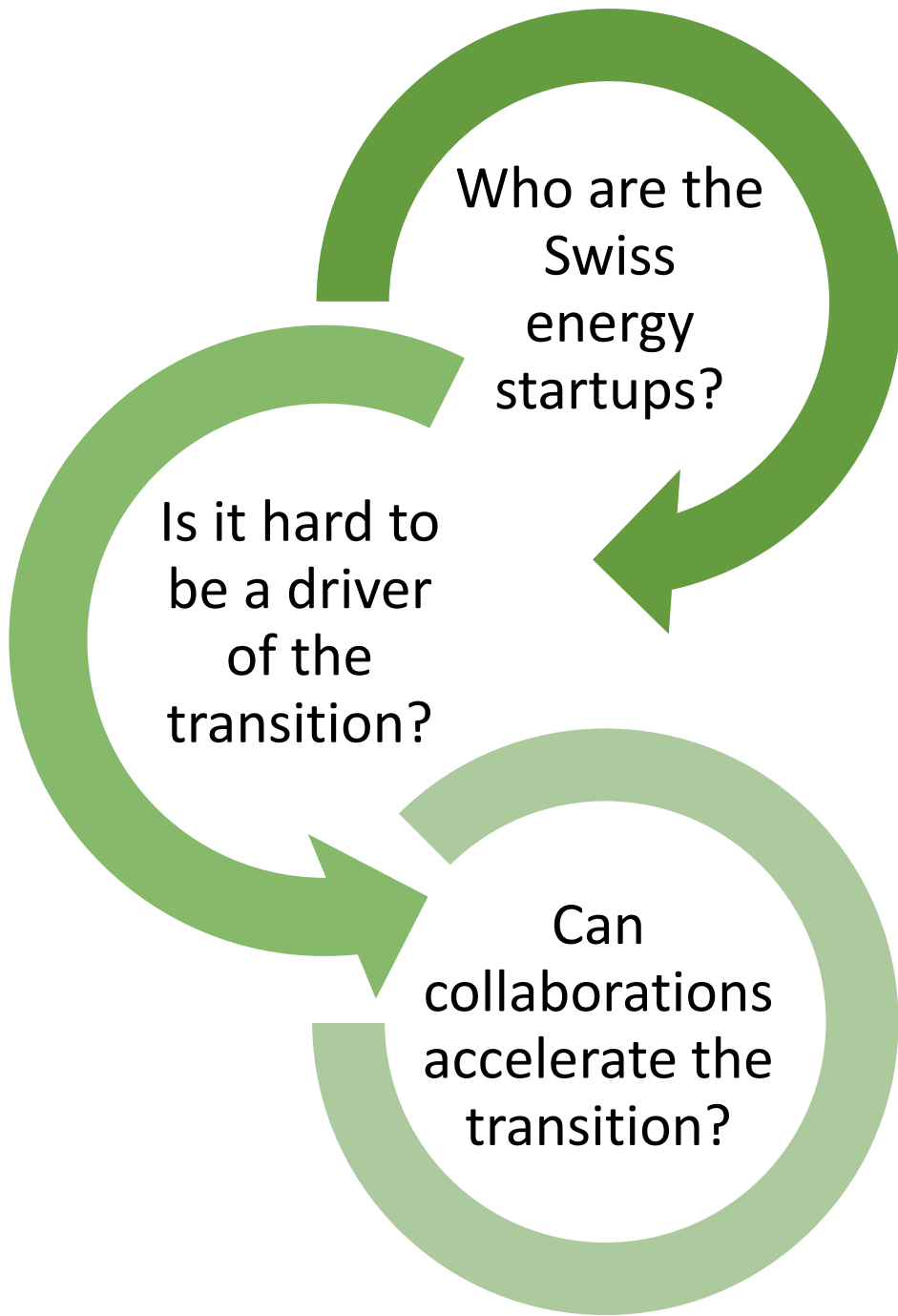




# Where we are & where we want to go

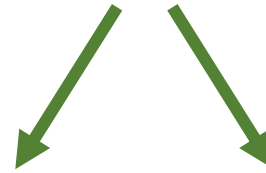




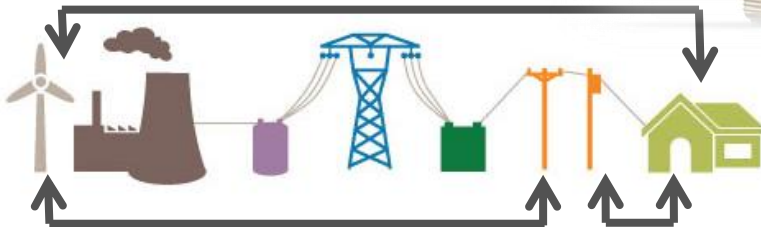
**Entrepreneurs as drivers of energy transition?**

# Background

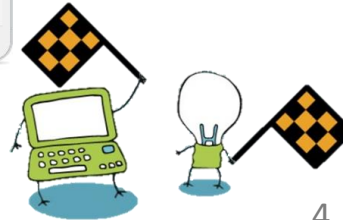
- BEng. Environmental engineer (Canada)  
& MSc. Environmental scientist (Switzerland)
- 5 years of applied science research in Switzerland



Energy Entrepreneurship



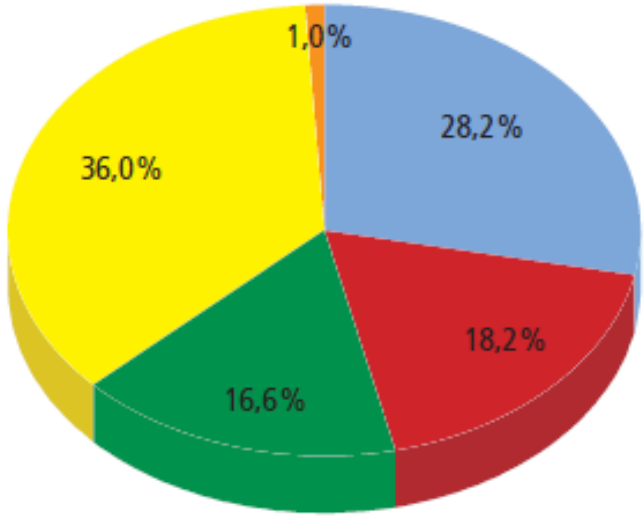
Energy behaviour change



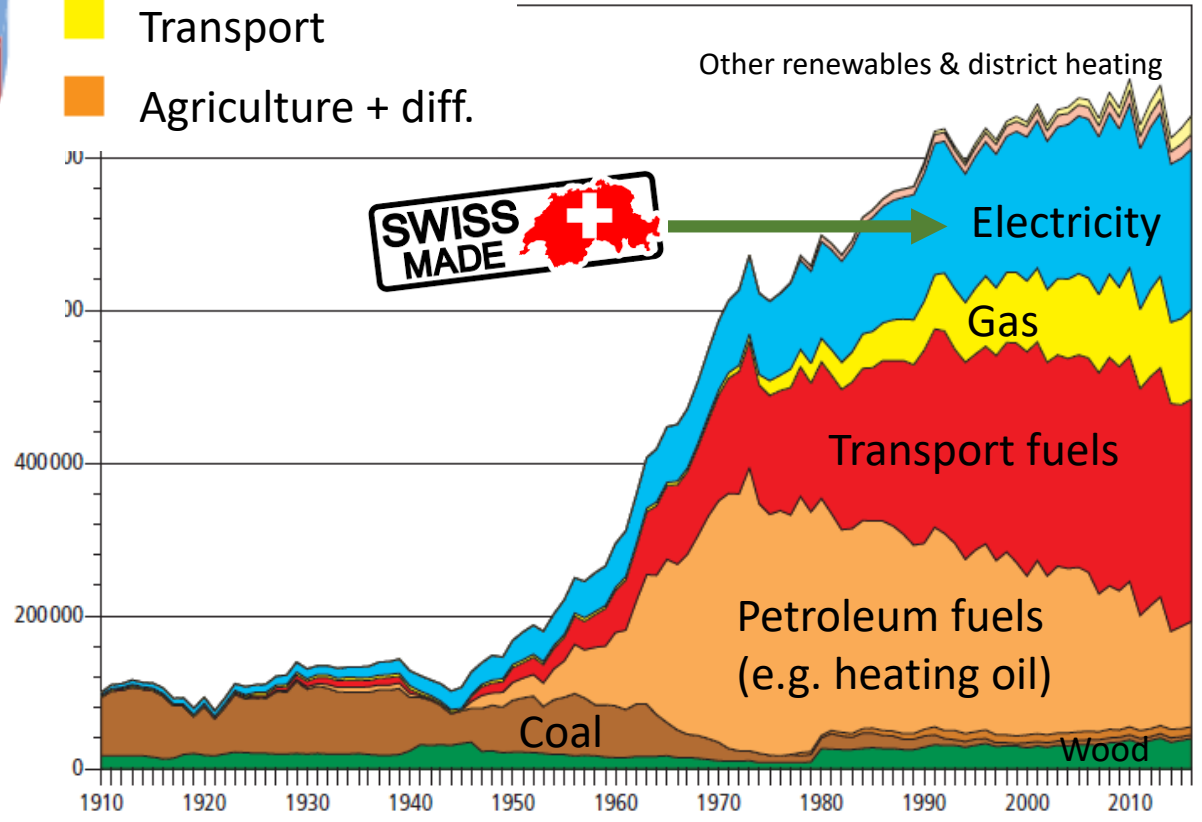


# Swiss heterogeneity

# Opportunities mostly in electricity



- Households
- Industry
- Services
- Transport
- Agriculture + diff.

