

# Performance of Fixed-wing GG AWES: A Sensitivity Study

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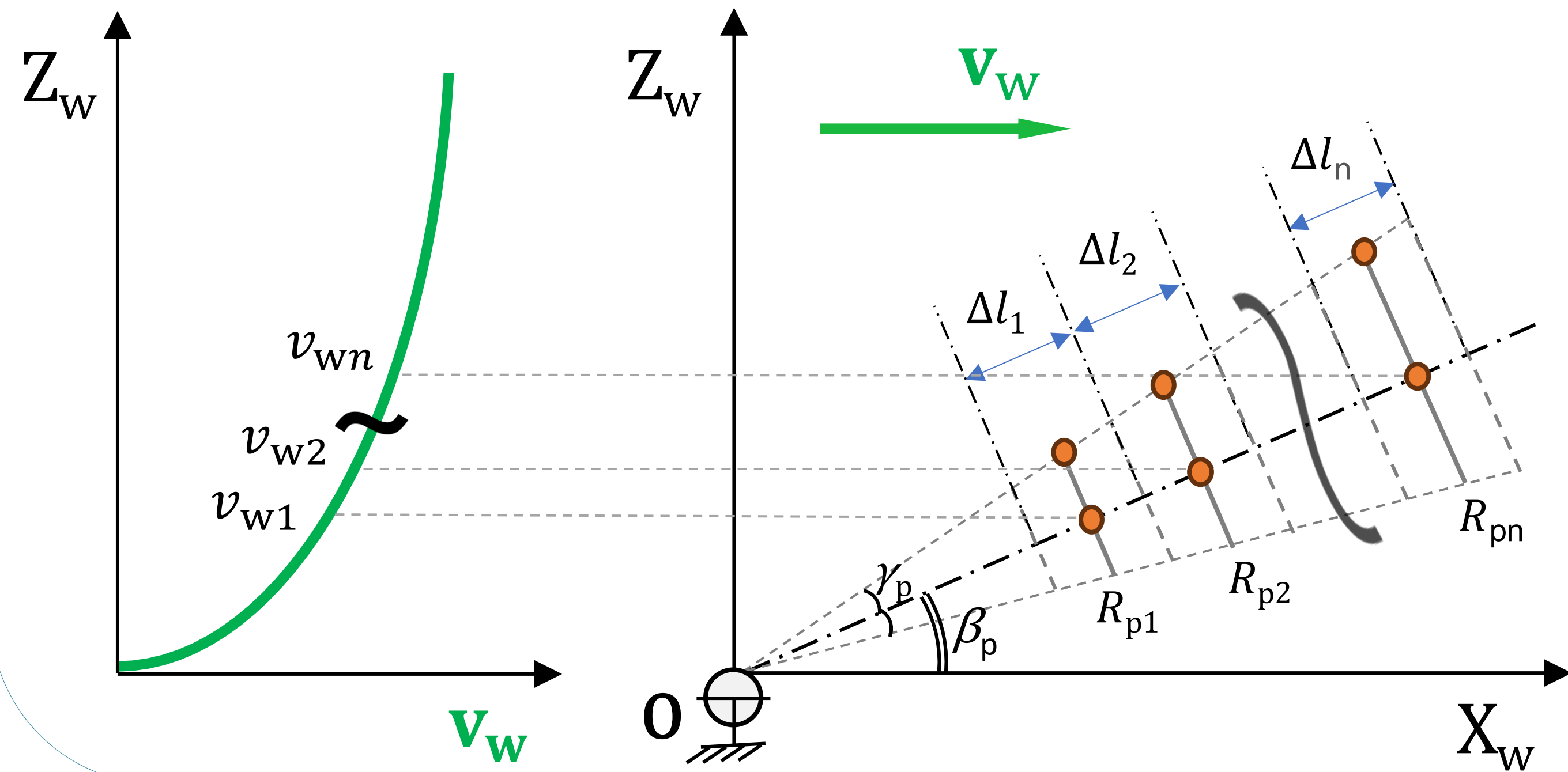
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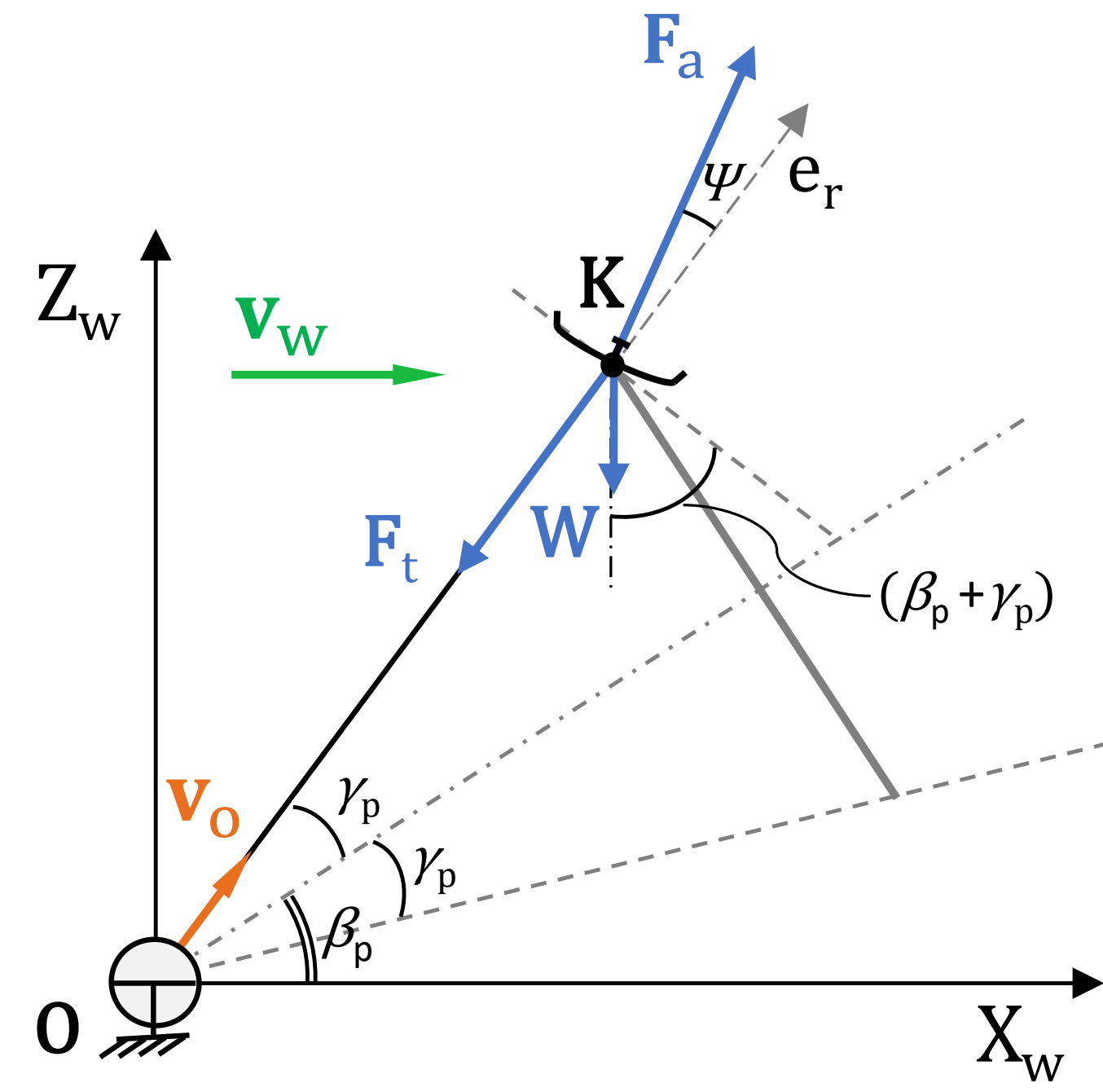


