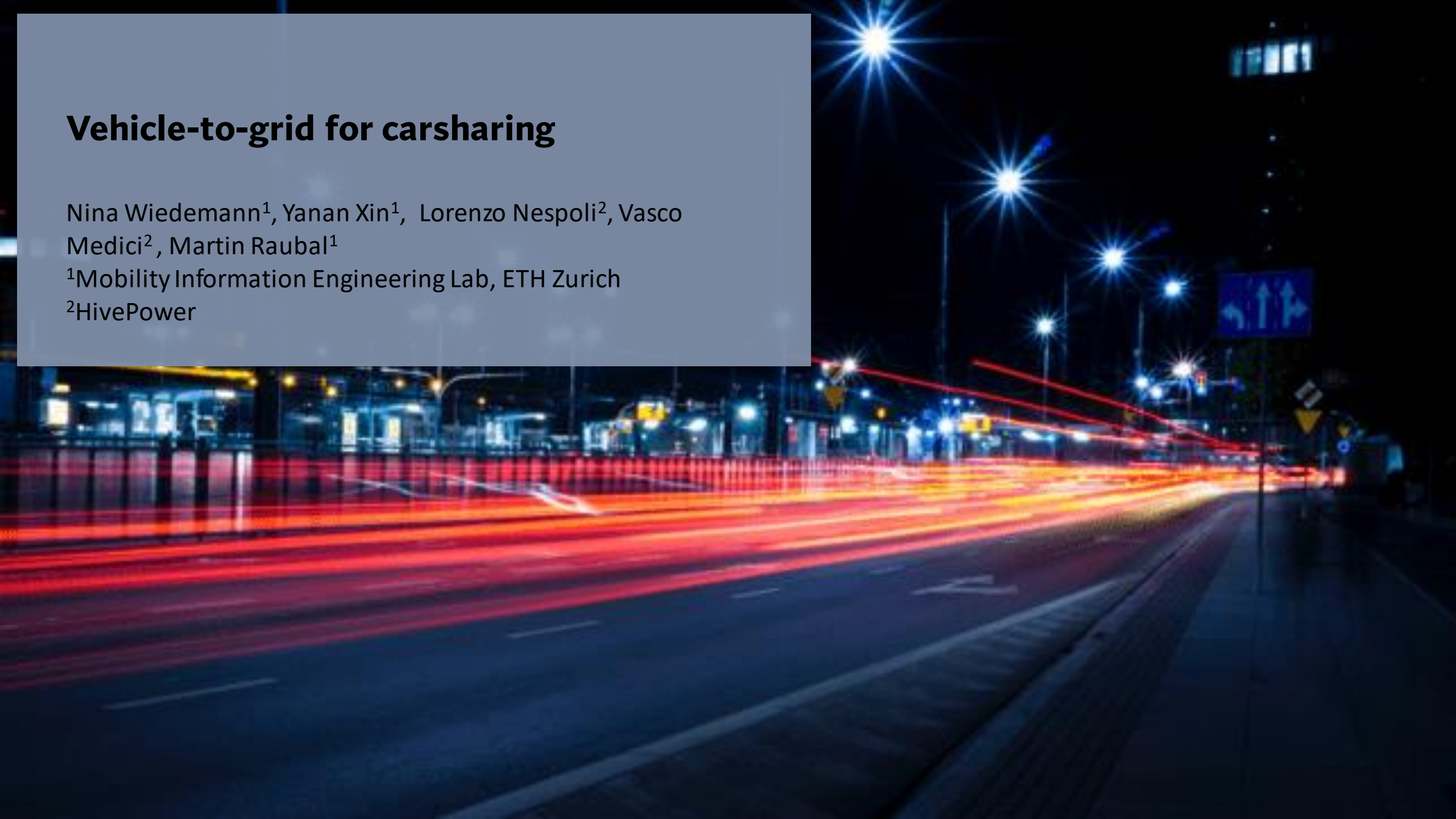


# Vehicle-to-grid for carsharing

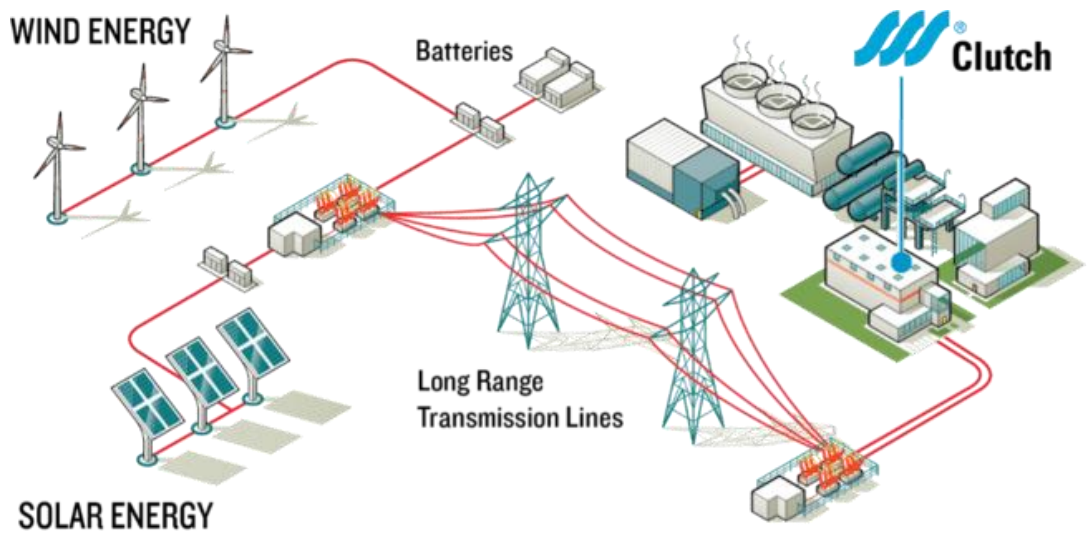
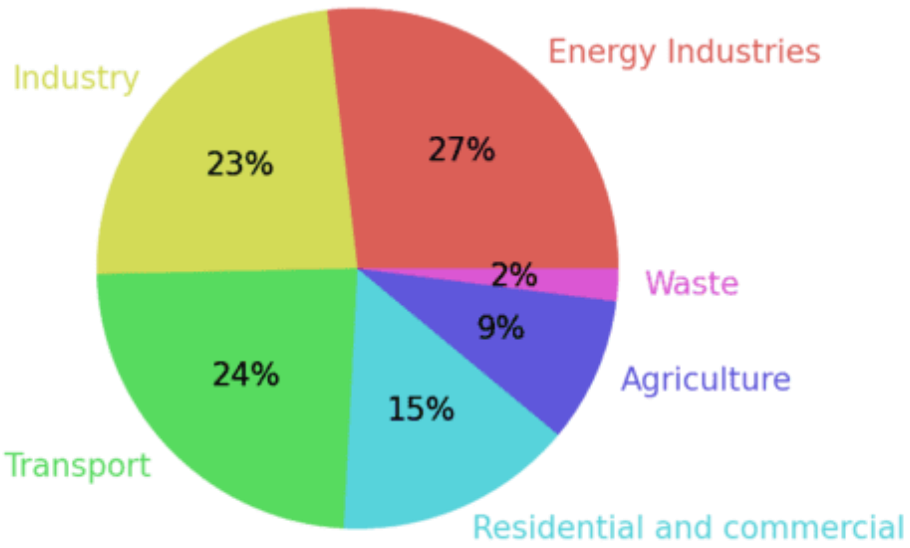
Nina Wiedemann<sup>1</sup>, Yanan Xin<sup>1</sup>, Lorenzo Nespoli<sup>2</sup>, Vasco Medici<sup>2</sup>, Martin Raubal<sup>1</sup>

