Mooring system

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The mooring system cost curve was updated from the one used in Beiter et al. (2016) to one based off of designs in a more recent study focused on wind energy development off of the California coast (Cooperman et al., 2022). Of the several designs in Cooperman et al. (2022), the semi-taut design was selected because that design is more physically and economically preferable to the catenary chain design (which was assumed in Beiter et al. (2016)).

The semi-taut mooring system module ORBIT (Nunemaker et al., 2020) was updated, based on Figure 26 in Cooperman et al., (2022). This module was run over the depths that the semi-taut mooring system was designed for (500 – 1300 m) in increments of 100 m for a plant size of 1 GW with turbines of a 15 MW rating. The results were used to generate a polynomial cost curve that shows a slightly nonlinear increase of total mooring system cost with depth (Equation 4).

0.2463 \* depth - 386 \* depth + 5.164\*105 \* depth – 3.064\*106 (4)

Chart, line chart

Description automatically generated

Figure 5: Mooring system cost curve ($/kW) as a function of depth (m)