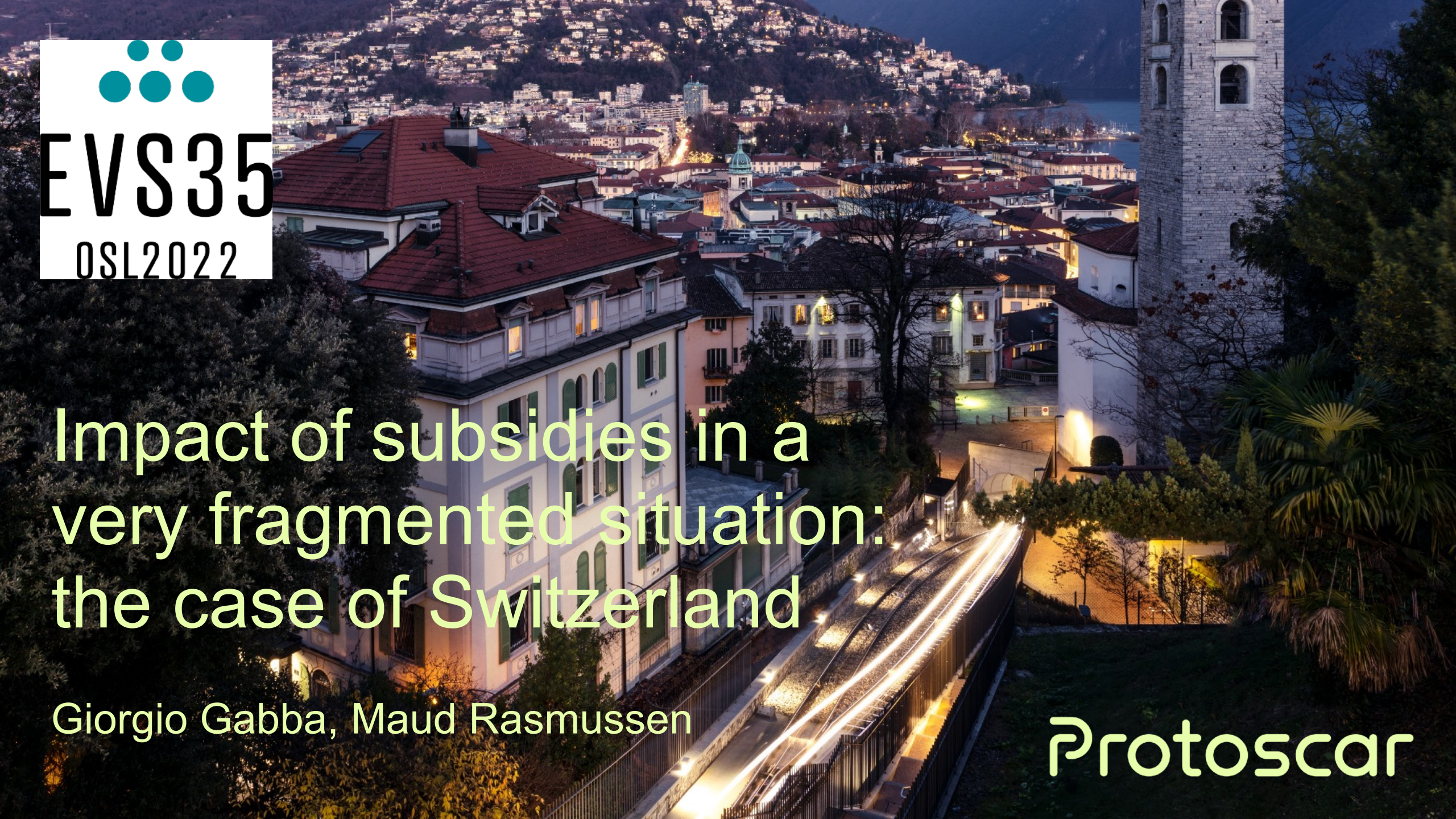

Impact of subsidies in a very fragmented situation: the case of Switzerland

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Protoscar

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Who we are

- Our missions: since 30 years, we open the road to e-mobility. We simplify the planning of charging infrastructure with in-depth analysis and definition of scenarios. We accompany companies and public institutions toward the mobility of the future with independent, practice-oriented consultancy.
- Our team: 8 specialists with different backgrounds (engineering, energy, economics).


