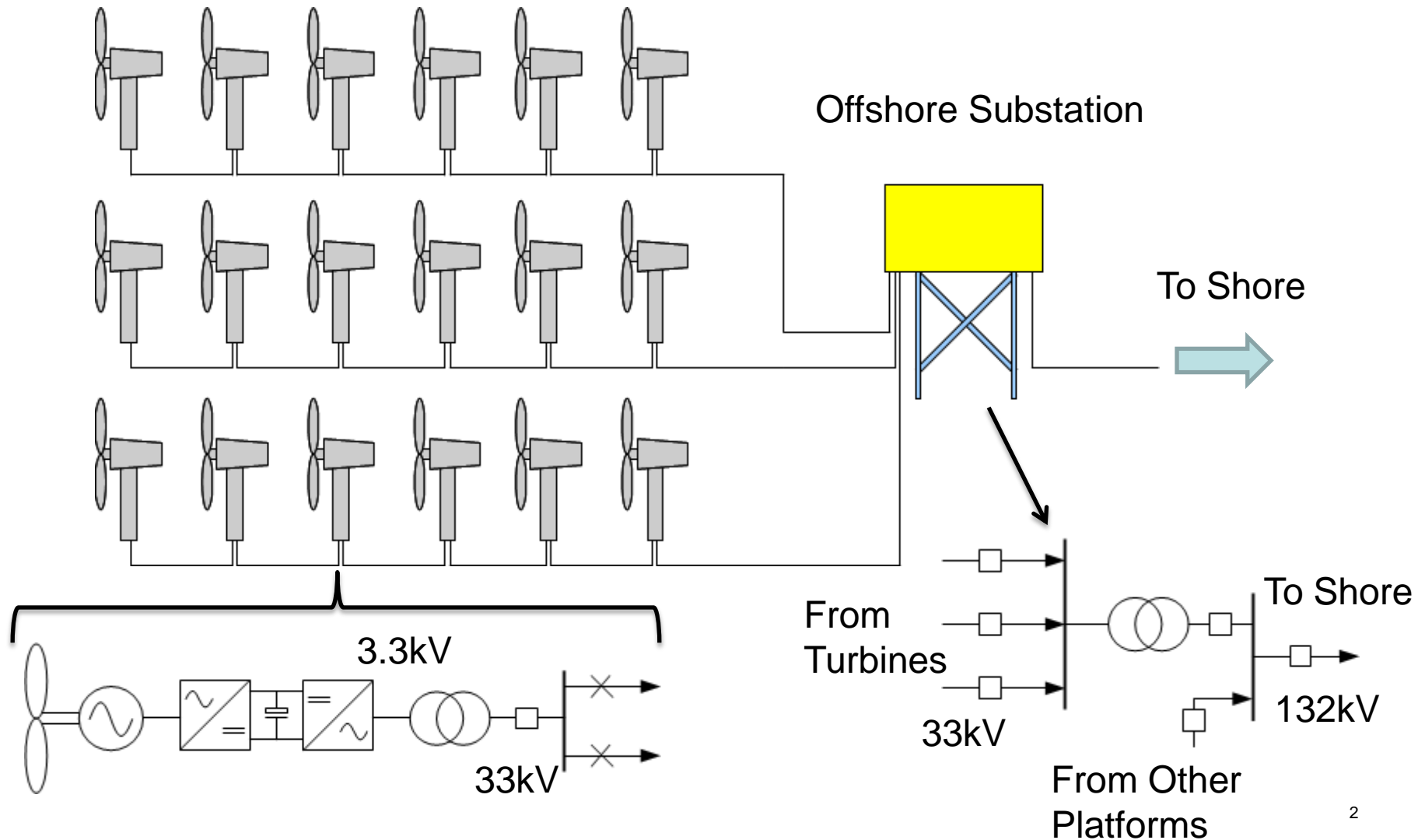




Collection Networks for Large Offshore Wind Farms

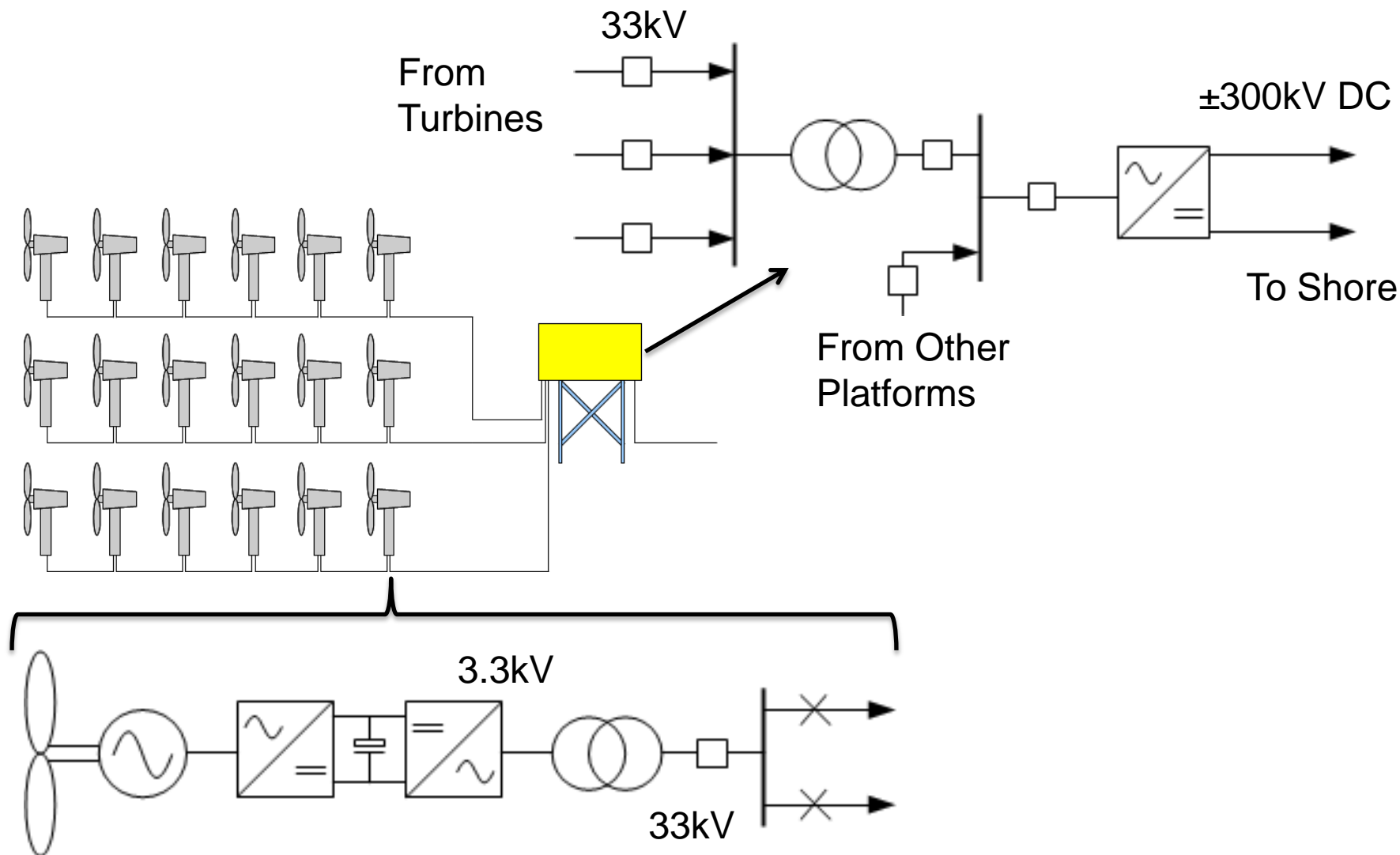
Max Parker

Conventional Arrangement

