

2030: 100% EV

Elsene



Molenbeek



2030: 100% EV

- Electric vehicles
- Charging infrastructure
 - Public parking
 - Electricity grid
 - Charging models
 - Renewable energy
- Autonomous driving & car sharing

SparkCity



2030: EV adoption and impact in real neighborhoods

Peter Hogeveen



- A team of 15 consultants with various academic backgrounds
- Fully dedicated to the acceleration of sustainable mobility
- Strategy consultancy, project management research & innovation
- Offices in the Netherlands and Belgium
- National and Global clients



A bottom-up modelling approach

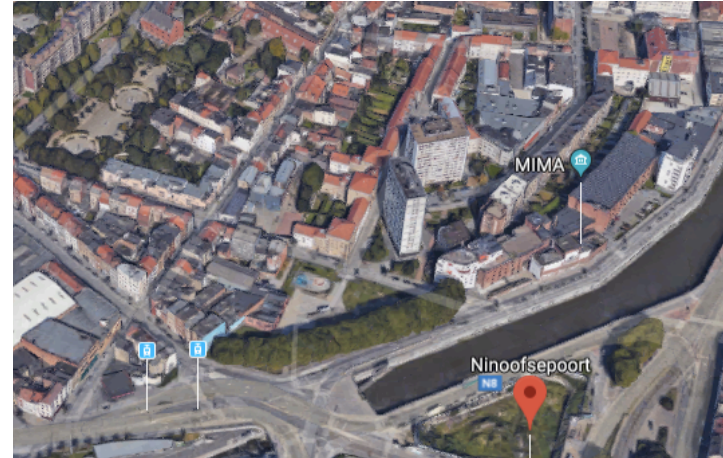


Agent-Based modelling

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'Sparkcity' simulates EV dynamics



Buying

- TCO calculations
 - Buying profiles
- Calibrated with historical sales

Driving & Charging

- Commuters, visitors and residents
 - Dutch driving statistics
- Smart charging and V2G models

Infrastructure

- Charging infra & roll out policies
 - Electricity grid & loads
 - Public parking
 - Solar panels

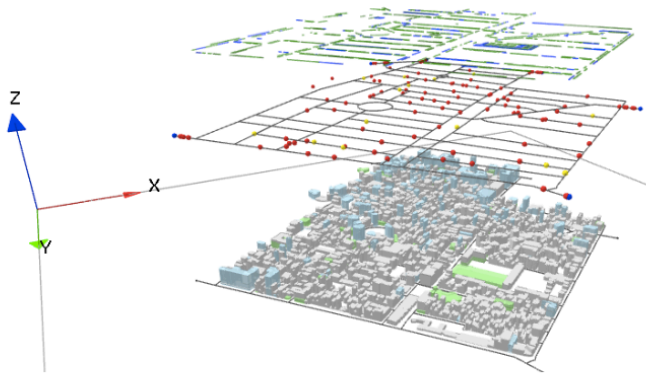


Figure 15: Example simulation of neighbourhood in the Hague. Bottom layer contains buildings, middle layer EVs on the road network (charging EVs are yellow) and top layer parking places (green if available)

