

Opinion | 17 October 2025

ENERGY SUSTAINABILITY

# Don't build renewables at nature's expense: my message to corporate leaders

Renewable power projects have a duty to support the nature around them, but how they're designed is crucial. Gerben Hieminga looks at how solar and wind projects can benefit biodiversity and argues that regulation, not market forces, is key to aligning climate, nature, and financial goals



Agrivoltaics in action, where farming and clean energy share the land

## Gerben's 4 key messages

- **Renewables and nature restoration can go hand-in-hand if projects are designed thoughtfully.** Solar and wind farms can support biodiversity, but only when their location and design are carefully considered.
- **Market forces alone are not enough to deliver nature-positive outcomes; regulation is essential.** Voluntary credits and market incentives may be insufficient to ensure meaningful biodiversity gains, and clear regulatory standards are needed.
- **Nature-positive measures in renewables are often low-cost or even revenue-generating, but require upfront commitment.** Simple changes like animal-friendly fencing or pollinator plantings can benefit nature without significant extra cost, and some innovations can even boost returns.

- **Embedding nature restoration into renewable energy projects is a strategic boardroom opportunity.** Corporate leaders need to treat nature as a core business priority, integrating biodiversity goals with climate action for measurable, long-term benefits.

### The dual mandate for corporate leaders

Corporate leaders right now must address two urgent priorities: They've got to rapidly scale up renewable energy to reduce emissions. And they've also got to try harder to restore nature and stem biodiversity loss.

Both goals seemed at odds to me, until recently. Utility-scale solar fields hardly resemble the forests I love to hike in, and as someone who enjoys birdwatching, I'm keenly aware of the threats wind turbines can pose to bird populations. But I've changed my mind. Here's why.

### Renewables provide leaders a practical way to contribute to nature restoration

Research shows that the impact of solar and wind farms on biodiversity can be both positive and negative, depending on how and where these projects are built. The key takeaway is that the energy transition can support or damage nature, and it's up to us to shape the outcome.

#### My perspective has changed

The location and ecological context of each project are critical. Building wind farms on sensitive marine habitats or migratory routes can be highly damaging, while clearing forests for solar fields is counterproductive. However, installing solar panels on intensively farmed land can actually improve biodiversity. In other words, careful spatial planning makes all the difference.

There is growing evidence that, if designed thoughtfully, renewable projects can deliver clear benefits for biodiversity, as you can see in the charts below.

For instance, solar fields can be paired with pollinator-friendly plantings to support insect populations. Small mammals benefit too, provided that fencing allows movement and installations are protected from animal interference. Increasingly, I see birds foraging in solar parks with native vegetation.

Offshore wind farms can also create new habitats. Reefs formed around turbine monopiles can

support fish and benthic communities, right on the ocean floor, especially when fishing is restricted in their vicinity, creating a 'nature reserve effect.'

These examples show that with the right approach, renewables and nature can go hand-in-hand.

### Balancing renewable energy with nature

Unlocking co-benefits in large-scale solar fields.

Destroying nature just to build a solar field is wrong given the level of deforestation. We might get sustainable energy production from acres of solar panels, but think again! If we integrate biodiversity alongside the industrial products, nature can thrive.



Source: ING Research

### Ranging from low cost to essential investments

And here's another clear message: these nature-positive measures don't have to come at extra cost. Installing animal-friendly fencing costs roughly the same as standard fencing, for instance.

#### **This shouldn't be a cost burden**

The extra structures for taller solar panels and native seeds represent only a small fraction of total project costs. Some initiatives, such as farming shellfish around offshore wind turbines, even generate additional revenue. However, when significant land is needed for restoration, costs rise, especially in densely populated areas. Spacing solar panels to benefit wildlife may require more land to generate a certain amount of energy, or it may reduce energy output given a fixed plot size, impacting project returns.

In regions battling climate stress and desertification, solar panels can offer vital benefits by providing shade for crops and natural habitats. Combining solar fields with agriculture (agrivoltaics) can be essential for sustaining food production. The structures supporting these panels can also be used to mount crops and install irrigation systems. Some even track the sun's movement, optimising both energy output and shading for crops, plants and animals. In such cases, the cost increase is less of a barrier compared to the urgent need to sustain food

production and protect the local habitats.

