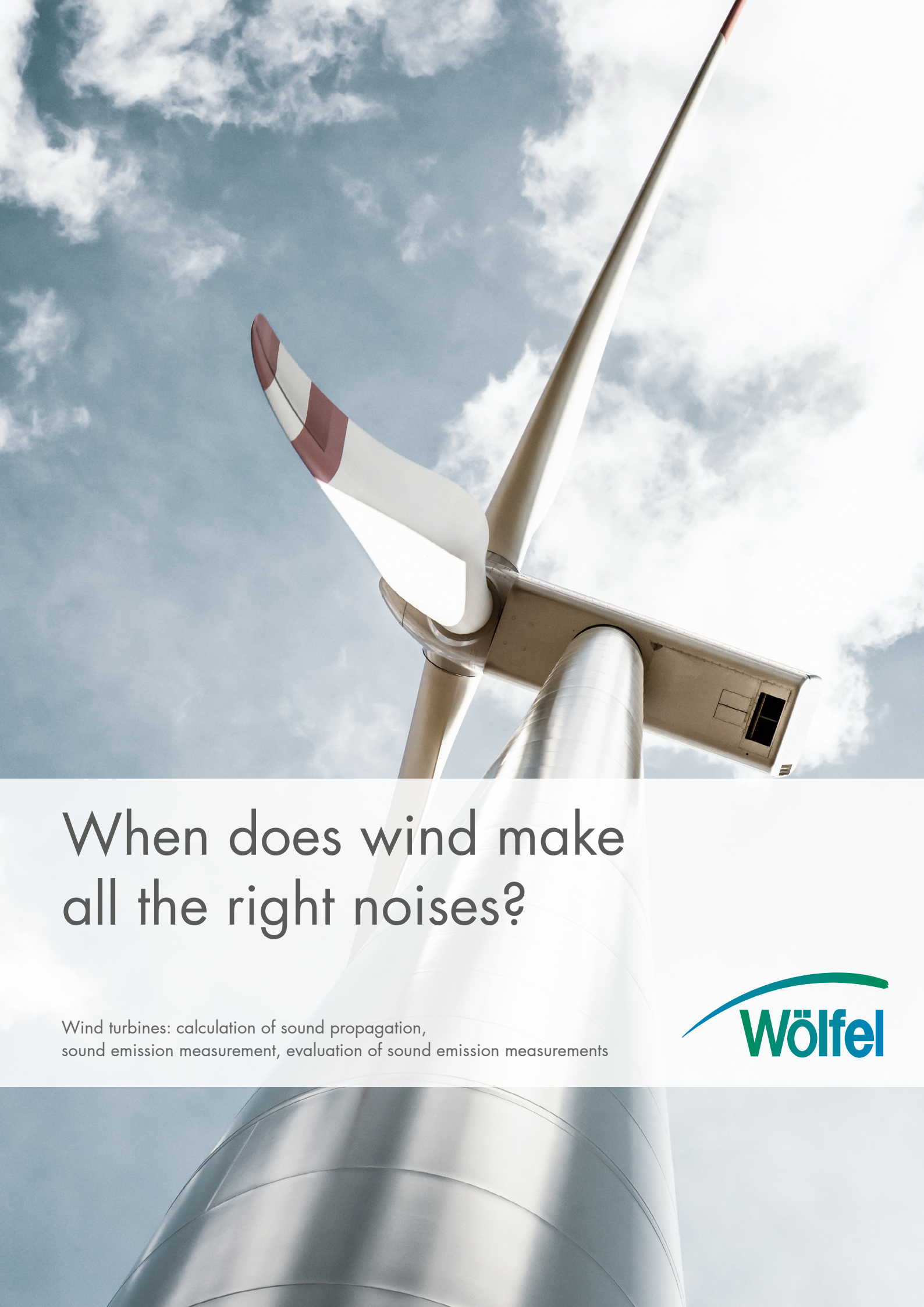


When does wind make all the right noises?