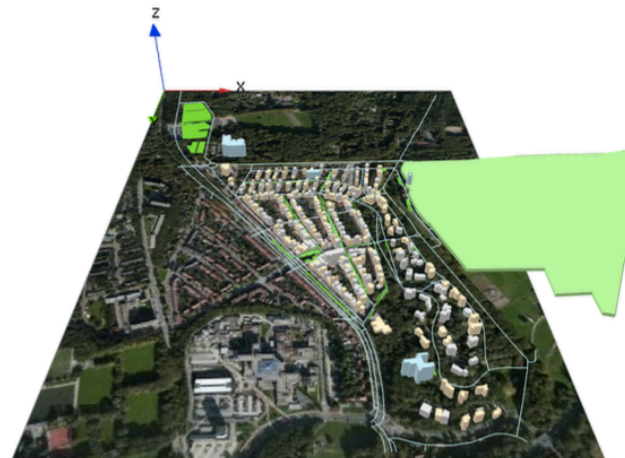
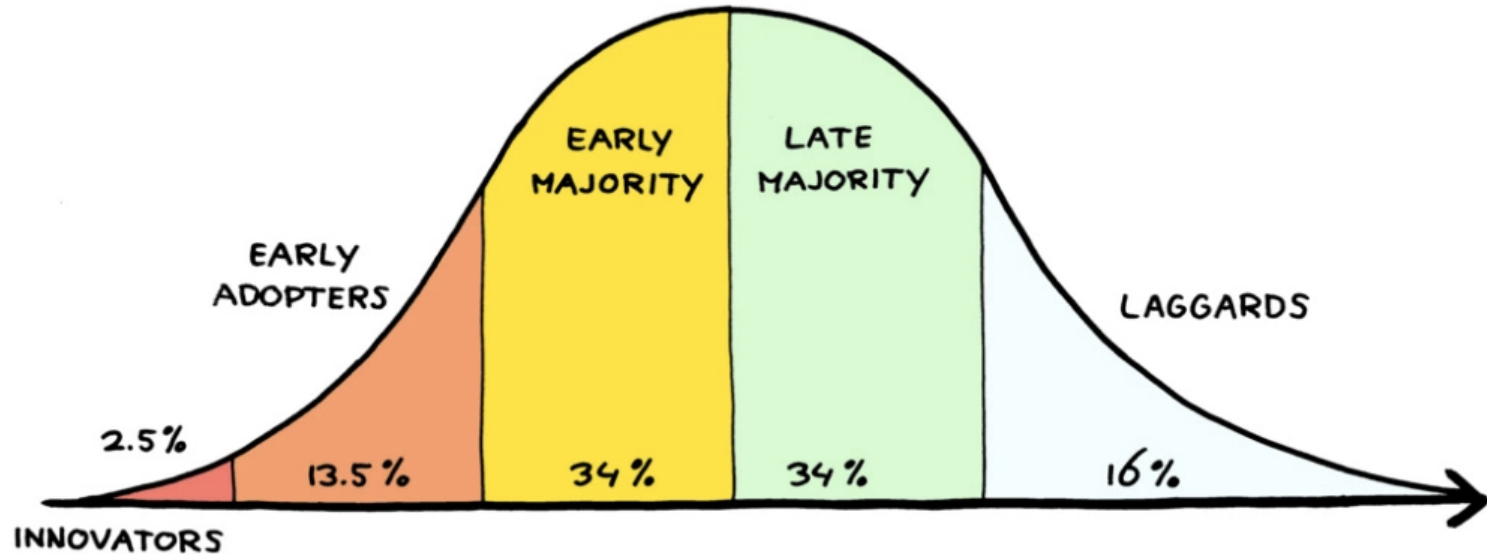


Figure 3: Imported neighbourhood from the city of Arnhem on top of a layer from Google earth.

The majority adopts innovations when financially attractive



Vehicle TCO calculations take many factors into account



Fuel costs	Maintenance costs	Vehicle class	Residual value
Fuel efficiency	Purchase subsidies	Luxury level	Battery capacity
Yearly mileage	Tax rebates	Vehicle power	Battery pack costs
Income	Lease or private	Discount rate	Ownership period

Total Cost of Ownership (TCO)

The power of agent-based simulation lies within modeling heterogeneity

Non-financial factors play a large role in EV adoption



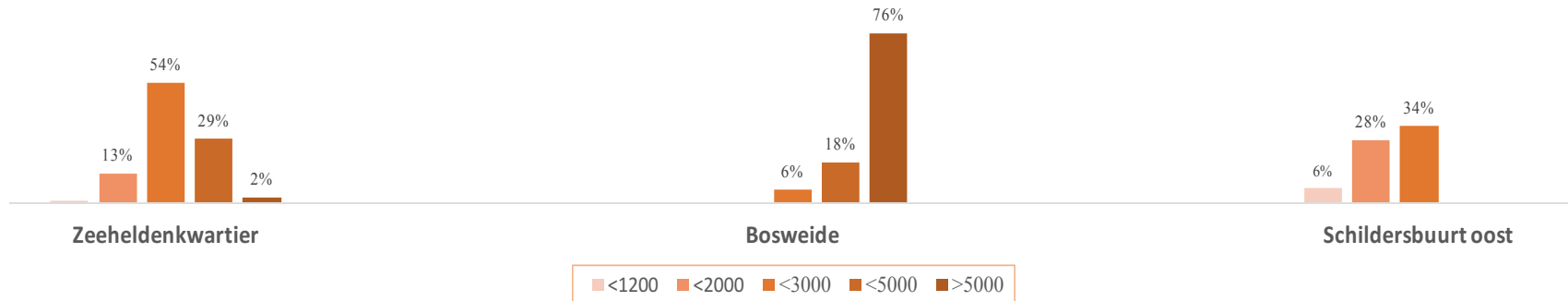
- Brand and drive-train preferences
 - Driving range
- Charging infrastructure
 - Charging process
- Limited model choices for EVs
 - Limited EV stock



