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Evaluation of new voltage operating strategies for integration of distributed generation into distribution network

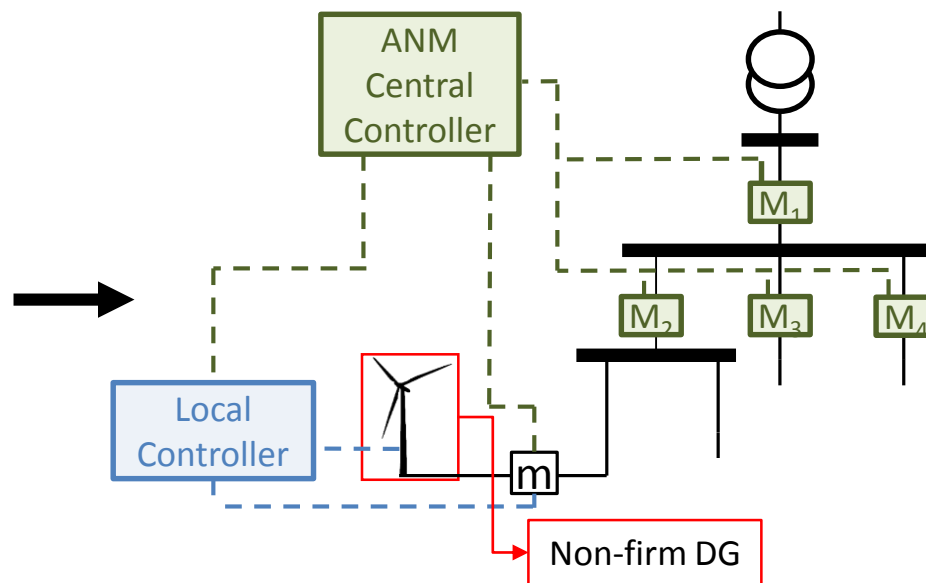
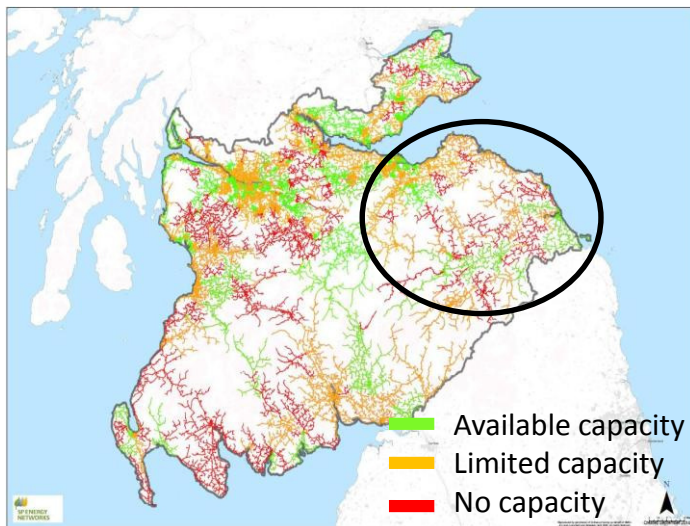
Milana Plecas¹, Simon Gill¹, Ivana Kockar¹, Ross Anderson²

¹University of Strathclyde; ²SP Energy Networks

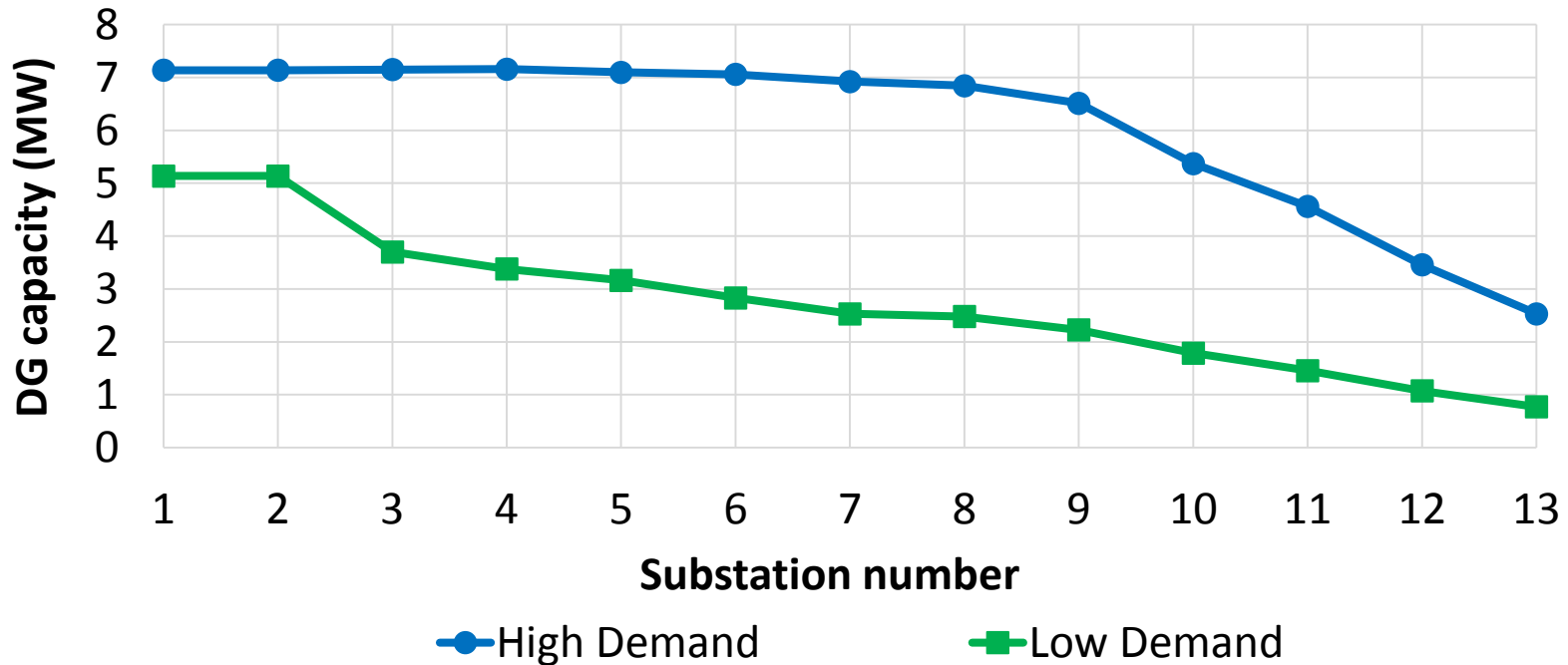
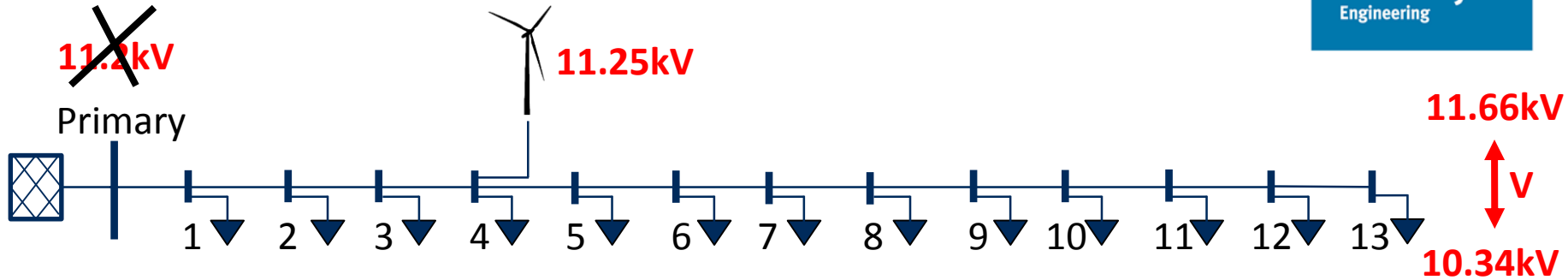
- Possible strategies for operating voltage constrained 11kV feeder
 - The effect of raising the voltage limit
 - The effect of increasing demand
 - The effect of non-firm connection agreement