## Power Computation Model: Quasi-steady

Discretised reeling distance

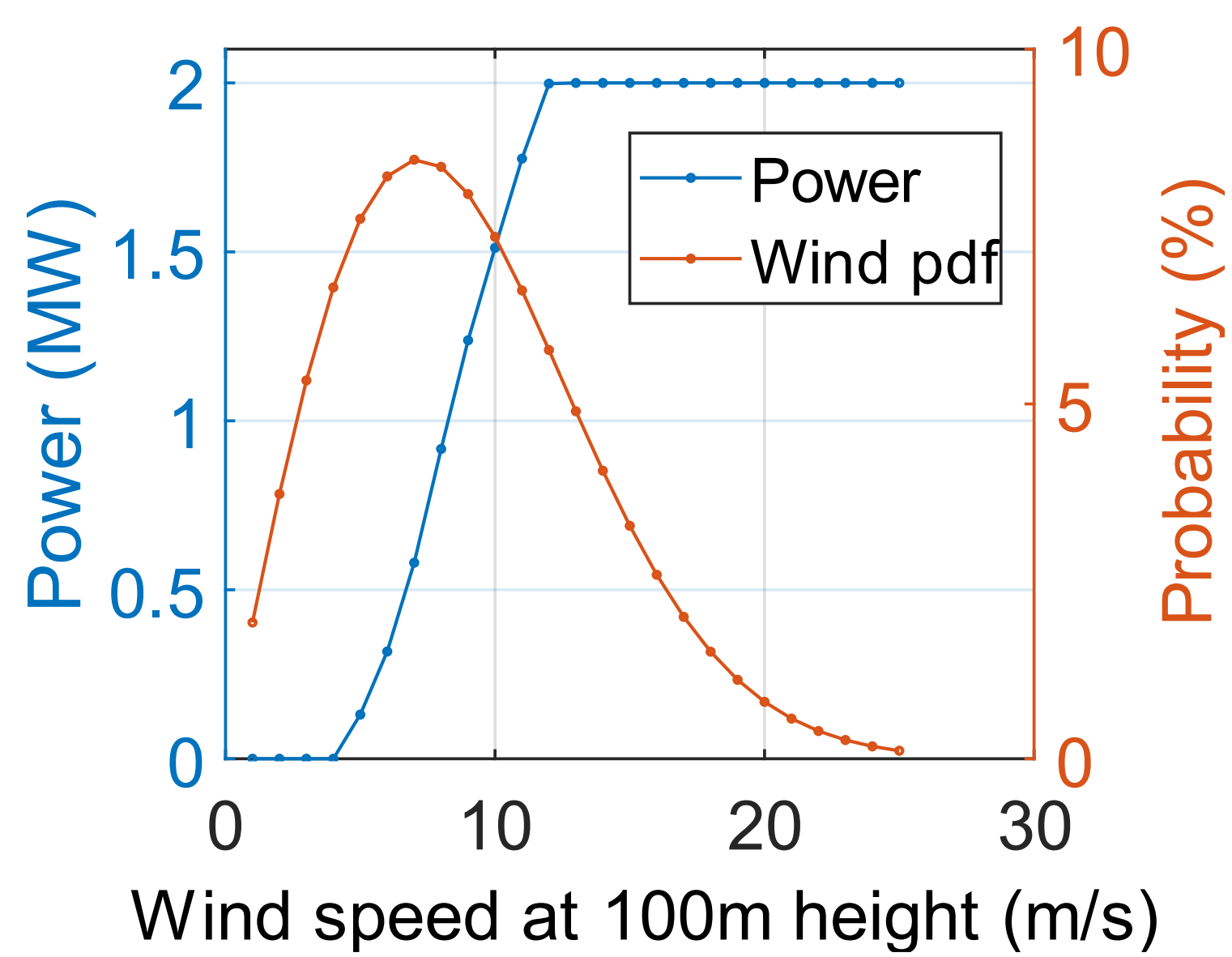


Steady-state force balance



