EV’s in Germany: stations and vehicles

Data Analytics - Mid Bootcamp Project

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Key facts about EV’s in Germany

- EV’s became available in Germany in 2015
- In 2016 the government set a goal to have between 7-10 million plug-in electric vehicles on the road and 1 million charging points by 2030
- By 2035, the EU fleet wide CO2 emission target for new cars and vans is 0g CO2/km
- Previously registered vehicles can remain in operation

Source 1

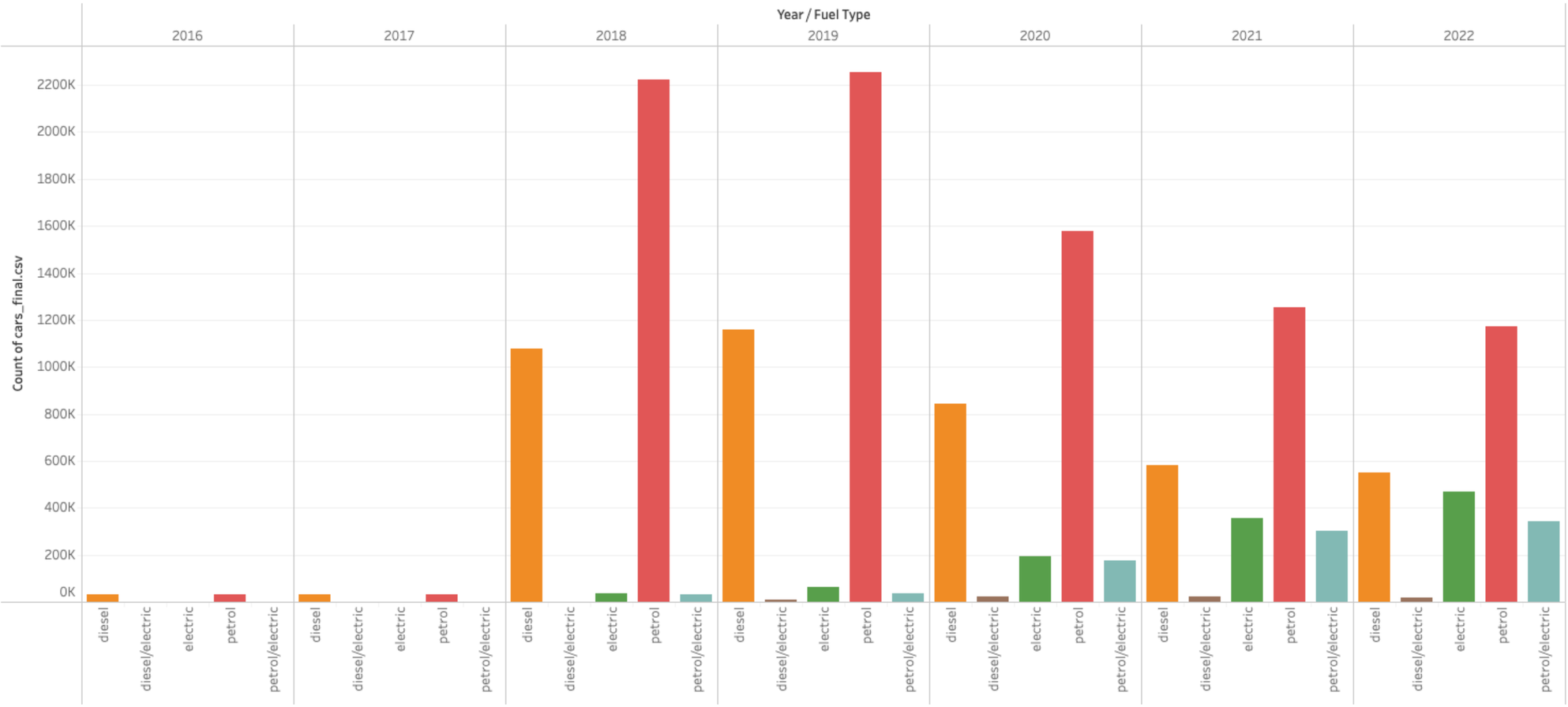
Project Goal

- Analyse the number and coverage of EV chargers
- Analyse the number of vehicles per fuel type
- Make projections until 2035
- **Hypothesis:** There will be enough chargers to cover the EV fleet in 2035