Masterplan


Market analysis


Fleet electrification


Education


Sustainable mobility


Charging infrastructure

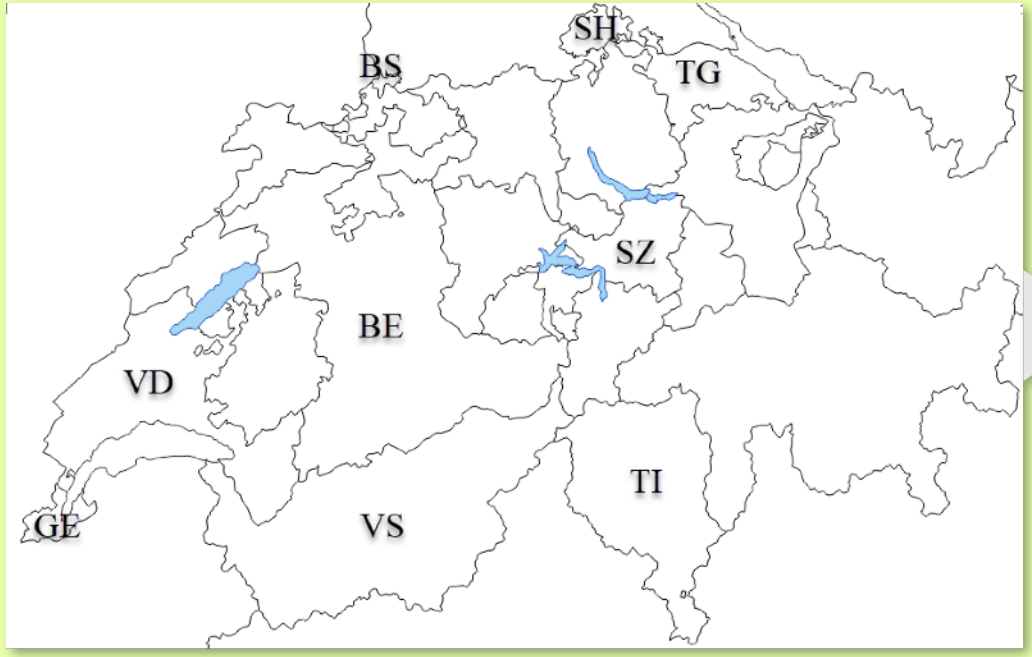

New business models

The particular situation of Switzerland

- High market penetration of electric vehicles (22.4% in 2021), even without national subsidies, which are granted only in few Cantons.
- Each Canton has implemented the measures to sustain the e-mobility in its own way, resulting in a very fragmented situation.
- Given the high receptivity of Swiss market:
  - Are the subsidies, at least at local level, an effective way to push the electrification of vehicles?
  - In Cantons where subsidies are granted, would the market penetration have been the same without them?

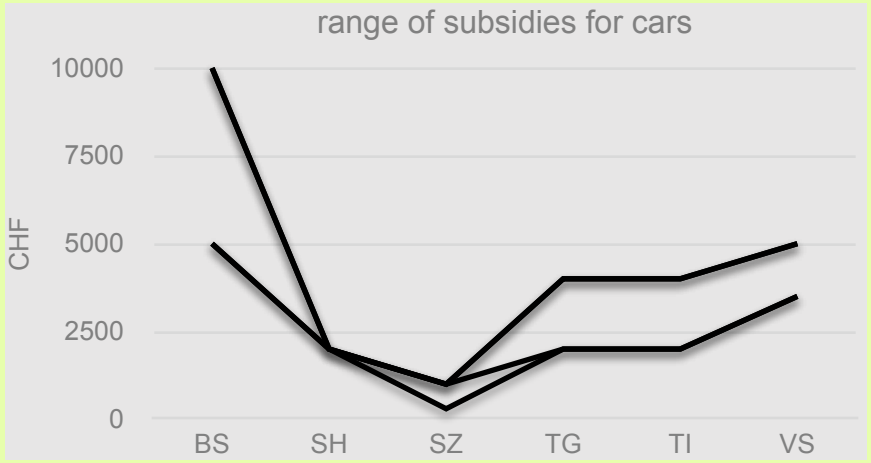
Where the subsidies are granted (status end 2021)