Accelerating Renewable Connections (ARC)

- Objective
 - Facilitate improved network access to the distribution network to connect renewable generation
- Project partners



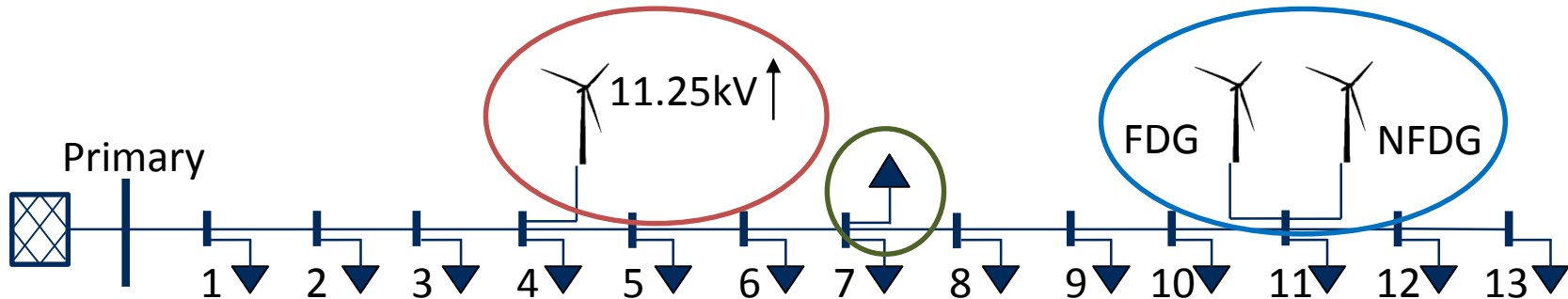
Existing operating principles for 11kV network



