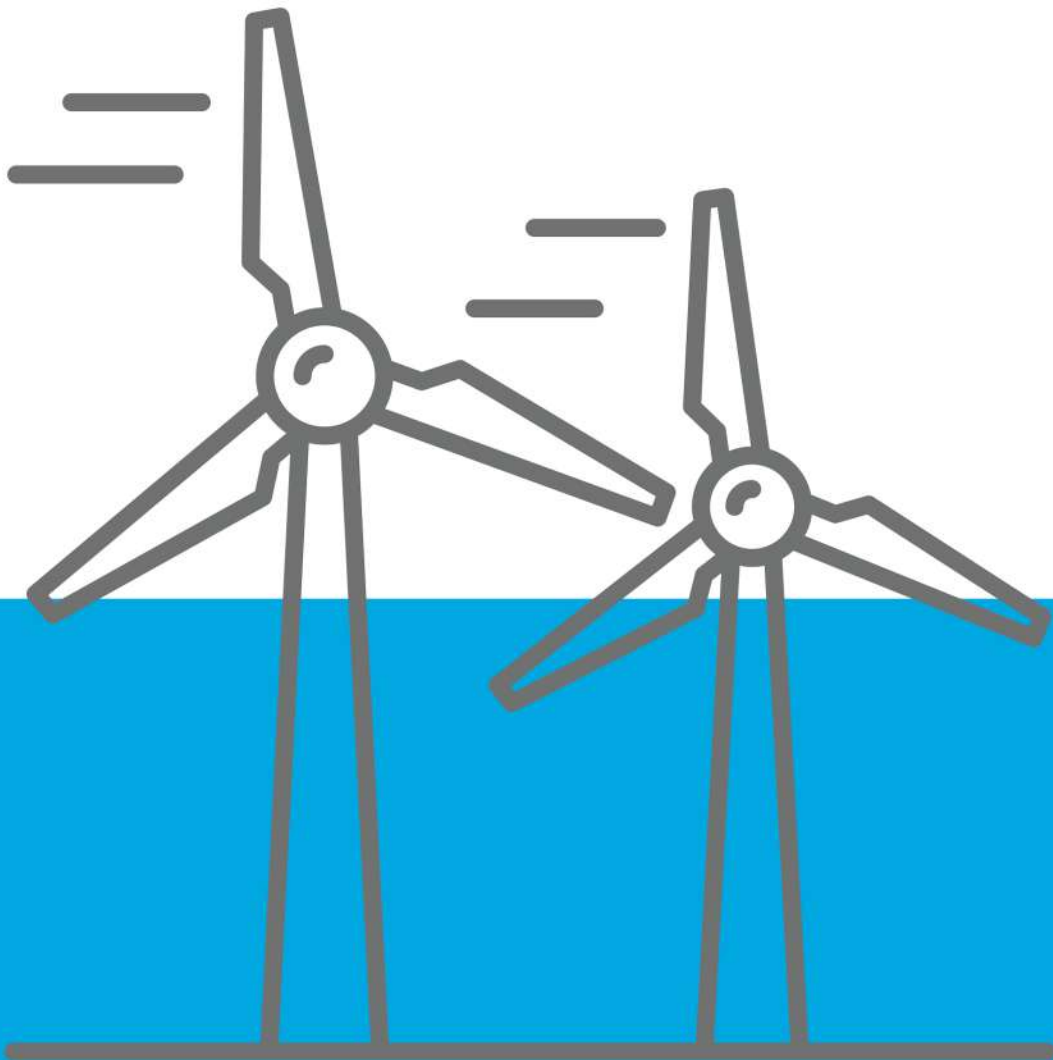


## WIND FARMS

# WHITE PAPER

This white paper explores the purpose of wind farms and how important an ultra-reliable two-way radio system/solution is for worker safety, productivity, and efficiency.



# AN ON-AND-OFF FUTURE

The on and offshore wind farm industry is pivotal if the UK is to stand any chance of reaching Net Zero targets by 2050. The energy crisis and lack action/bids has seen elements of the industry enter uncertain land and turbulent waters - as it looks to hit its own set targets and revenue goals for now and in the future. Here's some facts for both types of wind farm, before we get into the nitty gritty of two-way communication.

## WIND FARM FACTS

- In November 2022, 20GW of electricity was produced for the first time.
- In the first three months of 2023 wind farms generated more electricity than gas-fired power stations.
- Over 11,000 wind turbines are installed across the UK.
- Dogger Bank wind farm will become the world's largest when its final turbine is installed.
- An ambitious target of 50GW (installed capacity) has been set for 2050.



## ONSHORE

There are more than 1,500 onshore wind farms in the UK. This in part is down to the fact an onshore wind farm has less moving parts when it comes to construction and production. But, due to their position inland, they less power generation than their offshore counterparts.

In recent times, there's been a de-facto ban on new onshore wind farms in England and Wales, while Scotland has been pressing ahead with producing more wind power onshore.

## OFFSHORE

Offshore wind farms are less populous than the onshore alternative, but due to their position off-land, they can generate power with less turbines thanks to higher wind speeds and consistency in wind direction.

Despite their advantages, they can be more challenging to construct due to harsh conditions and remote locations.

The emergence of floating wind farms is creating a positive stir in the industry.

# AT THE CORE OF ONSHORE



Onshore wind farms may not have the risk factor of being situated at sea, but their remote location on land means they throw up their own challenges. And these challenges aren't just safety related, teams need to work round the clock in close communication with each other to keep producing power.

Here's a list of communication considerations for onshore wind farm operators.