Source 1

Cars in Germany

- Car volumes per type of fuel



Charging stations explained

- Standard charging:
  - Level 2 power output: 33 kW (avg. in Germany)
  - Charing capacity per station: 15kW/h or 9 cars/day
  - Charging cap per year: 3,285 cars/year

- Fast charging (Super chargers):
  - Level 3 power output: 161 kW (avg. in Germany)
  - Charging capacity per station: 434 kW/h or 36 cars/day
  - Charging cap per year: 13,140 cars/year

Source 1

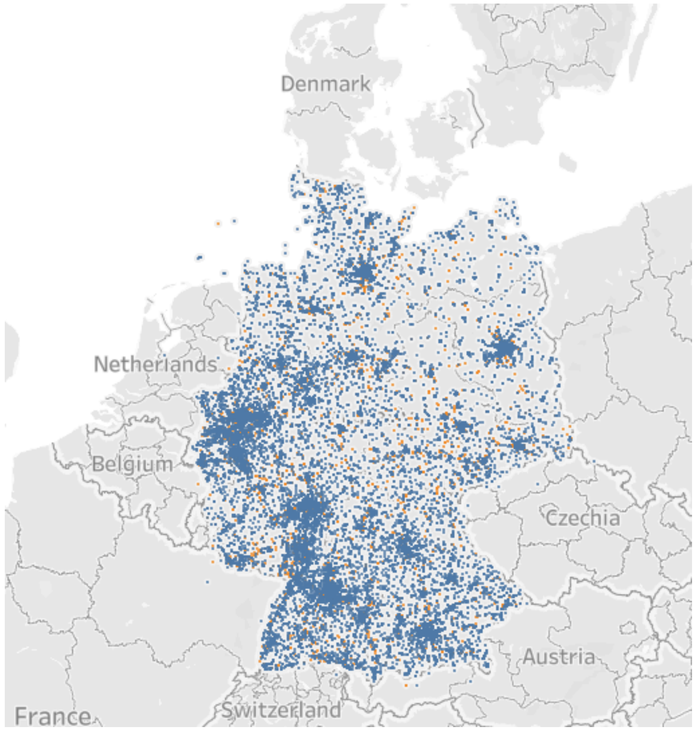
Charging requirement

- Average distance per vehicle per weekday: 64km
- Average distance per vehicle per weekend day: 80km
- Total distance per vehicle per week: 480 km/week
- Average EV driving range: 400 km —> the vehicle would need to charge 1.5 times per week or ca. **104 times per year**