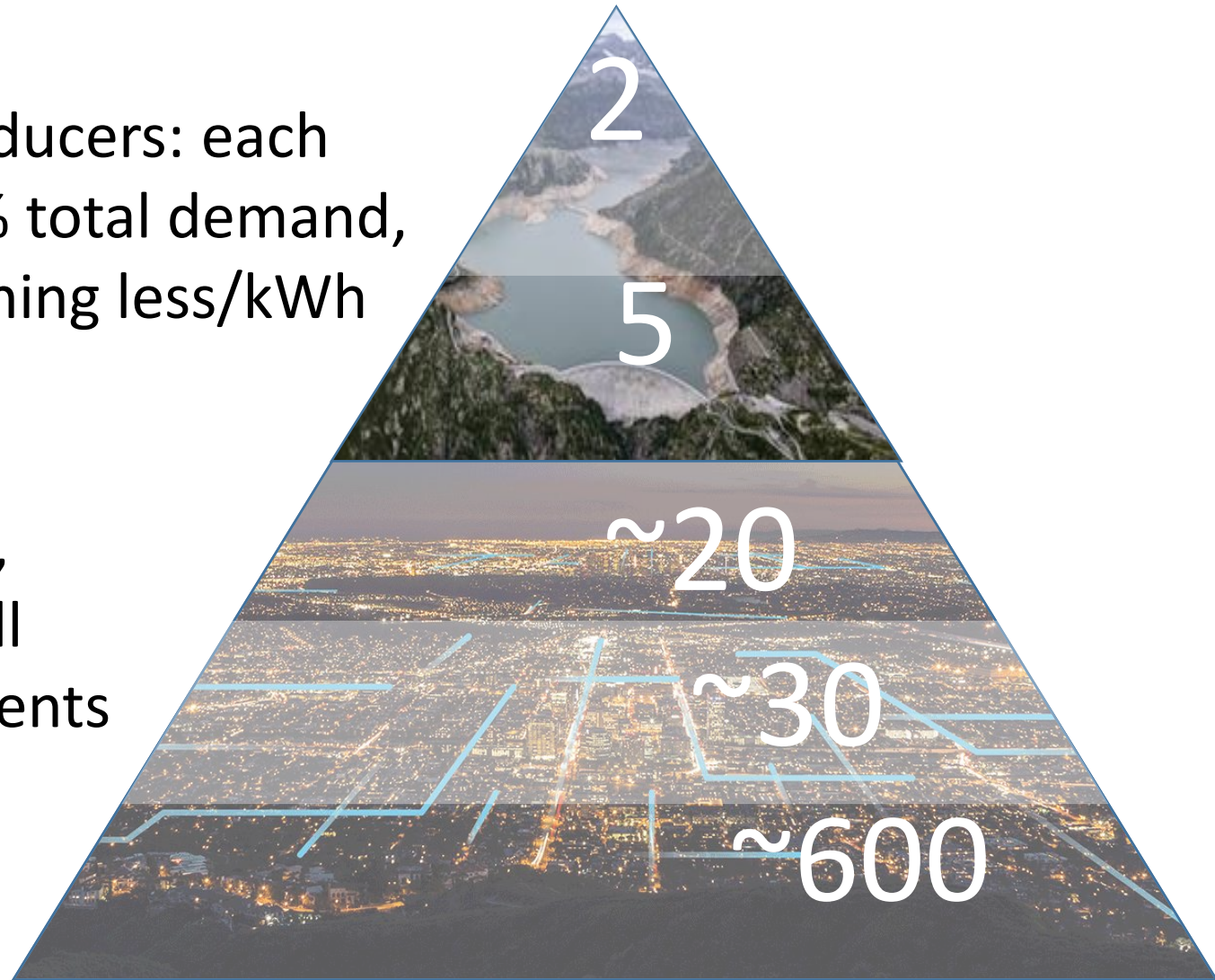


Source: Schweizerische Gesamtenergiestatistik 2016

# European renewable prices disrupting traditional business models

Producers: each  
>3% total demand,  
earning less/kWh

Retailers: Large,  
medium & small  
customer segments  
pass on costs

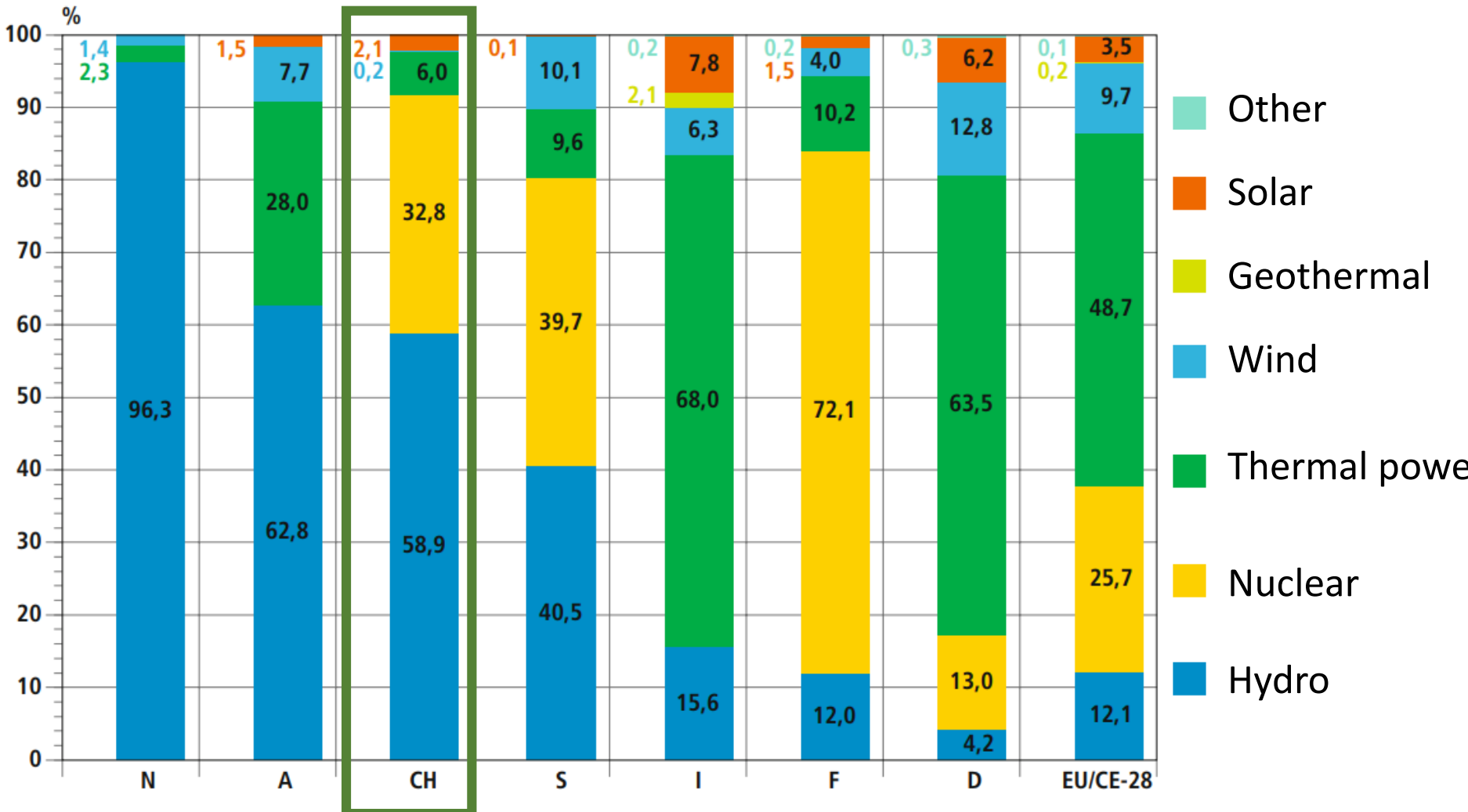


# Power in the hands of a few



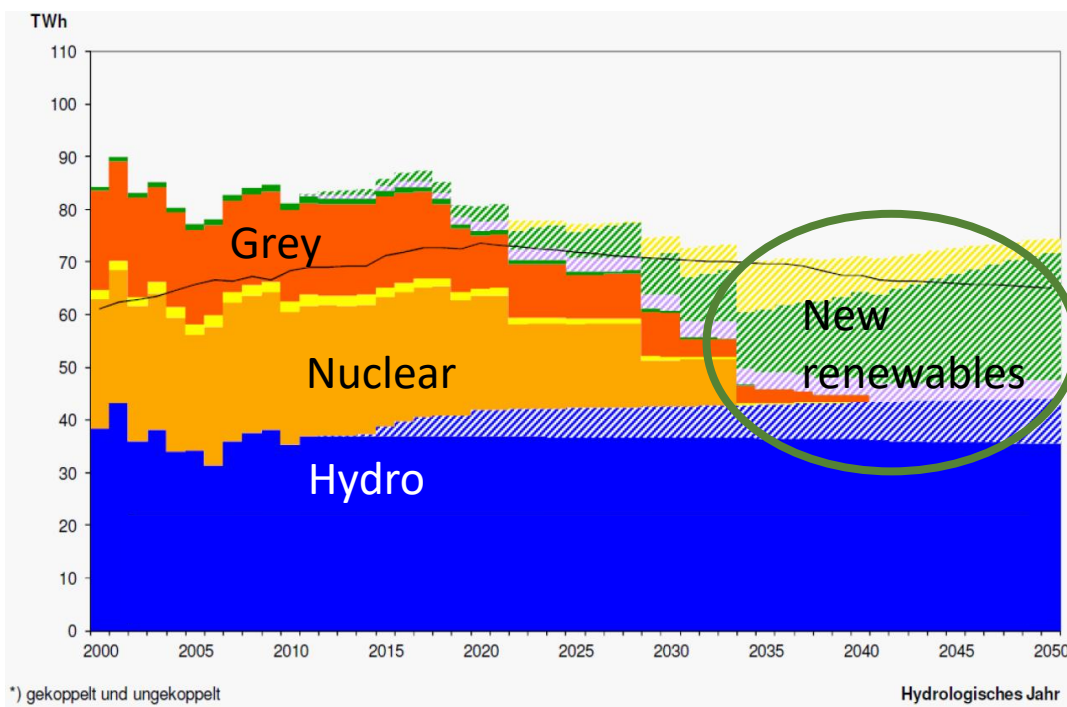


# Fossil-free electricity mix... to stay?



BFE, Schweizerische Elektrizitätsstatistik 2017 (Fig. 5)  
 OFEN, Statistique suisse de l'électricité 2017 (fig. 5)