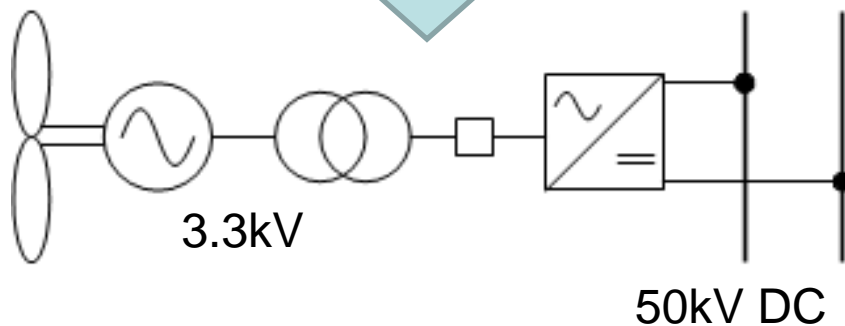
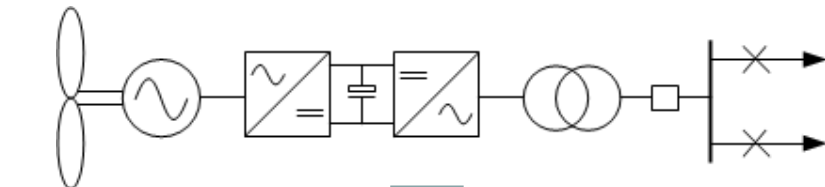
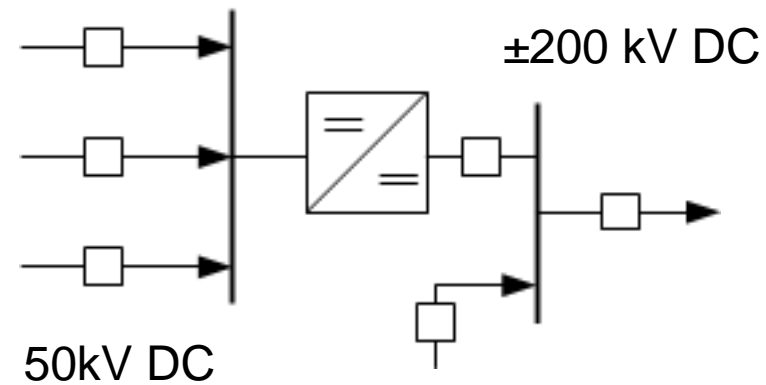
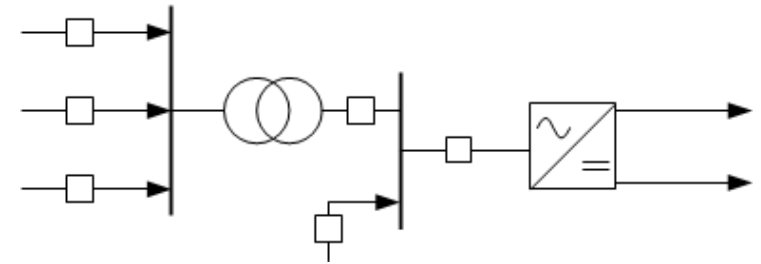
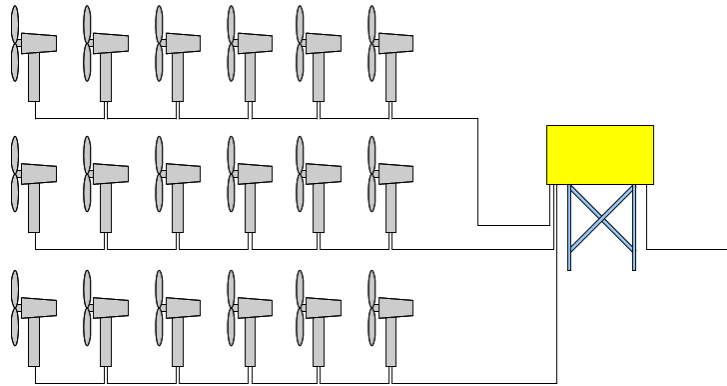