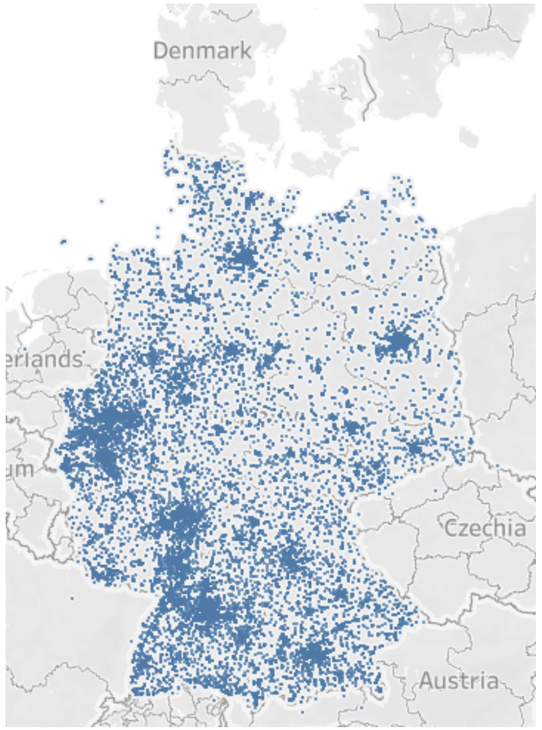
Vehicle usage is assumed

Charging stations in Germany 2012-2022

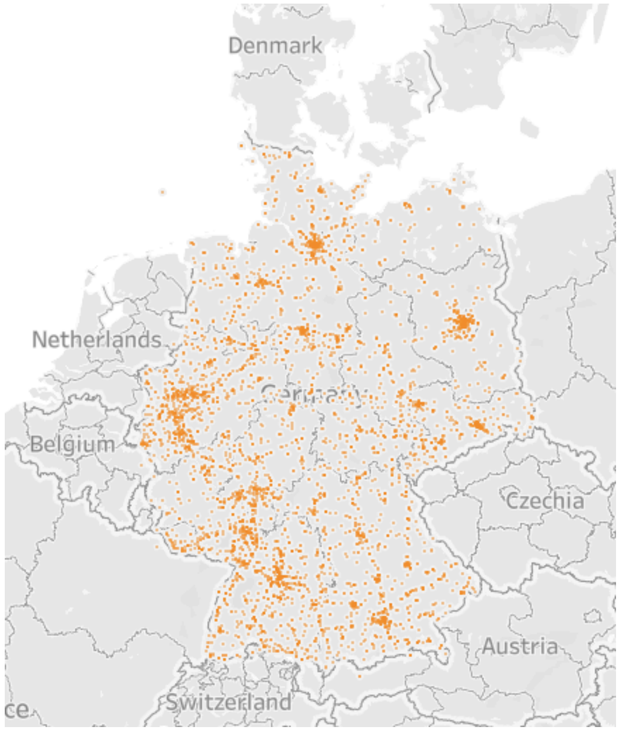
Standard and Super Chargers



Standard Chargers