Possible strategies for operating voltage constrained 11kV feeder

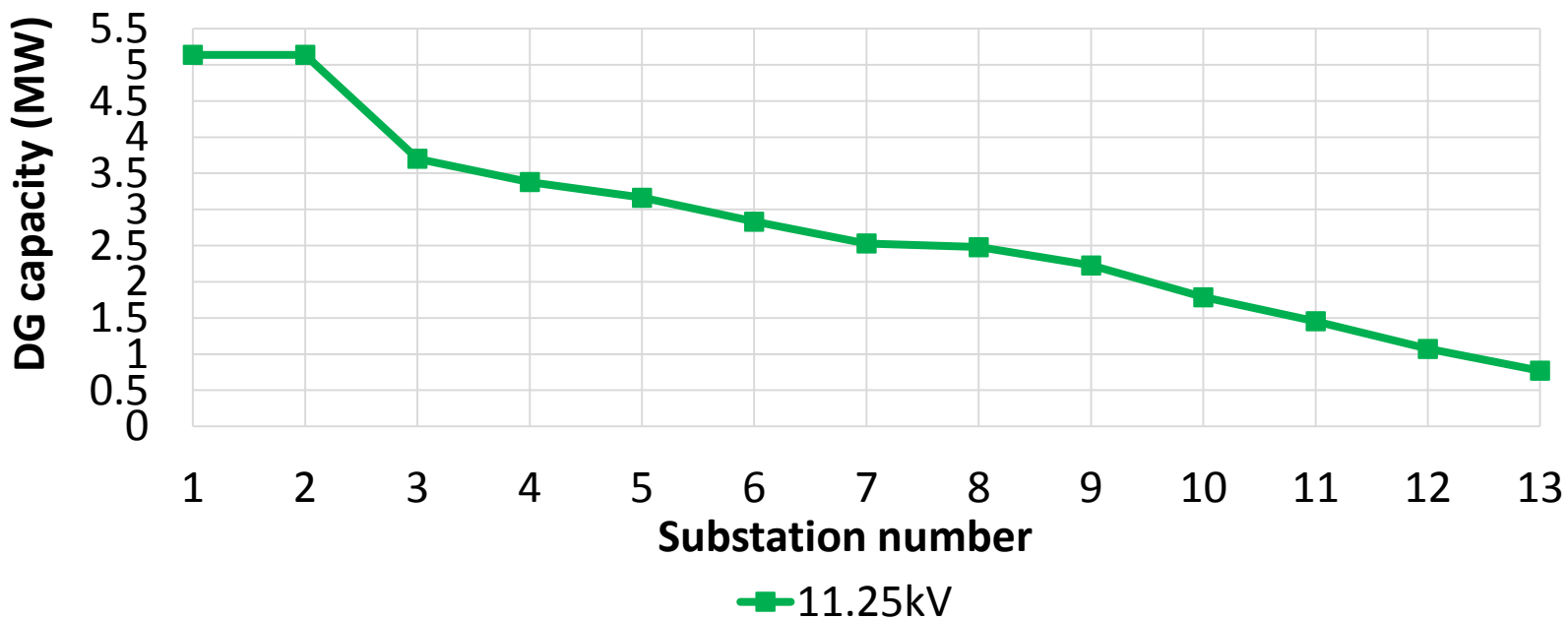
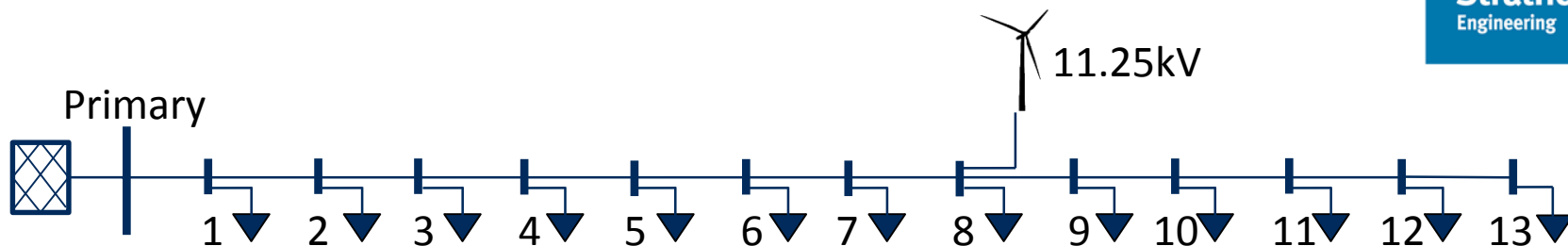
How does the raising the point-of-connection voltage limit affect the capacity for DG?

How much additional non-firm DG capacity can be connected when using non-firm agreements?

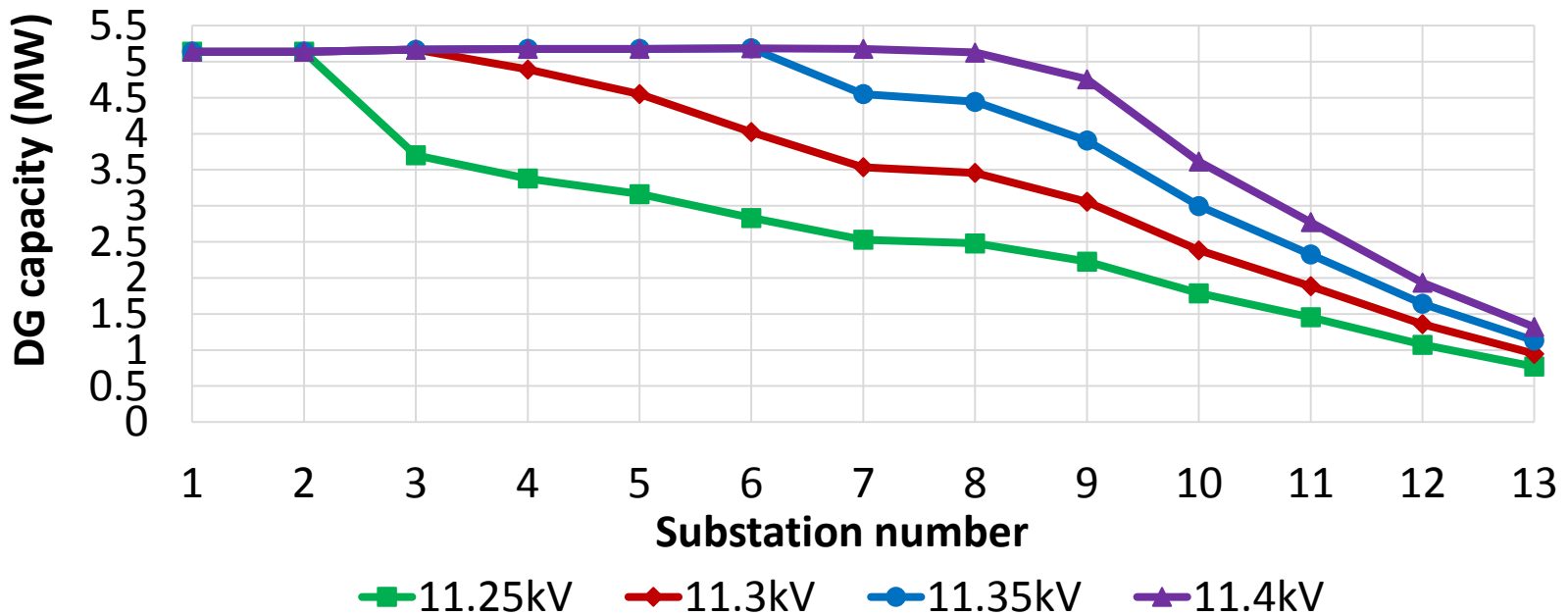
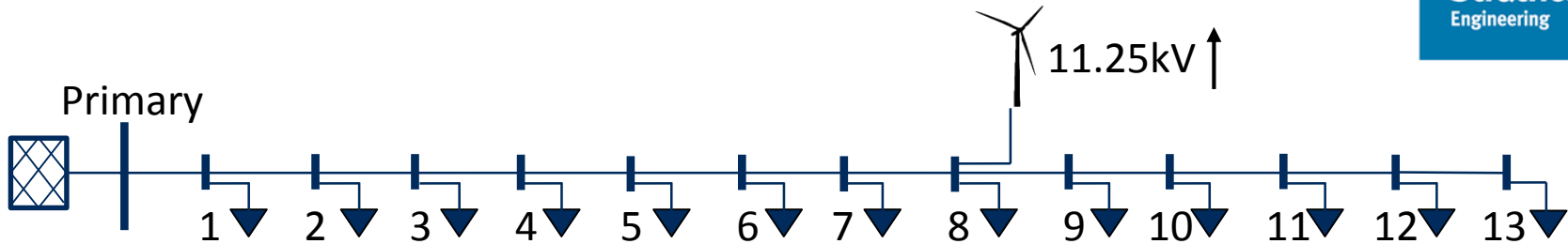