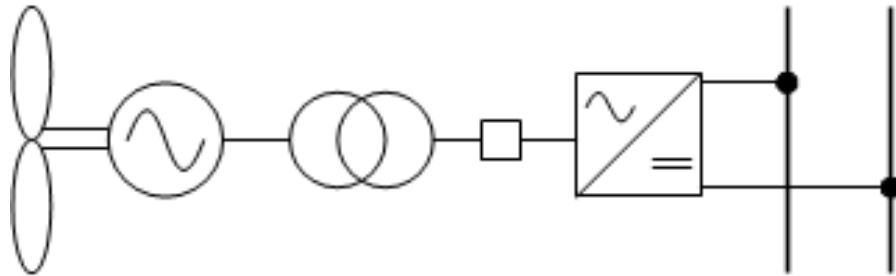
Conventional, with DC Transmission



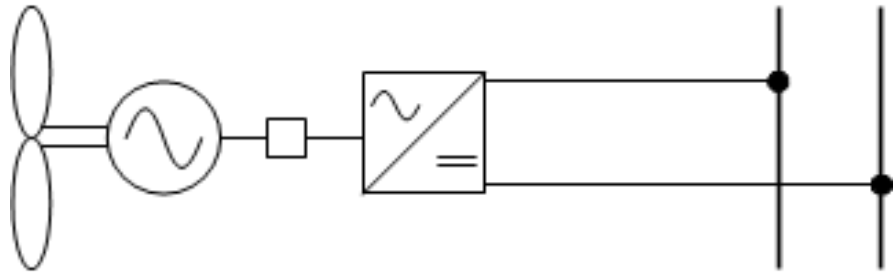
Parallel DC Collection Network



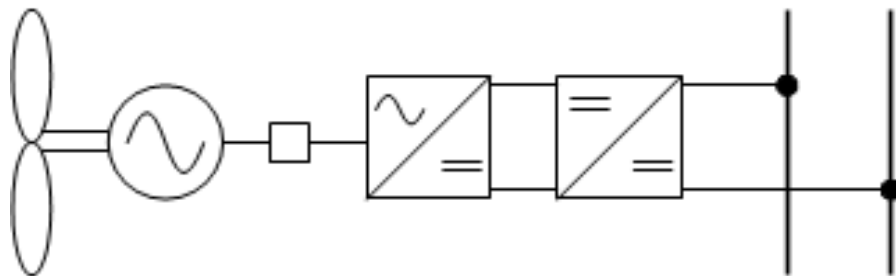
Parallel DC Collection, Variations