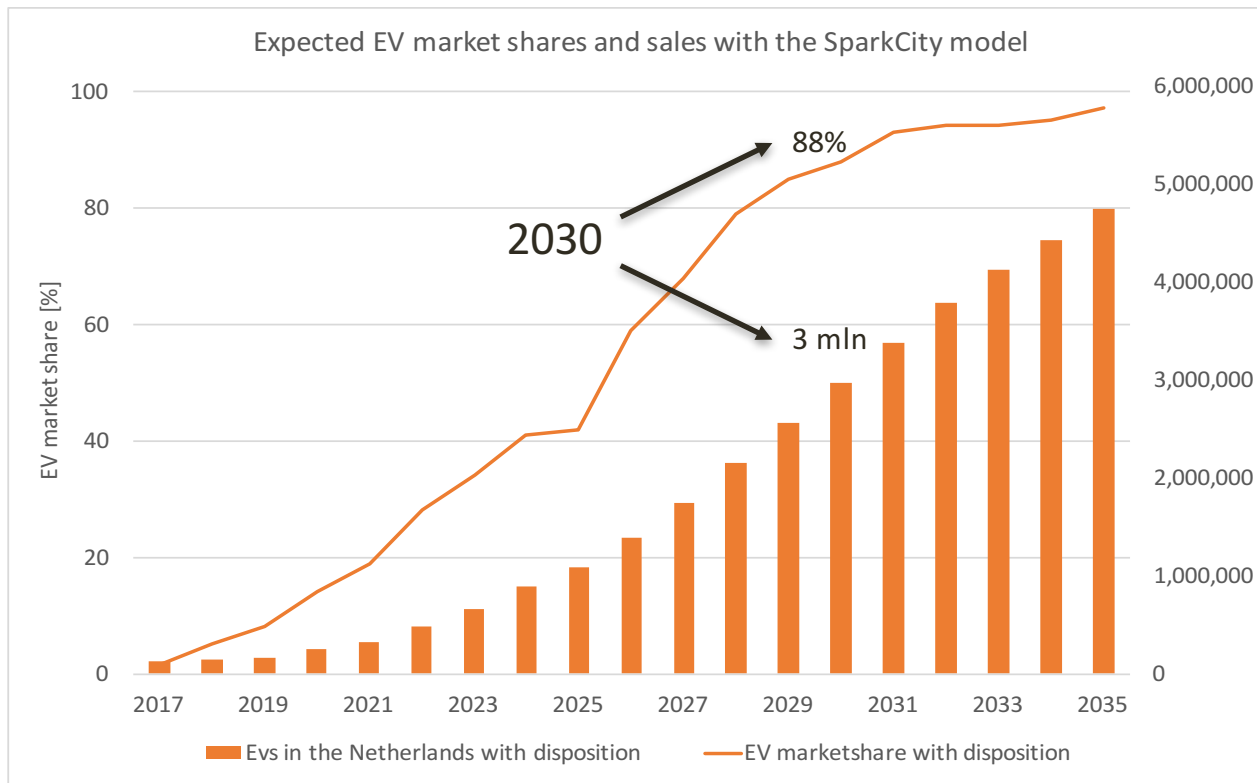
Open data characterizes real neighborhoods