## Environmental impact of bottom-fixed offshore wind farms

Activity or Change	Benthic communities	Fish communities	Marine mammals	General
<b>Construction phase</b>				
Creation of <b>reef and reserve effect</b> due to the presence of offshore wind turbines	<ul style="list-style-type: none"> <li>✓ Development of seafloor material where species can attach themselves onto</li> <li>✓ Enhanced biodiversity</li> <li>✓ Provision of spawning site for species such as mussels, crabs, lobsters and oysters.</li> <li>✗ Stepping-stone for invasive species</li> </ul>	<ul style="list-style-type: none"> <li>✓ Enhanced food availability and efficiency for fish due to the artificial reefs</li> <li>✓ Shelter from predators, fisheries and currents between rock materials</li> <li>✓ Turbines are seen as "fish aggregation devices" because of attraction behavior</li> <li>✓ Provision of spawning site</li> </ul>	<ul style="list-style-type: none"> <li>✓ Enhanced food availability and efficiency</li> </ul>	<ul style="list-style-type: none"> <li>✗ Stepping-stone for invasive species</li> <li>✗ Impede primary production</li> <li>● Changes in predator-prey distribution due to changes in the marine environment</li> </ul>
<b>Operational phase</b>				
Generation of <b>noise pollution</b> due to the installation, construction, and presence of offshore wind turbines			<ul style="list-style-type: none"> <li>✗ Mortality</li> <li>✗ Avoidance behavior</li> <li>✗ Permanent hearing loss</li> <li>✗ Increased stress levels</li> </ul>	
<b>Habitat displacement and fragmentation</b> due to the installation, pile driving, and overall presence and maintenance of offshore wind parks.			<ul style="list-style-type: none"> <li>✗ Avoidance behavior</li> <li>● Navigation and migration change</li> </ul>	
<b>Electromagnetic field emission</b> generated from electric cable network	<ul style="list-style-type: none"> <li>● Changes in predator-prey distribution</li> <li>● Attraction and avoidance behavior</li> <li>✗ Increased stress levels</li> </ul>	<ul style="list-style-type: none"> <li>✗ Increased stress levels</li> </ul>	<ul style="list-style-type: none"> <li>● Knowledge gap</li> </ul>	

✓ positive effect   ● neutral effect   ✗ negative effect

Source: ING Research

## Tradable credits for carbon and nature: helpful but not a complete solution

So how do we get more of this? In my view, market forces alone are unlikely to ensure these positive outcomes. Renewable energy developers currently operate under pressure to minimise costs and maximise returns, which can lead to choices that ignore ecological value. To strengthen the business case, many developers are turning to [voluntary carbon markets](#) as a way to monetise nature-related benefits.

While carbon credits are well-established and widely available for solar and wind projects, monetising biodiversity benefits through these markets remains challenging. 'Nature credit' systems, such as US water credits and Austria's water credit initiatives, primarily focus on water quality improvements rather than supporting renewables. The EU's Carbon Removals and Carbon Farming Certification (CRCF) Regulation will require biodiversity monitoring for certified carbon farming projects starting in 2026, but this offers limited direct benefit for renewable energy. The UK's Biodiversity Net Gain Policy stands out by requiring at least a 10% biodiversity net gain for renewable energy projects, allowing developers to purchase or sell biodiversity units or credits.

### Nature credits are not a complete solution

However, for most solar and wind developers, direct monetisation of biodiversity benefits through nature credits is still limited. Typically, carbon credits remain the main option, with projects delivering extra community or biodiversity benefits earning the Climate, Community & Biodiversity (CCB) label. According to Rystad Energy, CCB-certified carbon credits command a premium of \$1.50 to \$2.00 per ton of CO<sub>2</sub>e over standard credits. While these premiums generate additional revenue, they typically support only basic, low-cost actions, making more impactful measures difficult to finance.

So, credits are far from a complete solution, and they are not likely to become one soon. The European Emissions Trading System (ETS), for example, took almost two decades to reach price levels that drive meaningful emission reductions. With nature, we do not have the luxury of time. As Mark Carney, the then Governor of the Bank of England, famously warned a decade ago about the *"tragedy of the horizon"* when referring to climate change: by the time we feel the loss, it's too late.