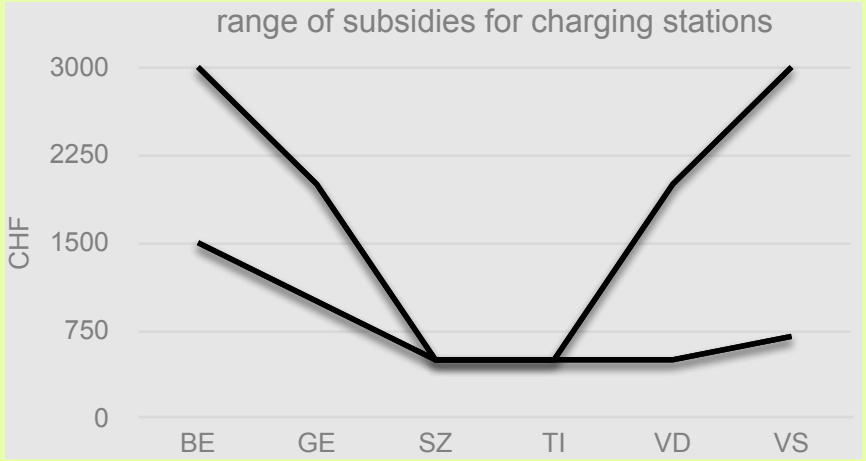
Cantons with subsidies for		
Vehicles	Vehicles and charging infrastructure	Charging infrastructure
1	5	3



- All the cultural regions of Switzerland are represented, but the German-speaking part of Switzerland is under-represented
- These Cantons represent the
  - 44% of the population
  - 43% of the whole car fleet
- Update 2022: 3 additional Cantons (LU, NE, SG) are granting subsidies for the charging infrastructure

