

Shutting down offshore wind turbines during peak bird migration



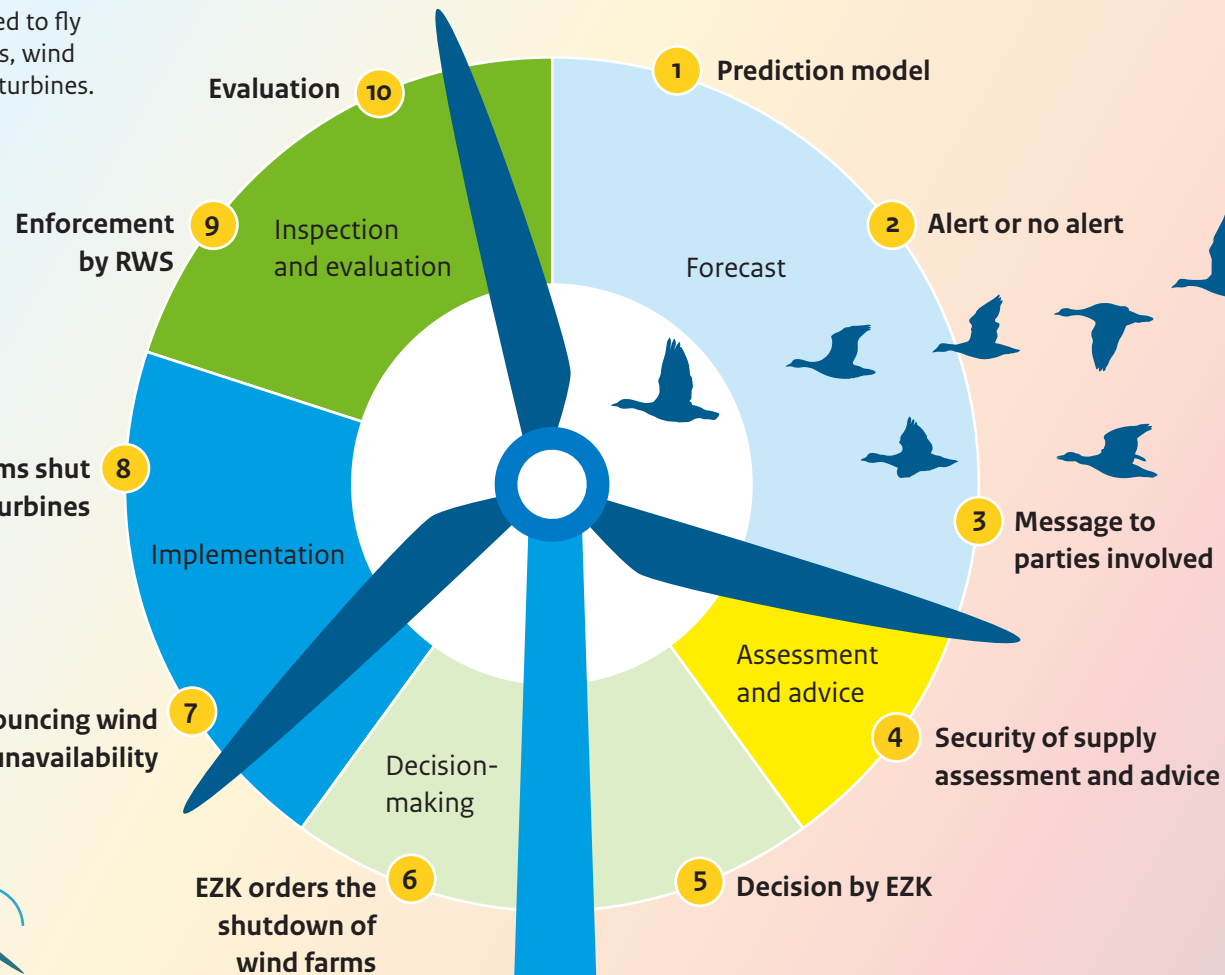
Rijkswaterstaat
Ministry of Infrastructure
and Water Management

On nights when migratory birds are expected to fly en masse through offshore wind farm zones, wind farm owners have to shut down their wind turbines. By doing this, we aim to ensure that fewer migratory birds fly into the turbines.

This procedure is a collaborative effort, with representatives from government and wind farm owners. They follow a step-by-step plan called the Start/Stop procedure.

Parties involved

Please see the [Noordzeeloket](#) for more information.



Click the numbers for an explanation per step.

