retroX - Digital Backbone for Existing Turbines

retroX offers a stand-alone retrofit solution for digitalization and efficiency optimization of existing turbines. retroX prepares operators for a possible continued operation after 20+ years.

**Digitalization**
Know your turbine.

**Optimization**
Higher yield.

**Continued Operation**
Be ideally prepared.

fos4Blade Hardware  
X4edge Apps  
Cloud Data Access

- **AEP Increase**
- **OpEx Reduction**
- **Life Time Extension**
- **Risk Mitigation**

Asset Transparency as Key for Optimization

Increase performance transparency as well as condition transparency through real-time data access to enable the optimization potential of your turbine and wind farm. Find out more about retroX on www.fos4x.de/retroX

Contact us for more information on retroX  
www.fos4x.de  
Thalkirchner Straße 210  
81371 Munich  
Germany

Contact person
Philipp Gerster  
Business Development Manager  
philipp.gerster@fos4x.de  
+49 89 999542-6709
OpEx Reduction
Get better transparency of asset with more and smarter data
Automate recurring analyses and make informed decisions
Improve maintenance planning and empower predictive approaches

Life Time Extension
Improve commercial decision making for continued operation
Use real load data to allow less conservative lifetime assessment
Be able to trade life time for output or make better PPAs

AEP Increase
Create turbine specific portfolio of initiatives for AEP optimization
Tackle static performance issues (e.g. rotor imbalance)
Reduce curtailments with additional apps (e.g. blade ice detection)

Risk Mitigation
Detect premature structural damages early on
Be informed about the structural pain points of your assets
Improve risk reporting for management and owners

Basic Solution

Initial Investment

fos4Blade sensor platform
Proven series system, used in hundreds of turbines

Edge computer
DPU with real-time digital twin (basic version)

Connectivity
3G/4G connection and field bus/SCADA integration

Operation

Data transfer and storage
Buffer of dynamic data and continuous cloud transfer

IoT cloud platform
Offline analysis, updates and device management

SCADA integration
Integration via API into existing 2nd level SCADA software

Performance & condition reports
Event-based or periodical load, performance and condition reports

Performance apps
fos4X and 3rd party software optimization products

Individual services
Automate specific analyses, deep-dives into your data

Contact us for more information on retroX
www.fos4x.de
Thalkirchner Straße 210
81371 Munich
Germany

Contact person
Philipp Gerster
Business Development Manager
philipp.gerster@fos4x.de
+49 89 999542-6709
With retroX, fos4X offers a stand-alone retrofit solution for digitizing and improving the efficiency of existing turbines and supports operators for potential extended operation after the expiration of the EEG subsidy. retroX will be available for different turbine types (multi brand) from Q2 2019.

**Yield Optimization and OPEX Reduction - Fast Return on Investment**

By using the standardized fos4Blade sensor platform, the initial investment for retroX is extremely low. Additional modular, digital optimization packages form a flexible and holistic solution. For the first time, an economically sensible retrofitting of existing turbines in their second decade of design-life is made possible.

Higher availability and more efficient operation of the turbine through retroX lead to a very fast amortization of the investment. At the same time, the real-time availability of operating and status data enables optimized maintenance and a reduction in operating costs.

**Load Data for Decision on Continued Operation**

retroX prepares operators of wind turbines optimally for the upcoming assessment of the extended service life of wind turbines. Through the long-term recording of load data and its extrapolation, a plant-specific load history is created over the entire operating life. Previous conservative load assumptions for the calculation of the remaining service life are supplemented by qualified and reliable data.

**About fos4X GmbH**

Founded in Munich in 2010, fos4X GmbH is a specialist for reliable, fiber optic measurement and sensor technology as well as for innovative data analysis. It develops IIoT and edge computing solutions and enables significant cost reductions and efficiency increases for the wind industry.

This technology is primarily used in wind turbine rotor blades. In addition, fiber-optic sensors and solutions are also used in the fields of electromobility, process measurement technology and railway technology.