## **PREPARATION AT THE SUBSTATION**

Substations are vital facilities. They are the a key cog between the wind farm and the National Grid. Substations can be dangerous places to work or be on location at. So consider a bespoke solution that boosts worker safety.

## **STAY IN CONTROL 24/7**

Wind farms require constant monitoring. Not just from a production perspective, but a safety one too. Workers operating in isolated environment can become vulnerable to the elements and other hazards, so it's important your centralised control rooms have a finger on the pulse of the entire operation.

Adopting a PC dispatcher solution where desktops speak to radio users (and track where they are) can not only boost safety, but improve efficiency too.

## **MULTI-SITE, MULTI-LOCATION APPROACH**

The nature of the job means that workers will be dotted here, there, and everywhere. Often they'll also need to collaborate with other sites and locations to get the job done.

Using IP infrastructure, multiple sites and locations can be connected together. You can even make a two-way communication system device agnostic, so radio users can speak to mobile phone and landline users without interruption.

# OFFSHORE & THE NEED FOR MORE

Once you venture out to sea, things become a bit more complex. You have harsher conditions and more moving parts during both the construction phase and O&M phase of the wind farm.

Here's a list of two-way communication considerations for offshore wind farm operators, that differ from onshore wind farms.

## SHIP-TO-SHORE

Vessels do a lot of heavy lifting, particularly during the construction phase. But are you equipped to communicate with them from ship to shore? Vessels need specific VHF marine comms in order to communicate with coastguards and other vessels.

Your team at ports and O&M bases will need to communicate effectively with vessels to ensure safe and efficient installation.

## PENETRATING TURBINES

We'll explain this in more detail in the section below, but reliable communication in and around the wind turbine is vital. If you use the wrong infrastructure it can end up costing you time and money, as due to the nature of wind turbines, certain radio frequencies struggle to penetrate them without additional infrastructure. Something you could avoid by picking the most cost-effective solution to begin with.

## BATTLING THE ELEMENTS

Weather conditions at sea can genuinely look like something out of a movie. Are you constantly checking in on your workers with automated welfare checks and regular two-way radio calls?

Having a range of safety solutions in place is paramount for the welfare of everyone. Whether they're bracing the elements or operating from a desk.

# DMR V TETRA

We could write a section on how two-way radios are more suitable than mobile phones on wind farms, but a lot of wind farm operators now use two-way radios over smartphones as signal coverage is far more reliable and in turn presents far less worker safety risks.

But this doesn't mean operators always choose the right system. And with costs a hot topic of discussion in the industry, it's important that decision makers know exactly what system they're getting, and at what price.

Here's an overview of the two most common systems, Digital Mobile Radio (DMR) Terrestrial Trunked Radio (TETRA).

## DMR

- Designed for high volumes of communication over a wide area network
- Can be upgraded from analogue, with next to no infrastructure
- Finds it easier to penetrate wind turbines with minimal infrastructure
- More flexibility and less infrastructure makes it more cost-effective as a solution
- Takes two DMR sites to achieve the same coverage as seven TETRA sites

## TETRA

- Designed for high volumes communication over a smaller area network in dense urban areas
- No ability to upgrade from analogue radio. New system is needed in this instance
- Struggles to penetrate wind turbines without additional infrastructure
- With no back-up and need for additional infrastructure to get desired coverage, it's more costly than is required
- Takes seven TETRA sites to achieve the same coverage as two DMR sites

# WE ARE ENERGY SPECIALISTS

# WE ARE COMMS EXPERTS

# WE ARE EEMITS

Thanks to our cloud-based TRBOCALL platform, we're able to rapidly deploy cost-effective two-way radio systems for wind farms all over the UK and beyond.



## CONTACT US ABOUT TRBOCALL



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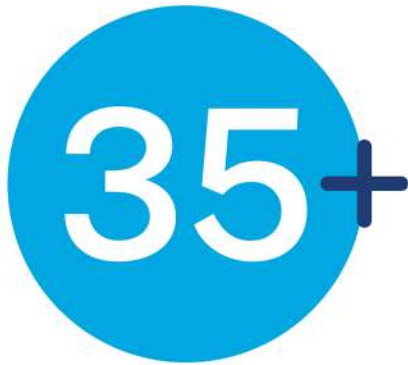
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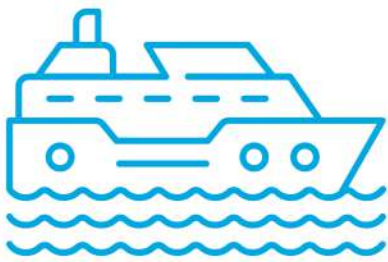
[www.eemits.co.uk](http://www.eemits.co.uk)

# OUR WORK IN THE INDUSTRY

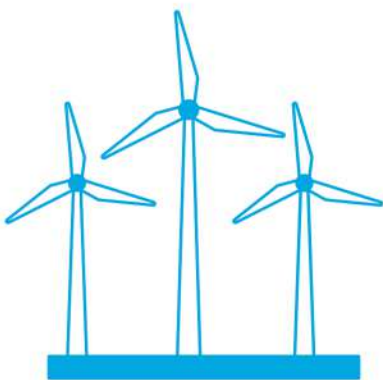
We have an extensive portfolio of working with major energy providers on a diverse range of wind farms.



For one major provider, we have two-way radio solutions on over 35 of their UK wind farms.



From Dundee to Dover, we've fitted VHF comms on vessels that travel all over the UK.



We get involved in the construction phase and the O&M phase, and have done work for the soon-to-be world's largest wind farm, Dogger Bank.



We've even done consultancy work for North American clients.