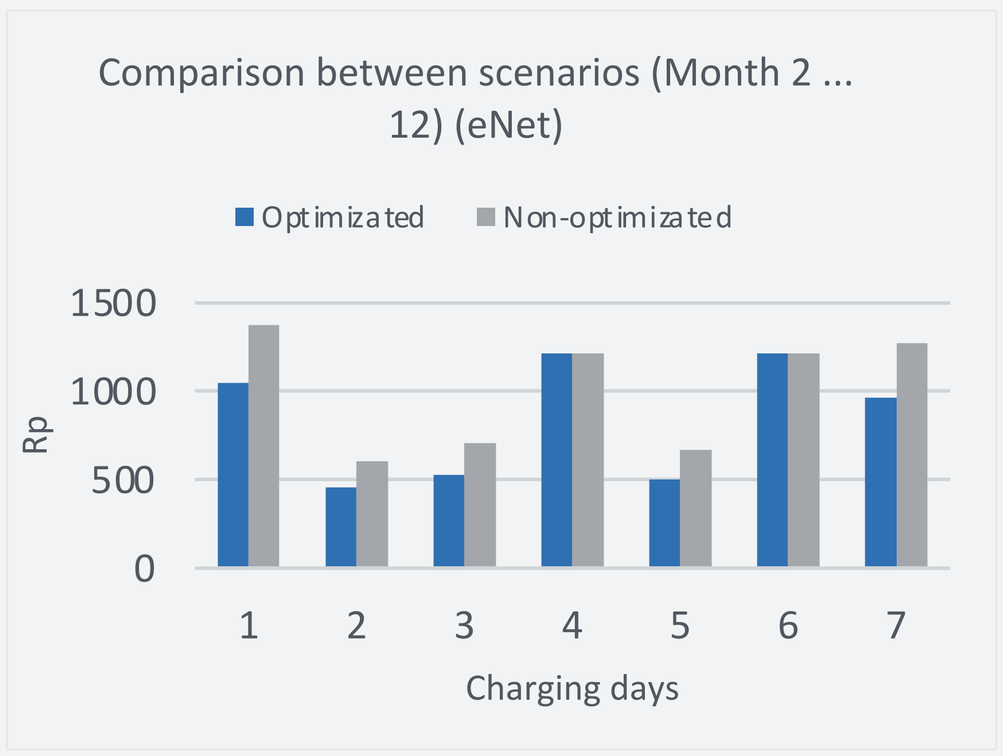
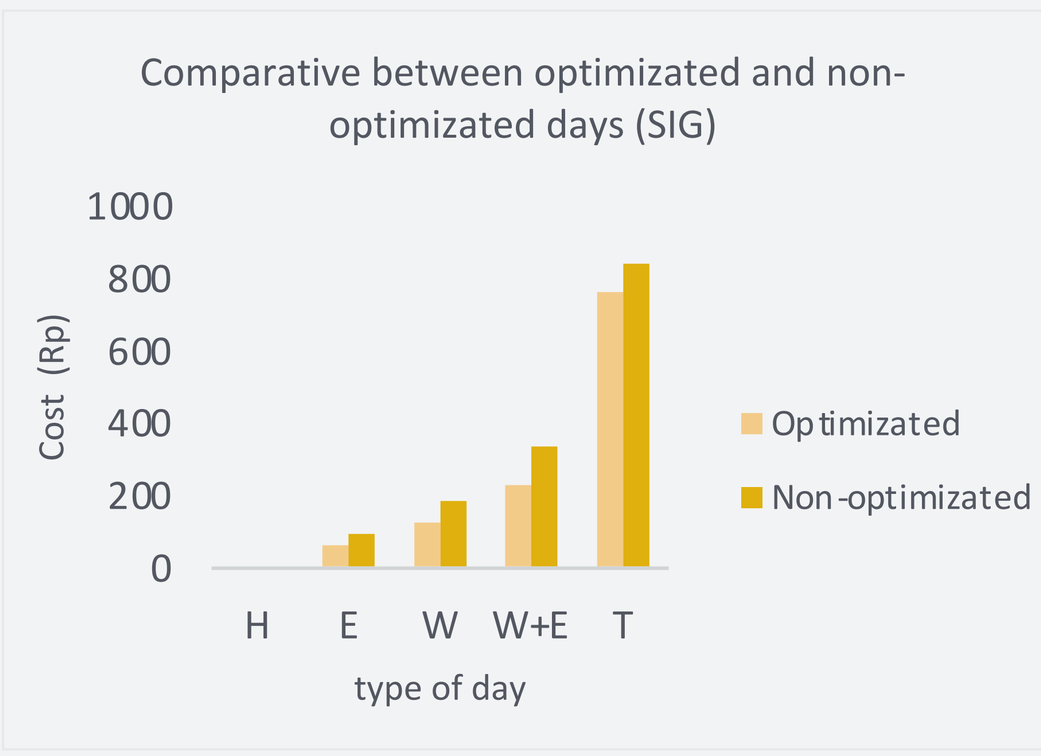
HSLU Hochschule Luzern

Technik & Architektur

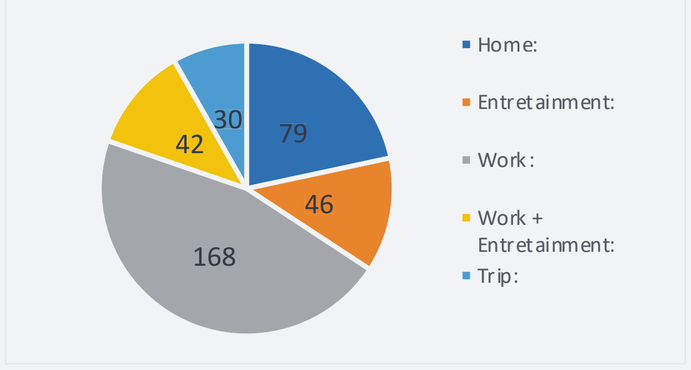
Bachelor in Business Engineering | Innovation

Modelling and comparison of electricity costs and the impact of using flexibility from domestic demand response





	Scenarios	
	Optimized	Non-optimized
SIG	Sz1: Annual charging cost within low hours	Sz2: Annual charging cost within high hours
eNet	Sz3: Annual charging cost, calculating it during home days, in order to get the most out of the price of solar energy, with the exception of trip days	Sz4: Annual charging cost, calculating it during home or trip days, using the higher electricity prices.



The aim of this thesis is the possible generation of economic flexibility in a specific household, referring exclusively to the consumption scenario of an electric car. For this purpose, two sub-scenarios have been defined, one as an optimized scenario and in the opposite way, a non-optimized one.

The idea of defining those scenarios is to compare between them the annual cost in order to reach to the desired flexibility through different electricity market like through the Services Industriels de Genève (SIG) or through an emergent market called eNet, supported by the HSLU and other members. It is going to explained briefly in the introduction the current electric Swiss situation and it is made an overview about the electric vehicle penetration in the market.

Nevertheless, to obtain realistic results, some hypothesis had to me made, such as, creating logical driving patterns and schedule, starting with a general database and adapting it to the Swiss situation as much as possible.

In addition, an optimization technique called linear programming was used to solve the scenarios, in which two types of sub-problems were defined for each type of electricity market. Finally, a validation of results was established to confirm the validity of the results obtained, and a conclusion was drawn under the work carried out. It was found out an economic flexibility for SIG of 24%, and for eNet, one of 16%.

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