Low Frequency Transformer

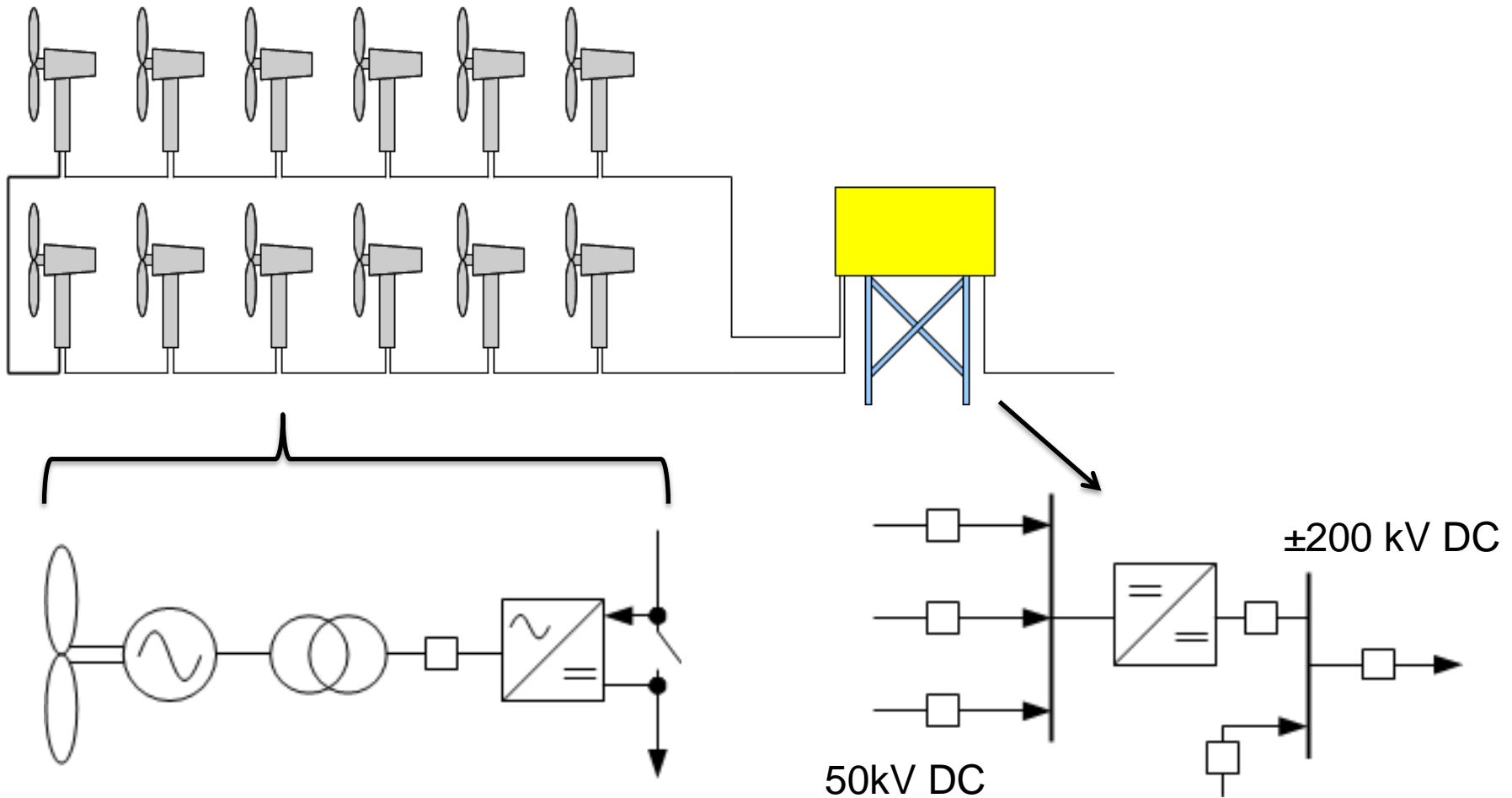


Transformerless Configuration

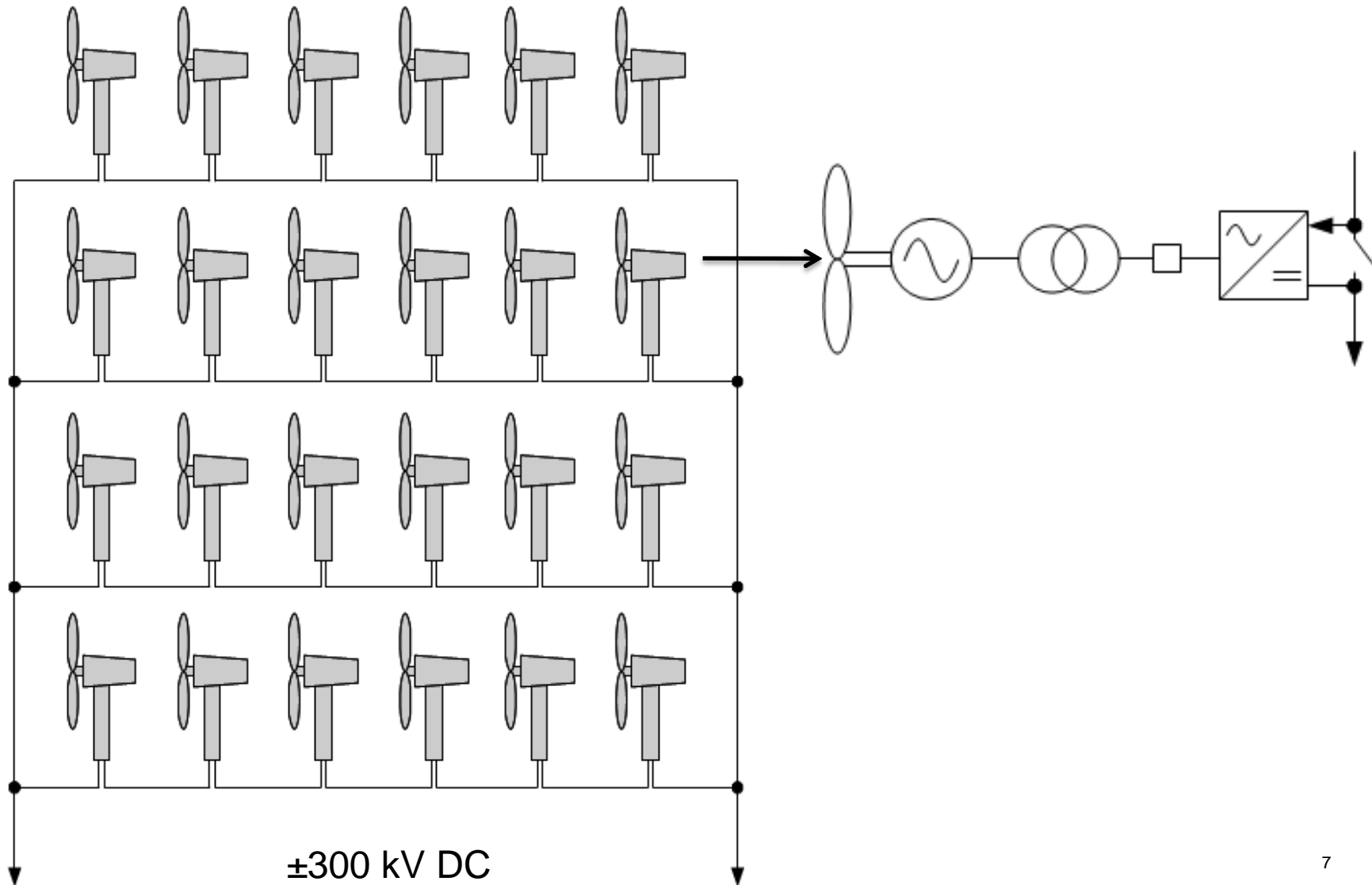


2-Stage Converter

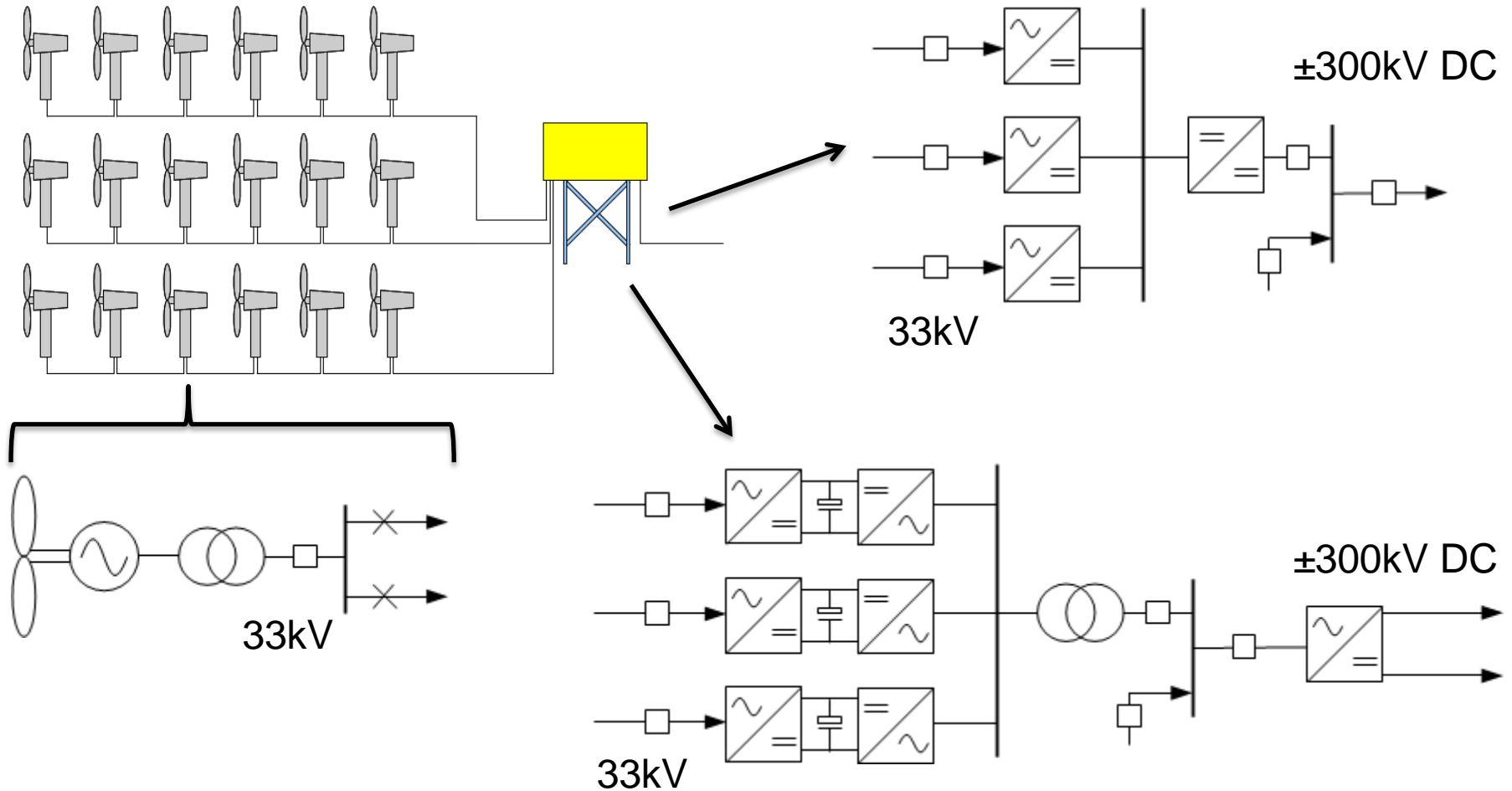
Series DC Collection Network



