Norm for new buildings referring to plug-in vehicles: an example from Switzerland (SIA 2060)

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Protoscar SA

- The company
  - Protoscar is a SME located in Southern Switzerland, focusing on electric mobility since 1987.
  - A 100% subsidiary of the Zürich based company energie360° from 1/1/19
- Our vision
  - On 2050 all the new cars will be powered by an electric motor supplied by renewable energy.

Protoscar
CLEAN MOBILITY SHAPERS

energie360°

What we do

Fleet analysis (TCOs)

Energy consumption and emissions analysis

EV-policy and market potential

Masterplans for charging infrastructure

EV architecture and prototypes

Development/ micro-production of EVSEs

References

DAIMLER
GM
BMW
ewz Die Energie
ebl
EKZ
WZ
ST. MORITZ ENERGIE
NISSAN
OPEL
Regionalwerke Baden
ESB
REPOWER
HONDA
IAO
Fraunhofer Institut Arbeitswirtschaft und Organisation
TCS
FLUGHAFEN ZÜRICH
MITSUBISHI
ABB
ALPIQ
SIEMENS
FONDATION DES PARKINGS

Why a norm

- New or a deeply renewed building have to be conceived to facilitate the plug-in vehicle charging.
- Some countries (e.g. France, Italy, etc.) and EU as well (directive 2018/844), had included the charging requirements in their legislations.
- In Switzerland it is difficult to get a national legislation: building sector is managed by each Canton, so the process is slow.
- Nevertheless, architects, engineers and investors must know today about how to deal with the charging needs of the plug-in vehicles parked in the buildings.

Filling the legislation gap

Protoscar, with the help of some partners, developed an Handbook, in order to overcome the lack of a legislation and to provide a set of basic knowledges. Some topics has been included in the SIA 2060.

The handbook is available on line in 3 languages:
D: https://www.emobility-schweiz.ch
F: https://www.emobility-suisse.ch
I: https://www.emobility-svizzera.ch

The born of SIA 2060

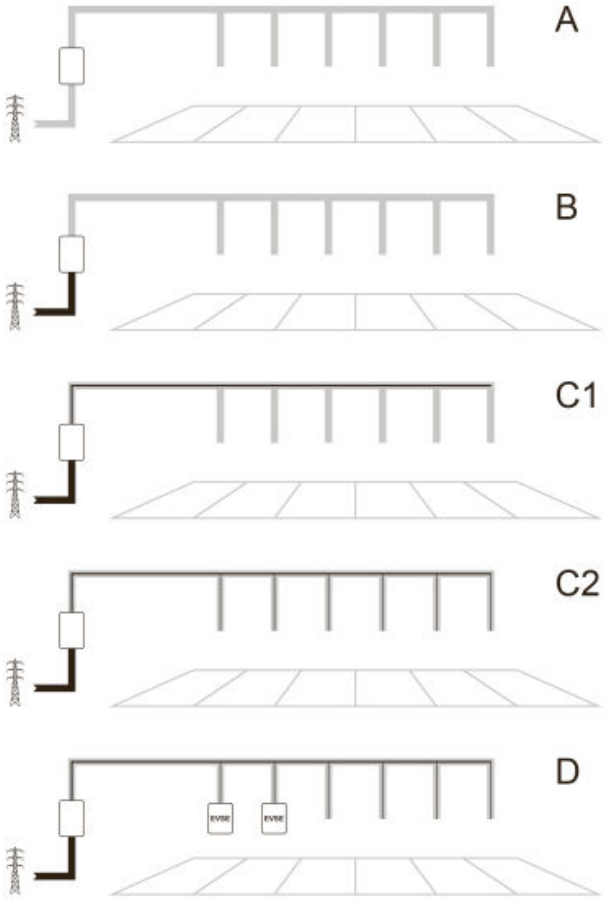
- SIA (the Swiss Association of Engineers and Architects), acknowledged the importance to provide engineers, architects and investors with guidelines for the implementation of charging needs in the buildings.
- End 2017 SIA decided to develop a technical norm, SIA 2060, to cover this topic.
- Protoscar was selected to support SIA for the developing of the norm, which will be published end 2019.