<sup>1</sup>Mobility Information Engineering Lab, ETH Zurich

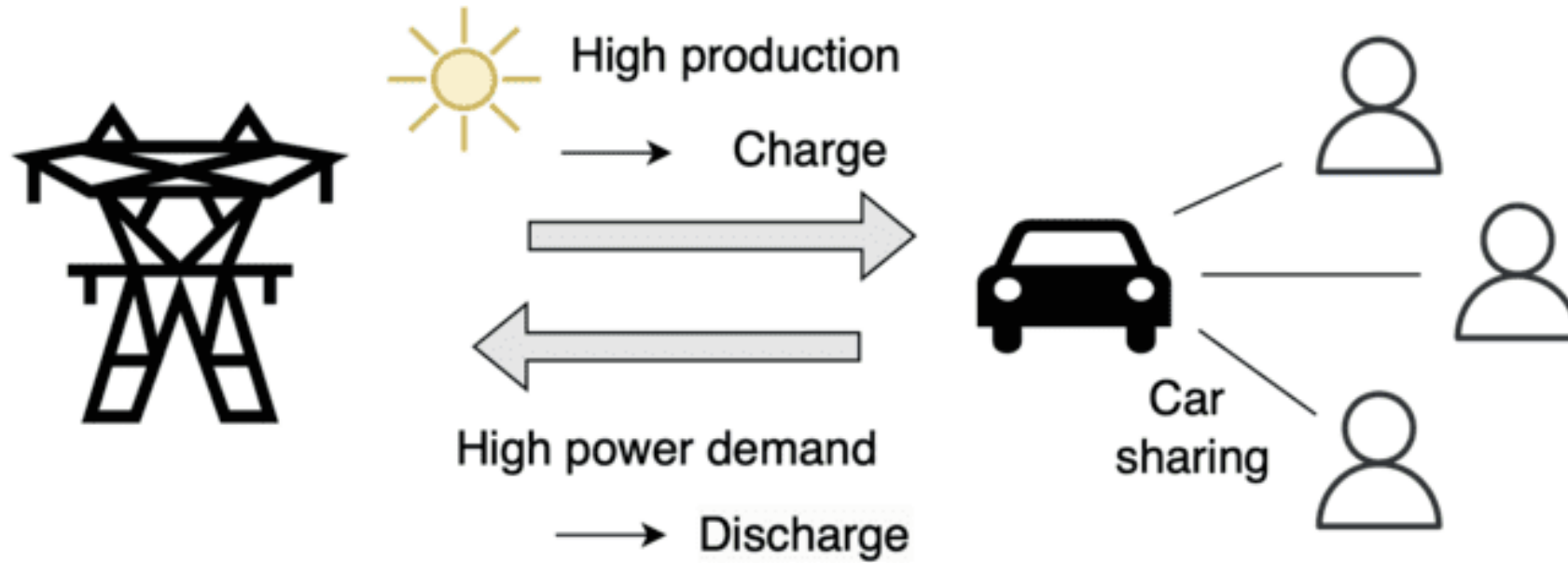
<sup>2</sup>HivePower



# High emissions in the transport sector & Risk for power grid instability