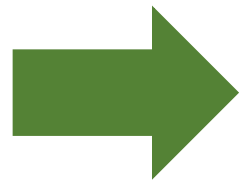
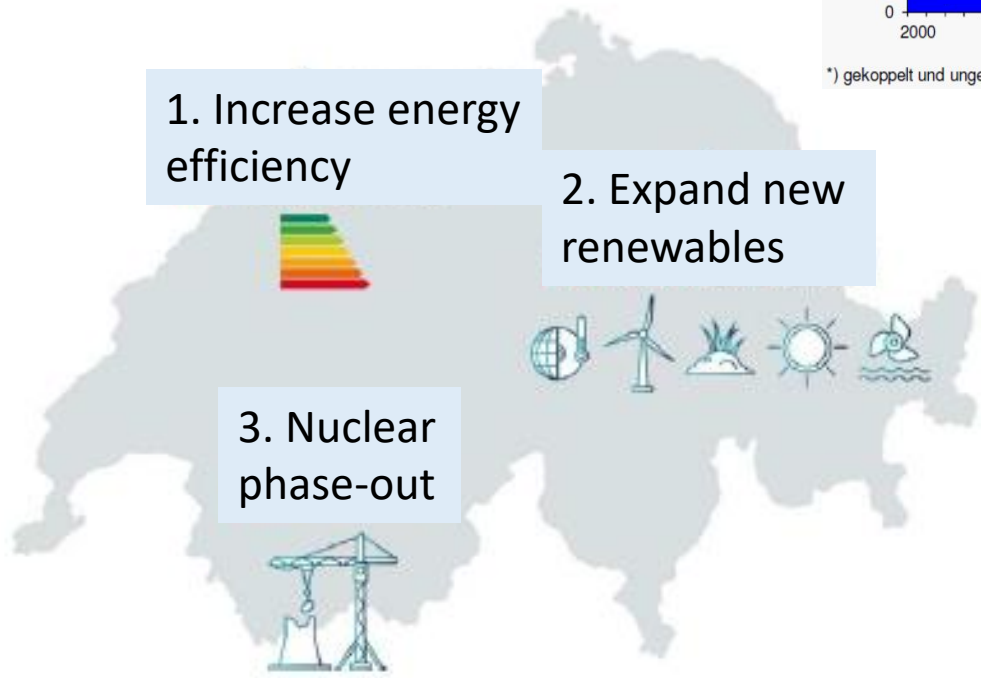
# Policy goals are ambitious



1. Increase energy efficiency

2. Expand new renewables

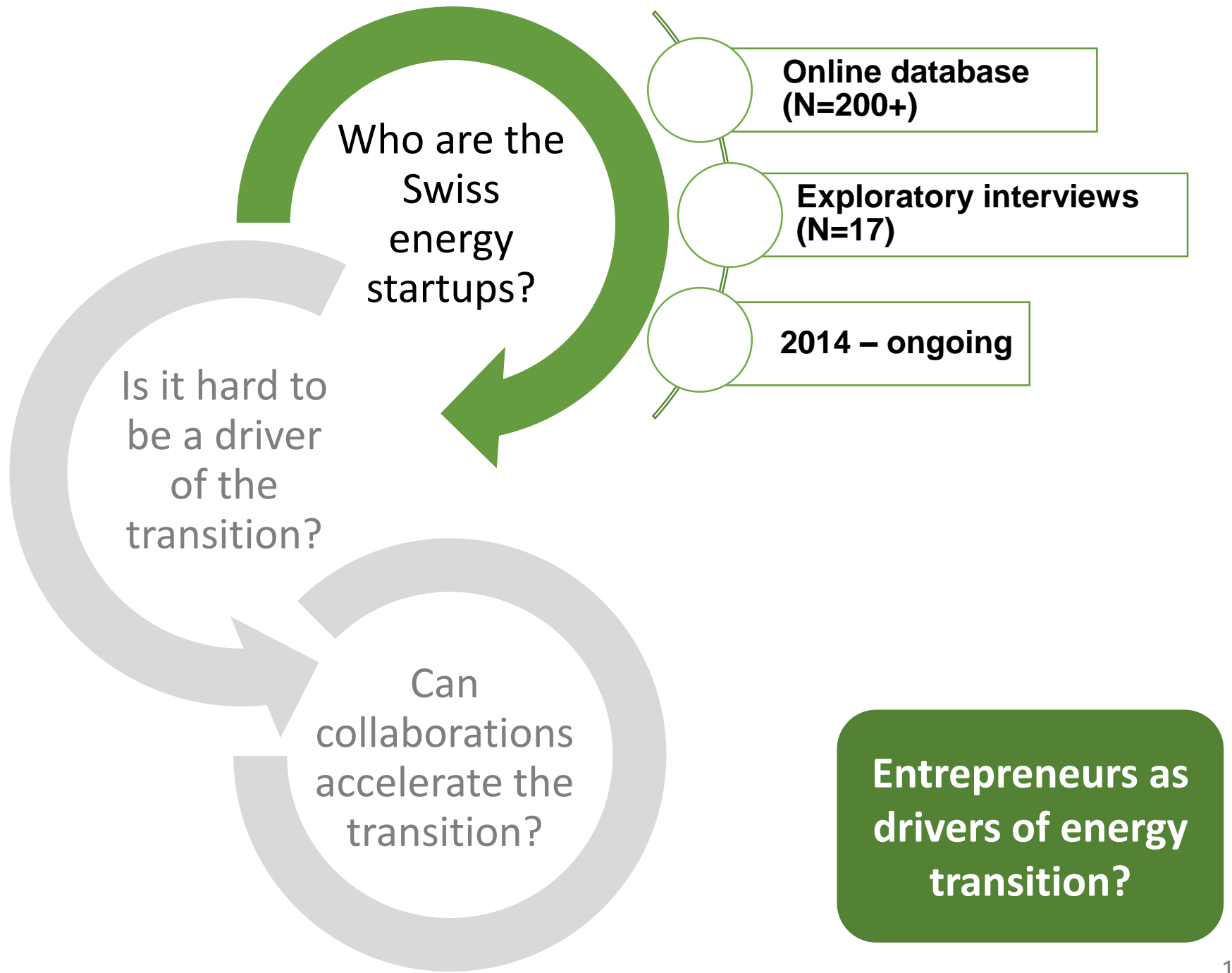
3. Nuclear phase-out



Digitisation  
 Decentralisation  
 (Decarbonisation)  
 Complexity  
 Flexibility

Transition is underway with serious impact on incumbents and tangible opportunities for start-ups.

