

# U.S. Offshore Grid Risks, Mitigation & Opportunities

Mike Spector, Mainstream Renewable Power, U.S. Grid Manager

## BACKGROUND

The world is electrifying, and our power grid needs to rise to the challenge. Ambitious clean energy goals and a desire for energy security are driving an increased demand for electricity, putting pressure on current electric grids.

To support a successful clean energy transition and meet the resulting electricity demand, offshore wind industry entities – including regulators, grid authorities, Original Equipment Manufacturers (OEMs), developers and consultants – will need to work hand-in-hand to mitigate grid challenges.

This session will review three of the major grid risks facing the offshore wind industry and discuss future mitigation and opportunities to address those risks.

### FLOATING TURBINE BEING TOWED



## Risks

1. Transmission Build Timing
2. Interconnection Process
3. Future OEM Capabilities

## Mitigation

1. Collaboration between regulators, grid authorities & developers to develop:
  - Linkage between lease process & availability of capacity
  - Long-range regional transmission planning (FERC 1000)
  - A reliable & redundant transmission “meshed” network
2. Standardized criteria & cost allocation for connection approvals
3. Wind turbines will need to adapt to changing grid requirements

## Opportunities

Development of Control Systems:

- Fast frequency inertial response
- Grid forming

Equipment Development for floating:

- Subsea transformers
- Dynamic export cables
- HVDC floating converters

Mainstream’s NEART NA GAOITH SUBSTATION:



## CONCLUSION

We have a once-in-a-lifetime opportunity to reimagine how the power grid can support a successful clean energy transition.

Much of our current grid risks are based on how the grid functions today. The creation of a robust U.S. offshore wind industry offers a chance to develop a more reliable and flexible grid based on existing and future technologies.

The 140-year-old U.S. grid (that has historically delivered synchronous sources of energy) isn’t the same grid needed to connect inverter-based, asynchronous offshore wind turbines.

Reaching clean energy goals will require a high-level of collaboration, timing and investment. It will also require the creativity and willingness to use new technologies like floating substations and dynamic cables to create a resilient grid for our future.

## ACKNOWLEDGEMENTS

Thank you to Mainstream Renewable Power for the support to work with the ACP Transmission Subcommittee & offshore wind industry on such standardization activities.

## REFERENCES

Photo of floating substation from: [Design for Floating Offshore Substation to Support Floating Wind Farms \(maritime-executive.com\)](https://www.maritime-executive.com/story/design-for-floating-offshore-substation-to-support-floating-wind-farms)

## CONTACT INFORMATION

E-mail: [mike.spector@mainstreamrp.com](mailto:mike.spector@mainstreamrp.com)