HSLU Lucerne University of Applied Sciences and Arts

Engineering and Architecture
B.Sc.. Energy and Environmental Systems Engineering
Bachelor-Thesis

Adapting to Environmental Laws: Organizational and Technological Responses of Swiss Energy Companies

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1. Introduction, Goals and Research Questions

Switzerland's energy transition, guided by the *Energy Strategy 2050*, involves the phase-out of nuclear power, expansion of renewables, and stricter environmental laws. Companies must now navigate complex, multi-level regulations (federal, cantonal, international).

Problem & Objective: Energy firms face legal pressure + operational complexity → must reorganize & innovate. This study investigates how firms adapt internally and technologically to comply.

Main Research Question (MRQ): How do Swiss energy companies adapt organizationally and technologically to evolving environmental laws and regulations?

2. Method Overview and Materials

Qualitative research following a sequential structure, using ten expert interviews across diverse Swiss energy providers (municipal, national, international). The design is based on empirical, interpretive methods.

Semi-structured interviews conducted online using a list of questions as a guide. The content of the interview questions was determined with the sub research questions (SRQ) in mind.

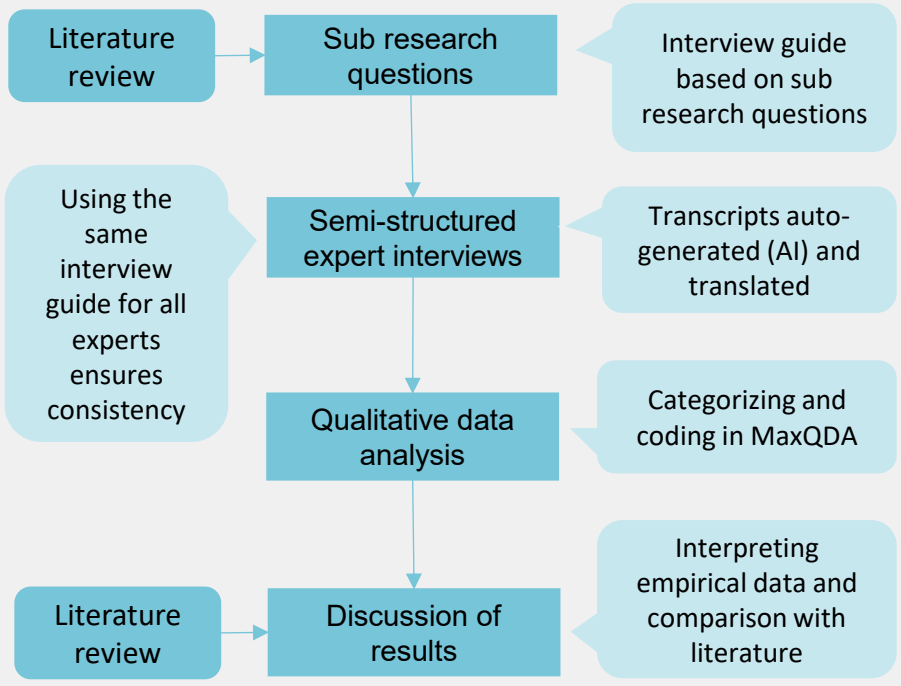

Figure: Step by step research approach

Key Tools & Inputs:

- MaxQDA for code development & analysis
- AI transcription tool: noScribe
- Deductive + inductive coding model
- Expert sample: strategic, compliance, sustainability professionals

Key Topics Covered: Laws, leadership, tech adoption, challenges, opportunities and strategies

3. Results and Discussion

The results come from expert interviews, coded and grouped into seven main categories. These show how companies deal with environmental laws in practice.

Figure: Code system: main categories from MaxQDA

Organizational changes: New sustainability teams, cross-functional compliance units, ESG in KPIs. Leadership is key, drives strategy and internal buy-in.

Technology adoption: Smart meters (mandated), SF_6-free switchgear, battery systems, hydropower retrofits, e-mobility. Often piloted before full rollout.

Challenges: Regulatory layering (federal/cantonal/EU), Approval delays, Skills and resource shortages, Financial uncertainty for long-term projects

Opportunities: Efficiency gains through smart infrastructure, Stronger public image, easier access to green finance, New services (energy consulting, EV infrastructure)

4. Conclusion and Recommendations

Swiss energy firms are shifting internally and technologically due to regulation—some proactively, others reactively. Laws are both a constraint and catalyst.

Firms: Build internal expertise, use pilot testing, align sustainability with strategy
Policy: Simplify laws, speed up approvals, support small actors
Sector: Share knowledge, plan for long-term, engage stakeholders

References

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Semester: Spring Semester, 2025