Description of the subsidies



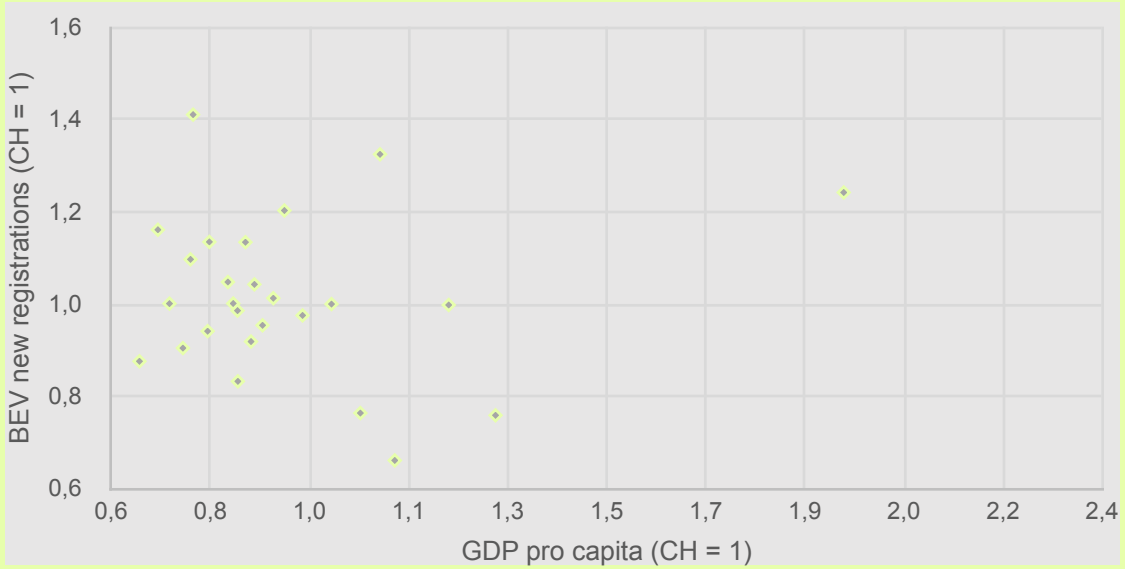


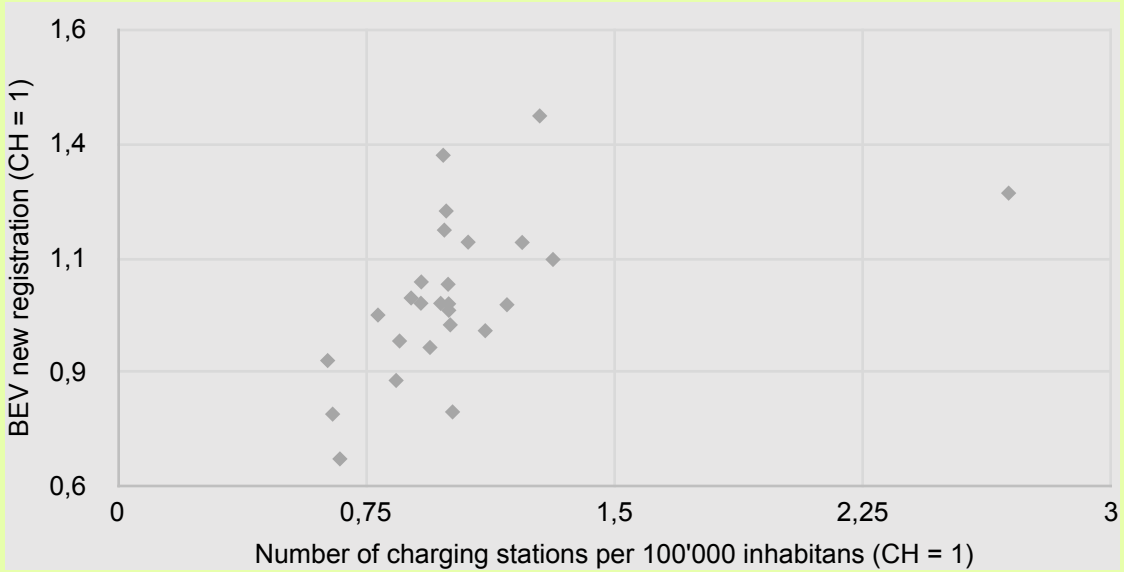
- Subsidies for electric vehicles (BEVs)
  - some Cantons have limited the subsidies to specific owners (e.g. only private owners, only business owners), others to specific vehicles,
  - additional constraints are sometimes added: BEV must be supplied by PV and an ICE car must be scrapped.
- Subsidies for charging infrastructure
  - addressed to both the purchase of charging stations and the installation costs,
  - sometimes limited either to specific owners or to specific uses, e.g. only in condominiums,
  - based on a fixed amount, according to the charging power or even on the type of parking site,
  - the installation costs are usually subsidized with a percentage of the total costs with a cap,
  - sometimes additional reward or constraints are introduced (only 100% renewable energy, bonus for bi-dir chargers, mandatory load management etc.).

Analysis of the boundary conditions

- The subsidies have been introduced in Cantons with different socio-economic conditions and level of deployment of public charging infrastructure.
- The number of public charging stations (48% of the answers), the upfront cost (46%) and the range (45%) are the main barriers to the purchase of EVs in Switzerland
- GDP pro capita and number of public charging stations per 100’000 inhabitants are taken as indicators to evaluate the positions of the Cantons concerning the 2 main barriers for BEVs introduction.

Analysis of the boundary conditions





The subsidies are applied to quite different contexts

- with higher GDP pro capita than the national average but with both a higher and lower market penetration of BEVs,
- higher public charging station density with a higher market penetration,
- charging station market density aligned with the national average with both higher and lower market penetration.

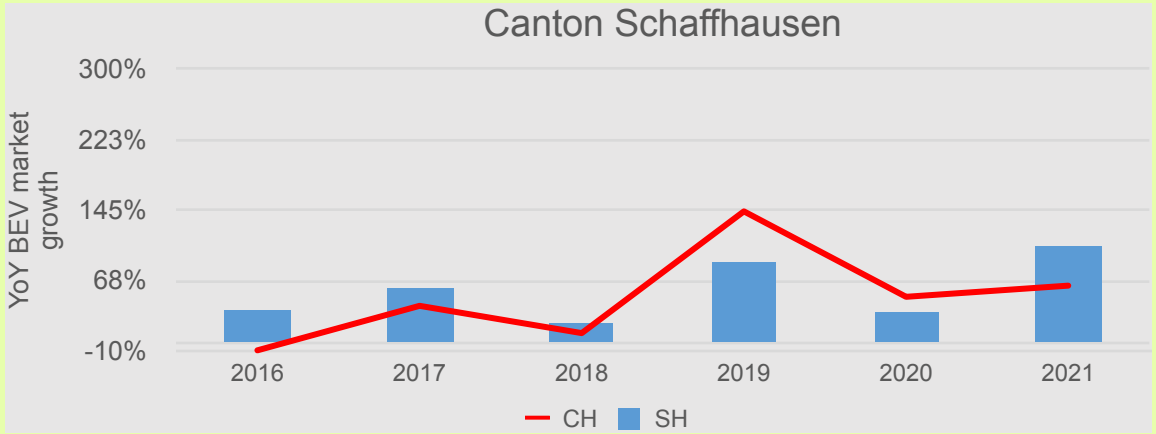
Evaluation of the impact of the subsidies

