

# **INNOVATION AND DESIGN OF WIND TURBINES OF TOMORROW**

// DIS PRESENTATION

# INTRODUCTION DIS



**MOGENS HESS**

President

**Phone no.** +45 41 72 73 51

**Mail:** moh@d-i-s.dk

---



**FRANK SØE**

Senior Vice President

**Phone no.** +45 28 95 10 33

**Mail:** soe@d-i-s.dk

---

# WORLD OF DIS/CREADIS

## Founded in 1997

Today complete development partner and leading in technical product development in Europe

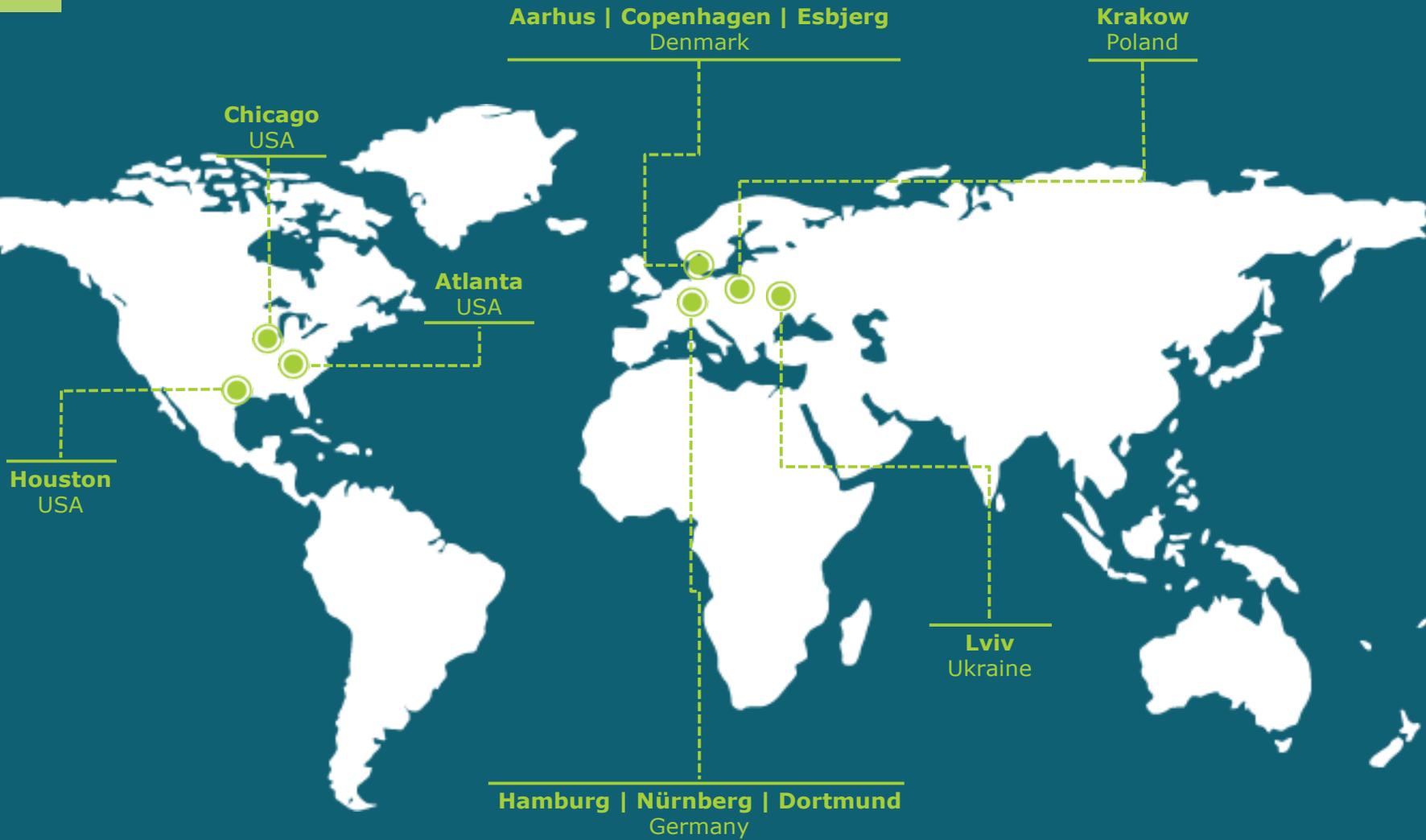
**DIS A/S & CREADIS** Covering Europe from Germany, Poland, Ukraine & Denmark with 8 offices. Including innovation facilities, workshops and test facilities, HW lab and project hotels

**AAA**<sup>®</sup> credit rated

 **ISO** 9001 rated  
International Organization for Standardization  
9001



# WORLD OF DIS/CREADIS



## OUR EXPERTISE

DIS is a full-service development company focused on **PRODUCTS & PRODUCTION**.