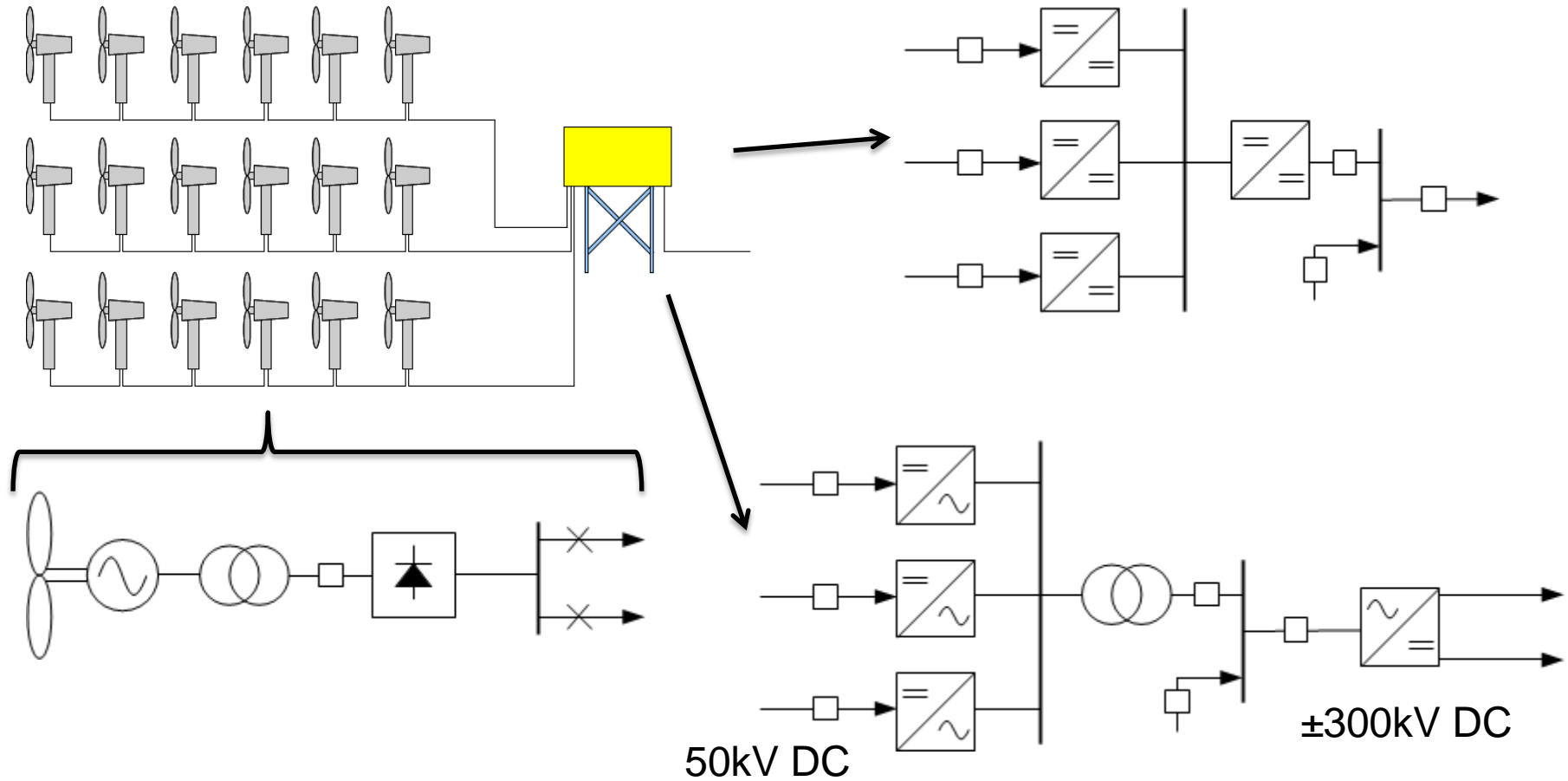
Series DC, No Collection Platform



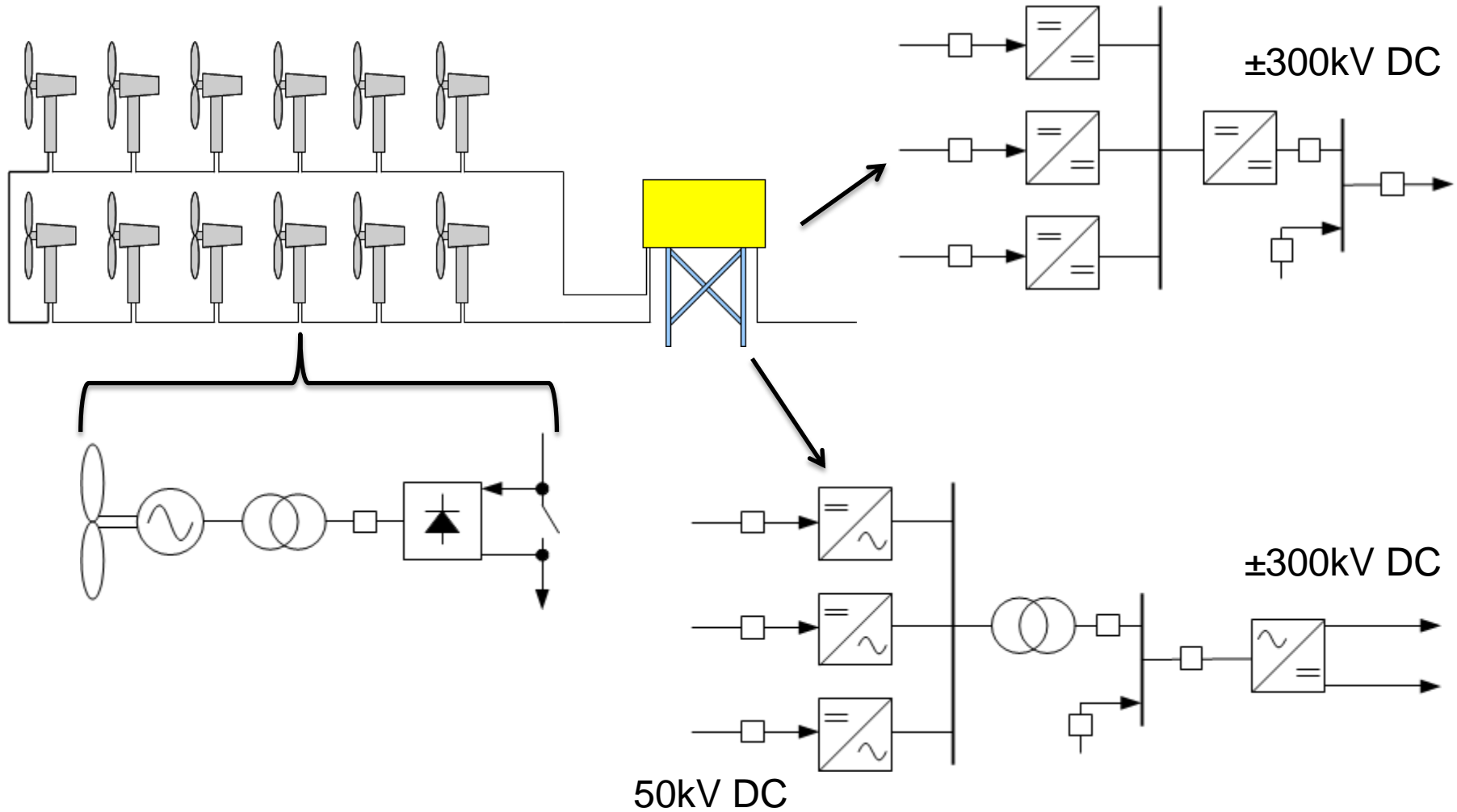
Cluster Connection, AC



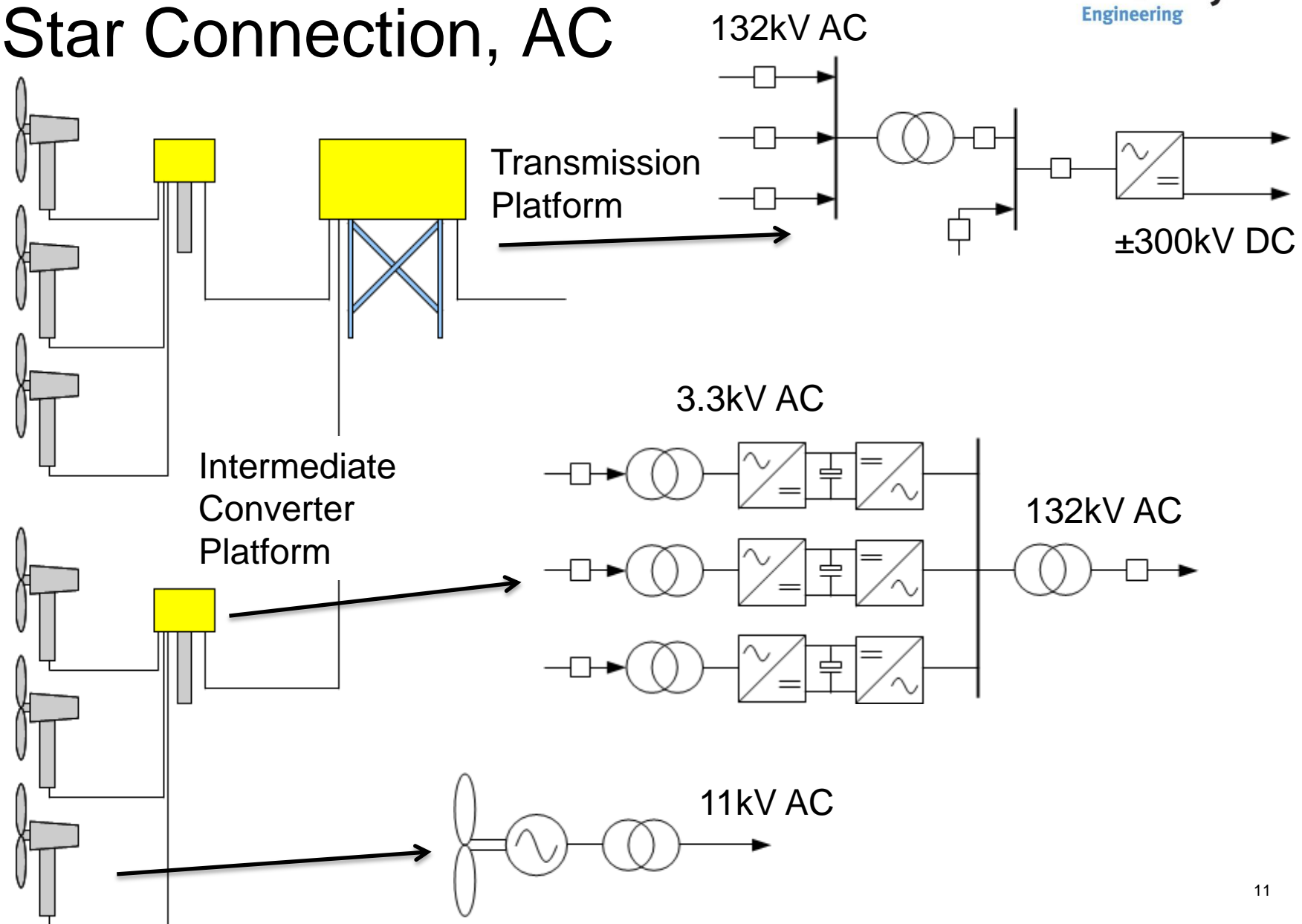
Cluster Connection, Parallel DC