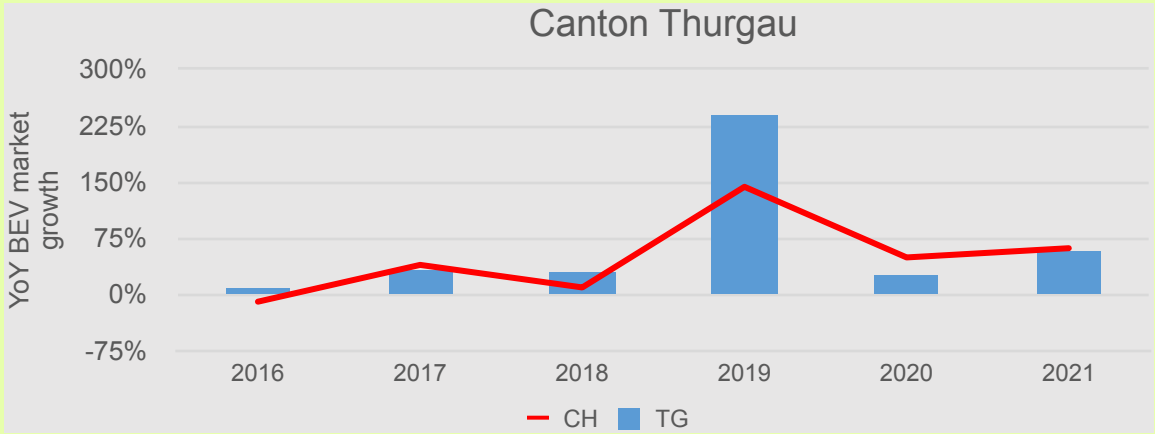
- The analysis is done on the Cantons which have implemented subsidies for electric cars targeting the private owners but excluding SZ (subsidies are granted by a power utility only for their clients).
- The impact of the subsidies is evaluated comparing the evolution of the market penetration in the Canton with subsidies to the national one and to that in the Cantons without subsidies.
- The YoY growth of the market penetration is taken as the indicator.

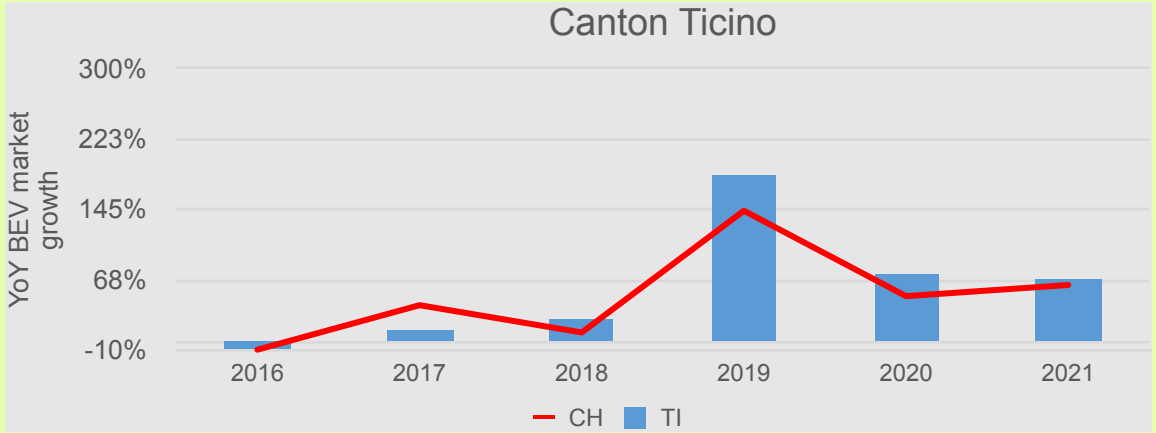
	2015	2016	2017	2018	2019	2020	2021
CH	1.2%	1.1%	1.6%	1.8%	4.2%	8.3%	13.2%
Cantons with subsidies for BEV purchase							
SH	1.0%	1.3%	2.2%	2.8%	4.9%	9.1%	17.5%
TG	1.1%	1.2%	1.7%	2.2%	6.7%	12.0%	18.7%
TI	0.7%	0.6%	0.7%	1.0%	2.7%	6.0%	10.1%
VS	0.8%	0.8%	1.7%	1.3%	3.4%	7.3%	15.4%
Cantons with subsidies for charging infrastructure							
GE	0.9%	1.0%	1.4%	1.5%	3.8%	7.4%	10.0%
VD	0.7%	0.8%	1.3%	1.1%	4.4%	8.2%	12.6%

