacting overall biodiversity and ecosystem services

¹⁶ SWD(2019) 305 final. Commission Staff Working Document: EU Guidance on integrating ecosystems and their services into decision-making. Available at: https://ec.europa.eu/environment/nature/ecosystems/pdf/SWD_2019_305_F1_STAFF_WORKING_PAPER_EN_V2_P1_1042629.PDF

¹⁷ European Commission. 2018. Guidance on the requirements for hydropower in relation to EU Nature legislation, retrieved from https://ec.europa.eu/environment/nature/natura2000/management/docs/hydro_final_june_2018_en.pdf

3.3 Site/local level actions

While the previous chapter focused on sector-specific actions, this last chapter gives an overview of measures that can be applied to all business sectors, since they target individual business locations (for example, the premises of a business' headquarters or an industrial facility), as well as the company's properties that have not yet been developed for business purposes.

Action within companies' grounds

Businesses can draw up a long-term action plan, alongside a management plan, that identifies and protects the areas on the company's premises that are already providing food (for example, patches of wildflowers, weeds or flowering hedgerows) and shelter (like bare soil, long grass and dry-stone walls) for wild pollinators. In order to ensure pollinator-friendly management, the following actions are key:

- ▶ Reduce mowing frequency to create species-rich grasslands. Natural habitats can be further supplemented by artificial ones (for instance, bee hotels).
- ▶ When planting for pollinators, use native species (like seed mixes, clovers, bulbs, trees and shrubs). Ensure that wild pollinators have foraging resources during the whole vegetation season.
- ▶ Ensure connectivity with surrounding areas of green infrastructure and nature importance by creating grasslands and other types of vegetation that support rich biodiversity.
- ▶ Avoid and control the spread of invasive alien species¹⁸, both plants and animals.
- ▶ Consider the construction of green roofs and walls¹⁹, as they can provide considerable feeding ground for wild pollinators.
- ▶ Reduce light pollution, as artificial light can negatively affect insect populations.
- ▶ Adopt a pollinator-friendly management protocol and do not use pesticides (insecticides, fungicides and herbicides), as these can be harmful to wild pollinators.
- ▶ Ensure contractors that manage the company's land are aware of the company's intentions to enhance wild pollinators and how this should be realised.



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¹⁸ See also 'Managing invasive alien species to protect wild pollinators', technical guidance prepared by IUCN (2019) for the European Commission.

¹⁹ See also 'A guide for pollinator-friendly cities: How can spatial planners and land-use managers create favourable urban environments for pollinators?' by Wil et al. (2019), guidance prepared by ICLEI Europe for the European Commission.

²⁰ See also 'Citizens for pollinator conservation: a practical guidance', guidance prepared by the Institute for European Environmental Policy (2020) for the European Commission.

It is recommended that businesses partner with local NGOs/authorities or experts to include biodiversity and ecosystem services at the design stage of the company's site. They can also help with development of key performance indicators (KPIs) and, as it was already mentioned, with monitoring, reporting and evaluation of outcomes. The company could, for example, monitor the presence and diversity of local pollinator species at the company's site and the wider environment either through local partnerships or by engaging in local citizen science programmes²⁰.

These actions within the companies' grounds can benefit wild pollinators and overall biodiversity most when they are applied early in the design stage of the company's site when the landscaping and infrastructure features are still open for creativity. **When securing habitats for wild pollinators, the main guiding principle is to let nature regenerate on its own.** This can be complemented by additional planting of native flowers seed mixes, if/when needed.



Generic actions which do not require any land holding

It is recommended for businesses to embed pollinator-friendly actions into the company's strategy and daily operations:

- ▶ Integrate pollinator-sensitive practices into the company's environmental management system and/or other certification schemes or standards.
- ▶ Introduce internal biodiversity policy commitments that include measures to improve pollination. For example, by implementing a biodiversity- or pollinator-friendly purchasing policy, the business can direct its suppliers to reduce the negative impacts on pollinators.
- ▶ Link the business' strategy to national and international biodiversity policy (including the EU Pollinators Initiative) and to the SDGs²¹(namely SDG 15 "Life on Land", SDG 2 "Zero hunger" and SDG 12 "Responsible consumption and production").