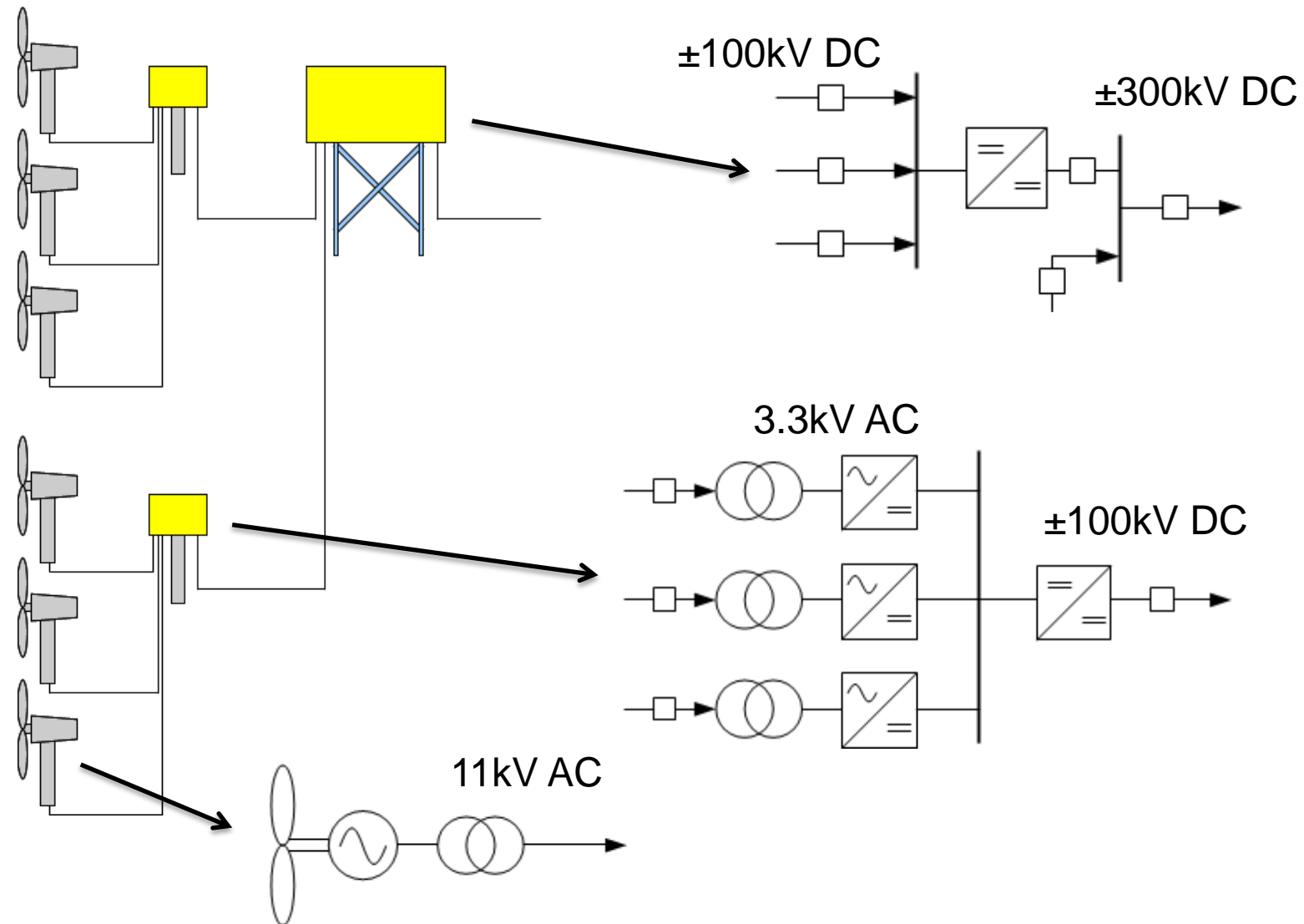
Cluster Connection, Series DC



Star Connection, AC

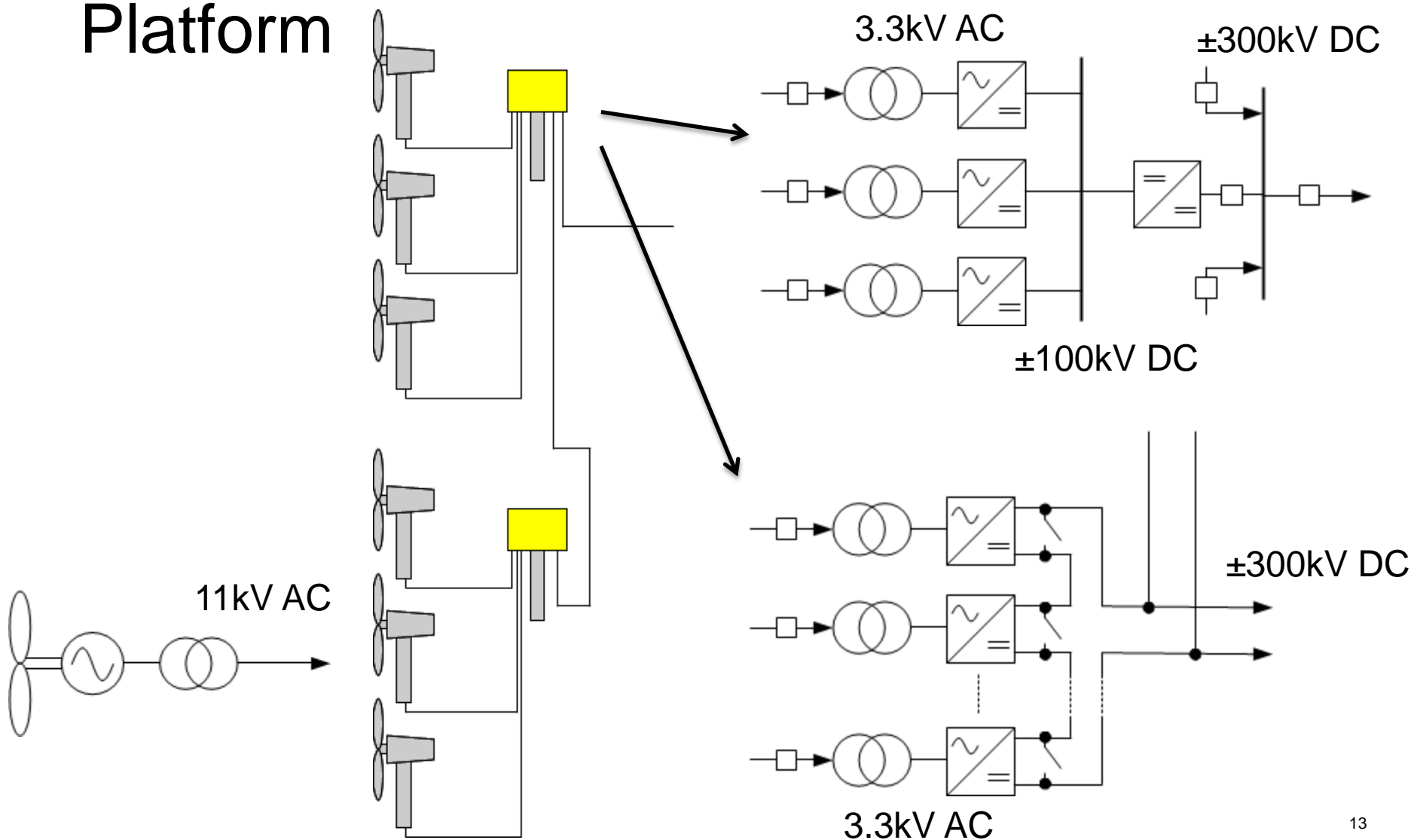


Star Connection, DC Collector





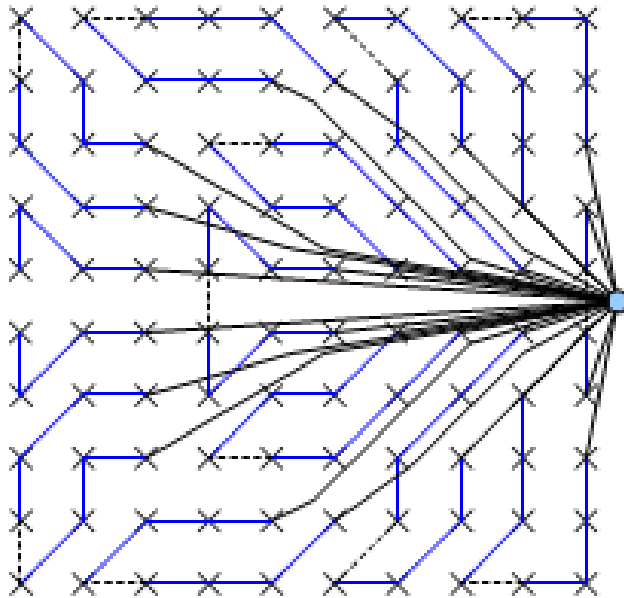
Star Connection, No Transmission Platform