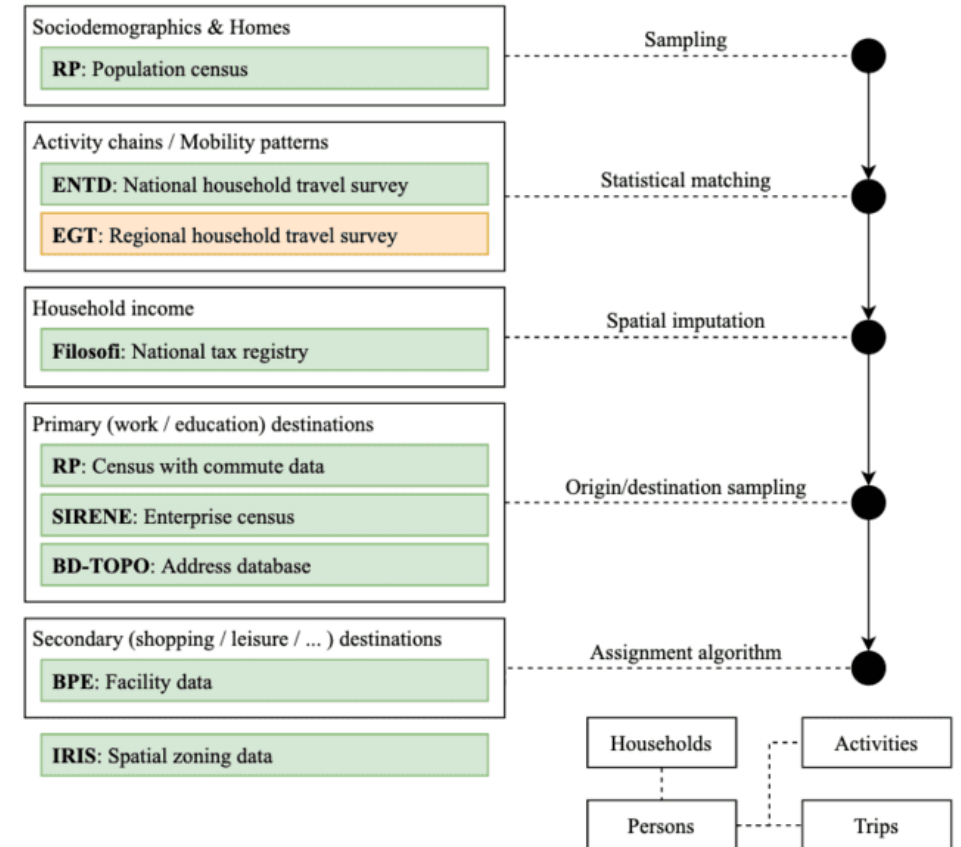
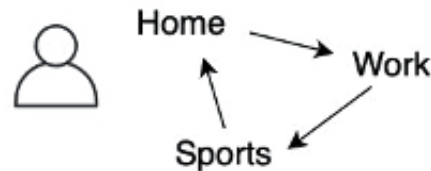
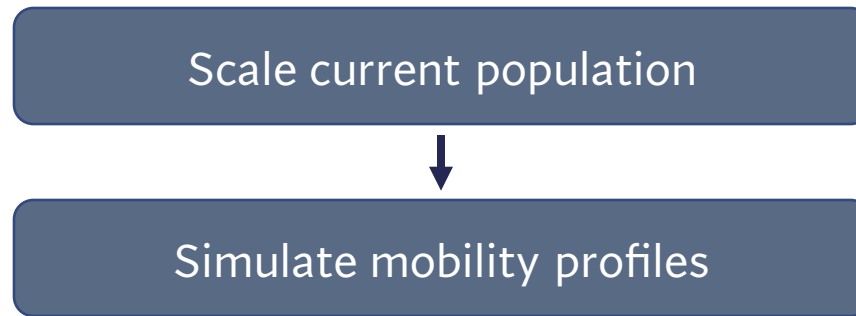
# V2G for car sharing



→ What is the potential for V2G in car sharing in 2030?