How does the additional demand at one substations affect DG capacity at other substations?

The effect of raising the voltage limit



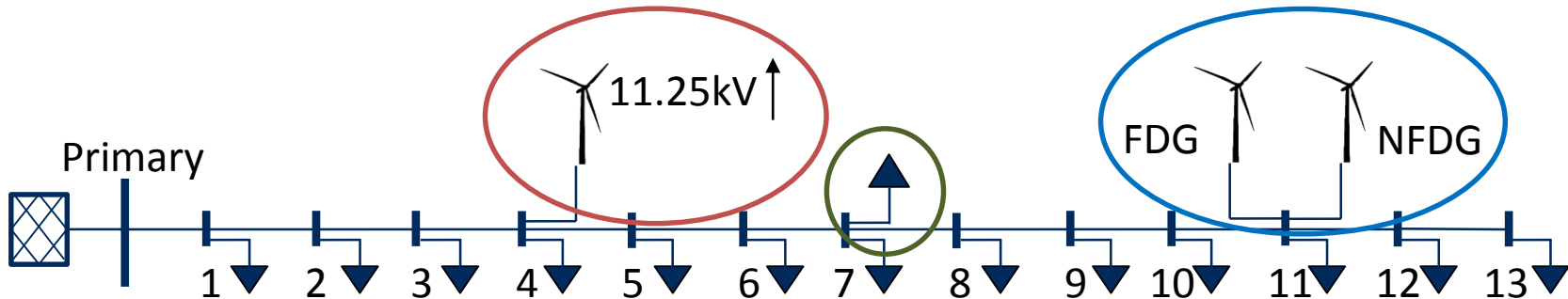
The effect of raising the voltage limit



Possible strategies for operating voltage constrained 11kV feeder

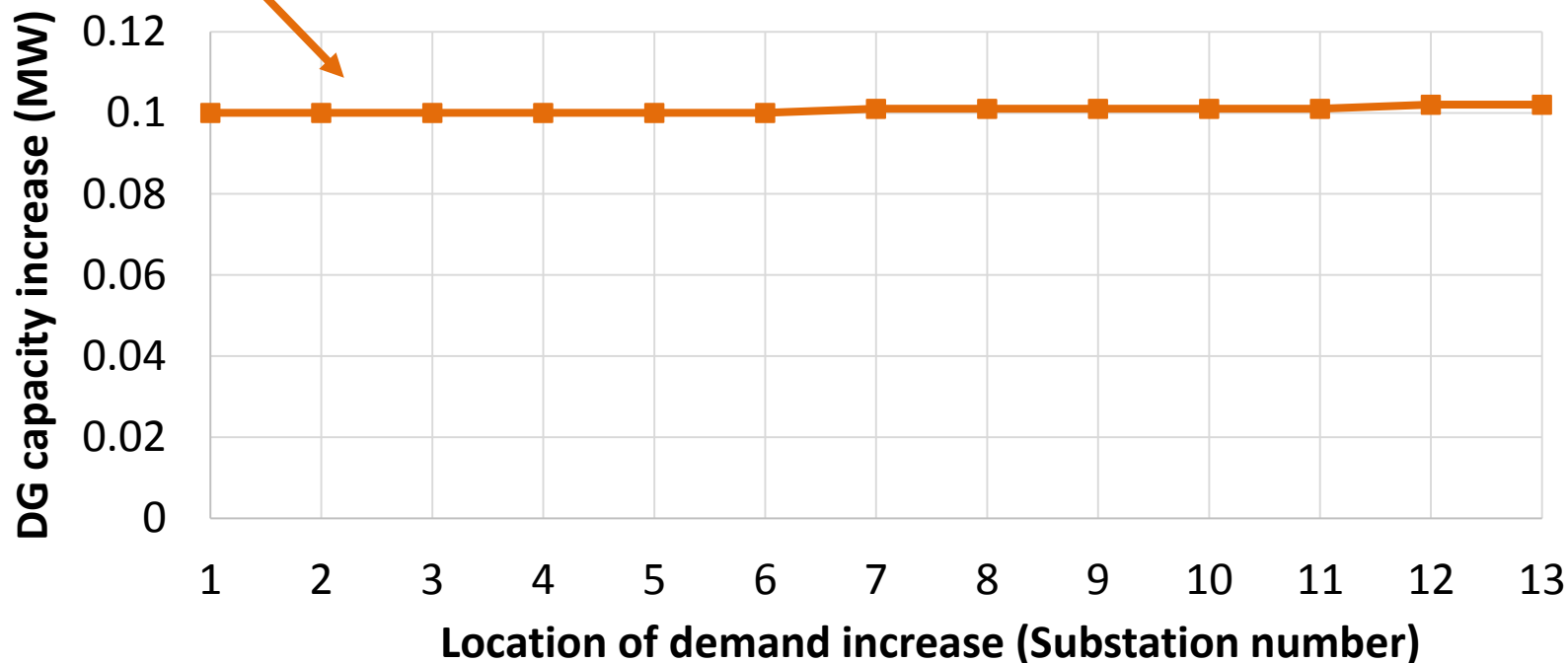
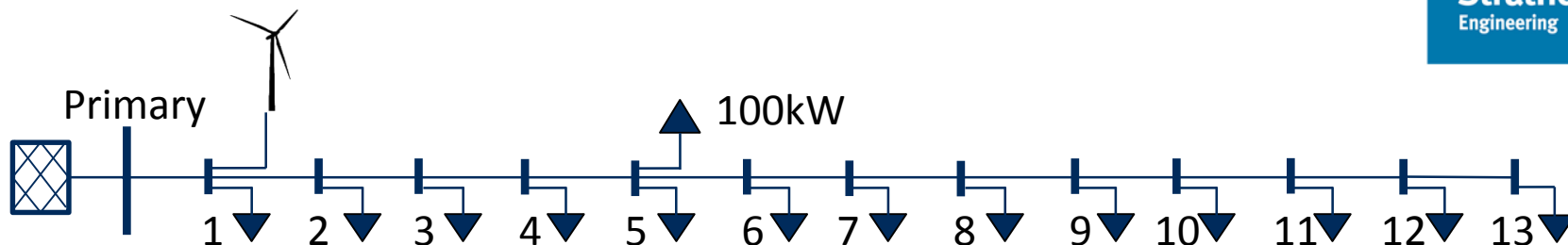
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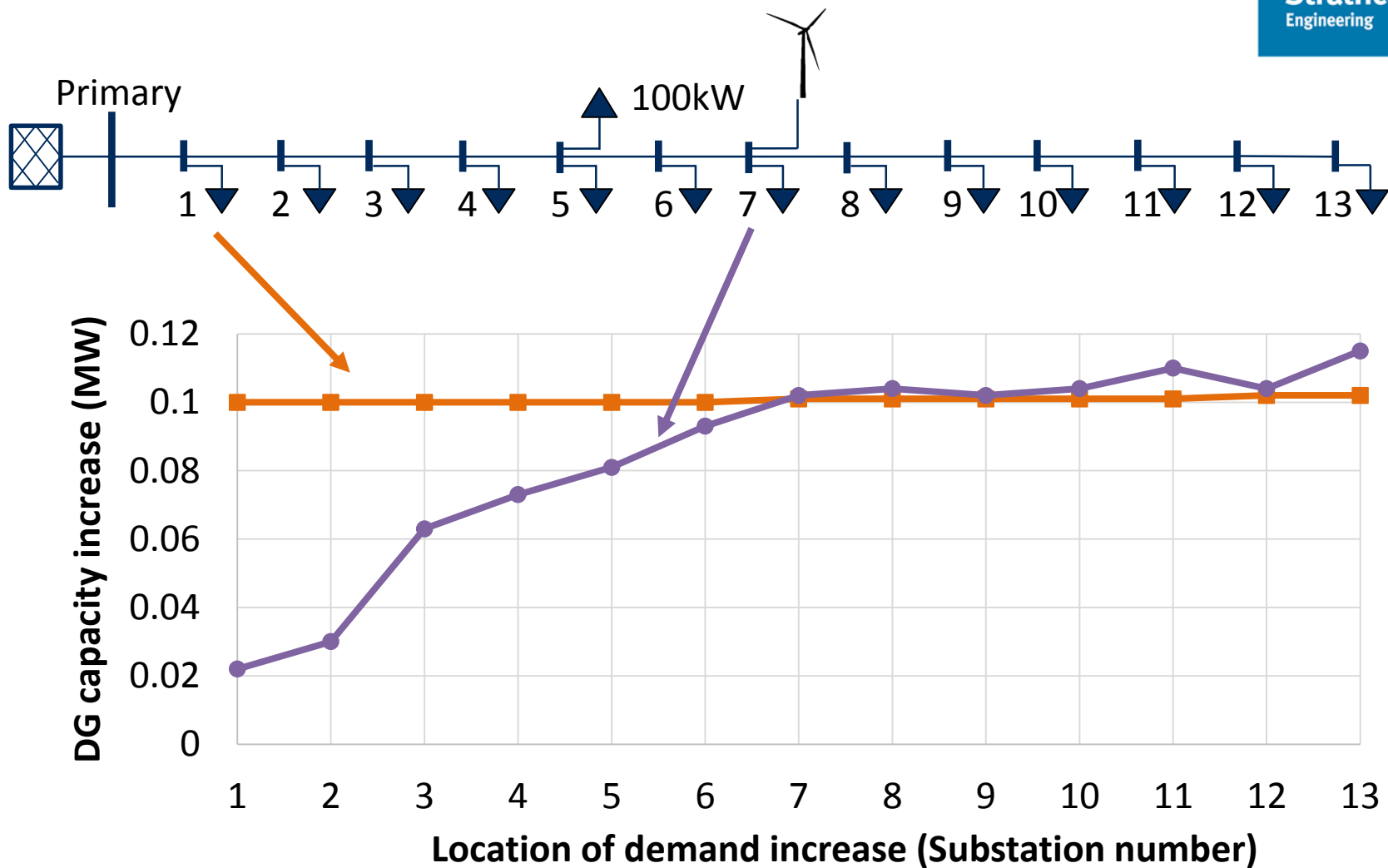