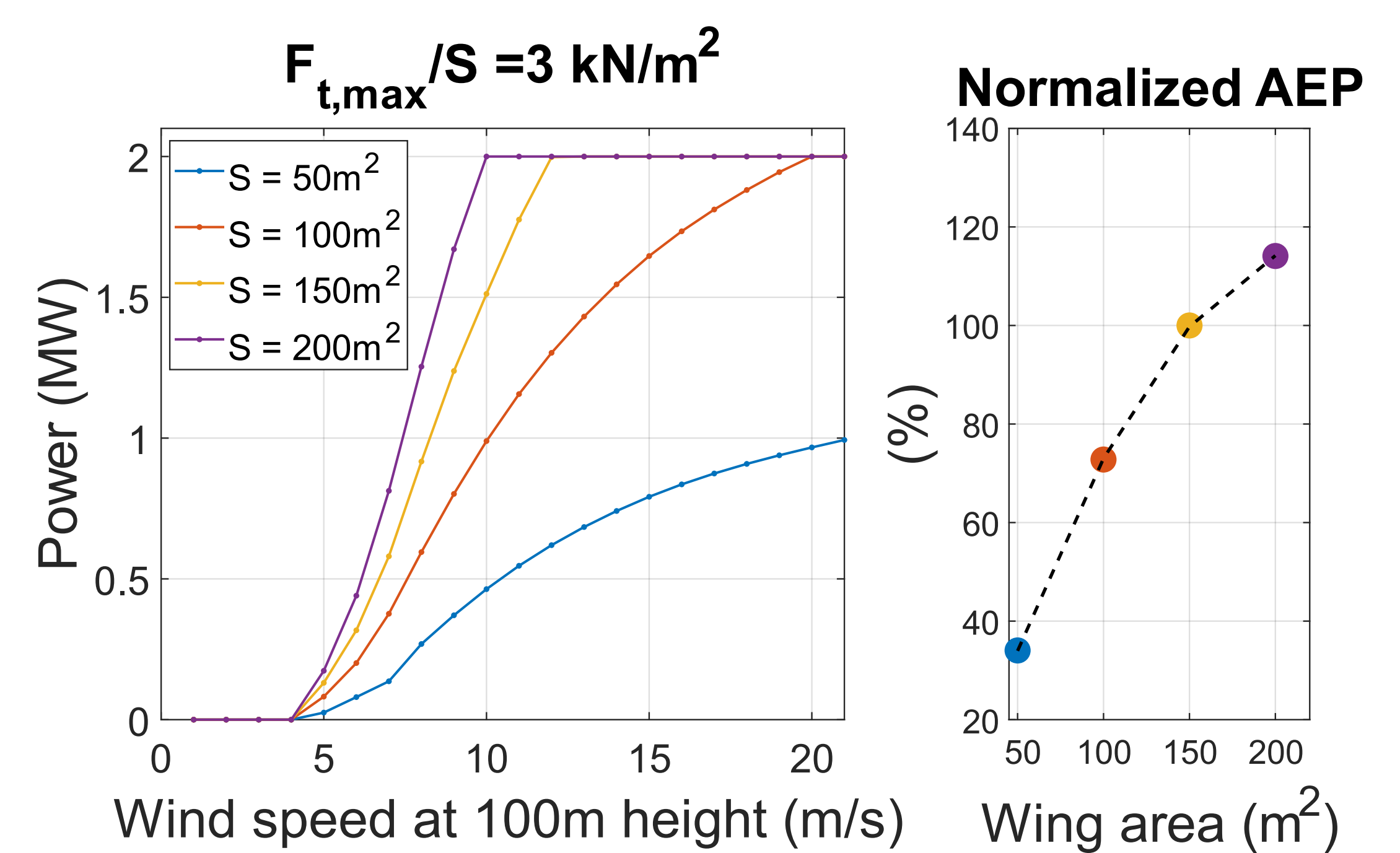
- Cycle power optimisation
- Kite mass scaling
- Effect of (kite+tether) weight
- Cost model integration

