



# SMØLA WIND FARM



The Smøla wind farm located in Møre og Romsdal County is Norway's largest wind farm

The Smøla wind farm is located in Smøla municipality in Møre og Romsdal County. The wind farm comprises 68 wind turbines with a total installed capacity of 150 MW. The wind farm lies in a flat and open landscape, 10 to 40 metres above sea level. The average annual production is 356 GWh, enough to supply 17 800 Norwegian households.

## WIND SPEEDS

The average wind speed 50 metres above ground is 8 metres per second (m/s). Production starts at 3 m/s and is stopped at 25 m/s to avoid damage to the equipment. The optimum production is at 13 m/s.

## ROUNDS PER MINUTE

- Turbine rotor, below 6 to 8 m/s: 11 rpm
- Turbine rotor, above 6 to 8 m/s: 17 rpm
- Generator, below 6 to 8 m/s: 1000 rpm
- Generator, above 6 to 8 m/s: 1500 rpm

## WEIGHT

|                    |          |
|--------------------|----------|
| Tower:             | 125 tons |
| Nacelle:           | 82 tons  |
| Blade:             | 9 tons   |
| Rotor with blades: | 54 tons  |

## FOUNDATIONS

Each wind turbine foundation consists of 60 cubic metres of concrete, 17 tons of reinforcement steel and eight anchoring struts which run 15 metres into the bedrock.

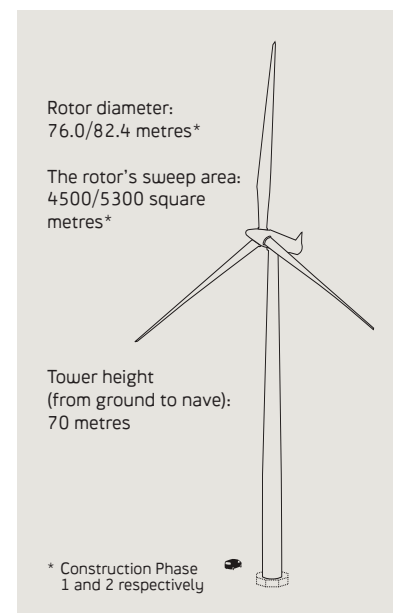
## LIGHTNING ROD

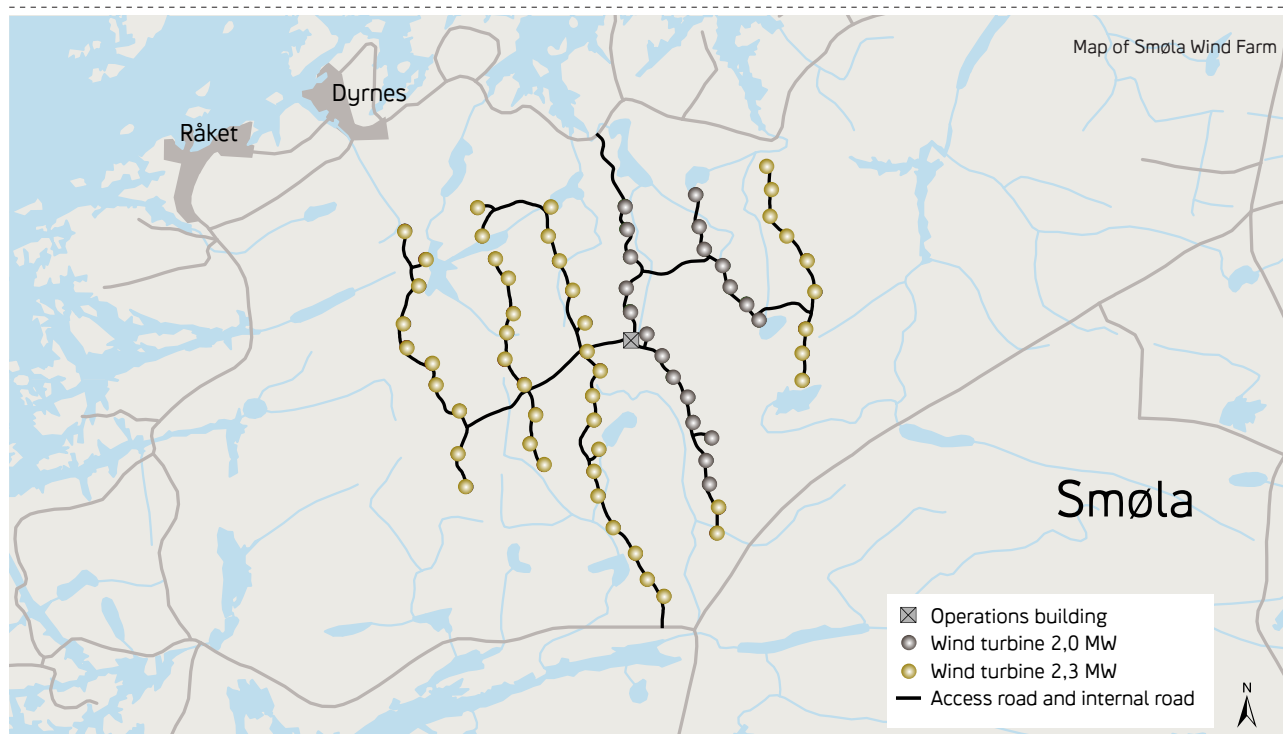
Each blade contains earthed receptors.