Income distribution per neighborhood



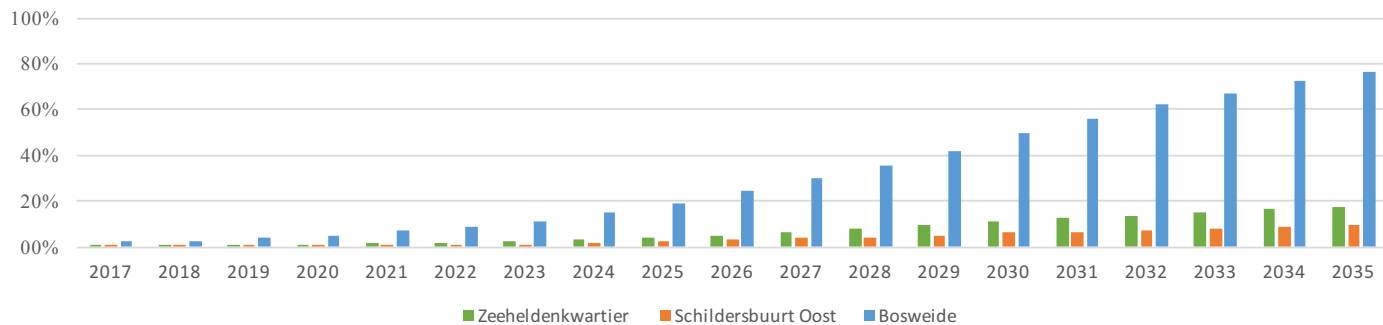
88% market share by 2030



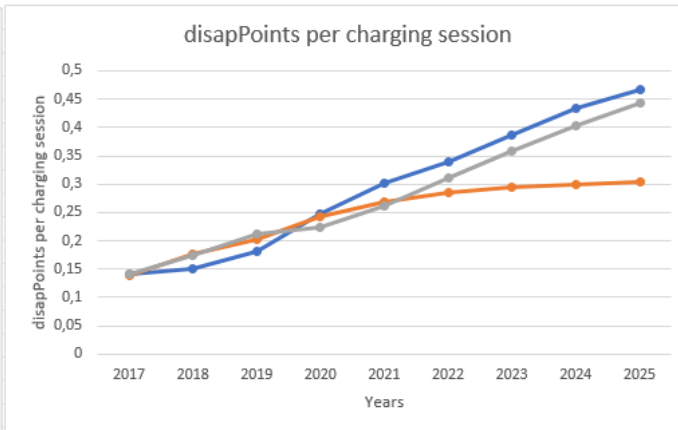
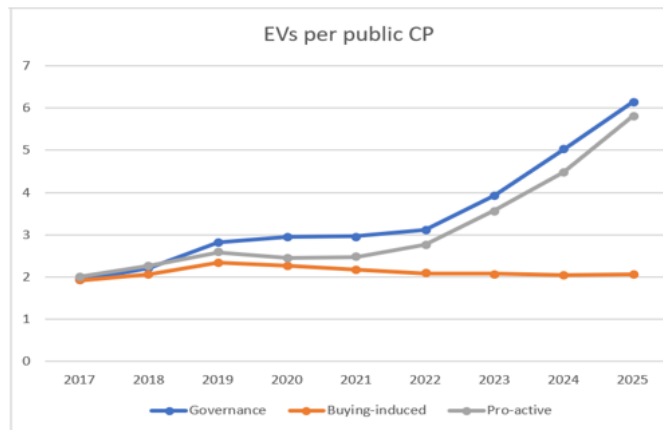
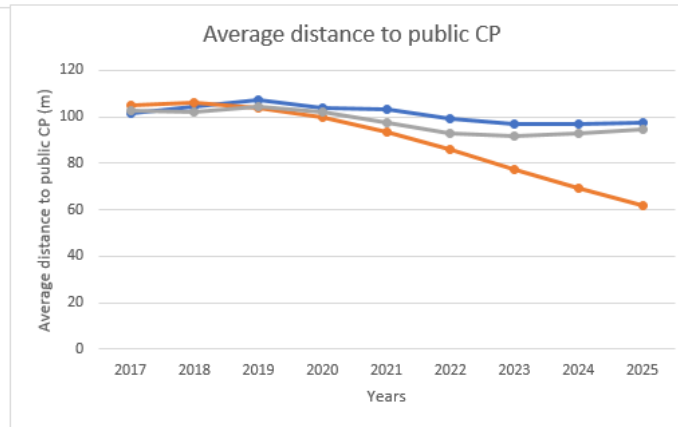
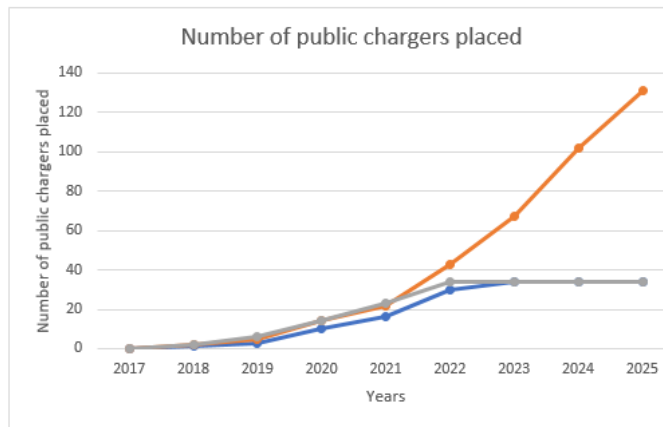
The adoption varies per neighborhood