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Parties involved:

- **Wind farm owners in the Dutch section of the North Sea:** cooperate in the Start/Stop procedure and shut down the wind turbines in the event of a bird alert.
- **The Ministry of Economic Affairs and Climate Policy (EZK):** is responsible for the Start/Stop procedure and decides when turbines in certain offshore wind farms have to be shut down.
- **The Ministry of Agriculture, Nature and Food Quality (LNV):** determines the threshold at which there is a significant bird migration, measured in the number of birds per kilometre/per hour. This is the threshold value. Once this threshold value is reached, a bird alert is issued.
- **Rijkswaterstaat (RWS):** is responsible for the implementation and enforcement of the Start/Stop procedure.
- **National grid operator TenneT:** is the organisation that manages the energy transmission from sea to land and monitors the electricity grid balance in the Netherlands.
- **The University of Amsterdam:** developed the bird migration prediction model.
- **The bird migration expert team:** assesses the prediction of peak migration of migratory birds.

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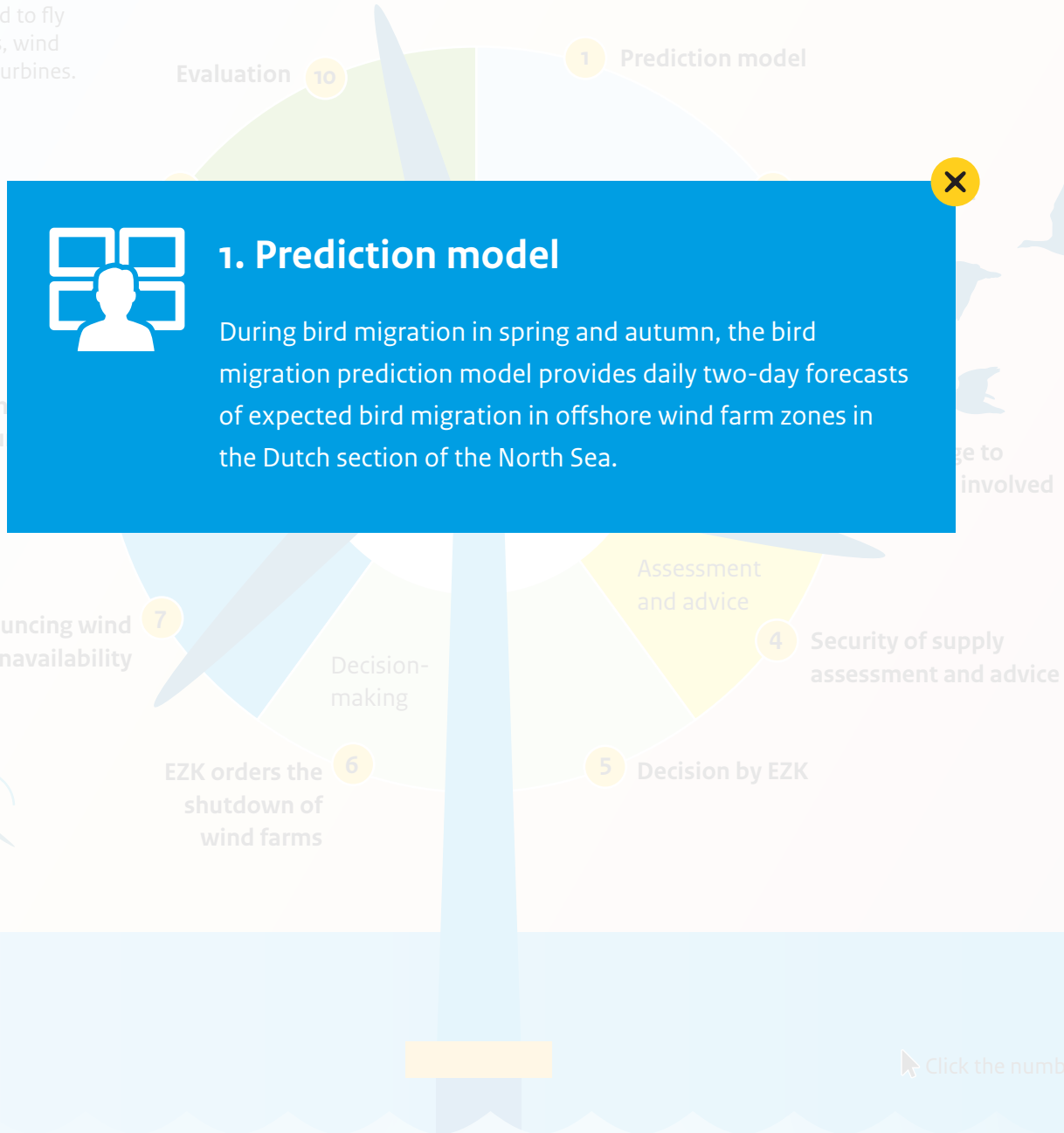
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2. Alert or no alert