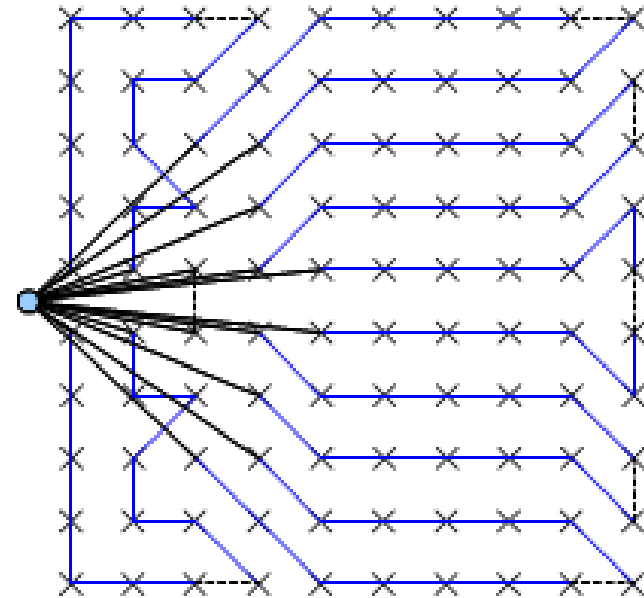
Example Wind Farm Layout

- 1GW transmission platform rating.
- $\pm 300\text{kV}$ HVDC link.
- Turbines: 10MW, Swept diameter 170m.
- Spacing: 7 diameters, 1190m.
- 10x10 square.