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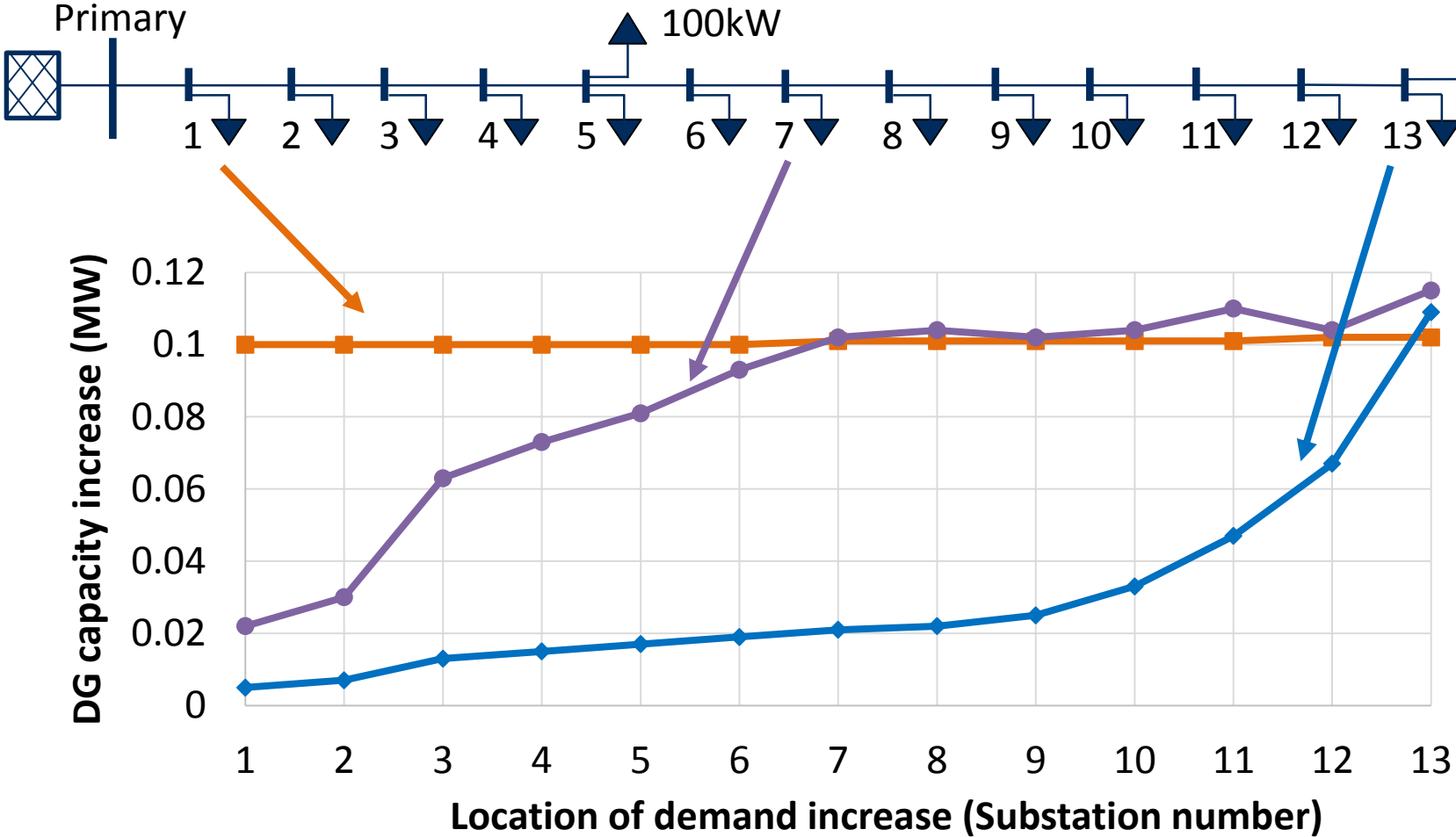
The effect of increasing demand



