Scope
The VirtuWind project investigates the use of SDN & NFV to address the stringent requirements of industrial domains. VirtuWind will develop and demonstrate a SDN & NFV ecosystem in real wind parks, as a representative use case of industrial networks, providing industrial-grade QoS.

Based on an open, modular and secure framework, VirtuWind envisions lower capital expenditure (CAPEX) and operational expenditure (OPEX) costs in industrial network infrastructures.

Objectives
The EU-project VirtuWind will demonstrate the technical and economic benefits of introducing an open, modular and secure control infrastructure for the wind energy industry. Following are the 5 key objectives of VirtuWind:

1. Realize industrial-grade Quality of Service (QoS) for intra-domain Software Defined Networking (SDN) solution
2. Guarantee inter-domain QoS for SDN based multi-operator ecosystem
3. Reduce time and cost for service provisioning and network maintenance
4. Assure security-by-design for the SDN and Network Function Virtualisation (NFV) ecosystem
5. Field trial of intra- and inter-domain SDN and NFV prototype

Challenges
VirtuWind will overcome a number of identified challenges, including:

- Secure and reliable access to equipment at remote installations.
- Individual access control for multiple stakeholders.
- Lowering costs during deployment of network infrastructure.
- Scalable industrial network management solutions.
- Effective deployment of network services.

Impact
Wind energy is one of the most cost-effective renewable technologies in terms of the cost per kWh of electricity generated and it is measured as Levelized Cost of Electricity - (LCOE):

\[
\text{LCOE} = \frac{\text{Lifetime cost}}{\text{Lifetime Electricity Production}}
\]

The main goal of VirtuWind is to adapt SDN as per requirements in industrial networks by developing novel SDN-based mechanisms to reduce CAPEX and OPEX and thereby reduce the LCOE of wind energy.