We develop and deliver innovative solutions to demanding technical problems from idea to finished product.

We have all the competencies necessary for developing technical products and production equipment.



ELECTRICAL



MECHANICS



SOFTWARE



AUTOMATION



PROJECT  
MANAGEMENT



HARDWARE



MANAGEMENT  
CONSULTING



PROCESS &  
CHEMISTRY



PRODUCTION  
EQUIPMENT

## WE COMBINE CROSS-INDUSTRY KNOWLEDGE

We operate in various sectors and utilize the synergies across industries.

We challenge our customers by transferring our cross-industry knowledge, while carefully handling the necessary confidentiality.

- Wind Energy
- Oil & Gas
- Food Production
- Medical Products (Medico/Pharma Industry)
- Electronic Instruments
- Agriculture
- Metal Industry
- Solar Energy
- Process & Environment
- Military Industry (Defence Industry)



## HOW WE WORK

We give our customers a competitive edge by lowering total cost through predictability and a more efficient process.

We offer various collaboration forms and solve projects at DIS' facilities or at the customer's organization.

Our collaboration forms support

- shorter development processes
- greater predictability
- and higher flexibility.



At **DIS**

Development Projects

Delivery Projects

Project Hotel

DIS Academy



At **CUSTOMER**

Consultancy Services

Optimization

Efficiency

Troubleshooting

Seminars & Workshops



In **AREA**

Pop Up Office

Local Office

Project Office

# EMPLOYEES

DIS employs some of the most capable engineers, with bachelor, masters and PhD degrees in mechanics, electrical engineering & automation, hardware, software, industrial design and project management. DIS employees have a solid theoretical and practical foundation.

We are...

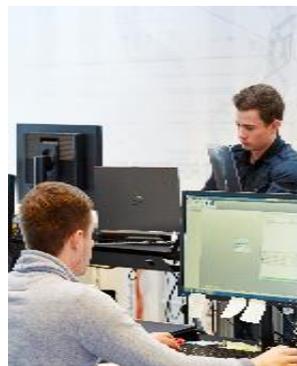
**+ 300** employees

**85 %** engineers

**90 %** consultants

**37** years old in average

**100 %** dedicated



## THE MOST INNOVATIVE ENGINEERING- AND CONSULTING COMPANY

At DIS we deliver consulting and turnkey solutions in product development as well as unique machinery for some of the largest and most innovative wind companies in the industry sector.

In Wind Energy we have:

- 20+ years experience
- 1.000.000+ hours experience
- 1.000+ delivered projects
- 20 nationalities with a cross-cultural mindset