# Simulating future car sharing behaviour

Agent-based modelling approach:

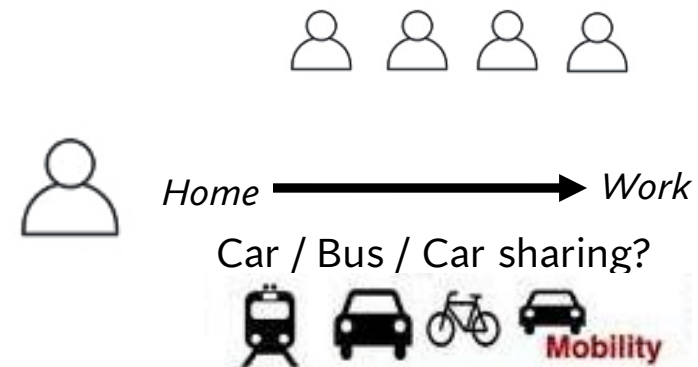
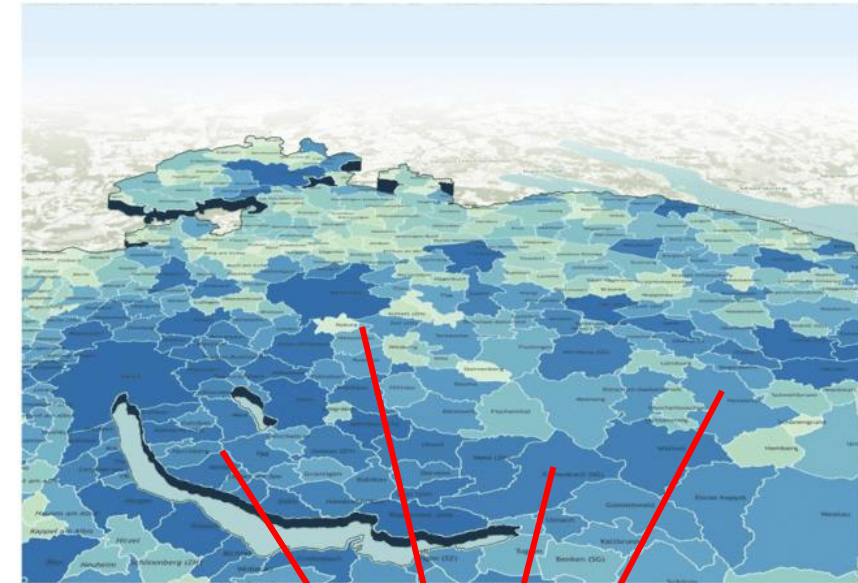
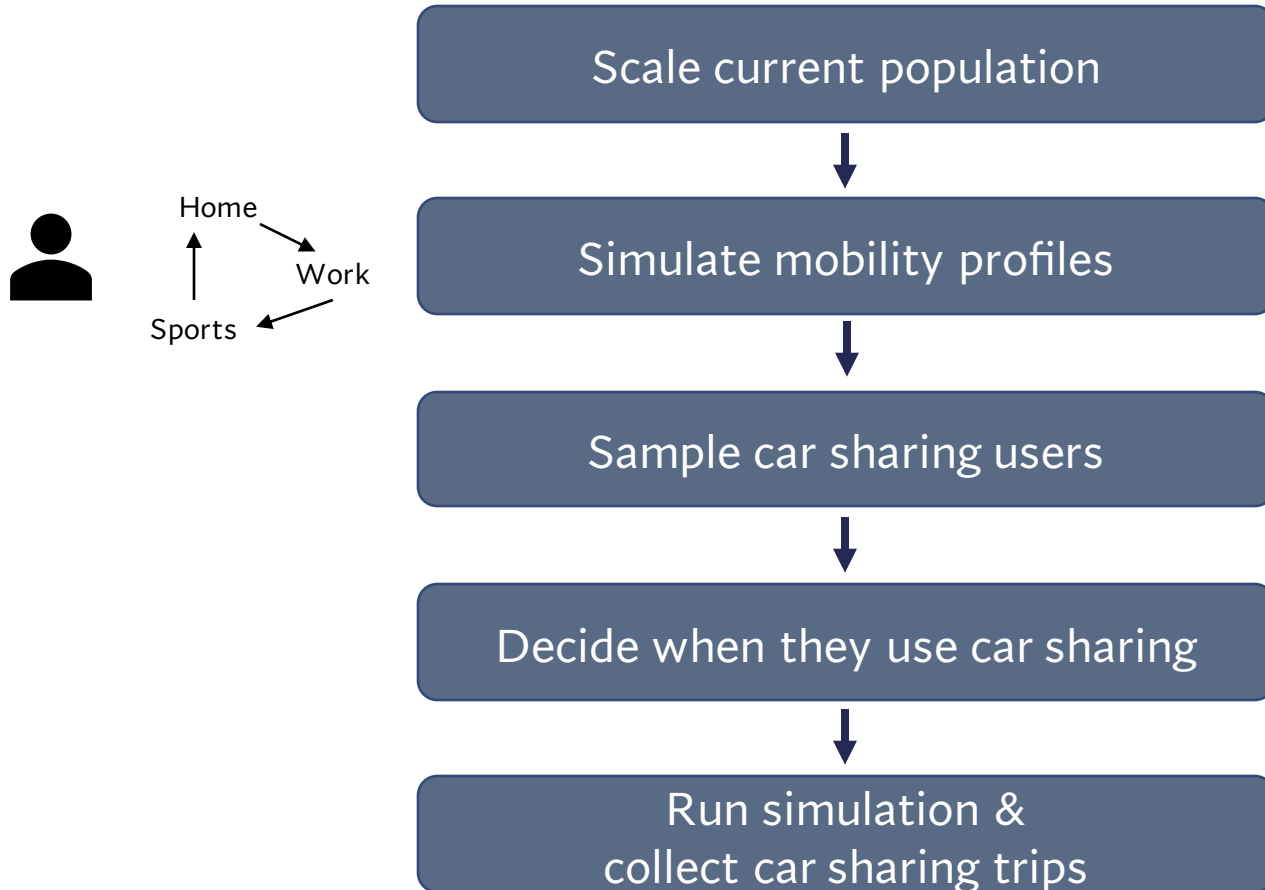