### Baseline system



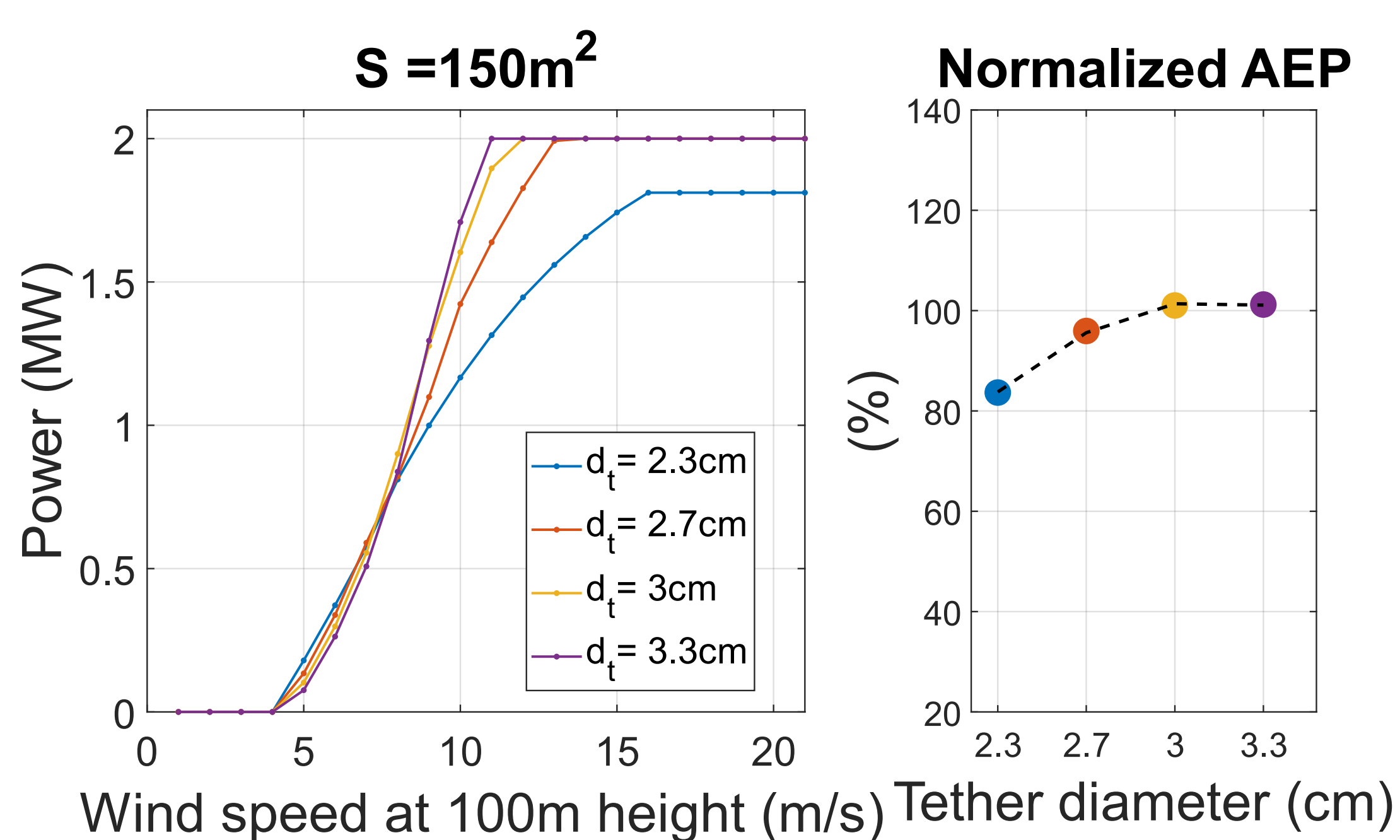
Parameter	Value
Wing area	150 m <sup>2</sup>
Kite mass	9,250 kg
Tether mass	1,500 kg
Tether diameter	2.9 cm
$C_{L,max}$	2.5
Tether drag coeff.	1
Generator size	4 MW
AEP	9 GWh
Mean wind speed	9 m/s
Wind shear coeff.	0.143