Windfarm Layout, Radial Strings



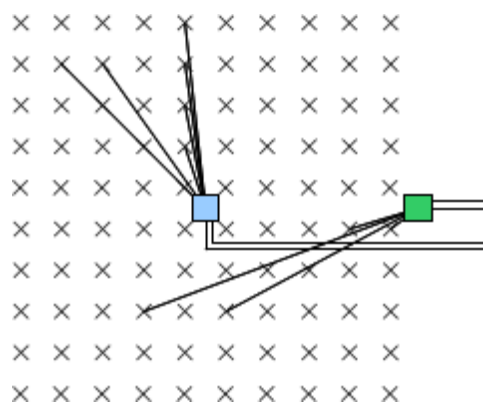
33kV Strings
4 turbines/string
25 Strings
252km Cable



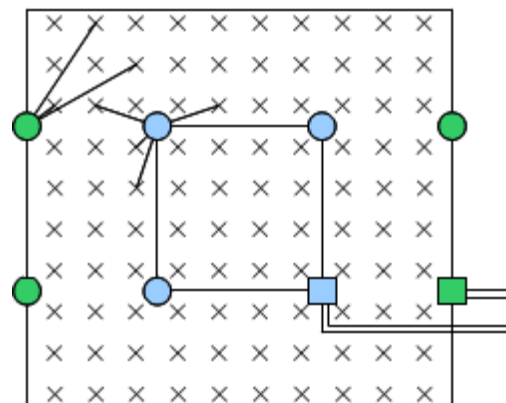
52kV Strings
7 turbines/string
15 Strings
170km Cable



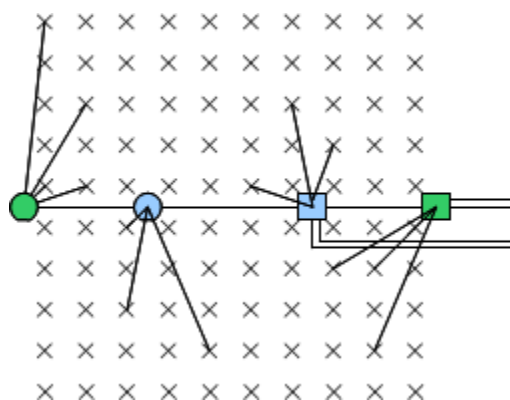
Windfarm Layout, Star Connection



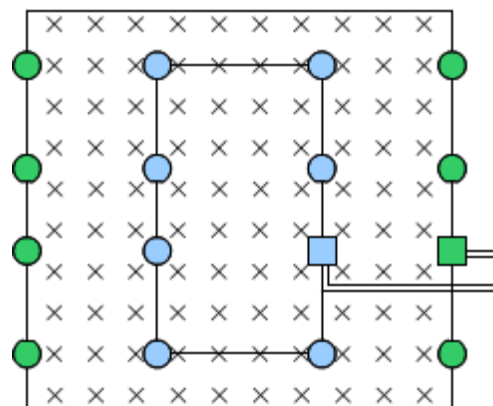
1 Platform



4 Platforms



2 Platforms



8 Platforms

==== DC Link

— Intermediate Connection

Platforms Outside

Platforms Inside



Collection

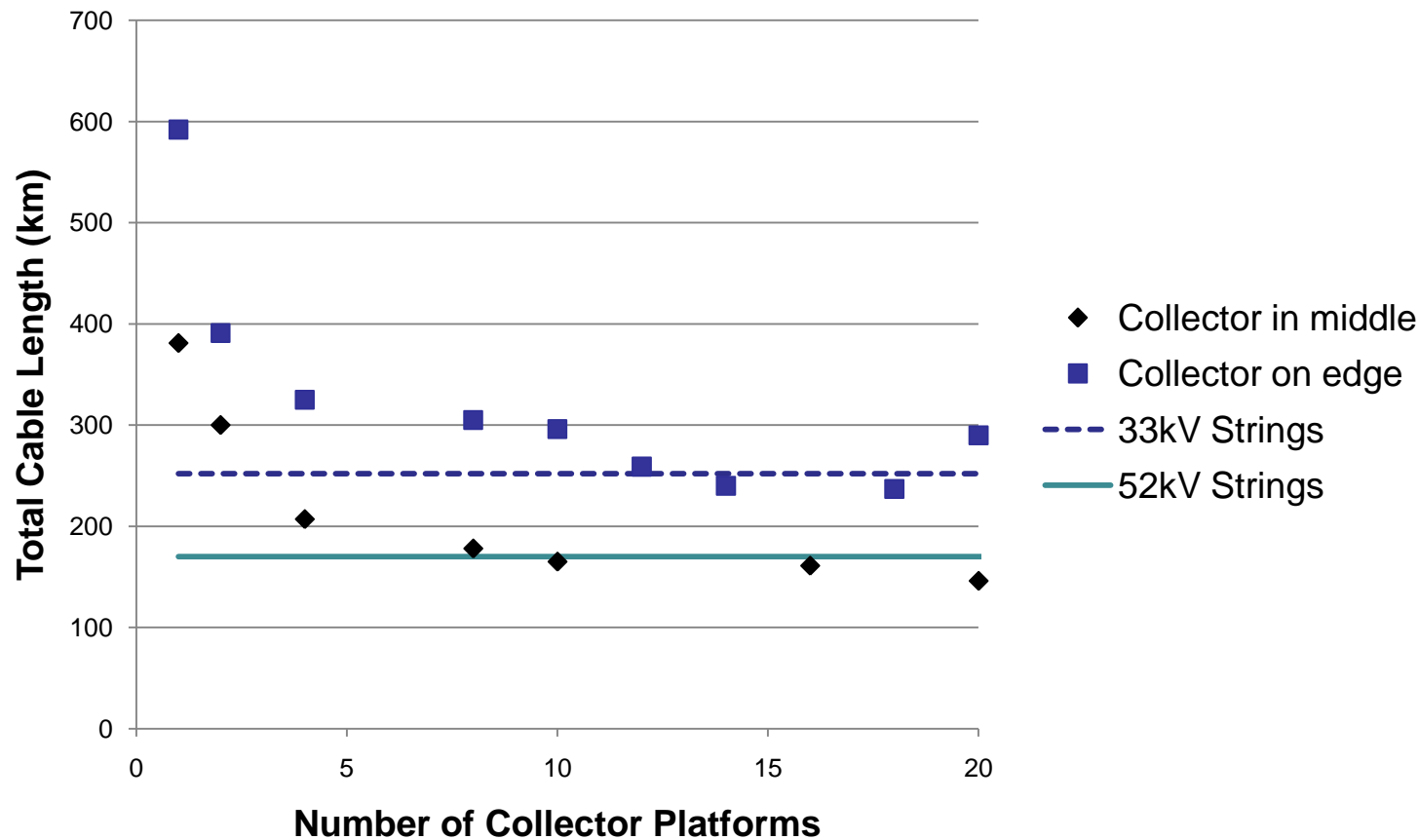


Collection/Transmission





Total Cable Lengths



Thank You!