

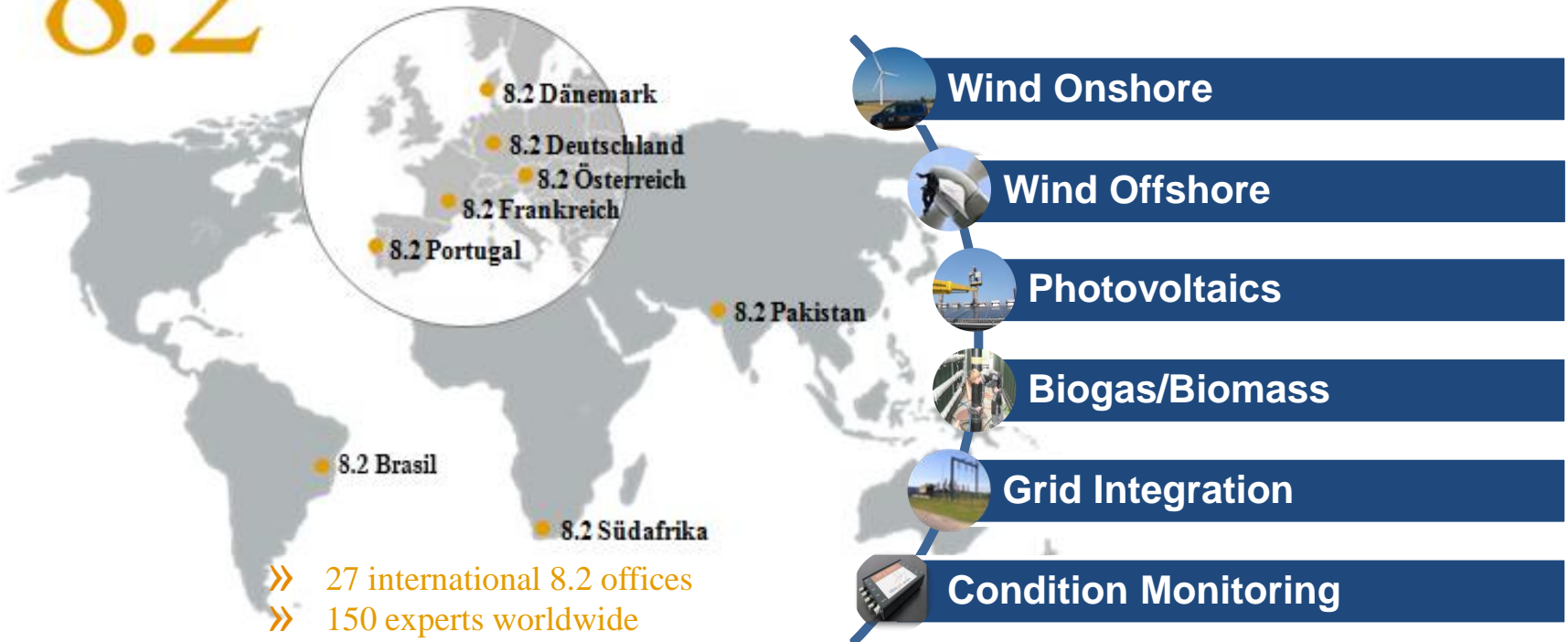
# Blade inspection: mixed method

## 8.2 -The Experts in Renewable Energies

# 8.2 Group

Decentralized network of experts in renewable energies

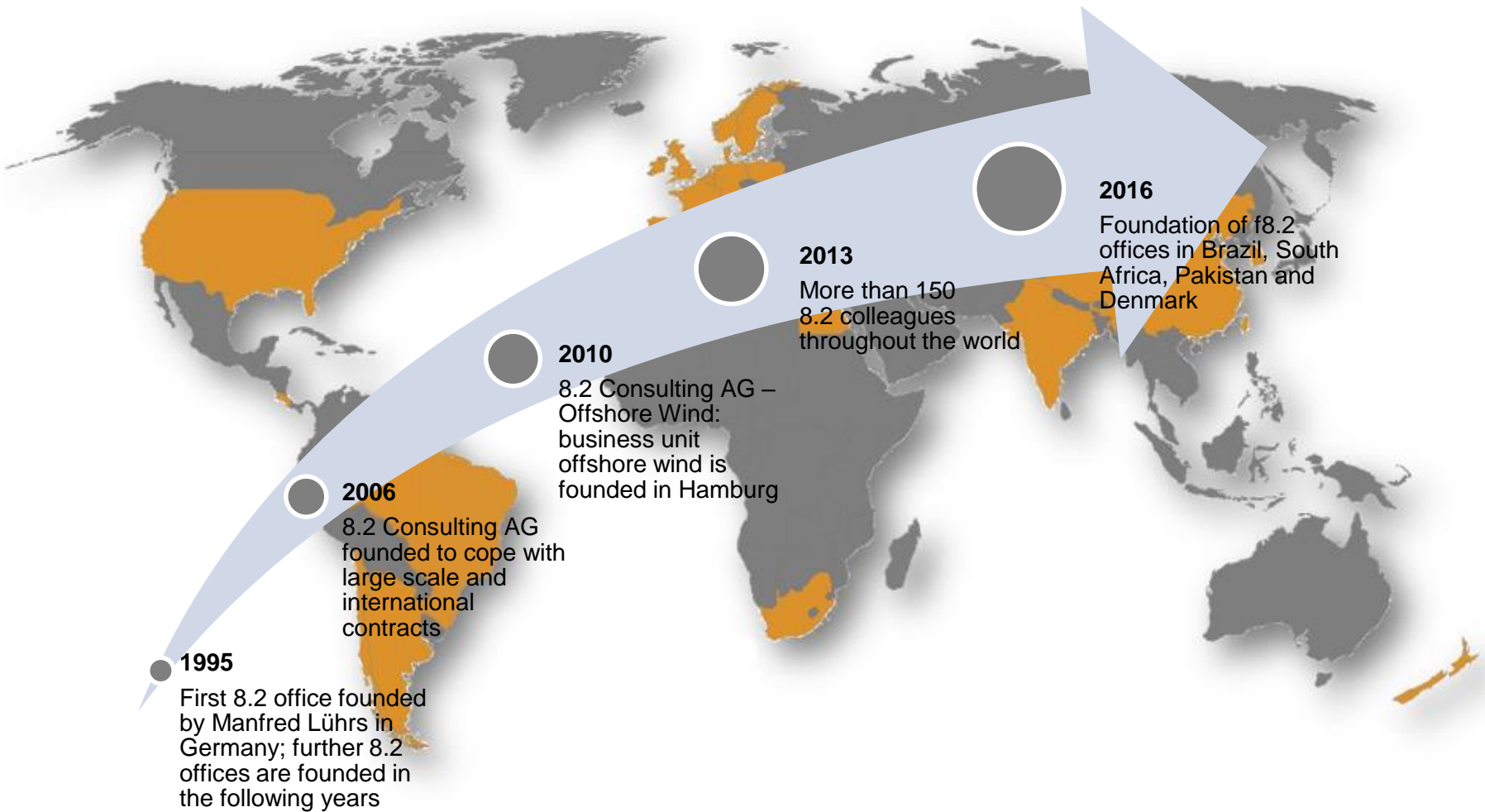
## 8.2 GROUP



- » 27 international 8.2 offices
- » 150 experts worldwide

More than 20 years of experience in wind energy

# 8.2 History



## 8.2 Expertise in Wind Power, PV and Biomass



In-depth knowledge of all turbine types  
> 20 000 turbines inspected

Due Diligence of more than 6 000 MW onshore/offshore worldwide



International Due Diligence of more than 2.5 GW PV projects

More than 17 years of experience in the area of CHP technology with biomass/biogas