Goals of SIA 2060

- SIA 2060 is a technical norm: it is up to architects, engineers and investors to decide whether to be compliant or not.
- The norm provides:
  - the guidelines for the implementation of the charging needs in the new and deeply renewed buildings (qualitative and quantitative);
  - methods for the computation of required power and energy consumption;
  - basic information about the charging process.

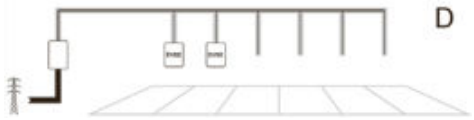
The key concept of SIA 2060

- Definition of 4 levels of “readiness for e-mobility” in a building:
  - “pipe for power”: conduits/channel are provided for the future deployment of EVSEs.
  - “power to building”: the connection to the grid is already dimensioned for the future charging power demand.
  - ”power to garage/parking”: implementation of the supply lines for the EVSEs.
  - “ready to charge”: deployment of EVSEs



Quantification of the levels

Number of charging points vs number of parking places

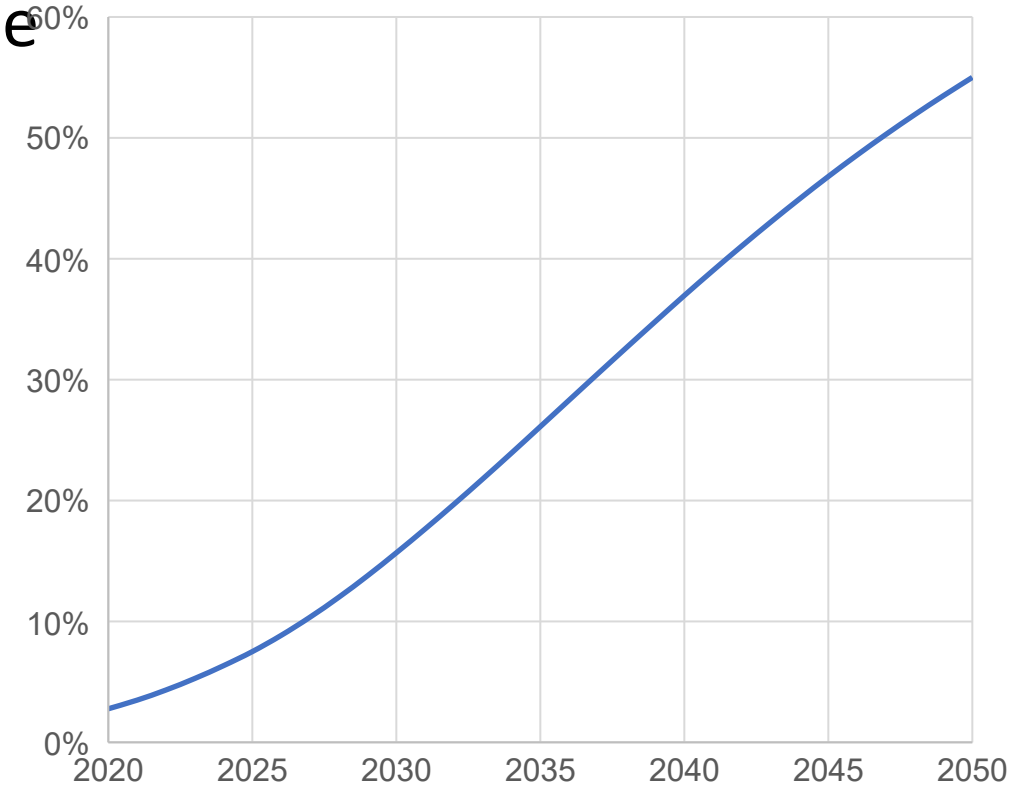
Level	Building	Cars	2 wheelers - LEVs	E-bikes
 A	Residential	100%	100%	100%
	Non-residential			
 B	Residential	60% - 80%	60% - 80%	100%
	Non-residential		No recommendation	No recommendation
 C	Residential	No recommendations: the number of charging points is in between level B and level D		
	Non-residential			
 D	Residential	16% (min. 1) – 20% (min. 2)	1 socket/apartment	60% - 80%
	Non-residential		No recommendation	No recommendation

Note: residential buildings = multifamily.