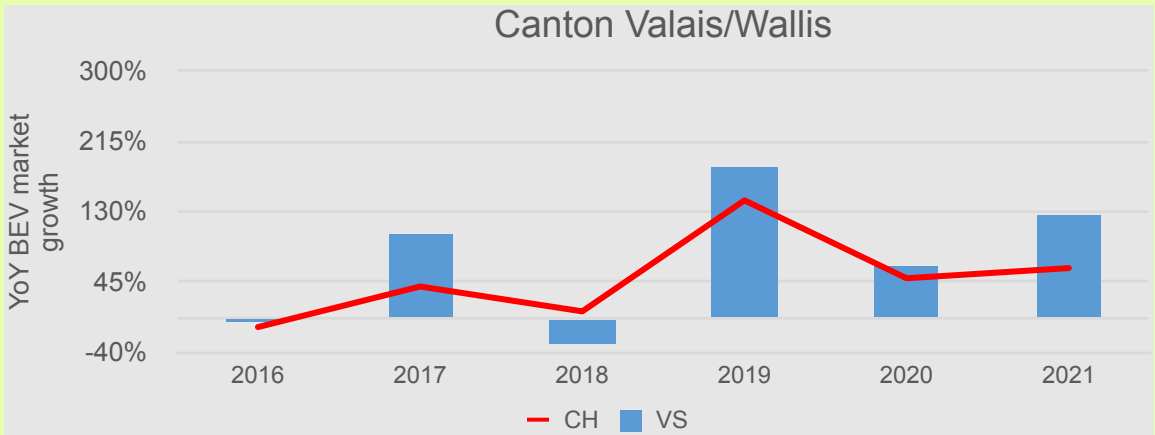
Market penetration of BEV (% of new registrations).
Blue cells indicate the years covered by subsidies