### Wing area sensitivity



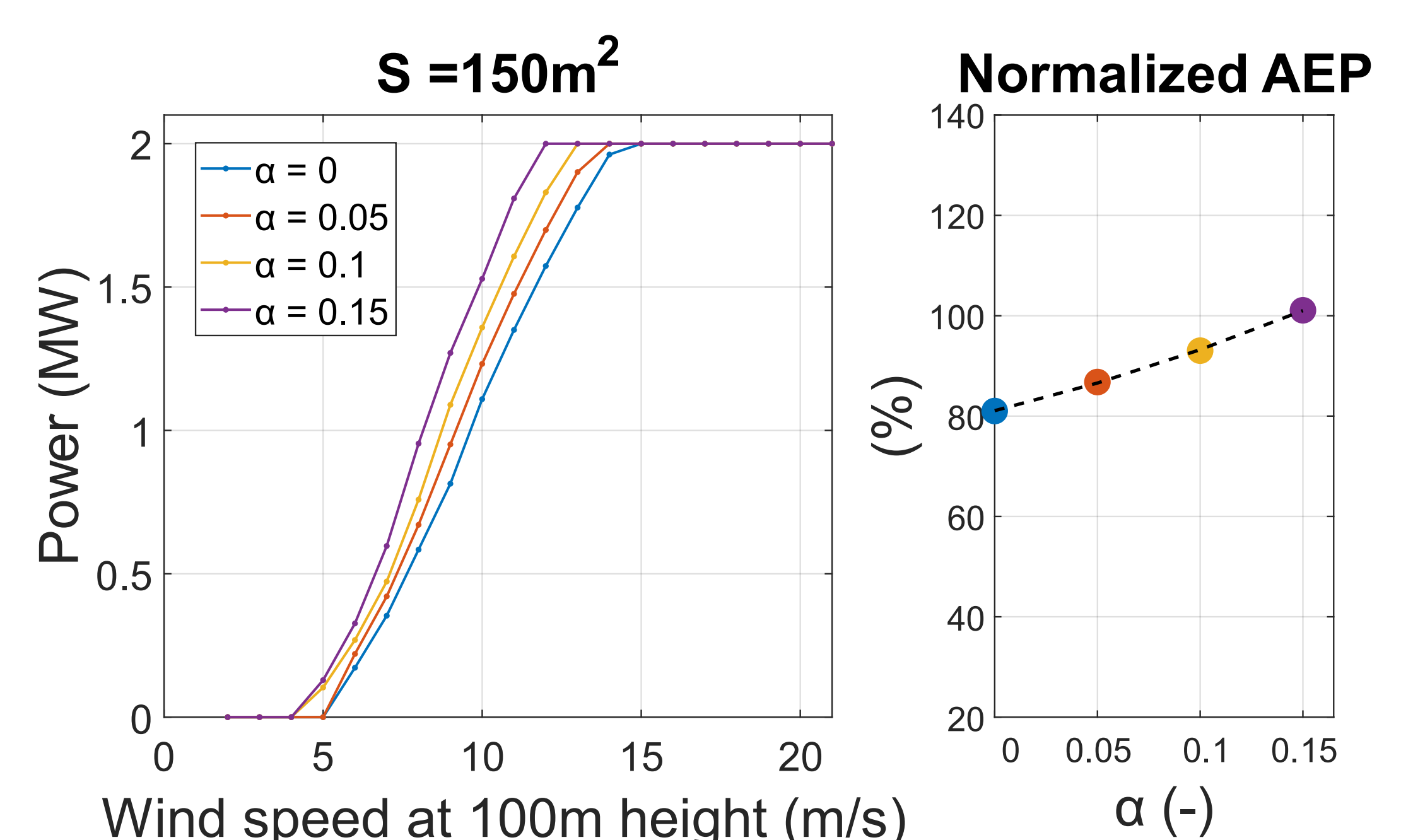
**High sensitivity**

### Tether diameter sensitivity



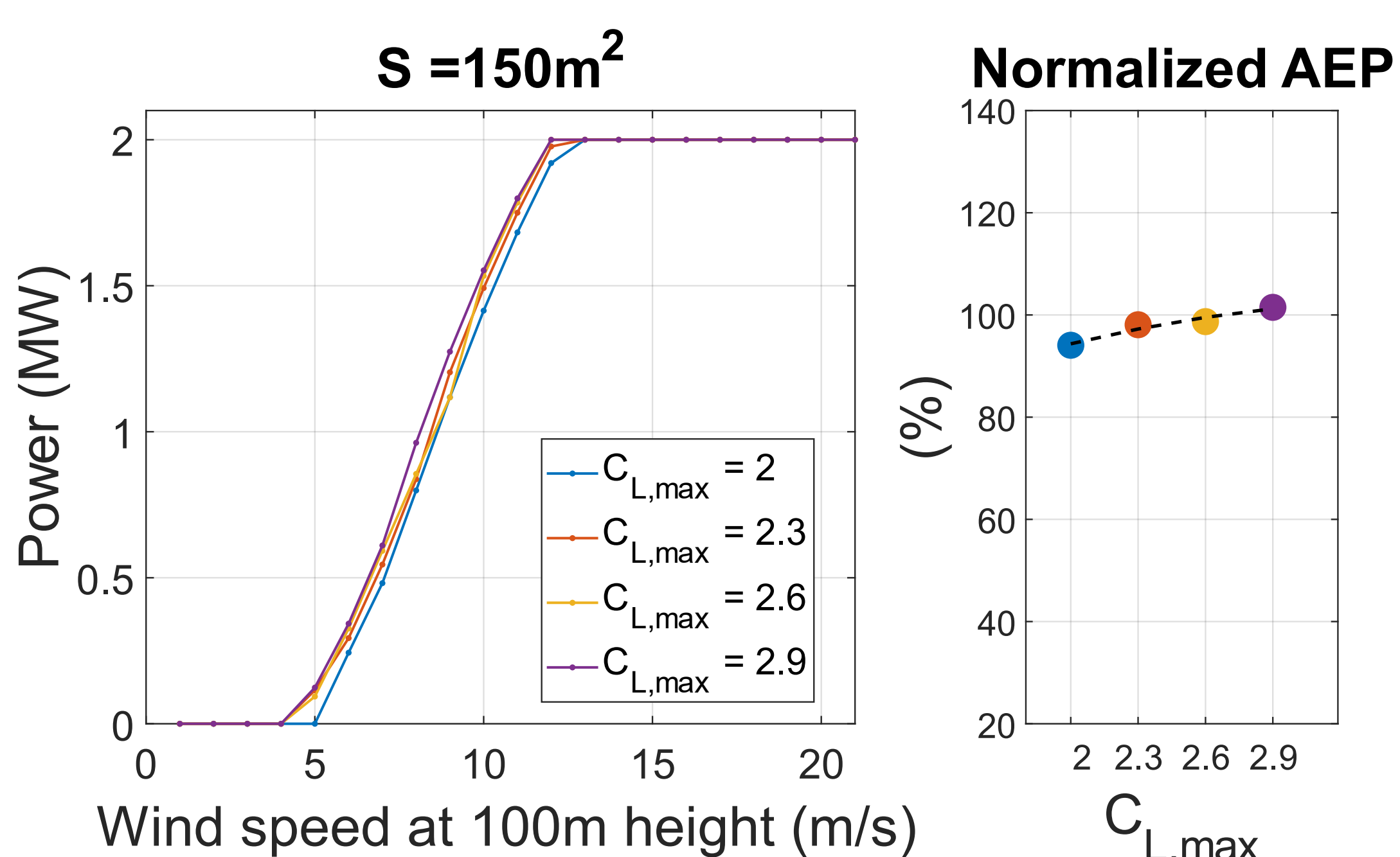
