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Report on research projects under the IDEA League Student Grant

Personal information				
Full Name:		Fabian Rottmann		
Field of study:		Energy Engineering		
Degree pursued:		Master of Science	**Current year of studies:**	2
Home University:		RWTH Aachen University		
Sponsoring professor at home university	**Name:**	Univ.-Prof. Dr.-Ing. Robert Pitz-Paal		
	Email address:	robert.pitz-paal@dlr.de		

Information about the research stay					
Host University:		ETH Zürich			
Sponsoring professor at host university	**Name:**	Prof. Dr. Volker Hoffmann			
	Email address:	vhoffmann@ethz.ch			
Dates of research stay		**from:**	02/2019	**to:**	08/2019

Summary of the research project
(200 words max.)

Deployment policies proved to effectively stimulate the diffusion of renewable energies. Yet, the adjustment of incentives to evolving technology costs remains a challenge. A previous study suggested novel policy designs, which automatically adjust the incentives based on control theory principles, to produce a more effective and cost-efficient feed-in tariff for photovoltaics (PV) than the historical policy in Germany. However, policy transfer between countries sometimes leads to policy failure. Thus, the reproducibility of the suggested achievements in jurisdictions comprising different economic, social or environmental contexts remains unclear. Especially for technologies such as solar PV, the transfer of deployment policies from one country to another could be particularly risky. They often combine rapidly evolving technology costs, influenced by global and local learning rates, and an attractiveness heavily influenced by local factors, such as irradiation. This study assesses if the new mechanisms can repeat the improvements upon historical policies in Switzerland and Spain. Therefore, it employs an agent-based model of the socio-technical system for solar PV in each country. The results state that the analyzed design can reliably achieve a higher deployment with significantly lower costs per installed capacity than the simulated historical policies in each country. It can curb, yet not fully avoid the historically occurred boom and bust cycles in Spain. The results show that different overall deployment targets as well as different initial incentive levels do not compromise the policy's cost efficiency when using the new suggested policy design. However, they stress that a later deployment generally allows for higher cost-efficient policies. The novel policy design could offer policy makers a reliable new tool for designing future deployment policies under different conditions that effectively accelerate the diffusion of technologies to mitigate climate change without becoming too costly. As it becomes

less critical to decide upon the right initial level of incentives or a suitable target for overall deployment, the novel design could encourage governments to apply deployment policies in the future.

Experience report
Please tell us about your experience at the host university and give us an evaluation of the benefits of the research stay for the course of your studies

Throughout my whole time at SusTec at ETH Zürich I felt welcome and absolutely respected as a person as well as a researcher. Thus, I can only thank Professor Hoffmann as well as the whole SusTec Team for their continuous support on this project. Additionally, I also need to commend the manner in which Professor Pitz-Paal as my supervising professor at RWTH offered me this possibility to pursue this research project.
I cannot think of any situation in which I regretted the decision of pursuing this thesis at ETH in general and at SusTec in particular. I benefitted in various ways from this opportunity, academically, as well as personally:

Academically:

- My stay offered me the possibility to perform a research project within a research area that was not covered by any institution at my home university at that time.
- It offered me insights into the research approach of a different university, including a stronger focus on publishing the research results afterwards.

Personally:

- This project highly facilitated the entry into the Swiss labour market by giving me a reference from a national institution to show to my current employer.
- It furthermore offered me the possibility to get a temporary insight into living in Switzerland and thus contributed to my final decision of staying.

Picture
Please provide a picture of you at the guest university

The report should be signed by both professors involved. (The signatures will be deleted when the template is published on the IDEA League web page.)

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Fabian Rottmann		
Students Name	Sending Professor	Host Professor