Results: YoY market penetration growth of BEVs compared to the national one

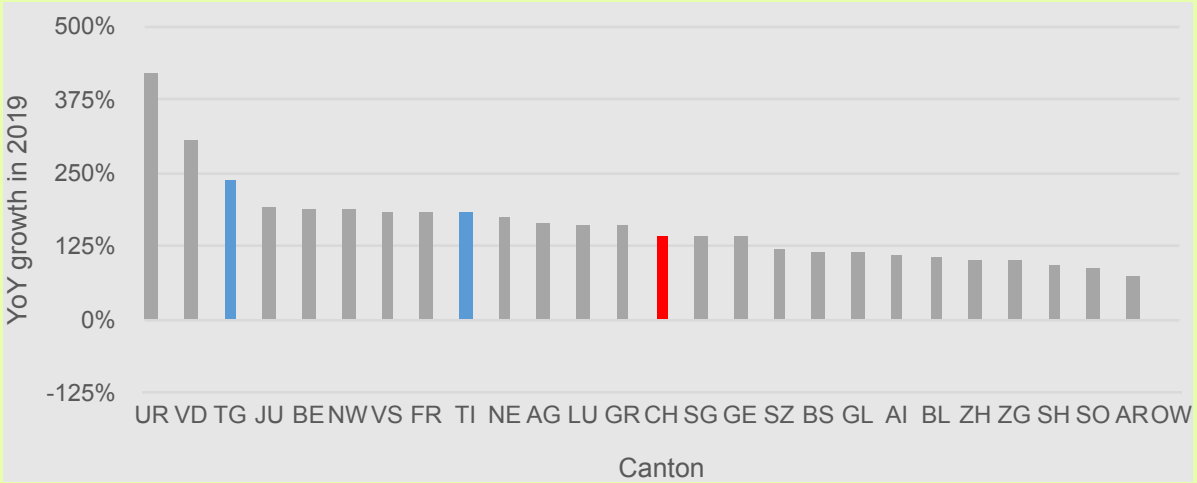


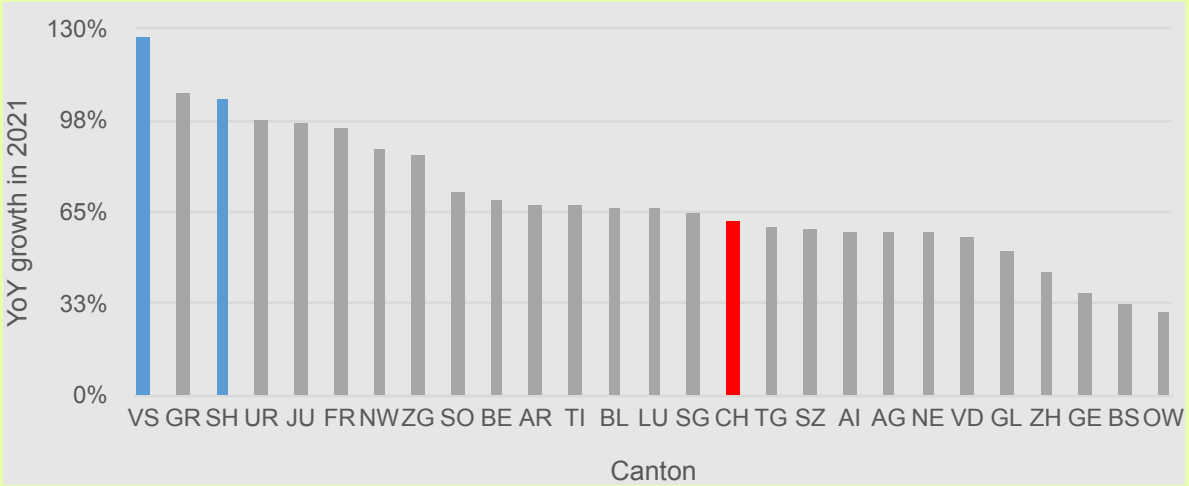






Results: YoY market penetration comparison





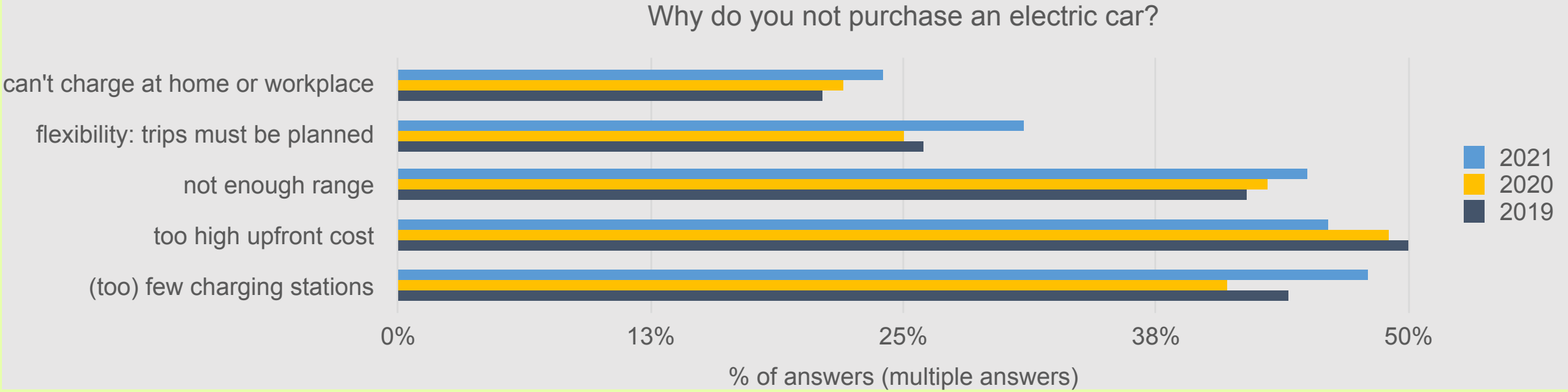
- National trend: peak in 2019, decrease in 2020, partial recovery in 2021.
- Cantons with subsidies experienced a similar trend, but YoY market growth is 1.3 to 2 times higher.
- In 2019 TG and TI ranked 3rd and 9th in the YoY growth.
  - 3 Cantons doing better than TI, (UR, JU and NW), represent small markets where an increase of the new registrations by only 19, 39 and 52 units caused a huge growth.
- In 2021 subsidies were introduced in VS and SH, which ranked 1st and 3rd in the YoY growth.

Conclusions

- The subsidies for the purchase of electric cars are an effective tool even in a country characterized by a high level of wealth.
  - They seem to be a very effective way to stimulate the market even in those contexts where the boundary conditions, like the economic situation of the inhabitants and/or their acceptance of the technology is already high.
  - Local authorities may decide not to add local subsidies, assessing boundary conditions in their region already favorable to EV market penetration: the results show that the application of additional subsidies can effectively stimulate the market.
- Even if Switzerland is already a receptive market for BEVs, subsidies for the purchase of vehicles stimulated the market growth in the Cantons where they were applied.
- In Cantons already highly receptive to BEVs, the subsidies have had a strong impact.