**Moderate sensitivity**

### Wind shear coefficient sensitivity



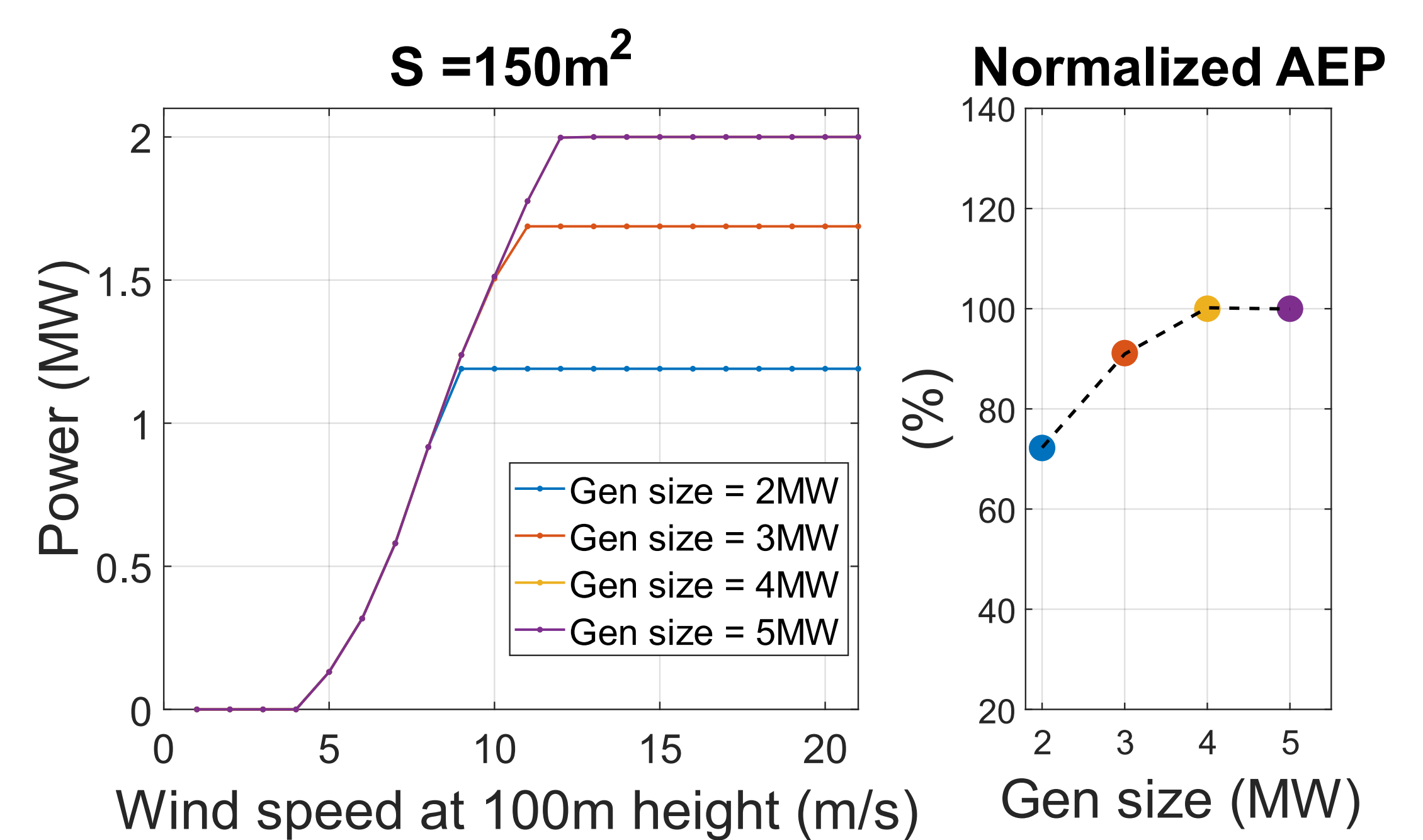
**High sensitivity**

### $C_{L,max}$ sensitivity



**Low sensitivity**

### Generator size sensitivity



**High sensitivity**

## Conclusion & Next steps

Along with performance drivers, the design choices will be significantly driven by the cost penalty associated with all the above parameters.