EV, grids & Smart charging

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Thijs Turèl
Assetmanagement Liander

Beheert het netwerk voor gas en stroom

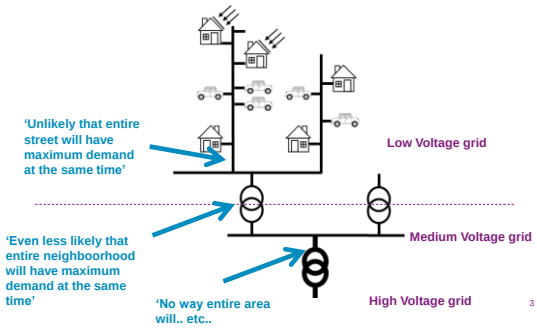
Liander

- DSO
- 4,7 mln connections
- Reliable and affordable grids
- "Enable rise of EV"

Liander
Elektriciteit en gas
Elektriciteit
Gas

Endinet
Gas
Elektriciteit en gas

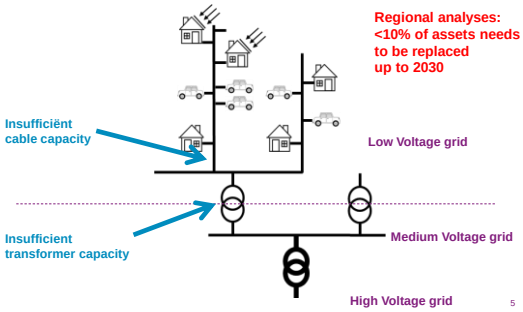
Grid dimensioning



What is the problem?

- EV charging takes place at grid peak times
- EV charging draws high currents (16A and up)
- For an extended period of time

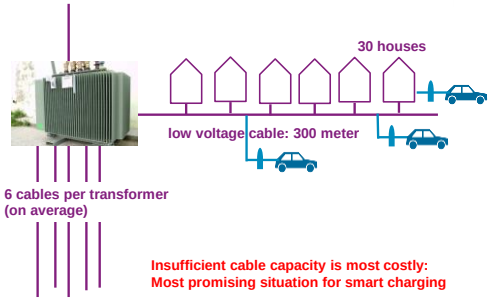
Possible bottlenecks



Most promising situation for smart charging

Prevent the need to replace an expensive cable

A grid situation



Insufficient cable capacity is most costly:
Most promising situation for smart charging

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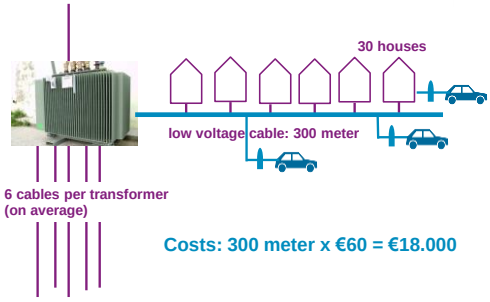
Solution 1: replace cable



Costs: 300 meter x €60 = €18.000

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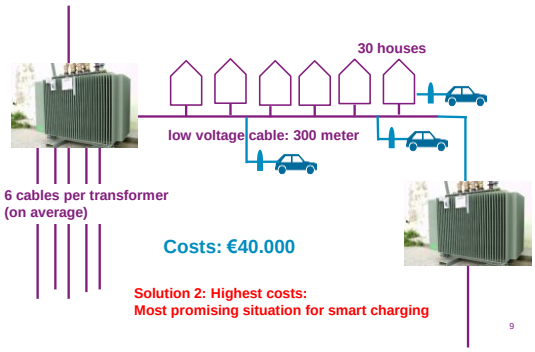
Solution 2: add substation



Costs: €40.000

Solution 2: Highest costs:
Most promising situation for smart charging

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Costs of solution

Replace substation	€40.000
/ 40 years (recovery period)	
Costs per year	€1000
/ 30 households	
Per household per year	€33

Implications for Smart Charging
< €40.000
-To implement a smart charging solution
-To incentivize people to participate
For 40 years.

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Conclusion

- Business case to implement Smart Charging in the entire grid solely to prevent Grid Congestion seems difficult
- Financial incentives (<€33 annually) seem meagre
- Smart charging needs broad societal business case

- DSO: apart from smart charging, more solutions are needed to keep the grid reliable and affordable

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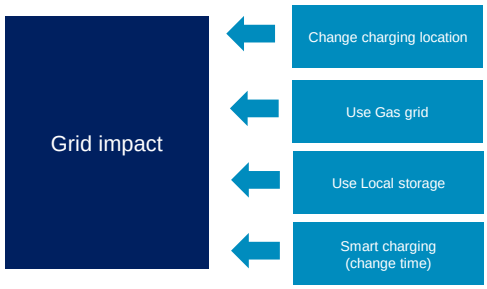
Different solutions



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Different situations – different solutions

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When do we have a grid problem?

Cable fuse: 37 kW per phase x 3 phases	111kW
domestic peak demand (assumption)	- 36 kW
Remaining capacity for charging	75kW
Seven cars (charging at 11 kW between 18.00-20.00)	77 kW

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