Design review performed for most offshore turbines

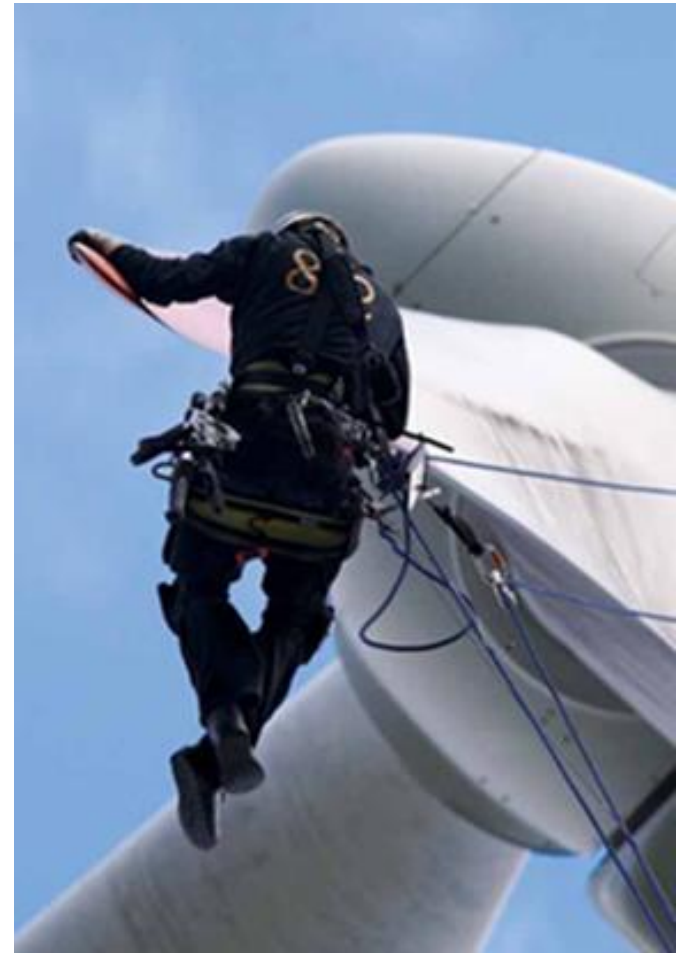
- » Technical consulting
- » Owner's Engineering
- » Technical inspections
- » Technical due diligences
- » Damage and value analysis
- » Recurrent and condition based assessments
- » Factory and warranty assessments
- » Grid connection expertise
- » Construction supervision
- » Operation optimization
- » Condition Monitoring
- » Foundation inspections
- » Rotor blade inspections
- » Vibration analysis and monitoring
- » Video endoscopy
- » Thermography

## 8.2 Expertise in blade inspections

» With our experience of more than 10.000 blades assessed and taking the advantages of latest technical tools, we present the inspection by mixed method.

It optimises:

- Time
- Cost
- Accuracy



# What it is the blade inspection mix method?

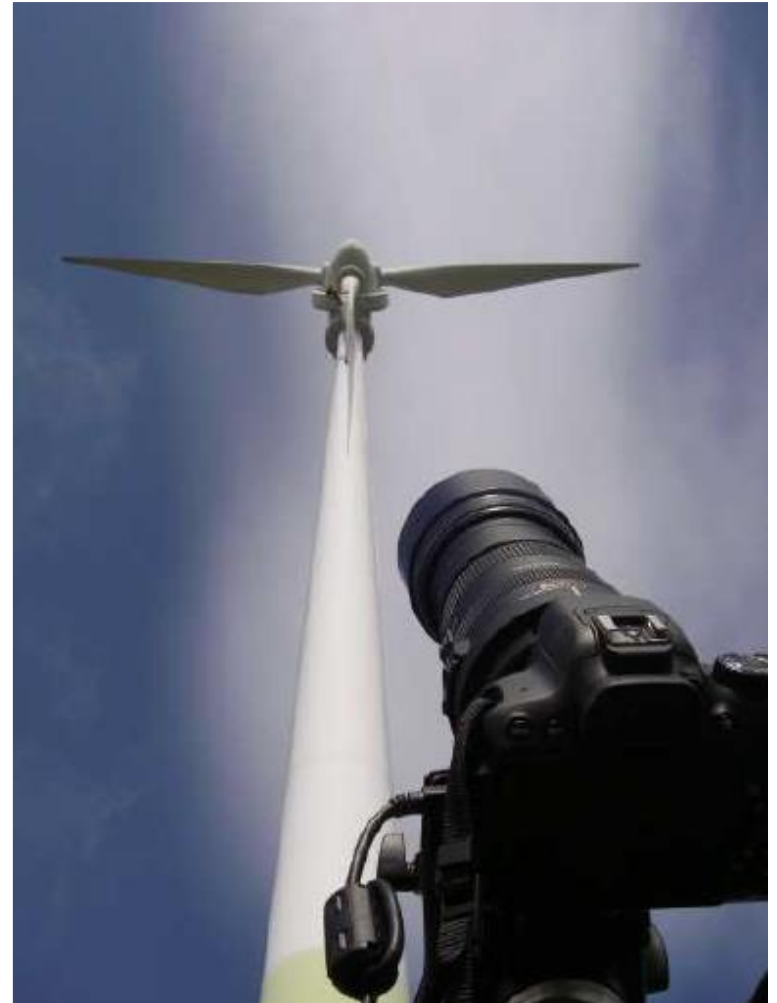
» It is the use of 3 different ways to access the blades in the same wind farm and with the same 2 experts:

- Inspection from the ground including composite image of each side of each blade
- Inspection with a drone with distance sensors and film 4k
- Inspection by rope with active thermography



