SparkCity

predicting the future of energy and mobility from the bottom up

An agent-based model using GIS maps that creates rich “quantified narratives”

It includes:
- Thousands of unique agents (humans, machines and real estate)
- Realistic travel patterns
- Spatially accurate representation and interaction
- Learning curves for batteries, drivetrains, solar panels and more
- An approach where the system can emerge (and change) from the bottom up
- Monitors that can observe transition pathways in detail

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SparkCity agents live in an environment based on real maps

SparkCity can use GIS maps of actual physical infrastructure (buildings, electricity grid, parking places, charge points etc.) and inhabitants with specific demographics and behavior. On this canvas you can play out complex and integral scenarios with realistic interactions.

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Using agent-based modelling, SparkCity can model thousands of unique agents

For each agent the factors that determine e.g. financial attractiveness of EVs are different
These are just some examples of the variables that have been taken 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)

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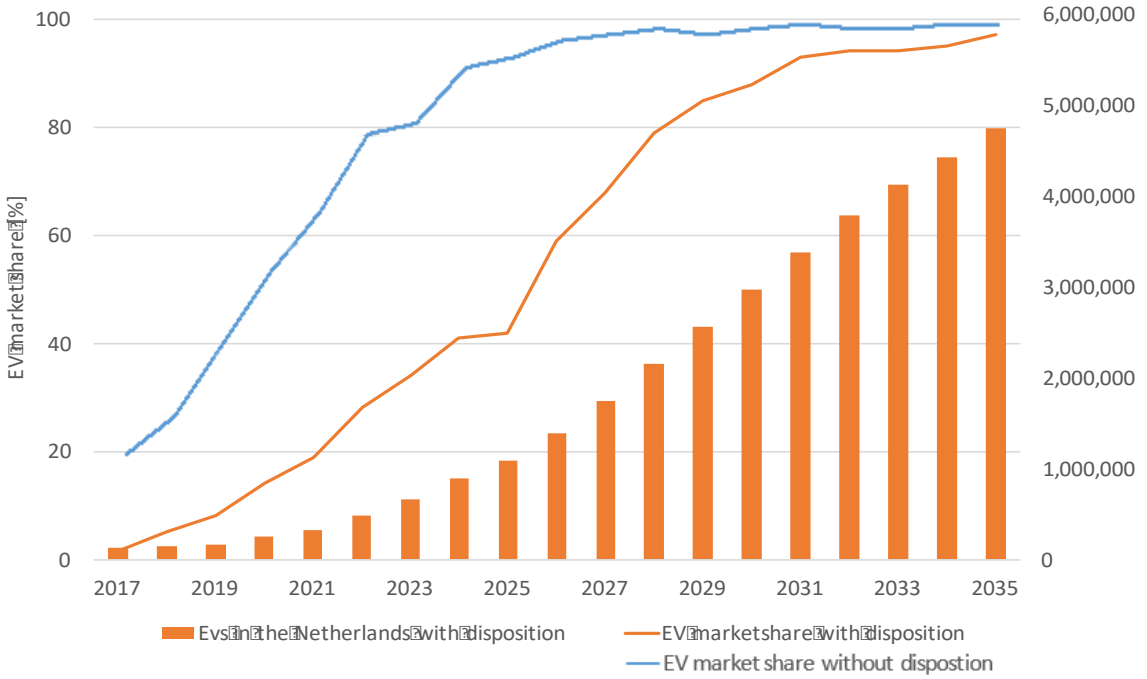
SparkCity can predict behavior like EV buying in a fine grained and realistic way



Difference between blue and red line takes non-financial reasoning in car purchases into account through a disposition factor. E.g.:

1. Limited model choices for EVs
2. Limited EV stock/production
3. Psychological factors (brand and drive-train preferences)
4. Limitations of EVs (range, charging infra)

Validity can be improved through market research into such factors.