Note: Level D for cars = number of EVSEs, for 2 wheelers, LEVs (Light Electric Vehicles) and E-Bikes = sockets

Quantification background

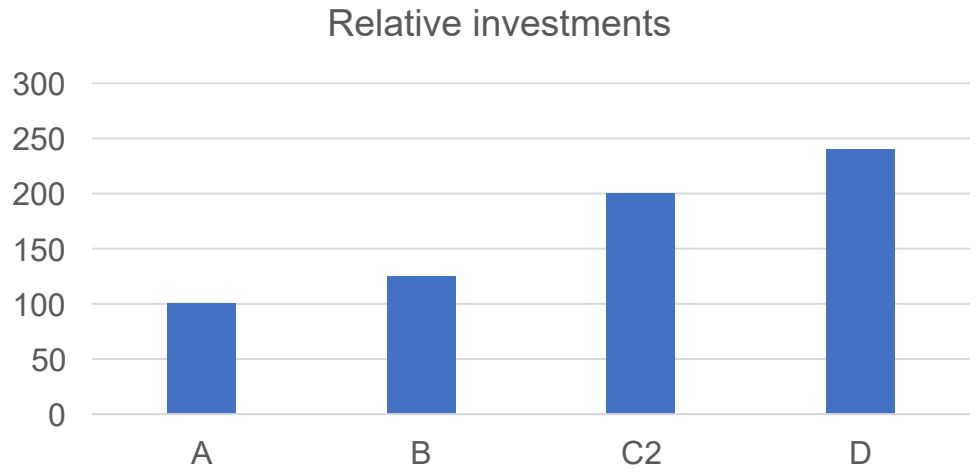
- Level A: during the life building the private mobility will be totally electrified.
- Level B and C: plug-in vehicles market penetration in the next 50 years (typical time frame of a major renovation of a building)
- Level D: plug-in vehicles market penetration in the next 10 years (typical lifetime of EVSEs)
- Scenarios: Energy Strategy 2050 of Switzerland and SIA2060 committee assumptions.



% of plug-in car according “POM” scenario

Impact on the investments

- Engineers, architects, investors may decide to be compliant to SIA 2060 and the compliance level.
- The highest the compliance level, the highest the initial investments, but the overall total cost at the end will be lower.



Relative investments in a residential building with 10 parking lots.
Level C2 has been selected because more capital intensive.

Uniqueness of SIA2060 approach

- SIA 2060 includes 2 wheelers, LEVs, E-bikes as well as cars: most of the legislations around the world focus on cars.
- It applies whatever be the size of the building, no lower limit for the applicability according the number of parking places or building surface.
- 4 levels of applicability and not 1 (corresponding to Level A) or 2 (corresponding to levels A and D) like other legislations.
- Non-residential buildings, level A: 100% of parking place have to be provided with conduits/channels for the supply of the charging points (lower or much lower in other legislations).

To learn more

- Protoscar has developed a web tool for the computation of the charging points (https://sia2060.ch, now only in German; F, I and E version will follow).
- The inputs are the type of building, vehiucles and the number of parking places.
- The outputs are the number of charging points according the compliance level, power and energy demand.

SIA2060 configurator

sia
schweizerischer ingenieur- und architektenverein
société suisse des ingénieurs et des architectes
società svizzera degli ingegneri e degli architetti
swiss society of engineers and architects

Example of a residential building with 50 parking places for car

Conclusion and next steps

- Thanks to its unique approach, SIA 2060 may be useful even outside Switzerland, providing a benchmark and a possible inspiration, both for the countries still lacking of legislation or norms on this topic and for the review of existing legislations.
- SIA 2060 is undergoing the review phase by all the stakeholders (draft, in German, downloadable from https://sia2060.ch).
- Finalization, translation in French and Italian: December 2019.
- Publishing: January 2020
- SIA 2060 is candidate to be converted from a professional norm to an official Swiss Norm (SN)

Thank you for your attention!