The effect of increasing demand



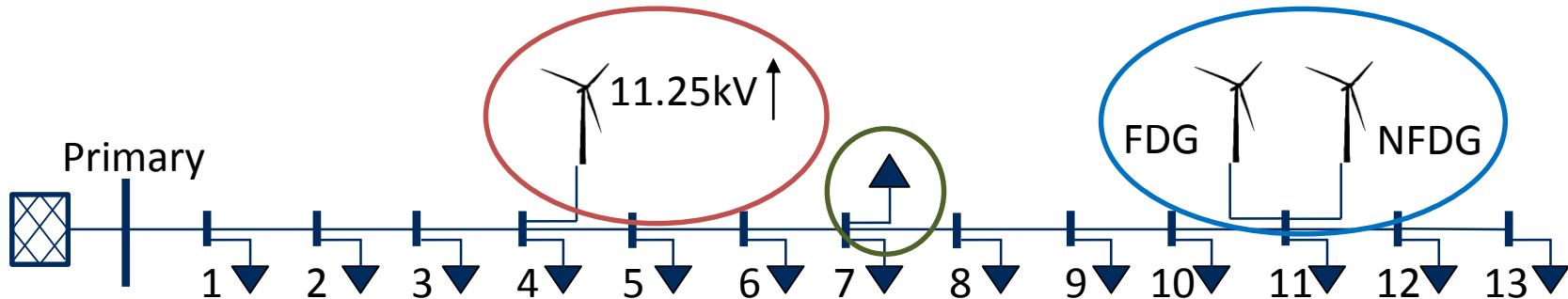
The effect of increasing demand



Possible strategies for operating voltage constrained 11kV feeder