In addition, the company can invest in projects to restore, create and connect pollinator habitats to reduce the environmental footprint of their buildings and operations and obtain general environmental benefits (reduced solid waste and wastewater, less pollution, energy efficiency etc.) and implement green procurement. Overall, these improvements will benefit nature and wild pollinators alike.

²¹ <https://sdgs.un.org/goals>

Also, the company can take efforts to **raise awareness** of:

- ▶ **the local community:** sponsor creation/restoration of pollinator habitats or arrange an expert to give a training/lecture on the conservation of wild pollinators;
- ▶ **the business' workplace:**
 - organise pollinator awareness training sessions or workshops for employees (for example, on how to ensure their own gardens are pollinator-friendly, or how to observe and record wild pollinators in order to help monitoring efforts);
 - include environmental considerations at each stage of the procurement process of goods, services and works (i.e. green procurement);
- ▶ **the business sector:** share your experiences regarding the implementation of pollinator-friendly measures with the EU Business @ Biodiversity Platform²² at relevant conferences or seminars, and/or through social media using the #EUPollinators.



**Business @
Biodiversity**

²² <https://ec.europa.eu/environment/biodiversity/business/>



4. WHAT ARE FRONT-RUNNERS ALREADY DOING?

This section presents a limited, non-exhaustive set of examples of businesses taking action for pollinators, to illustrate the diversity of potential actions that could be uptaken by the energy sector. The list has been generated by consulting the members of the EU Business and Biodiversity Platform²³, and through literature review.

ELIA and RTE

Company: ELIA and RTE, electricity transmission system operators in resp. Belgium and France, led a project funded by the European Commission LIFE Programme (2011-2017) to manage and restore natural habitat over 300 hectares under medium and high-voltage overhead power lines crossing forested and N2000 areas in Wallonia and France.

Action:

Until recently, Elia's management for habitat under overhead lines consisted of levelling all vegetation in a corridor of about 30-50 metres below the lines. While being a costly undertaking for Elia, this was also detrimental to biodiversity.



Source: Elia

Improvements were done through several actions:

- Orchards of very rare and local species were planted under overhead power lines providing shelter and food to a whole range of local fauna (large animals, birds and insects), including wild pollinator populations.
- Flower meadows were recreated on the access routes and in some corridors for the high-voltage power lines. Ecological management aimed for species-rich grasslands by mowing and removal of the clippings.
- The project had the objective to create and restore 70 km biodiverse forest edges between power line corridors and forest. These edges, with sizable trees of a variety of species, will provide food and shelter habitat for a whole range of insect, mammal and bird species which that would not be present with the earlier approach where corridors were kept clean and were managed intensively. [15]
- Elia and RTE regularly work with Belgian farmers or shepherds to have corridors being managed ecologically, increasing biodiversity and being compatible with the transmission lines.
- In parallel to actions on the ground, Elia and RTE started a communication campaign targeting various focal groups to raise awareness on how biodiversity could be favoured. Also, training modules and brochures were developed and information panels are foreseen to provide explanation at the companies' locations.
- RTE signed the Act4nature policy, an initiative launched by the French association Entreprises pour l'Environnement and a number of partners with the aim of mobilising companies to protect, promote and restore biodiversity.

Benefits for ELIA and RTE:

- By a shift to low-investment management habitat favouring biodiversity that is compatible with the power lines, this also has reduced operational costs for the companies (avoiding regular cuttings) and reduced the outage risk (less high trees). A cost-benefit-analysis proved the success of this project for both the companies and for biodiversity.
- In addition, there is an important reputational benefit. The project proved to create a more positive image of the transmission system operations, which increased the acceptance of its installations and the implication of local stakeholders who for the first time could see a benefit in the presence of the overhead lines in their environment.