[1] Tchervenkov, Christopher, et al. "The Switzerland agent-based scenario." *Arbeitsberichte Verkehrs- und Raumplanung* 1802 (2022).

[2] Hörl, Sebastian, and Miloš Balać. "Open data travel demand synthesis for agent-based transport simulation: A case study of Paris and Île-de-France." *Arbeitsberichte Verkehrs- und Raumplanung* 1499 (2020).

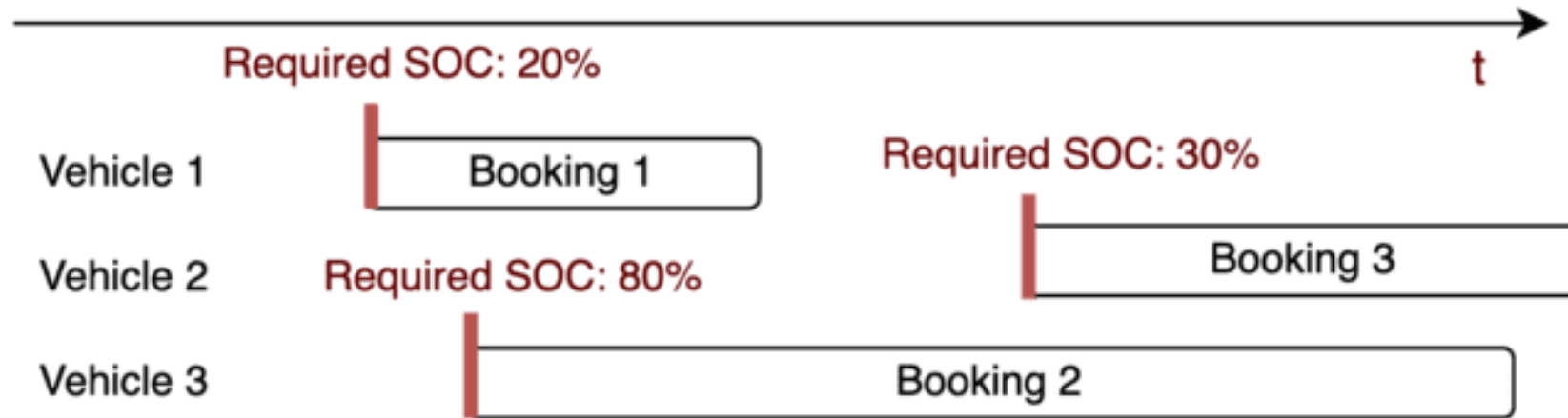
# Simulating future car sharing behaviour