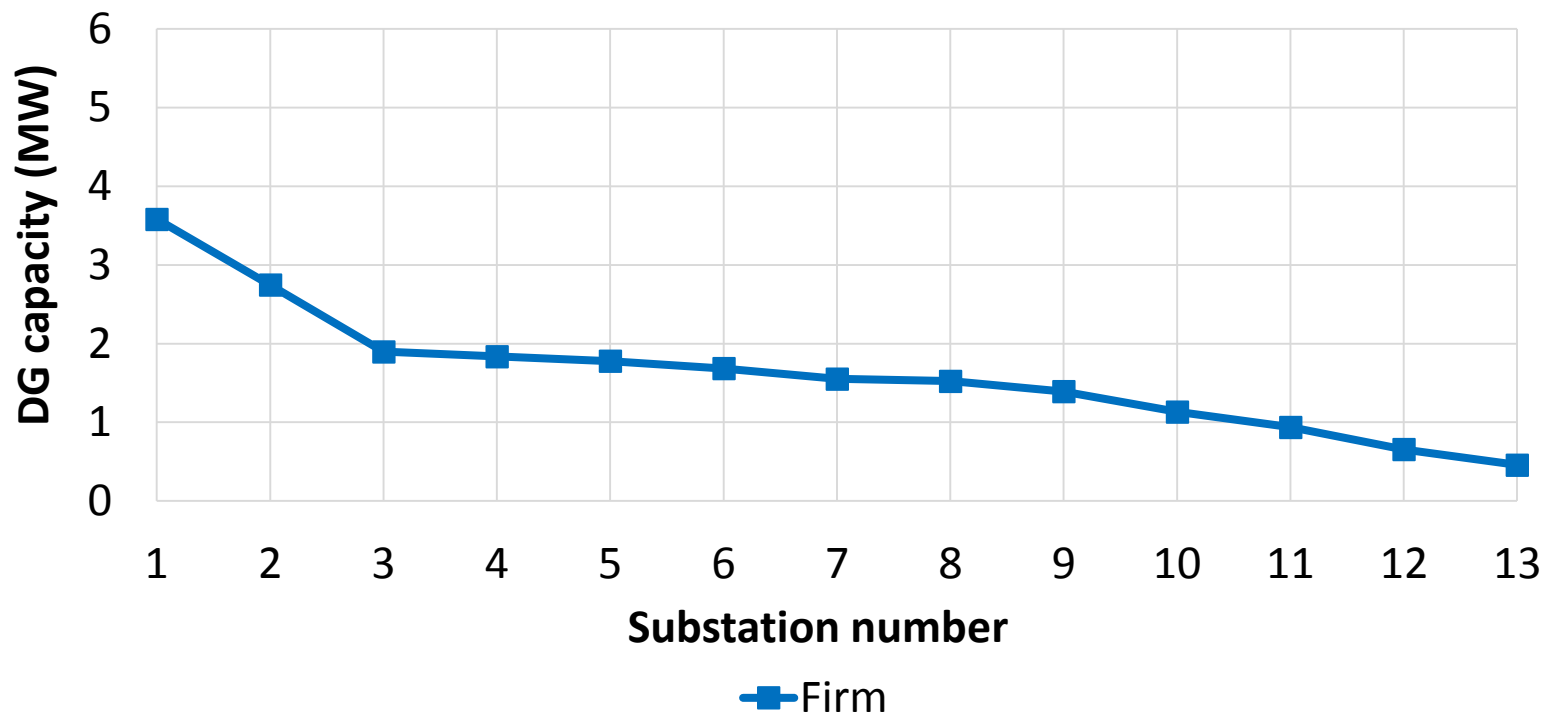
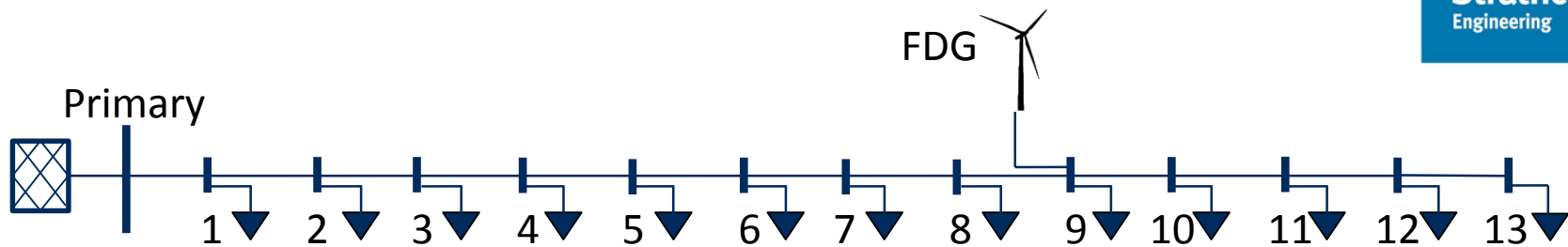
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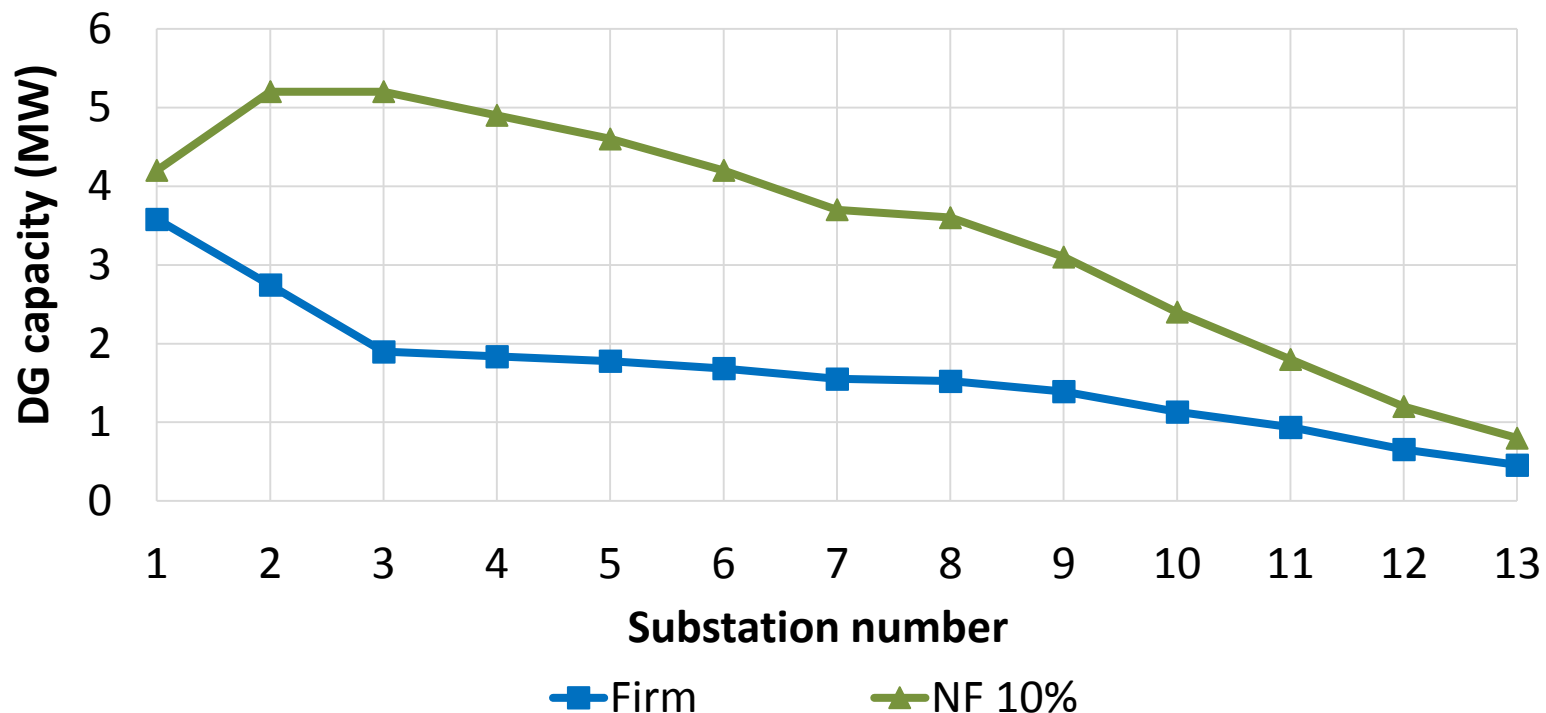
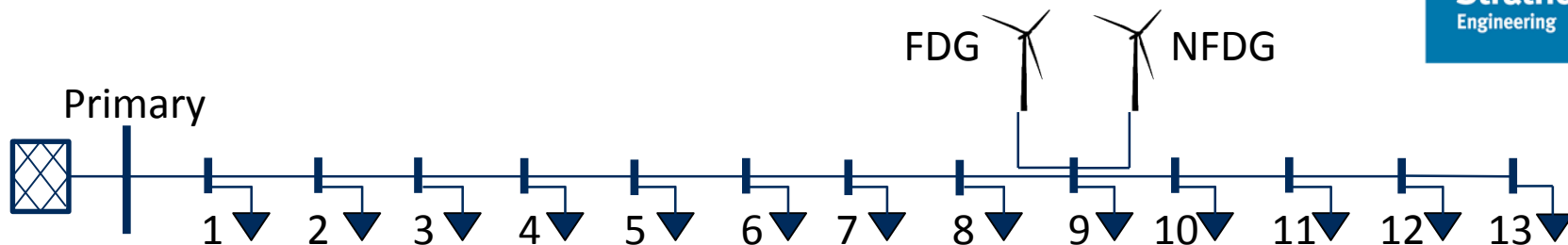