Whether or not to activate the bird alert depends on the two possible outcomes of the bird migration prediction model:

- The model predicts a bird intensity that exceeds the threshold value > **bird alert** > step 3.
- The model predicts a bird intensity that remains below the threshold value > **no bird alert** > no further action.

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3. Message to parties involved

Every day, the model automatically sends a bird migration prediction message to the parties directly involved in the Start/Stop procedure. In case of a bird alert – a prediction exceeding the threshold value – the model automatically issues a pre-warning to the parties involved.



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Wind farm owners

Announcements to wind farms' users



4. Security of supply assessment and advice

TenneT assesses the risks of shutting down the turbines to the electricity supply security on the electricity market. Then, TenneT issues a recommendation to the Ministry of Economic Affairs and Climate Policy (EZK). There are two possible outcomes. Both lead to step 5.

- Shutting down the offshore wind farms poses no risk to meeting the electricity demand > *TenneT advises EZK that the offshore wind farms can be safely shut down.*
- Shutting down the offshore wind farms poses a high risk to meeting the electricity demand > *TenneT advises EZK against shutting down the offshore wind farms.*

At the same time, other parties involved in the Start/Stop procedure make the necessary preparations for the potential shutdown of the wind farms. The migratory bird expert team assesses the model's prediction and reports their findings to EZK. All these essential preparations are made based on a *prediction* of peak bird migration, rather than *real-time* observation.



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5. Decision by EZK

The Ministry of Economic Affairs and Climate Policy (EZK) makes a final decision whether or not to shut down offshore wind farms:

- EZK decides to shut down the offshore wind farms > step 6.
- EZK decides not to shut down the offshore wind farms > no further action.

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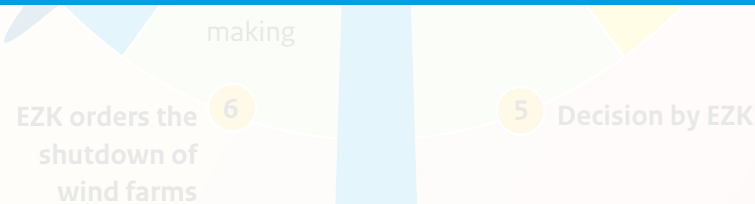


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6. EZK orders the shutdown of wind farms

The Ministry of Economic Affairs and Climate Policy (EZK) announces the shutdown of the offshore wind farms through an announcement published in the Staatscourant (Government Gazette). In this announcement, EZK specifies the date and the start and end times of the shutdown. This constitutes a formal decision.



5 Decision by EZK

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7. Announcing the unavailability of wind farms

Within one hour of completion of step 6, the offshore wind farm owners publish a message stating that the offshore wind farms will not be operational for a specific number of hours on a specific night.

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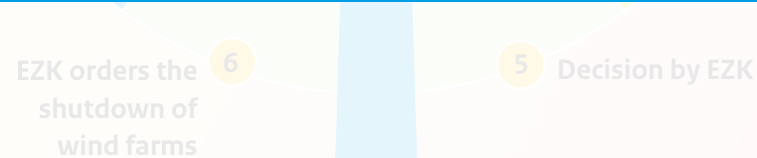
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8. Wind farms shut down turbines

The owners of offshore wind farms shut down the turbines at the specified time. This means they lower the rotation speed of the turbines to less than two rotations per minute. Complete shutdown is not preferred for technical reasons, and for the birds, this near shutdown suffices.

The time between the prediction in step 1 and the actual shutdown of the turbines is a maximum of two days.



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9. Enforcement by RWS

The Inspection and Law Enforcement Unit of Rijkswaterstaat (RWS) carries out an administrative check to verify whether the wind farm owners have correctly executed the Start/Stop procedure. If any violations are found, the Unit takes appropriate action.

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10. Evaluation

Rijkswaterstaat ensures that the data from bird radars at wind farms are analysed to assess the actual bird migration. The analysis also contributes to the continuous improvement of the bird migration prediction model.

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