

A solar-powered aircraft, resembling a long, thin glider with a series of lights along its wingspan, is shown in flight against a dark blue twilight sky. Below the aircraft, a city is illuminated with numerous lights, and a large body of water is visible. The overall scene is a night-time aerial view of a city and its surrounding water.

Financing investments in clean technologies

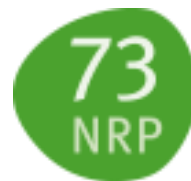
**Joëlle Noailly, Graduate Institute
Gaétan de Rassenfosse, EPFL**

PROJECT «FINANCING CLEANTECH»

- Co-led by Joëlle Noailly (Graduate Institute Geneva) and Gaétan de Rassenfosse (EPFL)
- January 2018 to December 2021
- Academic disciplines: Environmental economics and Science and Innovation Policy
- 2 PhD students: Laura Nowzohour and Matthias van den Heuvel
- 10 partners (policy organizations, financial institutions, cleantech actors, data partners)
- Funded by Swiss Science Foundation – NRP73 «Sustainable Economy»

NRP73 – Sustainable Economy

- National Research Programmes «contributing to the solution of contemporary problems of national importance»
- NRP73 «Sustainable Economy»: 25 projects selected, CHF 20 million
- Partners from the praxis and international collaboration
- Research results:
 - Expected to have practical applications within 5 years
 - Scientific basis for decision-making by government



Sustainable Economy
National Research Programme

NRP73- Sustainable Economy

NRP 73

The figure shows thematic areas of the NRP 73 research projects clustered according to the Sustainable Development Goals (SDGs).



Financing cleantech - Motivation

Clean technologies

Technologies designed to reduce our environmental footprint.



Clean energy
and energy
storage



Green
materials



Energy and
resource
efficiency



Sustainable
transport



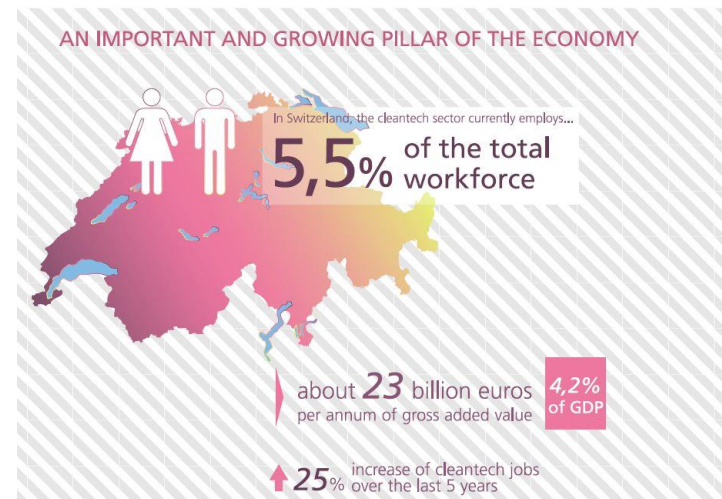
Water, land,
and air quality



Recycling &
waste

Why invest in cleantech?

1. Addressing climate change
2. Potential gains in terms of competitiveness and growth



⇒ **How can society steer financing towards cleantech investments?**

Cleantech are different from other technologies

1. Highly dependent on long-term public support

- No incentives to invest in cleantech if pollution/carbon is not priced.
- Large scientific literature in economics on how various environmental policies (e.g. taxes, feed-in tariffs..) encourage innovation and private investment in cleantech.
- Research gap: Not much evidence on the impact of «**policy uncertainty**» → frequent and unpredictable changes in environmental and climate policy.

Research objective 1: Impact of policy uncertainty

⇒ How does climate and environmental **policy uncertainty** impacts cleantech investments?