How does the additional demand at one substations affect DG capacity at other substations?

The effect of non-firm connection agreement



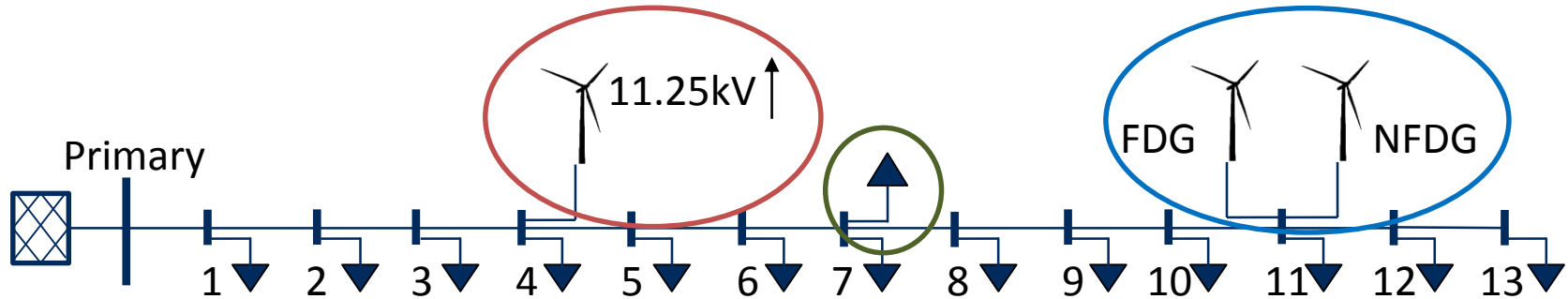
The effect of non-firm connection agreement



Conclusions

Greater capacity at any substation that is voltage constrained.

Increase in the capacity in the middle regions of the feeder.



Additional capacity if demand is connected either at the same location or further away from the primary.

Thank you for listening!



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