Agent-based modelling approach:





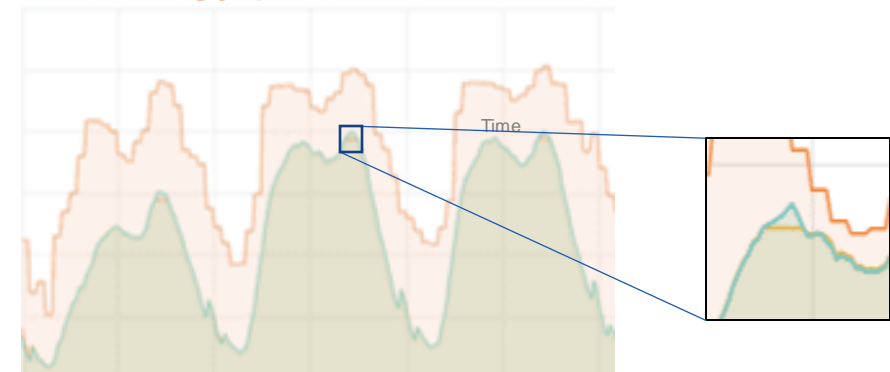
# V2G optimization



→ Maximize revenues / peak shaving effect

Under booking constraints

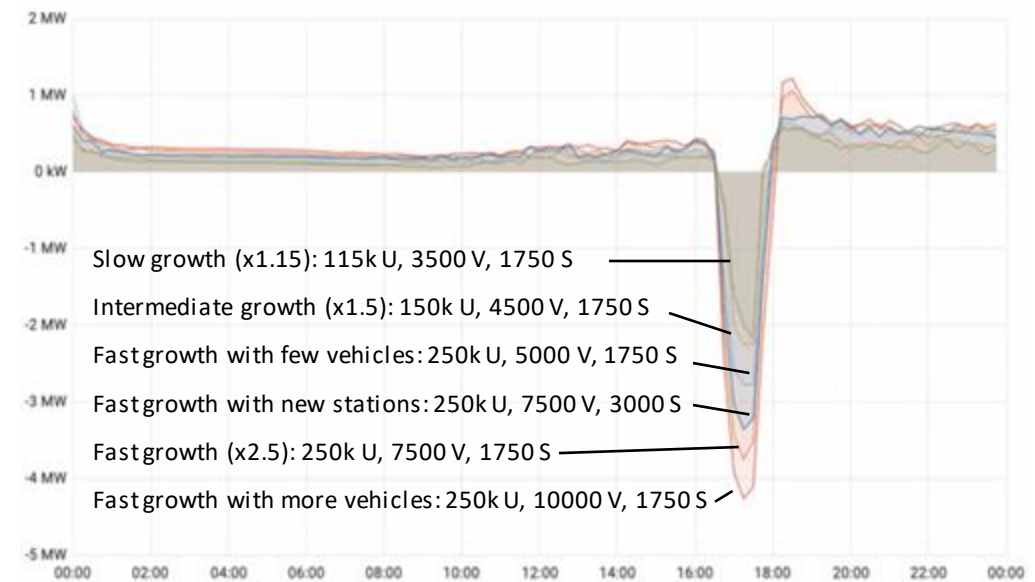
Energy prices Power demand



# Results

- Dependent on the scenario, different levels of peak shaving can be achieved
- Both car sharing fleet owner and grid operator can benefit

## Peak shaving event



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