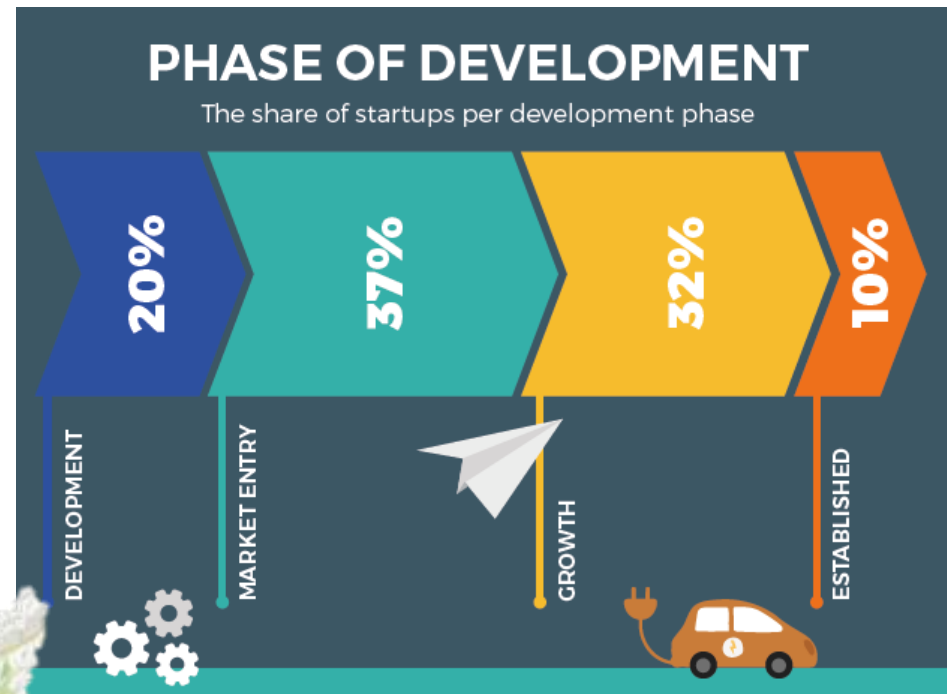




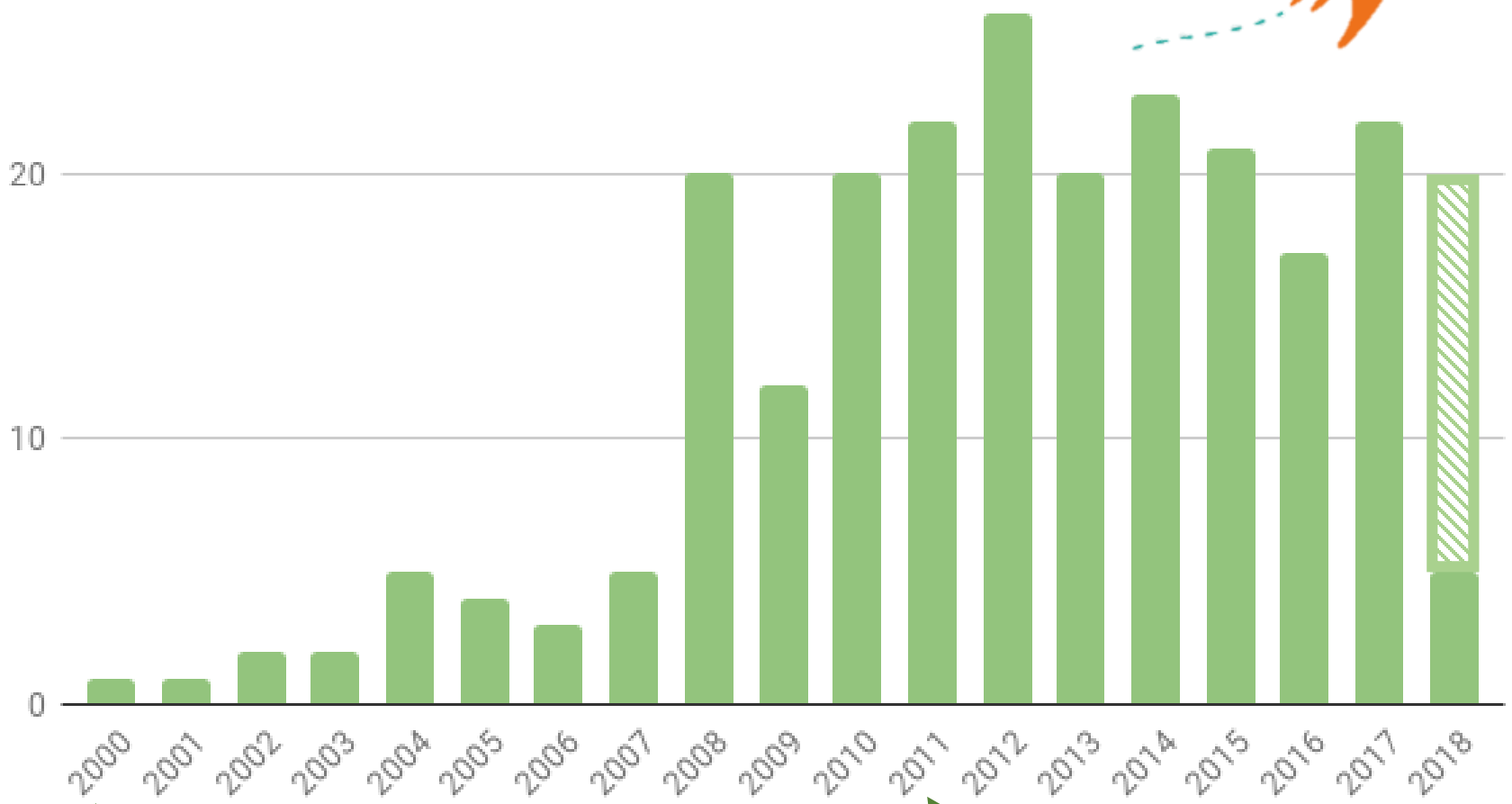
# Tracking the startups since 2014

 [www.innovation-monitor.ch](http://www.innovation-monitor.ch)

350 Startups  
→ 215 Energy



# Emergence after policy and business opportunities



↑  
CO2 tax

↗  
Partial liberalisation  
& solar FiT

↗  
Building efficiency  
programme expansion

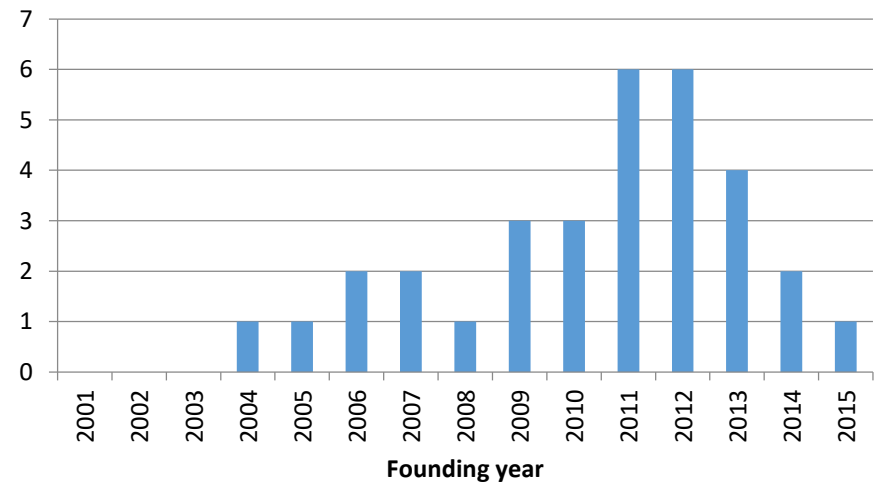
↗  
Fukushima & New Energy  
Strategy introduced

# Producing renewable energy



- Development of decentralized electricity production technology: solar panels, wind turbines, storage solutions

*“[installers and planners] chose technologies they know and which do not cause any problems”  
— fuel cell developer*

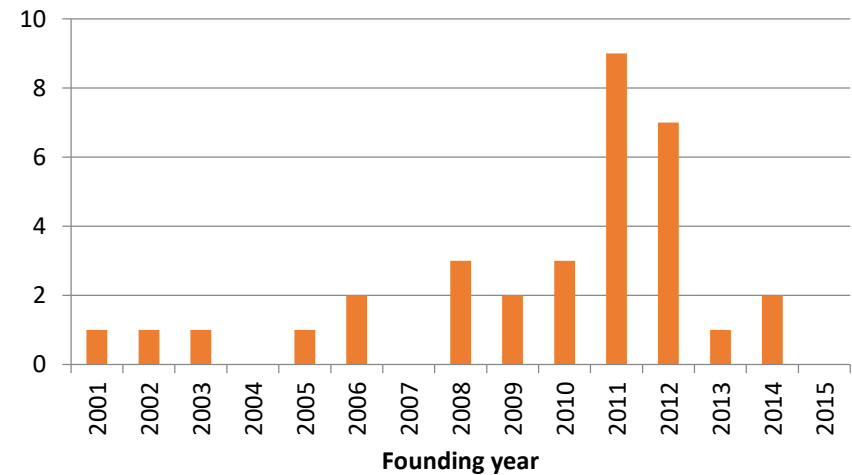


# Reducing electricity demand



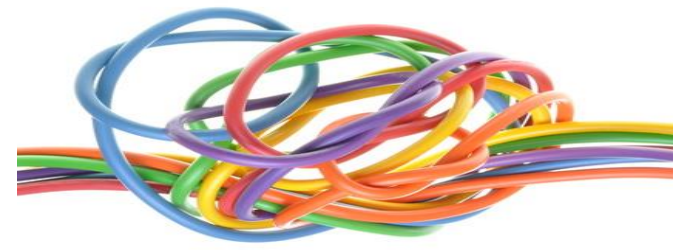
- Changing end consumer patterns through feedback, incentives, consultants. Technology and service providers.

*“Utilities are a key aggregator of household consumers, thus we have to reach them through that channel” – Energy efficiency device producer*



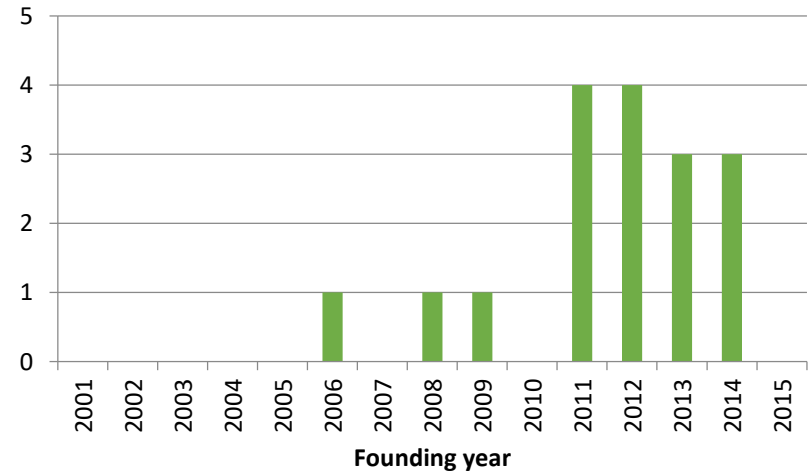


# Ensuring availability and flexibility



- Active in many parts of the energy supply chain to address problems related to predictions, storage, availability, safety, and pricing

*“The system is complex and changing, sector actors need new knowledge and skills” –Grid stability prediction software developer*



# Start-up Challenges

## Swiss Energy Business Environment

Customer Acceptance




Potential customers are not aware of value proposition

Potential customers struggle with understanding the value proposition

High concern for data security and privacy

Sector Barriers



Incumbent companies act as gatekeepers

Key actors are risk averse

**Building legitimacy in a conservative environment**

Long investment/ contract cycles client-side as entry barrier

Energy technology development and manufacturing are capital intensive

Regulatory Framework



Future political and legal situation is uncertain

(Indirectly) Energy prices

Start-up scene emerged from policy change and market opportunities, but significant challenges exist.