²³ https://ec.europa.eu/environment/biodiversity/business/index_en.htm

More info:

Email correspondence with Elia

<https://www.elia.be/nl/duurzaamheid/milieu/biodiversiteit-en-herstel-van-natuurlijke-habitats>

<http://www.life-elia.eu/>

Exelon Nuclear

Company: Exelon Corporation is an American Fortune 100 energy company headquartered in Chicago, United States. It employs approximately 33,400 people. Exelon is the largest electric parent company in the United States by revenue, the largest regulated utility in the United States with approximately 10 million customers, and also the largest operator of nuclear power plants in the United States. Guided by their corporate Biodiversity and Habitat Policy, the company is dedicated to reduce its impacts on wildlife and enhance habitats wherever possible.

Action:

- Exelon collaborated with U.S. Fish and Wildlife Service (local nature authorities) to create monarch and pollinator-friendly habitat underneath high-voltage power lines.
 - Many of Exelon's operations are in areas where monarch butterflies may rest and recharge (feed) along their 3,000-mile journey. Exelon Corporate launched an interactive pollinator map showing the migration path of Monarch butterflies and projects that Exelon has implemented to support pollinator species.
- Furthermore, Exelon is a funder of the Power-in-Pollinators program of the Electric Power Research Institute (EPRI), that supports member companies to brainstorm and execute company-specific activities to demonstrate utility leadership and interest in pollinator conservation.
- Exelon participated in the National Pollinator Week program, organized by the Pollinator Partnership, a non-profit organization dedicated to promoting the health of pollinators:
 - Pollinator Week posters and various printouts were displayed at all 14 nuclear stations as well as the Cantera and Kennett Square corporate offices.
 - The Kennett Square office built 12 bee hotels with children from 'Take Your Child to Work Day' and installed them near the company's offices. The office also hosted an Eco Fair that incorporated environmental education.
 - FitzPatrick and Nine Mile Point hosted a joint butterfly release.
 - FitzPatrick, Braidwood, Dresden, and Byron all planted or expanded existing pollinator gardens.
 - Three Mile Island handed out SeedBallz to employees, allowing people to have their own flower habitats for pollinators.

More info:

<https://www.exeloncorp.com/sustainability/pollinator>

<https://www.exeloncorp.com/newsroom/bee-ing-a-good-neighbor>

<https://www.fws.gov/midwest/news/IllinoisROW.html>

SolarEnergyWorks

Company: SolarEnergyWorks is a Dutch solar farm developer with expertise in investments, real estate and financial structuring. The focus of SolarEnergyWorks is on project development of large-scale ground based solar parcs.

Action:

The project developer has joined forces with the Dutch Beekeepers' Association (NBV) (local NGO) in order to make its solar park 'Zonnepark Aadijk Almelo' suitable as habitats for honey bees, wild bees and other insects. NBV advises the company on the requirements to improve conditions for wild pollinators. The approved actions are integrated in the overall plan and taken into account in the initial phase of landscape design.

The solar panels are installed in such a way that a maximum of light is still reaching the ground. This keeps the soil life healthy. The soil under the solar park is sown with a mix of plants and herbs that attracts many insects. The flower mix is matched to the environment.

The company designs and manages its solar meadows in such a way that they provide a good living environment for wild pollinators. Furthermore, the company places information boards about beekeeping and the importance of bees and other insects in preserving biodiversity.

Benefits for SolarEnergyWorks:

Solar parks often are responded to by residents with a NIMBY (not in my backyard) reflex. In dealing with such resistance, the company has eyes and ears for integrating their parks most optimally in a neighbourhood. To this end, they work together with renowned landscape architects. By setting up the solar parks as refuges for wild bees and other insects, biodiversity is improved while simultaneously increasing the social support.

More info:

Email correspondence with SolarEnergyWorks

<https://solar-ew.nl/bijenparken/>

<https://www.trouw.nl/duurzaamheid-natuur/dit-zonnepark-wordt-een-bloeiende-bijenweide~b8d59e90/?referrer=https%3A%2F%2Fwww.google.com%2F>



Source: SolarEnergyWorks



5. FURTHER READING

EU Pollinator Initiative:

- https://ec.europa.eu/environment/nature/conservation/species/pollinators/index_en.htm
- https://ec.europa.eu/environment/biodiversity/business/news-and-events/news/news-84_en.htm
- Business and nature working together: Guidance on action to protect for the agri-food and beverage sector. (2020)
- Business and nature working together: Guidance on action to protect for the forestry sector. (2020)
- Business and nature working together: Guidance on action to protect for the mining sector. (2020)