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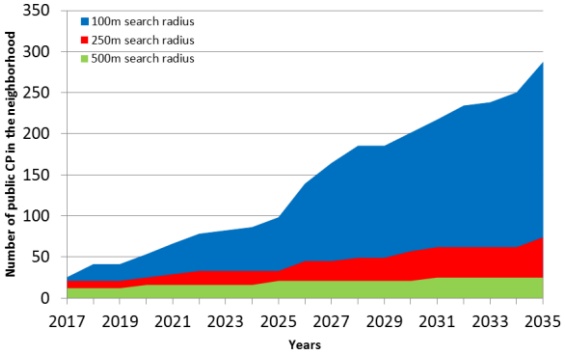
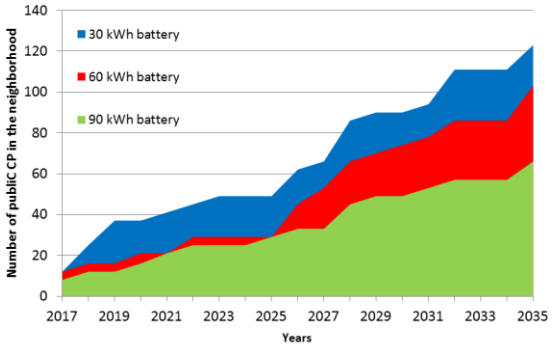
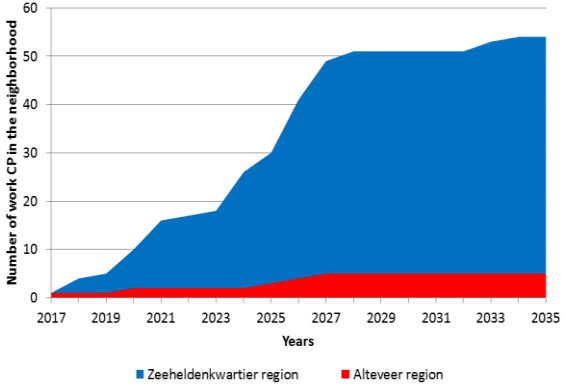
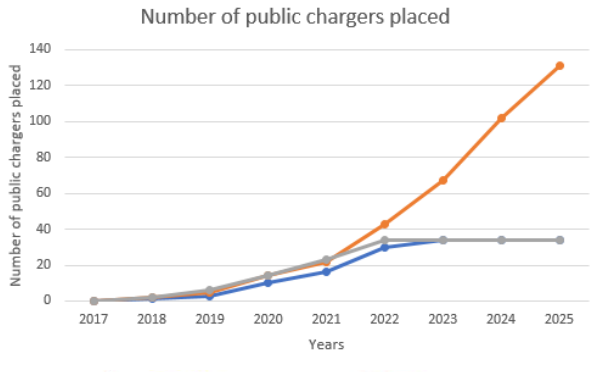
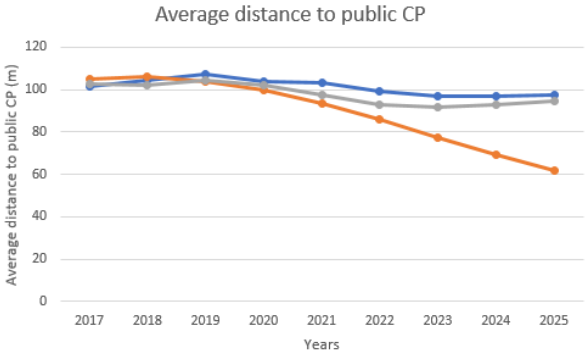
SparkCity can predict the number of charge points and their usage
Each charge point is monitored separately (e.g. every 15 minutes)











We can include battery state of charge in the charging behavior and monitor how often users are disappointed and how far they had to walk to home or work. There are big impacts of search radius (from the viewpoint of the municipality), battery size, neighborhood and placement strategy.

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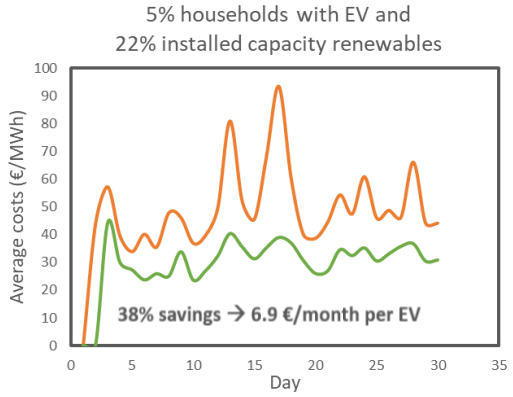
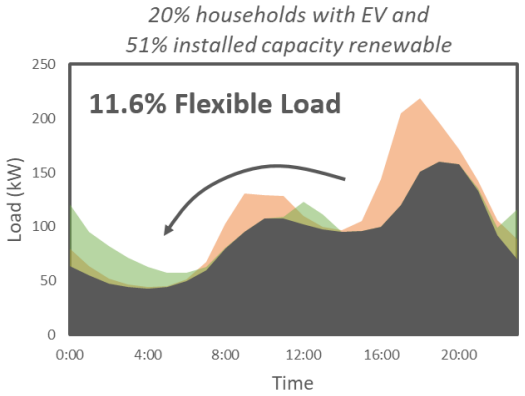
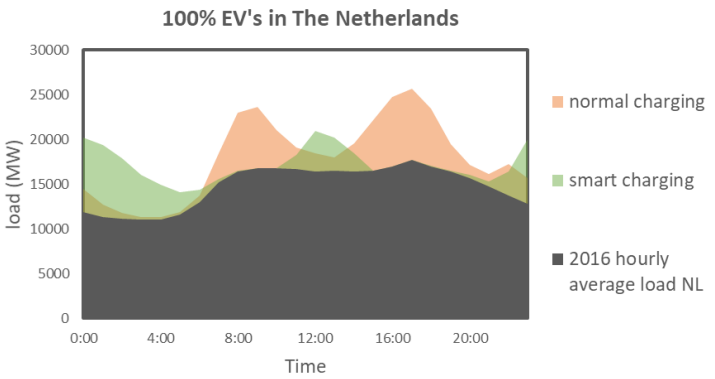
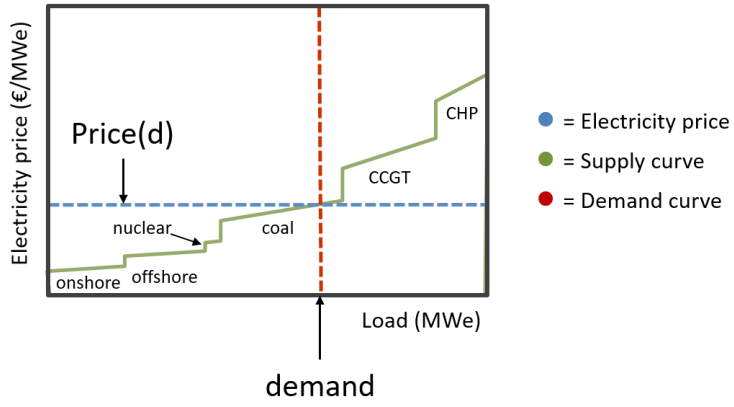
Impact on energy supply and grid can be modelled in detail
Including energy markets, individual grid elements et cetera









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