Super Chargers



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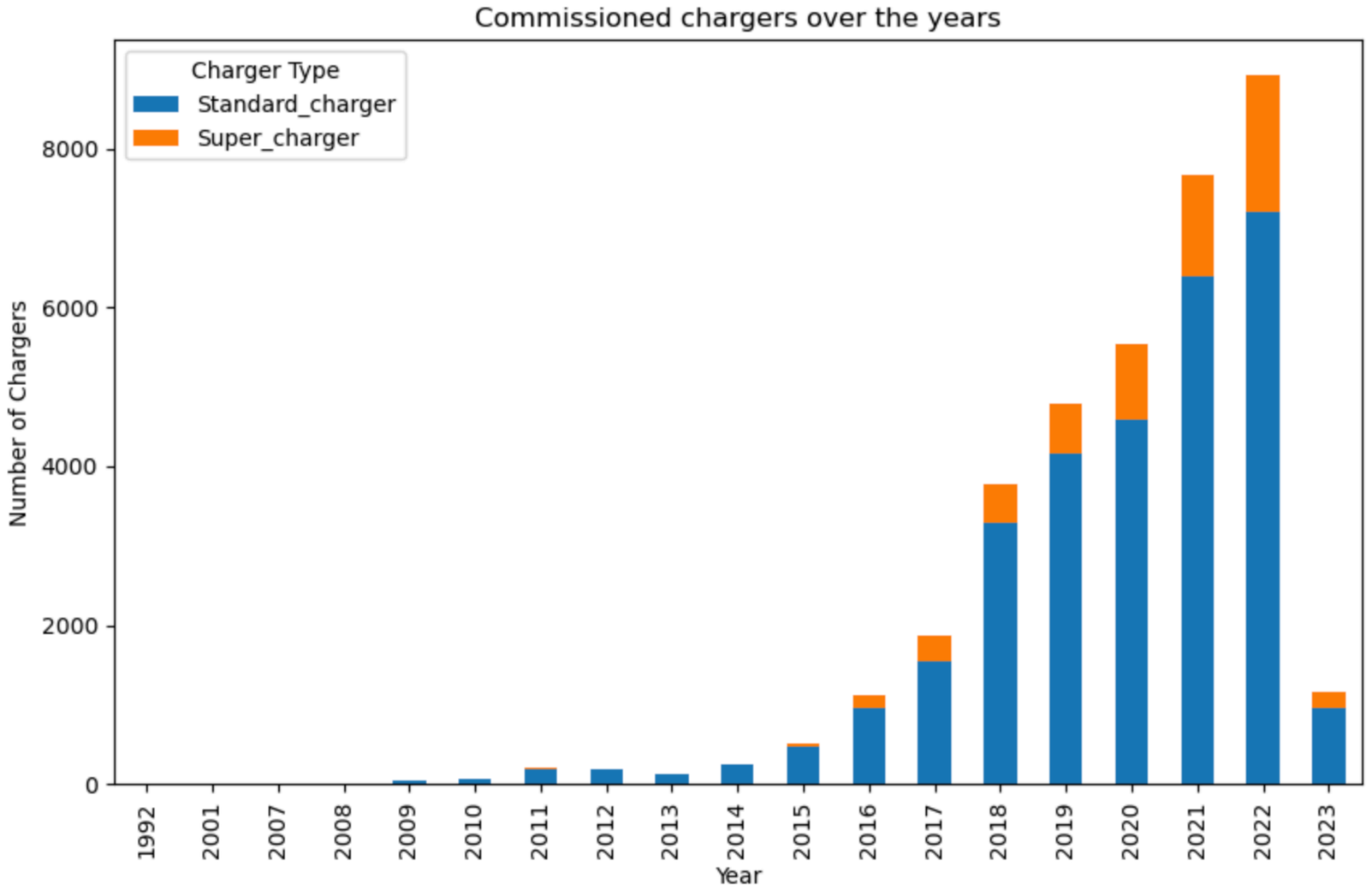
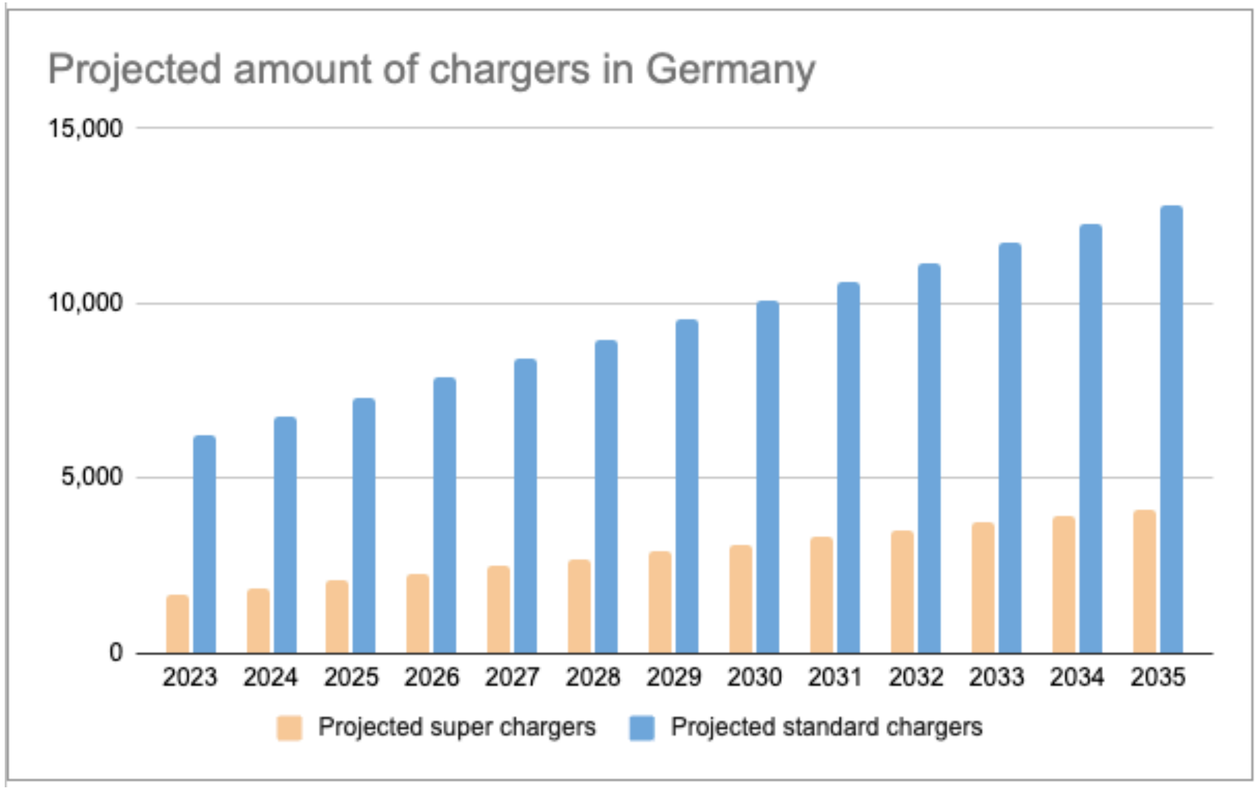
Charging Stations in Germany