Le solaire suisse est freiné par les incertitudes politiques

Les ventes du solaire thermique et du photovoltaïque ont reculé de 15% et 20% l'an dernier. L'issue du référendum du 21 mai sur la stratégie énergétique 2050 pourrait relancer la croissance



(Sources: Le Temps and NYT)

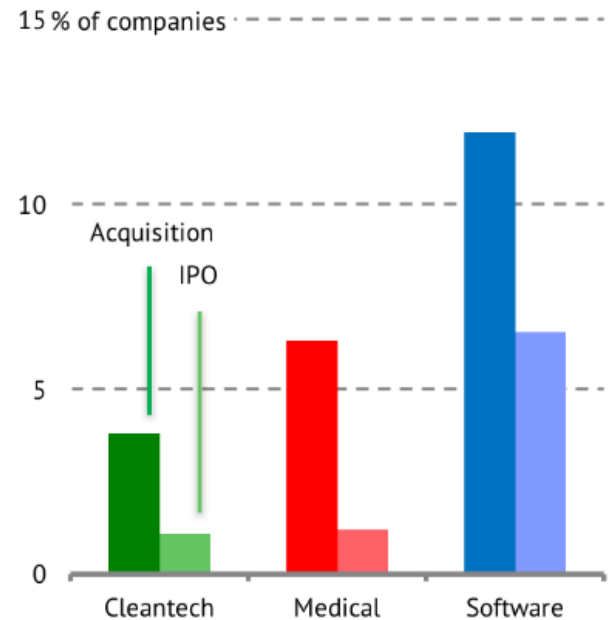
Cleantech are different from other technologies

2. Lower involvement from traditional investors

- «Valley of death» particularly acute for cleantech startups, lack of exit opportunities
- New types of investors (state banks, institutional investors, households...) rather than traditional ones (e.g. incumbent energy firms)

Figure 4. No exit for cleantech

Cleantech companies saw fewer exits overall, and fewer acquisitions compared to other sectors.



(Source: Gaddy et al, 2016)

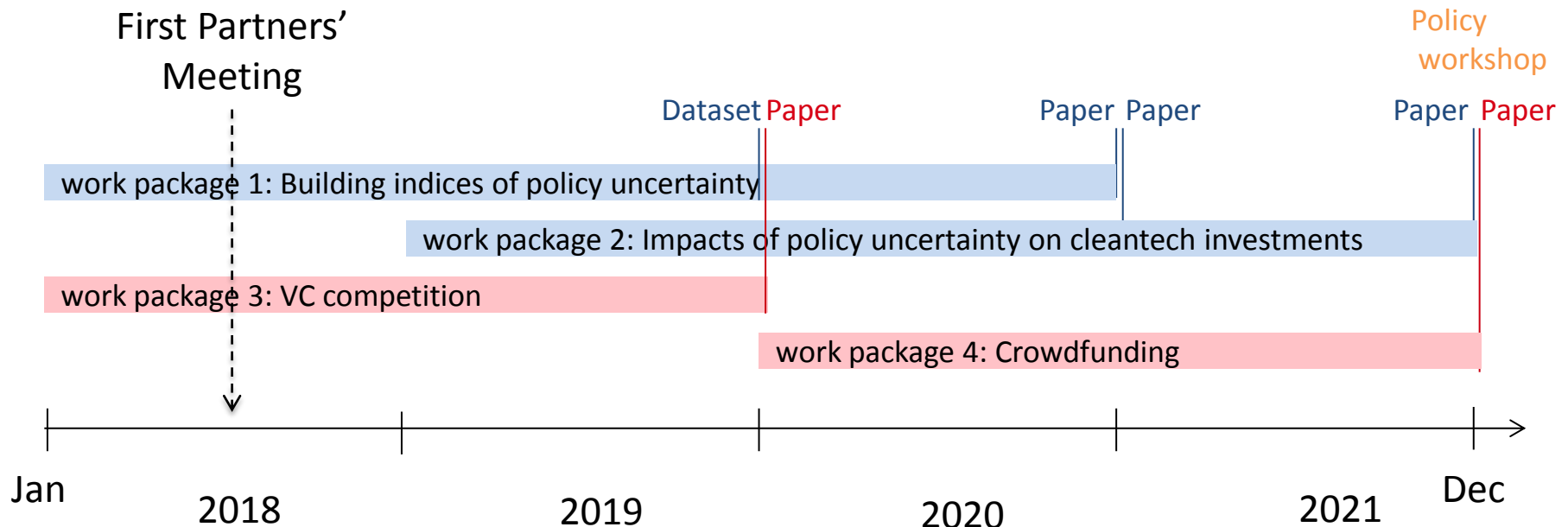
Research objective 2: New financing tools