European Commission Guidance documents:

- Natura 2000 and renewable energy developments, retrieved from https://ec.europa.eu/environment/nature/natura2000/management/natura_2000_and_renewable_energy_developments_en.htm
- Guidance on Energy Transmission Infrastructure and EU nature legislation (2018), retrieved from <https://ec.europa.eu/environment/nature/natura2000/management/docs/Energy%20guidance%20and%20EU%20Nature%20legislation.pdf>
- Guidance on The requirements for hydropower in relation to EU Nature legislation (2018), retrieved from https://ec.europa.eu/environment/nature/natura2000/management/docs/hydro_final_june_2018_en.pdf
- SWD(2019) 305 final. Commission Staff Working Document: EU Guidance on integrating ecosystems and their services into decision-making.

IPBES reports:

- <https://ipbes.net/global-assessment-report-biodiversity-ecosystem-services>
- <https://ipbes.net/assessment-reports/pollinators>

IUCN. 2014. A Global Assessment of the Environmental and Social Impacts Caused by the Production and Use of Biofuels. Gland, Switzerland: IUCN. 42pp. Available at: <https://www.iucn.org/theme/business-and-biodiversity/resources/business-sectors/renewable-energy>

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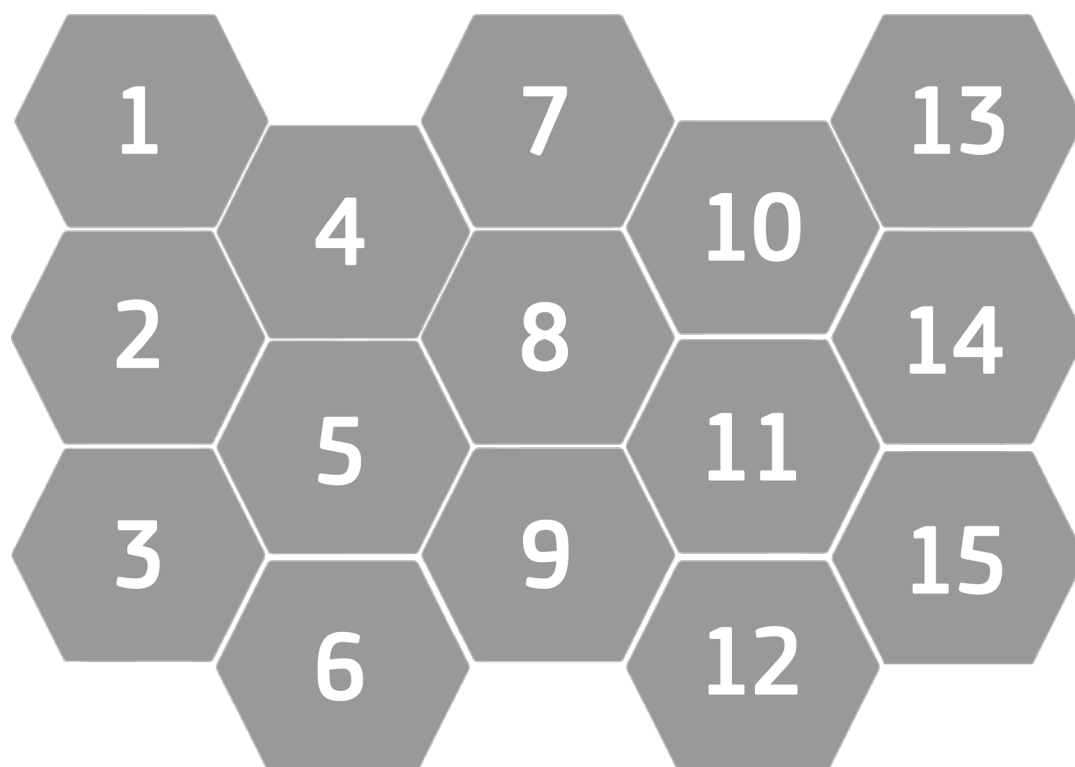
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Annex I



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