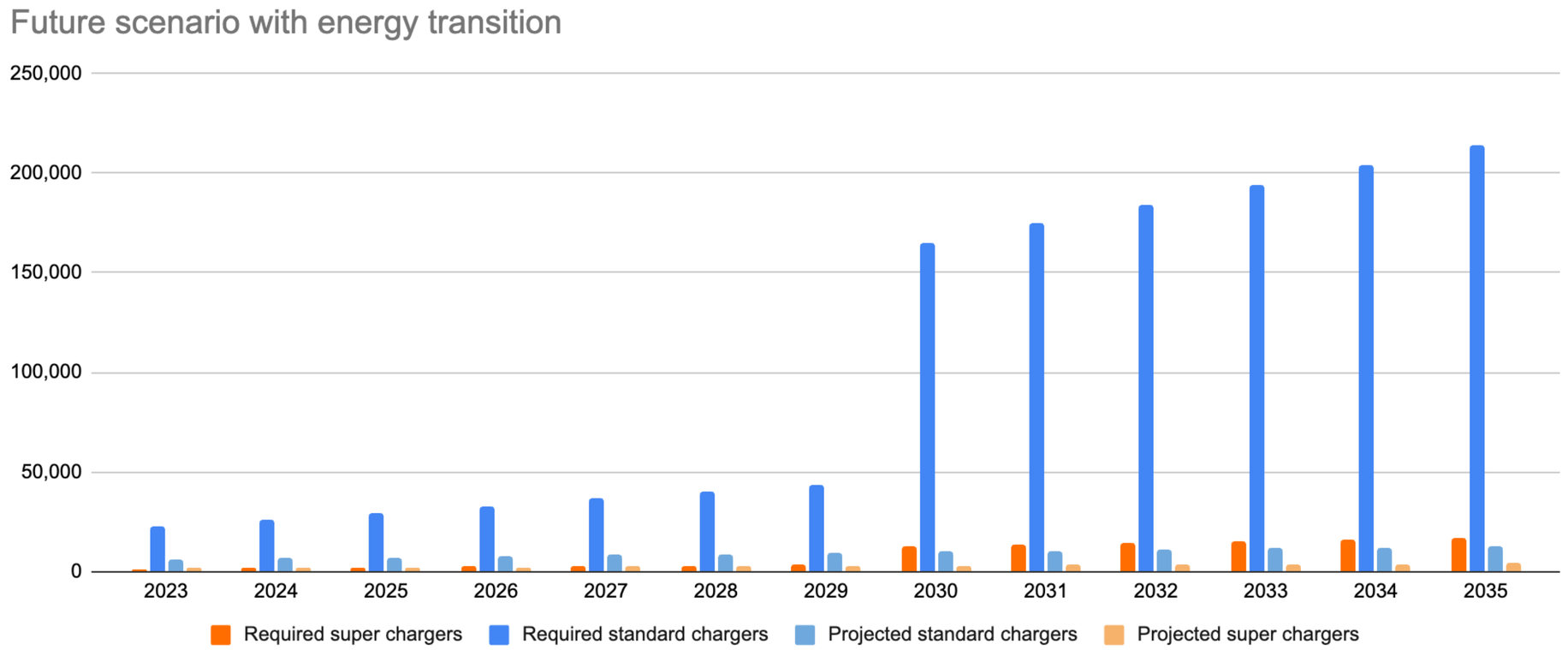
Charging Stations in Germany

- The following would be the amount of stations in Germany **if nothing changed:**
  - Existing proportion: 77% Standard vs. 23% Super chargers