Wind turbines: calculation of sound propagation,
sound emission measurement, evaluation of sound emission measurements

Wölfel

Calculation of sound propagation, sound emission measurement and evaluation

We offer services and product solutions covering the entire wind turbine approval procedure, from noise impact prediction in the planning phase to acceptance measurement following the commissioning of a wind turbine. We develop our products based on our engineers' valuable experiences. Being a member of FGW e.V. (Fördergesellschaft Windenergie, Association for the Promotion of Wind Power) and a measuring body according to Section 29b BImSchG (Federal Immission Control Act), we are dealing with these tasks every day. The continuous exchange between developers and engineers results in practical products and efficient service processing.

Product solutions	
IMMI software for predicting the noise impact caused by wind turbines	ROBIN Post software for quality-assured evaluation according to IEC 61400-11

+

Engineering services	
Noise impact prediction to be submitted within the scope of the approval procedure	**Sound emission and noise impact measurements** within the scope of acceptance and type measurements

IMMI

In its latest 2016 version, the leading software product for the prediction of noise impact and air pollutants, IMMI, supports the calculation of the sound propagation of wind turbines (WT) even more efficiently.

- Tailored to suit wind turbines: WT element for calculating sound propagation and easily selecting current calculation methods (general and simplified method according to ISO 9613-2 as well as interim method)
- Optimized wind turbine presentation in the terrain model: 2D and 3D display of WT objects
- Efficient: databases for managing wind turbine emission data

- Quality assurance: the software meets the requirements of DIN 45687
- Realistic preload presentation: design of point, line and area sound sources
- Flexible: import and export of data in various formats
- Versatile: input of emission data as sum level, third-octave level and octave level, both A-weighted and linear
- And many more …