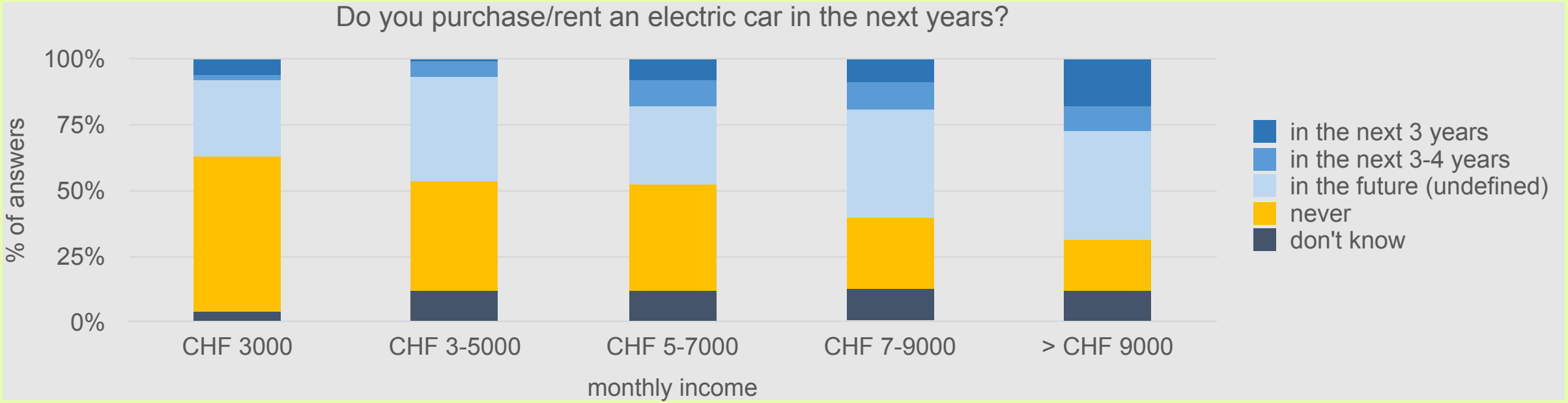
Conclusions

- The barriers to e-mobility should be constantly monitored and subsidies or any other active measure for e-mobility should address the most critical points.
- Public charging stations and the upfront cost are the main barriers in Switzerland, but they are following different trends.



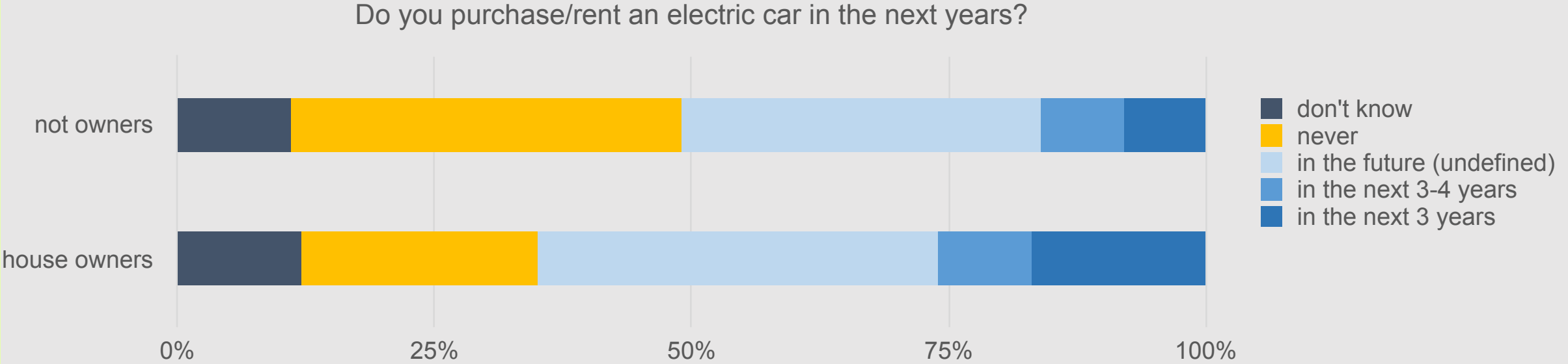
Conclusions

- Today the subsidies for vehicle purchase are effective, but if the trends will be confirmed, subsidies for the BEV purchase should be reviewed, allocating them to the charging stations or other measures.



Conclusions

- Not being able to charge at home or at work is a barrier showing an increasing trend.
- The impact of subsidies to charging may become very important in the next few years, once the potential market coming from people who can easily charge will be fully exploited: it is strongly recommend that the subsidies include the deployment of charging infrastructure in condominiums.



Thank you for your attention

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