**Comparative online survey**

**Energy (n = 44/105)**

**Fintech (n = 39/216)**

**2015 - 2016**

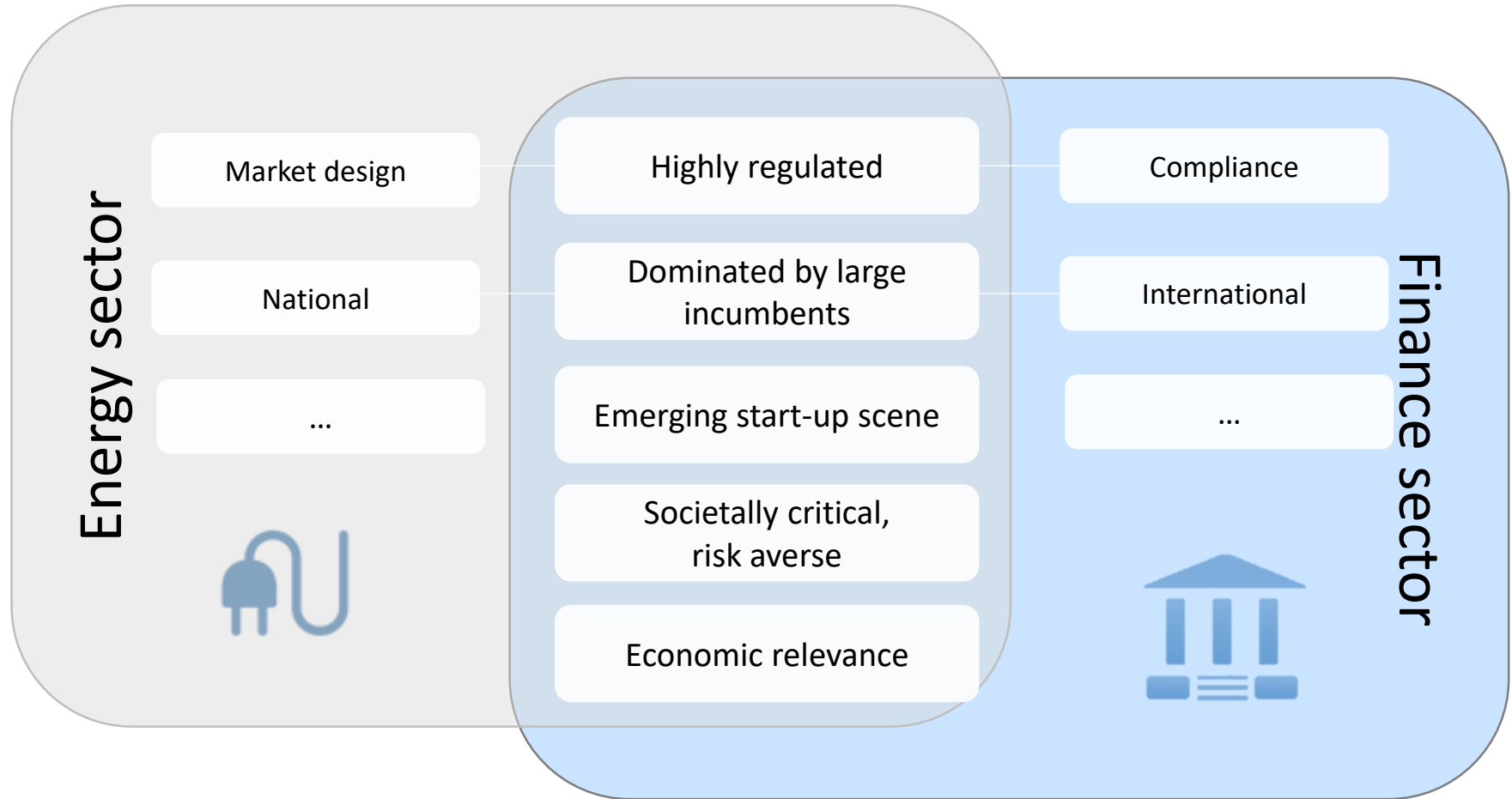
**Entrepreneurs as drivers of energy transition?**

Is it hard to be a driver of the transition?

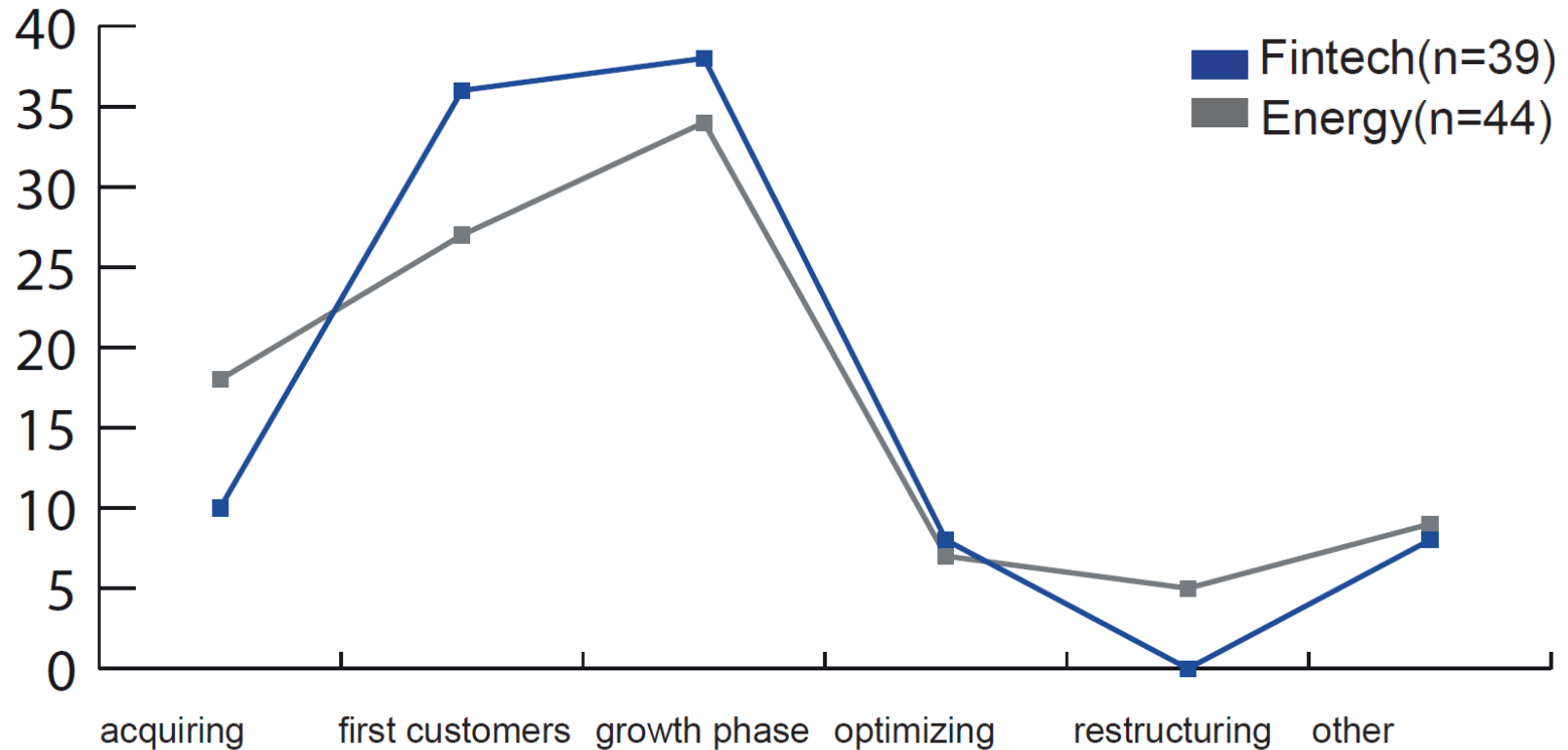
Who are the Swiss energy startups?

Can collaborations accelerate the transition?

# Energy and finance – similarities and differences



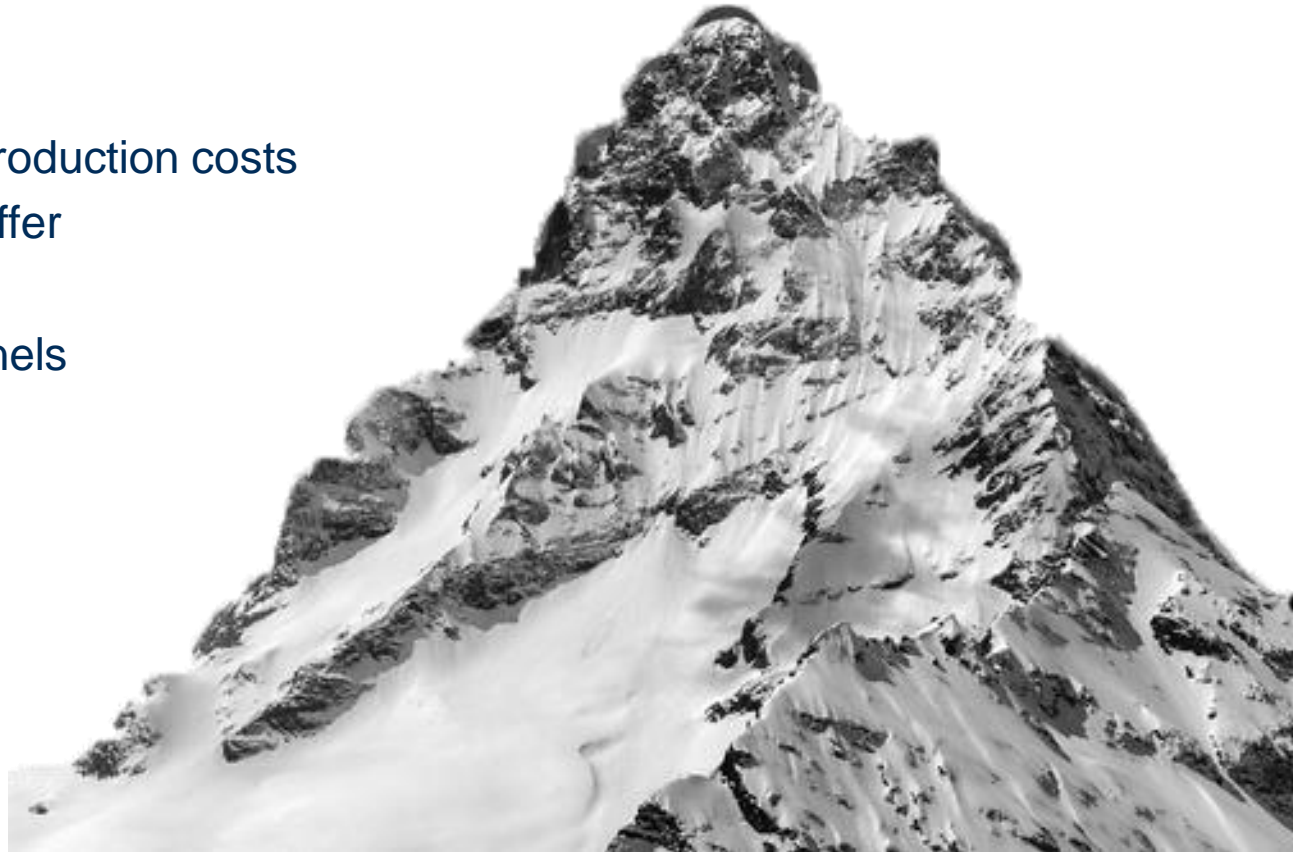
# Both are indeed start-up samples...