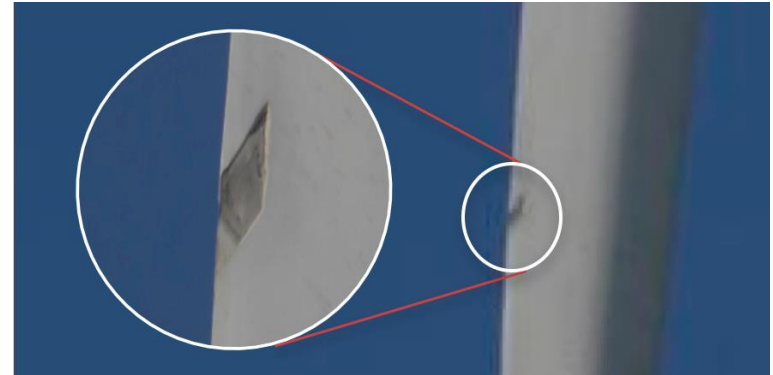
# How it is done?

1. All blades are inspected visually from the ground
2. We decide along with the client which blades need further investigation by drone. ~50%
3. A limited number of blades are accessed by touch using rope access to verify specific items like conductivity in the lightning receptors. min. 10%



# How the inspection is performed from the ground?

- » With a 1/800 lens and an automatic tracker;
- » A composite image for each blade side is delivered with the inspection report. It is made of hundreds of close up photos for easy localization and identification of the non-conformities and for future reference



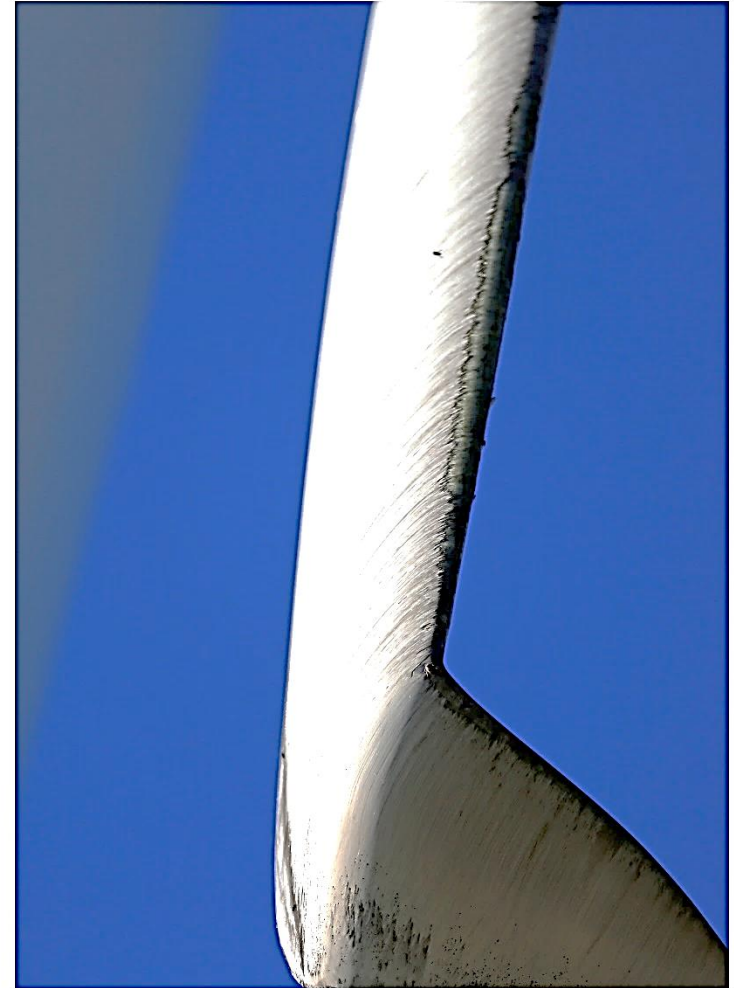
*ZOOM IN TO  
CLEARIFY DAMAGES*



# How about the drone inspection?

- » Our drones have distance sensors that allow fast inspection and close investigation of previously detected non-conformities
- » The client receives an all blade 4K film with the inspection report. It supports repair preparation and other future reference.