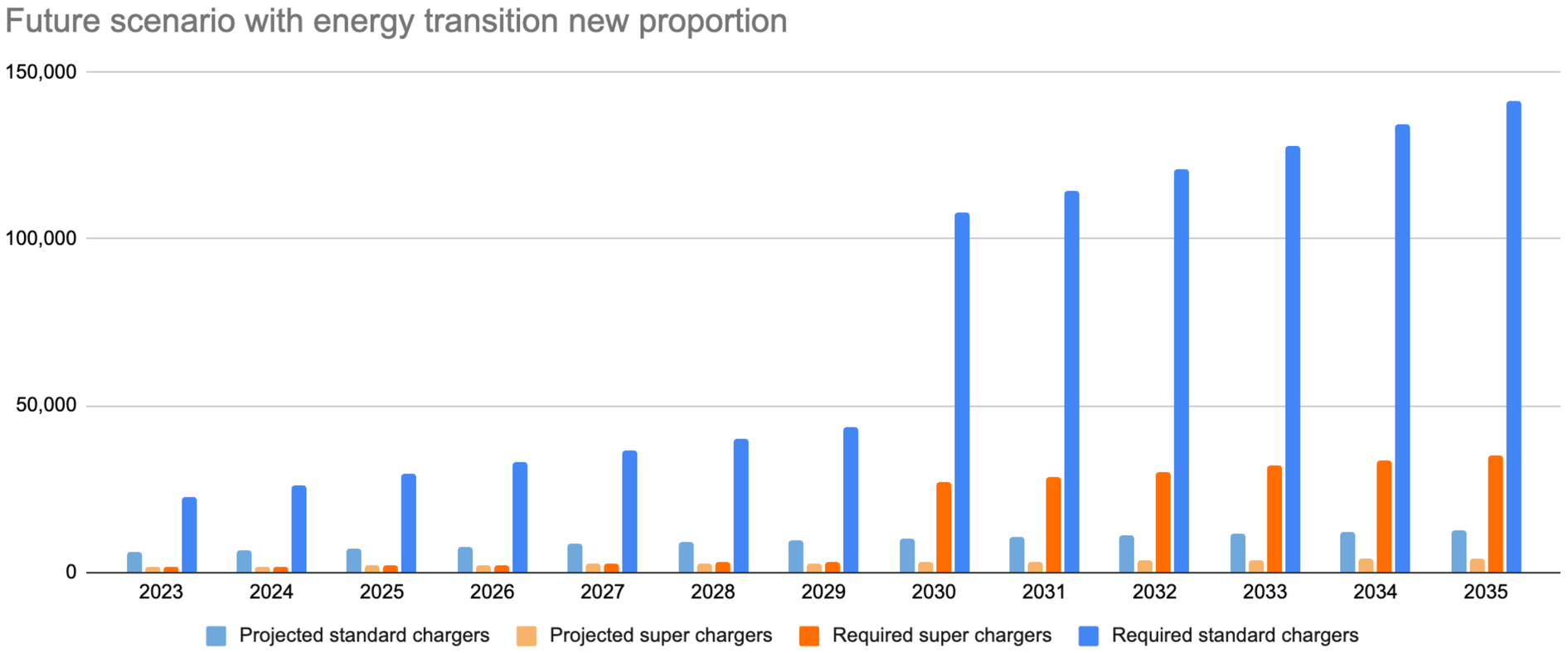
Charging Stations in Germany

- The following would be the amount of stations **required** in Germany **if the fossil fuel powered vehicles became electric:**
  - Proportion of standard and super chargers maintained



Charging Stations in Germany

- The following would be the amount of stations **required** in Germany **if the fossil fuel powered vehicles became electric:**
  - Proportion of standard and super chargers **changed** to 50%-50% after 2030



Conclusions

- The projected charging infrastructure **is not enough** to handle the amount of EV's and the petrol and diesel cars that are assumed to be substituted by EV's: **hypothesis rejected**
- The projected vehicle volume is **increasing**
- For users to switch to EV's the government or private owners need to make super chargers available
  - This represents a very interesting business opportunity for people that want to build charging stations
- However, this poses a question about the electricity grids, **do they have enough capacity?**
- **Overall recommendation: the government needs to provide better public transportation infrastructure, to decrease the overall car usage**