RoBin Post

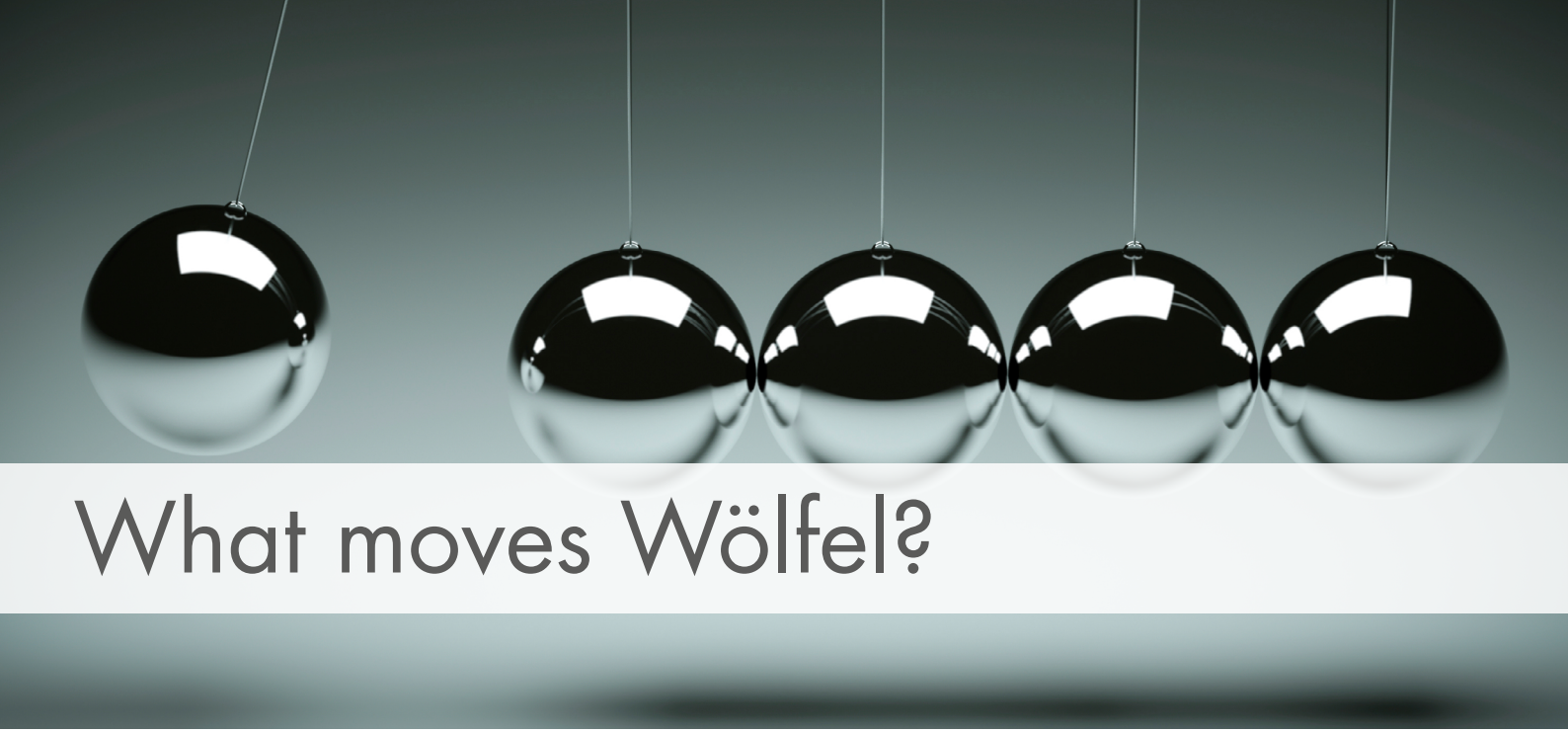
Our sound analysis software, RoBin.Post, that has specifically been developed to assume wind power tasks is used to evaluate the data required for sound power calculation. In RoBin.Post, the user can edit data directly recorded with RoBin or any other measured data. Data are evaluated according to latest standards, such as IEC 61400-11and FGW TR1(editions 2.1 and 3), simply by pushing a button. Immediately after the measurement, reports are output automatically which makes the process particularly efficient.

At present, RoBin.Post participates in the FGW TR3 ring robin test for evaluation according to IEC 61400-11 Ed. 3.

You can now determine your own jigsaw puzzle. All presented pieces of the jigsaw puzzle are included in a product or service offer. You choose the piece precisely in the shape you need.

Being an independent test laboratory recognized by FGW e.V. (Fördergesellschaft Windenergie, Association for the Promotion of Wind Power), we perform sound emission and acceptance measurements according to IEC 61400-11 and the FGW directive. Noise impact protection is mainly concerned with issues of the propagation of sound outdoors. The objective of noise impact protection is to keep limit values (TA Lärm) so as to protect the general public. This also includes operation of a wind turbine.

In the development planning phase and the approval procedure for your wind turbine, our engineers process all tasks relating to noise impact protection. They turn their particular attention to preparing professional opinions on noise impact predictions using IMMI, the software developed by Wölfel that is used to calculate noise and other impact types.



What moves Wölfel?

Vibrations, structural mechanics and acoustics – this is the Wölfel world. Here we are experts, this world is our home. More than 120 employees daily do their best for complete satisfaction of our customers. For more than four decades we support our customers with engineering services and products for the analysis, prognosis and solution of tasks in the fields of vibrations and noise.

Are vibrations really everywhere? Yes! That's why we need a wide variety of solutions!
Whether it is engineering services, products or software – there is a specific Wölfel solution to every vibration or noise problem, for example

- simulation-based seismic design of plants and power stations
- measurement of acoustic emissions of wind turbines
- universal measuring systems for sound and vibrations
- expert reports on noise immission control and air pollution forecasts
- dynamic occupant simulations for the automotive and aviation industry
- and many other industry-specific Wölfel solutions …

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WEA-01-EN-11-2021