Percentage of households that own an EV



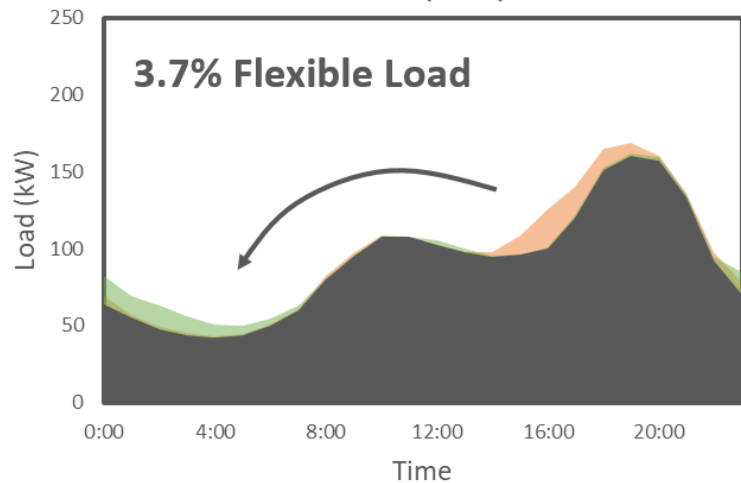
Roll-out policies and performance of charging network



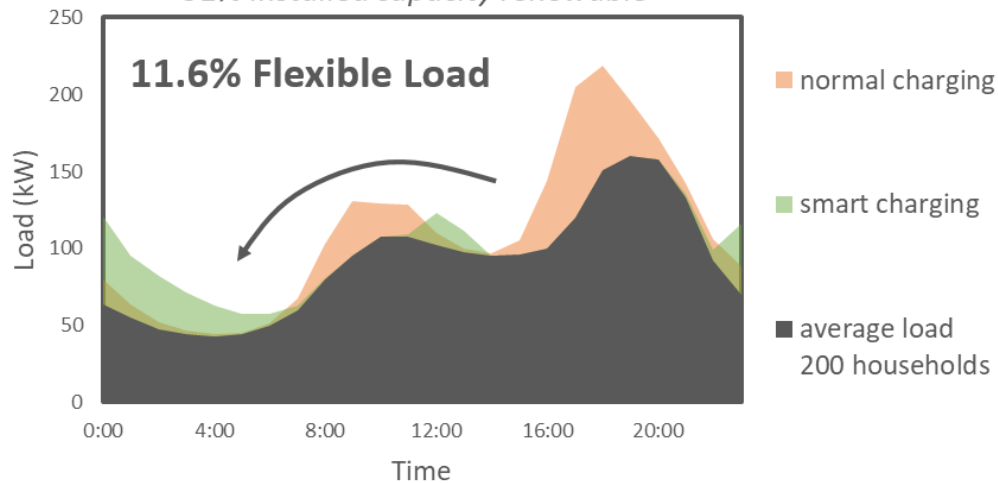
Smart charging analysis shows the load flexibility



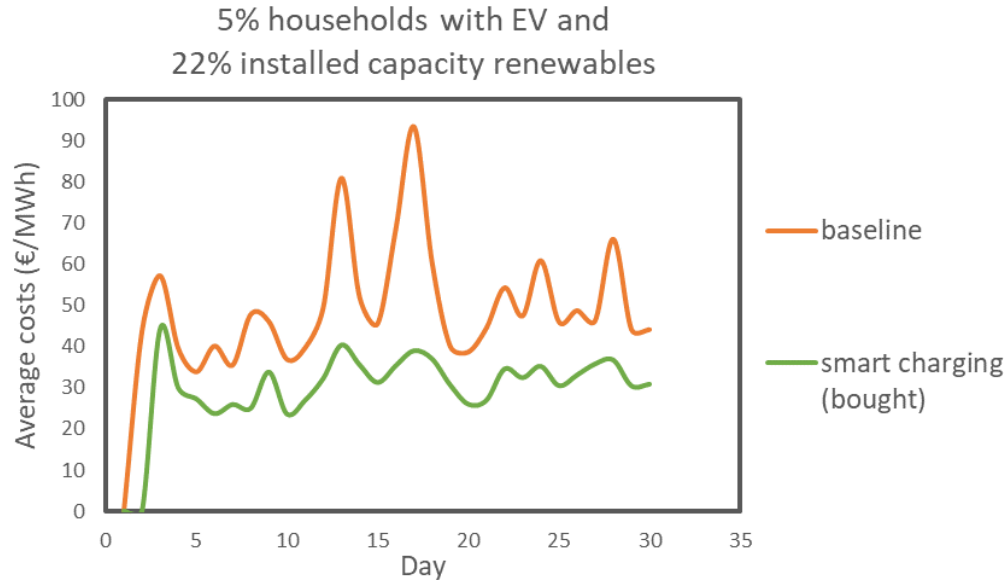
*5% households with EV and
22% installed capacity renewable*



*20% households with EV and
51% installed capacity renewable*



Cost savings for an aggregator can be calculated



38% savings → 6.9 €/month per EV

SparkCity

Shaping the future of energy, mobility, and smart infrastructure



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