## Environmental impact of ground mounted solar PV installations

When placed on previously undisturbed or natural land

Activity or Change	Soil Impacts	Water Resource Impacts	Floral Impacts	Faunal Impacts
Construction works preparation and construction of new powerlines and solar fields across unfragmented ecosystems	● Soil compaction through heavy machinery limits soil's ability to infiltrate water	✘ Potential alterations in biological quality of local water bodies due to construction	✘ Disruption of plant growth leads to habitat alteration through removal of vegetation and surface grading ✘ Possible introduction of invasive alien species	✘ Alteration of floral habitats modifies trophic resource availability for fauna and can lead to significant cumulative impacts on species populations
Presence of panels and infrastructure creates large areas with covered surfaces	✘ Soil under panels is deprived of sunlight and water which leads to decrease of soil quality ✘ Changed microclimate like decreased evaporation	✘ Increased surface-water runoff through water only reaching soil under panel edges ✘ Change in surface-water flows	✘ Area underneath panels experiences decreased population diversity and composition through less sun and water on soil ● Changed microclimate like decreased evaporation ✔ Increase of shade tolerant species	✔ Panels serve as shelter or nesting opportunities ✘ Behavioral and physiological changes in animals through avoidance of facilities due to fear ✘ Effects of shading impact plant-soil food web negatively ✘ Bird, bat and aquatic insect collision with panels or transmission lines, wildlife mortality
Presence of fences around field for protection of facility				✘ Barrier to mammal movement and access, cuts in migration routes
Changed management of vegetation	● Mowing, trimming and planting of seeds leads to changed soil composition	✘ Change in surface-water flows	● Mowing, trimming and planting of seeds leads to changed soil composition which in turn effects species diversity	

✔ positive effect   
 ● neutral effect   
 ✘ negative effect

Source: ING Research

## Regulation: essential for aligning climate, nature, and economic goals

This underscores the critical role that regulation plays in advancing nature-positive outcomes where market mechanisms alone may fall short. Nature is a public good which justifies public investment. It would be a mistake to assume that market forces alone will incentivise developers and investors to deliver nature benefits, particularly the expensive, high-impact

measures. If the business case doesn't stack up, regulation will eventually be needed. So why not start there?

There are some good Intentions. Some nature-related criteria now appear in tenders or approval processes for large-scale projects, but governments struggle to assess and compare the nature impacts of competing bids. This lack of clear standards frustrates developers, who often receive little feedback on why their proposals were less successful in delivering nature benefits compared to the winning bid. As a result, transparency and incentives for innovation remain weak.

## Environmental impacts of ground mounted solar PV installations

When placed on former agricultural land

Activity or Change	Soil Impacts	Water Resource Impacts	Floral Impacts	Faunal Impacts
<b>Construction phase</b>				
<b>Land use change/</b> preparation and construction of new powerlines and solar fields across unfragmented ecosystems	✔ Less activity than during agricultural use	✘ Potential alterations in biological quality of local water bodies due to construction	✘ Possible introduction of invasive alien species	
<b>Operational phase</b>				
<b>Presence of panels and infrastructure creates</b> large areas with covered surfaces	✘ Soil under panels is deprived of sunlight and water which leads to decrease of soil quality ● Changed microclimate like decreased evaporation ✔ Less or no pesticide use	✘ Increased surface-water runoff through water only reaching soil under panel edges ✘ Changed microclimate like decreased evaporation ✘ Change in surface-water flows	✘ Area underneath panels experiences decreased population diversity and composition through less sun and water on soil ● Changed microclimate like decreased evaporation ✔ Increase of shade tolerant species ✔ Less or no pesticide use	✘ Bird, bat and aquatic insect collision with panels or transmission lines, wildlife mortality ✔ Panels serve as shelter or nesting opportunities ✘ Behavioral and physiological changes in animals through avoidance of facilities due to fear ✘ Effects of shading impact plant-soil food web negatively ✔ Less or no pesticide use
<b>Fences</b> around field for protection of facility				
<b>Cleaning of panels</b> to reduce dust		✔ Less water consumption than in agricultural use		
<b>Changed Management of vegetation</b>	✔ Mowing, trimming and planting of seeds leads to changed soil composition +/- ✔ Through less anthropogenic disturbances soil can recover	● Change in surface-water flows	✔ Mowing, trimming and planting of seeds leads to changed soil composition ✔ Through less anthropogenic disturbances soil can recover	

✔ positive effect   
 ● neutral effect   
 ✘ negative effect

Source: ING Research

## The boardroom opportunity

Traditionally, corporate sustainability strategies have treated emission reduction and nature restoration as separate priorities, with the latter often considered outside a company's typical scope of action. When nature is brought into boardroom discussions, the emphasis tends to be on addressing climate risks and strengthening business resilience, rather than on actively restoring natural ecosystems.

In contrast, renewable energy development is already closely aligned with most companies' core operations. This alignment presents a powerful opportunity: by embedding nature-positive measures into renewable energy projects, organisations can bridge the gap between

emission reduction and ecosystem restoration. As a result, nature becomes a strategic boardroom priority, one that corporate decision makers can address through clear, actionable initiatives that deliver measurable benefits.

*With special thanks to Irthe Schoute and Johanna Diederichs for excellent research assistance on the environmental impact chains of large-scale onshore solar fields and offshore wind farms.*

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