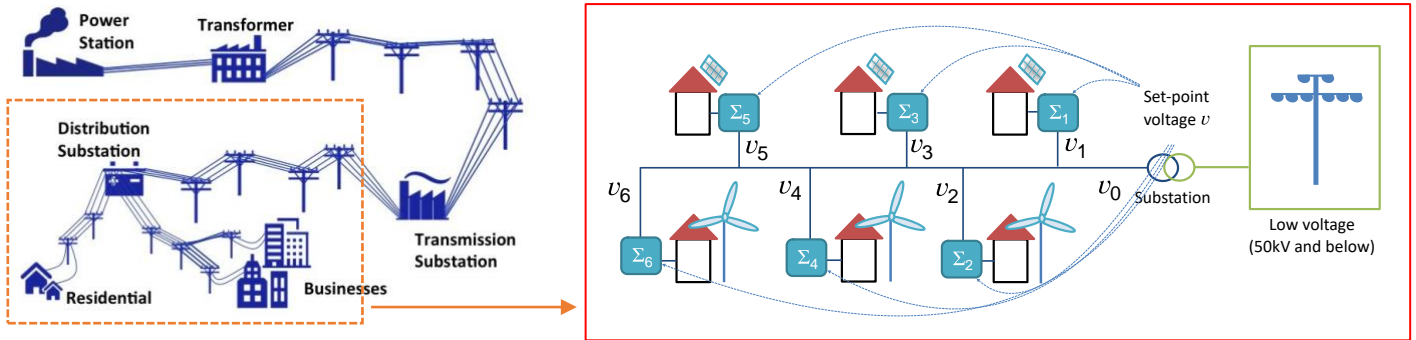


Resilient, distributed and modular designs for Smart Power Grids

Power distribution systems are receiving an increasing amount of local power generation, due to the incorporation of renewable energy sources such as wind and solar, as well as batteries such as electric vehicles. Consequently, customers who were once only consumers, are now also producers. This requires smart algorithms to guarantee that the system operates within safe regimes in a wide variety of circumstances.



Local controllers $\Sigma_i, i \in \{1, \dots, N\}$ ensure that the voltages v_i are within a safe margin

Projects in this area include:

1. Modelling of the power distribution network to include batteries.
2. Distributed controller design.
3. Scalable and modular controller design.
4. Resilient system design in the presence of data corruption, communication outages and hardware failure.

Related work can be found here:

1. M. Chong and H. Sandberg (2020) Adaptive voltage regulation of an inverter-based power distribution network.
Paper available at <https://arxiv.org/pdf/2005.04060.pdf>
Video presentation available at <https://youtu.be/tkzM6WHHLzQ>
2. M. Chong, H. Sandberg and J.P. Hespanha (2020)
Paper available at <https://arxiv.org/pdf/2008.12697.pdf>
Video presentation available at <https://youtu.be/AgAsFGmtCE>

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