## VOLTAGE/TRANSMISSION

- Generator voltage: 690 volts
- Transformer at the bottom of each turbine: 690 → 22 000 volts
- The main transformer in the wind farm: 22 000 volts → 132 000 volts

The voltage is increased to reduce loss of effect over long distances. The power is transmitted from the wind turbine to the main transformer by 110 kilometres of cables dug into the roads in the wind farm. The power exits the wind farm and goes to the Nordheim transformer station on the neighbouring island Tustna using a 10 kilometre aerial cable, 15 kilometre cable and five kilometre sea cable.





#### VALUE CREATION

The Smøla wind farm employs about 15 people. The wind farm has also created many jobs in retail, service and tourist industries. Every year, the Smøla wind farm contributes more than NOK 5 million in property tax to the municipality. In addition, the wind farm has contributed significant indirect income. The number of beds in the tourist industry has increased from 50 to 600 since 2000. Statkraft is an active contributor to the local community, sponsoring Gurisenteret and local sports clubs to name a few.

#### LOCAL SUPPORT

Seventy-two per cent of the residents of Smøla have a positive view of the wind farm – they are even proud of it, according to a survey carried out by Synovate MMI in 2007. Thirty-one per cent say they are more positive towards the wind farm today than during construction, while 53 per cent have not changed views. The wind farm is open to non-motorised traffic year round, and has become a popular hiking area with locals and tourists. The 28-kilometre network of roads is particularly well suited for cycling, and there are both swimming and fishing spots in the wind farm area.

#### SEA EAGLE RESEARCH

On average, six sea eagles are killed every year due to collisions with the wind turbines on Smøla. However, the sea eagle population is healthy and has grown since construction of the wind farm. In 2009, we registered activity in 61 sea eagle territories on the island – the largest on record. At the time, the sea eagle population was estimated to about 150 animals, and as many as 10 000 nationwide. The birds nest to a very little extent inside the actual wind farm, while the activity on the rest of the island remains fairly high. Statkraft has contributed with significant research funds to map sea eagle collisions and attempts to limit the problem. The research programme is headed by the Norwegian Institute for Scientific Research (NINA).



The wind farm viewed north

#### CONSTRUCTION PHASE 1

Constructed: 2001/2002  
 Wind turbines: 20, 2.0 MW each  
 Opened: 5 September 2002 by King Harald

#### CONSTRUCTION PHASE 2

Constructed: 2004/2005  
 Wind turbines: 48, 2.3 MW each  
 Opened: 27 September 2005 by former Prime Minister Gro Harlem Brundtland

#### TOTAL INVESTMENT

Approx NOK 1.3 billion, of which NOK 138 million are investment subsidies from ENOVA.