# Same same...

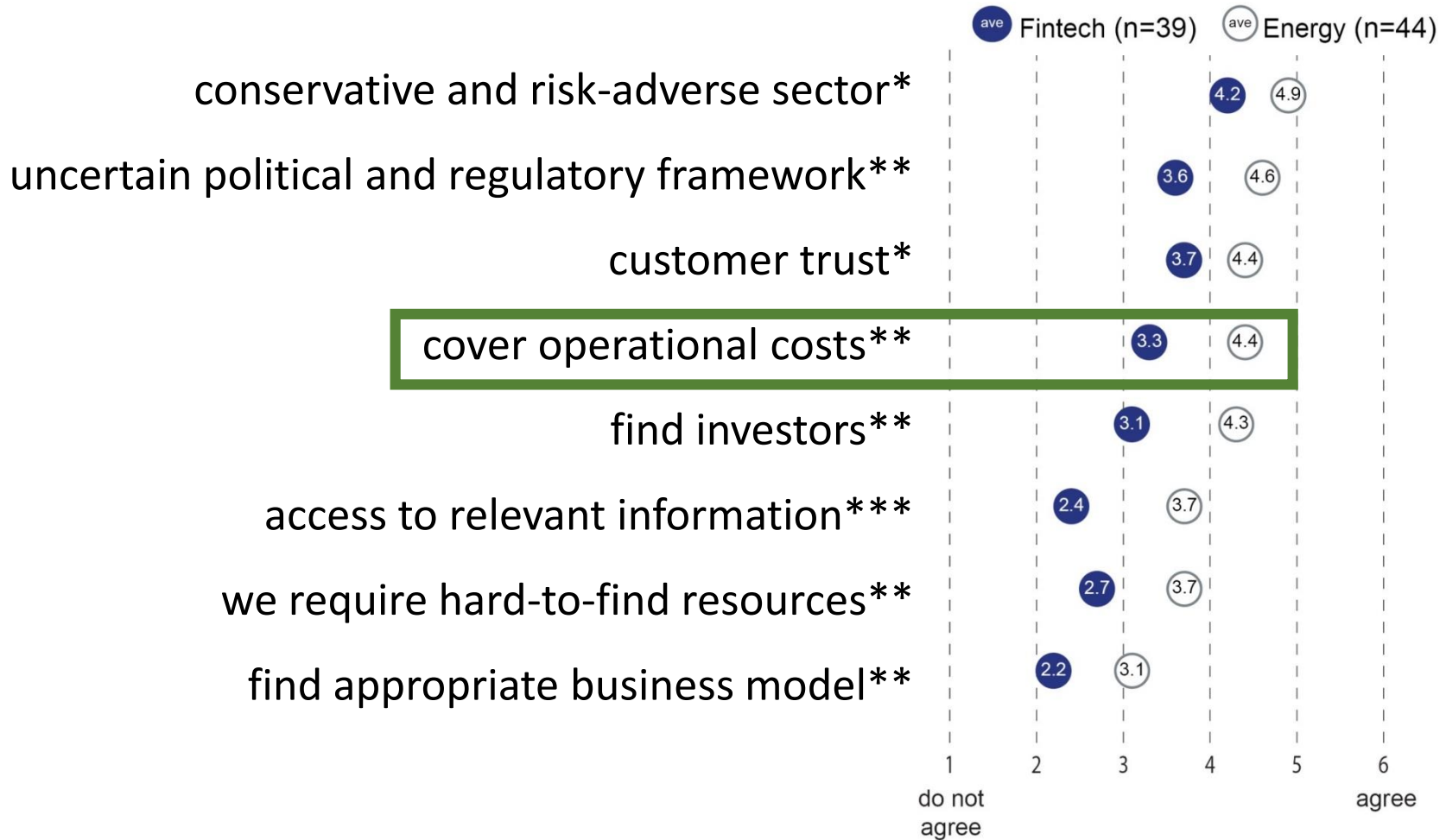
Top challenges → Same for both groups

1. conservative and risk-averse environment
2. uncertain regulatory framework
3. gain customer trust
4. cover operational costs
5. find investors
6. high development and production costs
7. convince customers of offer
8. skilled employees
9. finding distribution channels



But we need to look closer....

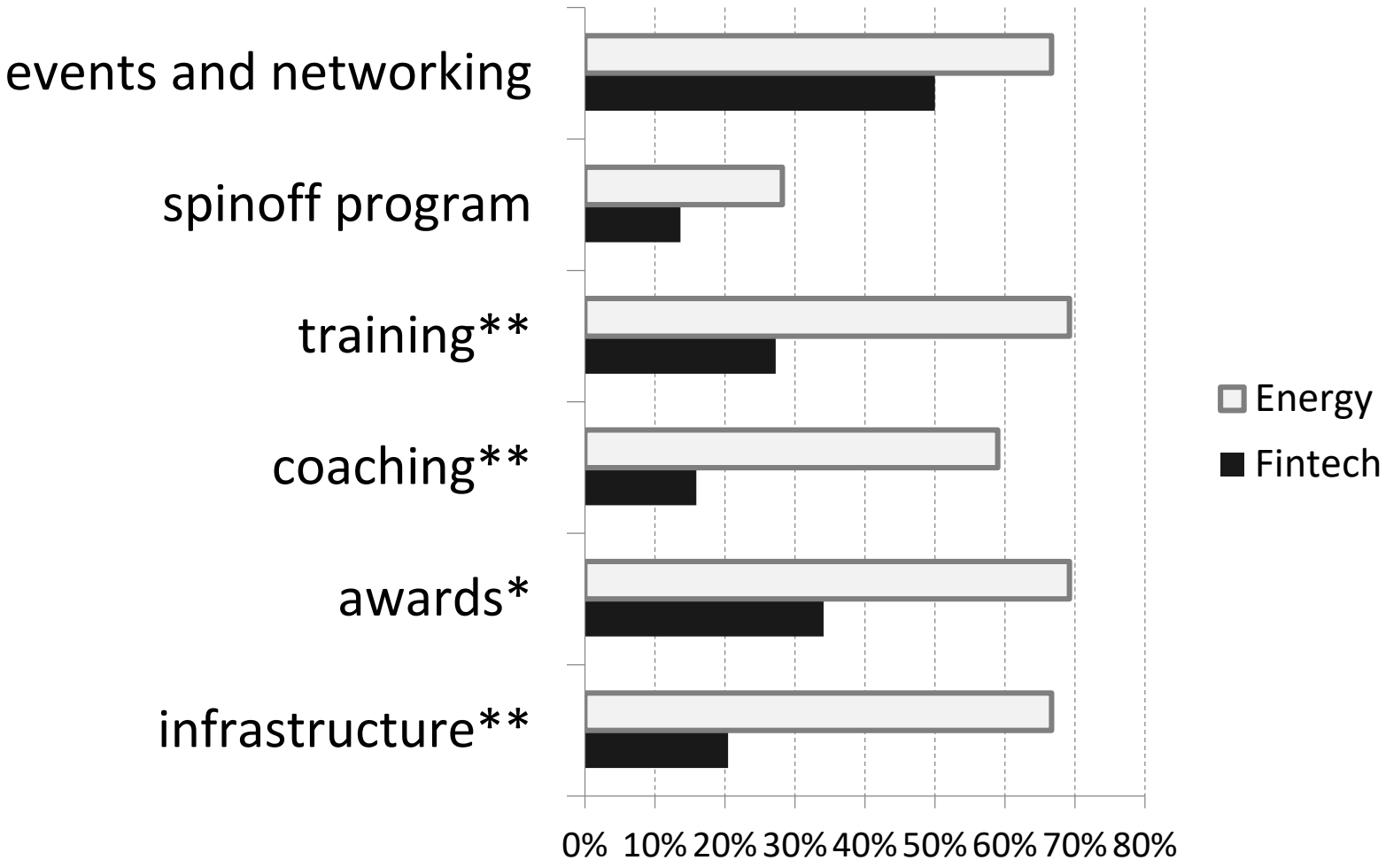
# ... but different



\*p<.05, \*\*p<.01, \*\*\*p<.001 (t-test)



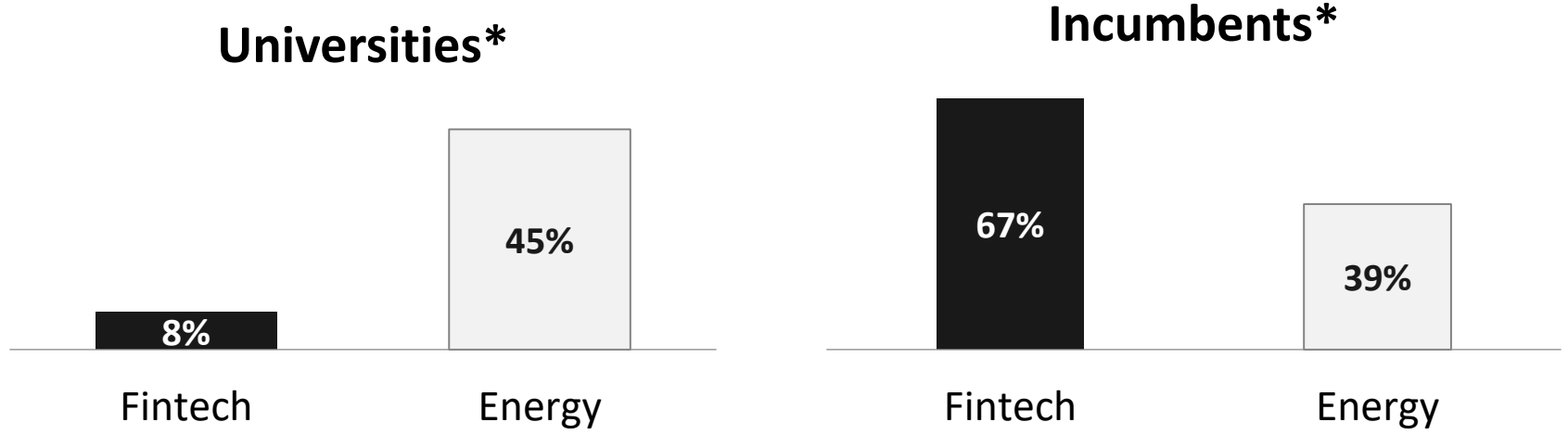
# Energy start-ups use more support



\*p<.05, \*\*p<.01, ( $\chi^2$ )