# SELECTED WIND ENERGY REFERENCES



## OUR FOCUS IN WIND

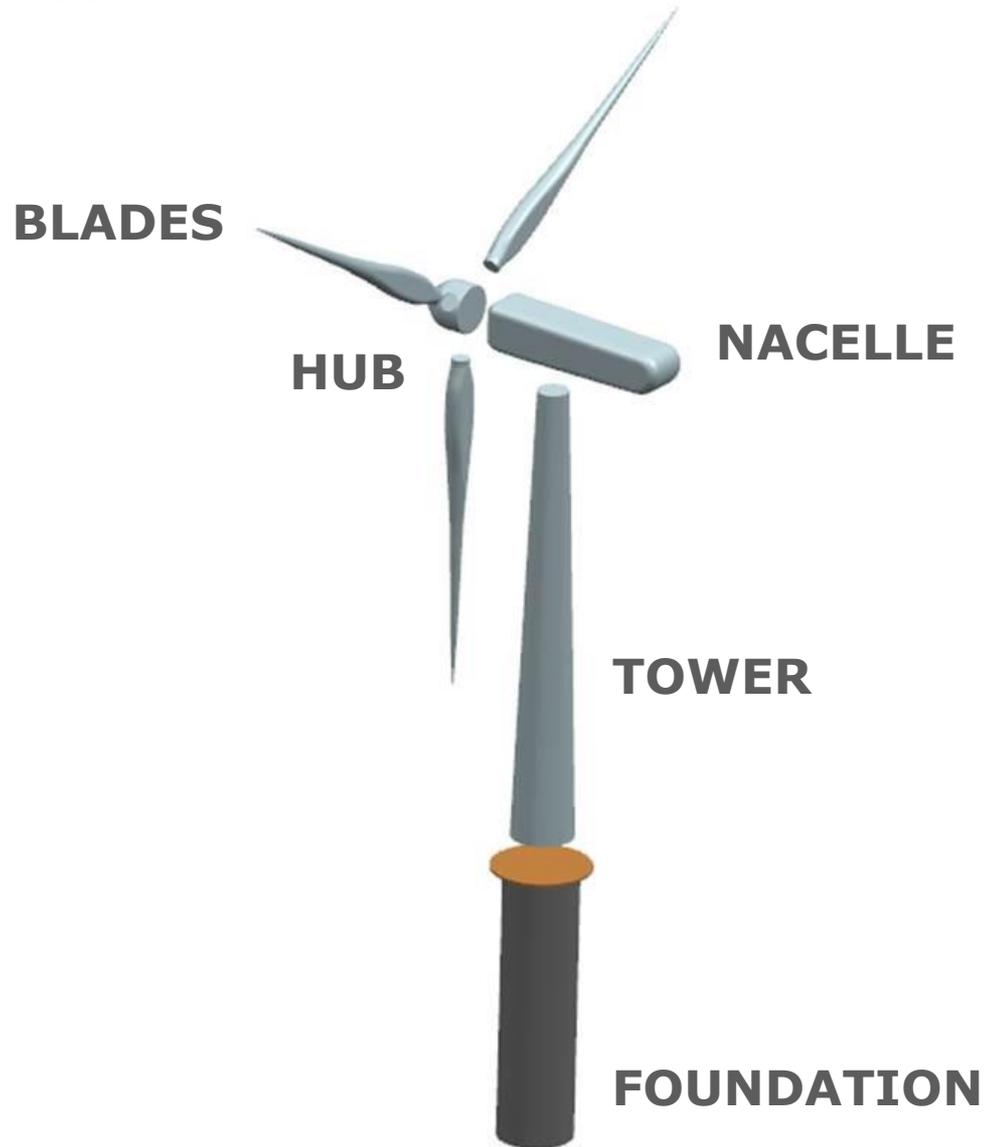
Advisors for the energy and wind developers. Development of new wind turbines. Design and construction of wind turbines for the major OEM, including:

- **Blades.**
- **Nacelle design.**
- **Tower and tower internal design.**
- **Transition pieces.**
- **Foundations.**
- **Floating foundations.**
- **Design off pre-assembly area and layouts for offshore ports.**
- **Service and aftersales activity.**
- **Hub**
- **Modularisation**
- **Value Chain / Cost out**

Consultant and advisor to establishment of local production.



## OUR FOCUS IN WIND



# DIS WIND ENERGY EXPERIENCE

## NACELLE

- Cooling & Lubrication
- Drive train
- Machine frame
- Nacelle components
- Yaw system
- FEM

## HUB

- Pitch control
- Hydraulics
- Power transfer
- FEM

## LOADS & CONTROLS

- Load definition and calculations
- Load reduction strategies
- Control algoritmes

## ELECTRICAL SYSTEMS

- Converter system
- Power electronics
- Converter software
- Controller PCB & Software
- Control system design
- Electrical system design
- Safety systems
- Transformer/Switch gear

## TOWER

- Tower design
- Internals
- Cabling
- FEM

## BLADES

- Production methods
- Production equipment
- Cost out redesign and implementation

## AUXILIARY EQUIPMENT

- Transport equipment
- Logistics setup
- Port handling, Lifting & loading equipment
- Assembly rigs

## FOUNDATION

- Monopiles
- Jackets
- Floating foundation



DESIGN & ENGINEERING

PRODUCTION & EQUIPMENT

SUPPLY CHAIN & COST OUT

SYSTEM ENGINEERING

CERTIFICATION

HANDLING & LOGISTICS

PROJECT MANAGEMENT

## POTENTIAL ROADMAP

1. Concept study

2. Concept evaluation

3. Conceptual design

4. Detailed design

5. Document-  
ation

6. Prototype  
testing

7. Implemen-  
tation

8. Production

# INNOVATION OF WIND TURBINES

## FUTURE FOR WIND ENERGY

**Clean Source:** The production of wind energy is “clean”. Unlike using oil.

**Renewable:** Wind is free. In the event that you live in a geological area that gets a lot of wind, it is ready and waiting.

## FUTURE FOR WIND TURBINES

**Focus On:** Cost reduction

**Focus On:** Standardized components /  
Materials

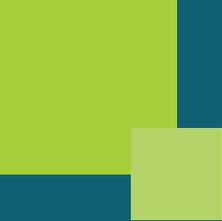
**Focus On:** Prize / Service / Maintained





# QUESTIONS





# LEARN MORE

[www.d-i-s.net](http://www.d-i-s.net) / [www.creadis.com](http://www.creadis.com)