- Research gap: limited understanding on how to leverage this diversity of actors. How do investors evaluate cleantech startups? What are their motives?

⇒ How can new financing tools (e.g. venture competition, crowdfunding...) help to attract **new types of investors** into cleantech?

Timeline and work packages

1. How does climate and environmental **policy uncertainty** impacts cleantech investments?
2. How can new financing tools help to attract **new types of investors** into cleantech?



Work Package 1: Indices of policy uncertainty

Methods	Data partners
Newspaper-based index	Swiss Institute of Bioinformatics (Patrick Ruch, Julien Gobeill)
Revisions of environmental policy instruments using PINE-OECD database	OECD (Ivan Hascic, Maxwell Andersen)

Expected output/results:

- Databases of environmental and climate policy uncertainty (international vs. national)
- Publications, policy briefs, website
- Practical recommendations for policies (how changes in regulation are perceived by investors; which policy measures may be perceived as more stable)

Audience/ Impact

- Applied researchers, policymakers at Swiss/international level, cleantech entrepreneurs and investors
- e.g. EPU index, RECAI index

Work Package 2: Impact of policy uncertainty

Methods	Data partners
Theoretical model	
Econometric estimation: impact of policy uncertainty on cleantech investments (e.g. patent data, project finance data, others)	OECD
Discrete choice experiment on Swiss VCs	Various partners' networks

Expected output/results:

- Scientific publications, policy briefs, chapter by CleantechAlps
- Practical recommendations for policies (what are the consequences of policy changes; which investments are most affected by policy uncertainty)

Audience/ Impact

- Academic researchers, policymakers, cleantech entrepreneurs and investors
- Education of policymakers and financial actors

Work Packages 3+4: New financing tools

Methods	Data Partners
Empirical evaluation of effectiveness of VC competition	VentureKick, EPFL
Evaluation of motives of cleantech investors in crowdfunding	possibly data from Experiment.com

Expected output/results:

- Scientific publications, policy briefs
- Improving knowledge on new financing tools for cleantech

Audience/ Impact

- Academic researchers, start-up investors, VC community, policymakers
- Platform to initiate discussion about new funding instruments

Partners



Western
Switzerland
Cleantech
Cluster



CARBON DELTA
the environmental fintech



**SWITZERLAND
GLOBAL
ENTERPRISE**
enabling new business



VENTURE
KICKSTART
YOUR HIGHTECH
BUSINESS **KICK**



CleanTech Capital



emerald
Technology Ventures



Jadeberg Partners



OECD
BETTER POLICIES FOR BETTER LIVES



GREEN GROWTH
Knowledge Platform

First Partners' Meeting - Objectives

- Introduction of the project
- Report on ongoing progress on WP1 and WP3
- Questions to practitioners
- Feedbacks on both content and process:
 - what do you see as main challenges in our research methodology?
 - which insights from the praxis could we add?
 - how does a successful implementation and practical application of our results look like?
 - how can we maximize the impact of our research?
- Other expectations (communication, periodic exchanges and meetings)

Presentation of each partner

1. General presentation
2. What does your organization do regarding financing investments in cleantech? What can your expertise bring to the project?
3. What are your expectations from the project/meeting?