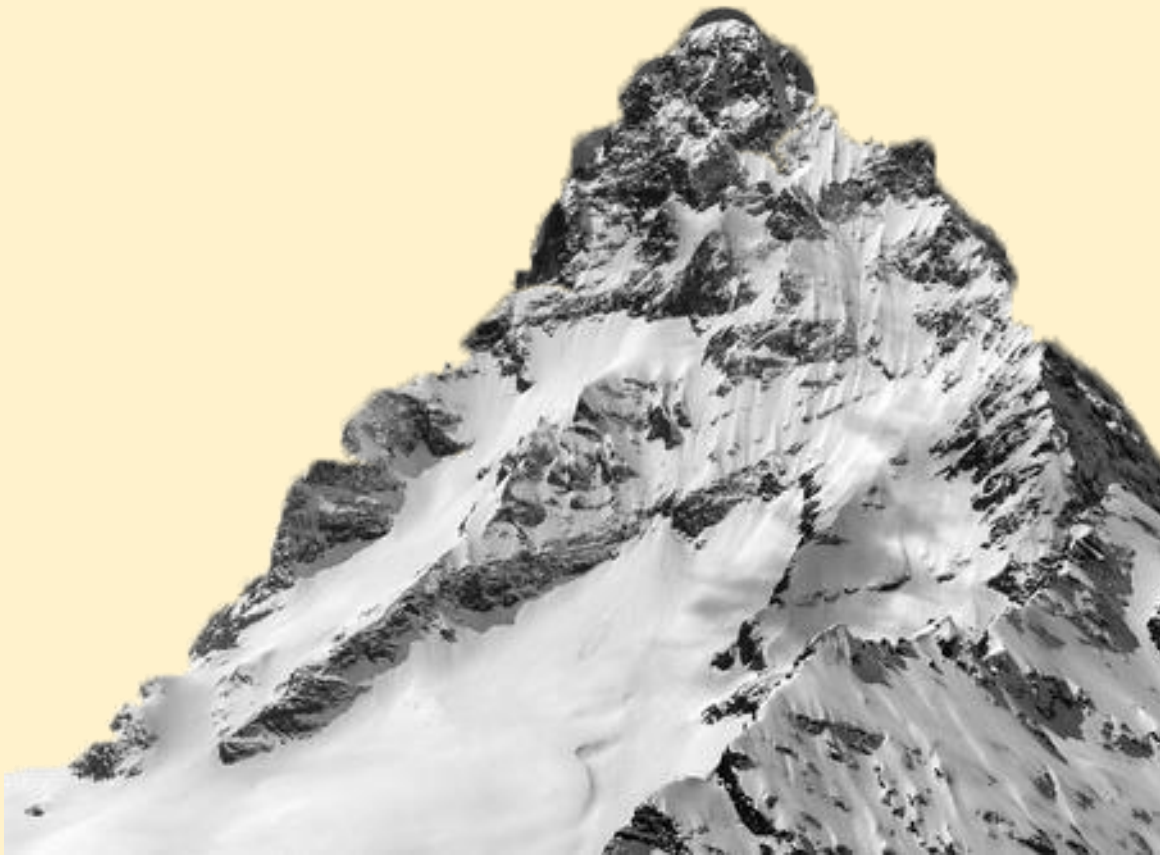
# Energy start-ups lack access to market

Typical collaboration partners:

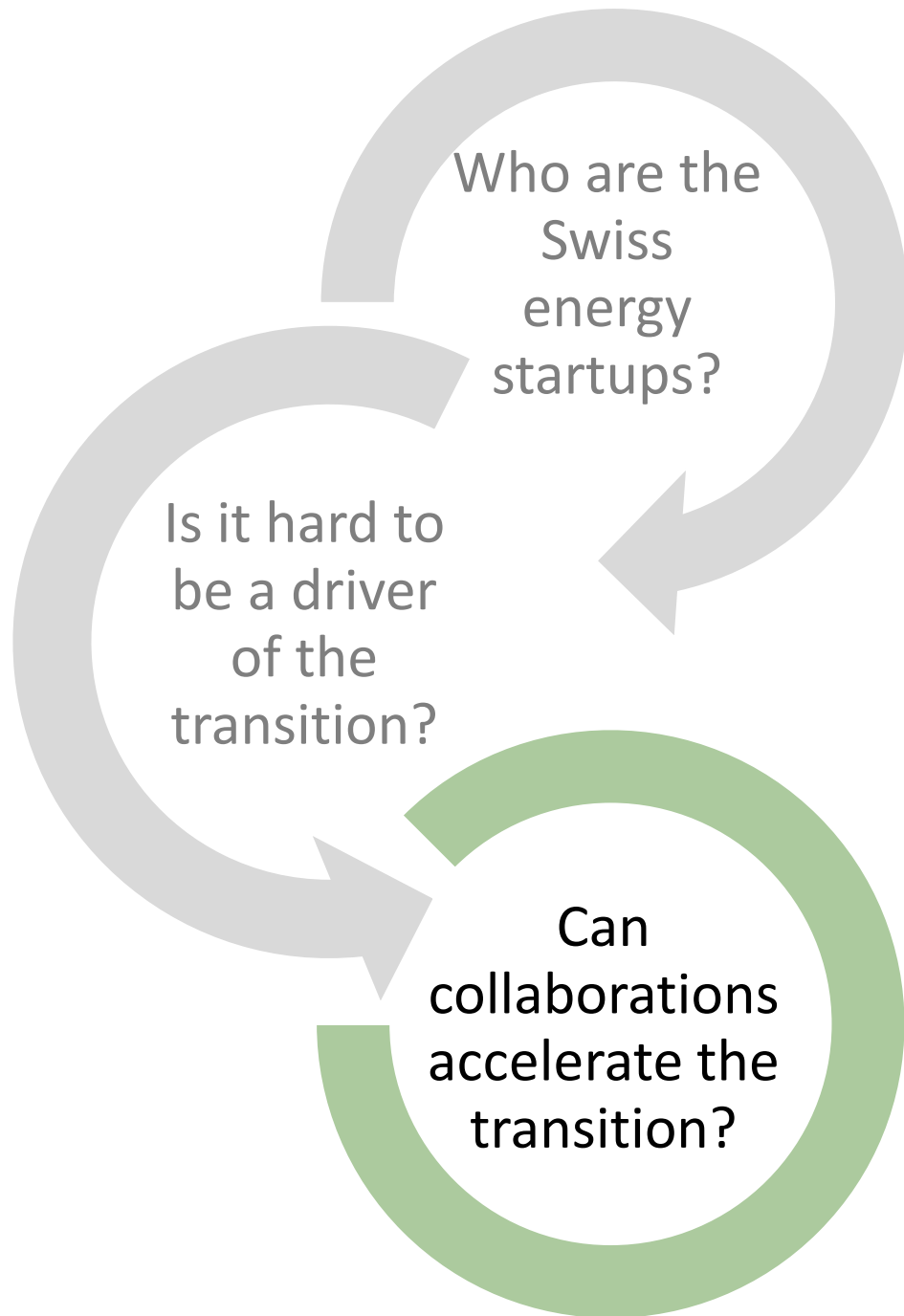


\*p<.05

Energy start-ups are  
unique in the  
extent of their  
challenges to  
growth.