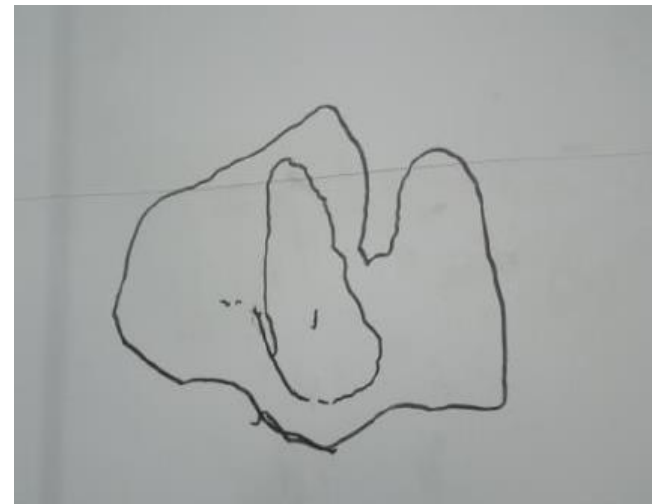
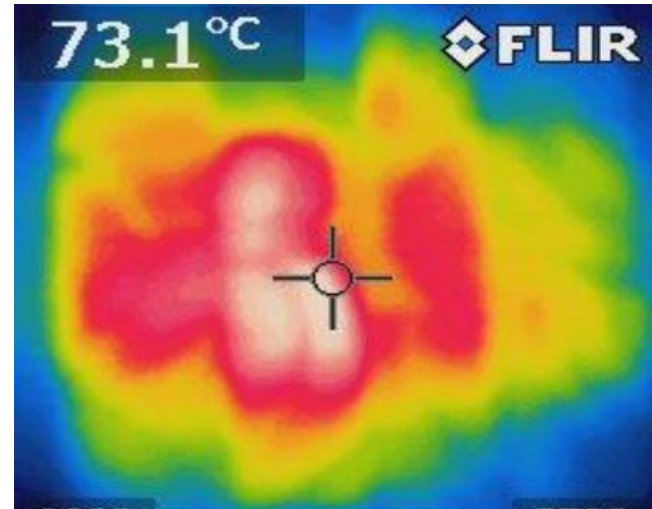
## *CLOSE INSPECTION*



# How do we make rope inspection?

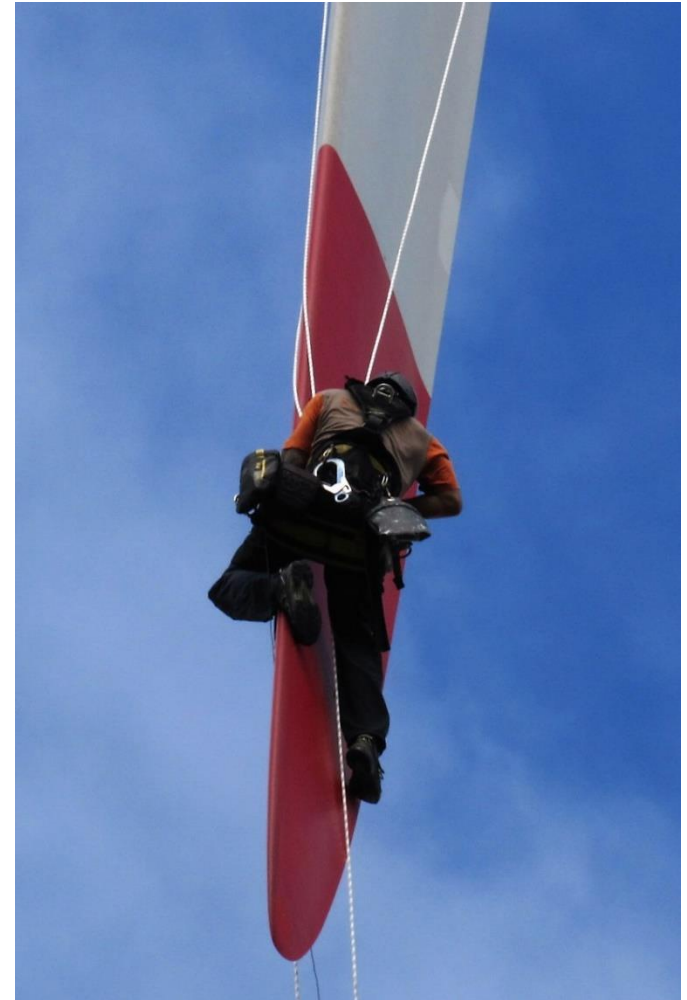
- » Rope inspection is made by 2 experts, one on each side of the blade
- » Full detailed inspection of the blade including active thermography allowing proper evaluation of the damages and their dimension

## DEEP INVESTIGATION



# What are the advantages?

- » For wind farms with more than 10 turbines, an average of half of the inspection cost with almost the same inspection quality, when compared to rope inspection
- » Reduced turbine stopping time.
- » Comprehensive imaging documentation



# 8.2 - Your reliable partner!

**20**  
Jahre / years  
**8.2**

- » *Wind Energy*
- » *PV Energy*
- » *Biomass/Biogas*
- » *Grid Integration*