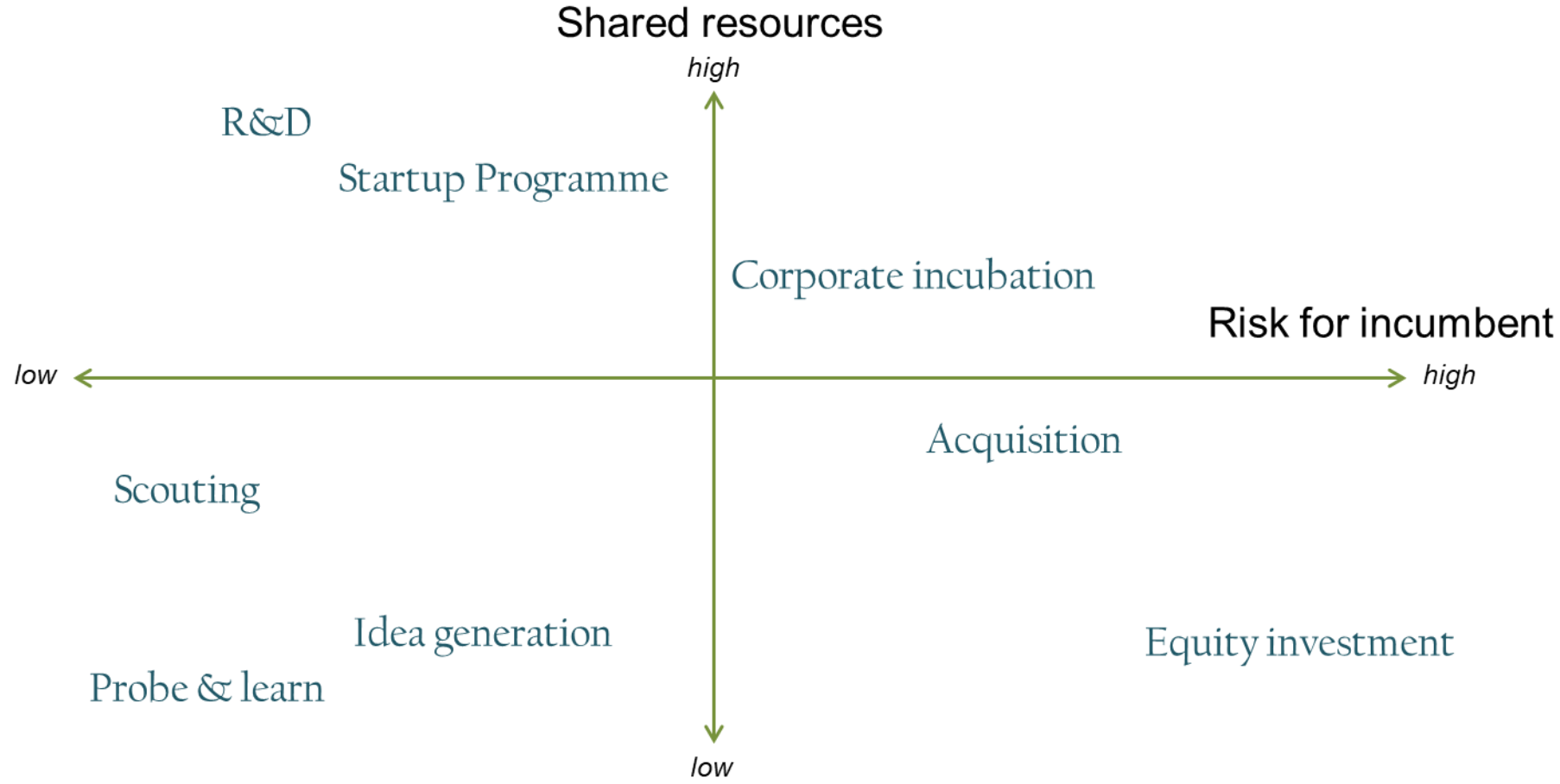


# Entrepreneurs as drivers of energy transition?

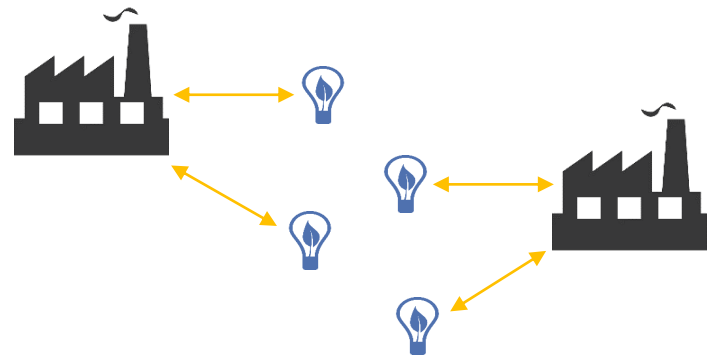
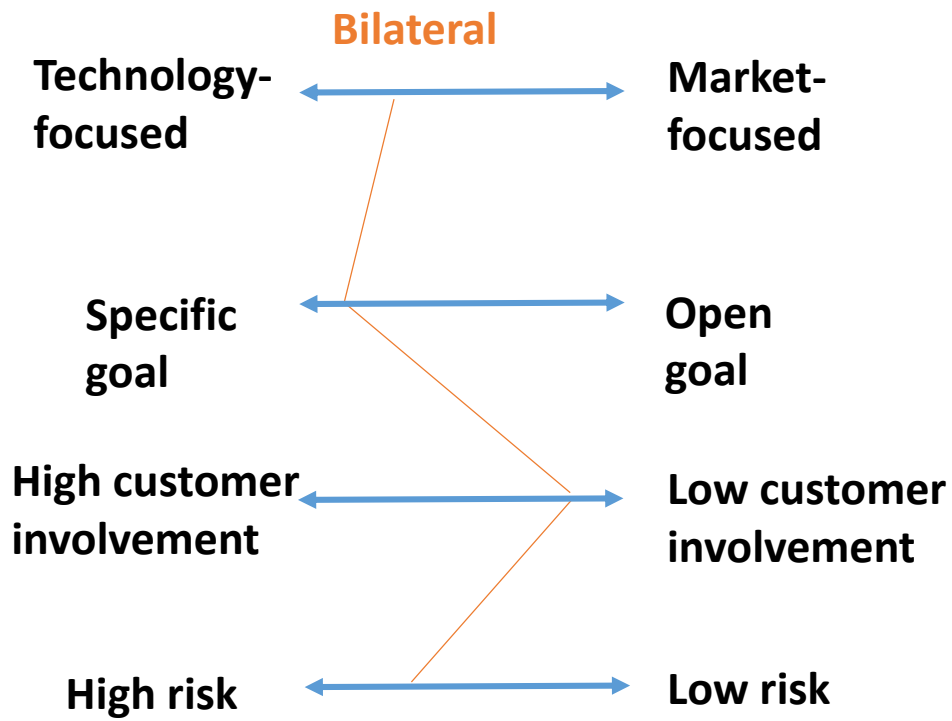


- Structured interviews
- 1 utility + 2 start-ups
- 1 Tech. Dev. + 3 start-ups
- 2017 – ongoing

# Different goals = different models

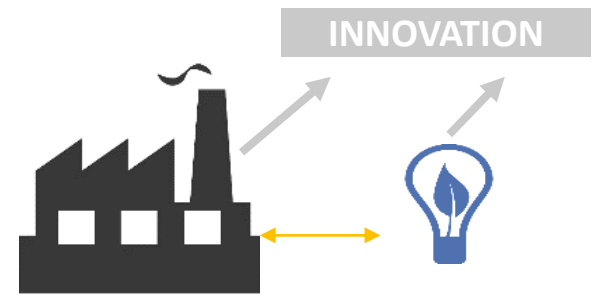


# Bilateral relations



*Traits:*

- Established company leads
- Enhances existing innovation
- Risk management strategies: driven by need for innovation or market-change



# Expectations vs. Reality

## Startups

- Bring product to market
- 1 large customer attracts the next
- Provide specialized skill or product
- Reputation and survival

- Continuing contracts
- Further customers make first collaboration fade

**Expectations fulfilled!**

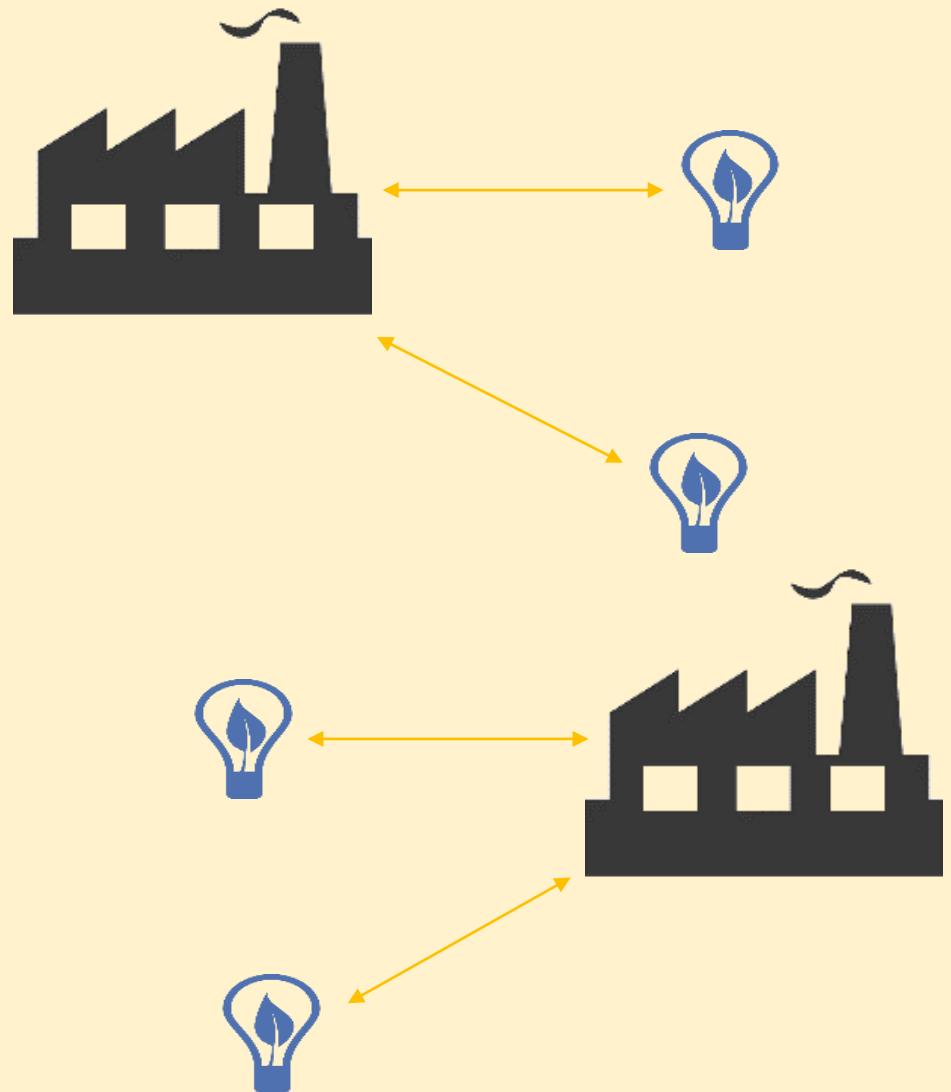
## Incumbents

- Looking for innovation in services, products, access to existing or new markets
- Risk management

- Learning just as valuable as investment
- Pivoting occurs within collaboration
- Cultural clashes

**More variability than anticipated.**

Start-ups benefit greatly from collaboration but competences challenged for majority of Swiss utilities.





# Take home messages

## 1) Energy start-ups are on a bumpy road

- Energy specific support
- More sector involvement
- Variety in collaborations

## 2) Policy development can play a bigger role

- Realise indirect impacts of policy
- Create conditions for uninhibited growth
- Push (& pull) sector to move

# Thank You

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Zurich University of Applied Sciences

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